

Low backlash planetary
gearheads
Servo right-angle gearheads
System solutions
Accessories

Product catalog 2014/2015

1984

30 years

WITTENSTEIN alpha

2014

Product catalog 2014/2015

Low backlash planetary gearheads
Servo right-angle gearheads
System solutions
Accessories

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Contents

Your partner in excellence	06
WITTENSTEIN alpha Services	12
Gearhead overview	18
Planetary gearhead High End	22
alpheno®	24
RP+	26
TP+/TP+ HIGH TORQUE	28
SP+/SP+ HIGH SPEED	70
Planetary gearheads Economy	120
LP+/LPB+ Generation 3	122
alphira®	140
Right-angle gearheads High End	150
RPK+	152
TK+/TPK+/TPK+ HIGH TORQUE	154
SK+/SPK+	202
HG+	240
SC+/SPC+/TPC+	252
V-Drive+	284
Right-angle gearheads Economy	312
LK+/LPK+/LPBK+	314
V-Drive economy	342
System solutions	356
alpha linear systems	358
Systems	360
Rack, pinion, lubrication system	364
alpha IQ/torqXis	386
Accessories	388
Couplings	390
Shrink discs	410
Flange shafts	412
Information	414
Quick gearhead selection	416
Gearhead – Detailed sizing	418
Hypoid – Detailed sizing	422
Modular system matrix “Output type”	424
V-Drive – Detailed sizing	426
Coupling – Detailed sizing	428
Glossary	432
Order information	438



WITTENSTEIN alpha GmbH Management:
Dr. Bernd Schimpf

Dear Customers,

In 2014, we celebrate the anniversary of our company's 30-year history. When he founded alpha getriebebau GmbH in 1984, Dr. Manfred Wittenstein laid the foundation for what has now become WITTENSTEIN alpha GmbH. While the name of the company has changed, the characteristics that have made us successful remain the same today. For many years now, our customers have known what they can rely on: leadership in innovation, consulting, technology, and quality.

But how does a company achieve market leadership, and how does that company remain successful? First and foremost, through the dedicated commitment of each and every employee to achieve engineering excellence.

With efficiency engineering, WITTENSTEIN alpha combines many of the unmistakable features that have characterized our organization for many years into a powerful mission statement. For us, efficiency engineering means efficient processes and efficient products. This drives us to focus not only on the efficiency of a component, but on all of our customers' requirements. Consider these two examples: The new rack installation concept reduces installation time by up to 50%, and the new Hygienic Design series is the world's first planetary gearhead that is certified to EHEDG.

This is our commitment to you: in the future, we will continue doing exactly what the founders of the WITTENSTEIN Group did so well: ensure leadership in the world market through an unwavering commitment to innovation, and be the global benchmark for drive technology.

Find out for yourself!

Your WITTENSTEIN alpha GmbH Management Team

WITTENSTEIN Group

Specialized fields united in one company



Drives, controls and positional accuracy are areas that require maximum precision. Products manufactured by WITTENSTEIN alpha GmbH are setting benchmarks worldwide in the fields of mechanical engineering and drive technology. From low backlash planetary gearheads, servo right-angle gearheads and complete drive units to the comprehensive cymex® engineering software package and expert technical consultation: WITTENSTEIN alpha GmbH has redefined the meaning of precision.



WITTENSTEIN electronics GmbH develops, manufactures and distributes **electronic and software components** for complex mechatronic drive systems and provides tailor-made support for its own innovative technology. The intelligent and efficient electronic components are characterized by outstanding power density and excellent reliability and are capable of working under extreme environmental conditions.



Integration plays an innovative role here and is a decisive factor in increasing power density and dynamics. WITTENSTEIN motion control GmbH develops **mechatronic drive systems with a high customer benefit** based on the products of the WITTENSTEIN Group. Under extreme operating conditions, electromechanical servo systems impressively demonstrate characteristics such as controllability, precision, functionality, reliability and durability.



Outstanding power density and dynamics, minimal weight and maximum reliability characterize the **servo motors** from WITTENSTEIN cyber motor GmbH. Customized motors for increased productivity and longest service life. Thanks to the development of special materials, the motors are suitable for use under extreme environmental conditions such as ultra-high vacuum, radioactive areas and in high-temperature applications.



Photo Phoenix: EADS Astrium

WITTENSTEIN – Products that know no limits. High-precision drive systems for diverse branches of industry: Drive technology · Electronics · Machine tools · Manufacturing systems · Robotics, automation, handling · Textile, printing and paper machines · Laser, glass and wood processing machines · Food and packaging machines · Pneumatics · Semiconductor industry · Linear technology · Aerospace industry · Extreme ambient conditions (such as high temperatures, ultra-high vacuums) · Oil exploration · Medical technology · Pharmaceutical industry · Motor racing · Automotive and tire industry · Optical media · Vehicle technology · Defense technology

WITTENSTEIN AG is active in **eight innovative fields of business**, each with their own subsidiaries: Servo gearheads, servo drive systems, medical technology, miniature servo units, innovative gearing technology, rotary and linear actuator systems, nanotechnology, as well as electronic and software components for drive technology.

WITTENSTEIN AG employs approximately 1,800 people worldwide and is represented by 60 subsidiaries and dealerships in more than 40 countries.



intens



bastian



aerospace
& simulation



Intelligence fascinates, inspires and adds that extra dimension. Innovative medical technology manufactured by WITTENSTEIN intens GmbH, which **focuses mainly on intelligent implants** achieves all of the above. FITBONE® is currently the only fully-implantable, mechatronic intramedullary pin for bone extension worldwide that can be controlled and adjusted through the use of intelligent technology. Intelligence is crucial to every step of the development process, right up to the end product.

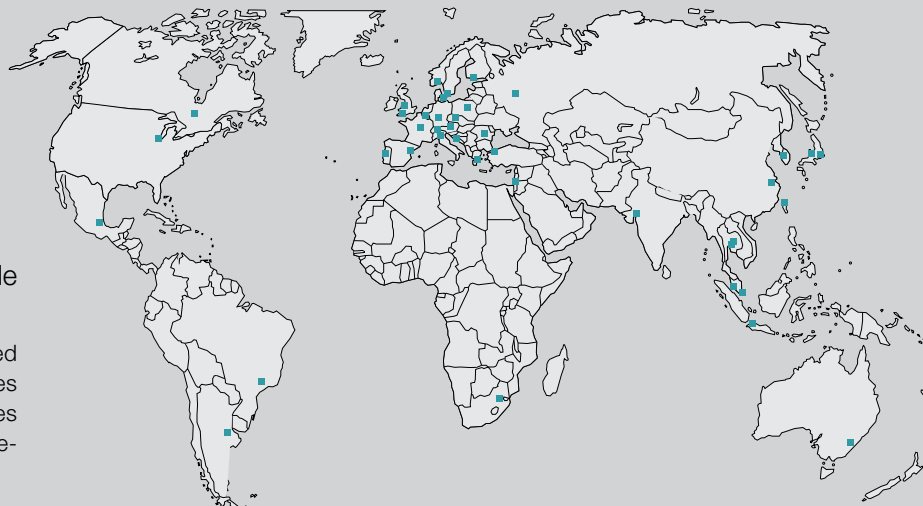
Whether in the design, manufacture, inspection or testing phase – when developing innovative gearing technology, WITTENSTEIN bastian GmbH always considers the unique requirements of the different application areas. Thus, solutions are **created that really connect**. WITTENSTEIN bastian GmbH redefines the concept of individuality on a daily basis: because the company is open to innovation and has the courage to explore unknown territory.

Maximum effect, minimum weight and efficiency plays a vital role in the aerospace industry. The powerful actuator systems manufactured by WITTENSTEIN aerospace & simulation GmbH represent both high quality and unique compactness. These highly efficient systems are used **in the Airbus A380 as well as in training aircraft and simulators**.

attocube systems is a sought after partner for high-end laboratories in science and industry worldwide and specializes in integrated system solutions for custom applications in the field of nano technology. The company develops and produces an unrivaled product family comprised of **nano positioners, distance sensors, cryostats and complete microscope systems** – all of which operate reliably and precisely at the very limit of what is physically and technically possible.

WITTENSTEIN worldwide

No matter where you need us: A comprehensive sales and service network provides quick availability and competent support worldwide.



WITTENSTEIN alpha is setting benchmarks worldwide in the fields of mechanical engineering and drive technology

3 x 1 = one or
“The whole is more than the sum of its parts!”

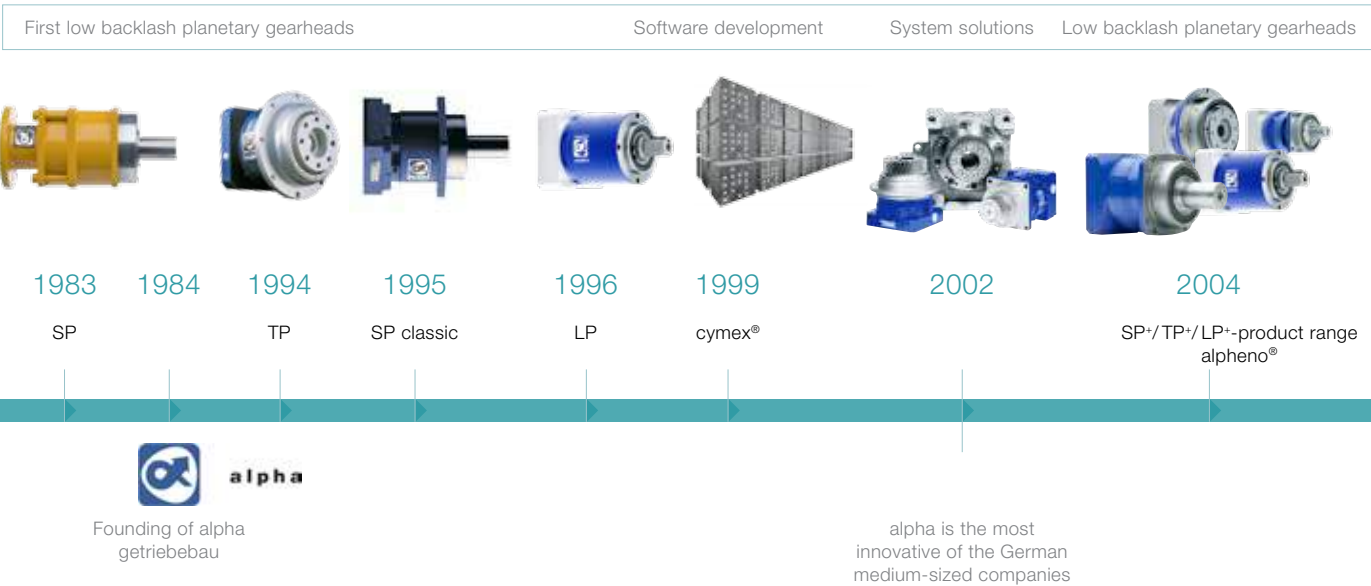
Listening, understanding, calculating, optimizing and implementing tailored solutions for our customers – for WITTENSTEIN alpha, engineering begins at an early stage and continues far beyond successful implementation.

As one of the few manufacturers of mechanical drive systems worldwide, we combine multiple core competencies as a prerequisite for stringent as well as integrated engineering, all under one roof.

Research &
Development,
Production
and Sales ...

... from a single source!

30 years of WITTENSTEIN alpha



A comprehensive sales and service network provides quick availability and competent support worldwide. Thanks to many years of experience, our expert specialists provide market leading consultation for a wide variety of industrial sectors.



Machine tools and manufacturing systems

Maximum precision, process reliability and productivity thanks to durable, virtually backlash-free and torsionally-rigid mechanical system solutions used in feed, swivel and auxiliary axes, for example.



Food and packaging machines

A range of gearheads designed for all types of axis used in packaging technology - including gearheads in a corrosion-proof design - for maximum operating efficiency, machine flexibility and cycle speeds.



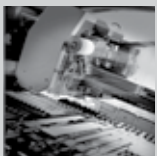
Wood processing machines

Mechanical systems such as gearheads with rack and pinion combined with on-site consultation and a comprehensive knowledge of engineering, form an impressive package that guarantees a high-quality end product with maximum efficiency.



Printing and paper machines

Innovative gearhead products that offer high constant speeds, seamless synchronization and permanent precision – the perfect solution for high-quality printing processes and other continuous applications. Available as an option: Integrated sensors for monitoring web tension and similar parameters.



Robotics, automation and handling technology

A wide range of servo gearheads and mechanical drive systems, from low-cost to high-end products for all types of robot and auxiliary axes such as drive axes and tool manipulators.

Servo right-angle gearheads

The revolution
in linear technology

New generation LP⁺/LPB⁺

Hygienic Design/New
generation of bevel gears

New generation
of racks



2007 2008

TPK⁺/SPK⁺/
HG⁺/SK⁺/TK⁺



2011

High Performance Linear System



2012

LP⁺/LPB⁺
Generation 3



2013

Hygienic Design/
SC⁺/SPC⁺/TPC⁺



2014

Innovative
rack installation



Change of name to
WITTENSTEIN alpha

alpha



efficiency engineering
mission statement

30 years of
WITTENSTEIN alpha

WITTENSTEIN alpha Services

Individual support at each interaction stage



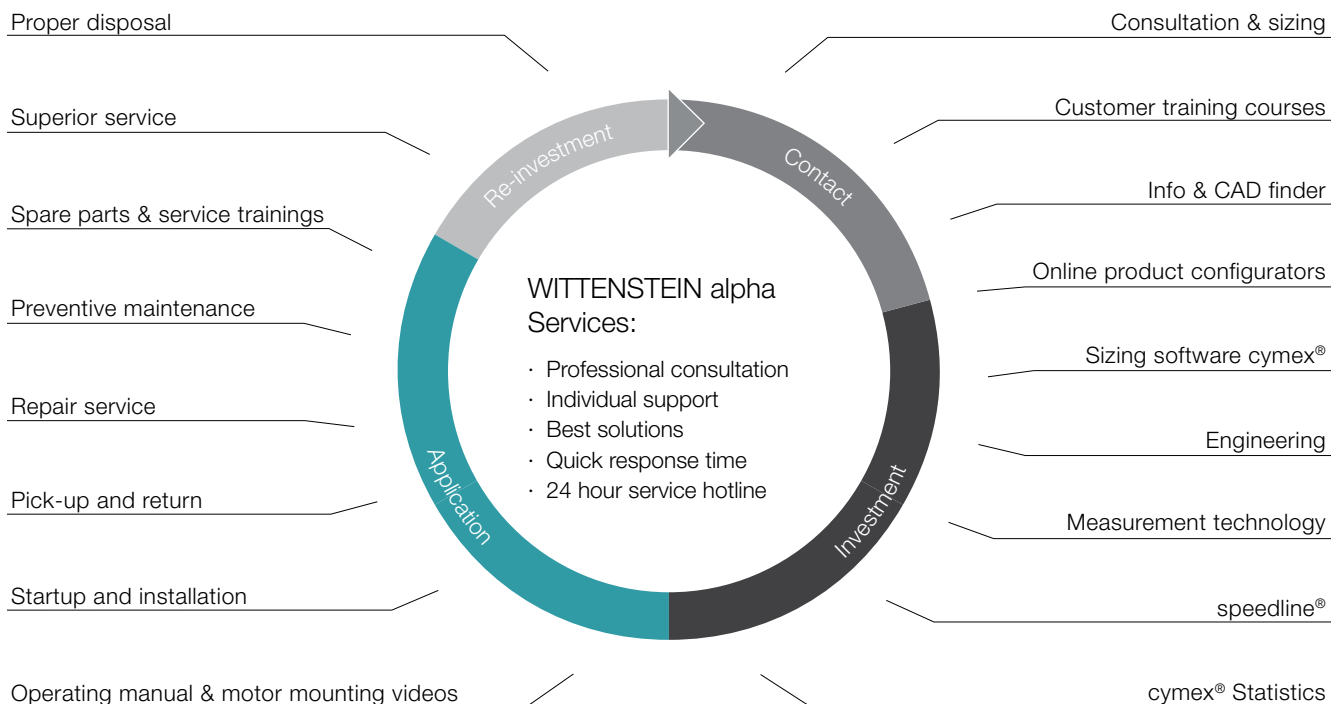
Fascinated with innovative and efficient system solutions

With the WITTENSTEIN alpha service concept, we are now also setting new standards in the field of customer support. We are there for you, from the initial concept and throughout the entire life cycle of your application. Our global consultation network supports you in your complex challenges through our extensive

experience, a variety of sizing tools and individual engineering services. Fast response times in the logistics area and the speedline® as well as on-site support during the installation and commissioning of mechanical systems provide you with a sustained competitive edge. In terms of after-sales, our Customer Service is personally

available to you with highly qualified and committed expert personnel - around the clock.

When it comes to customer support, you can count on us!



You can find detailed information in our Service catalog and at: www.wittenstein-alpha.de/en

In North America use: www.wittenstein-us.com
In the UK use: www.wittenstein.co.uk

speedline®: Tel. +49 7931 493-10444 24h service hotline: Tel. +49 7931 493-12900

Consultation
and sizing
Personally on-site
for you

Engineering
Your challenge
is our drive



Consultation means experience

Our expertise

Personal consultation on drive technology, customized services, and process and drive peripherals. You can count on our regionally-based sales and technical expertise, worldwide.

Your benefits

- Professional consulting
- Personal contact
- Best solutions through professional application calculations and drive design

Your benefits

Increase reliability through selection of drives for highly complex applications

- Reduce development costs through time savings
- Increase machine and process reliability
- Increase performance and productivity
- Individual project support

System expertise

- Complex multi-axle analysis
- Multi-body simulation (2D)
- Multi-body simulation (3D)
- Optimization of motion design

Component expertise

- Tooth design
- Shaft and bearing design
- FEM calculations
- Project consulting and design support



Extensive expertise
in application sizing and simulation



Online tools

Available free of charge at any time



Online product configurators

Your application is configured according to your specific requirements

Are you searching for the right drive solution for your application? With our product configurators, we will help you at every step of the way to find your solution.

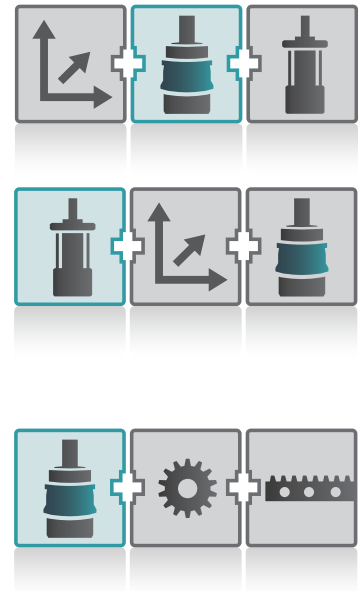
Your benefits

- Optimized for a quick and efficient selection
- Intuitive user guidance
- Online check of motor and gearhead compatibility
- All application information at a glance

We offer three different online product configurators:

- Gearhead + motor configurator:
Uses your application requirements to first select a gearhead and then a suitable motor.
- Motor + gearhead configurator:
You know which motor you would like to use, or wish to select a motor first. Once you have selected the correct motor, you want to find the right gearhead that is compatible with your motor and also satisfies your application requirements.
- Rack & pinion configurator:
Find the right components for your rack and pinion system.

The online product configurators are available free of charge at: <http://www.wittenstein-us.com/tech-support/design-tools/>



Info & CAD Finder

The required information - simply and quickly

With our Info & CAD Finder, you can find the product you are looking for in just a few clicks. Here you will also find performance data, CAD data, operating instructions and motor mounting instructions for your product.

Using the intuitive menu, it is easy to configure your product and request the required data.

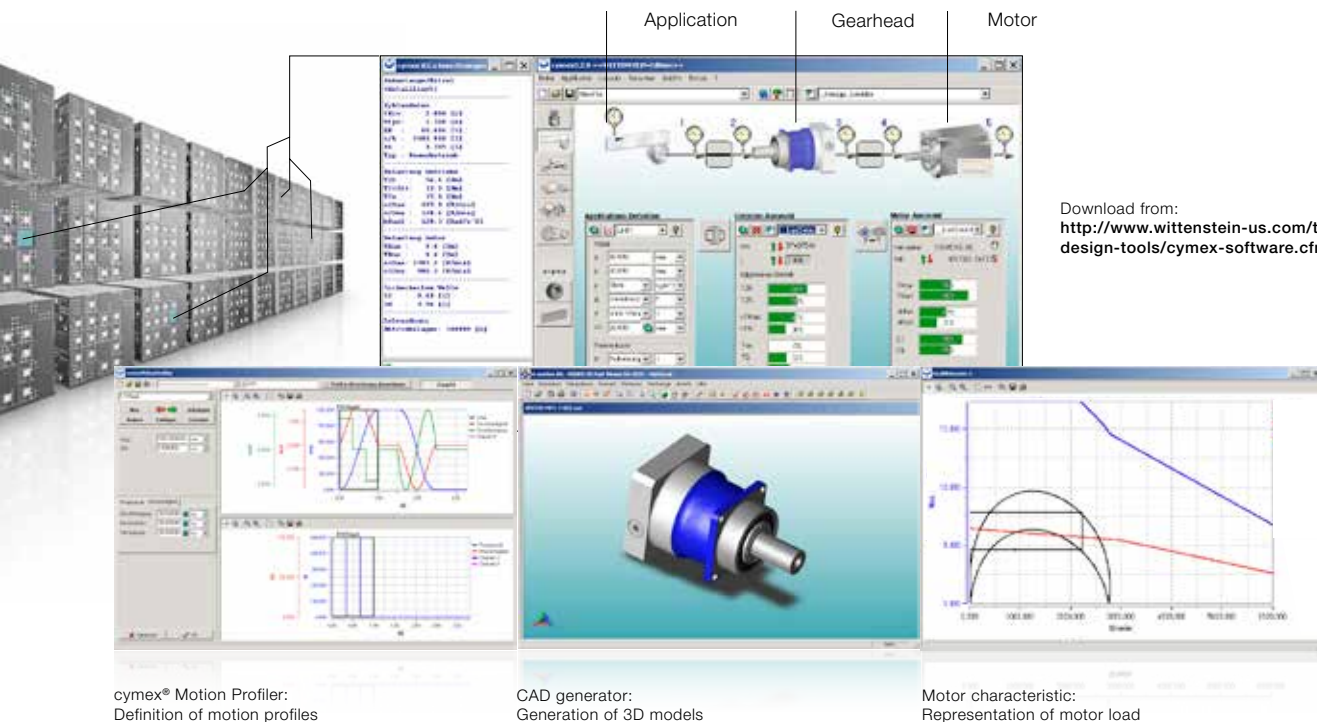
Your benefits

- Online comparison with motor geometry
- Transparent and simple selection
- Ordering code generation
- Documentation of selection
- 3D file of selected solution



The Info & CAD Finder is available free of charge at: <http://www.wittenstein-alpha.de/en/info-and-cad-finder>

cymex® 3 (cyber motion explorer) – Sizing of the entire drive train



cymex® training courses

We offer our customers regular cymex® training courses. We would welcome the opportunity to make our application calculation and drive design expertise available to you.

If you are interested in either cymex® or product training courses, please contact your responsible sales engineer or send an e-mail to:

tech-schulung@wittenstein.de
info@wittenstein-us.com

Your benefits

- Simple and reliable design through pre-defined standard applications
- All customer-specific application parameters taken into account
- cymex® Motion Profiler for creating simple and complex motion and load profiles
- Functions for importing motion profiles from SAM, Excel, ASCII
- Database containing all WITTENSTEIN alpha products as well as 11,000 motors from all current manufacturers
- Visualization of loads in relation to all important component parameters in the drive train
- Offline CAD generator: 3D gearhead files including all attached components
- Technical calculation documentation

speedline®
Speedy deliveries

Pick-up & return
Customized
logistics solution



Speed demands flexibility

We handle
the complete shipment for you

We offer you delivery of the standard SP+, TP+ and LP+ Generation 3 series within 24 or 48 hours ex works at attractive conditions.* Benefit now from the short-term availability of our V-Drive+ servo worm gearhead.

In time-critical situations, we ensure immediate and professional pick-up as well as the fastest possible delivery of your drive requiring repair. Benefit from our bring service, even in the case of a speedline® order.

The benefits for you:

Your benefits:

- Fast and short-term implementation of ideas thanks to high flexibility
- Minimum re-stocking times and fastest response time in case of unplanned needs
- Maximum reliability through transparent information flow and dependable processing

- Cost savings through minimization of downtimes
- Professional logistics organization
- Reduction of transport risks through customized, direct delivery



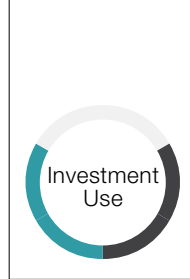
Our speedline® team can be contacted under:

Tel. +49 7931 493-10444 (Germany)
Tel. +49 7931 493-10333 (International)

* non-binding delivery time depending upon part availability

Customer Service

Perfectly coordinated service
from a single source

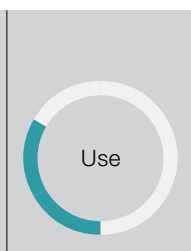


Customer Service: Our objective is to delight you as an excellent partner through an active and flexible service.

Our offer is your benefit:

- Installation and commissioning
Professional support for the best possible start
- Repair service
Customized repairs
- speedline® Repair service
Fast repairs in proven quality
- Preventive maintenance
Highest demands require maximum reliability
- Spare parts service
Fast, simple and in original quality
- Modernization service
Application-specific retrofitting
- Proper disposal
Ecologically sustainable

24h service hotline
Always there for you!



Our Global Customer Service team is personally available to you around the clock: 24h a day – 365 days a year

Tel. +49 7931 493-12900

cymex® Statistics –
our knowledge
is your advantage



Our cymex® service database allows us to provide you with optimum consultation.



"For outstanding, sustainable implementation of innovation and quality management in operational practice and the achievement of demonstrable corporate success."

Low backlash planetary gearheads High End/Economy

					
Products		alpheno®	RP+	TP+	TP+ HIGH TORQUE
Version				MF	MA
Power density		←			
Catalog page		24	26	28	54
Ratio ^{a)}	min. i =	3	22	4	22
	max. i =	100	220	100	220
Torsional backlash [arcmin] ^{c)}	Standard	≤ 3	≤ 1	≤ 3	≤ 1
	Reduced	≤ 1	-	≤ 1	-
Max. acceleration torque [Nm] (max. 1000 cycles per hour)		2800 / 3360 ^{b)}	10.000	6000	10.000
Output type					
Smooth output shaft		•			
Grooved output shaft		•			
Output shaft with involute toothing		•			
Attachable shaft Connected via shrink disc		•			
Output flange			•	•	•
System output with pinion		•	•	•	•
Input type					
Motor attachment version		•	•	•	•
Drive shaft		•		•	
Version					
ATEX ^{a)}					
Food-grade lubrication ^{a) b)}		•	•	•	•
Corrosion resistant ^{a) b)}				•	•
Optimized mass moment of inertia ^{a)}		•	•	•	•
Accessories (please refer to the product pages for further options)					
Coupling		•		•	•
Rack		•	•	•	•
Pinion		•	•	•	•
Belt pulley					
Shrink disc		•			
torqXis sensor flange				•	•
B5 mounting flange					

^{a)} Power reduction: technical data available upon request

^{b)} Please contact WITTENSTEIN alpha

^{c)} In relation to reference sizes

					
SP+	SP+ HIGH SPEED	SP+ HIGH SPEED	LP+ Generation 3	LPB+ Generation 3	alphira®
MF	MC	MC-L	MF	MF	MO

70	96	100	120	134	140
3	3	3	3	3	4
100	100	10	100	100	100
≤ 3	≤ 4	≤ 4	≤ 8	≤ 8	≤ 20
≤ 1	≤ 2	≤ 2	-	-	-
4500	3600	3600	500	305	200

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Servo right-angle gearheads High End / Economy

							
Products		RPK⁺	TK⁺	TPK⁺	TPK⁺ HIGH TORQUE	SK⁺	SPK⁺
Version		MF	MF	MF	MA	MF	MF
Power density		←					
Catalog page		152	154	166	192	202	214
Ratio ^{c)}	min. i =	66	3	12	66	3	12
	max. i =	5500	100	10000	5500	100	10000
Torsional backlash [arcmin] ^{c)}	Standard	≤ 1,3	≤ 4	≤ 4	≤ 1,3	≤ 4	≤ 4
	Reduced	-	-	-	-	-	≤ 2
Max. acceleration torque [Nm] (max. 1000 cycles per hour)		10000	640	6000	10000	640	4500

Output type

Smooth output shaft						•	•
Grooved output shaft						•	•
Output shaft with involute toothing						•	•
Output shaft, rear side, smooth			•	•	•	•	•
Output shaft, rear side, keywayed			•	•	•	•	•
Output flange		•		•	•		
Hollow shaft interface Connected via shrink disc	Standard						
	Rear side		•	•	•	•	•
Flanged hollow shaft			•				
Closed cover, back		•	•	•	•	•	•
System output with pinion		•		•	•		
Shaft on both sides						•	

Input type

Motor attachment version	•	•	•	•	•	•
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Version

ATEX ^{a)}		•			•	
Food-grade lubrication ^{a) b)}	•	•	•	•	•	•
Corrosion resistant ^{a) b)}		•	•	•	•	•

Accessories (please refer to the product pages for further options)

Coupling		•	•	•	•	•
Rack	•	•	•	•	•	•
Pinion	•	•	•	•	•	•
Belt pulley						
Shrink disc		•	•	•	•	•
torqXis sensor flange		•	•	•	•	•
B5 mounting flange						

^{a)} Power reduction: technical data available upon request

^{b)} Please contact WITTENSTEIN alpha

^{c)} In relation to reference sizes

											
HG+	SC+	SPC+	TPC+	VDT+	VDH+	VDS+	LK+	LPK+	LPBK+	VDHe	VDSe
MF	MF	MF	MF	MF	MF	MF	MO	MO	MO	MF	MF

240	252	264	274	284	294	304	314	326	336	342	350
3	1	3	3	4	4	4	1	3	3	4	4
100	2	20	20	40	40	40	1	100	100	40	40
≤ 4	≤ 4	≤ 4	≤ 4	≤ 3	≤ 3	≤ 3	≤ 15	≤ 12	≤ 12	≤ 8	≤ 8
-	-	≤ 2	≤ 2	≤ 2	≤ 2	≤ 2	-	-	-	-	-
640	315	1210	1600	1505	1505	1505	93	450	220	301	301

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Low backlash planetary gearheads High End



alpheno®

Perfection in a new dimension

- Low backlash planetary gearhead with output shaft
- Cyclic or continuous operation
- Torsional backlash: ≤ 1 arcmin
- Ratio: 3-100

Product highlights:

- Maximum power density
- High axial and radial forces
- High torsional rigidity



RP+

High-precision powerhouse

- Low backlash planetary gearhead with output flange
- Application in cyclic operation
- Torsional backlash: ≤ 1 arcmin
- Ratio: 4-220

Product highlights:

- Maximum torsional rigidity
- Maximum axial and radial forces
- Easy installation
- Optimized for rack and pinion applications



TP+ and TP+ HIGH TORQUE

Compact precision

- Low backlash planetary gearhead with output flange
- Cyclic operation
- Torsional backlash: ≤ 1 arcmin
- Ratio: 4-302.5

Product highlights:

- High torsional rigidity
- Space-saving design

Power density ←

Maximum power density

And the torques?

Although the previous series achieved outstanding results, we managed to increase the torques by up to 40%. Raising the limits – Typical of WITTENSTEIN alpha!

Versatile installation

In whatever position you install it – your gearhead always contains the same quantity of oil/grease. The gearheads are so flexible, you can install them vertically, horizontally or with the output facing upwards or downwards.

Simple motor installation

Safe, and secure motor installation is possible in a single step. The WITTENSTEIN alpha-patented motor mounting is also available with integrated thermal length compensation as an option.

Maximum positioning accuracy

Upon request, the High End planetary gearheads are available with torsional backlash of less than one arc minute. This significantly increases the positioning accuracy of your application.



SP+ and SP+ HIGH SPEED

The classic all-rounder

- Low backlash planetary gearhead with output shaft
- Application in cyclic or continuous operation
- Torsional backlash: ≤ 1 arcmin
- Ratio: 3-100

Product highlights:

- Multiple output configurations
- High nominal speeds (SP+ HIGH SPEED)

Planetary gearheads
High End



Superior running thanks to helical teeth

Our High End planetary gearheads “whisper”. Compared to the straight-toothed gearheads, our helical-toothed gearheads are 6 dB(A) quieter during operation. And what a difference 64 instead of 70 decibels makes to added value. You will barely notice vibrations because these gearheads run so smoothly.

World-class lifespan

The seal rings on the High End planetary gearheads were specially developed and the material and geometry are both optimized to ensure an extremely long lifespan!

alpheno® – Perfection in a new dimension



WITTENSTEIN alpha sets standards

The alpheno® gear output interface facilitates a higher power transmission when compared to the industry standard which limits the transmitting torques of the gearhead. alpheno® transcends these limitations.

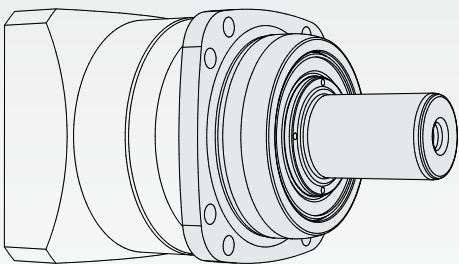
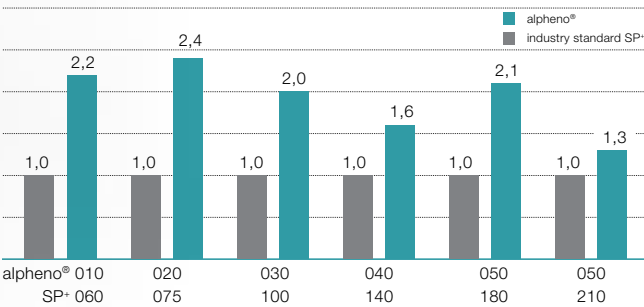


The technical advancement of alpheno® and its increased power can be directly utilized for your applications with the new design of the gear output.

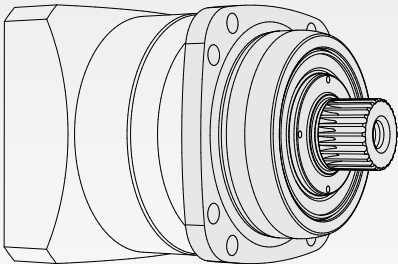
alpheno® convinces with highest power density

We offer you more performance in less space for the most compact drive requirements. This will allow your machine to perform better if specific system solutions are required.

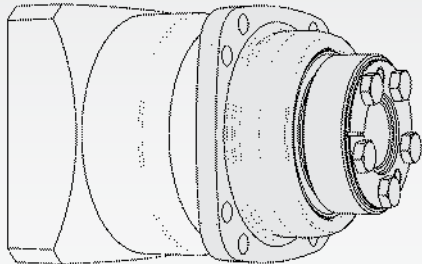
Power density of the industry standard and alpheno®



Smooth shaft



Involute



Slip-on shaft incl. shrink disk

Performance linear system
with alpheno® planetary gearhead
in an optimized version for rack
and pinion applications.

The integrated slots reduce the design
and installation requirements to
a minimum.



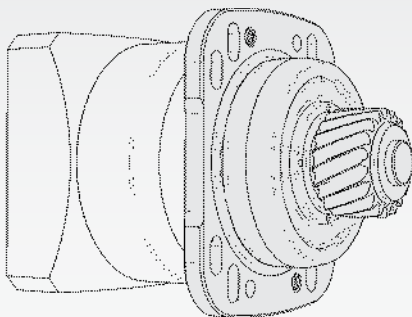
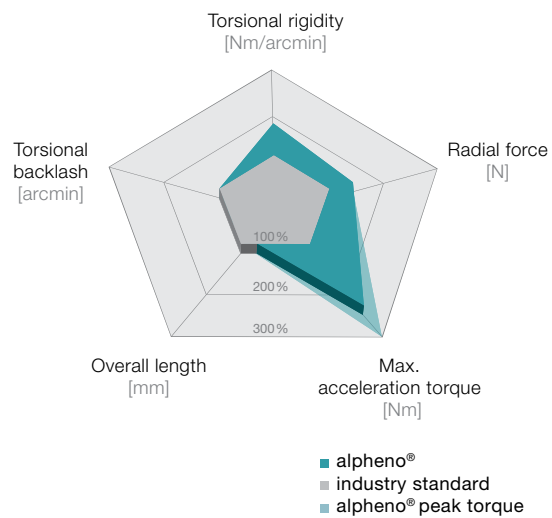
Planetary gearheads
High End



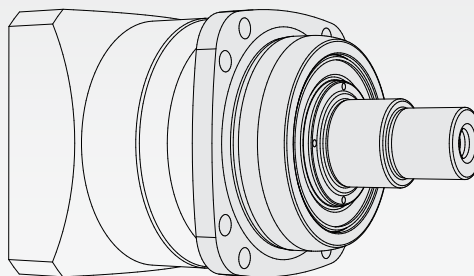
Performance data

alpheno® in comparison to the industry standard

Torsional backlash [arcmin]	< 1
Ratio [-]	3 - 100
Max. acceleration torque [Nm]	2800
alpha peak torque [Nm]	3360
Max. input speed [min ⁻¹]	6000
Efficiency [%]	97



Incl. pinion



Customer-specific

Options

Like the SP+ shaft gearhead, alpheno® is also available in a HIGH SPEED version and with a slip-on shaft at the gear output. A variant with optimized mass inertia guarantees a maximum level of energy efficiency. In combination with the WITTENSTEIN alpha rack-and-pinion portfolio, alpheno® represents an unbeatable drive bearing arrangement in the field of linear motion.

RP+ – High-precision powerhouse

Sets standards in terms of power density, modularity and easy installation.



The new standard for flange gearheads

The RP+ gearhead series combines all the advantages of the familiar gearhead series.

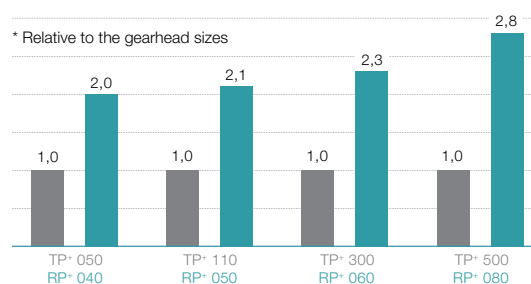
Features include reduced backlash of < 1 arcmin, maximum power density, modular mounting position, simple motor installation, superior running thanks to helical teeth, maximum positioning accuracy and world-class lifespan.



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

Power density comparison between industry standard & RP+ *



The geometry of the RP+ output flange is perfectly adapted to the power density.



The RP+ highperformance planetary gearhead is optimized for rack and pinion applications.

High Performance Linear System

For use where the individual requirements far exceed what has previously been possible. Compared to the industry standard, the values have been improved by 150% on average!

The integrated slots reduce the design and installation requirements to a minimum.

Further information is available in the "High Performance Linear System" catalog or on the Internet at www.rack-pinion.com

The pinions, which are specially adapted to the gearhead enable the transmission of maximum moving forces.

Planetary gearheads
High End

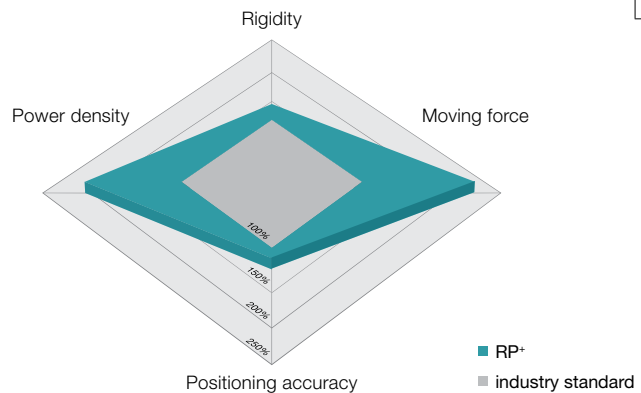
Performance data for RP+

Positioning accuracy [μm]	< 5 *
Ratios [-]	4-220
Max. moving force per drive [N]	112,000
Movement speed [m/min]	400
Efficiency [%]	≥ 97
System rigidity [%]	+ 50 **

* Direct measuring system required

** Compared to industry standard

Performance data as linear system



RP+



The RP+ is also available as the RPM+ actuator version. The RPM+ combines the advantages of the RP+ series in an even more compact design. Thanks to its special design, the permanently excited servo motor ensures maximum power density.



The RPK+, which combines the hypoid angle section and the high performance planetary gearhead RP+ completes the series.

TP+/TP+ HIGH TORQUE – Compact precision



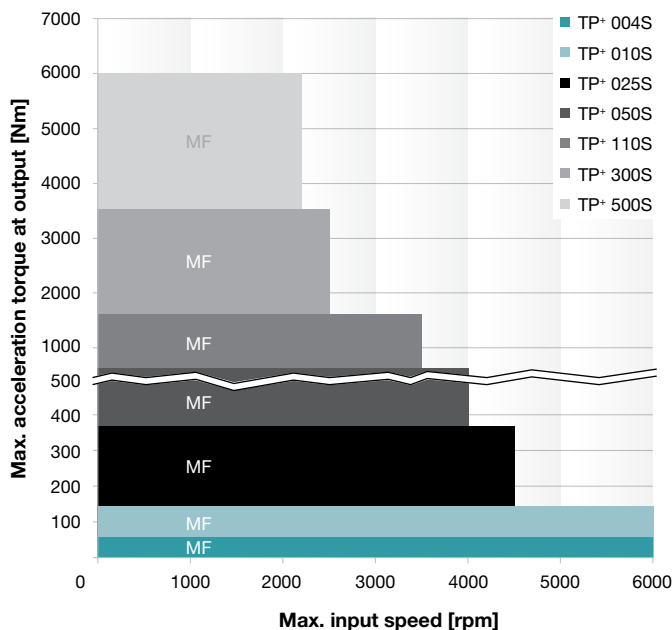
Compact top performers with output flange. The standard version is ideally suited for high positioning accuracy and highly dynamic cyclic operation.

The TP+ HIGH TORQUE is particularly well suited for high-precision applications in which high torsional rigidity is required.

Quick size selection

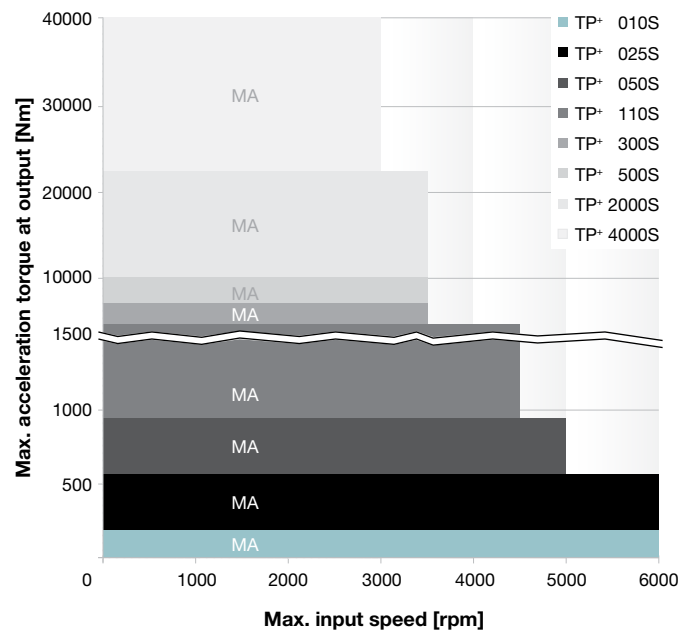
TP+ MF (example for $i = 5$)

For applications in cyclic operation ($ED \leq 60\%$)



TP+ HIGH TORQUE MA (example for $i = 22$)

For applications in cyclic operation ($ED \leq 60\%$)



Versions and Applications

Features	TP+ MF version page 30	TP+ HIGH TORQUE MA version page 54
Power density	• •	• • •
Positioning accuracy (e.g. clamped drives)	• •	• • •
Highly dynamic applications (e.g. Delta robot)	• • •	• • •
Torsional rigidity	• •	• • •
Space-saving design	• •	• • •
Stringent safety requirement (e.g. vertical axes)	• •	• • •

Product features

Ratios ^{c)}		4 - 100	22 - 302,5
Torsional backlash [arcmin] ^{c)}	Standard	≤ 3	≤ 1
	Reduced	≤ 1	-
Output type			
Output flange		•	•
System output with pinion		•	•
Input type			
Motor mounted version		•	•
Input shaft		•	
Type			
Food-grade lubrication ^{a) b)}		•	•
Corrosion resistant ^{a) b)}		•	•
Optimized mass moment of inertia ^{a)}		•	•
Accessories			
Coupling		•	•
Rack		•	•
Pinion		•	•
torqXis sensor flange		•	•
Flange shaft		•	•
Intermediate plate for cooling connection		•	•
For Delta robot applications		•	•

^{a)} Power reduction: technical data available upon request

^{b)} Please contact WITTENSTEIN alpha

^{c)} In relation to reference sizes

Planetary gearheads
High End



TP+

MF

MA

TP+ 004 MF 1-stage

				1-stage						
Ratio ^{a)}			<i>i</i>		4	5	7	10		
cymex®-optimized acceleration torque (please contact us regarding the sizing)			<i>T</i> _{2Bcym}	Nm	60	62	60	–		
				in.lb	531	549	531	–		
Max. acceleration torque (max. 1000 cycles per hour)			<i>T</i> _{2B}	Nm	55	55	55	35		
				in.lb	487	487	487	310		
Nominal output torque (with <i>n</i> _{2N})			<i>T</i> _{2N}	Nm	28	28	28	18		
				in.lb	248	248	248	159		
Emergency stop torque (permitted 1000 times during the service life of the gearhead)			<i>T</i> _{2Not}	Nm	100	100	100	100		
				in.lb	885	885	885	885		
Nominal input speed (with <i>T</i> _{2N} and 20 °C ambient temperature) ^{b)}			<i>n</i> _{1N}	rpm	3300	3300	4000	4000		
Max. input speed			<i>n</i> _{1Max}	rpm	6000	6000	6000	6000		
Mean no load running torque (with <i>n</i> ₁ = 3000 rpm and 20 °C gearhead temperature) ^{c)}			<i>T</i> ₀₁₂	Nm	0.95	0.80	0.60	0.45		
				in.lb	8.41	7.08	5.31	3.98		
Max. torsional backlash			<i>j</i> _t	arcmin	Standard ≤ 4 / Reduced ≤ 2					
Torsional rigidity ^{c)}			<i>C</i> _{t21}	Nm/ arcmin	12	12	11	8		
				in.lb/ arcmin	106	106	97	71		
Tilting rigidity			<i>C</i> _{2K}	Nm/ arcmin	–					
				in.lb/ arcmin						
Max. axial force ^{d)}			<i>F</i> _{2AMax}	N	1630					
				lb _f	367					
Max. tilting moment			<i>M</i> _{2KMax}	Nm	110					
				in.lb	974					
Efficiency at full load			η	%	97					
Service life (For calculation, see the Chapter "Information")			<i>L</i> _h	h	> 20000					
Weight incl. standard adapter plate			<i>m</i>	kg	1.4					
				lb _m	3.1					
Operating noise (with <i>i</i> =10 and <i>n</i> ₁ =3000 rpm no load)			<i>L</i> _{PA}	dB(A)	≤ 58					
Max. permitted housing temperature				°C	+90					
				F	194					
Ambient temperature				°C	-15 to +40					
				F	5 to 104					
Lubrication			Lubricated for life							
Paint			Blue RAL 5002							
Direction of rotation			Motor and gearhead same direction							
Protection class			IP 65							
Moment of inertia (relates to the drive)			B	11	<i>J</i> ₁	kgcm ²	0.17	0.14	0.11	0.09
						10 ⁻³ in.lb.s ²	0.15	0.12	0.10	0.08
Clamping hub diameter [mm]			C	14	<i>J</i> ₁	kgcm ²	0.25	0.21	0.18	0.17
						10 ⁻³ in.lb.s ²	0.22	0.19	0.16	0.15
			E	19	<i>J</i> ₁	kgcm ²	0.57	0.54	0.51	0.49
						10 ⁻³ in.lb.s ²	0.50	0.47	0.45	0.43

Reduced mass moments of inertia available on request.

^{a)} Other ratios available on request

^{b)} For higher ambient temperatures, please reduce input speed

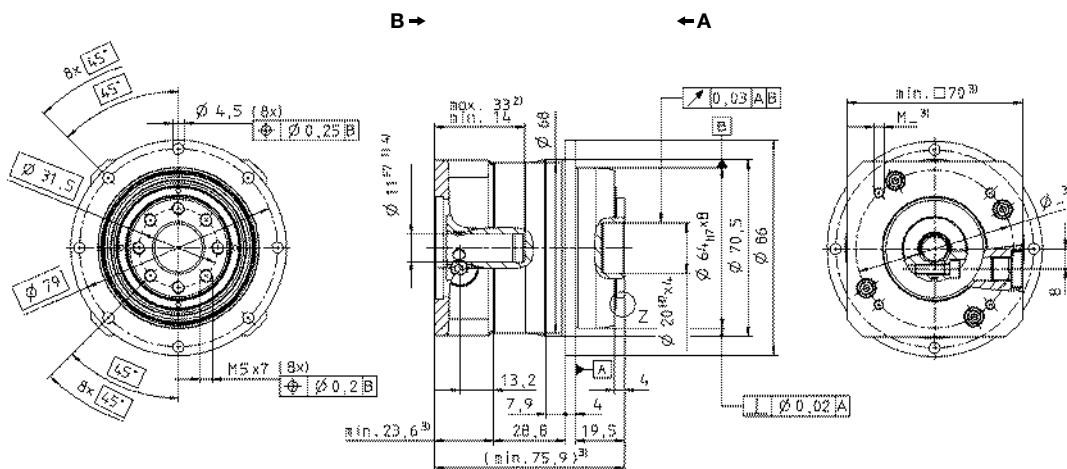
^{c)} Valid for clamping hub diameter of 14 mm

^{d)} Refers to center of the output shaft or flange

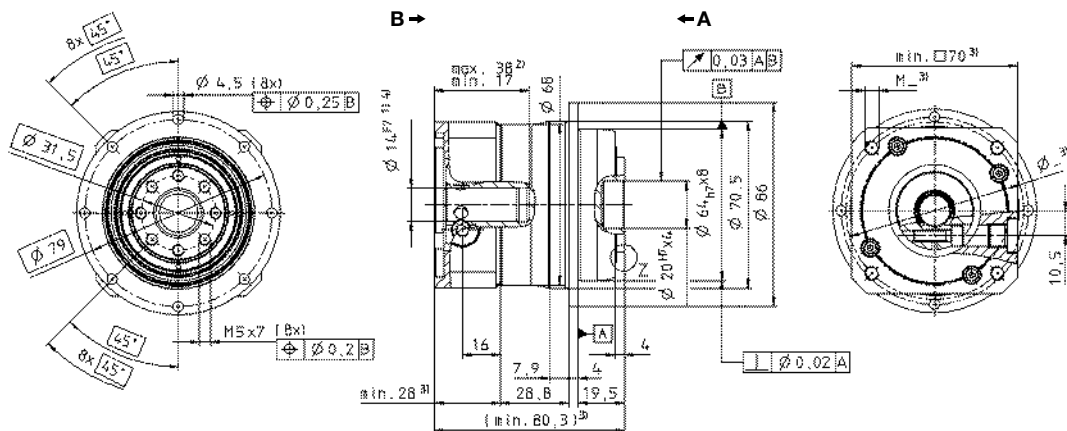
View A

View B

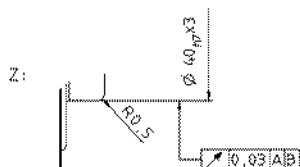
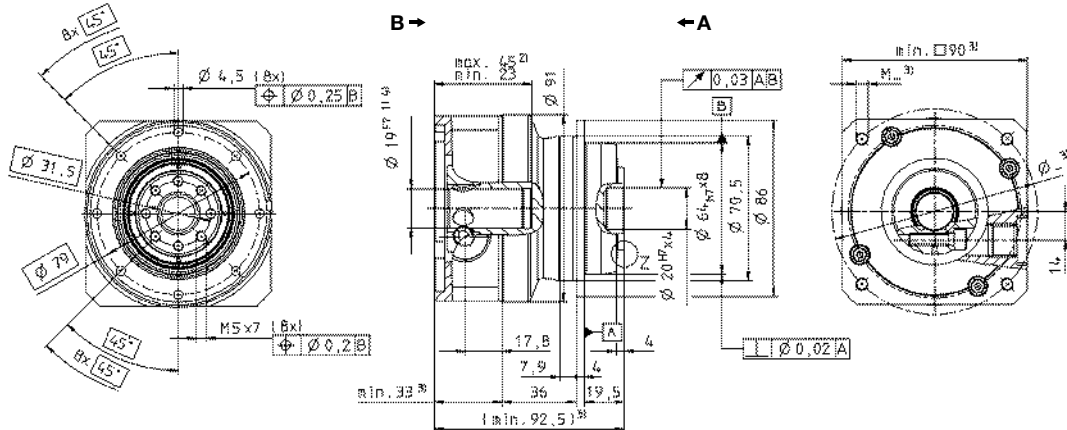
up to 11⁴⁾(B)
clamping hub
diameter



up to 14⁴⁾(C)
clamping hub
diameter



up to 19⁴⁾(E)
clamping hub
diameter



Non-tolerated dimensions ± 1 mm

- 1) Check motor shaft fit.
- 2) Min./Max. permissible motor shaft length. Longer motor shafts are adaptable, please contact us.
- 3) The dimensions depend on the motor.
- 4) Smaller motor shaft diameter is compensated by a bushing with a minimum thickness of 1 mm.



CAD data is available under
<http://www.wittenstein-alpha.de/en/info-and-cad-finder.html>



Motor mounting according to operating manual

Planetary gearheads
High End

TP+
MF

TP+ 004 MF 2-stage

				2-stage																		
Ratio ^{a)}				<i>i</i>	16	20	21	25	28	31	35	40	50	61	70	91	100					
cymex®-optimized acceleration torque (please contact us regarding the sizing)				<i>T</i> _{2Bcym}	Nm	60	60	–	62	60	–	62	62	62	–	60	–	–				
					in.lb	531	531	–	549	531	–	549	549	549	–	531	–	–				
Max. acceleration torque (max. 1000 cycles per hour)				<i>T</i> _{2B}	Nm	55	55	40	55	55	40	55	55	55	45	55	32	35				
					in.lb	487	487	354	487	487	354	487	487	487	398	487	283	310				
Nominal output torque (with <i>n</i> _{2N})				<i>T</i> _{2N}	Nm	40	40	30	40	40	30	40	40	40	30	40	15	18				
					in.lb	354	354	266	354	354	266	354	354	354	266	354	133	159				
Emergency stop torque (permitted 1000 times during the service life of the gearhead)				<i>T</i> _{2Not}	Nm	100	100	100	100	100	100	100	100	100	100	100	100	100				
					in.lb	885	885	885	885	885	885	885	885	885	885	885	885	885	885			
Nominal input speed (with <i>T</i> _{2N} and 20 °C ambient temperature) ^{b)}				<i>n</i> _{1N}	rpm	4000	4000	4000	4000	4000	4000	4000	4800	5500	5500	5500	5500					
Max. input speed				<i>n</i> _{1Max}	rpm	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000				
Mean no load running torque (with <i>n</i> ₁ = 3000 rpm and 20 °C gearhead temperature) ^{c)}				<i>T</i> ₀₁₂	Nm	0.55	0.45	0.45	0.45	0.35	0.35	0.30	0.25	0.25	0.20	0.20	0.20	0.20				
					in.lb	4.87	3.98	3.98	3.98	3.10	3.10	2.66	2.21	2.21	1.77	1.77	1.77	1.77				
Max. torsional backlash				<i>j</i> _t	arcmin	Standard ≤ 4 / Reduced ≤ 2																
Torsional rigidity ^{c)}				<i>C</i> _{t21}	Nm/ arcmin	12	12	10	12	12	9	12	11	12	9	11	7	8				
					in.lb/ arcmin	106	106	89	106	106	80	106	97	106	80	97	62	71				
Tilting rigidity				<i>C</i> _{2K}	Nm/ arcmin	–																
					in.lb/ arcmin																	
Max. axial force ^{d)}				<i>F</i> _{2AMax}	N	1630																
					lb _f	367																
Max. tilting moment				<i>M</i> _{2KMax}	Nm	110																
					in.lb	974																
Efficiency at full load				η	%	94																
Service life (For calculation, see the Chapter "Information")				<i>L</i> _n	h	> 20000																
Weight incl. standard adapter plate				<i>m</i>	kg	1.5																
					lb _m	3.3																
Operating noise (with <i>i</i> =100 and <i>n</i> ₁ = 3000 rpm no load)				<i>L</i> _{PA}	dB(A)	≤ 58																
Max. permitted housing temperature					°C	+90																
					F	194																
Ambient temperature					°C	-15 to +40																
					F	5 to 104																
Lubrication					Lubricated for life																	
Paint					Blue RAL 5002																	
Direction of rotation					Motor and gearhead same direction																	
Protection class					IP 65																	
Moment of inertia (relates to the drive) Clamping hub diameter [mm]				B	11	<i>J</i> ₁	kgcm ²	0.078	0.070	0.074	0.068	0.062	0.072	0.061	0.051	0.057	0.058	0.056	0.057	0.056		
							10 ⁻³ in.lb.s ²	0.069	0.062	0.066	0.060	0.054	0.064	0.054	0.051	0.050	0.051	0.050	0.051	0.050		
				C	14	<i>J</i> ₁	kgcm ²	0.17	0.17	0.17	0.16	0.16	0.17	0.16	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15
							10 ⁻³ in.lb.s ²	0.15	0.15	0.15	0.14	0.14	0.15	0.14	0.14	0.13	0.13	0.13	0.13	0.13	0.13	

Reduced mass moments of inertia available on request.

^{a)} Other ratios available on request

^{b)} For higher ambient temperatures, please reduce input speed

^{c)} Valid for clamping hub diameter of 11 mm

^{d)} Refers to center of the output shaft or flange

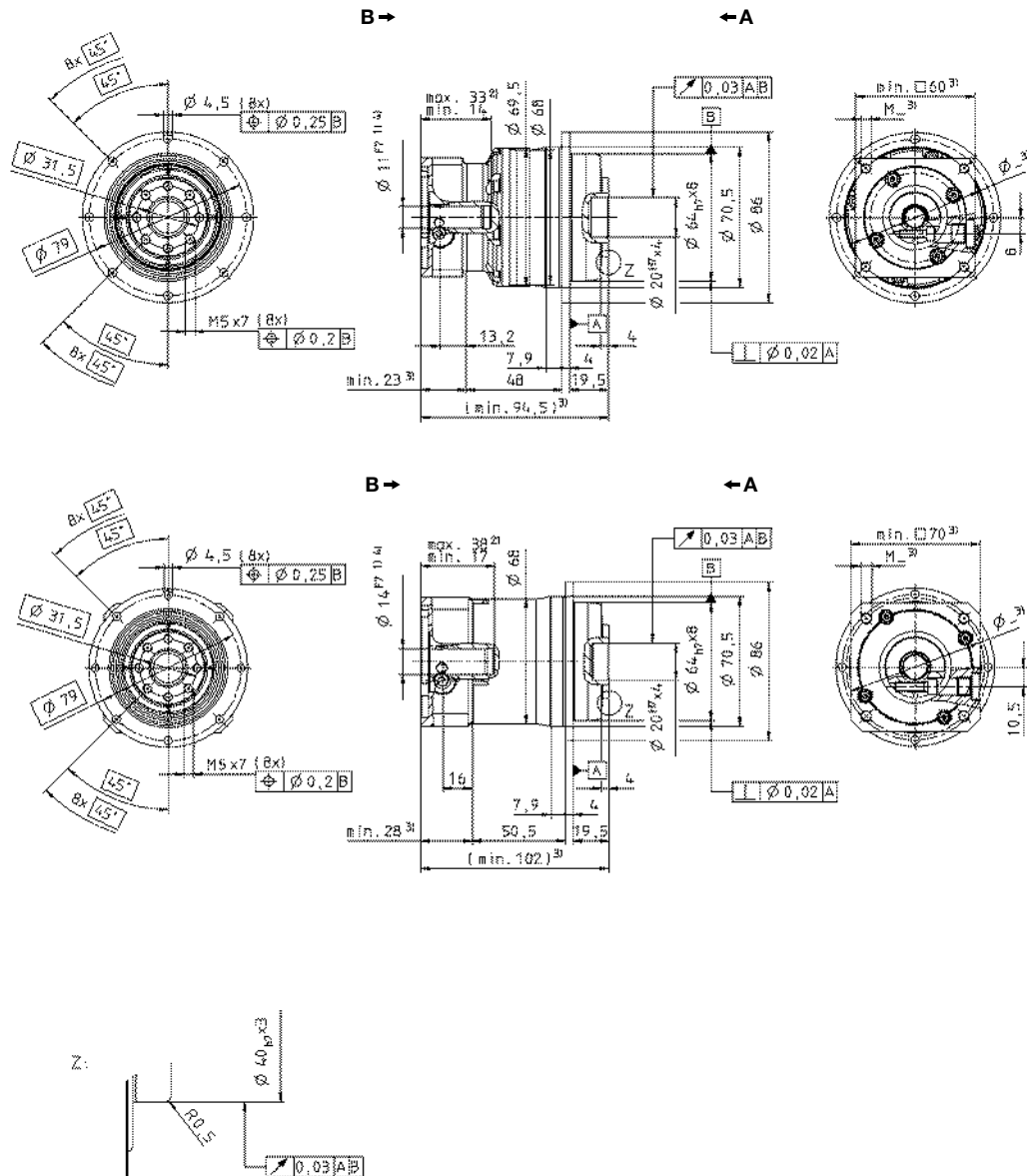
View A

View B

Motor shaft diameter [mm]

up to 11 ⁴⁾(B)
clamping hub
diameter

up to 14 ⁴⁾(C)
clamping hub
diameter



Planetary gearheads
High End

TP+
MF

Non-tolerated dimensions ± 1 mm

- 1) Check motor shaft fit.
- 2) Min./Max. permissible motor shaft length. Longer motor shafts are adaptable, please contact us.
- 3) The dimensions depend on the motor.
- 4) Smaller motor shaft diameter is compensated by a bushing with a minimum thickness of 1 mm.



CAD data is available under
<http://www.wittenstein-alpha.de/en/info-and-cad-finder.html>



Motor mounting according to operating manual

TP+ 010 MF 1-stage

					1-stage			
Ratio ^{a)}	<i>i</i>				4	5	7	10
cymex®-optimized acceleration torque (please contact us regarding the sizing)	T_{2Bcym}		Nm		150	162	162	–
				in.lb	1328	1434	1434	–
Max. acceleration torque (max. 1000 cycles per hour)	T_{2B}		Nm		143	143	143	105
				in.lb	1266	1266	1266	929
Nominal output torque (with n_{1N})	T_{2N}		Nm		75	75	75	60
				in.lb	664	664	664	531
Emergency stop torque (permitted 1000 times during the service life of the gearhead)	T_{2Not}		Nm		250	250	250	250
				in.lb	2213	2213	2213	2213
Nominal input speed (with T_{2N} and 20 °C ambient temperature) ^{b)}	n_{1N}		rpm		2600	2900	3100	3100
Max. input speed	n_{1Max}		rpm		6000	6000	6000	6000
Mean no load running torque (with n_1 = 3000 rpm and 20 °C gearhead temperature) ^{c)}	T_{012}		Nm		1.6	1.3	1.0	0.7
				in.lb	14.2	11.5	8.85	6.20
Max. torsional backlash	j_t		arcmin		Standard ≤ 3 / Reduced ≤ 1			
Torsional rigidity ^{c)}	C_{t21}		Nm/ arcmin		32	33	30	23
				in.lb/ arcmin	283	292	266	204
Tilting rigidity	C_{2K}		Nm/ arcmin		225			
				in.lb/ arcmin	1991			
Max. axial force ^{d)}	F_{2AMax}		N		2150			
				lb _f	484			
Max. tilting moment	M_{2KMax}		Nm		270			
				in.lb	2390			
Efficiency at full load	η		%		97			
Service life (For calculation, see the Chapter "Information")	L_h		h		> 20000			
Weight incl. standard adapter plate	m		kg		3.8			
				lb _m	8.4			
Operating noise (with $i=10$ and n_1 = 3000 rpm no load)	L_{PA}		dB(A)		≤ 59			
Max. permitted housing temperature			°C		+90			
				F	194			
Ambient temperature			°C		-15 to +40			
				F	5 to 104			
Lubrication					Lubricated for life			
Paint					Blue RAL 5002			
Direction of rotation					Motor and gearhead same direction			
Protection class					IP 65			
Moment of inertia (relates to the drive)	C	14	J_1	kgcm ²	0.78	0.62	0.48	0.40
				10 ⁻³ in.lb.s ²	0.69	0.55	0.42	0.35
Clamping hub diameter [mm]	E	19	J_1	kgcm ²	0.95	0.79	0.64	0.57
				10 ⁻³ in.lb.s ²	0.84	0.70	0.57	0.50
	G	24	J_1	kgcm ²	2.32	2.16	2.02	1.94
				10 ⁻³ in.lb.s ²	2.05	1.91	1.78	1.72

Reduced mass moments of inertia available on request.

^{a)} Other ratios available on request

^{b)} For higher ambient temperatures, please reduce input speed

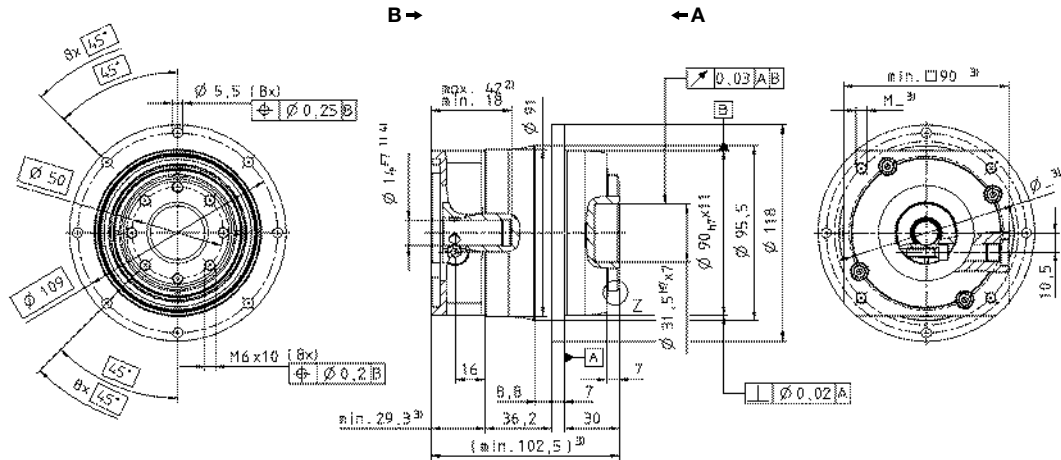
^{c)} Valid for clamping hub diameter of 19 mm

^{d)} Refers to center of the output shaft or flange

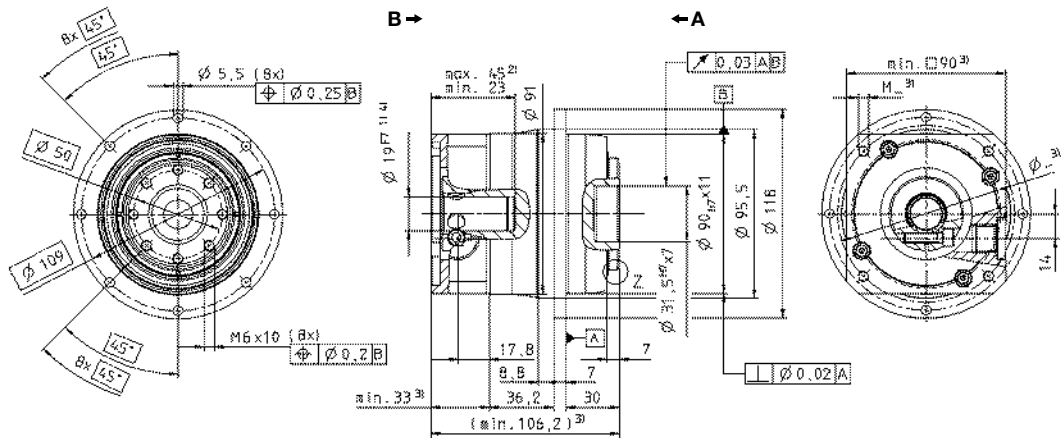
View A

View B

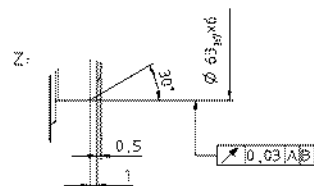
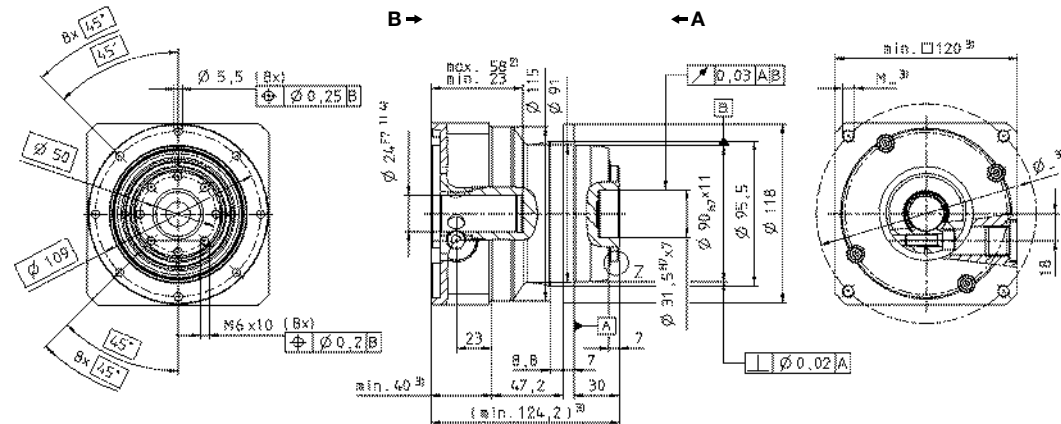
up to 14 ⁴⁾(C)
clamping hub
diameter



up to 19 ⁴⁾(E)
clamping hub
diameter



up to 24 ⁴⁾(G)
clamping hub
diameter



Non-tolerated dimensions ±1 mm

- 1) Check motor shaft fit.
- 2) Min./Max. permissible motor shaft length. Longer motor shafts are adaptable, please contact us.
- 3) The dimensions depend on the motor.
- 4) Smaller motor shaft diameter is compensated by a bushing with a minimum thickness of 1 mm.



CAD data is available under
<http://www.wittenstein-alpha.de/en/info-and-cad-finder.html>



Motor mounting according to operating manual

Planetary gearheads
High End

TP+
MF

TP+ 010 MF 2-stage

				2-stage														
Ratio ^{a)}				<i>i</i>	16	20	21	25	28	31	35	40	50	61	70	91	100	
cymex®-optimized acceleration torque (please contact us regarding the sizing)				<i>T</i> _{2Bcym}	Nm	162	162	–	162	162	–	162	–	162	–	162	–	–
					in.lb	1434	1434	–	1434	1434	–	1434	–	1434	–	1434	–	1434
Max. acceleration torque (max. 1000 cycles per hour)				<i>T</i> _{2B}	Nm	143	143	100	143	143	110	143	140	143	110	143	80	105
					in.lb	1266	1266	885	1266	1266	974	1266	1239	1266	974	1266	708	929
Nominal output torque (with <i>n</i> _{2N})				<i>T</i> _{2N}	Nm	90	90	80	90	90	70	90	80	90	70	90	35	60
					in.lb	797	797	708	797	797	620	797	708	797	620	797	310	531
Emergency stop torque (permitted 1000 times during the service life of the gearhead)				<i>T</i> _{2Not}	Nm	250	250	250	250	250	250	250	250	250	250	250	250	250
					in.lb	2213	2213	2213	2213	2213	2213	2213	2213	2213	2213	2213	2213	2213
Nominal input speed (with <i>T</i> _{2N} and 20 °C ambient temperature) ^{b)}				<i>n</i> _{1N}	rpm	3500	3500	3500	3500	3500	3500	3500	3800	4500	4500	4500	4500	4500
Max. input speed				<i>n</i> _{1Max}	rpm	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000
Mean no load running torque (with <i>n</i> ₁ =3000 rpm and 20 °C gearhead temperature) ^{c)}				<i>T</i> ₀₁₂	Nm	0.90	0.75	0.70	0.65	0.55	0.50	0.50	0.40	0.35	0.35	0.35	0.30	0.30
					in.lb	7.97	6.64	6.20	5.75	4.87	4.43	4.43	3.54	3.10	3.10	3.10	2.66	2.66
Max. torsional backlash				<i>j</i> _t	arcmin	Standard ≤ 3 / Reduced ≤ 1												
Torsional rigidity ^{c)}				<i>C</i> _{t21}	Nm/ arcmin	32	32	26	32	31	24	32	30	30	24	28	21	22
					in.lb/ arcmin	283	283	230	283	274	212	283	266	266	212	248	186	195
Tilting rigidity				<i>C</i> _{2K}	Nm/ arcmin	225												
					in.lb/ arcmin	1991												
Max. axial force ^{d)}				<i>F</i> _{2AMax}	N	2150												
					lb _f	484												
Max. tilting moment				<i>M</i> _{2KMax}	Nm	270												
					in.lb	2390												
Efficiency at full load				η	%	94												
Service life (For calculation, see the Chapter "Information")				<i>L</i> _h	h	> 20000												
Weight incl. standard adapter plate				<i>m</i>	kg	3.6												
					lb _m	8.0												
Operating noise (with <i>i</i> =100 and <i>n</i> ₁ =3000 rpm no load)				<i>L</i> _{PA}	dB(A)	≤ 59												
Max. permitted housing temperature					°C	+90												
					F	194												
Ambient temperature					°C	-15 to +40												
					F	5 to 104												
Lubrication					Lubricated for life													
Paint					Blue RAL 5002													
Direction of rotation					Motor and gearhead same direction													
Protection class					IP 65													
Moment of inertia (relates to the drive)				B	11	<i>J</i> ₁	kgcm ²	0.17	0.14	0.15	0.13	0.11	0.13	0.10	0.09	0.09	0.09	0.09
							10 ⁻³ in.lb.s ²	0.15	0.12	0.13	0.12	0.10	0.12	0.09	0.08	0.08	0.08	0.08
Clamping hub diameter [mm]				C	14	<i>J</i> ₁	kgcm ²	0.24	0.21	0.22	0.20	0.18	0.21	0.18	0.17	0.17	0.17	0.16
							10 ⁻³ in.lb.s ²	0.21	0.19	0.19	0.19	0.16	0.18	0.16	0.15	0.15	0.15	0.14
				E	19	<i>J</i> ₁	kgcm ²	0.56	0.53	0.55	0.53	0.51	0.53	0.50	0.49	0.49	0.49	0.49
							10 ⁻³ in.lb.s ²	0.50	0.47	0.49	0.47	0.45	0.47	0.44	0.43	0.43	0.43	0.43

Reduced mass moments of inertia available on request.

^{a)} Other ratios available on request

^{b)} For higher ambient temperatures, please reduce input speed

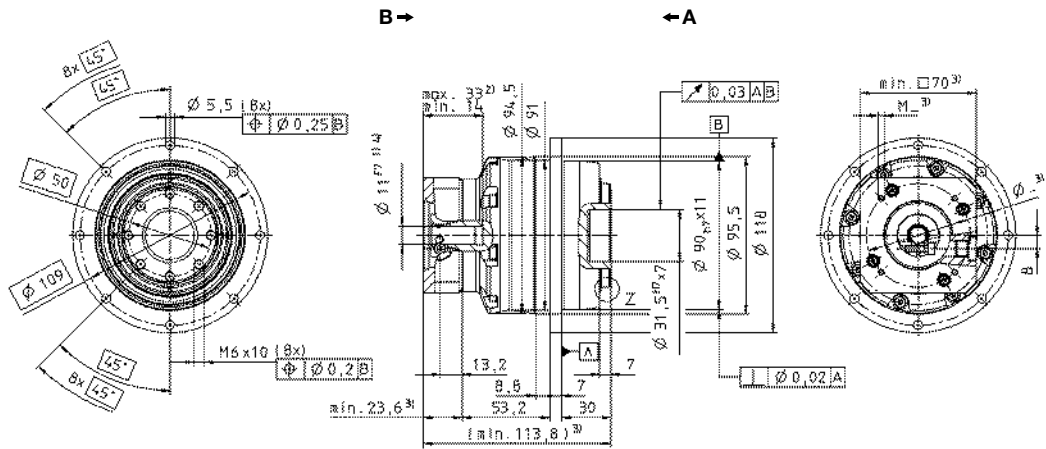
^{c)} Valid for clamping hub diameter of 14 mm

^{d)} Refers to center of the output shaft or flange

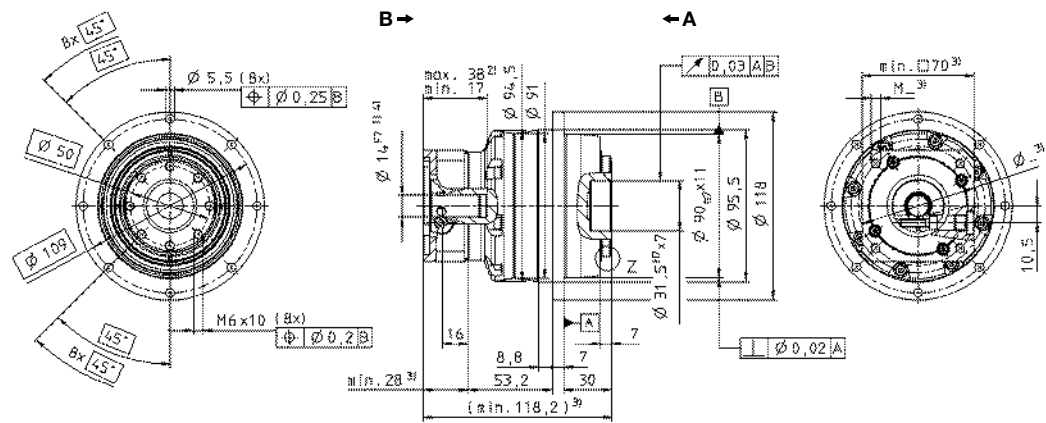
View A

View B

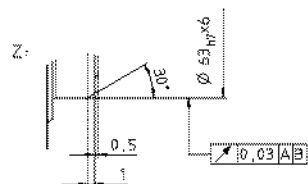
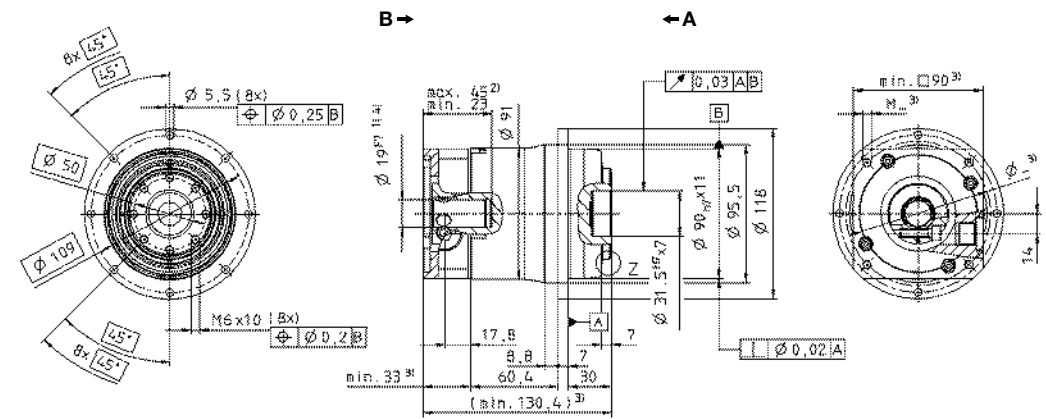
up to 11⁴⁾(B)
clamping hub
diameter



up to 14⁴⁾(C)
clamping hub
diameter



up to 19⁴⁾(E)
clamping hub
diameter



Non-tolerated dimensions ± 1 mm

- 1) Check motor shaft fit.
- 2) Min./Max. permissible motor shaft length. Longer motor shafts are adaptable, please contact us.
- 3) The dimensions depend on the motor.
- 4) Smaller motor shaft diameter is compensated by a bushing with a minimum thickness of 1 mm.



CAD data is available under
<http://www.wittenstein-alpha.de/en/info-and-cad-finder.html>



Motor mounting according to operating manual

Planetary gearheads
High End

TP+

MF

TP+ 025 MF 1-stage

				1-stage							
Ratio ^{a)}				<i>i</i>	4	5	7	10			
cymex®-optimized acceleration torque (please contact us regarding the sizing)				<i>T</i> _{2Bcym}	Nm	390	420	350	275		
					in.lb	3452	3717	3098	2434		
Max. acceleration torque (max. 1000 cycles per hour)				<i>T</i> _{2B}	Nm	350	380	330	265		
					in.lb	3098	3363	2921	2345		
Nominal output torque (with <i>n</i> _{2N})				<i>T</i> _{2N}	Nm	170	170	170	120		
					in.lb	1505	1505	1505	1062		
Emergency stop torque (permitted 1000 times during the service life of the gearhead)				<i>T</i> _{2Not}	Nm	625	625	625	625		
					in.lb	5531	5531	5531	5531		
Nominal input speed (with <i>T</i> _{2N} and 20 °C ambient temperature) ^{b)}				<i>n</i> _{1N}	rpm	2300	2500	2500	2500		
Max. input speed				<i>n</i> _{1Max}	rpm	4500	4500	4500	4500		
Mean no load running torque (with <i>n</i> ₁ =3000 rpm and 20 °C gearhead temperature) ^{c)}				<i>T</i> ₀₁₂	Nm	3.3	2.7	2.0	1.4		
					in.lb	29.2	23.9	17.7	12.4		
Max. torsional backlash				<i>j</i> _t	arcmin	Standard ≤ 3 / Reduced ≤ 1					
Torsional rigidity ^{c)}				<i>C</i> _{t21}	Nm/ arcmin	80	86	76	62		
					in.lb/ arcmin	708	761	673	549		
Tilting rigidity				<i>C</i> _{2K}	Nm/ arcmin	550					
					in.lb/ arcmin	4868					
Max. axial force ^{d)}				<i>F</i> _{2AMax}	N	4150					
					lb _f	934					
Max. tilting moment				<i>M</i> _{2KMax}	Nm	440					
					in.lb	3894					
Efficiency at full load				η	%	97					
Service life (For calculation, see the Chapter "Information")				<i>L</i> _h	h	> 20000					
Weight incl. standard adapter plate				<i>m</i>	kg	6.5					
					lb _m	14.4					
Operating noise (with <i>i</i> =10 and <i>n</i> ₁ =3000 rpm no load)				<i>L</i> _{PA}	dB(A)	≤ 64					
Max. permitted housing temperature					°C	+90					
					F	194					
Ambient temperature					°C	-15 to +40					
					F	5 to 104					
Lubrication				Lubricated for life							
Paint				Blue RAL 5002							
Direction of rotation				Motor and gearhead same direction							
Protection class				IP 65							
Moment of inertia (relates to the drive) Clamping hub diameter [mm]				E	19	<i>J</i> ₁	kgcm ²	2.59	2.11	1.69	1.45
							10 ⁻³ in.lb.s ²	2.29	1.87	1.50	1.28
				G	24	<i>J</i> ₁	kgcm ²	3.28	2.80	2.38	2.14
							10 ⁻³ in.lb.s ²	2.90	2.48	2.11	1.89
				H	28	<i>J</i> ₁	kgcm ²	2.89	2.41	1.99	1.75
							10 ⁻³ in.lb.s ²	2.56	2.13	1.76	1.55
				K	38	<i>J</i> ₁	kgcm ²	10.3	9.87	9.45	9.21
							10 ⁻³ in.lb.s ²	9.11	8.73	8.36	8.15

Reduced mass moments of inertia available on request.

^{a)} Other ratios available on request

^{b)} For higher ambient temperatures, please reduce input speed

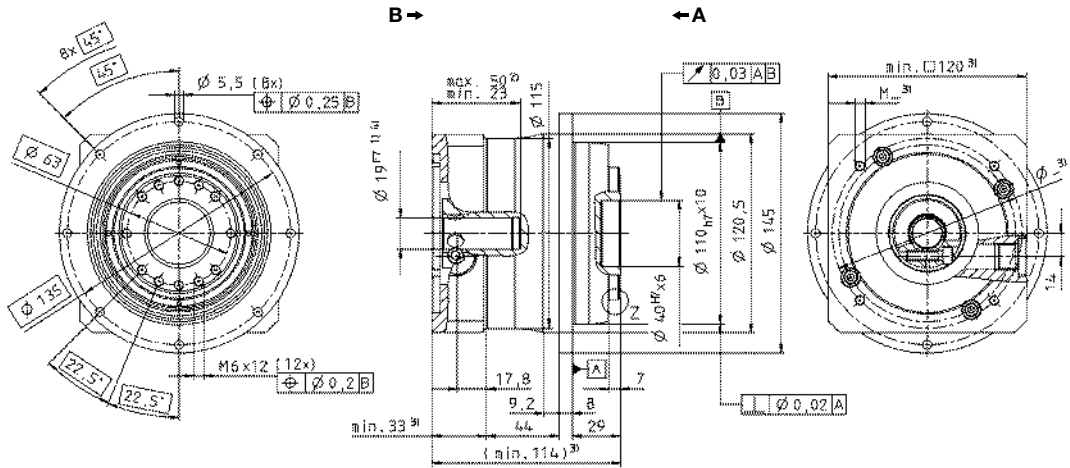
^{c)} Valid for clamping hub diameter of 24 and 28 mm

^{d)} Refers to center of the output shaft or flange

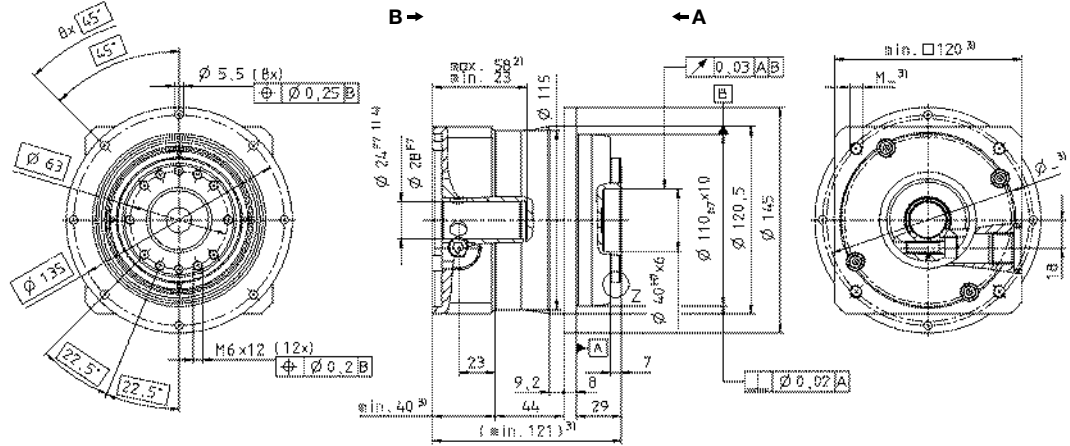
View A

View B

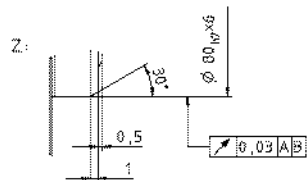
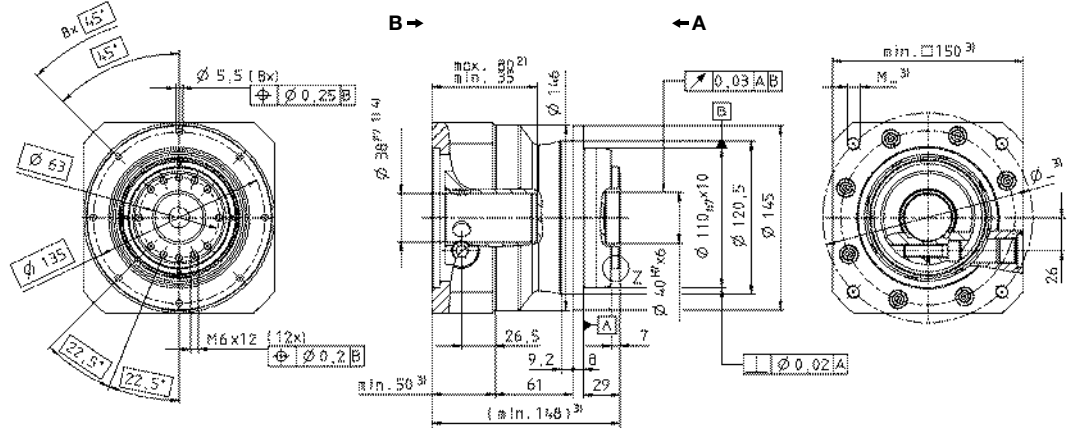
up to 19⁴⁾ (E)
clamping hub
diameter



up to 24/28⁴⁾
(G/H) clamping
hub diameter



up to 38⁴⁾ (K)
clamping hub
diameter



Non-tolerated dimensions ± 1 mm

- 1) Check motor shaft fit.
- 2) Min./Max. permissible motor shaft length. Longer motor shafts are adaptable, please contact us.
- 3) The dimensions depend on the motor.
- 4) Smaller motor shaft diameter is compensated by a bushing with a minimum thickness of 1 mm.



CAD data is available under
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Motor mounting according to operating manual

Planetary gearheads
High End

TP+
MF

TP+ 025 MF 2-stage

				2-stage													
Ratio ^{a)}	<i>i</i>			16	20	21	25	28	31	35	40	50	61	70	91	100	
cymex®-optimized acceleration torque (please contact us regarding the sizing)	<i>T</i> _{2Bcym}	Nm		390	390	–	420	390	–	420	390	420	–	350	–	275	
		in.lb		3452	3452	–	3717	3452	–	3717	3452	3717	–	3098	–	2434	
Max. acceleration torque (max. 1000 cycles per hour)	<i>T</i> _{2B}	Nm		350	350	300	380	350	300	380	350	380	280	330	250	265	
		in.lb		3098	3098	2655	3363	3098	2655	3363	3098	3363	2478	2921	2213	2345	
Nominal output torque (with <i>n</i> _{IN})	<i>T</i> _{2N}	Nm		200	210	170	200	210	190	220	200	220	170	200	100	120	
		in.lb		1770	1859	1505	1770	1859	1682	1947	1770	1947	1505	1770	885	1062	
Emergency stop torque (permitted 1000 times during the service life of the gearhead)	<i>T</i> _{2Not}	Nm		625	625	625	625	625	625	625	625	625	625	625	625	625	
		in.lb		5531	5531	5531	5531	5531	5531	5531	5531	5531	5531	5531	5531	5531	
Nominal input speed (with <i>T</i> _{2N} and 20 °C ambient temperature) ^{b)}	<i>n</i> _{1N}	rpm		2800	2800	2800	2800	2800	2800	2800	2800	3100	3500	3500	4200	4200	
Max. input speed	<i>n</i> _{1Max}	rpm		6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	
Mean no load running torque (with <i>n</i> ₁ =3000 rpm and 20 °C gearhead temperature) ^{c)}	<i>T</i> ₀₁₂	Nm		1.8	1.5	1.4	1.4	1.1	1.1	1.0	0.8	0.8	0.7	0.7	0.6	0.6	
		in.lb		15.9	13.3	12.4	12.4	9.7	9.7	8.9	7.1	7.1	6.2	6.2	5.3	5.3	
Max. torsional backlash	<i>j</i> _t	arcmin		Standard ≤ 3 / Reduced ≤ 1													
Torsional rigidity ^{c)}	<i>C</i> _{t21}	Nm/ arcmin		81	81	70	83	80	54	82	76	80	61	71	55	60	
		in.lb/ arcmin		717	717	620	735	708	478	726	673	708	540	628	487	531	
Tilting rigidity	<i>C</i> _{2K}	Nm/ arcmin		550													
		in.lb/ arcmin		4867													
Max. axial force ^{d)}	<i>F</i> _{2AMax}	N		4150													
		lb _f		934													
Max. tilting moment	<i>M</i> _{2KMax}	Nm		440													
		in.lb		3894													
Efficiency at full load	η	%		94													
Service life (For calculation, see the Chapter "Information")	<i>L</i> _n	h		> 20000													
Weight incl. standard adapter plate	<i>m</i>	kg		6.7													
		lb _m		14.8													
Operating noise (with <i>i</i> =100 and <i>n</i> ₁ =3000 rpm no load)	<i>L</i> _{PA}	dB(A)		≤ 60													
Max. permitted housing temperature		°C		+90													
		F		194													
Ambient temperature		°C		-15 to +40													
		F		5 to 104													
Lubrication				Lubricated for life													
Paint				Blue RAL 5002													
Direction of rotation				Motor and gearhead same direction													
Protection class				IP 65													
Moment of inertia (relates to the drive)	C	14	<i>J</i> ₁	kgcm ²	0.66	0.55	0.60	0.53	0.44	0.55	0.43	0.38	0.38	0.39	0.37	0.38	0.37
				10 ⁻³ in.lb.s ²	0.59	0.49	0.51	0.47	0.39	0.49	0.38	0.34	0.33	0.35	0.33	0.34	0.33
Clamping hub diameter [mm]	E	19	<i>J</i> ₁	kgcm ²	0.83	0.71	0.77	0.69	0.61	0.72	0.60	0.55	0.54	0.55	0.54	0.54	0.54
				10 ⁻³ in.lb.s ²	0.73	0.63	0.68	0.61	0.54	0.64	0.53	0.49	0.48	0.4	0.48	0.48	0.48
	G	24	<i>J</i> ₁	kgcm ²	2.20	2.08	2.14	2.06	1.98	2.09	1.97	1.92	1.92	1.92	1.91	1.92	1.91
				10 ⁻³ in.lb.s ²	1.95	1.84	1.89	1.82	1.75	1.85	1.74	1.70	1.70	1.70	1.69	1.70	1.69

Reduced mass moments of inertia available on request.

^{a)} Other ratios available on request

^{b)} For higher ambient temperatures, please reduce input speed

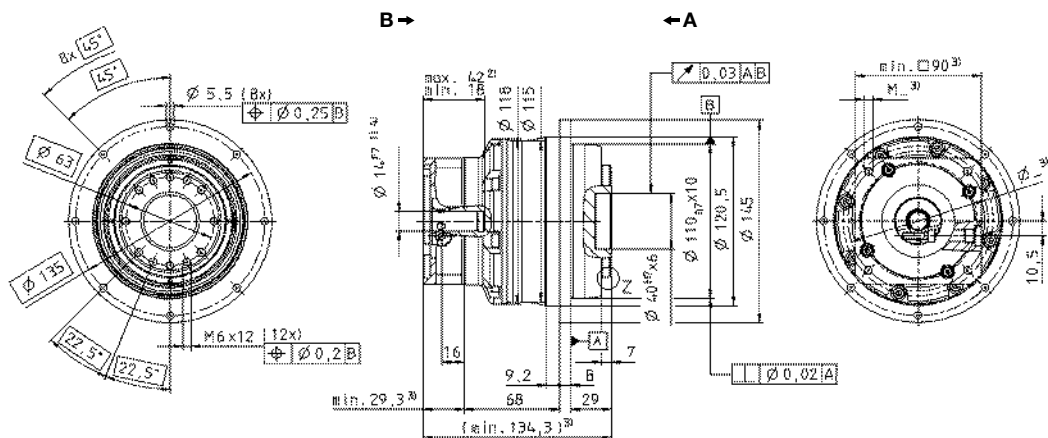
^{c)} Valid for clamping hub diameter of 19 mm

^{d)} Refers to center of the output shaft or flange

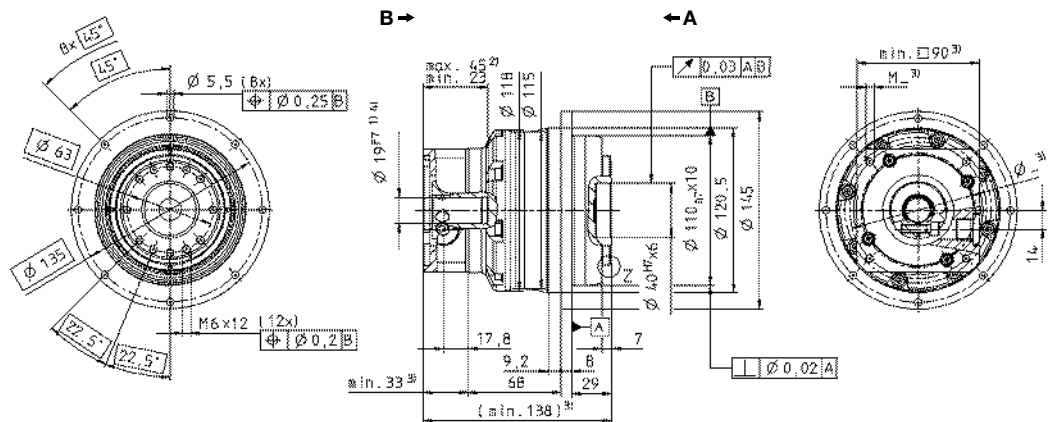
View A

View B

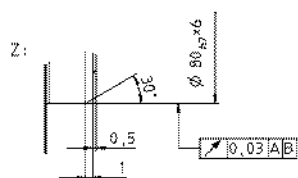
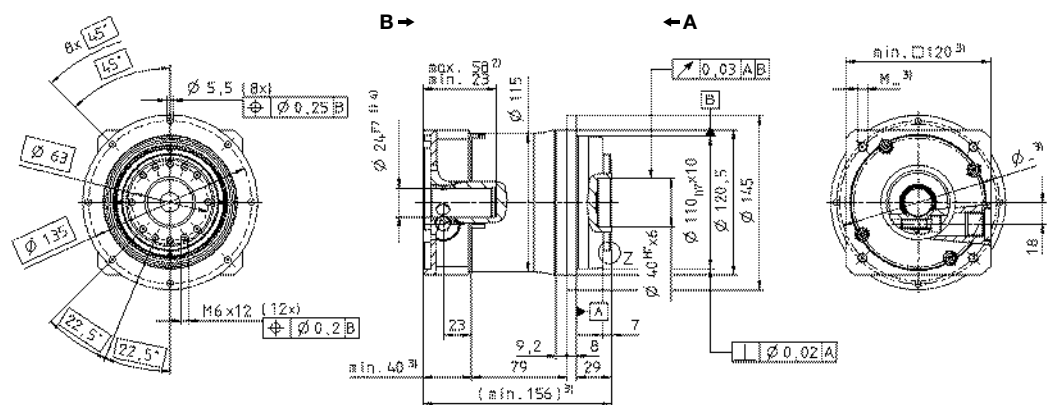
up to 14⁴⁾(C)
clamping hub
diameter



up to 19⁴⁾(E)
clamping hub
diameter



up to 24⁴⁾(G)
clamping hub
diameter



Non-tolerated dimensions ± 1 mm

- 1) Check motor shaft fit.
- 2) Min./Max. permissible motor shaft length. Longer motor shafts are adaptable, please contact us.
- 3) The dimensions depend on the motor.
- 4) Smaller motor shaft diameter is compensated by a bushing with a minimum thickness of 1 mm.



CAD data is available under
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Motor mounting according to operating manual

Planetary gearheads
High End

TP+
MF

TP+ 050 MF 1-stage

				1-stage							
Ratio ^{a)}				<i>i</i>	4	5	7	10			
cymex®-optimized acceleration torque (please contact us regarding the sizing)				<i>T</i> _{2Bcym}	Nm	750	800	–	600		
					in.lb	6638	7080	–	5310		
Max. acceleration torque (max. 1000 cycles per hour)				<i>T</i> _{2B}	Nm	700	700	700	540		
					in.lb	6195	6195	6195	4779		
Nominal output torque (with <i>n</i> _{2N})				<i>T</i> _{2N}	Nm	370	370	370	240		
					in.lb	3275	3275	3275	2124		
Emergency stop torque (permitted 1000 times during the service life of the gearhead)				<i>T</i> _{2Not}	Nm	1250	1250	1250	1250		
					in.lb	11063	11063	11063	11063		
Nominal input speed (with <i>T</i> _{2N} and 20 °C ambient temperature) ^{b)}				<i>n</i> _{1N}	rpm	1900	2000	2500	2500		
Max. input speed				<i>n</i> _{1Max}	rpm	4000	4000	4000	4000		
Mean no load running torque (with <i>n</i> ₁ =3000 rpm and 20 °C gearhead temperature) ^{c)}				<i>T</i> ₀₁₂	Nm	8.1	6.6	4.8	3.5		
					in.lb	71.7	58.4	42.5	31.0		
Max. torsional backlash				<i>j</i> _t	arcmin	Standard ≤ 3 / Reduced ≤ 1					
Torsional rigidity ^{c)}				<i>C</i> _{t21}	Nm/ arcmin	190	187	159	123		
					in.lb/ arcmin	1682	1655	1407	1089		
Tilting rigidity				<i>C</i> _{2K}	Nm/ arcmin	560					
					in.lb/ arcmin	4956					
Max. axial force ^{d)}				<i>F</i> _{2AMax}	N	6130					
					lb _f	1379					
Max. tilting moment				<i>M</i> _{2KMax}	Nm	1335					
					in.lb	11815					
Efficiency at full load				η	%	97					
Service life (For calculation, see the Chapter "Information")				<i>L</i> _n	h	> 20000					
Weight incl. standard adapter plate				<i>m</i>	kg	14.0					
					lb _m	30.9					
Operating noise (with <i>i</i> =10 and <i>n</i> ₁ =3000 rpm no load)				<i>L</i> _{PA}	dB(A)	≤ 65					
Max. permitted housing temperature					°C	+90					
					F	194					
Ambient temperature					°C	-15 to +40					
					F	5 to 104					
Lubrication						Lubricated for life					
Paint						Blue RAL 5002					
Direction of rotation						Motor and gearhead same direction					
Protection class						IP 65					
Moment of inertia (relates to the drive) Clamping hub diameter [mm]				G	24	<i>J</i> ₁	kgcm ²	9.47	7.85	6.39	5.54
							10 ⁻³ in.lb.s ²	8.38	6.95	5.66	4.90
				I	32	<i>J</i> ₁	kgcm ²	12.6	11.0	9.55	8.71
							10 ⁻³ in.lb.s ²	11.1	9.74	8.45	7.70
				K	38	<i>J</i> ₁	kgcm ²	13.7	12.1	10.6	9.78
							10 ⁻³ in.lb.s ²	12.1	10.7	9.38	8.65
				M	48	<i>J</i> ₁	kgcm ²	28.3	26.7	25.3	24.4
							10 ⁻³ in.lb.s ²	25.0	23.6	22.4	21.6

Reduced mass moments of inertia available on request.

^{a)} Other ratios available on request

^{b)} For higher ambient temperatures, please reduce input speed

^{c)} Valid for clamping hub diameter of 32 and 38 mm

^{d)} Refers to center of the output shaft or flange

View A

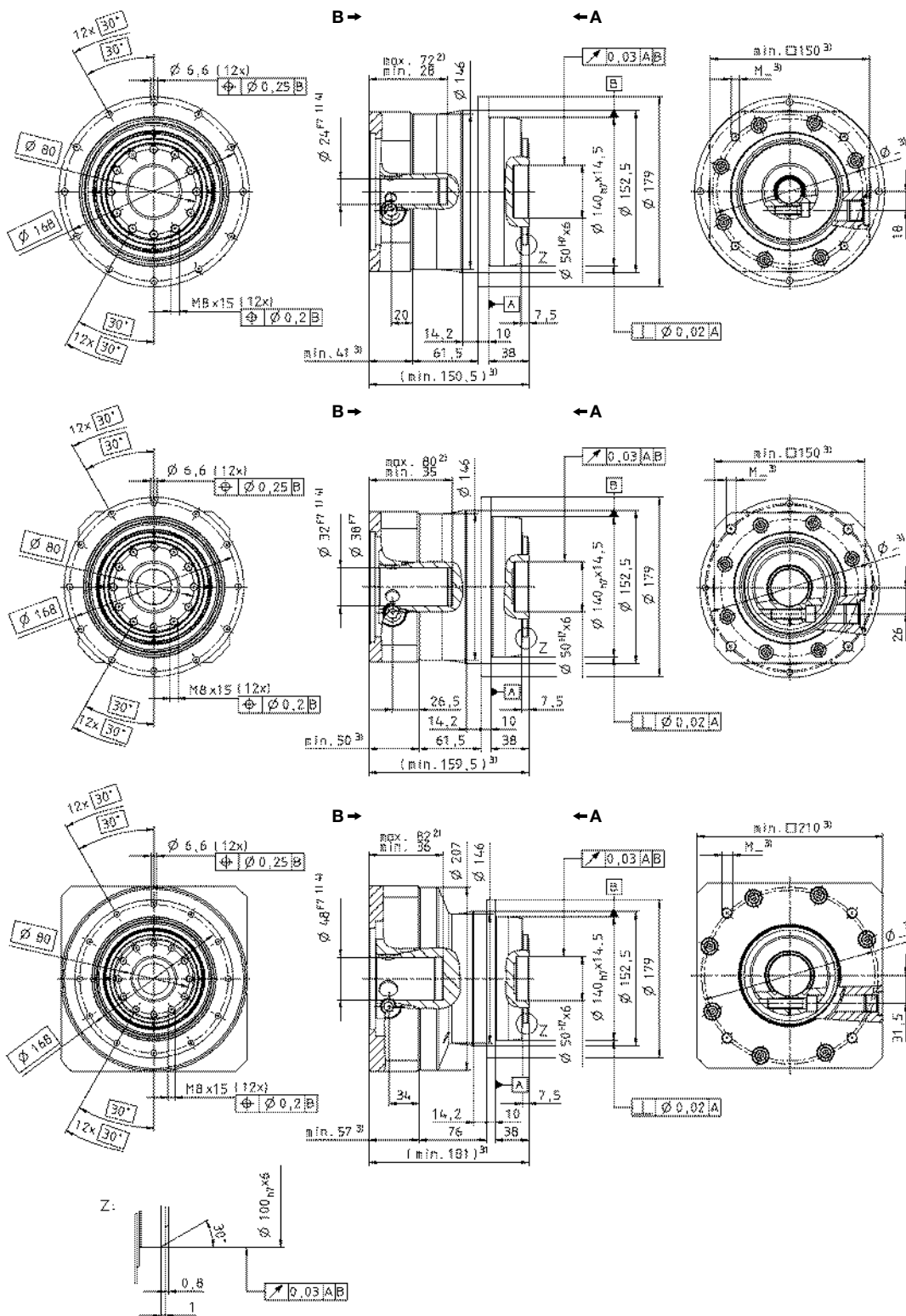
View B

Motor shaft diameter [mm]

up to 24⁴⁾ (G)
clamping hub
diameter

up to 32/38⁴⁾
(I/K) clamping hub
diameter

up to 48⁴⁾ (M)
clamping hub
diameter



Non-tolerated dimensions ± 1 mm

- 1) Check motor shaft fit.
- 2) Min./Max. permissible motor shaft length. Longer motor shafts are adaptable, please contact us.
- 3) The dimensions depend on the motor.
- 4) Smaller motor shaft diameter is compensated by a bushing with a minimum thickness of 1 mm.



CAD data is available under
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Motor mounting according to operating manual

Planetary gearheads
High End

TP+

MF

TP+ 050 MF 2-stage

				2-stage														
Ratio ^{a)}				<i>i</i>	16	20	21	25	28	31	35	40	50	61	70	91	100	
cymex®-optimized acceleration torque (please contact us regarding the sizing)				<i>T</i> _{2Bcym}	Nm	800	800	–	800	800	–	800	800	800	–	–	–	600
					in.lb	7080	7080	–	7080	7080	–	7080	7080	7080	–	–	–	5310
Max. acceleration torque (max. 1000 cycles per hour)				<i>T</i> _{2B}	Nm	750	750	600	750	750	620	750	750	750	550	700	500	540
					in.lb	6638	6638	5310	6638	6638	5487	6638	6638	6638	4868	6195	4425	4779
Nominal output torque (with <i>n</i> _{IN})				<i>T</i> _{2N}	Nm	400	400	350	400	400	400	400	400	400	350	400	220	240
					in.lb	3540	3540	3098	3540	3540	3540	3540	3540	3540	3098	3540	1947	2124
Emergency stop torque (permitted 1000 times during the service life of the gearhead)				<i>T</i> _{2Not}	Nm	1250	1250	1250	1250	1250	1250	1250	1250	1250	1250	1250	1250	1250
					in.lb	11063	11063	11063	11063	11063	11063	11063	11063	11063	11063	11063	11063	11063
Nominal input speed (with <i>T</i> _{2N} and 20 °C ambient temperature) ^{b)}				<i>n</i> _{1N}	rpm	2900	2900	2900	2900	2900	2900	2900	2900	3200	3200	3200	3900	3900
Max. input speed				<i>n</i> _{1Max}	rpm	5000	5000	5000	5000	5000	5000	5000	5000	5000	5000	5000	5000	5000
Mean no load running torque (with <i>n</i> ₁ =3000 rpm and 20 °C gearhead temperature) ^{c)}				<i>T</i> ₀₁₂	Nm	4.2	3.4	3.3	3.1	2.5	2.4	2.3	1.8	1.7	1.5	1.5	1.4	1.3
					in.lb	37.2	30.1	29.2	27.4	22.1	21.2	20.4	15.9	15.1	13.3	13.3	12.4	11.5
Max. torsional backlash				<i>j</i> _t	arcmin	Standard ≤ 3 / Reduced ≤ 1												
Torsional rigidity ^{c)}				<i>C</i> _{t21}	Nm/ arcmin	180	185	145	180	180	130	175	175	175	123	145	100	115
					in.lb/ arcmin	1593	1637	1283	1593	1593	1151	1549	1549	1549	1089	1283	885	1018
Tilting rigidity				<i>C</i> _{2K}	Nm/ arcmin	560												
					in.lb/ arcmin	4956												
Max. axial force ^{d)}				<i>F</i> _{2AMax}	N	6130												
					lb _f	1379												
Max. tilting moment				<i>M</i> _{2KMax}	Nm	1335												
					in.lb	11815												
Efficiency at full load				η	%	94												
Service life (For calculation, see the Chapter "Information")				<i>L</i> _h	h	> 20000												
Weight incl. standard adapter plate				<i>m</i>	kg	14.1												
					lb _m	31.2												
Operating noise (with <i>i</i> =100 and <i>n</i> ₁ =3000 rpm no load)				<i>L</i> _{PA}	dB(A)	≤ 63												
Max. permitted housing temperature					°C	+90												
					F	194												
Ambient temperature					°C	-15 to +40												
					F	5 to 104												
Lubrication					Lubricated for life													
Paint					Blue RAL 5002													
Direction of rotation					Motor and gearhead same direction													
Protection class					IP 65													
Moment of inertia (relates to the drive)	E	19	<i>J</i> ₁	kgcm ²	2.53	2.07	2.30	2.01	1.67	2.12	1.64	1.44	1.42	1.46	1.41	1.43	1.40	
				10 ⁻³ in.lb.s ²	2.24	1.83	2.04	1.78	1.48	1.88	1.45	1.27	1.26	1.29	1.25	1.27	1.24	
Clamping hub diameter [mm]	G	24	<i>J</i> ₁	kgcm ²	3.22	2.77	2.99	2.70	2.36	2.81	2.33	2.13	2.12	2.15	2.10	2.12	2.09	
				10 ⁻³ in.lb.s ²	2.85	2.45	2.65	2.39	2.09	2.49	2.06	1.89	1.88	1.90	1.86	1.88	1.85	
	K	38	<i>J</i> ₁	kgcm ²	10.3	9.83	10.1	9.77	9.43	9.88	9.40	9.20	9.18	9.22	9.17	9.19	9.16	
				10 ⁻³ in.lb.s ²	9.11	8.70	8.94	8.64	8.35	8.74	8.32	8.14	8.12	8.16	8.12	8.13	8.11	

Reduced mass moments of inertia available on request.

^{a)} Other ratios available on request

^{b)} For higher ambient temperatures, please reduce input speed

^{c)} Valid for clamping hub diameter of 24 mm

^{d)} Refers to center of the output shaft or flange

View A

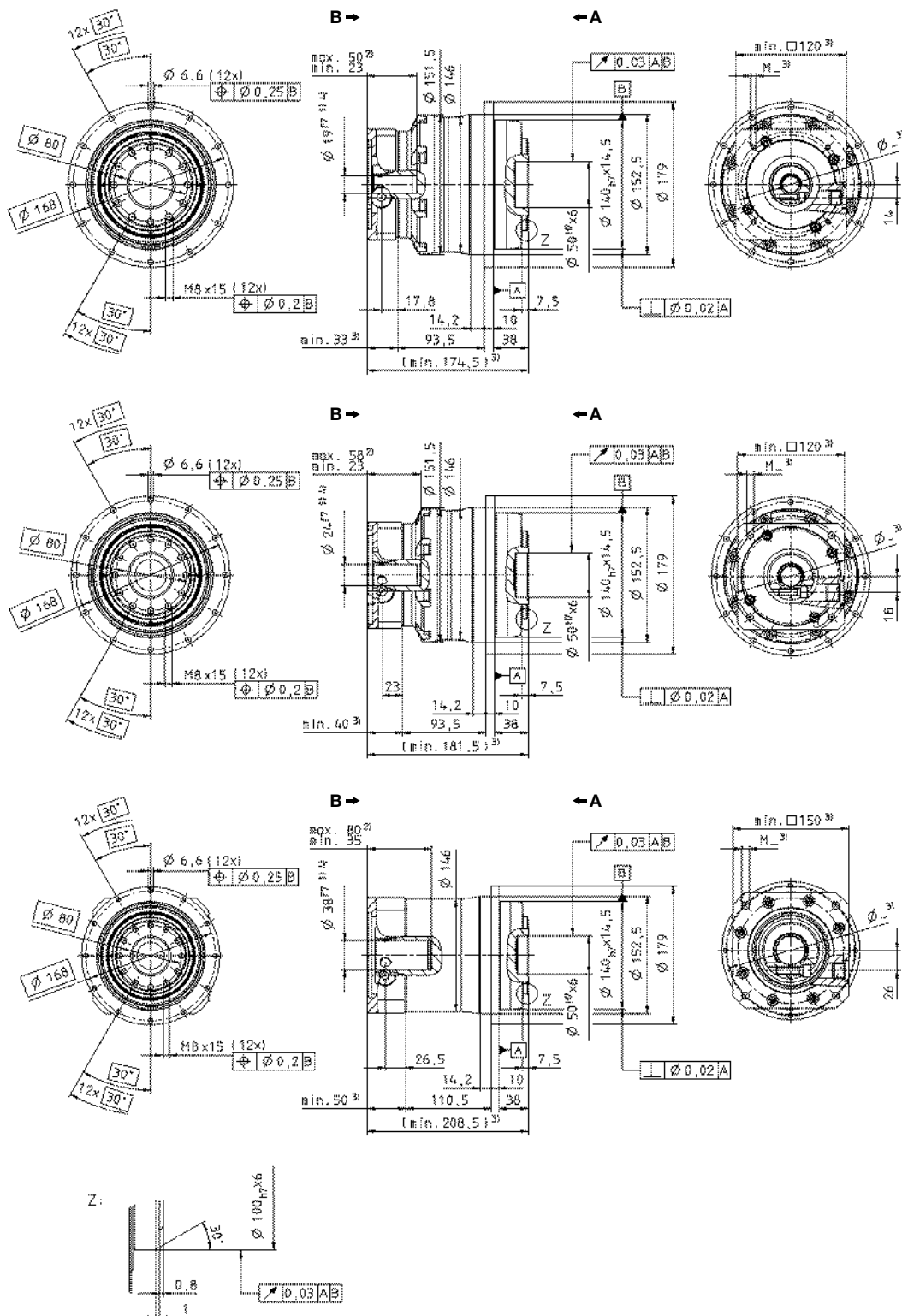
View B

Motor shaft diameter [mm]

up to 19⁴⁾ (E)
clamping hub
diameter

up to 24⁴⁾ (G)
clamping hub
diameter

up to 38⁴⁾ (K)
clamping hub
diameter



Non-tolerated dimensions ± 1 mm

- 1) Check motor shaft fit.
- 2) Min./Max. permissible motor shaft length. Longer motor shafts are adaptable, please contact us.
- 3) The dimensions depend on the motor.
- 4) Smaller motor shaft diameter is compensated by a bushing with a minimum thickness of 1 mm.



CAD data is available under
<http://www.wittenstein-alpha.de/en/info-and-cad-finder.html>



Motor mounting according to operating manual

Planetary gearheads
High End

TP+
MF

TP+ 110 MF 1-stage

				1-stage					
Ratio ^{a)}			<i>i</i>		4	5	7	10	
cymex®-optimized acceleration torque (please contact us regarding the sizing)			<i>T</i> _{2Bcym}	Nm	1900	2000	1900	1500	
				in.lb	16815	17700	16815	13275	
Max. acceleration torque (max. 1000 cycles per hour)			<i>T</i> _{2B}	Nm	1600	1600	1600	1400	
				in.lb	14160	14160	14160	12390	
Nominal output torque (with <i>n</i> _{IN})			<i>T</i> _{2N}	Nm	700	750	750	750	
				in.lb	6195	6638	6638	6638	
Emergency stop torque (permitted 1000 times during the service life of the gearhead)			<i>T</i> _{2Not}	Nm	2750	2750	2750	2750	
				in.lb	24338	24338	24338	24338	
Nominal input speed (with <i>T</i> _{2N} and 20 °C ambient temperature) ^{b)}			<i>n</i> _{1N}	rpm	1400	1500	2000	2000	
Max. input speed			<i>n</i> _{1Max}	rpm	3500	3500	3500	3500	
Mean no load running torque (with <i>n</i> ₁ = 3000 rpm and 20 °C gearhead temperature) ^{c)}			<i>T</i> ₀₁₂	Nm	15.6	12.7	9.4	7.0	
				in.lb	138.1	112.4	83.2	62.0	
Max. torsional backlash			<i>j</i> _t	arcmin	Standard ≤ 3 / Reduced ≤ 1				
Torsional rigidity ^{c)}			<i>C</i> _{t21}	Nm/ arcmin	610	610	550	445	
				in.lb/ arcmin	5399	5399	4868	3938	
Tilting rigidity			<i>C</i> _{2K}	Nm/ arcmin	1452				
				in.lb/ arcmin	12850				
Max. axial force ^{d)}			<i>F</i> _{2AMax}	N	10050				
				lb _f	2261				
Max. tilting moment			<i>M</i> _{2KMax}	Nm	3280				
				in.lb	29028				
Efficiency at full load			η	%	97				
Service life (For calculation, see the Chapter "Information")			<i>L</i> _h	h	> 20000				
Weight incl. standard adapter plate			<i>m</i>	kg	30.0				
				lb _m	66				
Operating noise (with <i>i</i> =10 and <i>n</i> ₁ =3000 rpm no load)			<i>L</i> _{PA}	dB(A)	≤ 66				
Max. permitted housing temperature				°C	+90				
				F	194				
Ambient temperature				°C	-15 to +40				
				F	5 to 104				
Lubrication					Lubricated for life				
Paint					Blue RAL 5002				
Direction of rotation					Motor and gearhead same direction				
Protection class					IP 65				
Moment of inertia (relates to the drive)		K	38	<i>J</i> ₁	kgcm ²	44.5	34.6	25.5	20.6
					10 ⁻³ in.lb.s ²	39.4	30.6	22.6	18.2
Clamping hub diameter [mm]		M	48	<i>J</i> ₁	kgcm ²	51.8	41.9	32.9	28.0
					10 ⁻³ in.lb.s ²	45.8	37.1	29.1	24.8

Reduced mass moments of inertia available on request.

^{a)} Other ratios available on request

^{b)} For higher ambient temperatures, please reduce input speed

^{c)} Valid for clamping hub diameter of 48 mm

^{d)} Refers to center of the output shaft or flange

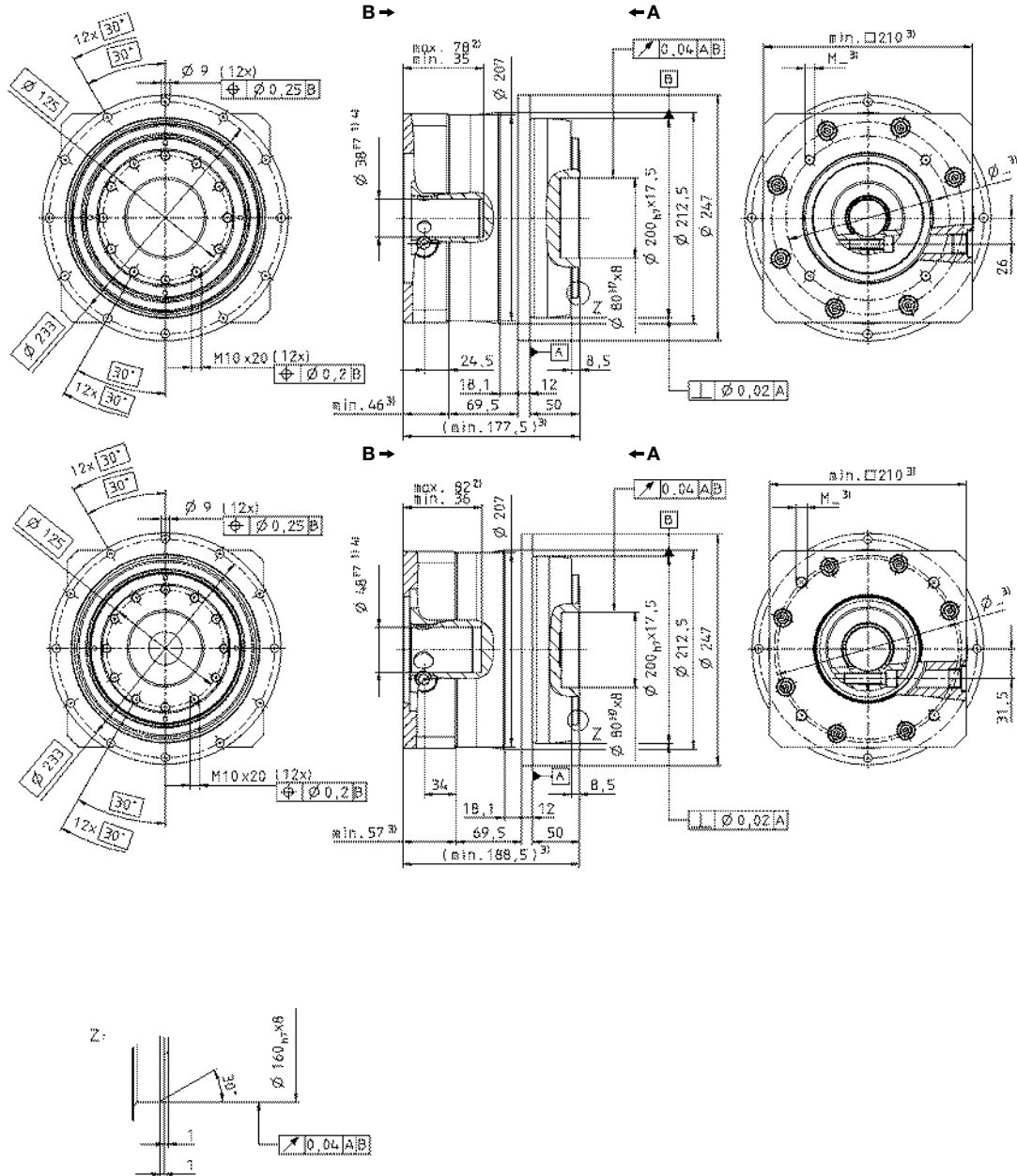
View A

View B

Motor shaft diameter [mm]

up to 38⁴⁾ (K)
clamping hub
diameter

up to 48⁴⁾ (M)
clamping hub
diameter



Planetary gearheads
High End

TP+
MF

Non-tolerated dimensions ± 1 mm

- 1) Check motor shaft fit.
- 2) Min./Max. permissible motor shaft length. Longer motor shafts are adaptable, please contact us.
- 3) The dimensions depend on the motor.
- 4) Smaller motor shaft diameter is compensated by a bushing with a minimum thickness of 1 mm.



CAD data is available under
<http://www.wittenstein-alpha.de/en/info-and-cad-finder.html>



Motor mounting according to operating manual

TP+ 110 MF 2-stage

				2-stage																
Ratio ^{a)}				<i>i</i>		16	20	21	25	28	31	35	40	50	61	70	91	100		
cymex®-optimized acceleration torque (please contact us regarding the sizing)				<i>T</i> _{2Bcym}	Nm	2000	2000	–	2000	2000	–	2000	1800	1800	–	1800	–	1500		
					in.lb	17700	17700	–	17700	17700	–	17700	15930	15930	–	15930	–	13275		
Max. acceleration torque (max. 1000 cycles per hour)				<i>T</i> _{2B}	Nm	1600	1600	1400	1600	1600	1600	1600	1600	1600	1400	1600	1300	1400		
					in.lb	14160	14160	12390	14160	14160	14160	14160	14160	14160	12390	14160	11505	12390		
Nominal output torque (with <i>n</i> _{in})				<i>T</i> _{2N}	Nm	980	980	850	1050	1050	1250	1250	850	1050	1100	900	700	800		
					in.lb	8673	8673	7523	9293	9293	11063	11063	7523	9293	9735	7965	6195	7080		
Emergency stop torque (permitted 1000 times during the service life of the gearhead)				<i>T</i> _{2Not}	Nm	2750	2750	2750	2750	2750	2750	2750	2750	2750	2750	2750	2750	2750		
					in.lb	24338	24338	24338	24338	24338	24338	24338	24338	24338	24338	24338	24338	24338	24338	
Nominal input speed (with <i>T</i> _{2N} and 20 °C ambient temperature) ^{b)}				<i>n</i> _{1N}	rpm	2500	2500	2500	2500	2500	2500	2500	2500	2900	3200	3200	3400	3400		
Max. input speed ^{c)}				<i>n</i> _{1Max}	rpm	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500		
Mean no load running torque (with <i>n</i> ₁ =3000 rpm and 20 °C gearhead temperature) ^{c)}				<i>T</i> ₀₁₂	Nm	6.9	5.6	5.5	5.0	4.1	3.9	3.7	3.0	2.7	2.5	2.4	2.2	2.2		
					in.lb	61.1	49.6	48.7	44.3	36.3	34.5	32.7	26.6	23.9	22.1	21.2	19.5	19.5		
Max. torsional backlash				<i>j</i> _t	arcmin	Standard ≤ 3 / Reduced ≤ 1														
Torsional rigidity ^{c)}				<i>C</i> _{t21}	Nm/ arcmin	585	580	465	570	560	440	560	520	525	415	480	360	395		
					in.lb/ arcmin	5177	5133	4115	5045	4956	3894	4956	4602	4646	3673	4248	3186	3496		
Tilting rigidity				<i>C</i> _{2K}	Nm/ arcmin	1452														
					in.lb/ arcmin	12850														
Max. axial force ^{d)}				<i>F</i> _{2AMax}	N	10050														
					lb _f	2261														
Max. tilting moment				<i>M</i> _{2KMax}	Nm	3280														
					in.lb	29028														
Efficiency at full load				η	%	94														
Service life (For calculation, see the Chapter "Information")				<i>L</i> _h	h	> 20000														
Weight incl. standard adapter plate				<i>m</i>	kg	34.0														
					lb _m	75.1														
Operating noise (with <i>i</i> =100 and <i>n</i> ₁ =3000 rpm no load)				<i>L</i> _{PA}	dB(A)	≤ 66														
Max. permitted housing temperature					°C	+90														
					F	194														
Ambient temperature					°C	-15 to +40														
					F	5 to 104														
Lubrication				Lubricated for life																
Paint				Blue RAL 5002																
Direction of rotation				Motor and gearhead same direction																
Protection class				IP 65																
Moment of inertia (relates to the drive) Clamping hub diameter [mm]				G	24	<i>J</i> ₁	kgcm ²	8.51	8.21	8.98	7.82	6.57	8.09	6.37	5.63	5.54	5.63	5.44	5.50	5.39
							10 ⁻³ in.lb.s ²	7.53	7.27	7.95	6.92	5.81	7.16	5.64	4.99	4.90	4.99	4.82	4.87	4.77
				I	32	<i>J</i> ₁	kgcm ²	11.7	11.4	12.1	11.0	9.73	11.3	9.54	8.80	8.70	8.79	8.61	8.67	8.56
							10 ⁻³ in.lb.s ²	10.3	10.1	10.7	9.72	8.61	9.96	8.44	7.78	7.70	7.78	7.62	7.67	7.57
				K	38	<i>J</i> ₁	kgcm ²	12.7	12.5	13.2	12.1	10.8	12.3	10.6	9.87	9.77	9.87	9.68	9.74	9.63
							10 ⁻³ in.lb.s ²	11.3	11.0	11.7	10.7	9.6	10.9	9.39	8.73	8.65	8.73	8.56	8.62	8.52
M	48	<i>J</i> ₁	kgcm ²	27.4	27.1	27.8	26.7	25.4	26.9	25.3	24.5	24.4	24.5	24.3	24.4	24.3				
			10 ⁻³ in.lb.s ²	24.2	24.0	24.6	23.6	22.5	23.8	22.3	21.7	21.6	21.7	21.5	21.6	21.5				

Reduced mass moments of inertia available on request.

^{a)} Other ratios available on request

^{b)} For higher ambient temperatures, please reduce input speed

^{c)} Valid for clamping hub diameter of 32 and 38 mm

^{d)} Refers to center of the output shaft or flange

View A

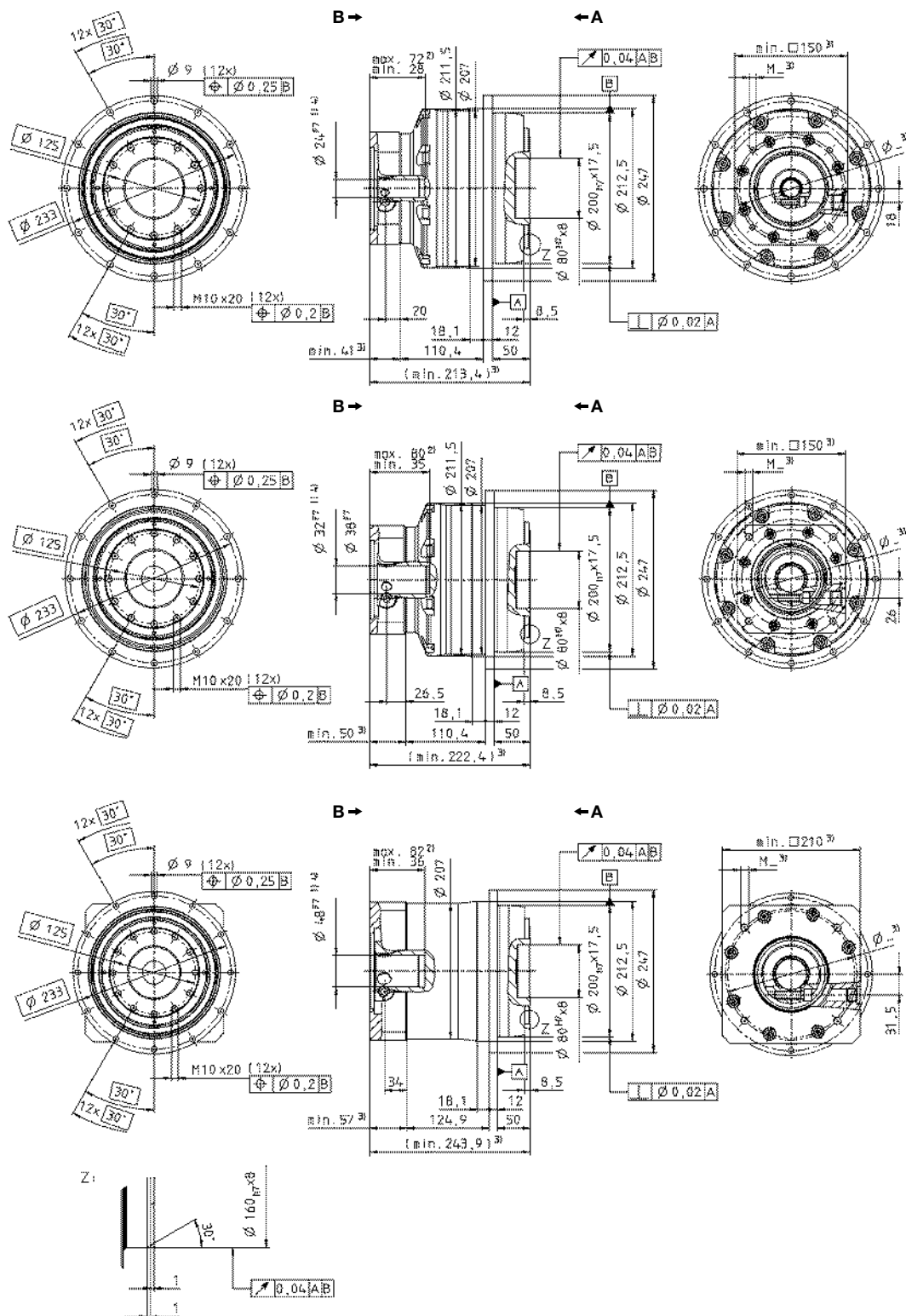
View B

Motor shaft diameter [mm]

up to 24 ⁴⁾ (G)
clamping hub
diameter

up to 32/38 ⁴⁾
(I/K) clamping hub
diameter

up to 48 ⁴⁾ (M)
clamping hub
diameter



Non-tolerated dimensions ± 1 mm

- 1) Check motor shaft fit.
- 2) Min./Max. permissible motor shaft length. Longer motor shafts are adaptable, please contact us.
- 3) The dimensions depend on the motor.
- 4) Smaller motor shaft diameter is compensated by a bushing with a minimum thickness of 1 mm.



CAD data is available under
<http://www.wittenstein-alpha.de/en/info-and-cad-finder.html>



Motor mounting according to operating manual

Planetary gearheads
High End

TP+

MF

TP+ 300 MF 1/2-stage

					1-stage			2-stage									
Ratio ^{a)}	<i>i</i>		5	7	10	20	21	25	31	35	50	61	70	91	100		
Max. acceleration torque (max. 1000 cycles per hour)	<i>T</i> _{2B}	Nm	3500	3300	1900	3500	3400	3500	3500	3500	3000	2800	3300	2800	2800		
		in.lb	30975	29205	16815	30975	30090	30975	30975	30975	30975	26550	24780	29205	24780	24780	
Nominal output torque (with <i>n</i> _{in})	<i>T</i> _{2N}	Nm	2200	1800	1000	2300	2100	2400	2200	2500	1900	1600	1800	1600	1600		
		in.lb	19470	15930	8850	20355	18585	21240	19470	22125	16815	14160	15930	14160	14160		
Emergency stop torque (permitted 1000 times during the service life of the gearhead)	<i>T</i> _{2Not}	Nm	8750	8750	8750	8750	8750	8750	8750	8750	8750	8750	8750	8750	8750		
		in.lb	77438	77438	77438	77438	77438	77438	77438	77438	77438	77438	77438	77438	77438		
Nominal input speed (with <i>T</i> _{2N} and 20 °C ambient temperature) ^{b)}	<i>n</i> _{1N}	rpm	1000	1400	1700	2000	2000	2000	2000	2000	2300	2400	2400	2500	2500		
Max. input speed	<i>n</i> _{1Max}	rpm	2500	2500	2500	3500	3500	3500	3500	3500	3500	3500	3500	3500	3500		
Mean no load running torque (with <i>n</i> ₁ =2000 rpm and 20 °C gearhead temperature)	<i>T</i> ₀₁₂	Nm	23	17	11	10	9,5	9,0	7,0	6,0	5,0	4,0	4,0	3,5	3,5		
		in.lb	204	150	97	89	84	80	62	53	44	35	35	31	31		
Max. torsional backlash	<i>j</i> _t	arcmin	Standard ≤ 3 / Reduced ≤ 1			Standard ≤ 3 / Reduced ≤ 2											
Torsional rigidity	<i>C</i> _{t21}	Nm/ arcmin	1000	900	700	850	800	950	750	900	800	700	800	600	650		
		in.lb/ arcmin	8850	7965	6195	7523	7080	9408	6638	7965	7080	6195	7080	5310	5753		
Tilting rigidity	<i>C</i> _{2K}	Nm/ arcmin	5560														
		in.lb/ arcmin	49206														
Max. axial force ^{c)}	<i>F</i> _{2AMax}	N	33000														
		lb _f	7425														
Max. tilting moment	<i>M</i> _{2KMax}	Nm	3900			5900											
		in.lb	34515			52215											
Efficiency at full load	η	%	95			93											
Service life (For calculation, see the Chapter "Information")	<i>L</i> _h	h	> 20000														
Weight incl. standard adapter plate	<i>m</i>	kg	60			58.5											
		lb _m	132.6			129.3											
Operating noise (with <i>i</i> =10 and <i>n</i> ₁ =2000 rpm without load)	<i>L</i> _{PA}	dB(A)	≤ 64														
Max. permitted housing temperature		°C	+90														
		F	194														
Ambient temperature		°C	-15 to +40														
		F	5 to 104														
Lubrication			Lubricated for life														
Paint			Blue RAL 5002														
Direction of rotation			Motor and gearhead same direction														
Protection class			IP 65														
Moment of inertia (relates to the drive)	M	48	<i>J</i> ₁	kgcm ²	–	–	–	27.5	27.0	25.9	25.6	22.4	21.5	21.4	21.3	21.2	21.2
		10 ⁻² in.lb.s ²					24.3	23.9	22.9	22.7	19.8	19.0	18.9	18.9	18.8	18.8	
Clamping hub diameter [mm]	N	55	<i>J</i> ₁	kgcm ²	82.6	61.2	49.5	–	–	–	–	–	–	–	–	–	–
		10 ⁻² in.lb.s ²		73.1	54.2	43.8											

Reduced mass moments of inertia available on request.

^{a)} Other ratios available on request

^{b)} For higher ambient temperatures, please reduce input speed

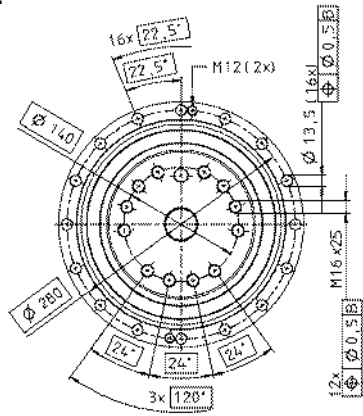
^{c)} Refers to center of the output shaft or flange

View A

View B

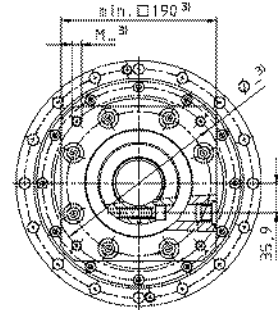
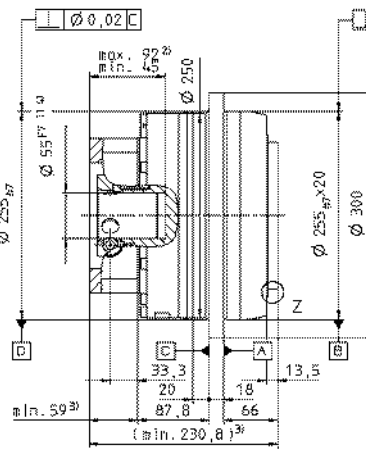
Motor shaft diameter [mm]

1-stage:

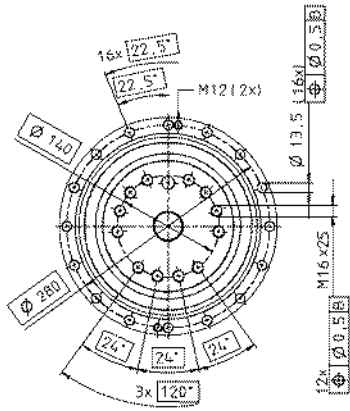


B →

← A

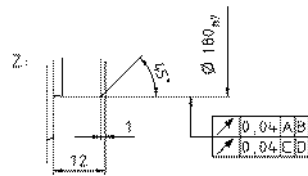
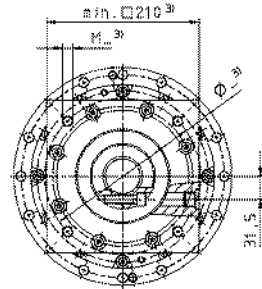
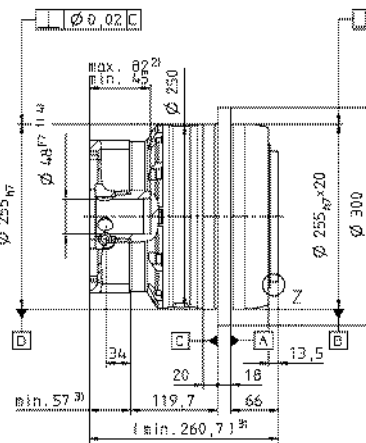


2-stage:



B →

← A



Non-tolerated dimensions $\pm 1,5$ mm

- 1) Check motor shaft fit.
- 2) Min./Max. permissible motor shaft length. Longer motor shafts are adaptable, please contact us.
- 3) The dimensions depend on the motor.
- 4) Smaller motor shaft diameter is compensated by a bushing with a minimum thickness of 1 mm.



CAD data is available under
<http://www.wittenstein-alpha.de/en/info-and-cad-finder.html>



Motor mounting according to operating manual

Planetary gearheads
High End

TP+
MF

TP+ 500 MF 1/2-stage

				1-stage			2-stage										
Ratio ^{a)}		<i>i</i>		5	7	10	20	21	25	31	35	50	61	70	91	100	
Max. acceleration torque (max. 1000 cycles per hour)		<i>T</i> _{2B}	Nm	6000	5000	3400	6000	5000	6000	6000	6000	4500	4800	5000	4800	4800	
			in.lb	53100	44250	30090	53100	44250	53100	53100	53100	39825	42480	44250	42480	42480	
Nominal output torque (with <i>n</i> _m)		<i>T</i> _{2N}	Nm	3250	2800	1700	3350	3200	3800	3700	3800	2900	2900	2800	2900	2900	
			in.lb	28763	24780	15045	29648	28320	33630	32745	33630	25665	25665	24780	25665	25665	
Emergency stop torque (permitted 1000 times during the service life of the gearhead)		<i>T</i> _{2Not}	Nm	15000	15000	15000	15000	15000	15000	15000	15000	15000	15000	15000	15000	15000	
			in.lb	132750	132750	132750	132750	132750	132750	132750	132750	132750	132750	132750	132750	132750	
Nominal input speed (with <i>T</i> _{2N} and 20 °C ambient temperature) ^{b)}		<i>n</i> _{1N}	rpm	900	1300	1500	1500	1500	1500	1500	1500	2000	2100	2100	2200	2200	
Max. input speed		<i>n</i> _{1Max}	rpm	2500	2500	2500	3500	3500	3500	3500	3500	3500	3500	3500	3500	3500	
Mean no load running torque (with <i>n</i> ₁ =2000 rpm and 20 °C gearhead temperature)		<i>T</i> ₀₁₂	Nm	30	22	14	13	12	10	8,0	7,0	6,0	5,0	5,0	4,5	4,5	
			in.lb	266	195	124	115	106	89	71	62	53	44	44	40	40	
Max. torsional backlash		<i>j</i> _t	arcmin	Standard ≤ 3 / Reduced ≤ 1			Standard ≤ 3 / Reduced ≤ 2										
Torsional rigidity		<i>C</i> _{t21}	Nm/ arcmin	1450	1300	1100	1400	1200	1450	1200	1400	1300	1100	1250	950	1050	
			in.lb/ arcmin	12833	11505	9735	12390	10620	12833	10620	12390	11505	9735	11063	8401	9293	
Tilting rigidity		<i>C</i> _{2K}	Nm/ arcmin	9480													
			in.lb/ arcmin	83898													
Max. axial force ^{c)}		<i>F</i> _{2AMax}	N	50000													
			lb _f	11250													
Max. tilting moment		<i>M</i> _{2KMax}	Nm	5500			8800										
			in.lb	48675			77880										
Efficiency at full load		η	%	95			93										
Service life (For calculation, see the Chapter "Information")		<i>L</i> _h	h	> 20000													
Weight incl. standard adapter plate		<i>m</i>	kg	82			77.5										
			lb _m	181.2			171.3										
Operating noise (with <i>i</i> =10 and <i>n</i> ₁ =2000 rpm no load)		<i>L</i> _{PA}	dB(A)	≤ 66													
Max. permitted housing temperature			°C	+90													
			F	194													
Ambient temperature			°C	-15 to +40													
			F	5 to 104													
Lubrication				Lubricated for life													
Paint				Blue RAL 5002													
Direction of rotation				Motor and gearhead same direction													
Protection class				IP 65													
Moment of inertia (relates to the drive)	M	48	<i>J</i> ₁	kgcm ²	–	–	–	32.3	37.6	31.1	32.8	25.1	23.2	23.6	23.2	23.0	22.7
				10 ⁻² in.lb.s ²	–	–	–	28.6	33.3	27.5	29.0	22.2	20.5	20.9	20.5	20.4	20.1
Clamping hub diameter [mm]	O	60	<i>J</i> ₁	kgcm ²	175.5	137.0	115.8	–	–	–	–	–	–	–	–	–	–
				10 ⁻¹ in.lb.s ²	155.3	121.2	102.5	–	–	–	–	–	–	–	–	–	–

Reduced mass moments of inertia available on request.

^{a)} Other ratios available on request

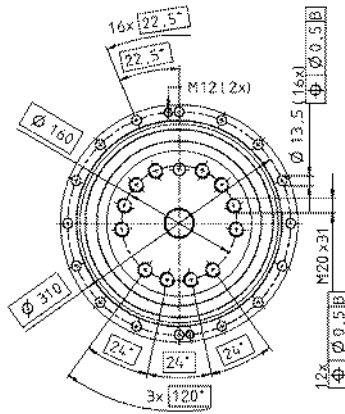
^{b)} For higher ambient temperatures, please reduce input speed

^{c)} Refers to center of the output shaft or flange

View A

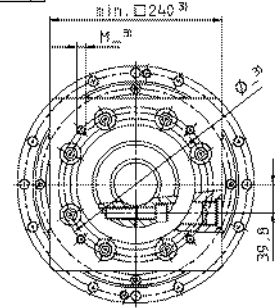
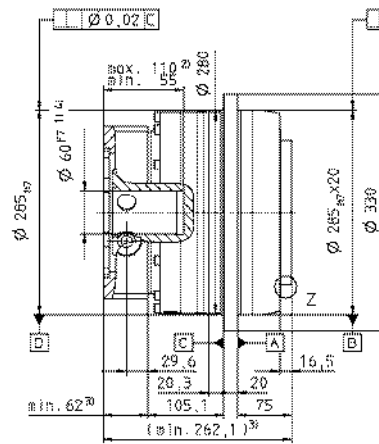
View B

1-stage:

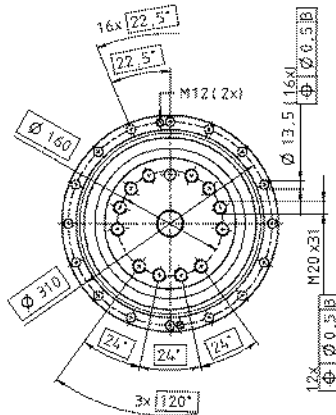


B →

← A

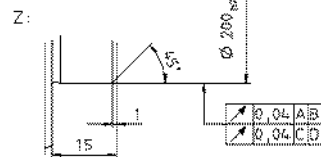
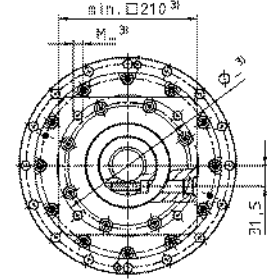
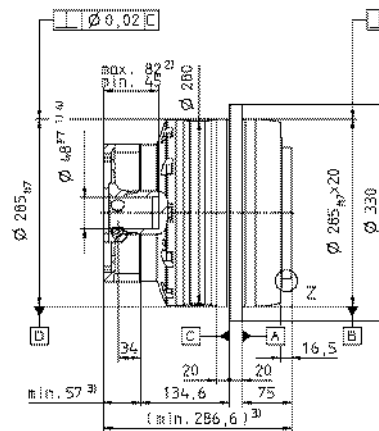


2-stage:



B →

← A



Motor shaft diameter [mm]

up to 60 ⁴⁾ (O)
clamping hub
diameter

up to 48 ⁴⁾ (M)
clamping hub
diameter

Planetary gearheads
High End

TP+
MF

Non-tolerated dimensions $\pm 1,5$ mm

- 1) Check motor shaft fit.
- 2) Min./Max. permissible motor shaft length. Longer motor shafts are adaptable, please contact us.
- 3) The dimensions depend on the motor.
- 4) Smaller motor shaft diameter is compensated by a bushing with a minimum thickness of 1 mm.



CAD data is available under
<http://www.wittenstein-alpha.de/en/info-and-cad-finder.html>



Motor mounting according to operating manual

TP+ 010 MA HIGH TORQUE

				2-stage				3-stage				
Ratio ^{a)}		<i>i</i>		22	27.5	38.5	55	88	110	154	220	
Max. acceleration torque (max. 1000 cycles per hour)		<i>T</i> _{2B}	Nm	230	230	230	230	230	230	230	230	
			in.lb	2036	2036	2036	2036	2036	2036	2036	2036	
Nominal output torque (with <i>n</i> _m)		<i>T</i> _{2N}	Nm	150	150	180	110	180	180	180	180	
			in.lb	1328	1328	1593	974	1593	1593	1593	1593	
Emergency stop torque (permitted 1000 times during the service life of the gearhead)		<i>T</i> _{2Not}	Nm	525	525	525	525	525	525	525	525	
			in.lb	4646	4646	4646	4646	4646	4646	4646	4646	
Nominal input speed (with <i>T</i> _{2N} and 20 °C ambient temperature) ^{b)}		<i>n</i> _{1N}	rpm	4000	4000	4000	4000	4500	4500	4500	4500	
Max. input speed		<i>n</i> _{1Max}	rpm	6000	6000	6000	6000	6000	6000	6000	6000	
Mean no load running torque (with <i>n</i> ₁ =3000 rpm and 20 °C gearhead temperature) ^{c)}		<i>T</i> ₀₁₂	Nm	0.60	0.50	0.45	0.35	0.35	0.35	0.30	0.30	
			in.lb	5.30	4.40	4.00	3.10	3.10	3.10	2.70	2.70	
Max. torsional backlash		<i>j</i> _t	arcmin	≤ 1				≤ 1				
Torsional rigidity ^{c)}		<i>C</i> _{t21}	Nm/ arcmin	43	43	43	42	42	42	42	42	
			in.lb/ arcmin	381	381	381	372	372	372	372	372	
Tilting rigidity		<i>C</i> _{2K}	Nm/ arcmin	225				225				
			in.lb/ arcmin	1991				1991				
Max. axial force ^{d)}		<i>F</i> _{2AMax}	N	2150				2150				
			lb _f	484				484				
Max. tilting moment		<i>M</i> _{2KMax}	Nm	400				400				
			in.lb	3540				3540				
Efficiency at full load		η	%	94				92				
Service life (For calculation, see the Chapter "Information")		<i>L</i> _h	h	> 20000				> 20000				
Weight incl. standard adapter plate		<i>m</i>	kg	3.2				3.6				
			lb _m	7.1				8.0				
Operating noise (with <i>n</i> ₁ =3000 rpm no load)		<i>L</i> _{PA}	dB(A)	≤ 60				≤ 60				
Max. permitted housing temperature		°C		+90								
		F		194								
Ambient temperature		°C		-15 to +40								
		F		5 to 104								
Lubrication				Lubricated for life								
Paint				Blue RAL 5002								
Direction of rotation				Motor and gearhead same direction								
Protection class				IP 65								
Moment of inertia (relates to the drive)	C	14	<i>J</i> _i	kgcm ²	0.21	0.18	0.16	0.14	0.16	0.15	0.14	0.13
				10 ⁻³ in.lb.s ²	0.19	0.16	0.14	0.12	0.14	0.13	0.12	0.12
Clamping hub diameter [mm]	E	19	<i>J</i> _i	kgcm ²	0.52	0.50	0.47	0.46	—	—	—	—
				10 ⁻² in.lb.s ²	0.46	0.44	0.42	0.41				

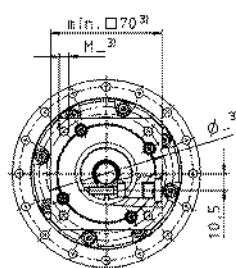
Reduced mass moments of inertia available on request.

^{a)} Other ratios available on request

^{b)} For higher ambient temperatures, please reduce input speed

^{c)} Valid for clamping hub diameter of 14 mm

^{d)} Refers to center of the output shaft or flange



Motor mounting according to operating manual

MA

TP+ 025 MA HIGH TORQUE

					2-stage				3-stage						
Ratio ^{a)}			<i>i</i>		22	27.5	38.5	55	66	88	110	154	220		
Max. acceleration torque (max. 1000 cycles per hour)			<i>T</i> _{2B}	Nm	530	530	530	530	480	480	480	480	480		
				in.lb	4691	4691	4691	4691	4248	4248	4248	4248	4248		
Nominal output torque (with <i>n</i> _m)			<i>T</i> _{2N}	Nm	320	350	375	375	260	260	260	260	260		
				in.lb	2832	3098	3319	3319	2301	2301	2301	2301	2301		
Emergency stop torque (permitted 1000 times during the service life of the gearhead)			<i>T</i> _{2Not}	Nm	1200	1200	1200	1200	1200	1200	1200	1200	1200		
				in.lb	10620	10620	10620	10620	10620	10620	10620	10620	10620		
Nominal input speed (with <i>T</i> _{2N} and 20 °C ambient temperature) ^{b)}			<i>n</i> _{1N}	rpm	3500	3500	3500	3500	4000	4000	4000	4000	4000		
Max. input speed			<i>n</i> _{1Max}	rpm	6000	6000	6000	6000	6000	6000	6000	6000	6000		
Mean no load running torque (with <i>n</i> ₁ =3000 rpm and 20 °C gearhead temperature) ^{c)}			<i>T</i> ₀₁₂	Nm	1.1	1.0	0.8	0.6	0.7	0.7	0.6	0.4	0.4		
				in.lb	9.7	8.9	7.1	5.3	6.2	6.2	5.3	3.5	3.5		
Max. torsional backlash			<i>j</i> _t	arcmin	≤ 1				≤ 1						
Torsional rigidity ^{c)}			<i>C</i> _{t21}	Nm/ arcmin	105	105	105	100	95	95	95	95	95		
				in.lb/ arcmin	929	929	929	885	841	841	841	841	841		
Tilting rigidity			<i>C</i> _{2K}	Nm/ arcmin	550				550						
				in.lb/ arcmin	4868				4868						
Max. axial force ^{d)}			<i>F</i> _{2AMax}	N	4150				4150						
				lb _f	934				934						
Max. tilting moment			<i>M</i> _{2KMax}	Nm	550				550						
				in.lb	4868				4868						
Efficiency at full load			η	%	94				92						
Service life (For calculation, see the Chapter "Information")			<i>L</i> _h	h	> 20000				> 20000						
Weight incl. standard adapter plate			<i>m</i>	kg	5.6				6.1						
				lb _m	12.4				13.5						
Operating noise (with <i>n</i> ₁ =3000 rpm no load)			<i>L</i> _{PA}	dB(A)	≤ 62				≤ 62						
Max. permitted housing temperature			°C		+90										
			F		194										
Ambient temperature			°C		-15 to +40										
			F		5 to 104										
Lubrication					Lubricated for life										
Paint					Blue RAL 5002										
Direction of rotation					Motor and gearhead same direction										
Protection class					IP 65										
Moment of inertia (relates to the drive)			E	19	<i>J</i> ₁	kgcm ²	0.87	0.70	0.60	0.55	0.63	0.56	0.53	0.51	0.50
						10 ⁻² in.lb.s ²	0.77	0.62	0.53	0.49	0.56	0.50	0.47	0.45	0.44
Clamping hub diameter [mm]			G	24	<i>J</i> ₁	kgcm ²	2.39	2.22	2.12	2.07	–	–	–	–	–
						10 ⁻² in.lb.s ²	2.12	1.96	1.88	1.83					

Reduced mass moments of inertia available on request.

^{a)} Other ratios available on request

^{b)} For higher ambient temperatures, please reduce input speed

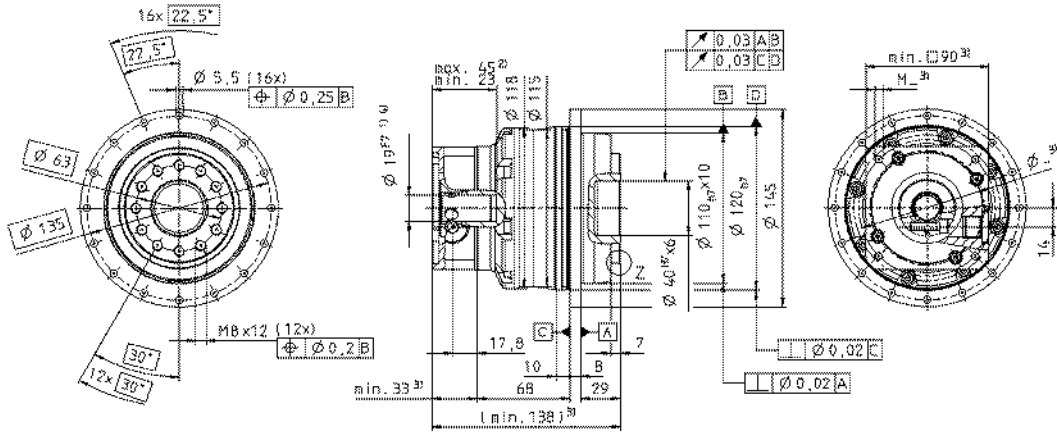
^{c)} Valid for clamping hub diameter of 19 mm

^{d)} Refers to center of the output shaft or flange

View A

View B

2-stage:

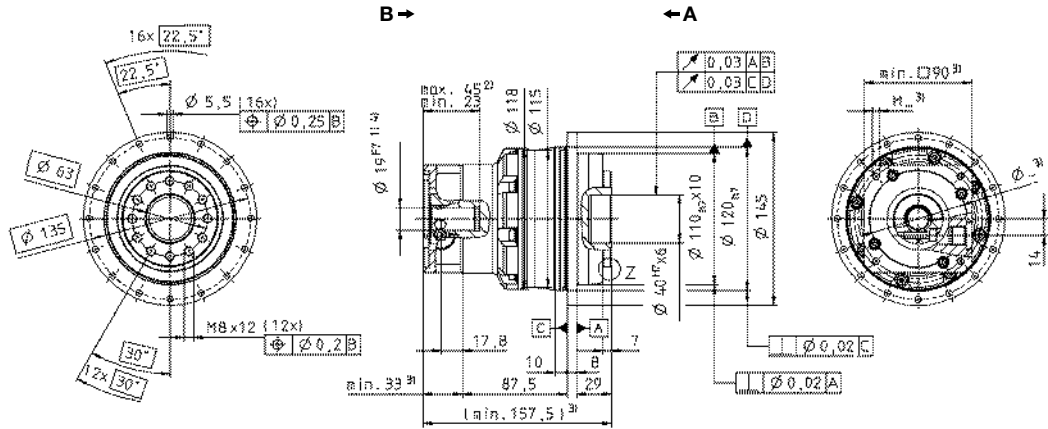


up to 19⁴⁾ (E)
clamping hub
diameter

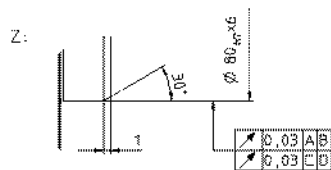
Motor shaft diameter [mm]

up to 24⁴⁾ (G)
clamping hub
diameter

3-stage:



up to 19⁴⁾ (E)
clamping hub
diameter



Non-tolerated dimensions ± 1 mm

- 1) Check motor shaft fit.
- 2) Min./Max. permissible motor shaft length. Longer motor shafts are adaptable, please contact us.
- 3) The dimensions depend on the motor.
- 4) Smaller motor shaft diameter is compensated by a bushing with a minimum thickness of 1 mm.



CAD data is available under
<http://www.wittenstein-alpha.de/en/info-and-cad-finder.html>



Motor mounting according to operating manual

Planetary gearheads
High End

TP+

MA

TP+ 050 MA HIGH TORQUE

				2-stage				3-stage								
Ratio ^{a)}				<i>i</i>		22	27.5	38.5	55	66	88	110	154	220		
Max. acceleration torque (max. 1000 cycles per hour)				<i>T</i> _{2B}	Nm	950	950	950	950	950	950	950	950	950		
					in.lb	8408	8408	8408	8408	8408	8408	8408	8408	8408		
Nominal output torque (with <i>n</i> _m)				<i>T</i> _{2N}	Nm	575	600	650	675	675	675	675	675	675		
					in.lb	5089	5310	5753	5974	5974	5974	5974	5974	5974		
Emergency stop torque (permitted 1000 times during the service life of the gearhead)				<i>T</i> _{2Not}	Nm	2375	2375	2375	2375	2375	2375	2375	2375	2375		
					in.lb	21019	21019	21019	21019	21019	21019	21019	21019	21019		
Nominal input speed (with <i>T</i> _{2N} and 20 °C ambient temperature) ^{b)}				<i>n</i> _{1N}	rpm	3000	3000	3000	3000	3500	3500	3500	3500	3500		
Max. input speed				<i>n</i> _{1Max}	rpm	5000	5000	5000	5000	5000	5000	5000	5000	5000		
Mean no load running torque (with <i>n</i> ₁ =3000 rpm and 20 °C gearhead temperature) ^{c)}				<i>T</i> ₀₁₂	Nm	3.7	2.9	2.0	1.7	2.0	1.6	1.4	0.9	0.7		
					in.lb	32.7	25.7	17.7	15.0	17.7	14.2	12.4	8.0	6.2		
Max. torsional backlash				<i>j</i> _t	arcmin	≤ 1				≤ 1						
Torsional rigidity ^{c)}				<i>C</i> _{t21}	Nm/ arcmin	220	220	220	220	205	205	205	205	205		
					in.lb/ arcmin	1947	1947	1947	1947	1814	1814	1814	1814	1814		
Tilting rigidity				<i>C</i> _{2K}	Nm/ arcmin	560				560						
					in.lb/ arcmin	4956				4956						
Max. axial force ^{d)}				<i>F</i> _{2AMax}	N	6130				6130						
					lb _f	1379				1379						
Max. tilting moment				<i>M</i> _{2KMax}	Nm	1335				1335						
					in.lb	11815				11815						
Efficiency at full load				η	%	94				92						
Service life (For calculation, see the Chapter "Information")				<i>L</i> _h	h	> 20000				> 20000						
Weight incl. standard adapter plate				<i>m</i>	kg	12.5				13.4						
					lb _m	27.6				29.6						
Operating noise (with <i>n</i> ₁ =3000 rpm no load)				<i>L</i> _{PA}	dB(A)	≤ 64				≤ 64						
Max. permitted housing temperature					°C	+90										
					F	194										
Ambient temperature					°C	-15 to +40										
					F	5 to 104										
Lubrication					Lubricated for life											
Paint					Blue RAL 5002											
Direction of rotation					Motor and gearhead same direction											
Protection class					IP 65											
Moment of inertia (relates to the drive)				G	24	<i>J</i> ₁	kgcm ²	3.76	3.32	3.01	2.82	2.61	2.42	2.22	2.12	2.07
							10 ⁻³ in.lb.s ²	3.33	2.94	2.66	2.50	2.31	2.14	1.96	1.88	1.83
Clamping hub diameter [mm]				K	38	<i>J</i> ₁	kgcm ²	10.7	10.3	9.92	9.73	–	–	–	–	–
							10 ⁻³ in.lb.s ²	9.47	9.11	8.78	8.61					

Reduced mass moments of inertia available on request.

^{a)} Other ratios available on request

^{b)} For higher ambient temperatures, please reduce input speed

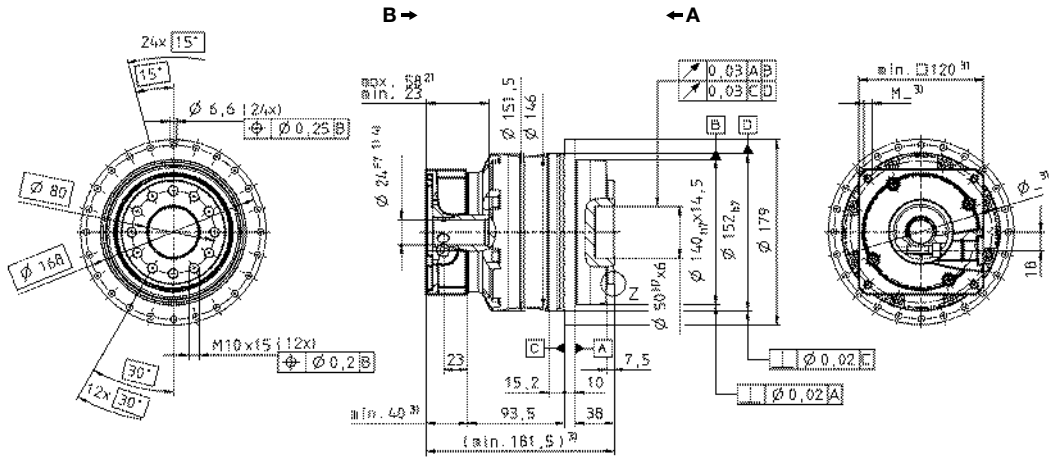
^{c)} Valid for clamping hub diameter of 24 mm

^{d)} Refers to center of the output shaft or flange

View A

View B

2-stage:

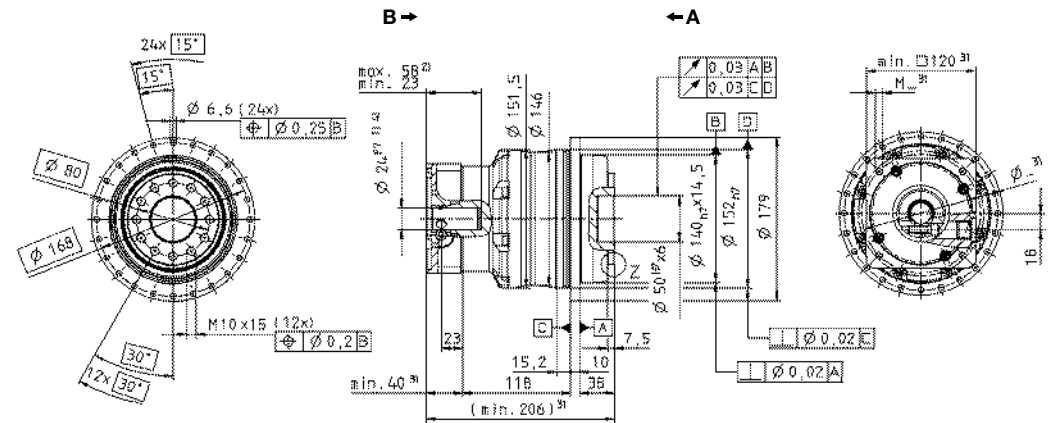


up to 24 ⁴⁾ (G)
clamping hub
diameter

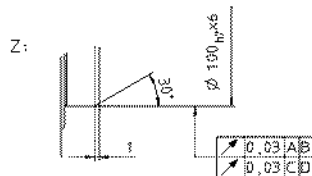
Motor shaft diameter [mm]

up to 38 ⁴⁾ (K)
clamping hub
diameter

3-stage:



up to 24 ⁴⁾ (G)
clamping hub
diameter



Non-tolerated dimensions ± 1 mm

- 1) Check motor shaft fit.
- 2) Min./Max. permissible motor shaft length. Longer motor shafts are adaptable, please contact us.
- 3) The dimensions depend on the motor.
- 4) Smaller motor shaft diameter is compensated by a bushing with a minimum thickness of 1 mm.



CAD data is available under
<http://www.wittenstein-alpha.de/en/info-and-cad-finder.html>



Motor mounting according to operating manual

Planetary gearheads
High End

TP+

MA

TP+ 110 MA HIGH TORQUE

					2-stage				3-stage					
Ratio ^{a)}			<i>i</i>		22	27.5	38.5	55	66	88	110	154	220	
Max. acceleration torque (max. 1000 cycles per hour)			<i>T</i> _{2B}	Nm	3100	3100	3100	2000	2600	2600	2600	2600	2600	
				in.lb	27435	27435	27435	17700	23010	23010	23010	23010	23010	
Nominal output torque (with <i>n</i> _{in})			<i>T</i> _{2N}	Nm	1570	1600	1650	1400	1600	1750	1750	1750	1750	
				in.lb	13895	14160	14603	12390	14160	15488	15488	15488	15488	
Emergency stop torque (permitted 1000 times during the service life of the gearhead)			<i>T</i> _{2Not}	Nm	6500	6500	6500	6500	6500	6500	6500	6500	6500	
				in.lb	57525	57525	57525	57525	57525	57525	57525	57525	57525	
Nominal input speed (with <i>T</i> _{2N} and 20 °C ambient temperature) ^{b)}			<i>n</i> _{1N}	rpm	2500	2500	2500	2500	3000	3000	3000	3000	3000	
Max. input speed			<i>n</i> _{1Max}	rpm	4500	4500	4500	4500	4500	4500	4500	4500	4500	
Mean no load running torque (with <i>n</i> ₁ =3000 rpm and 20 °C gearhead temperature) ^{c)}			<i>T</i> ₀₁₂	Nm	8.0	5.5	4.5	4.0	5.0	4.0	3.5	2.0	1.8	
				in.lb	70.8	48.7	39.8	35.4	44.3	35.4	31.0	17.7	15.9	
Max. torsional backlash			<i>j</i> _t	arcmin	≤ 1				≤ 1					
Torsional rigidity ^{c)}			<i>C</i> _{t21}	Nm/ arcmin	730	725	715	670	650	650	650	650	650	
				in.lb/ arcmin	6461	6416	6328	5930	5753	5753	5753	5753	5753	
Tilting rigidity			<i>C</i> _{2K}	Nm/ arcmin	1452				1452					
				in.lb/ arcmin	12850				12850					
Max. axial force ^{d)}			<i>F</i> _{2AMax}	N	10050				10050					
				lb _f	2261				2261					
Max. tilting moment			<i>M</i> _{2KMax}	Nm	3280				3280					
				in.lb	29028				29028					
Efficiency at full load			η	%	94				92					
Service life (For calculation, see the Chapter "Information")			<i>L</i> _h	h	> 20000				> 20000					
Weight incl. standard adapter plate			<i>m</i>	kg	33.1				35.4					
				lb _m	73.2				78.2					
Operating noise (with <i>n</i> ₁ = 3000 rpm no load)			<i>L</i> _{PA}	dB(A)	≤ 66				≤ 66					
Max. permitted housing temperature			°C		+90									
			F		194									
Ambient temperature			°C		-15 to +40									
			F		5 to 104									
Lubrication					Lubricated for life									
Paint					Blue RAL 5002									
Direction of rotation					Motor and gearhead same direction									
Protection class					IP 65									
Moment of inertia (relates to the drive)		K	38	<i>J</i> ₁	kgcm ²	16.6	15.2	13.9	13.1	13.8	10.2	9.77	9.47	9.16
					10 ⁻² in.lb.s ²	14.7	13.5	12.3	11.6	12.2	9.03	8.65	8.38	8.11
Clamping hub diameter [mm]		M	48	<i>J</i> ₁	kgcm ²	31.4	29.9	28.7	28.0	–	–	–	–	–
					10 ⁻² in.lb.s ²	27.8	26.5	25.4	24.8					

Reduced mass moments of inertia available on request.

^{a)} Other ratios available on request

^{b)} For higher ambient temperatures, please reduce input speed

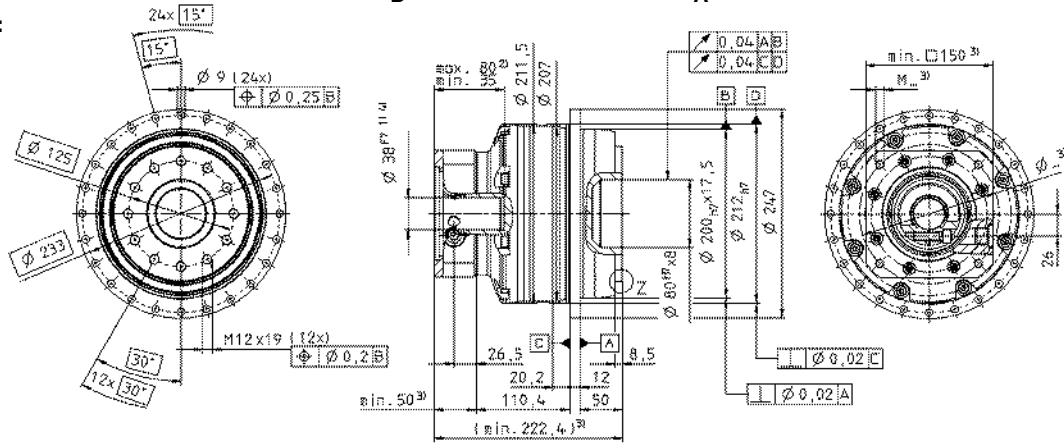
^{c)} Valid for clamping hub diameter of 38 mm

^{d)} Refers to center of the output shaft or flange

View A

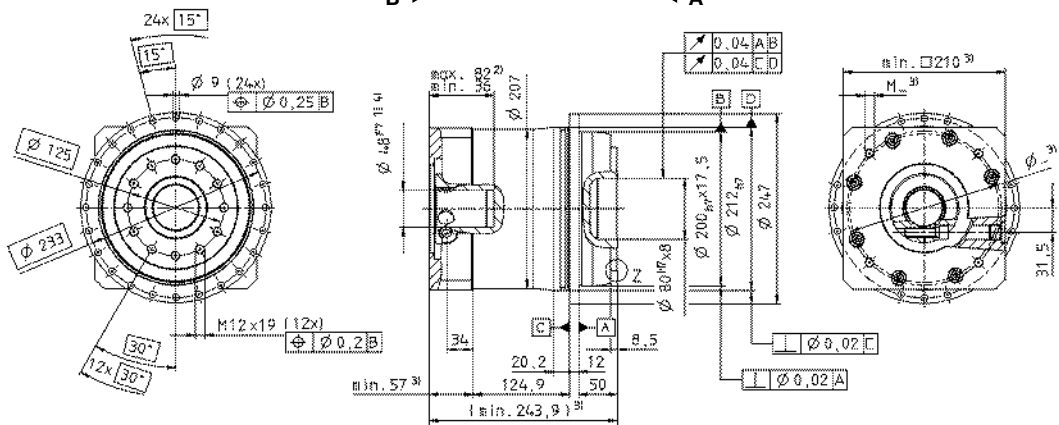
View B

2-stage:



B →

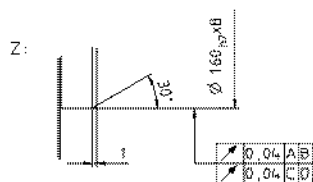
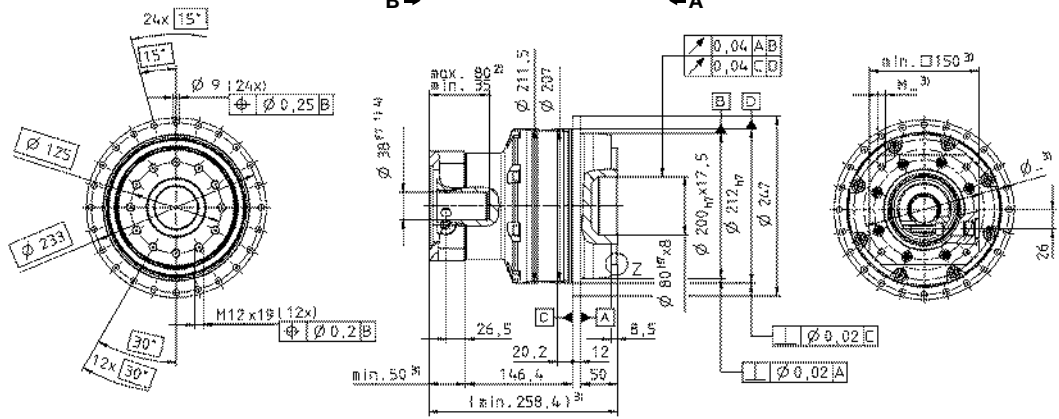
← A



B →

← A

3-stage:



Non-tolerated dimensions ± 1 mm

- 1) Check motor shaft fit.
- 2) Min./Max. permissible motor shaft length. Longer motor shafts are adaptable, please contact us.
- 3) The dimensions depend on the motor.
- 4) Smaller motor shaft diameter is compensated by a bushing with a minimum thickness of 1 mm.



CAD data is available under
<http://www.wittenstein-alpha.de/en/info-and-cad-finder.html>



Motor mounting according to operating manual

Planetary gearheads
High End

TP+

MA

Motor shaft diameter [mm]

up to 38 ⁴⁾ (K)
clamping hub
diameter

up to 48 ⁴⁾ (M)
clamping hub
diameter

up to 38 ⁴⁾ (K)
clamping hub
diameter

TP+ 300 MA HIGH TORQUE

					1-stage	2-stage					3-stage				
Ratio ^{a)}			<i>i</i>		5.5	22	27.5	38.5	55	66	88	110	154	220	
Max. acceleration torque (max. 1000 cycles per hour)			<i>T</i> _{2B}	Nm	4600	5500	5500	5500	3900	5500	5500	5500	5500	5500	
				in.lb	40714	48679	48679	48679	34518	48679	48679	48679	48679	48679	48679
Nominal output torque (with <i>n</i> _m)			<i>T</i> _{2N}	Nm	2200	3500	3500	3500	2500	3500	3500	3500	3500	3500	
				in.lb	19472	30978	30978	30978	22127	30978	30978	30978	30978	30978	30978
Emergency stop torque (permitted 1000 times during the service life of the gearhead)			<i>T</i> _{2Not}	Nm	8750	13250	13250	13250	13250	13250	13250	13250	13250	13250	
				in.lb	77445	117273	117273	117273	117273	117273	117273	117273	117273	117273	117273
Nominal input speed (with <i>T</i> _{2N} and 20 °C ambient temperature) ^{b)}			<i>n</i> _{1N}	rpm	1000	2000	2000	2000	2000	2000	2000	2000	2000	2000	
Max. input speed			<i>n</i> _{1Max}	rpm	2500	3500	3500	3500	3500	3500	3500	3500	3500	3500	
Mean no load running torque (with <i>n</i> _i =2000 rpm and 20 °C gearhead temperature)			<i>T</i> ₀₁₂	Nm	22	12	10	9,0	7,0	6,5	4,5	4,0	3,0	2,0	
				in.lb	195	106	89	80	62	58	40	35	27	18	
Max. torsional backlash			<i>j</i> _t	arcmin	Standard ≤ 2 / Reduced ≤ 1		Standard ≤ 3 / Reduced ≤ 1.5								
Torsional rigidity			<i>C</i> _{t21}	Nm/ arcmin	1400	1200	1200	1200	1200	1200	1200	1200	1200	1200	
				in.lb/ arcmin	12391	10621	10621	10621	10621	10621	10621	10621	10621	10621	10621
Tilting rigidity			<i>C</i> _{2K}	Nm/ arcmin	5560										
				in.lb/ arcmin	49210										
Max. axial force ^{c)}			<i>F</i> _{2AMax}	N	33000										
				lb _f	7425										
Max. tilting moment			<i>M</i> _{2KMax}	Nm	3900	6500									
				in.lb	34518	57530									
Efficiency at full load			η	%	95	93									
Service life (For calculation, see “Technical Basics”)			<i>L</i> _h	h	> 20000										
Weight incl. standard adapter plate			<i>m</i>	kg	55	64				67					
				lb _m	121.25	141.1				147.7					
Operating noise (with <i>n</i> _i =2000 rpm no load)			<i>L</i> _{PA}	dB(A)	≤ 68	≤ 67				≤ 66					
Max. permitted housing temperature			°C		+90										
			F		194										
Ambient temperature			°C		-15 to +40										
			F		5 to 104										
Lubrication					Lubricated for life										
Paint					Blue RAL 5002										
Direction of rotation					Motor and gearhead same direction										
Protection class					IP 65										
Moment of inertia (relates to the drive)		K	38	<i>J</i> _i	kgcm ²	–	–	–	–	–	16.6	12.9	11.6	10.3	9.50
					in.lb.s ²	–	–	–	–	–	0.0147	0.0114	0.0103	0.0091	0.0084
Clamping hub diameter [mm]		M	48	<i>J</i> _i	kgcm ²	–	30.8	27.6	24.9	23.0	–	–	–	–	–
					in.lb.s ²	–	0.0273	0.0244	0.0220	0.0204	–	–	–	–	–
		N	55	<i>J</i> _i	kgcm ²	129	–	–	–	–	–	–	–	–	–
					in.lb.s ²	0.1142	–	–	–	–	–	–	–	–	–

Reduced mass moments of inertia available on request.

^{a)} Other ratios available on request

^{b)} For higher ambient temperatures, please reduce input speed

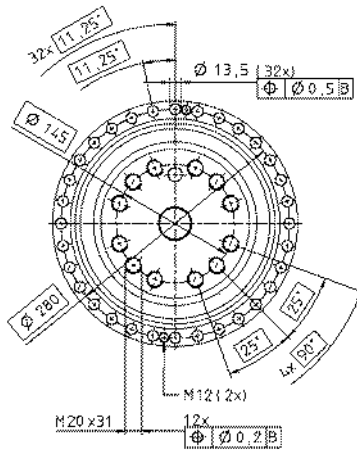
^{c)} Refers to center of the output shaft or flange

View A

View B

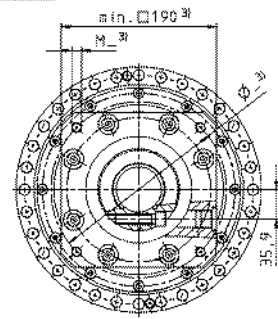
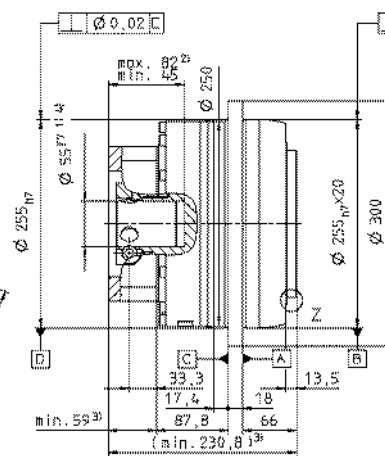
1-stage:

up to 55⁴⁾ (N)
clamping hub
diameter



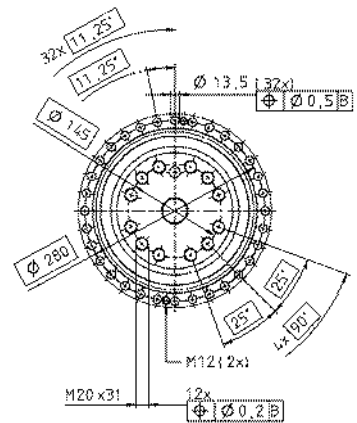
B →

← A



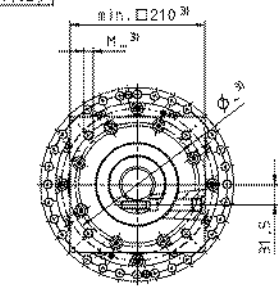
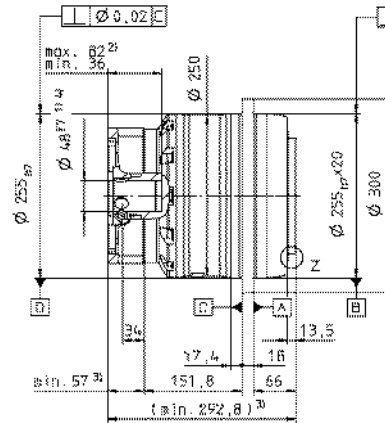
2-stage:

up to 48⁴⁾ (M)
clamping hub
diameter



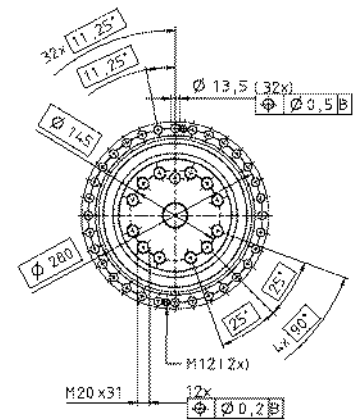
B →

← A



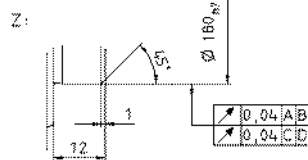
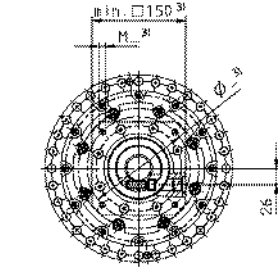
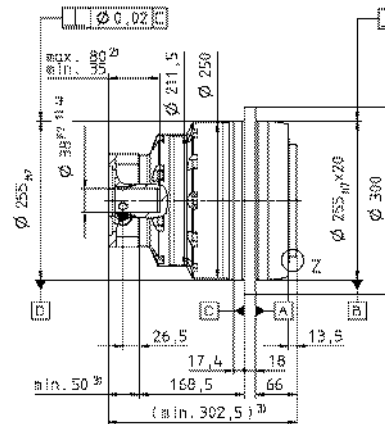
3-stage:

up to 38⁴⁾ (K)
clamping hub
diameter



B →

← A



Non-tolerated dimensions ±1,5 mm

- 1) Check motor shaft fit.
- 2) Min./Max. permissible motor shaft length. Longer motor shafts are adaptable, please contact us.
- 3) The dimensions depend on the motor.
- 4) Smaller motor shaft diameter is compensated by a bushing with a minimum thickness of 1 mm.



CAD data is available under
<http://www.wittenstein-alpha.de/en/info-and-cad-finder.html>



Motor mounting according to operating manual

TP+ 500 MA HIGH TORQUE

					1-stage	2-stage					3-stage				
Ratio ^{a)}			<i>i</i>		5.5	22	27.5	38.5	55	66	88	110	154	220	
Max. acceleration torque (max. 1000 cycles per hour)			<i>T</i> _{2B}	Nm	8000	10000	10000	10000	7200	10000	10000	10000	10000	10000	
				in.lb	70806	88508	88508	88508	63726	88508	88508	88508	88508	88508	
Nominal output torque (with <i>n</i> _m)			<i>T</i> _{2N}	Nm	3500	6000	4600	4600	4700	6000	6000	6000	6000	6000	
				in.lb	30978	53105	40714	40714	41599	53105	53105	53105	53105	53105	
Emergency stop torque (permitted 1000 times during the service life of the gearhead)			<i>T</i> _{2Not}	Nm	15000	25000	25000	25000	25000	25000	25000	25000	25000	25000	
				in.lb	132762	221270	221270	221270	221270	221270	221270	221270	221270	221270	
Nominal input speed (with <i>T</i> _{2N} and 20 °C ambient temperature) ^{b)}			<i>n</i> _{1N}	rpm	900	1500	1500	1500	1500	1500	1500	1500	1500	1500	
Max. input speed			<i>n</i> _{1Max}	rpm	2500	3500	3500	3500	3500	3500	3500	3500	3500	3500	
Mean no load running torque (with <i>n</i> ₁ =2000 rpm and 20 °C gearhead temperature)			<i>T</i> ₀₁₂	Nm	28	18	14	12	9.0	8.5	6.5	6.0	5.0	4.0	
				in.lb	248	159.3	124	106	80	75	58	53	44	35	
Max. torsional backlash			<i>j</i> _t	arcmin	Standard ≤ 2 / Reduced ≤ 1		Standard ≤ 3 / Reduced ≤ 1.5								
Torsional rigidity			<i>C</i> _{t21}	Nm/ arcmin	1650	2000	2000	1950	1900	1800	1800	1800	1800	1800	
				in.lb/ arcmin	14603	17700	17700	17258	16815	15930	15930	15930	15930	15930	
Tilting rigidity			<i>C</i> _{2K}	Nm/ arcmin	9480										
				in.lb/ arcmin	83906										
Max. axial force ^{c)}			<i>F</i> _{2AMax}	N	50000										
				lb _f	11250										
Max. tilting moment			<i>M</i> _{2KMax}	Nm	6600	9500									
				in.lb	58415	84083									
Efficiency at full load			η	%	95	93									
Service life (For calculation, see "Technical Basics")			<i>L</i> _h	h	> 20000										
Weight incl. standard adapter plate			<i>m</i>	kg	80					89					
				lb _m	176.4					196.2					
Operating noise (with <i>n</i> ₁ = 2000 rpm no load)			<i>L</i> _{PA}	dB(A)	≤ 68					≤ 67					
Max. permitted housing temperature				°C	+90										
				F	194										
Ambient temperature				°C	-15 to +40										
				F	5 to 104										
Lubrication					Lubricated for life										
Paint					Blue RAL 5002										
Direction of rotation					Motor and gearhead same direction										
Protection class					IP 65										
Moment of inertia (relates to the drive)	M	48	<i>J</i> ₁	kgcm ²	–	43.8	36.9	30.5	27.0	32.7	28.3	26.7	25.2	24.4	
				in.lb.s ²		0.0388	0.0327	0.0270	0.0239	0.0289	0.0250	0.0236	0.0223	0.0216	
Clamping hub diameter [mm]	O	60	<i>J</i> ₁	kgcm ²	175	–	–	–	–	–	–	–	–	–	
				in.lb.s ²											0.1549

Reduced mass moments of inertia available on request.

^{a)} Other ratios available on request

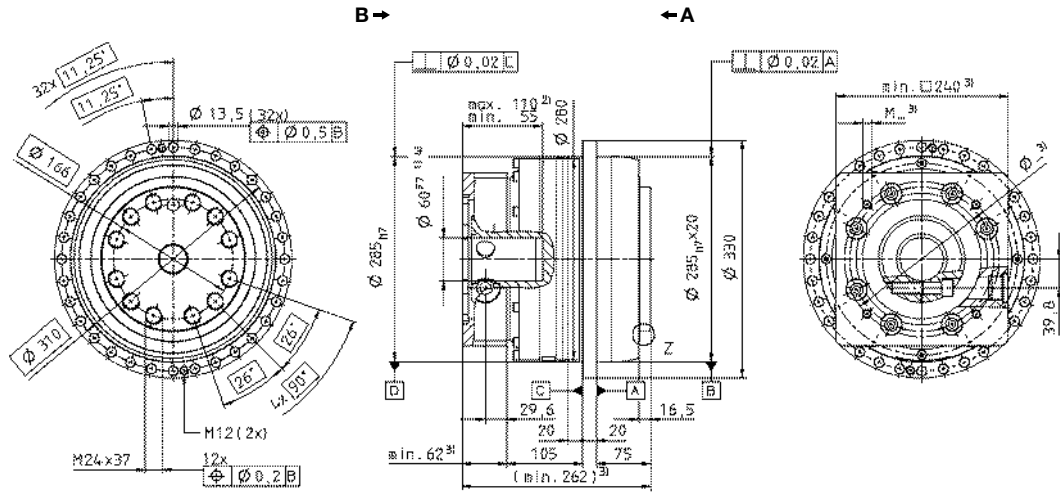
^{b)} For higher ambient temperatures, please reduce input speed

^{c)} Refers to center of the output shaft or flange

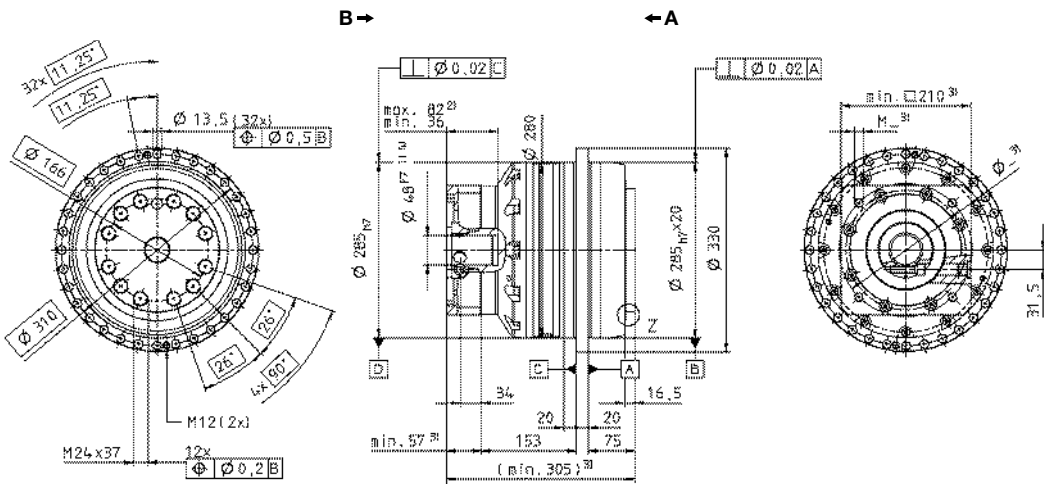
View A

View B

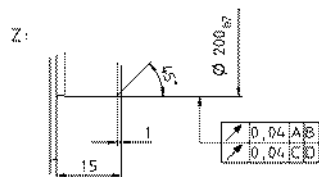
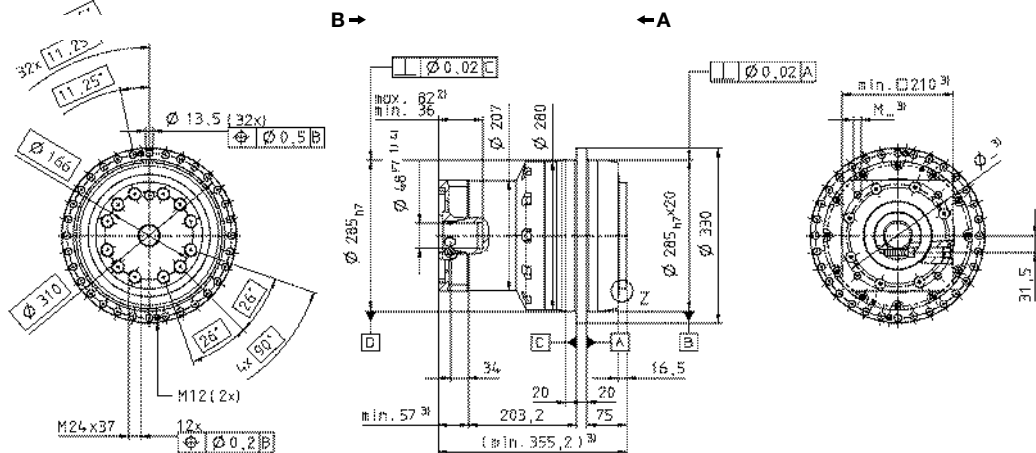
1-stage:



2-stage:



3-stage:



Non-tolerated dimensions $\pm 1,5$ mm

- 1) Check motor shaft fit.
- 2) Min./Max. permissible motor shaft length. Longer motor shafts are adaptable, please contact us.
- 3) The dimensions depend on the motor.
- 4) Smaller motor shaft diameter is compensated by a bushing with a minimum thickness of 1 mm.



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Motor mounting according to operating manual

Planetary gearheads
High End

TP+

MA

Motor shaft diameter [mm]

up to 60 ⁴⁾ (O)
clamping hub
diameter

up to 48 ⁴⁾ (M)
clamping hub
diameter

up to 48 ⁴⁾ (M)
clamping hub
diameter

TP+ 2000 MA HIGH TORQUE

					2-stage		3-stage							
Ratio			<i>i</i>		22	30.25	66	88	110	121	154	220	302.5	
Max. acceleration torque (max. 1000 cycles per hour)			<i>T</i> _{2B}	Nm	22000	22000	22000	22000	22000	22000	22000	15600	21500	
				in.lb	194700	194700	194700	194700	194700	194700	194700	138060	190275	
Nominal output torque (with <i>n</i> _{in})			<i>T</i> _{2N}	Nm	13500	13500	13500	13500	13500	13500	13500	10000	13500	
				in.lb	119475	119475	119475	119475	119475	119475	119475	119475	88500	119475
Emergency stop torque (permitted 1000 times during the service life of the gearhead)			<i>T</i> _{2Not}	Nm	44000	44000	44000	44000	44000	44000	44000	44000	44000	
				in.lb	389400	389400	389400	389400	389400	389400	389400	389400	389400	389400
Nominal input speed (with <i>T</i> _{2N} and 20 °C ambient temperature) ^{a)}			<i>n</i> _{1N}	rpm	2000	2000	2500	2500	2500	2500	2500	2500	2500	
Max. input speed			<i>n</i> _{1Max}	rpm	3000	3000	3500	3500	3500	3500	3500	3500	3500	
Mean no load running torque (with <i>n</i> ₁ =2000 rpm and 20 °C gearhead temperature)			<i>T</i> ₀₁₂	Nm	17	13	7.5	6	5	5	4.5	4	4	
				in.lb	150	115	66	53	44	44	40	35	35	
Max. torsional backlash			<i>j</i> _t	arcmin	≤ 3									
Torsional rigidity			<i>C</i> _{t21}	Nm/ arcmin	2900	2900	3000	3000	3000	3000	2950	2850	2850	
				in.lb/ arcmin	25665	25665	26550	26550	26550	26550	26108	25223	25223	
Tilting rigidity			<i>C</i> _{2K}	Nm/ arcmin	-									
				in.lb/ arcmin	-									
Max. axial force ^{b)}			<i>F</i> _{2AMax}	N	100000									
				lb _f	22500									
Max. tilting moment			<i>M</i> _{2KMax}	Nm	31600		31600							
				in.lb	279660		279660							
Efficiency at full load			η	%	95		93							
Service life (For calculation, see the Chapter "Information")			<i>L</i> _h	h	> 20000									
Weight incl. standard adapter plate			<i>m</i>	kg	190		185							
				lb _m	420		409							
Operating noise (with <i>n</i> ₁ =3000 rpm no load)			<i>L</i> _{PA}	dB(A)	≤ 68		≤ 66							
Max. permitted housing temperature				°C	90									
				F	194									
Ambient temperature				°C	0 to +40									
				F	5 to 104									
Lubrication					Lubricated for life									
Paint					Blue RAL 5002									
Direction of rotation					Motor and gearhead same direction									
Protection class					IP 65									
Moment of inertia (relates to the drive)		M	48	<i>J</i> ₁	kgcm ²	-	-	52	37	35	35	28	26	25
					10 ⁻² in.lb.s ²	-	-	46	33	31	31	25	23	22
Clamping hub diameter [mm]		O	60	<i>J</i> ₁	kgcm ²	101	74	-	-	-	-	-	-	-
					10 ⁻² in.lb.s ²	89	65	-	-	-	-	-	-	-

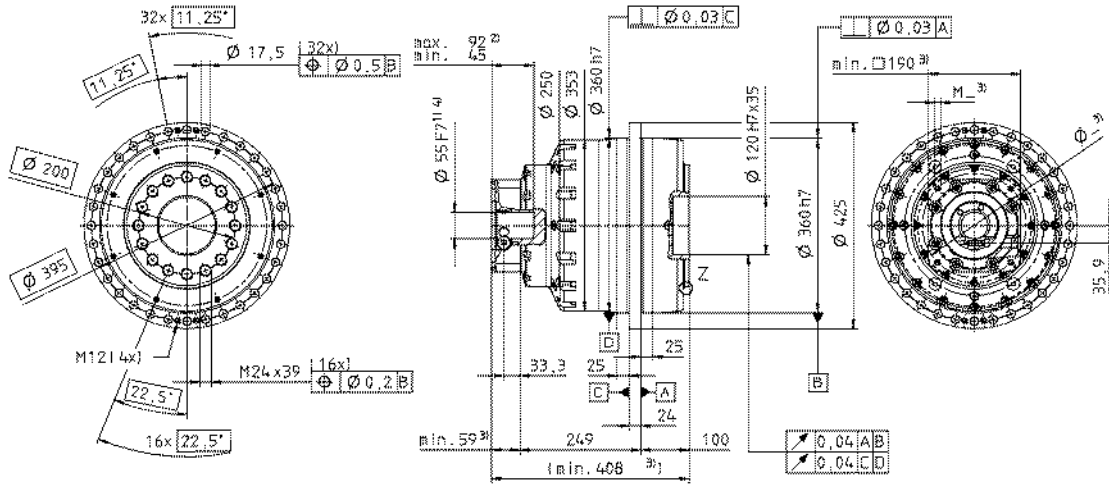
^{a)} For higher ambient temperatures, please reduce input speed

^{b)} Refers to center of the output shaft or flange

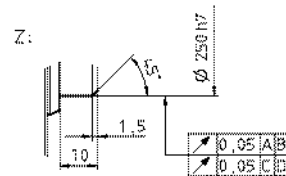
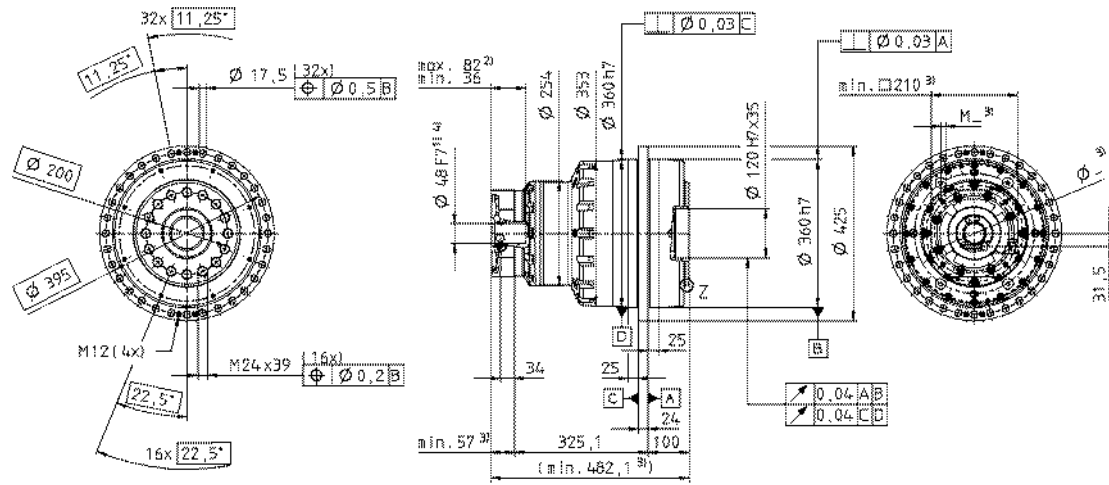
View A

View B

2-stage:



3-stage:



Non-tolerated dimensions ± 1 mm

- 1) Check motor shaft fit.
- 2) Min./Max. permissible motor shaft length. Longer motor shafts are adaptable, please contact us.
- 3) The dimensions depend on the motor.
- 4) Smaller motor shaft diameter is compensated by a bushing with a minimum thickness of 1 mm.



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Motor mounting according to operating manual

Planetary gearheads
High End

TP+

MA

TP+ 4000 MA HIGH TORQUE

				2-stage		3-stage							
Ratio	<i>i</i>			22	30.25	66	88	110	121	154	220	302.5	
Max. acceleration torque (max. 1000 cycles per hour)	<i>T</i> _{2B}	Nm		40000	40000	40000	40000	40000	40000	40000	32000	40000	
		in.lb		354000	354000	354000	354000	354000	354000	354000	283200	354000	
Nominal output torque (with <i>n</i> _{1N})	<i>T</i> _{2N}	Nm		18000	18000	18000	18000	18000	18000	18000	16500	18000	
		in.lb		159300	159300	159300	159300	159300	159300	159300	146025	159300	
Emergency stop torque (permitted 1000 times during the service life of the gearhead)	<i>T</i> _{2Not}	Nm		70000	70000	70000	70000	70000	70000	70000	61000	70000	
		in.lb		619500	619500	619500	619500	619500	619500	619500	539850	619500	
Nominal input speed (with <i>T</i> _{2N} and 20 °C ambient temperature) ^{a)}	<i>n</i> _{1N}	rpm		1500	1500	1500	1500	1500	1500	1500	1500	1500	
Max. input speed	<i>n</i> _{1Max}	rpm		3000	3000	3000	3000	3000	3000	3000	3000	3000	
Mean no load running torque (with <i>n</i> ₁ =2000 rpm and 20 °C gearhead temperature)	<i>T</i> ₀₁₂	Nm		26	21	15	12	10	10	8.5	7.5	7.5	
		in.lb		230	186	133	106	89	89	75	66	66	
Max. torsional backlash	<i>j</i> _t	arcmin		≤ 5									
Torsional rigidity	<i>C</i> _{t21}	Nm/ arcmin		5300	5300	5800	5800	5800	5800	5700	5700	5700	
		in.lb/ arcmin		46905	46905	51330	51330	51330	51330	50445	50445	50445	
Tilting rigidity	<i>C</i> _{2K}	Nm/ arcmin		65000									
		in.lb/ arcmin		575250									
Max. axial force ^{b)}	<i>F</i> _{2AMax}	N		140000									
		lb _f		31500									
Max. tilting moment	<i>M</i> _{2KMax}	Nm		58000		71400							
		in.lb		513300		631890							
Efficiency at full load	η	%		95		93							
Service life (For calculation, see the Chapter "Information")	<i>L</i> _h	h		> 20000									
Weight incl. standard adapter plate	<i>m</i>	kg		350		380							
		lb _m		774		840							
Operating noise (with <i>n</i> ₁ =3000 rpm no load)	<i>L</i> _{PA}	dB(A)		≤ 70		≤ 68							
Max. permitted housing temperature		°C		90									
		F		194									
Ambient temperature		°C		0 to +40									
		F		5 to 104									
Lubrication				Lubricated for life									
Paint				Blue RAL 5002									
Direction of rotation				Motor and gearhead same direction									
Protection class				IP 65									
Moment of inertia (relates to the drive)	M	48	<i>J</i> ₁	kgcm ²	-	-	85	55	43	48	34	29	28
				10 ⁻³ in.lb.s ²	-	-	75	49	38	42	30	26	25
Clamping hub diameter [mm]	O	60	<i>J</i> ₁	kgcm ²	230	174	-	-	-	-	-	-	-
				10 ⁻² in.lb.s ²	204	154	-	-	-	-	-	-	-

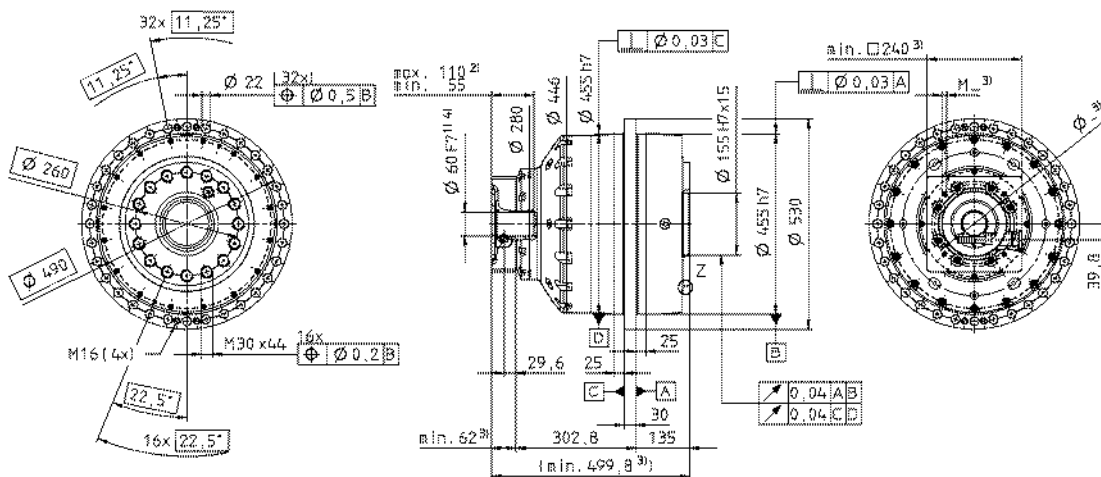
^{a)} For higher ambient temperatures, please reduce input speed

^{b)} Refers to center of the output shaft or flange

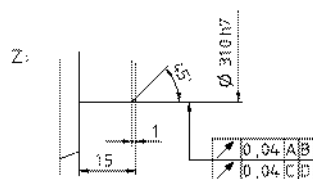
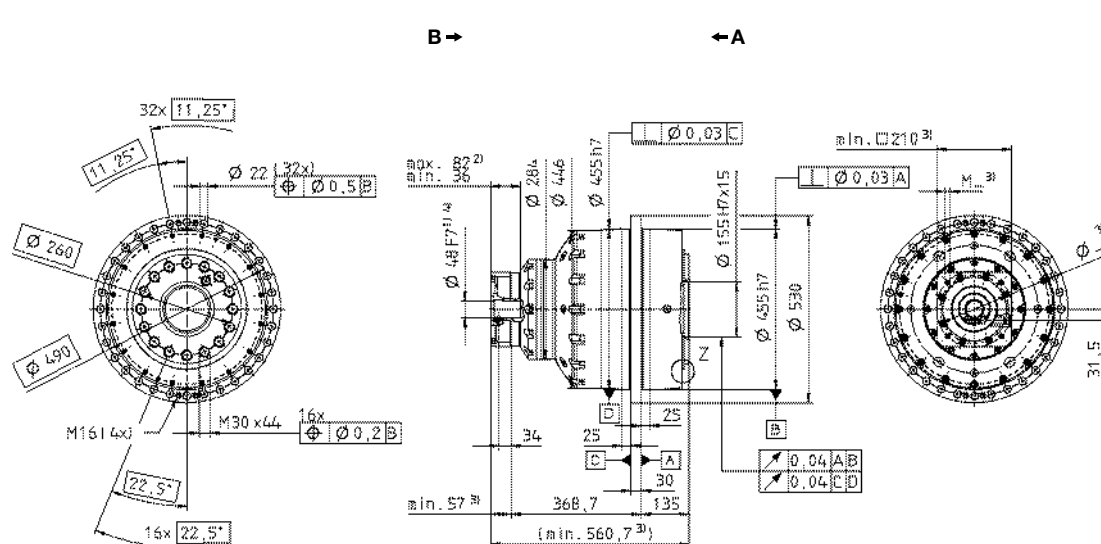
View A

View B

2-stage:



3-stage:



Non-tolerated dimensions ± 1 mm

- 1) Check motor shaft fit.
- 2) Min./Max. permissible motor shaft length. Longer motor shafts are adaptable, please contact us.
- 3) The dimensions depend on the motor.
- 4) Smaller motor shaft diameter is compensated by a bushing with a minimum thickness of 1 mm.



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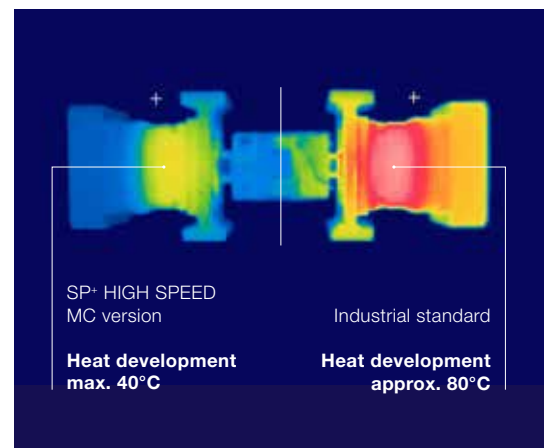


Motor mounting according to operating manual

SP⁺/SP⁺ HIGH SPEED – The classic all-rounder

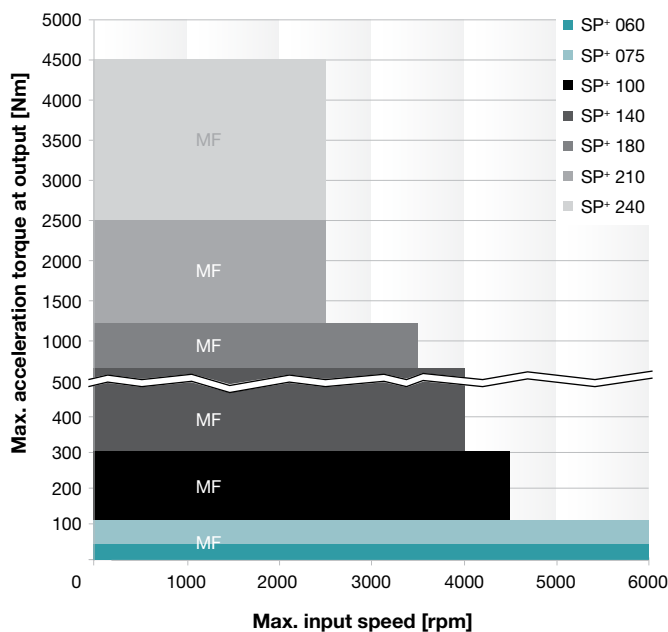


The low backlash planetary gearhead with output shaft. The standard version is ideally suited for high positioning accuracy and highly dynamic cyclic operation. The SP⁺ HIGH SPEED is particularly well suited for applications with maximum speeds during continuous operation.

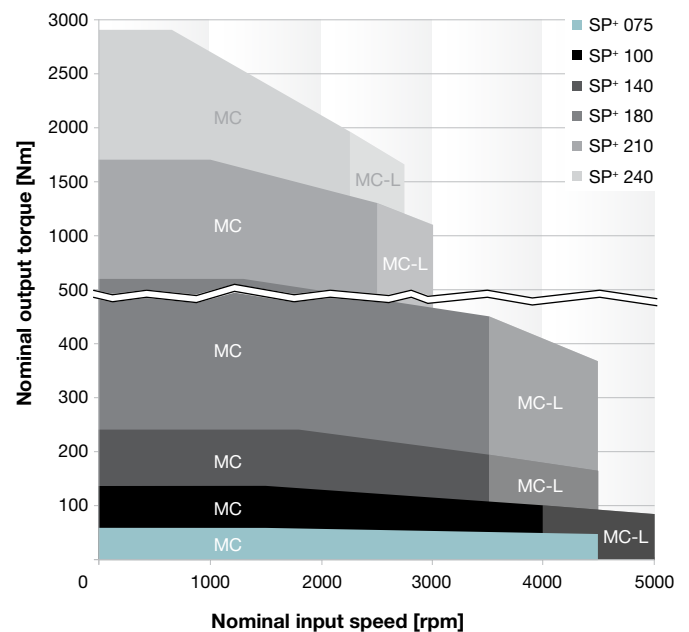


Quick size selection

SP⁺ MF (example for $i = 4$)
For applications in cyclic operation ($ED \leq 60\%$)



SP⁺ HIGH SPEED MC/MC-L (example for $i = 4$)
For applications in continuous operation ($ED \geq 60\%$)



Versions and Applications

Features	SP+ MF version page 72	SP+ HIGH SPEED MC version page 96	SP+ HIGH SPEED MC-L version page 100
Application	Cyclic operation (duty cycle ≤ 60%)	Continuous operation (duty cycle ≥ 60%)	Continuous operation (duty cycle ≥ 60%)
Positioning accuracy (e.g. clamped drives)	• •	•	•
Highly dynamic applications	• •	•	•
High input speeds	•	• •	• • •
Temperature-sensitive applications	•	• •	• • •
Low no-load running torque	•	• •	• • •

Product features

Ratios ^{c)}		3 -100	3 -100	3 -10
Torsional backlash [arcmin] ^{c)}	Standard	≤ 3	≤ 4	≤ 4
	Reduced	≤ 1	≤ 2	≤ 2
Output type				
Smooth output shaft		•	•	•
Output shaft with key		•	•	•
Output shaft with involute gearing		•	•	
Mounted shaft Connected via shrink disc		•	•	
System output with pinion		•	•	
Input type				
Motor mounted version		•	•	•
Input shaft		•		
Type				
ATEX ^{a)}		•	•	
Food-grade lubrication ^{a) b)}		•	•	•
Corrosion resistant ^{a) b)}		•	•	
Optimized mass moment of inertia ^{a)}		•		
Accessories				
Coupling		•	•	•
Rack		•	•	
Pinion		•	•	
Shrink disc		•	•	
torqXis sensor flange		•	•	•
Intermediate plate for cooling connection		•	•	•

^{a)} Power reduction: technical data available upon request

^{b)} Please contact WITTENSTEIN alpha

^{c)} In relation to reference sizes

Planetary gearheads
High End



SP+

MF

MC

MC-L

SP+ 060 MF 1-stage

					1-stage				
Ratio ^{a)}			<i>i</i>		3	4	5	7	10
cymex®-optimized acceleration torque (please contact us regarding the design)			T_{2Bcym}	Nm	–	58	60	54	–
				in.lb		513	531	478	
Max. acceleration torque (max. 1000 cycles per hour)			T_{2B}	Nm	30	42	42	42	32
				in.lb	266	372	372	372	283
Nominal output torque (with n_{1N})			T_{2N}	Nm	17	26	26	26	17
				in.lb	150	230	230	230	150
Emergency stop torque (permitted 1000 times during the service life of the gearhead)			T_{2Not}	Nm	80	100	100	100	80
				in.lb	708	885	885	885	708
Nominal input speed (with T_{2N} and 20°C ambient temperature) ^{b)}			n_{1N}	rpm	3300	3300	3300	4000	4000
Max. input speed			n_{1max}	rpm	6000	6000	6000	6000	6000
Mean no load running torque (with $n_1=3000$ rpm and 20°C gearhead temperature) ^{c)}			T_{012}	Nm	0.9	0.7	0.6	0.4	0.3
				in.lb	8.0	6.2	5.3	3.5	2.7
Max. torsional backlash			j_t	arcmin	Standard ≤ 4 / Reduced ≤ 2				
Torsional rigidity			C_{t21}	Nm/ arcmin	4.5				
				in.lb/ arcmin	40				
Max. axial force ^{d)}			F_{2AMax}	N	2400				
				lb _f	540				
Max. radial force ^{d)}			F_{2RMax}	N	2800				
				lb _f	630				
Max. tilting torque			M_{2KMax}	Nm	152				
				in.lb	1345				
Efficiency at full load			η	%	97				
Service life (For calculation, see the Chapter "Information")			L_h	h	> 20000				
Weight incl. standard adapter plate			m	kg	1.9				
				lb _m	4.2				
Operating noise (with $i=10$ and $n_1=3000$ rpm no load)			L_{PA}	dB(A)	≤ 58				
Max. permitted housing temperature				°C	+90				
				F	194				
Ambient temperature				°C	-15 to +40				
				F	5 to 104				
Lubrication					Lubricated for life				
Paint					Blue RAL 5002				
Direction of rotation					Motor and gearhead same direction				
Protection class					IP 65				
Moment of inertia (relates to the drive)	B	11	J_1	kgcm ²	0.21	0.15	0.12	0.10	0.09
				10 ⁻³ in.lb.s ²	0.18	0.13	0.11	0.09	0.08
Clamping hub diameter [mm]	C	14	J_1	kgcm ²	0.28	0.22	0.20	0.18	0.17
				10 ⁻³ in.lb.s ²	0.25	0.20	0.17	0.16	0.15
	E	19	J_1	kgcm ²	0.61	0.55	0.52	0.50	0.49
				10 ⁻³ in.lb.s ²	0.54	0.48	0.46	0.44	0.43

Reduced mass moments of inertia available on request.

^{a)} Other ratios available on request

^{b)} For higher ambient temperatures, please reduce input speed

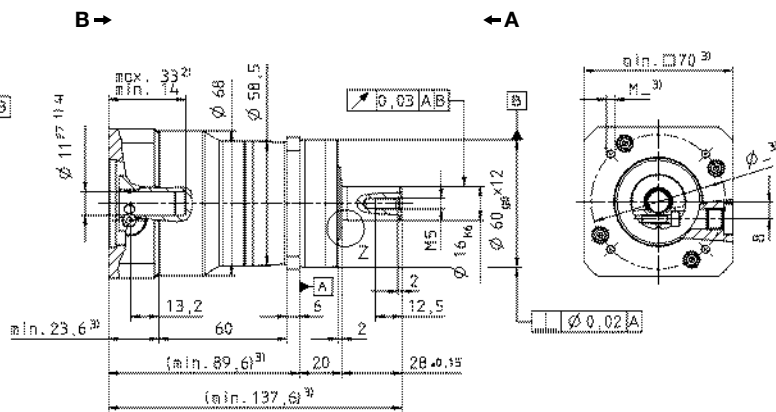
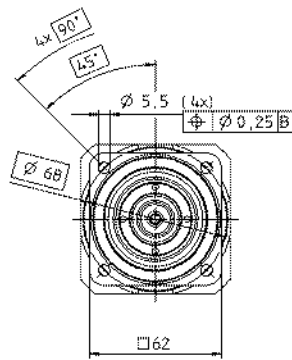
^{c)} Valid for clamping hub diameter of 14 mm

^{d)} Refers to center of the output shaft or flange

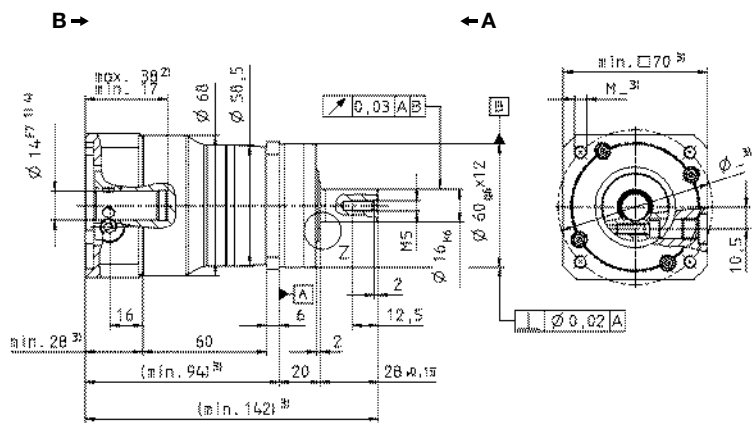
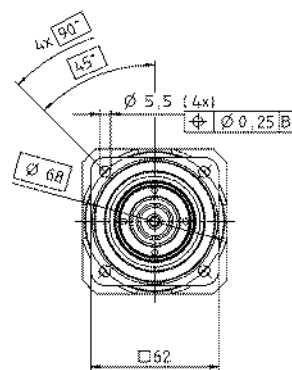
View A

View B

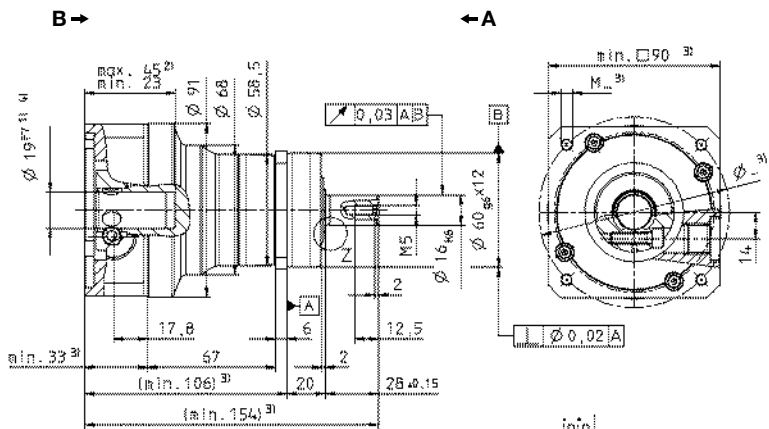
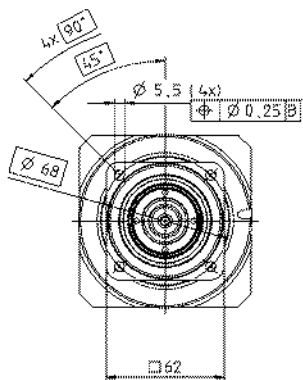
up to 11⁴⁾ (B)
clamping hub
diameter



up to 14⁴⁾ (C)
clamping hub
diameter¹⁾

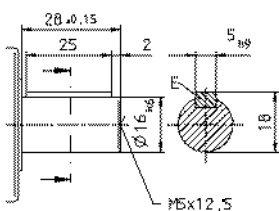


up to 19⁴⁾ (E)
clamping hub
diameter

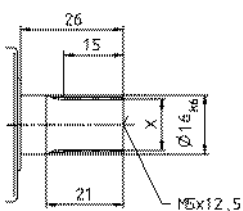


Alternatives: Output shaft variants

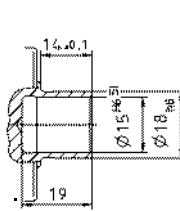
Output shaft with key in mm
E = key as per DIN 6885, sheet 1, form A



Involute gearing DIN 5480 in mm
X = W 16 x 0.8 x 30 x 18 x 6m, DIN 5480



Shaft mounted
Mounted via shrink disc



Non-tolerated dimensions ± 1 mm

- 1) Check motor shaft fit.
- 2) Min./Max. permissible motor shaft length.
Longer motor shafts are adaptable, please contact us.
- 3) The dimensions depend on the motor.
- 4) Smaller motor shaft diameter is compensated by a bushing with a minimum thickness of 1 mm.
- 5) Tolerance h6 for mounted shaft.

CAD data is available under www.wittenstein-alpha.com

Motor mounting according to operating manual

Planetary gearheads
High End

SP+
MF

SP+ 060 MF 2-stage

				2-stage										
Ratio ^{a)}			<i>i</i>		16	20	25	28	35	40	50	70	100	
cymex®-optimized acceleration torque (please contact us regarding the design)			<i>T</i> _{2Bcym}	Nm	58	58	60	58	60	58	60	54	–	
				in.lb	513	513	531	513	531	513	531	478	–	
Max. acceleration torque (max. 1000 cycles per hour)			<i>T</i> _{2B}	Nm	42	42	42	42	42	42	42	42	32	
				in.lb	372	372	372	372	372	372	372	372	372	283
Nominal output torque (with <i>n</i> _N)			<i>T</i> _{2N}	Nm	26	26	26	26	26	26	26	26	17	
				in.lb	230	230	230	230	230	230	230	230	230	150
Emergency stop torque (permitted 1000 times during the service life of the gearhead)			<i>T</i> _{2Not}	Nm	100	100	100	100	100	100	100	100	80	
				in.lb	885	885	885	885	885	885	885	885	885	708
Nominal input speed (with <i>T</i> _{2N} and 20°C ambient temperature) ^{b)}			<i>n</i> _{1N}	rpm	4400	4400	4400	4400	4400	4400	4800	5500	5500	
Max. input speed			<i>n</i> _{1max}	rpm	6000	6000	6000	6000	6000	6000	6000	6000	6000	
Mean no load running torque (with <i>n</i> ₁ =3000 rpm and 20°C gearhead temperature) ^{c)}			<i>T</i> ₀₁₂	Nm	0.5	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.2	
				in.lb	4.4	3.5	3.5	2.7	2.7	2.7	2.7	2.7	2.7	1.8
Max. torsional backlash			<i>j</i> _t	arcmin	Standard ≤ 6 / Reduced ≤ 4									
Torsional rigidity			<i>C</i> _{t21}	Nm/ arcmin	4.5									
				in.lb/ arcmin	40									
Max. axial force ^{d)}			<i>F</i> _{2AMax}	N	2400									
				lb _f	540									
Max. radial force ^{d)}			<i>F</i> _{2RMax}	N	2800									
				lb _f	630									
Max. tilting moment			<i>M</i> _{2KMax}	Nm	152									
				in.lb	1345									
Efficiency at full load			η	%	94									
Service life (For calculation, see the Chapter "Information")			<i>L</i> _h	h	> 20000									
Weight incl. standard adapter plate			<i>m</i>	kg	2.0									
				lb _m	4.4									
Operating noise (with <i>i</i> =100 and <i>n</i> ₁ =3000 rpm no load)			<i>L</i> _{PA}	dB(A)	≤ 58									
Max. permitted housing temperature				°C	+90									
				F	194									
Ambient temperature				°C	-15 to +40									
				F	5 to 104									
Lubrication					Lubricated for life									
Paint					Blue RAL 5002									
Direction of rotation					Motor and gearhead same direction									
Protection class					IP 65									
Moment of inertia (relates to the drive)		B	11	<i>J</i> ₁	kgcm ²	0.077	0.069	0.068	0.061	0.061	0.057	0.057	0.056	0.056
					10 ⁻³ in.lb.s ²	0.068	0.061	0.060	0.054	0.054	0.050	0.050	0.050	0.050
Clamping hub diameter [mm]		C	14	<i>J</i> ₁	kgcm ²	0.17	0.16	0.16	0.16	0.16	0.15	0.15	0.15	0.15
					10 ⁻³ in.lb.s ²	0.15	0.15	0.14	0.14	0.14	0.14	0.13	0.13	0.13

Reduced mass moments of inertia available on request.

^{a)} Other ratios available on request

^{b)} For higher ambient temperatures, please reduce input speed

^{c)} Valid for clamping hub diameter of 11 mm

^{d)} Refers to center of the output shaft or flange

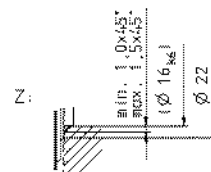
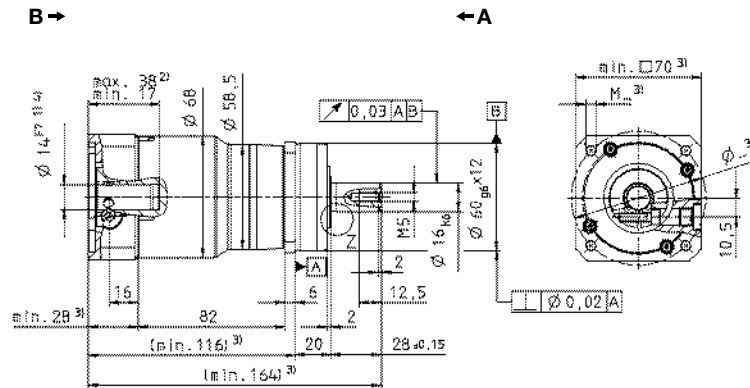
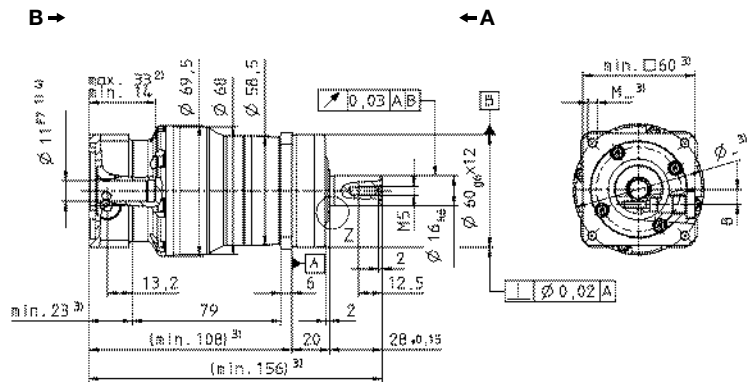
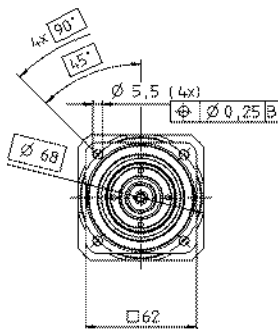
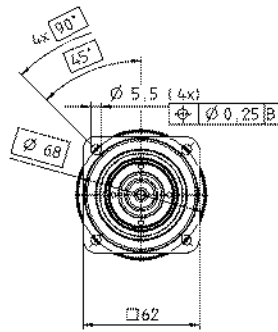
View A

View B

Motor shaft diameter [mm]

up to 11 ⁴⁾(B)
clamping hub
diameter

up to 14 ⁴⁾(C)
clamping hub
diameter



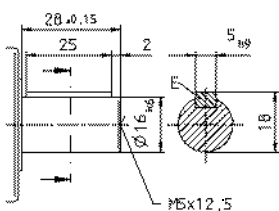
Planetary gearheads
High End

SP+

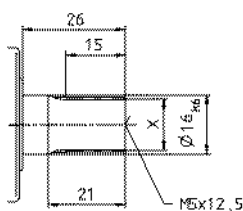
MF

Alternatives: Output shaft variants

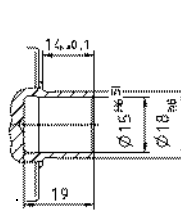
Output shaft with key in mm
E = key as per DIN 6885, sheet 1, form A



Involute gearing DIN 5480 in mm
X = W 16 x 0.8 x 30 x 18 x 6m, DIN 5480



Shaft mounted
Mounted via shrink disc



Non-tolerated dimensions ± 1 mm

- 1) Check motor shaft fit.
- 2) Min./Max. permissible motor shaft length.
Longer motor shafts are adaptable, please contact us.
- 3) The dimensions depend on the motor.
- 4) Smaller motor shaft diameter is compensated by a bushing with a minimum thickness of 1 mm.
- 5) Tolerance h6 for mounted shaft.



CAD data is available under www.wittenstein-alpha.com



Motor mounting according to operating manual

SP+ 075 MF 1-stage

					1-stage				
Ratio ^{a)}			<i>i</i>		3	4	5	7	10
cymex®-optimized acceleration torque (please contact us regarding the design)	T_{2Bcym}			Nm	–	142	160	142	100
				in.lb	–	1254	1416	1254	883
Max. acceleration torque (max. 1000 cycles per hour)	T_{2B}			Nm	85	110	110	110	95
				in.lb	752	974	974	974	841
Nominal output torque (with n_{2N})	T_{2N}			Nm	47	75	75	75	52
				in.lb	416	664	664	664	460
Emergency stop torque (permitted 1000 times during the service life of the gearhead)	T_{2Not}			Nm	200	250	250	250	200
				in.lb	1770	2213	2213	2213	1770
Nominal input speed (with T_{2N} and 20°C ambient temperature) ^{b)}	n_{1N}			rpm	2900	2900	2900	3100	3100
Max. input speed	n_{1Max}			rpm	6000	6000	6000	6000	6000
Mean no load running torque (with $n_1=3000$ rpm and 20°C gearhead temperature) ^{c)}	T_{012}			Nm	1.8	1.4	1.1	0.8	0.6
				in.lb	15.9	12.4	9.7	7.1	5.3
Max. torsional backlash	j_t			arcmin	Standard ≤ 4 / Reduced ≤ 2				
Torsional rigidity	C_{t21}			Nm/ arcmin	10				
				in.lb/ arcmin	89				
Max. axial force ^{d)}	F_{2AMax}			N	3350				
				lb _f	754				
Max. radial force ^{d)}	F_{2RMax}			N	4200				
				lb _f	945				
Max. tilting moment	M_{2KMax}			Nm	236				
				in.lb	2089				
Efficiency at full load	η			%	97				
Service life (For calculation, see the Chapter "Information")	L_h			h	> 20000				
Weight incl. standard adapter plate	m			kg	3.9				
				lb _m	8.6				
Operating noise (with $i=10$ and $n_1=3000$ rpm no load)	L_{PA}			dB(A)	≤ 59				
Max. permitted housing temperature				°C	+90				
				F	194				
Ambient temperature				°C	-15 to +40				
				F	5 to 104				
Lubrication					Lubricated for life				
Paint					Blue RAL 5002				
Direction of rotation					Motor and gearhead same direction				
Protection class					IP 65				
Moment of inertia (relates to the drive)	C	14	J_1	kgcm ²	0.86	0.61	0.51	0.42	0.38
				10 ⁻³ in.lb.s ²	0.76	0.54	0.46	0.37	0.33
Clamping hub diameter [mm]	E	19	J_1	kgcm ²	1.03	0.78	0.68	0.59	0.54
				10 ⁻³ in.lb.s ²	0.91	0.69	0.60	0.52	0.48
	G	24	J_1	kgcm ²	2.40	2.15	2.05	1.96	1.91
				10 ⁻³ in.lb.s ²	2.12	1.90	1.81	1.73	1.69

Reduced mass moments of inertia available on request.

^{a)} Other ratios available on request

^{b)} For higher ambient temperatures, please reduce input speed

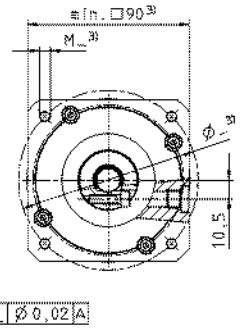
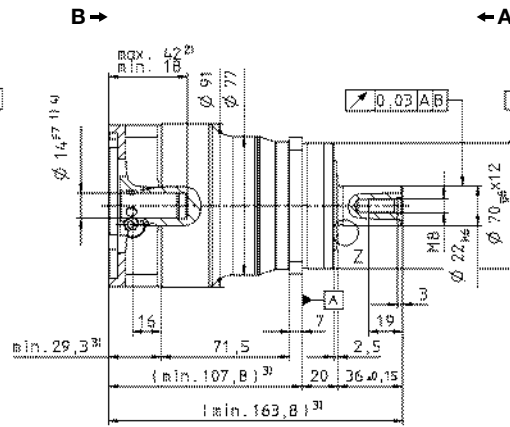
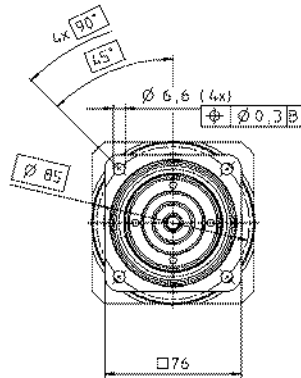
^{c)} Valid for clamping hub diameter of 19 mm

^{d)} Refers to centre of the output shaft or flange

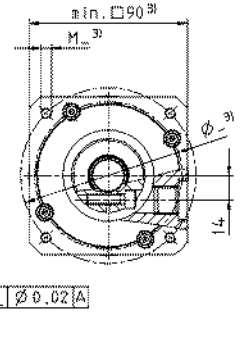
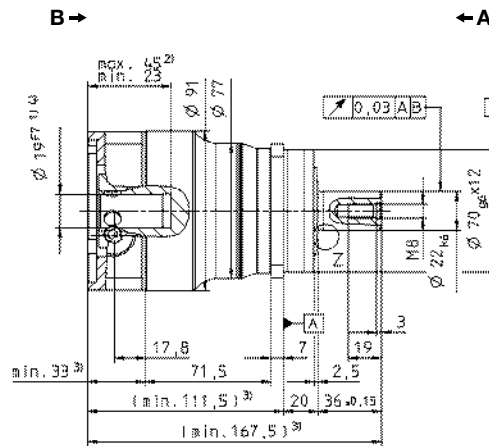
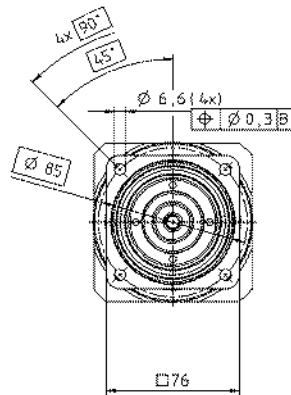
View A

View B

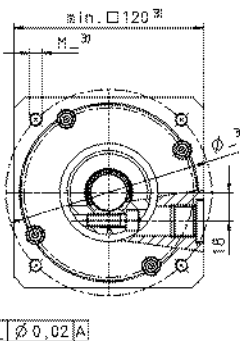
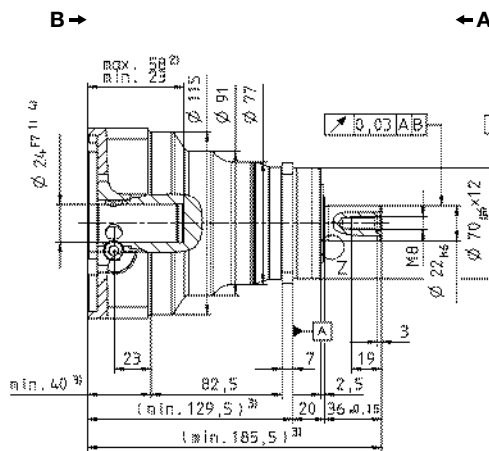
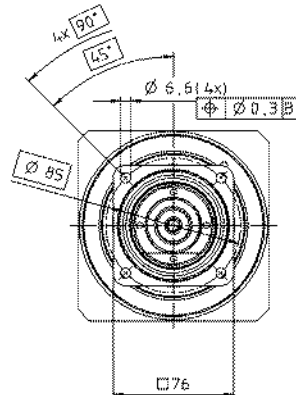
up to 14⁴⁾(C)
clamping hub
diameter



up to 19⁴⁾(E)
clamping hub
diameter

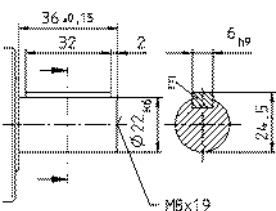


up to 24⁴⁾(G)
clamping hub
diameter

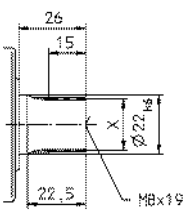


Alternatives: Output shaft variants

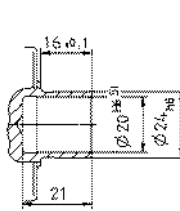
Output shaft with key in mm
E = key as per DIN 6885, sheet 1, form A



Involute gearing DIN 5480 in mm
X = W 22 x 1.25 x 30 x 16 x 6m, DIN 5480



Shaft mounted
Mounted via shrink disc



Non-tolerated dimensions ± 1 mm

- 1) Check motor shaft fit.
- 2) Min./Max. permissible motor shaft length.
Longer motor shafts are adaptable, please contact us.
- 3) The dimensions depend on the motor.
- 4) Smaller motor shaft diameter is compensated by a bushing with a minimum thickness of 1 mm.
- 5) Tolerance h6 for mounted shaft.

CAD data is available under www.wittenstein-alpha.com

Motor mounting according to operating manual

Planetary gearheads
High End

SP+

MF

SP+ 075 MF 2-stage

					2-stage								
Ratio ^{a)}		<i>i</i>			16	20	25	28	35	40	50	70	100
cymex®-optimized acceleration torque (please contact us regarding the design)		<i>T</i> _{2Bcym}	Nm		142	142	160	142	160	135	160	142	100
			in.lb		1254	1254	1416	1254	1416	1195	1416	1254	883
Max. acceleration torque (max. 1000 cycles per hour)		<i>T</i> _{2B}	Nm		110	110	110	110	110	110	110	110	90
			in.lb		974	974	974	974	974	974	974	974	797
Nominal output torque (with <i>n</i> _{2N})		<i>T</i> _{2N}	Nm		75	75	75	75	75	75	75	75	52
			in.lb		664	664	664	664	664	664	664	664	460
Emergency stop torque (permitted 1000 times during the service life of the gearhead)		<i>T</i> _{2Not}	Nm		250	250	250	250	250	250	250	250	200
			in.lb		2213	2213	2213	2213	2213	2213	2213	2213	1770
Nominal input speed (with <i>T</i> _{2N} and 20°C ambient temperature) ^{b)}		<i>n</i> _{1N}	rpm		3500	3500	3500	3500	3500	3500	3800	4500	4500
Max. input speed		<i>n</i> _{1Max}	rpm		6000	6000	6000	6000	6000	6000	6000	6000	6000
Mean no load running torque (with <i>n</i> ₂ =3000 rpm and 20°C gearhead temperature) ^{c)}		<i>T</i> ₀₁₂	Nm		0.8	0.6	0.6	0.5	0.4	0.4	0.3	0.3	0.3
			in.lb		4.4	3.5	3.5	2.7	2.7	1.8	1.8	1.8	1.8
Max. torsional backlash		<i>j</i> _t	arcmin		Standard ≤ 6 / Reduced ≤ 4								
Torsional rigidity		<i>C</i> _{t21}	Nm/ arcmin		10								
			in.lb/ arcmin		89								
Max. axial force ^{d)}		<i>F</i> _{2AMax}	N		3350								
			lb _f		754								
Max. radial force ^{d)}		<i>F</i> _{2RMax}	N		4200								
			lb _f		945								
Max. tilting moment		<i>M</i> _{2KMax}	Nm		236								
			in.lb		2089								
Efficiency at full load		η	%		94								
Service life (For calculation, see the Chapter “Information”)		<i>L</i> _h	h		> 20000								
Weight incl. standard adapter plate		<i>m</i>	kg		3.6								
			lb _m		8.0								
Operating noise (with <i>i</i> =100 and <i>n</i> ₁ =3000 rpm no load)		<i>L</i> _{PA}	dB(A)		≤ 59								
Max. permitted housing temperature			°C		+90								
			F		194								
Ambient temperature			°C		-15 to +40								
			F		5 to 104								
Lubrication					Lubricated for life								
Paint					Blue RAL 5002								
Direction of rotation					Motor and gearhead same direction								
Protection class					IP 65								
Moment of inertia (relates to the drive)	B	11	<i>J</i> ₁	kgcm ²	0.16	0.13	0.13	0.10	0.10	0.091	0.090	0.089	0.089
				10 ⁻³ in.lb.s ²	0.14	0.11	0.11	0.092	0.090	0.081	0.080	0.079	0.079
Clamping hub diameter [mm]	C	14	<i>J</i> ₁	kgcm ²	0.23	0.20	0.20	0.18	0.18	0.17	0.16	0.16	0.16
				10 ⁻³ in.lb.s ²	0.20	0.18	0.18	0.16	0.16	0.15	0.15	0.14	0.14
	E	19	<i>J</i> ₁	kgcm ²	0.55	0.53	0.52	0.50	0.50	0.49	0.49	0.49	0.49
				10 ⁻³ in.lb.s ²	0.49	0.47	0.46	0.44	0.44	0.43	0.43	0.43	0.43

Reduced mass moments of inertia available on request.

^{a)} Other ratios available on request

^{b)} For higher ambient temperatures, please reduce input speed

^{c)} Valid for clamping hub diameter of 14 mm

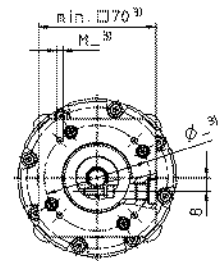
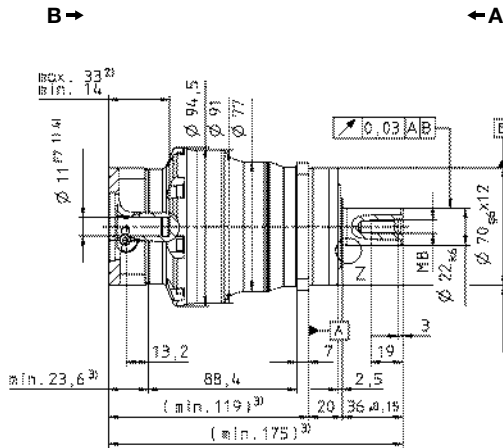
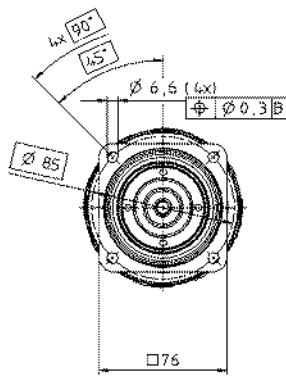
^{d)} Refers to centre of the output shaft or flange

View A

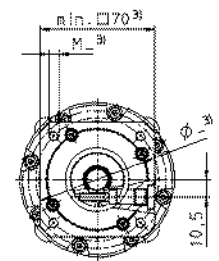
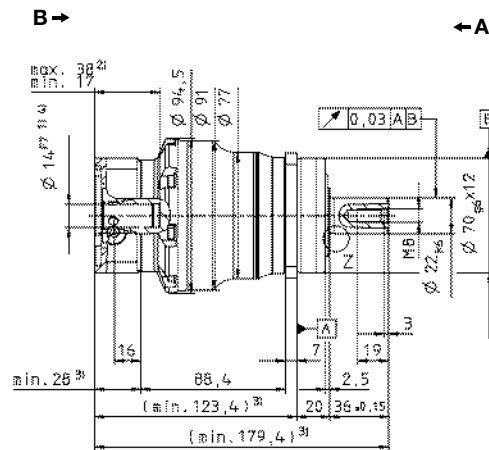
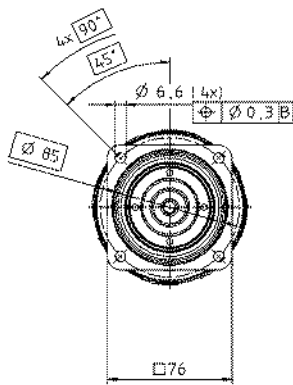
View B

Motor shaft diameter [mm]

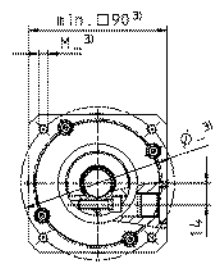
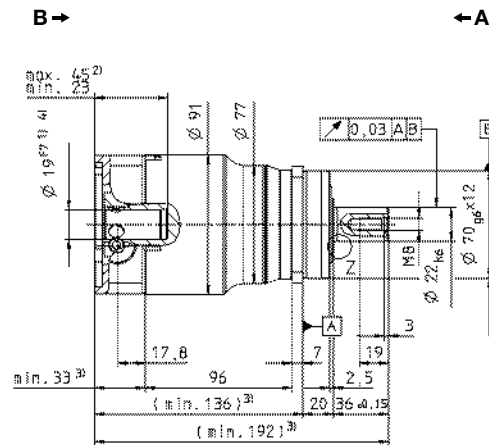
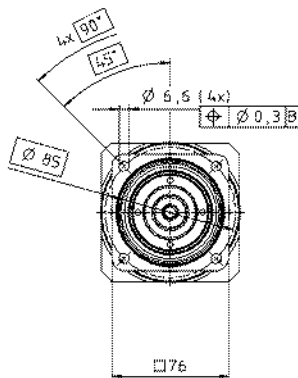
up to 11⁴⁾ (B)
clamping hub diameter



up to 14⁴⁾ (C)
clamping hub diameter

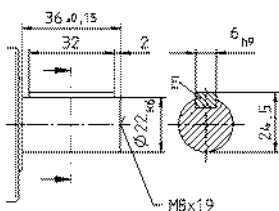


up to 19⁴⁾ (E)
clamping hub diameter

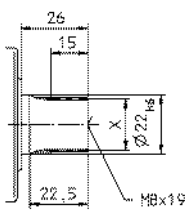


Alternatives: Output shaft variants

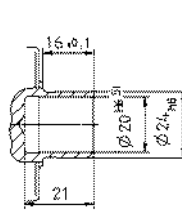
Output shaft with key in mm
E = key as per DIN 6885, sheet 1, form A



Involute gearing DIN 5480 in mm
X = W 22 x 1.25 x 30 x 16 x 6m, DIN 5480



Shaft mounted
Mounted via shrink disc



Non-tolerated dimensions ± 1 mm

- 1) Check motor shaft fit.
- 2) Min./Max. permissible motor shaft length.
Longer motor shafts are adaptable, please contact us.
- 3) The dimensions depend on the motor.
- 4) Smaller motor shaft diameter is compensated by a bushing with a minimum thickness of 1 mm.
- 5) Tolerance h6 for mounted shaft.

CAD data is available under www.wittenstein-alpha.com

Motor mounting according to operating manual

Planetary gearheads
High End

SP+

MF

SP+ 100 MF 1-stage

					1-stage				
Ratio ^{a)}			<i>i</i>		3	4	5	7	10
cymex®-optimized acceleration torque (please contact us regarding the design)	T_{2Bcym}			Nm	–	370	400	330	260
				in.lb	–	3275	3540	2921	2301
Max. acceleration torque (max. 1000 cycles per hour)	T_{2B}			Nm	235	315	315	315	235
				in.lb	2080	2788	2788	2788	2080
Nominal output torque (with n_{1N})	T_{2N}			Nm	120	180	175	170	120
				in.lb	1062	1593	1549	1505	1062
Emergency stop torque (permitted 1000 times during the service life of the gearhead)	T_{2Not}			Nm	500	625	625	625	500
				in.lb	4425	5531	5531	5531	4425
Nominal input speed (with T_{2N} and 20°C ambient temperature ^{b)})	n_{1N}			rpm	2500	2500	2500	2800	2800
Max. input speed	n_{1Max}			rpm	4500	4500	4500	4500	4500
Mean no load running torque (with $n_1=3000$ rpm and 20°C gearhead temperature ^{c)})	T_{012}			Nm	3.5	2.7	2.4	1.6	1.4
				in.lb	31.0	23.9	21.2	14.2	12.4
Max. torsional backlash	j_t			arcmin	Standard ≤ 3 / Reduced ≤ 1				
Torsional rigidity	C_{t21}			Nm/ arcmin	31				
				in.lb/ arcmin	274				
Max. axial force ^{d)}	F_{2AMax}			N	5650				
				lb _f	1271				
Max. radial force ^{d)}	F_{2RMax}			N	6600				
				lb _f	1485				
Max. tilting moment	M_{2KMax}			Nm	487				
				in.lb	4310				
Efficiency at full load	η			%	97				
Service life (For calculation, see the Chapter "Information")	L_h			h	> 20000				
Weight incl. standard adapter plate	m			kg	7.7				
				lb _m	17.0				
Operating noise (with $i=10$ and $n_1=3000$ rpm no load)	L_{PA}			dB(A)	≤ 64				
Max. permitted housing temperature				°C	+90				
				F	194				
Ambient temperature				°C	-15 to +40				
				F	5 to 104				
Lubrication					Lubricated for life				
Paint					Blue RAL 5002				
Direction of rotation					Motor and gearhead same direction				
Protection class					IP 65				
Moment of inertia (relates to the drive)	E	19	J_1	kgcm ²	3.29	2.35	1.92	1.60	1.38
				10 ⁻³ in.lb.s ²	2.91	2.08	1.70	1.42	1.22
Clamping hub diameter [mm]	G	24	J_1	kgcm ²	3.99	3.04	2.61	2.29	2.07
				10 ⁻³ in.lb.s ²	3.53	2.69	2.31	2.03	1.83
	H	28	J_1	kgcm ²	3.59	2.65	2.22	1.90	1.68
				10 ⁻³ in.lb.s ²	3.18	2.35	1.97	1.68	1.49
	K	38	J_1	kgcm ²	11.1	10.1	9.68	9.36	9.14
				10 ⁻³ in.lb.s ²	9.78	8.95	8.57	8.28	8.09

Reduced mass moments of inertia available on request.

^{a)} Other ratios available on request

^{b)} For higher ambient temperatures, please reduce input speed

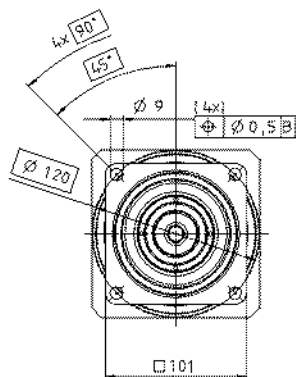
^{c)} Valid for clamping hub diameter of 24 mm

^{d)} Refers to centre of the output shaft or flange

View A

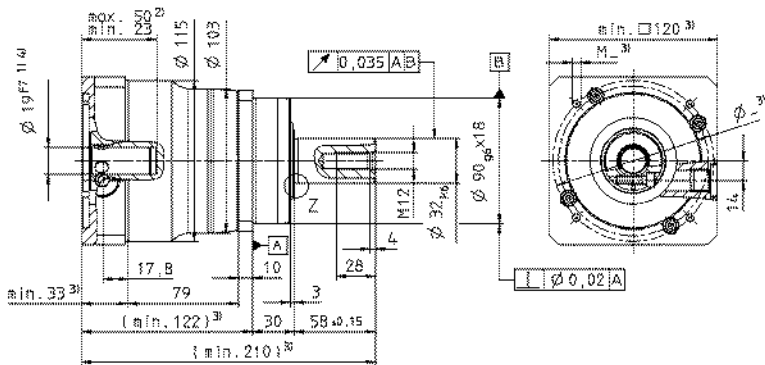
View B

up to 19⁴⁾ (E)
clamping hub
diameter

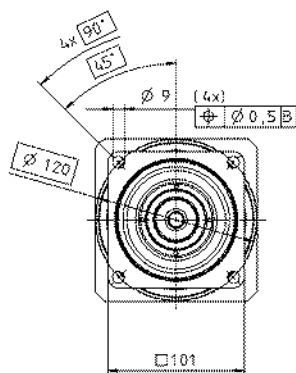


B →

← A

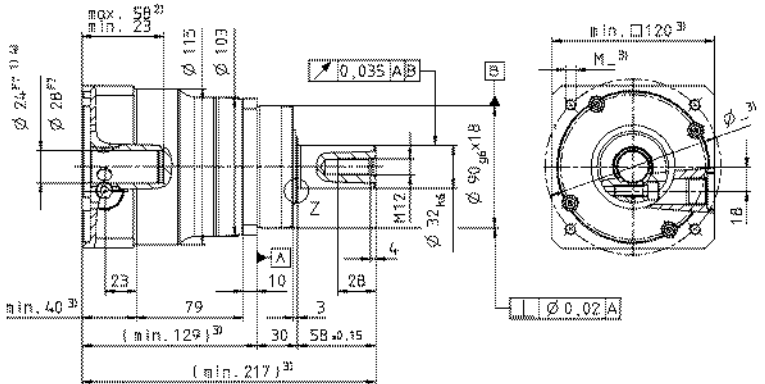


up to 24/28⁴⁾
(G/H) clamping
hub diameter

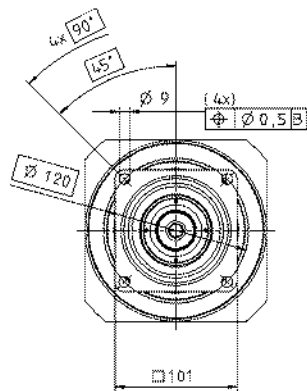


B →

← A

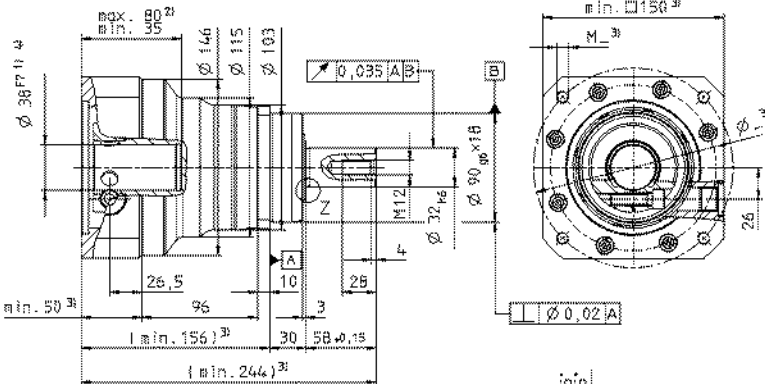


up to 38⁴⁾ (K)
clamping hub
diameter



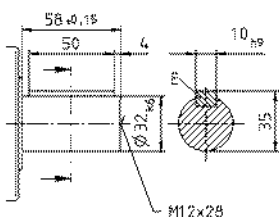
B →

← A

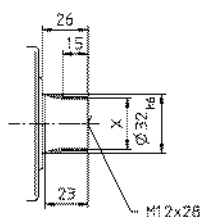


Alternatives: Output shaft variants

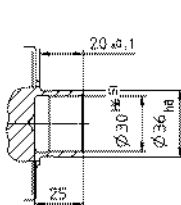
Output shaft with key in mm
E = key as per DIN 6885, sheet 1, form A



Involute gearing DIN 5480 in mm
X = W 32 x 1.25 x 30 x 24 x 6 m, DIN 5480



Shaft mounted
Mounted via shrink disc



Non-tolerated dimensions ± 1 mm

- 1) Check motor shaft fit.
- 2) Min./Max. permissible motor shaft length.
Longer motor shafts are adaptable, please contact us.
- 3) The dimensions depend on the motor.
- 4) Smaller motor shaft diameter is compensated by a bushing with a minimum thickness of 1 mm.
- 5) Tolerance h6 for mounted shaft.

CAD data is available under www.wittenstein-alpha.com



Motor mounting according to operating manual

SP+ 100 MF 2-stage

					2-stage								
Ratio ^{a)}		<i>i</i>			16	20	25	28	35	40	50	70	100
cymex®-optimized acceleration torque (please contact us regarding the design)		<i>T</i> _{2Bcym}		Nm	370	370	400	370	400	370	400	330	260
				in.lb	3275	3275	3540	3275	3540	3275	3540	2921	2301
Max. acceleration torque (max. 1000 cycles per hour)		<i>T</i> _{2B}		Nm	315	315	315	315	315	315	315	315	235
				in.lb	2788	2788	2788	2788	2788	2788	2788	2788	2080
Nominal output torque (with <i>n</i> _{IN})		<i>T</i> _{2N}		Nm	180	180	175	180	175	180	175	170	120
				in.lb	1593	1593	1549	1593	1549	1593	1549	1505	1062
Emergency stop torque (permitted 1000 times during the service life of the gearhead)		<i>T</i> _{2Not}		Nm	625	625	625	625	625	625	625	625	500
				in.lb	5531	5531	5531	5531	5531	5531	5531	5531	4425
Nominal input speed (with <i>T</i> _{2N} and 20°C ambient temperature) ^{b)}		<i>n</i> _{1N}	rpm		3100	3100	3100	3100	3100	3100	3500	4200	4200
Max. input speed		<i>n</i> _{1Max}	rpm		6000	6000	6000	6000	6000	6000	6000	6000	6000
Mean no load running torque (with <i>n</i> ₁ = 3000 rpm and 20°C gearhead temperature) ^{c)}		<i>T</i> ₀₁₂		Nm	1.5	1.2	1.1	0.9	0.8	0.7	0.6	0.5	0.5
				in.lb	13.3	10.6	9.7	8.8	7.1	6.2	5.3	4.4	4.4
Max. torsional backlash		<i>j</i> _t	arcmin		Standard ≤ 5 / Reduced ≤ 3								
Torsional rigidity		<i>C</i> _{t21}		Nm/ arcmin	31								
				in.lb/ arcmin	274								
Max. axial force ^{d)}		<i>F</i> _{2AMax}		N	5650								
				lb _f	1271								
Max. radial force ^{d)}		<i>F</i> _{2RMMax}		N	6600								
				lb _f	1485								
Max. tilting moment		<i>M</i> _{2KMax}		Nm	487								
				in.lb	4310								
Efficiency at full load		η	%		94								
Service life (For calculation, see the Chapter “Information”)		<i>L</i> _h	h		> 20000								
Weight incl. standardadapter plate		<i>m</i>		kg	7.9								
				lb _m	17.5								
Operating noise (with <i>i</i> =100 and <i>n</i> ₁ = 3000 rpm no load)		<i>L</i> _{PA}	dB(A)		≤ 60								
Max. permitted housing temperature				°C	+90								
				F	194								
Ambient temperature				°C	-15 to +40								
				F	5 to 104								
Lubrication					Lubricated for life								
Paint					Blue RAL 5002								
Direction of rotation					Motor and gearhead same direction								
Protection class					IP 65								
Moment of inertia (relates to the drive)	C	14	<i>J</i> _I	kgcm ²	0.64	0.54	0.52	0.43	0.43	0.38	0.38	0.37	0.37
				10 ⁻³ in.lb.s ²	0.57	0.47	0.46	0.38	0.38	0.34	0.33	0.33	0.33
Clamping hub diameter [mm]	E	19	<i>J</i> _I	kgcm ²	0.81	0.70	0.69	0.60	0.59	0.55	0.54	0.54	0.54
				10 ⁻³ in.lb.s ²	0.72	0.62	0.61	0.53	0.52	0.48	0.48	0.48	0.47
	G	24	<i>J</i> _I	kgcm ²	2.18	2.07	2.05	1.97	1.96	1.92	1.91	1.91	1.91
				10 ⁻³ in.lb.s ²	1.93	1.83	1.82	1.74	1.74	1.70	1.69	1.69	1.69
	H	28	<i>J</i> _I	kgcm ²	1,98	1,90	1,88	1,81	1,80	1,76	1,75	1,75	1,75
				10 ⁻³ in.lb.s ²	1,75	1,68	1,66	1,60	1,59	1,56	1,55	1,55	1,55

Reduced mass moments of inertia available on request.

^{a)} Other ratios available on request

^{b)} For higher ambient temperatures, please reduce input speed

^{c)} Valid for clamping hub diameter of 19 mm

^{d)} Refers to centre of the output shaft or flange

View A

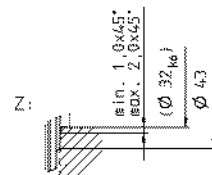
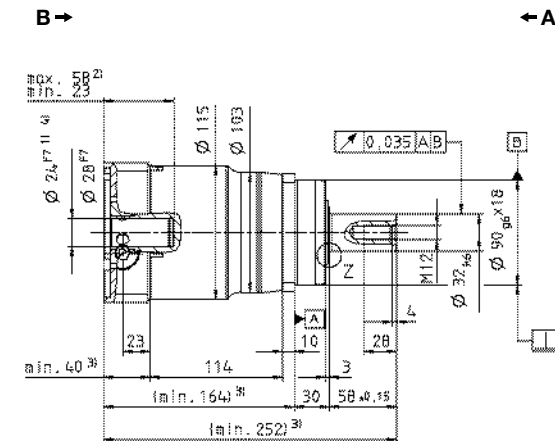
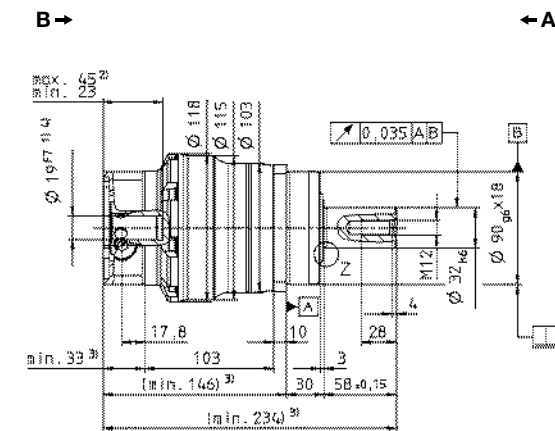
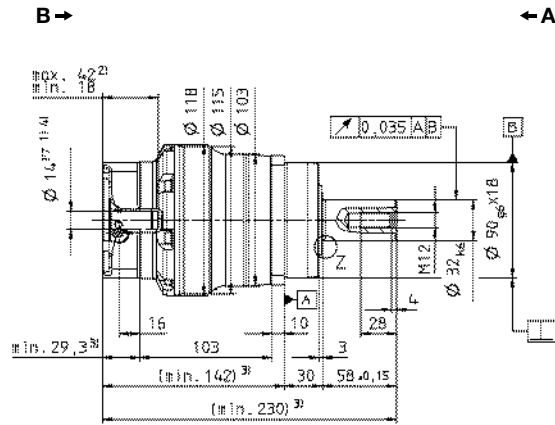
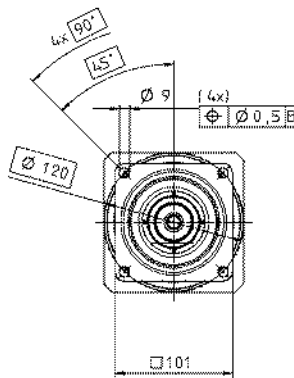
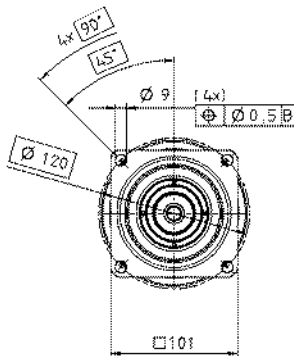
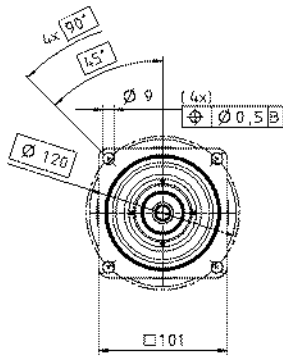
View B

Motor shaft diameter [mm]

up to 14 ⁴⁾ (C)
clamping hub
diameter

up to 19 ⁴⁾ (E)
clamping hub
diameter

up to 24/28 ⁴⁾
(G/H)
clamping hub
diameter

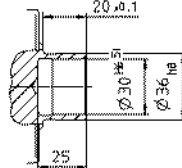
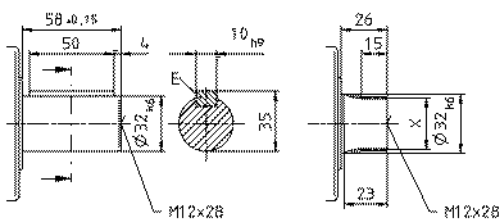


Alternatives: Output shaft variants

Output shaft with key in mm
E = key as per DIN 6885, sheet 1, form A

Involute gearing DIN 5480 in mm
X = W 32 x 1.25 x 30 x 24 x 6 m, DIN 5480

Shaft mounted
Mounted via shrink disc



Non-tolerated dimensions ± 1 mm

- 1) Check motor shaft fit.
- 2) Min./Max. permissible motor shaft length.
Longer motor shafts are adaptable, please contact us.
- 3) The dimensions depend on the motor.
- 4) Smaller motor shaft diameter is compensated by a bushing with a minimum thickness of 1 mm.
- 5) Tolerance h6 for mounted shaft.

CAD data is available under www.wittenstein-alpha.com

Motor mounting according to operating manual

Planetary gearheads
High End

SP+
MF

SP+ 140 MF 1-stage

					1-stage				
Ratio ^{a)}			<i>i</i>		3	4	5	7	10
cymex®-optimized acceleration torque (please contact us regarding the design)			T_{2Bcym}	Nm	–	710	755	680	560
				in.lb	–	6284	6682	6018	4956
Max. acceleration torque (max. 1000 cycles per hour)			T_{2B}	Nm	390	660	660	660	530
				in.lb	3451.5	5841	5841	5841	4691
Nominal output torque (with n_{1N})			T_{2N}	Nm	200	360	360	360	220
				in.lb	1770	3186	3186	3186	1947
Emergency stop torque (permitted 1000 times during the service life of the gearhead)			T_{2Not}	Nm	1000	1250	1250	1250	1000
				in.lb	8850	11063	11063	11063	8850
Nominal input speed (with T_{2N} and 20°C ambient temperature ^{b)})			n_{1N}	rpm	2100	2100	2100	2600	2600
Max. input speed			n_{1Max}	rpm	4000	4000	4000	4000	4000
Mean no load running torque (with $n_1=3000$ rpm and 20°C gearhead temperature ^{c)})			T_{012}	Nm	7.6	5.8	4.7	3.4	2.5
				in.lb	67	51	42	30	22
Max. torsional backlash			j_t	arcmin	Standard ≤ 3 / Reduced ≤ 1				
Torsional rigidity			C_{t21}	Nm/ arcmin	53				
				in.lb/ arcmin	469				
Max. axial force ^{d)}			F_{2AMax}	N	9870				
				lb _f	2221				
Max. radial force ^{d)}			F_{2RMax}	N	9900				
				lb _f	2228				
Max. tilting moment			M_{2KMax}	Nm	952				
				in.lb	8425				
Efficiency at full load			η	%	97				
Service life (For calculation, see the Chapter "Information")			L_h	h	> 20000				
Weight incl. standard adapter plate			m	kg	17.2				
				lb _m	38.0				
Operating noise (with $i=10$ and $n_1=3000$ rpm no load)			L_{PA}	dB(A)	≤ 65				
Max. permitted housing temperature				°C	+90				
				F	194				
Ambient temperature				°C	-15 to +40				
				F	5 to 104				
Lubrication					Lubricated for life				
Paint					Blue RAL 5002				
Direction of rotation					Motor and gearhead same direction				
Protection class					IP 65				
Moment of inertia (relates to the drive)	G	24	J_1	kgcm ²	10.7	7.82	6.79	5.84	5.28
				10 ⁻³ in.lb.s ²	9.45	6.92	6.01	5.17	4.67
	I	32	J_1	kgcm ²	13.8	11.0	9.95	9.01	8.44
				10 ⁻³ in.lb.s ²	12.3	9.72	8.81	7.97	7.47
	K	38	J_1	kgcm ²	14.9	12.1	11.0	10.1	9.51
				10 ⁻³ in.lb.s ²	13.2	10.7	9.76	8.92	8.42
	M	48	J_1	kgcm ²	29.5	26.7	25.6	24.7	24.2
				10 ⁻³ in.lb.s ²	26.1	23.6	22.7	21.9	21.4

Reduced mass moments of inertia available on request.

^{a)} Other ratios available on request

^{b)} For higher ambient temperatures, please reduce input speed

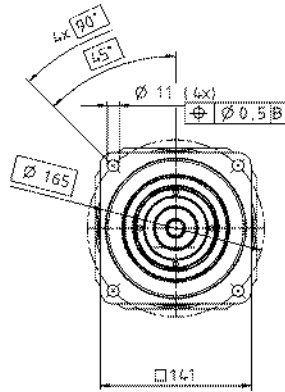
^{c)} Valid for clamping hub diameter of 38 mm

^{d)} Refers to center of the output shaft or flange

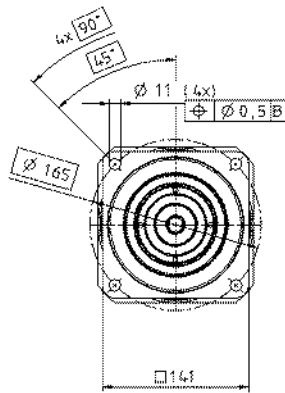
View A

View B

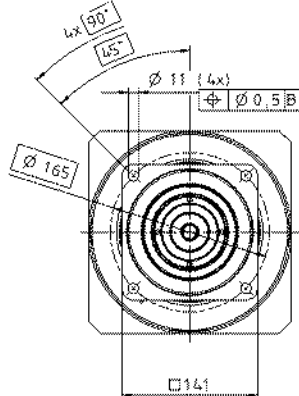
up to 24⁴⁾ (G)
clamping hub diameter



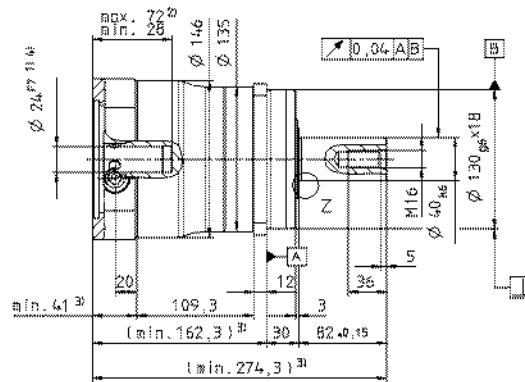
up to 32/38⁴⁾
(I/K) clamping hub diameter



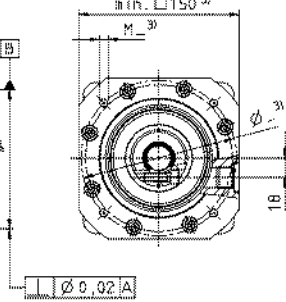
up to 48⁴⁾ (M)
clamping hub diameter



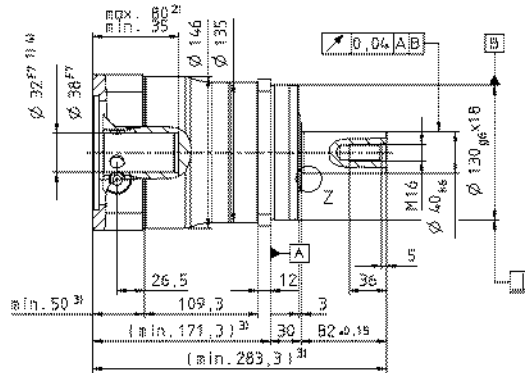
B →



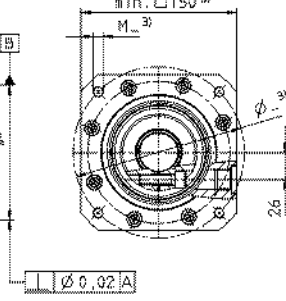
← A



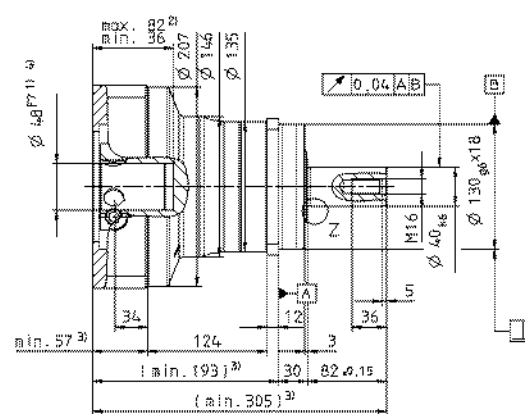
B →



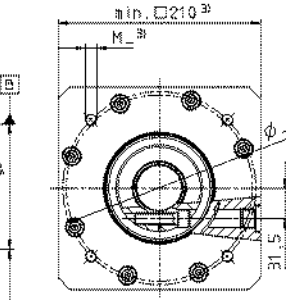
← A



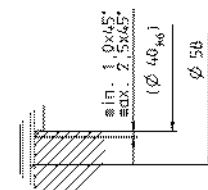
B →



← A

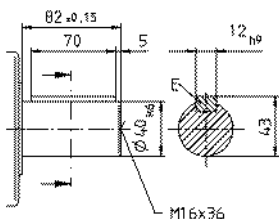


Z:

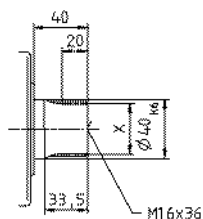


Alternatives: Output shaft variants

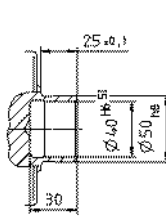
Output shaft with key in mm
E = key as per DIN 6885, sheet 1, form A



Involute gearing DIN 5480 in mm
X = W 40 x 2 x 30 x 18 x 6m, DIN 5480



Shaft mounted
Mounted via shrink disc



Non-tolerated dimensions ± 1 mm

- 1) Check motor shaft fit.
- 2) Min./Max. permissible motor shaft length.
Longer motor shafts are adaptable, please contact us.
- 3) The dimensions depend on the motor.
- 4) Smaller motor shaft diameter is compensated by a bushing with a minimum thickness of 1 mm.
- 5) Tolerance h6 for mounted shaft.

CAD data is available under www.wittenstein-alpha.com

Motor mounting according to operating manual

Planetary gearheads
High End

SP+

MF

SP+ 140 MF 2-stage

					2-stage								
Ratio ^{a)}		i			16	20	25	28	35	40	50	70	100
cymex®-optimized acceleration torque (please contact us regarding the design)		T _{2Bcym}		Nm	710	710	755	710	755	710	755	680	560
				in.lb	6284	6284	6682	6284	6682	6284	6682	6018	4956
Max. acceleration torque (max. 1000 cycles per hour)		T _{2B}		Nm	660	660	660	660	660	660	660	660	530
				in.lb	5841	5841	5841	5841	5841	5841	5841	5841	4691
Nominal output torque (with n _{2N})		T _{2N}		Nm	360	360	360	360	360	360	360	360	220
				in.lb	3186	3186	3186	3186	3186	3186	3186	3186	1947
Emergency stop torque (permitted 1000 times during the service life of the gearhead)		T _{2Not}		Nm	1250	1250	1250	1250	1250	1250	1250	1250	1000
				in.lb	11063	11063	11063	11063	11063	11063	11063	11063	8850
Nominal input speed (with T _{2N} and 20°C ambient temperature) ^{b)}		n _{1N}	rpm		2900	2900	2900	2900	2900	2900	3200	3200	3900
Max. input speed ^{c)}		n _{1Max}	rpm		5000	5000	5000	5000	5000	5000	5000	5000	5000
Mean no load running torque (with n _r =3000 rpm and 20°C gearhead temperature) ^{c)}		T ₀₁₂		Nm	3.3	2.7	2.4	1.9	1.8	1.4	1.3	1.2	1.1
				in.lb	29.2	23.9	21.2	16.9	15.9	12.4	11.5	10.6	9.7
Max. torsional backlash		j _t	arcmin	Standard ≤ 5 / Reduced ≤ 3									
Torsional rigidity		C _{t21}		Nm/ arcmin	53								
				in.lb/ arcmin	469								
Max. axial force ^{d)}		F _{2AMax}		N	9870								
				lb _f	2221								
Max. radial force ^{d)}		F _{2RMax}		N	9900								
				lb _f	2228								
Max. tilting moment		M _{2KMax}		Nm	952								
				in.lb	8425								
Efficiency at full load		η	%	94									
Service life (For calculation, see the Chapter “Information”)		L _h	h	> 20000									
Weight incl. standard adapter plate		m		kg	17								
				lb _m	37.6								
Operating noise (with i=100 and n _r =3000 rpm no load)		L _{PA}	dB(A)	≤ 63									
Max. permitted housing temperature				°C	+90								
				F	194								
Ambient temperature				°C	-15 to +40								
				F	5 to 104								
Lubrication				Lubricated for life									
Paint				Blue RAL 5002									
Direction of rotation				Motor and gearhead same direction									
Protection class				IP 65									
Moment of inertia (relates to the drive)	E	19	J ₁	kgcm ²	2.50	2.01	1.97	1.65	1.63	1.40	1.39	1.38	1.38
				10 ⁻³ in.lb.s ²	2.21	1.78	1.75	1.46	1.44	1.24	1.23	1.22	1.22
Clamping hub diameter [mm]	G	24	J ₁	kgcm ²	3.19	2.71	2.67	2.34	2.32	2.10	2.08	2.08	2.07
				10 ⁻³ in.lb.s ²	2.82	2.40	2.36	2.07	2.05	1.85	1.85	1.84	1.83
	K	38	J ₁	kgcm ²	10.3	9.77	9.73	9.41	9.39	9.16	9.15	9.14	9.14
				10 ⁻³ in.lb.s ²	9.07	8.65	8.61	8.33	8.31	8.11	8.10	8.09	8.09

Reduced mass moments of inertia available on request.

^{a)} Other ratios available on request

^{b)} For higher ambient temperatures, please reduce input speed

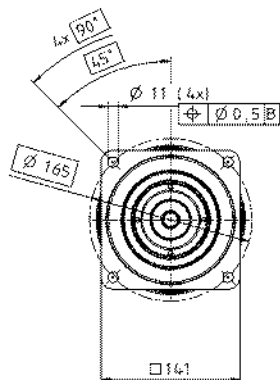
^{c)} Valid for clamping hub diameter of 24 mm

^{d)} Refers to center of the output shaft or flange

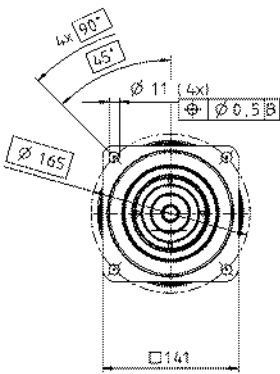
View A

View B

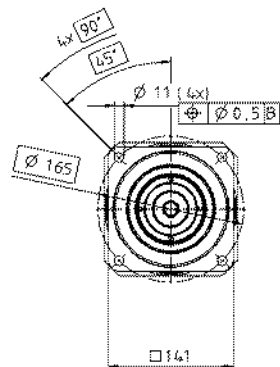
up to 19 ⁴⁾ (E)
clamping hub
diameter



up to 24 ⁴⁾ (G)
clamping hub
diameter

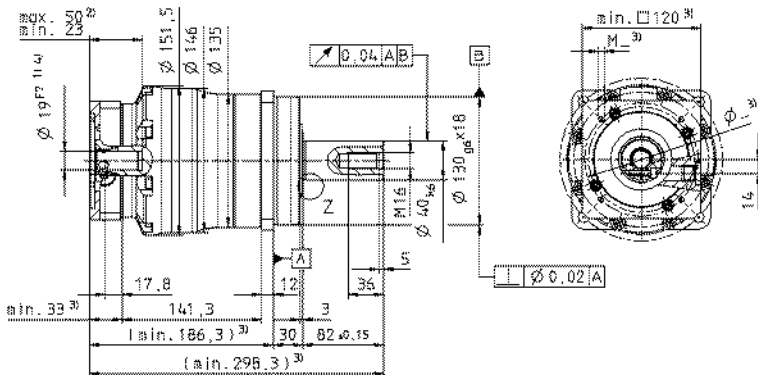


up to 38 ⁴⁾ (K)
clamping hub
diameter



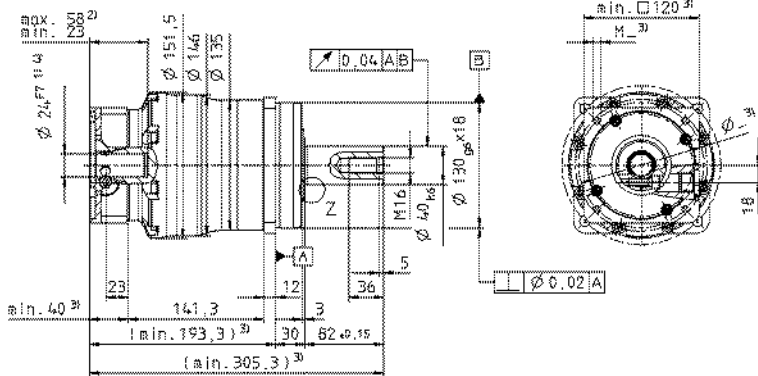
B →

← A



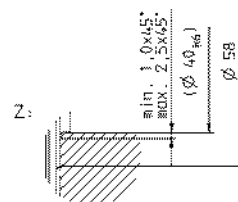
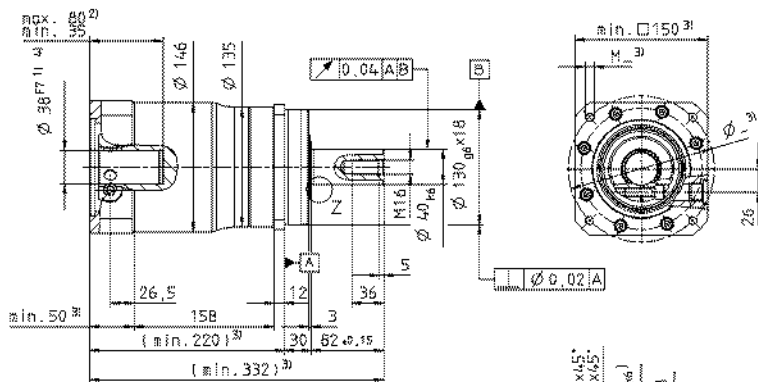
B →

← A



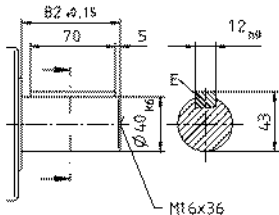
B →

← A

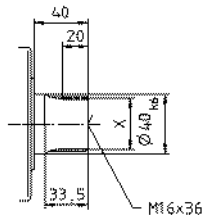


Alternatives: Output shaft variants

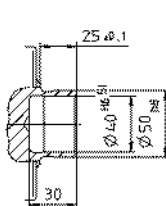
Output shaft with key in mm
E = key as per DIN 6885, sheet 1, form A



Involute gearing DIN 5480 in mm
X = W 40 x 2 x 30 x 18 x 6m, DIN 5480



Shaft mounted
Mounted via shrink disc



Non-tolerated dimensions ± 1 mm

- 1) Check motor shaft fit.
- 2) Min./Max. permissible motor shaft length.
Longer motor shafts are adaptable, please contact us.
- 3) The dimensions depend on the motor.
- 4) Smaller motor shaft diameter is compensated by a bushing with a minimum thickness of 1 mm.
- 5) Tolerance h6 for mounted shaft.

CAD data is available under www.wittenstein-alpha.com

Motor mounting according to operating manual

SP+ 180 MF 1-stage

					1-stage				
Ratio ^{a)}			<i>i</i>		3	4	5	7	10
cymex®-optimized acceleration torque (please contact us regarding the design)			T_{2Bcym}	Nm	–	1785	1890	1785	1400
				in.lb	–	15797	16727	15797	12390
Max. acceleration torque (max. 1000 cycles per hour)			T_{2B}	Nm	970	1210	1210	1210	970
				in.lb	8585	10709	10709	10709	8585
Nominal output torque (with n_{2N})			T_{2N}	Nm	530	750	750	750	750
				in.lb	4691	6638	6638	6638	6638
Emergency stop torque (permitted 1000 times during the service life of the gearhead)			T_{2Not}	Nm	2200	2750	2750	2750	2200
				in.lb	19470	24338	24338	24338	29470
Nominal input speed (with T_{2N} and 20°C ambient temperature) ^{b)}			n_{1N}	rpm	1500	1500	1500	2300	2300
Max. input speed			n_{1Max}	rpm	3500	3500	3500	3500	3500
Mean no load running torque (with $n_1=3000$ rpm and 20°C gearhead temperature) ^{c)}			T_{012}	Nm	14.0	11.0	9.0	6.8	5.0
				in.lb	123.9	97.4	79.7	60.2	44.3
Max. torsional backlash			j_t	arcmin	Standard ≤ 3 / Reduced ≤ 1				
Torsional rigidity			C_{t21}	Nm/ arcmin	175				
				in.lb/ arcmin	1549				
Max. axial force ^{d)}			F_{2AMax}	N	14150				
				lb _f	3184				
Max. radial force ^{d)}			F_{2RMax}	N	15400				
				lb _f	3465				
Max. tilting moment			M_{2KMax}	Nm	1600				
				in.lb	14160				
Efficiency at full load			η	%	97				
Service life (For calculation, see the Chapter "Information")			L_h	h	> 20000				
Weight incl. standard adapter plate			m	kg	34				
				lb _m	75.1				
Operating noise (with $i=10$ and $n_1=3000$ rpm no load)			L_{PA}	dB(A)	≤ 66				
Max. permitted housing temperature				°C	+90				
				F	194				
Ambient temperature				°C	-15 to +40				
				F	5 to 104				
Lubrication					Lubricated for life				
Paint					Blue RAL 5002				
Direction of rotation					Motor and gearhead same direction				
Protection class					IP 65				
Moment of inertia (relates to the drive)	K	38	J_1	kgcm ²	50.8	33.9	27.9	22.2	19.2
				10 ⁻³ in.lb.s ²	45.0	30.0	24.7	19.7	17.0
Clamping hub diameter [mm]	M	48	J_1	kgcm ²	58.2	41.2	35.3	29.6	26.5
				10 ⁻³ in.lb.s ²	51.5	36.5	31.2	26.2	23.5

Reduced mass moments of inertia available on request.

^{a)} Other ratios available on request

^{b)} For higher ambient temperatures, please reduce input speed

^{c)} Valid for clamping hub diameter of 48 mm

^{d)} Refers to center of the output shaft or flange

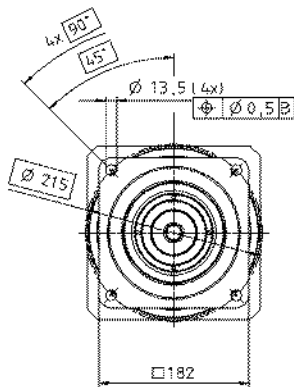
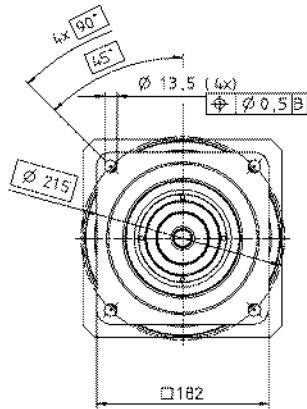
View A

View B

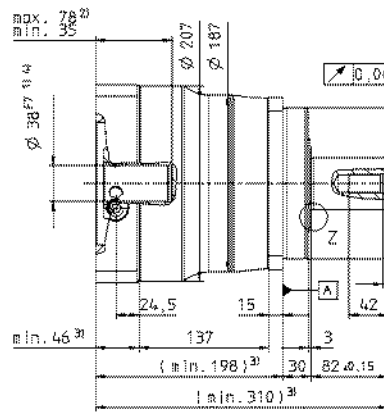
Motor shaft diameter [mm]

up to 38 ⁴⁾ (K)
clamping hub
diameter

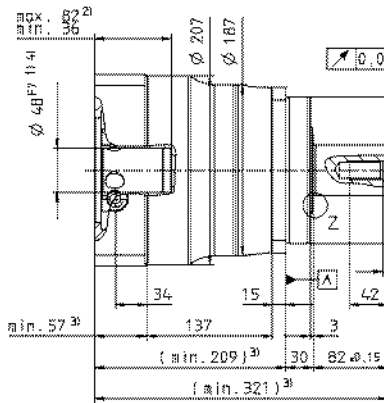
up to 48 ⁴⁾ (M)
clamping hub
diameter



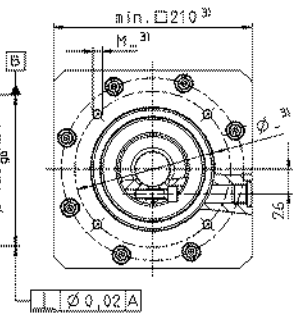
B →



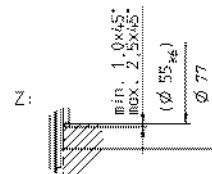
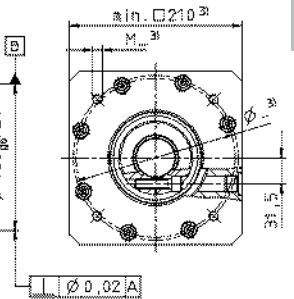
B →



← A



← A



Planetary gearheads
High End

SP+

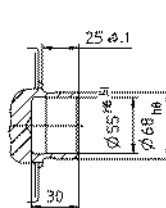
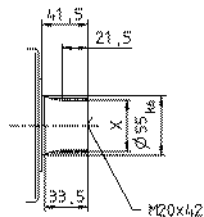
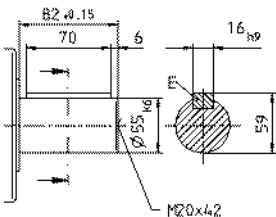
MF

Alternatives: Output shaft variants

Output shaft with key in mm
E = key as per DIN 6885, sheet 1, form A

Involute gearing DIN 5480 in mm
X = W 55 x 2 x 30 x 26 x 6m, DIN 5480

Shaft mounted
Mounted via shrink disc



Non-tolerated dimensions ± 1 mm

- 1) Check motor shaft fit.
- 2) Min./Max. permissible motor shaft length.
Longer motor shafts are adaptable, please contact us.
- 3) The dimensions depend on the motor.
- 4) Smaller motor shaft diameter is compensated by a bushing with a minimum thickness of 1 mm.
- 5) Tolerance h6 for mounted shaft.



CAD data is available under www.wittenstein-alpha.com



Motor mounting according to operating manual

SP+ 180 MF 2-stage

					2-stage								
Ratio ^{a)}		<i>i</i>			16	20	25	28	35	40	50	70	100
cymex®-optimized acceleration torque (please contact us regarding the design)		<i>T</i> _{2Bcym}		Nm	1785	1785	1890	1785	1890	1785	1800	1785	1400
				in.lb	15797	15797	16727	15797	16727	15797	15930	15797	12390
Max. acceleration torque (max. 1000 cycles per hour)		<i>T</i> _{2B}		Nm	1210	1210	1210	1210	1210	1210	1210	1210	970
				in.lb	10709	10709	10709	10709	10709	10709	10709	10709	8585
Nominal output torque (with <i>n</i> _{1N})		<i>T</i> _{2N}		Nm	750	750	750	750	750	750	750	750	750
				in.lb	6638	6638	6638	6638	6638	6638	6637	6638	6638
Emergency stop torque (permitted 1000 times during the service life of the gearhead)		<i>T</i> _{2Not}		Nm	2750	2750	2750	2750	2750	2750	2750	2750	2200
				in.lb	24338	24338	24338	24338	24338	24338	24338	24338	19470
Nominal input speed (with <i>T</i> _{2N} and 20°C ambient temperature) ^{b)}		<i>n</i> _{1N}	rpm		2700	2700	2700	2700	2700	2700	2900	3200	3400
Max. input speed ^{c)}		<i>n</i> _{1Max}	rpm		4500	4500	4500	4500	4500	4000	4500	4500	4500
Mean no load running torque (with <i>n</i> ₁ = 3000 rpm and 20°C gearhead temperature) ^{c)}		<i>T</i> ₀₁₂		Nm	5.3	4.3	3.9	3.1	2.8	2.3	2.1	1.9	1.7
				in.lb	46,9	38,1	34,5	27,4	24,8	20,4	18,6	16,8	15,0
Max. torsional backlash		<i>j</i> _t	arcmin	Standard ≤ 5 / Reduced ≤ 3									
Torsional rigidity		<i>C</i> _{t21}		Nm/ arcmin	175								
				in.lb/ arcmin	1549								
Max. axial force ^{d)}		<i>F</i> _{2AMax}		N	14150								
				lb _f	3184								
Max. radial force ^{d)}		<i>F</i> _{2RMMax}		N	15400								
				lb _f	3465								
Max. tilting moment		<i>M</i> _{2KMMax}		Nm	1600								
				in.lb	14160								
Efficiency at full load		η	%	94									
Service life (For calculation, see the Chapter “Information”)		<i>L</i> _h	h	> 20000									
Weight incl. standard adapter plate		<i>m</i>		kg	36.4								
				lb _m	80.4								
Operating noise (with <i>i</i> =100 and <i>n</i> ₁ = 3000 rpm no load)		<i>L</i> _{PA}	dB(A)	≤ 66									
Max. permitted housing temperature				°C	+90								
				F	194								
Ambient temperature				°C	-15 to +40								
				F	5 to 104								
Lubrication				Lubricated for life									
Paint				Blue RAL 5002									
Direction of rotation				Motor and gearhead same direction									
Protection class				IP 65									
Moment of inertia (relates to the drive)	G	24	<i>J</i> _I	kgcm ²	9.27	7.72	7.48	6.32	6.20	5.51	5.45	5.39	5.36
				10 ⁻³ in.lb.s ²	8.20	6.83	6.62	5.59	5.49	4.88	4.82	4.77	4.74
Clamping hub diameter [mm]	I	32	<i>J</i> _I	kgcm ²	12.4	10.9	10.6	9.48	9.36	8.67	8.61	8.55	8.52
				10 ⁻³ in.lb.s ²	11.0	9.63	9.42	8.39	8.28	7.67	7.62	7.57	7.54
	K	38	<i>J</i> _I	kgcm ²	13.5	12.0	11.7	10.6	10.4	9.74	9.68	9.63	9.60
				10 ⁻³ in.lb.s ²	12.0	10.6	10.4	9.34	9.23	8.62	8.57	8.52	8.49
	M	48	<i>J</i> _I	kgcm ²	28.1	26.6	26.3	25.2	25.1	24.4	24.3	24.3	24.3
				10 ⁻³ in.lb.s ²	24.9	23.5	23.3	22.3	22.2	21.6	21.5	21.5	21.5

Reduced mass moments of inertia available on request.

^{a)} Other ratios available on request

^{b)} For higher ambient temperatures, please reduce input speed

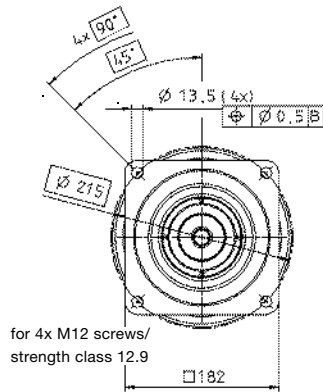
^{c)} Valid for clamping hub diameter of 38 mm

^{d)} Refers to center of the output shaft or flange

View A

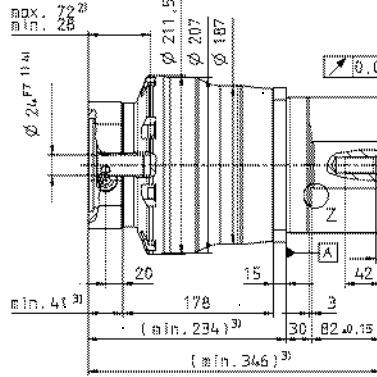
View B

up to 24 ⁴⁾ (G)
clamping hub diameter

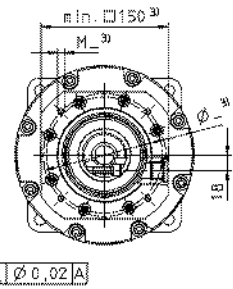


B →

← A

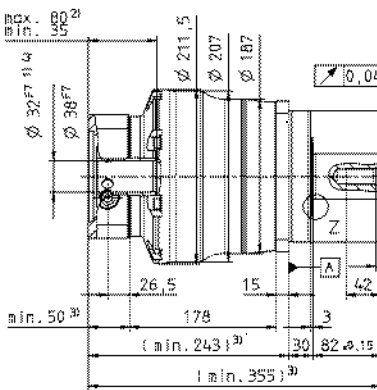


Thread

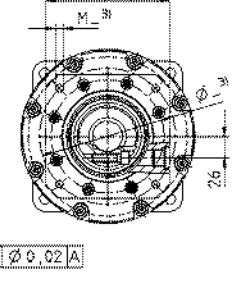


B →

← A

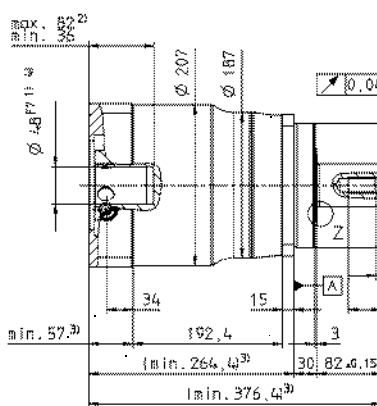


Thread

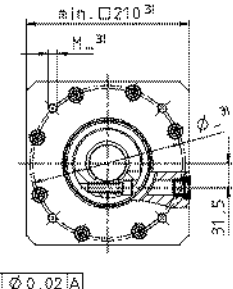


B →

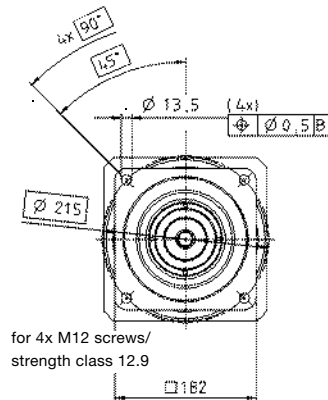
← A



Thread



up to 48 ⁴⁾ (M)
clamping hub diameter

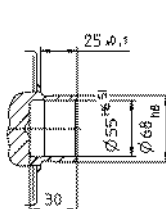
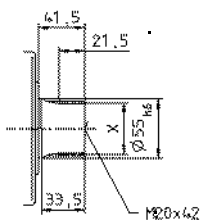
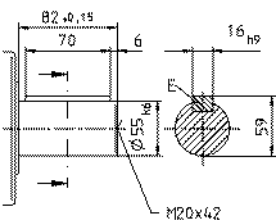


Alternatives: Output shaft variants

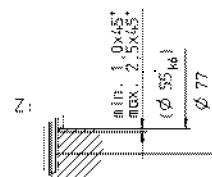
Output shaft with key in mm
E = key as per DIN 6885, sheet 1, form A

Involute gearing DIN 5480 in mm
X = W 55 x 2 x 30 x 26 x 6m, DIN 5480

Shaft mounted
Mounted via shrink disc



Z: Detail



Connecting part

Non-tolerated dimensions ± 1 mm

- 1) Check motor shaft fit.
- 2) Min./Max. permissible motor shaft length.
Longer motor shafts are adaptable, please contact us.
- 3) The dimensions depend on the motor.
- 4) Smaller motor shaft diameter is compensated by a bushing with a minimum thickness of 1 mm.
- 5) Tolerance h6 for mounted shaft.



CAD data is available under www.wittenstein-alpha.com



Motor mounting according to operating manual

Planetary gearheads
High End

SP+

MF

SP+ 210 MF 1/2-stage

				1-stage					2-stage										
Ratio ^{a)}			<i>i</i>		3	4	5	7	10	16	20	25	28	35	40	50	70	100	
cymex®-optimized acceleration torque (please contact us regarding the design)			<i>T</i> _{2Bcym}	Nm	- Please contact us -														
				in.lb															
Max. acceleration torque (max. 1000 cycles per hour)			<i>T</i> _{2B}	Nm	1600	2500	2500	2400	1900	2400	2500	2500	2400	2400	2400	2400	2400	1900	
				in.lb	14160	22125	22125	21240	16815	21240	22125	22125	21240	21240	21240	21240	21240	16815	
Nominal output torque (with <i>n</i> _{1N})			<i>T</i> _{2N}	Nm	1100	1500	1500	1400	1000	1500	1500	1500	1500	1500	1500	1500	1400	1000	
				in.lb	9735	13275	13275	12390	8850	13275	13275	13275	13275	13275	13275	13275	12390	8850	
Emergency stop torque (permitted 1000 times during the service life of the gearhead)			<i>T</i> _{2Not}	Nm	5000	5200	5200	5200	5000	5200	5200	5200	5200	5200	5200	5200	5200	5000	
				in.lb	44250	46020	46020	46020	44250	46020	46020	46020	46020	46020	46020	46020	46020	44250	
Nominal input speed (with <i>T</i> _{2N} and 20°C ambient temperature) ^{b)}			<i>n</i> _{1N}	rpm	1200	1200	1500	1700	2000	2500	2500	2500	2500	2500	2500	2500	3000	3000	
Max. input speed			<i>n</i> _{1Max}	rpm	2500	2500	2500	2500	2500	3500	3500	3500	3500	3500	3500	3500	3500	3500	
Mean no load running torque (with <i>n</i> ₁ = 2000 rpm and 20°C gearhead temperature)			<i>T</i> ₀₁₂	Nm	32	22	17	11	7,0	7,0	6,0	5,5	4,5	4,0	3,5	3,5	3,5	3,0	
				in.lb	283	195	151	97	62	62	53	49	40	35	31	31	31	27	
Max. torsional backlash			<i>j</i> _t	arcmin	Standard ≤ 3 / Reduced ≤ 1					Standard ≤ 5 / Reduced ≤ 3									
Torsional rigidity			<i>C</i> _{t21}	Nm/ arcmin	400					400									
				in.lb/ arcmin	3540					3540									
Max. axial force ^{c)}			<i>F</i> _{2AMax}	N	30000					30000									
				lb _f	6750					6750									
Max. radial force ^{c)}			<i>F</i> _{2RMax}	N	21000					21000									
				lb _f	4725					4725									
Max. tilting moment			<i>M</i> _{2KMax}	Nm	3100					3100									
				in.lb	27435					2744									
Efficiency at full load			η	%	97					94									
Service life (For calculation, see the Chapter "Information")			<i>L</i> _h	h	> 20000					> 20000									
Weight incl. standard adapter plate			<i>m</i>	kg	56					53									
				lb _m	124					117									
Operating noise (with <i>i</i> =10 and <i>n</i> ₁ = 2000 rpm no load)			<i>L</i> _{PA}	dB(A)	≤ 64														
Max. permitted housing temperature			°C		+90														
			F		194														
Ambient temperature			°C		-15 to +40														
			F		5 to 104														
Lubrication					Lubricated for life														
Paint					Blue RAL 5002														
Direction of rotation					Motor and gearhead same direction														
Protection class					IP 65														
Moment of inertia (relates to the drive)		M	48	<i>J</i> ₁	kgcm ²	-	-	-	-	-	34.5	31.5	30.8	30.0	29.7	28.5	28.3	28.1	28.0
					10 ⁻³ in.lb.s ²	-	-	-	-	-	30.5	27.9	27.3	26.6	26.3	25.2	25.0	24.9	24.8
Clamping hub diameter (mm)		N	55	<i>J</i> ₁	kgcm ²	139.0	94.3	76.9	61.5	53.1	-	-	-	-	-	-	-	-	-
					10 ⁻³ in.lb.s ²	118.2	80.2	65.4	52.3	45.1	-	-	-	-	-	-	-	-	-

Reduced mass moments of inertia available on request.

^{a)} Other ratios available on request

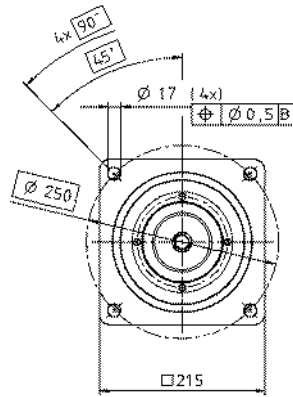
^{b)} For higher ambient temperatures, please reduce input speed

^{c)} Refers to center of the output shaft or flange

View A

View B

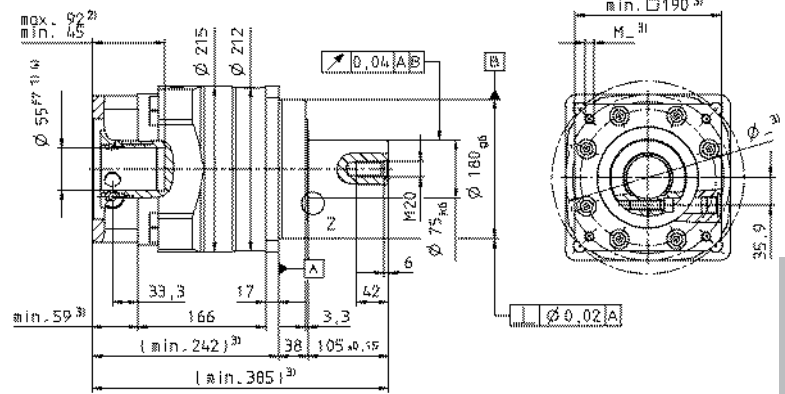
1-stage:



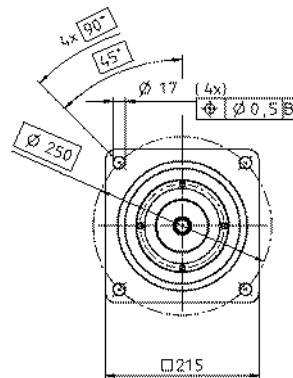
up to 55⁴⁾ (N)
clamping hub
diameter

B →

← A



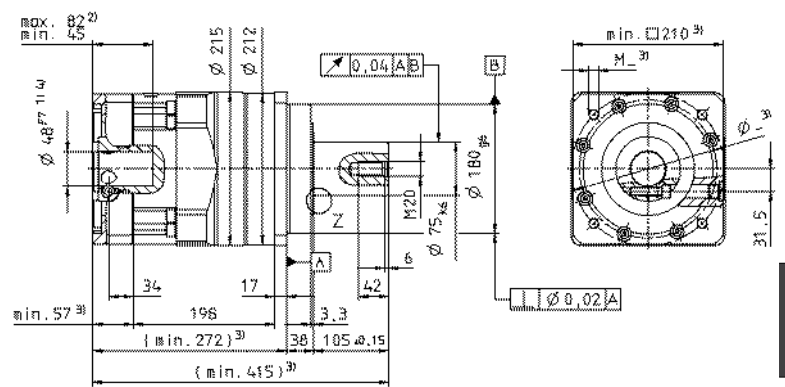
2-stage:



up to 48⁴⁾ (M)
clamping hub
diameter

B →

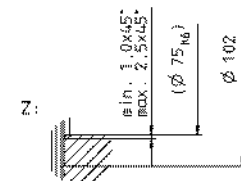
← A



Planetary gearheads
High End

SP+

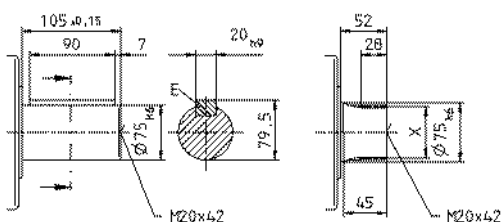
MF



Alternatives: Output shaft variants

Output shaft with key in mm
E = key as per DIN 6885, sheet 1, form A

Involute gearing DIN 5480 in mm
X = W 70 x 2 x 30 x 34 x 6 mm, DIN 5480



Non-tolerated dimensions ± 1.5 mm

- 1) Check motor shaft fit.
- 2) Min./Max. permissible motor shaft length.
Longer motor shafts are adaptable, please contact us.
- 3) The dimensions depend on the motor.
- 4) Smaller motor shaft diameter is compensated by a bushing with a minimum thickness of 1 mm.

CAD data is available under www.wittenstein-alpha.com

Motor mounting according to operating manual

SP+ 240 MF 1/2-stage

				1-stage						2-stage									
Ratio ^{a)}			<i>i</i>		3	4	5	7	10	16	20	25	28	35	40	50	70	100	
cymex®-optimized acceleration torque (please contact us regarding the design)			<i>T</i> _{2Bcym}	Nm	- Please contact us -														
				in.lb															
Max. acceleration torque (max. 1000 cycles per hour)			<i>T</i> _{2B}	Nm	2750	4500	4500	4300	3400	4500	4500	4500	4500	4500	4000	4300	4300	3400	
				in.lb	24338	39825	39825	38055	30090	39825	39825	39825	39825	39825	35400	38055	38055	30090	
Nominal output torque (with <i>n</i> _{IN})			<i>T</i> _{2N}	Nm	1500	2500	2500	2300	1700	2500	2500	2500	2500	2500	2500	2300	1700		
				in.lb	13275	22125	22125	20355	15045	22125	22125	22125	22125	22125	22125	22125	20355	15045	
Emergency stop torque (permitted 1000 times during the service life of the gearhead)			<i>T</i> _{2Not}	Nm	6800	8500	8500	8500	6800	8500	8500	8500	8500	8500	8500	8500	6800		
				in.lb	60180	75225	75225	75225	60180	75225	75225	75225	75225	75225	75225	75225	75225	60180	
Nominal input speed (with <i>T</i> _{2N} and 20°C ambient temperature) ^{b)}			<i>n</i> _{1N}	rpm	1000	1000	1200	1500	1700	2300	2500	2500	2500	2500	2500	2800	2800		
Max. input speed			<i>n</i> _{1Max}	rpm	2500	2500	2500	2500	2500	3500	3500	3500	3500	3500	3500	3500	3500		
Mean no load running torque (with <i>n</i> ₁ =2000 rpm and 20°C gearhead temperature)			<i>T</i> ₀₁₂	Nm	45	35	26	16	11	11	9,0	8,0	7,0	6,0	5,0	4,5	4,0	4,0	
				in.lb	398	310	230	142	97	97	80	71	62	53	44	40	35	35	
Max. torsional backlash			<i>j</i> _t	arcmin	Standard ≤ 3 / Reduced ≤ 1						Standard ≤ 5 / Reduced ≤ 3								
Torsional rigidity			<i>C</i> _{t21}	Nm/ arcmin	550						550								
				in.lb/ arcmin	4868						4868								
Max. axial force ^{c)}			<i>F</i> _{2AMax}	N	33000						33000								
				lb _f	7425						7425								
Max. radial force ^{c)}			<i>F</i> _{2RMax}	N	30000						30000								
				lb _f	6750						6750								
Max. tilting moment			<i>M</i> _{2KMax}	Nm	5000						5000								
				in.lb	44250						44250								
Efficiency at full load			η	%	97						94								
Service life (For calculation, see the Chapter "Information")			<i>L</i> _h	h	> 20000						> 20000								
Weight incl. standard adapter plate			<i>m</i>	kg	77						76								
				lb _m	170						168								
Operating noise (with <i>i</i> =10 and <i>n</i> ₁ =2000 rpm no load)			<i>L</i> _{PA}	dB(A)	≤ 66														
Max. permitted housing temperature				°C	+90														
				F	194														
Ambient temperature				°C	-15 to +40														
				F	5 to 104														
Lubrication				Lubricated for life															
Paint				Blue RAL 5002															
Direction of rotation				Motor and gearhead same direction															
Protection class				IP 65															
Moment of inertia (relates to the drive)		M	48	<i>J</i> ₁	kgcm ²	-	-	-	-	-	39.2	34.6	33.2	30.5	29.7	28.2	27.9	27.6	27.5
					10 ⁻³ in.lb.s ²	-	-	-	-	-	34.7	30.6	29.4	27.0	26.3	25.0	24.7	24.4	24.3
Clamping hub diameter [mm]		O	60	<i>J</i> ₁	kgcm ²	260.2	198.2	163.0	138,3	124,7	-	-	-	-	-	-	-	-	-
					10 ⁻³ in.lb.s ²	230.3	175.4	144.3	122,4	110,4	-	-	-	-	-	-	-	-	-

Reduced mass moments of inertia available on request.

^{a)} Other ratios available on request

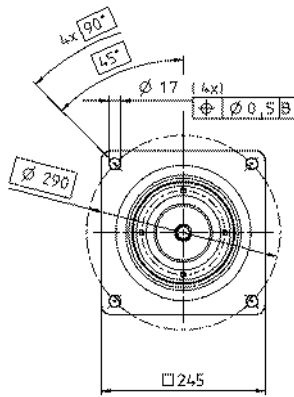
^{b)} For higher ambient temperatures, please reduce input speed

^{c)} Refers to center of the output shaft or flange

View A

View B

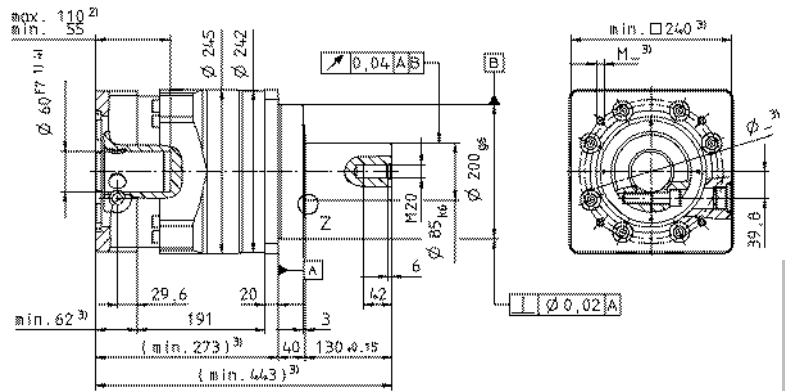
1-stage:



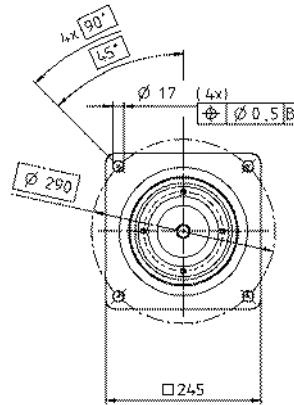
up to 60⁴⁾ (O)
clamping hub
diameter

B →

← A



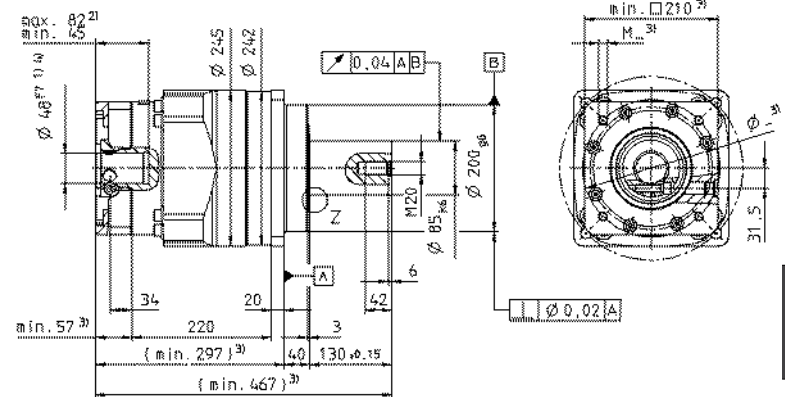
2-stage:



up to 48⁴⁾ (M)
clamping hub
diameter

B →

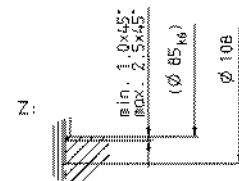
← A



Planetary gearheads
High End

SP+

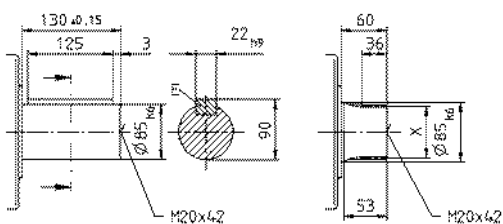
MF



Alternatives: Output shaft variants

Output shaft with key in mm
E = key as per DIN 6885, sheet 1, form A

Involute gearing DIN 5480 in mm
X = W 80 x 2 x 30 x 38 x 6m, DIN 5480



Non-tolerated dimensions ± 1.5 mm

- 1) Check motor shaft fit.
- 2) Min./Max. permissible motor shaft length.
Longer motor shafts are adaptable, please contact us.
- 3) The dimensions depend on the motor.
- 4) Smaller motor shaft diameter is compensated by a bushing with a minimum thickness of 1 mm.

CAD data is available under www.wittenstein-alpha.com

Motor mounting according to operating manual

SP+ 075 MC HIGH SPEED 1-stage

					1-stage				
Ratio ^{a)}			<i>i</i>		3	4	5	7	10
Max. acceleration torque (max. 1000 cycles per hour)	T_{2B}			Nm	68	90	90	90	70
				in.lb	602	797	797	797	620
cymex®-optimized nominal torque (please contact us regarding the design)	T_{2Ncym}			Nm	–	60	60	60	35
				in.lb	–	531	531	531	310
Nominal output torque (with n_{2N})	T_{2N}			Nm	28	48	48	48	30
				in.lb	248	425	425	425	266
Emergency stop torque (permitted 1000 times during the service life of the gearhead)	T_{2Not}			Nm	200	250	250	250	200
				in.lb	1770	2213	2213	2213	1770
Nominal input speed (with T_{2N} and 20°C ambient temperature) ^{b)}	n_{1N}			rpm	4500	4500	4500	4500	4500
Max. input speed	n_{1Max}			rpm	6000	6000	6000	6000	6000
Mean no load running torque (with $n_1=2000$ rpm and 20°C gearhead temperature) ^{c)}	T_{012}			Nm	1.4	1.1	0.9	0.6	0.5
				in.lb	12.4	9.7	8.0	5.3	4.4
Max. torsional backlash	j_t			arcmin	Standard ≤ 6 / Reduced ≤ 4				
Torsional rigidity	C_{t21}			Nm/ arcmin	10				
				in.lb/ arcmin	89				
Max. axial force ^{d)}	F_{2AMax}			N	3350				
				lb _f	754				
Max. radial force ^{d)}	F_{2RMax}			N	4200				
				lb _f	945				
Max. tilting moment	M_{2KMax}			Nm	236				
				in.lb	2089				
Efficiency at full load	η			%	98.5				
Service life (For calculation, see the Chapter "Information")	L_h			h	> 30000				
Weight incl. standard adapter plate	m			kg	3.9				
				lb _m	8.6				
Operating noise (with $i=10$ and $n_1=3000$ rpm no load)	L_{PA}			dB(A)	≤ 59				
Max. permitted housing temperature				°C	+90				
				F	194				
Ambient temperature				°C	-15 to +40				
				F	5 to 104				
Lubrication					Lubricated for life				
Paint					Blue RAL 5002				
Direction of rotation					Motor and gearhead same direction				
Protection class					IP 65				
Moment of inertia (relates to the drive)	E	19	J_1	kgcm ²	1.03	0.78	0.68	0.59	0.54
				10 ⁻³ in.lb.s ²	0.91	0.69	0.60	0.52	0.48
Clamping hub diameter [mm]	G	24	J_1	kgcm ²	2.40	2.15	2.05	1.96	1.91
				10 ⁻³ in.lb.s ²	2.12	1.90	1.81	1.73	1.69

Reduced mass moments of inertia available on request.

^{a)} Other ratios available on request

^{b)} For higher ambient temperatures, please reduce input speed

^{c)} Valid for clamping hub diameter of 19 mm

^{d)} Refers to centre of the output shaft or flange

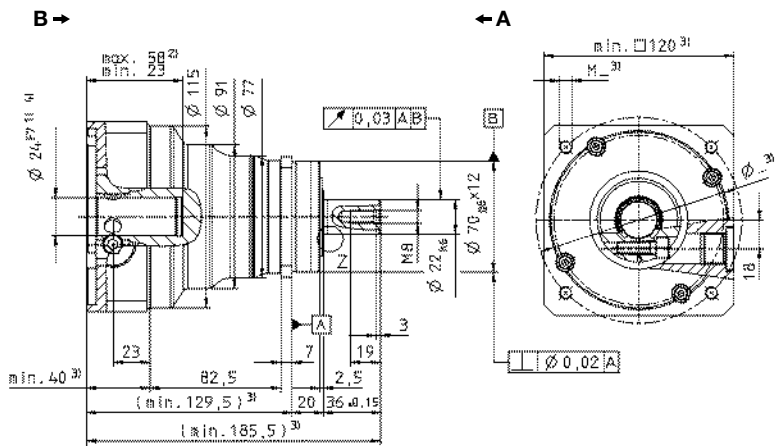
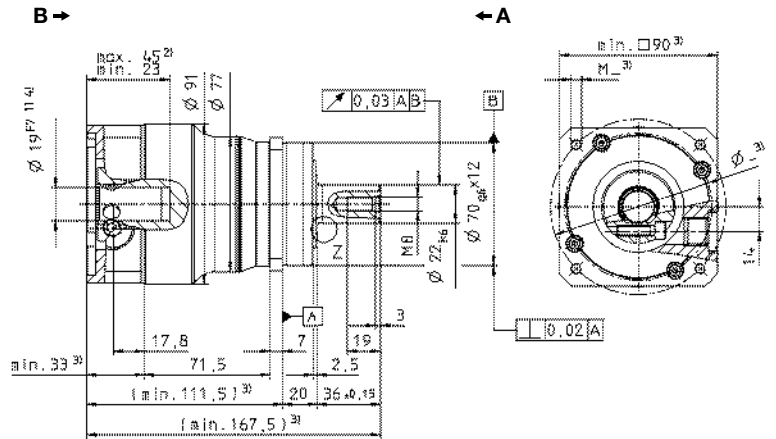
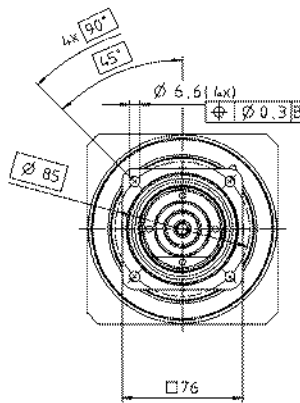
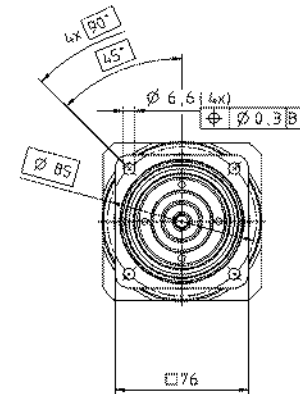
View A

View B

Motor shaft diameter [mm]

up to 19⁴⁾ (E)
clamping hub diameter

up to 24⁴⁾ (G)
clamping hub diameter



Planetary gearheads
High End

SP+

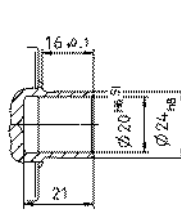
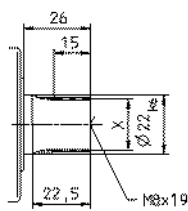
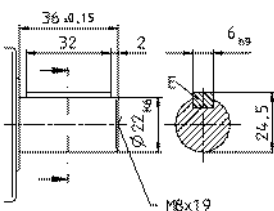
MC

Alternatives: Output shaft variants

Output shaft with key in mm
E = key as per DIN 6885, sheet 1, form A

Involute gearing DIN 5480 in mm
X = W 22 x 1.25 x 30 x 16 x 6m, DIN 5480

Shaft mounted
Mounted via shrink disc



Non-tolerated dimensions ± 1 mm

- 1) Check motor shaft fit.
- 2) Min./Max. permissible motor shaft length.
Longer motor shafts are adaptable, please contact us.
- 3) The dimensions depend on the motor.
- 4) Smaller motor shaft diameter is compensated by a bushing with a minimum thickness of 1 mm.
- 5) Tolerance h6 for mounted shaft.



CAD data is available under www.wittenstein-alpha.com



Motor mounting according to operating manual

SP+ 075 MC HIGH SPEED 2-stage

					2-stage								
Ratio ^{a)}		<i>i</i>			16	20	25	28	35	40	50	70	100
Max. acceleration torque (max. 1000 cycles per hour)		<i>T</i> _{2B}		Nm	90	90	90	90	90	90	90	90	70
				in.lb	797	797	797	797	797	797	797	797	620
cymex®-optimized nominal torque (please contact us regarding the design)		<i>T</i> _{2Ncym}		Nm	–	–	–	–	–	60	–	–	35
				in.lb						531			310
Nominal output torque (with <i>n</i> _{2N})		<i>T</i> _{2N}		Nm	60	60	60	60	60	55	60	60	30
				in.lb	531	531	531	531	531	487	531	531	266
Emergency stop torque (permitted 1000 times during the service life of the gearhead)		<i>T</i> _{2Not}		Nm	250	250	250	250	250	250	250	250	200
				in.lb	2213	2213	2213	2213	2213	2213	2213	2213	1770
Nominal input speed (with <i>T</i> _{2N} and 20°C ambient temperature) ^{b)}		<i>n</i> _{1N}	rpm		4500	4500	4500	4500	4500	4500	4500	4500	4500
Max. input speed		<i>n</i> _{1Max}	rpm		6000	6000	6000	6000	6000	6000	6000	6000	6000
Mean no load running torque (with <i>n</i> ₁ =2000 rpm and 20°C gearhead temperature) ^{c)}		<i>T</i> ₀₁₂		Nm	0.5	0.4	0.4	0.3	0.3	0.2	0.2	0.2	0.2
				in.lb	4.4	3.5	3.5	2.7	2.7	1.8	1.8	1.8	1.8
Max. torsional backlash		<i>j</i> _t	arcmin		Standard ≤ 8 / Reduced ≤ 6								
Torsional rigidity		<i>C</i> _{t21}		Nm/ arcmin	10								
				in.lb/ arcmin	89								
Max. axial force ^{d)}		<i>F</i> _{2AMax}		N	3350								
				lb _f	754								
Max. radial force ^{d)}		<i>F</i> _{2RMMax}		N	4200								
				lb _f	945								
Max. tilting moment		<i>M</i> _{2KMMax}		Nm	236								
				in.lb	2089								
Efficiency at full load		η	%		96,5								
Service life (For calculation, see the Chapter "Information")		<i>L</i> _h	h		> 30000								
Weight incl. standard adapter plate		<i>m</i>		kg	3,6								
				lb _m	8.0								
Operating noise (with <i>i</i> =100 and <i>n</i> ₁ =3000 rpm no load)		<i>L</i> _{PA}	dB(A)		≤ 59								
Max. permitted housing temperature				°C	+90								
				F	194								
Ambient temperature				°C	-15 to +40								
				F	5 to 104								
Lubrication				Lubricated for life									
Paint				Blue RAL 5002									
Direction of rotation				Motor and gearhead same direction									
Protection class				IP 65									
Moment of inertia (relates to the drive)	C	14	<i>J</i> ₁	kgcm ²	0.23	0.20	0.20	0.18	0.18	0.16	0.16	0.16	0.16
				10 ⁻³ in.lb.s ²	0.20	0.18	0.18	0.16	0.16	0.15	0.15	0.14	0.14
Clamping hub diameter [mm]	E	19	<i>J</i> ₁	kgcm ²	0.55	0.53	0.52	0.50	0.50	0.49	0.49	0.49	0.49
				10 ⁻³ in.lb.s ²	0.49	0.47	0.46	0.45	0.44	0.43	0.43	0.43	0.43

Reduced mass moments of inertia available on request.

^{a)} Other ratios available on request

^{b)} For higher ambient temperatures, please reduce input speed

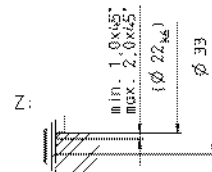
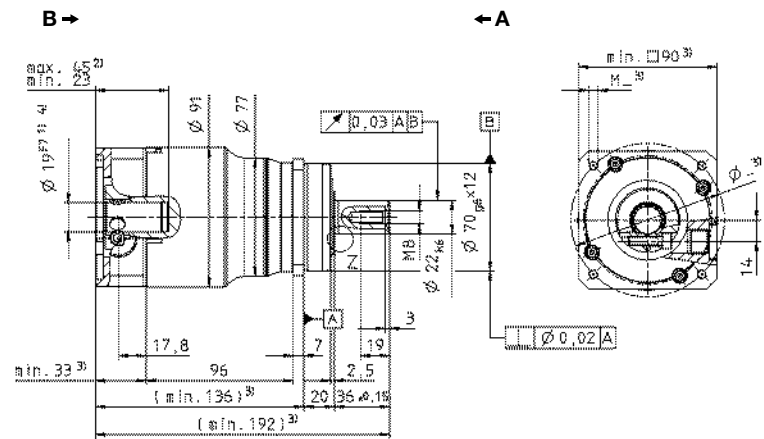
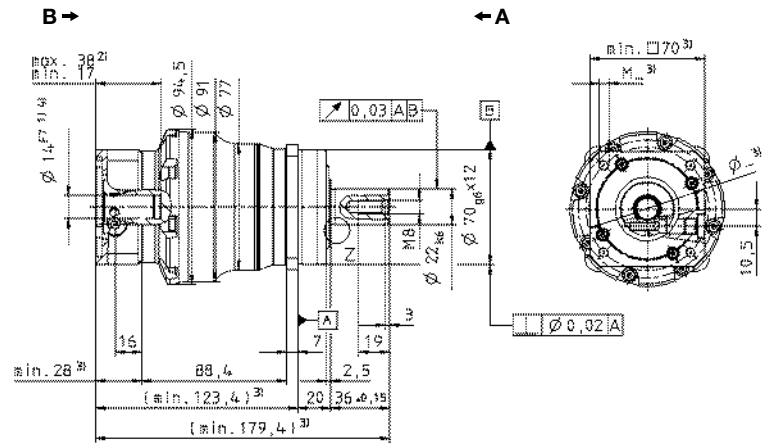
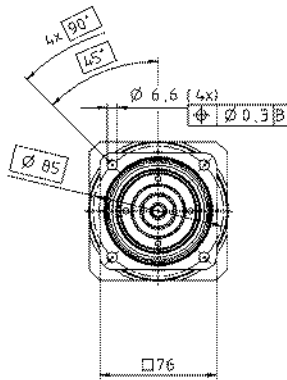
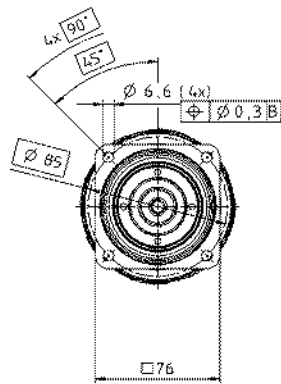
^{c)} Valid for clamping hub diameter of 14 mm

^{d)} Refers to centre of the output shaft or flange

Motor shaft diameter [mm]

up to 14⁴⁾ (C)
clamping hub
diameter

up to 19 ⁴⁾ (E)
clamping hub
diameter



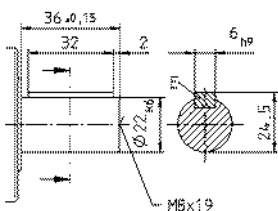
Planetary gearheads High End

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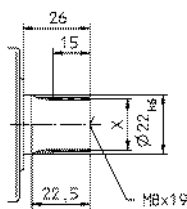
MC

Alternatives: Output shaft variants

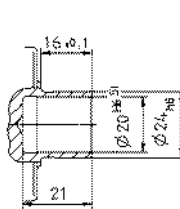
Output shaft with key in mm
E = key as per DIN 6885, sheet 1, form A



Involute gearing DIN 5480 in mm
X = W 22 x 1.25 x 30 x 16 x 6m, DIN 5480



Shaft mounted
Mounted via shrink disc



Non-tolerated dimensions ± 1 mm

- 1) Check motor shaft fit.
- 2) Min./Max. permissible motor shaft length.
Longer motor shafts are adaptable, please contact us.
- 3) The dimensions depend on the motor.
- 4) Smaller motor shaft diameter is compensated by a bushing with a minimum thickness of 1 mm.
- 5) Tolerance h6 for mounted shaft.



 CAD data is available under www.wittenstein-alpha.com



Motor mounting according to operating manual

SP+ 100 MC HIGH SPEED 1-stage

				Standard version MC					Friction optimized version L					
Ratio ^{a)}			<i>i</i>		3	4	5	7	10	3	4	5	7	10
Max. acceleration torque (max. 1000 cycles per hour)			<i>T</i> _{2B}	Nm	180	240	240	240	180	180	240	240	240	180
				in.lb	1593	2124	2124	2124	1593	1593	2124	2124	2124	1593
cymex®-optimized nominal torque (please contact us regarding the design)			<i>T</i> _{2Ncym}	Nm	95	135	135	135	90	95	135	135	135	90
				in.lb	841	1195	1195	1195	797	841	1195	1195	1195	797
Nominal output torque (with <i>n</i> _N)			<i>T</i> _{2N}	Nm	70	100	105	105	80	70	100	105	105	80
				in.lb	620	885	929	929	708	620	885	929	929	708
Emergency stop torque (permitted 1000 times during the service life of the gearhead)			<i>T</i> _{2Not}	Nm	500	625	625	625	500	500	625	625	625	500
				in.lb	4425	5531	5531	5531	4425	4425	5531	5531	5531	4425
Nominal input speed (with <i>T</i> _{2N} and 20°C ambient temperature) ^{b)}			<i>n</i> _{1N}	rpm	3500	4000	4500	4500	4500	3500	4000	4500	4500	4500
cymex® optimized speed (please contact us regarding the design)			<i>n</i> _{1Ncym}	rpm	–	–	–	–	–	4500	5000	5000	5000	5000
Max. input speed			<i>n</i> _{1Max}	rpm	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000
Mean no load running torque (with <i>n</i> ₁ = 2000 rpm and 20°C gearhead temperature) ^{c)}			<i>T</i> ₀₁₂	Nm	2.4	2.1	1.8	1.1	0.8	0.7	–	–	–	–
				in.lb	21.2	18.6	15.9	9.74	7.08	6.2	–	–	–	–
Max. torsional backlash			<i>j</i> _t	arcmin	Standard ≤ 4 / Reduced ≤ 2									
Torsional rigidity			<i>C</i> _{t21}	Nm/ arcmin	31									
				in.lb/ arcmin	274									
Max. axial force ^{d)}			<i>F</i> _{2AMax}	N	5650					–				
				lb _f	1271					–				
Max. radial force ^{d)}			<i>F</i> _{2RMax}	N	6600					1000				
				lb _f	1485					225				
Max. tilting moment			<i>M</i> _{2KMax}	Nm	487					72				
				in.lb	4310					637				
Efficiency at full load			η	%	98.5					99				
Service life (For calculation, see the Chapter "Information")			<i>L</i> _h	h	> 30000									
Weight incl. standard adapter plate			<i>m</i>	kg	7.7									
				lb _m	17.0									
Operating noise (with <i>i</i> =10 and <i>n</i> ₁ = 3000 rpm no load)			<i>L</i> _{PA}	dB(A)	≤ 64									
Max. permitted housing temperature				°C	+90									
				F	194									
Ambient temperature				°C	-15 to +40									
				F	5 to 104									
Lubrication					Lubricated for life									
Paint					Blue RAL 5002									
Direction of rotation					Motor and gearhead same direction									
Protection class					IP 65					IP 52				
Moment of inertia (relates to the drive)	G	24	<i>J</i> ₁	kgcm ²	3.99	3.04	2.61	2.29	2.07	3.99	3.04	2.61	2.29	2.07
				10 ⁻⁴ in.lb.s ²	3.53	2.69	2.31	2.03	1.83	3.53	2.69	2.31	2.03	1.83
Clamping hub diameter [mm]	K	38	<i>J</i> ₁	kgcm ²	11.1	10.1	9.68	9.36	9.14	11.1	10.1	9.68	9.36	9.14
				10 ⁻⁴ in.lb.s ²	9.78	8.95	8.57	8.28	8.09	9.78	8.95	8.57	8.28	8.09

Reduced mass moments of inertia available on request.

^{a)} Other ratios available on request

^{b)} For higher ambient temperatures, please reduce input speed

^{c)} Valid for clamping hub diameter of 24 mm

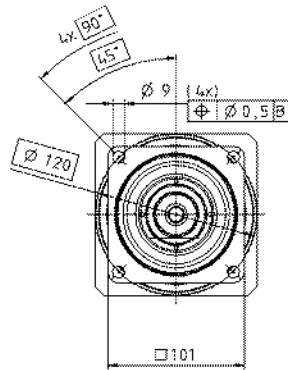
^{d)} Refers to centre of the output shaft or flange

View A

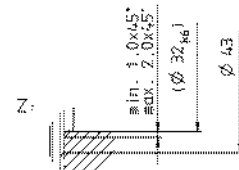
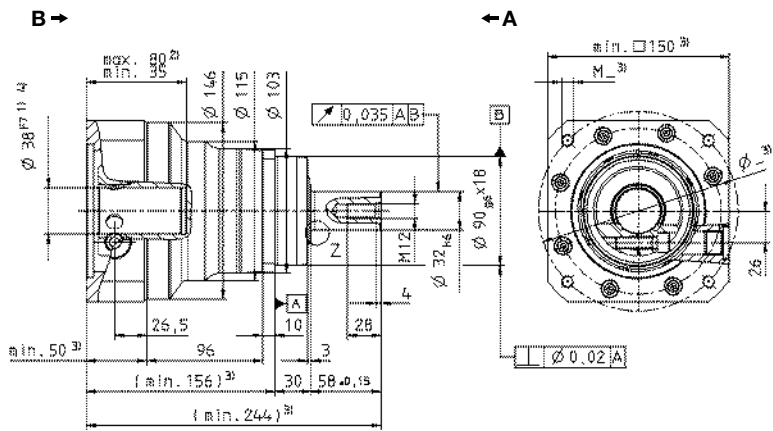
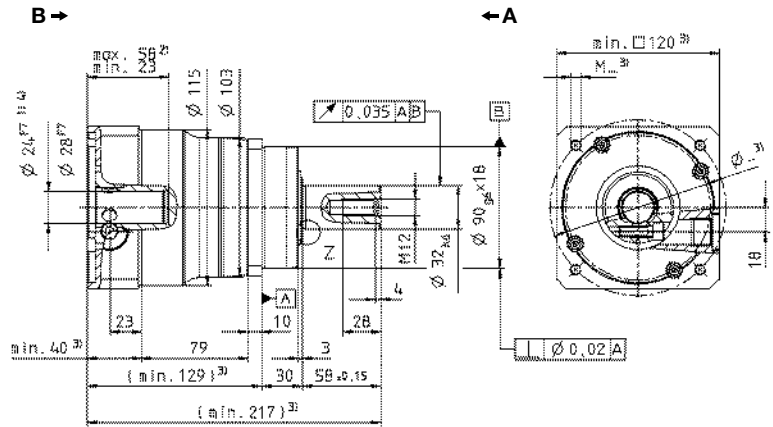
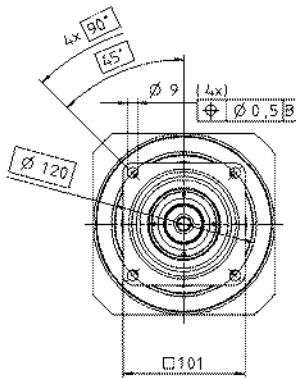
View B

Motor shaft diameter [mm]

up to 24 ⁴⁾(G)
clamping hub
diameter



up to 38 ⁴⁾(K)
clamping hub
diameter



Planetary gearheads
High End

SP+

MC

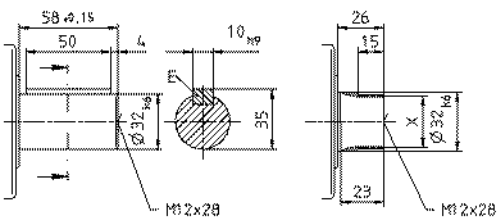
MC-L

Alternatives: Output shaft variants

Output shaft with key in mm
E = key as per DIN 6885, sheet 1, form A

Involute gearing DIN 5480 in mm
X = W 32 x 1.25 x 30 x 24 x 6m, DIN 5480

Shaft mounted
Mounted via shrink disc



Non-tolerated dimensions ± 1 mm

- 1) Check motor shaft fit.
- 2) Min./Max. permissible motor shaft length.
Longer motor shafts are adaptable, please contact us.
- 3) The dimensions depend on the motor.
- 4) Smaller motor shaft diameter is compensated by a bushing with a minimum thickness of 1 mm.
- 5) Tolerance h6 for mounted shaft.

CAD data is available under www.wittenstein-alpha.com

Motor mounting according to operating manual

SP+ 100 MC HIGH SPEED 2-stage

					2-stage										
Ratio ^{a)}			<i>i</i>		16	20	25	28	35	40	50	70	100		
Max. acceleration torque (max. 1000 cycles per hour)			<i>T</i> _{2B}	Nm	240	240	240	240	240	240	240	240	180		
				in.lb	2124	2124	2124	2124	2124	2124	2124	2124	1593		
cymex®-optimized nominal torque (please contact us regarding the design)			<i>T</i> _{2Ncym}	Nm	–	–	–	–	–	–	–	–	90		
				in.lb									797		
Nominal output torque (with <i>n</i>_N)			<i>T</i> _{2N}	Nm	140	140	140	140	140	140	140	135	80		
				in.lb	1239	1239	1239	1239	1239	1239	1239	1195	708		
Emergency stop torque (permitted 1000 times during the service life of the gearhead)			<i>T</i> _{2Not}	Nm	625	625	625	625	625	625	625	625	500		
				in.lb	5531	5531	5531	5531	5531	5531	5531	5531	4425		
Nominal input speed (with <i>T</i>_{2N} and 20°C ambient temperature) ^{b)}			<i>n</i> _{1N}	rpm	4500	4500	4500	4500	4500	4500	4500	4500	4500		
Max. input speed			<i>n</i> _{1Max}	rpm	6000	6000	6000	6000	6000	6000	6000	6000	6000		
Mean no load running torque (with <i>n</i>₁ = 2000 rpm and 20°C gearhead temperature) ^{c)}			<i>T</i> ₀₁₂	Nm	0.8	0.7	0.6	0.5	0.4	0.4	0.3	0.3	0.3		
				in.lb	7.1	6.2	5.3	4.4	3.5	3.5	2.7	2.7	2.7		
Max. torsional backlash			<i>j</i> _t	arcmin	Standard ≤ 6 / Reduced ≤ 4										
Torsional rigidity			<i>C</i> _{t21}	Nm/ arcmin	31										
				in.lb/ arcmin	274										
Max. axial force ^{d)}			<i>F</i> _{2AMax}	N	5650										
				lb _f	1271										
Max. radial force ^{d)}			<i>F</i> _{2RMax}	N	6600										
				lb _f	1485										
Max. tilting moment			<i>M</i> _{2KMax}	Nm	487										
				in.lb	4310										
Efficiency at full load			η	%	96.5										
Service life (For calculation, see the Chapter "Information")			<i>L</i> _h	h	> 30000										
Weight incl. standardadapter plate			<i>m</i>	kg	7.9										
				lb _m	17.5										
Operating noise (with <i>i</i>=100 and <i>n</i>₁=3000 rpm no load)			<i>L</i> _{PA}	dB(A)	≤ 60										
Max. permitted housing temperature				°C	+90										
				F	194										
Ambient temperature				°C	-15 to +40										
				F	5 to 104										
Lubrication					Lubricated for life										
Paint					Blue RAL 5002										
Direction of rotation					Motor and gearhead same direction										
Protection class					IP 65										
Moment of inertia (relates to the drive)			E	19	<i>J</i> ₁	kgcm ²	0.81	0.70	0.69	0.60	0.59	0.55	0.54	0.54	0.54
						10 ⁻³ in.lb.s ²	0.72	0.62	0.61	0.53	0.52	0.48	0.48	0.48	0.47
Clamping hub diameter [mm]			G	24	<i>J</i> ₁	kgcm ²	2.18	2.07	2.05	1.97	1.96	1.92	1.91	1.91	1.91
						10 ⁻³ in.lb.s ²	1.93	1.83	1.82	1.74	1.74	1.70	1.69	1.69	1.69

Reduced mass moments of inertia available on request.

^{a)} Other ratios available on request

^{b)} For higher ambient temperatures, please reduce input speed

^{c)} Valid for clamping hub diameter of 19 mm

^{d)} Refers to centre of the output shaft or flange

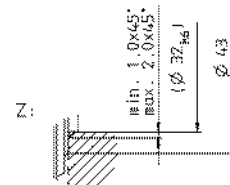
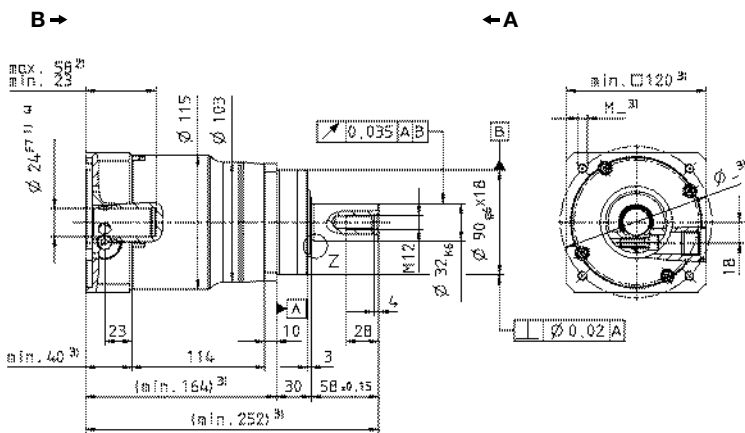
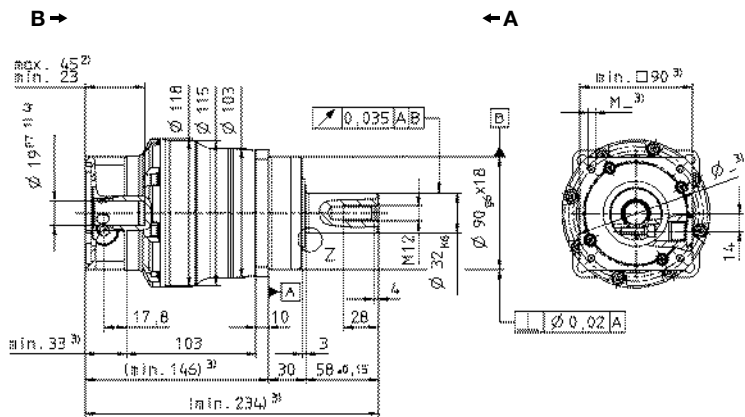
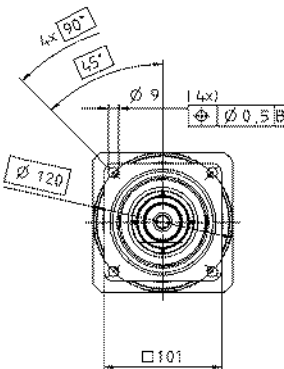
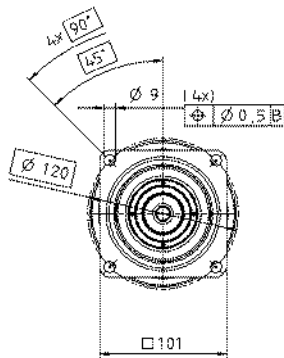
View A

View B

Motor shaft diameter [mm]

up to 19 ⁴⁾ (E)
clamping hub diameter

up to 24 ⁴⁾ (G)
clamping hub diameter

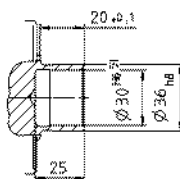
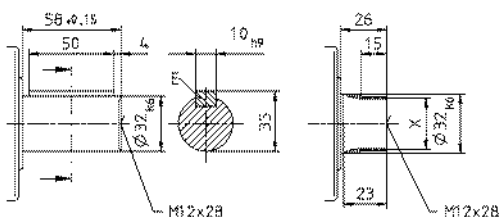


Alternatives: Output shaft variants

Output shaft with key in mm
E = key as per DIN 6885, sheet 1, form A

Involute gearing DIN 5480 in mm
X = W 32 x 1.25 x 30 x 24 x 6m, DIN 5480

Shaft mounted
Mounted via shrink disc



Non-tolerated dimensions ± 1 mm

- 1) Check motor shaft fit.
- 2) Min./Max. permissible motor shaft length.
Longer motor shafts are adaptable, please contact us.
- 3) The dimensions depend on the motor.
- 4) Smaller motor shaft diameter is compensated by a bushing with a minimum thickness of 1 mm.
- 5) Tolerance h6 for mounted shaft.

CAD data is available under www.wittenstein-alpha.com

Motor mounting according to operating manual

Planetary gearheads
High End

SP+

MC

SP+ 140 MC HIGH SPEED 1-stage

				Standard version MC					Friction optimized version L					
Ratio ^{a)}			<i>i</i>		3	4	5	7	10	3	4	5	7	10
Max. acceleration torque (max. 1000 cycles per hour)			<i>T</i> _{2B}	Nm	310	480	480	480	380	310	480	480	480	380
				in.lb	2744	4248	4248	4248	3363	2744	4248	4248	4248	3363
cymex®-optimized nominal torque (please contact us regarding the design)			<i>T</i> _{2Ncym}	Nm	150	240	240	270	180	150	240	240	270	180
				in.lb	1328	2124	2124	2390	1593	2744	4248	4248	4248	3363
Nominal output torque (with <i>n</i>_{in})			<i>T</i> _{2N}	Nm	130	195	205	210	160	130	195	205	210	160
				in.lb	1151	1726	1814	1859	1416	1151	1726	1814	1859	1416
Emergency stop torque (permitted 1000 times during the service life of the gearhead)			<i>T</i> _{2Not}	Nm	1000	1250	1250	1250	1000	1000	1250	1250	1250	1000
				in.lb	8850	11063	11063	11063	8850	8850	11063	11063	11063	8850
Nominal input speed (with <i>T</i>_{2N} and 20°C ambient temperature) ^{b)}			<i>n</i> _{1N}	rpm	3000	3500	4500	4500	4500	3000	3500	4500	4500	4500
cymex® optimized speed (please contact us regarding the design)			<i>n</i> _{1Ncym}	rpm	–	–	–	–	–	4000	4500	5000	5000	5000
Max. input speed			<i>n</i> _{1Max}	rpm	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000
Mean no load running torque (with <i>n</i>₁ = 2000 rpm and 20°C gearhead temperature) ^{c)}			<i>T</i> ₀₁₂	Nm	5.1	3.9	3.1	2.3	1.6	1.0	–	–	–	–
				in.lb	45.1	34.5	27.4	20.4	14.2	8.9	–	–	–	–
Max. torsional backlash			<i>j</i> _t	arcmin	Standard ≤ 4 / Reduced ≤ 2									
Torsional rigidity			<i>C</i> _{t21}	Nm/ arcmin	53									
				in.lb/ arcmin	469									
Max. axial force ^{d)}			<i>F</i> _{2AMax}	N	9870					–				
				lb _f	2221					–				
Max. radial force ^{d)}			<i>F</i> _{2RMax}	N	9900					1200				
				lb _f	2228					270				
Max. tilting moment			<i>M</i> _{2KMax}	Nm	952					110				
				in.lb	8425					974				
Efficiency at full load			η	%	98.5					99				
Service life (For calculation, see the Chapter "Information")			<i>L</i> _h	h	> 30000									
Weight incl. standard adapter plate			<i>m</i>	kg	17.2									
				lb _m	38									
Operating noise (with <i>i</i>=10 and <i>n</i>₁ = 3000 rpm no load)			<i>L</i> _{PA}	dB(A)	≤ 65									
Max. permitted housing temperature				°C	+90									
				F	194									
Ambient temperature				°C	-15 to +40									
				F	5 to 104									
Lubrication					Lubricated for life									
Paint					Blue RAL 5002									
Direction of rotation					Motor and gearhead same direction									
Protection class					IP 65					IP 52				
Moment of inertia (relates to the drive)	K	38	<i>J</i> ₁	kgcm ²	14.9	12.1	11.0	10.1	9.51	14.9	12.1	11.0	10.1	9.51
				10 ⁻³ in.lb.s ²	13.2	10.7	9.8	8.9	8.4	13.2	10.7	9.8	8.9	8.4
Clamping hub diameter [mm]	M	48	<i>J</i> ₁	kgcm ²	29.5	26.7	25.6	24.7	24.2	29.5	26.7	25.6	24.7	24.2
				10 ⁻³ in.lb.s ²	26.1	23.6	22.7	21.9	21.4	26.1	23.6	22.7	21.9	21.4

Reduced mass moments of inertia available on request.

^{a)} Other ratios available on request

^{b)} For higher ambient temperatures, please reduce input speed

^{c)} Valid for clamping hub diameter of 38 mm

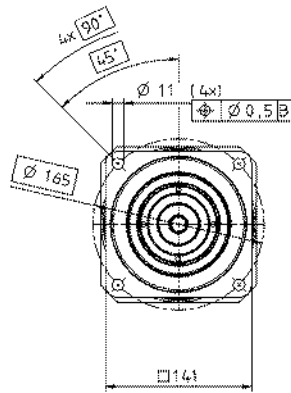
^{d)} Refers to center of the output shaft or flange

View A

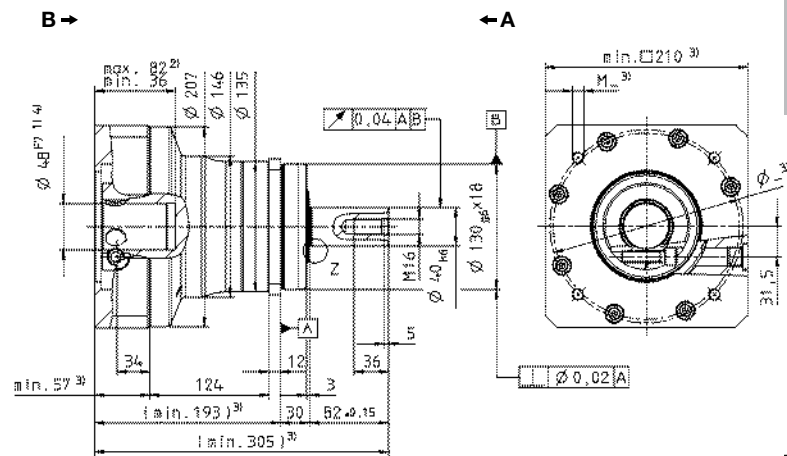
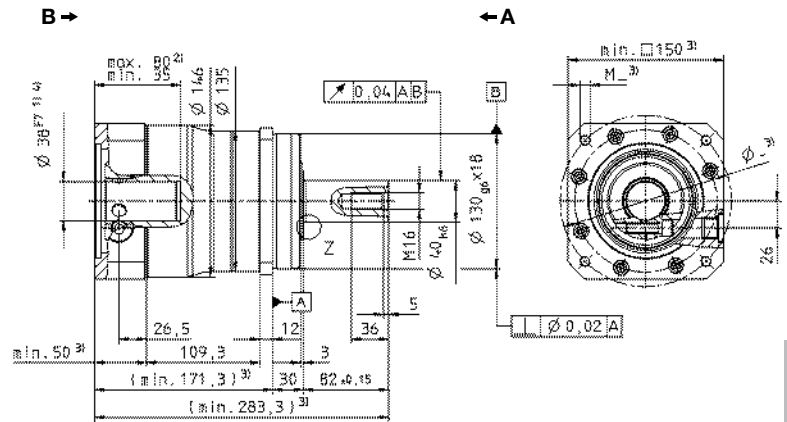
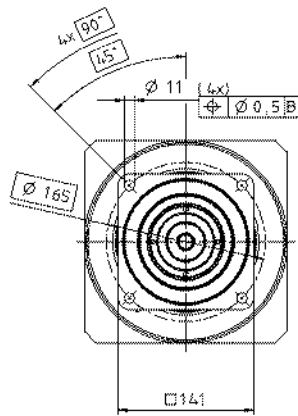
View B

Motor shaft diameter [mm]

up to 38⁴⁾ (K)
clamping hub diameter



up to 48⁴⁾ (M)
clamping hub diameter

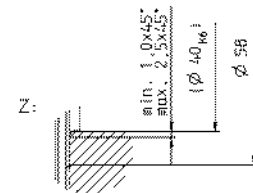


Planetary gearheads
High End

SP+

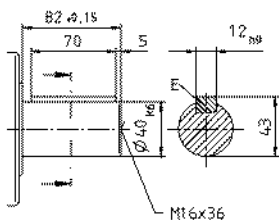
MC

MC-L

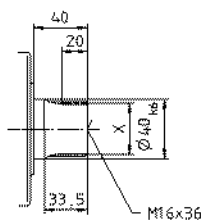


Alternatives: Output shaft variants

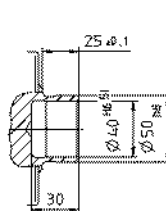
Output shaft with key in mm
E = key as per DIN 6885, sheet 1, form A



Involute gearing DIN 5480 in mm
X = W 40 x 2 x 30 x 18 x 6m, DIN 5480



Shaft mounted
Mounted via shrink disc



Non-tolerated dimensions ± 1 mm

- 1) Check motor shaft fit.
- 2) Min./Max. permissible motor shaft length.
Longer motor shafts are adaptable, please contact us.
- 3) The dimensions depend on the motor.
- 4) Smaller motor shaft diameter is compensated by a bushing with a minimum thickness of 1 mm.
- 5) Tolerance h6 for mounted shaft.



CAD data is available under www.wittenstein-alpha.com



Motor mounting according to operating manual

SP+ 140 MC HIGH SPEED 2-stage

				2-stage									
Ratio ^{a)}		<i>i</i>		16	20	25	28	35	40	50	70	100	
Max. acceleration torque (max. 1000 cycles per hour)		<i>T</i> _{2B}	Nm	480	480	480	480	480	480	480	480	380	
			in.lb	4248	4248	4248	4248	4248	4248	4248	4248	3363	
cymex®-optimized nominal torque (please contact us regarding the design)		<i>T</i> _{2Ncym}	Nm	290	290	290	–	–	–	–	–	–	
			in.lb	2567	2567	2567							
Nominal output torque (with <i>n</i> _{IN})		<i>T</i> _{2N}	Nm	260	280	280	290	290	290	290	260	180	
			in.lb	2301	2478	2478	2567	2567	2567	2567	2301	1593	
Emergency stop torque (permitted 1000 times during the service life of the gearhead)		<i>T</i> _{2Not}	Nm	1250	1250	1250	1250	1250	1250	1250	1250	1000	
			in.lb	11063	11063	11063	11063	11063	11063	11063	11063	8850	
Nominal input speed (with <i>T</i> _{2N} and 20°C ambient temperature) ^{b)}		<i>n</i> _{1N}	rpm	4500	4500	4500	4500	4500	4500	4500	4500	4500	
Max. input speed		<i>n</i> _{1Max}	rpm	6000	6000	6000	6000	6000	6000	6000	6000	6000	
Mean no load running torque (with <i>n</i> ₁ =2000 rpm and 20°C gearhead temperature) ^{c)}		<i>T</i> ₀₁₂	Nm	1.6	1.3	1.2	1.0	0.9	0.7	0.6	0.5	0.5	
			in.lb	14.2	11.5	10.6	8.9	8.0	6.2	5.3	4.4	4.4	
Max. torsional backlash		<i>j</i> _t	arcmin	Standard ≤ 6 / Reduced ≤ 4									
Torsional rigidity		<i>C</i> _{t21}	Nm/ arcmin	53									
			in.lb/ arcmin	469									
Max. axial force ^{d)}		<i>F</i> _{2AMax}	N	9870									
			lb _f	2221									
Max. radial force ^{d)}		<i>F</i> _{2RMax}	N	9900									
			lb _f	2228									
Max. tilting moment		<i>M</i> _{2KMax}	Nm	952									
			in.lb	8425									
Efficiency at full load		η	%	96.5									
Service life (For calculation, see the Chapter "Information")		<i>L</i> _h	h	> 30000									
Weight incl. standard adapter plate		<i>m</i>	kg	17									
			lb _m	38									
Operating noise (with <i>i</i> =100 and <i>n</i> ₁ =3000 rpm no load)		<i>L</i> _{PA}	dB(A)	≤ 63									
Max. permitted housing temperature			°C	+90									
			F	194									
Ambient temperature			°C	-15 to +40									
			F	5 to 104									
Lubrication				Lubricated for life									
Paint				Blue RAL 5002									
Direction of rotation				Motor and gearhead same direction									
Protection class				IP 65									
Moment of inertia (relates to the drive)	G	24	<i>J</i> ₁	kgcm ²	3.19	2.71	2.67	2.34	2.32	2.10	2.08	2.08	2.07
				10 ⁻³ in.lb.s ²	2.82	2.40	2.36	2.07	2.05	1.85	1.85	1.84	1.83
Clamping hub diameter [mm]	K	38	<i>J</i> ₁	kgcm ²	10.3	9.77	9.73	9.41	9.39	9.16	9.15	9.14	9.14
				10 ⁻³ in.lb.s ²	9.07	8.65	8.61	8.33	8.31	8.11	8.10	8.09	8.09

Reduced mass moments of inertia available on request.

^{a)} Other ratios available on request

^{b)} For higher ambient temperatures, please reduce input speed

^{c)} Valid for clamping hub diameter of 24 mm

^{d)} Refers to center of the output shaft or flange

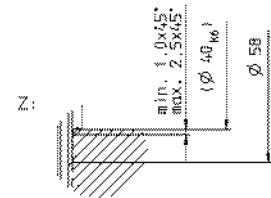
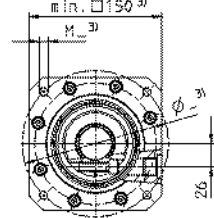
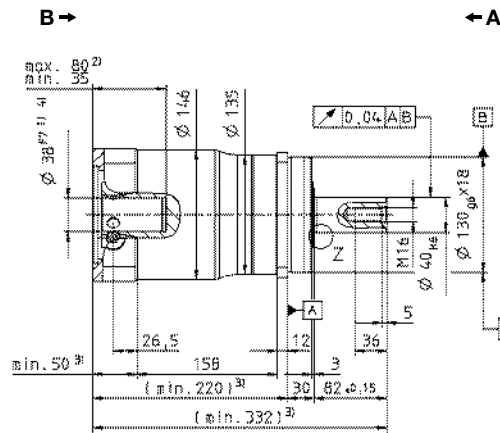
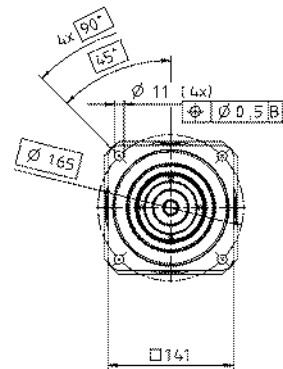
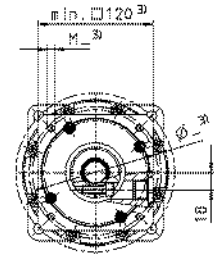
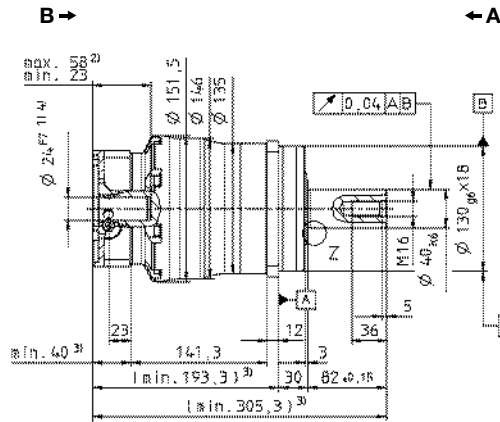
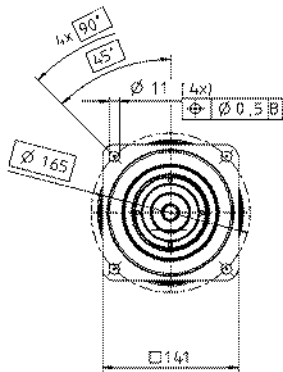
View A

View B

Motor shaft diameter [mm]

up to 24 ⁴⁾ (G)
clamping hub diameter

up to 38 ⁴⁾ (K)
clamping hub diameter



Planetary gearheads
High End

SP+

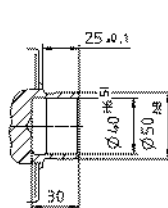
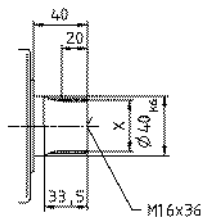
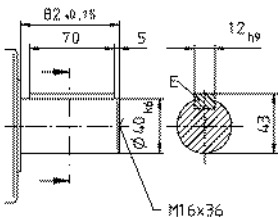
MC

Alternatives: Output shaft variants

Output shaft with key in mm
E = key as per DIN 6885, sheet 1, form A

Involute gearing DIN 5480 in mm
X = W 40 x 2 x 30 x 18 x 6m, DIN 5480

Shaft mounted
Mounted via shrink disc



Non-tolerated dimensions ± 1 mm

- 1) Check motor shaft fit.
- 2) Min./Max. permissible motor shaft length.
Longer motor shafts are adaptable, please contact us.
- 3) The dimensions depend on the motor.
- 4) Smaller motor shaft diameter is compensated by a bushing with a minimum thickness of 1 mm.
- 5) Tolerance h6 for mounted shaft.

CAD data is available under www.wittenstein-alpha.com

Motor mounting according to operating manual

SP+ 180 MC HIGH SPEED 1-stage

				Standard version MC					Friction optimized version L					
Ratio ^{a)}	<i>i</i>			3	4	5	7	10	3	4	5	7	10	
Max. acceleration torque (max. 1000 cycles per hour)	<i>T</i> _{2B}	Nm		700	880	880	880	700	700	880	880	880	700	
		in.lb		6195	7788	7788	7788	6195	6195	7788	7788	7788	6195	
cymex®-optimized nominal torque (please contact us regarding the design)	<i>T</i> _{2Ncym}	Nm		350	600	600	600	540	350	600	600	600	540	
		in.lb		3098	5310	5310	5310	4779	3098	5310	5310	5310	3098	
Nominal output torque (with <i>n</i> _{in})	<i>T</i> _{2N}	Nm		290	450	440	450	400	290	450	450	450	400	
		in.lb		2567	3983	3894	3983	3540	2567	3983	3983	3983	3540	
Emergency stop torque (permitted 1000 times during the service life of the gearhead)	<i>T</i> _{2Not}	Nm		2200	2750	2750	2750	2200	2200	2750	2750	2750	2200	
		in.lb		19470	24338	24338	24338	19470	19470	24338	24338	24338	19470	
Nominal input speed (with <i>T</i> _{2N} and 20°C ambient temperature) ^{b)}	<i>n</i> _{1N}	rpm		3000	3500	4500	4500	4500	3000	3500	4500	4500	4500	
cymex® optimized speed (please contact us regarding the design)	<i>n</i> _{1Ncym}	rpm		–	–	–	–	–	4000	4500	5000	5000	5000	
Max. input speed	<i>n</i> _{1Max}	rpm		4500	6000	6000	6000	6000	4500	6000	6000	6000	6000	
Mean no load running torque (with <i>n</i> _j = 2000 rpm and 20°C gearhead temperature) ^{c)}	<i>T</i> ₀₁₂	Nm		10.2	7.7	6.2	4.5	3.2	3.0	–	–	–	–	
		in.lb		90.3	68.1	54.9	39.8	28.3	26.6	–	–	–	–	
Max. torsional backlash	<i>j</i> _t	arcmin		Standard ≤ 4 / Reduced ≤ 2										
Torsional rigidity	<i>C</i> _{t21}	Nm/ arcmin		175										
		in.lb/ arcmin		1549										
Max. axial force ^{d)}	<i>F</i> _{2AMax}	N		14150					–					
		lb _f		3184					–					
Max. radial force ^{d)}	<i>F</i> _{2RMax}	N		15400					2000					
		lb _f		3465					450					
Max. tilting moment	<i>M</i> _{2KMax}	Nm		1600					208					
		in.lb		14160					1841					
Efficiency at full load	η	%		98.5					99					
Service life (For calculation, see the Chapter “Information”)	<i>L</i> _h	h		> 30000										
Weight incl. standard adapter plate	<i>m</i>	kg		34										
		lb _m		75										
Operating noise (with <i>i</i> =10 and <i>n</i> _j = 3000 rpm no load)	<i>L</i> _{PA}	dB(A)		≤ 66										
Max. permitted housing temperature			°C	+90										
			F	194										
Ambient temperature			°C	-15 to +40										
			F	5 to 104										
Lubrication				Lubricated for life										
Paint				Blue RAL 5002										
Direction of rotation				Motor and gearhead same direction										
Protection class				IP 65					IP 52					
Moment of inertia (relates to the drive)	M	48	<i>J</i> _i	kgcm ²	58.5	41.6	35.6	30.0	26.9	58.5	41.6	35.6	30.0	26.9
Clamping hub diameter [mm]				10 ⁻³ in.lb.s ²	51.8	36.8	31.5	26.6	23.8	51.8	36.8	31.5	26.6	23.8

Reduced mass moments of inertia available on request.

^{a)} Other ratios available on request

^{b)} For higher ambient temperatures, please reduce input speed

^{c)} Valid for clamping hub diameter of 48 mm

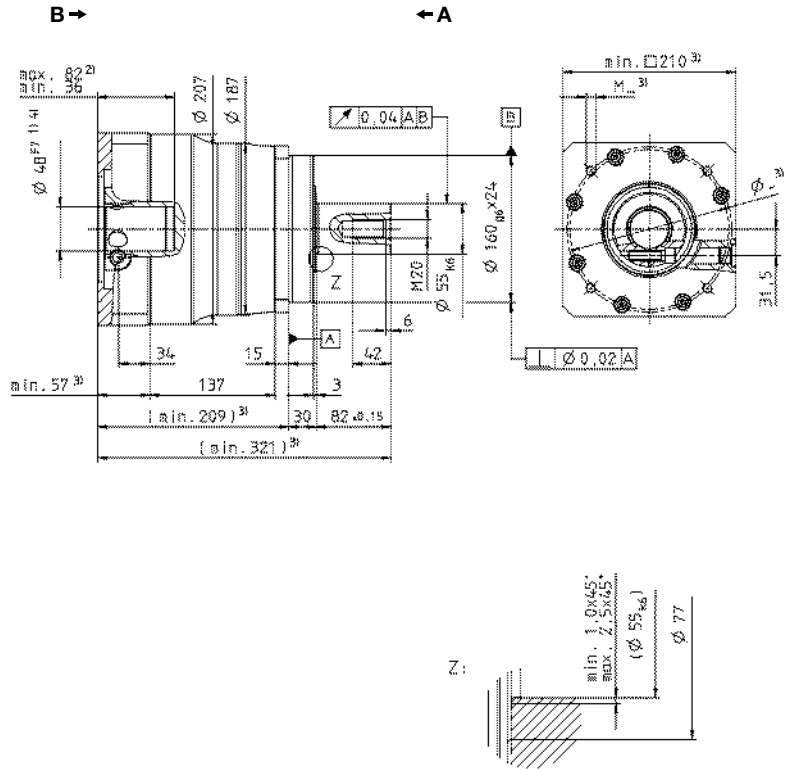
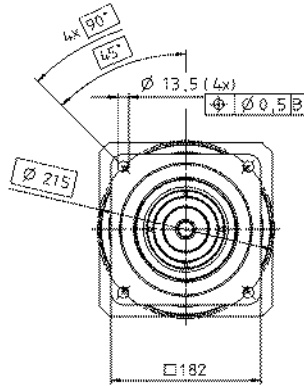
^{d)} Refers to center of the output shaft or flange

View A

View B

Motor shaft diameter [mm]

up to 48 ⁴⁾ (M)
clamping hub diameter



Planetary gearheads
High End

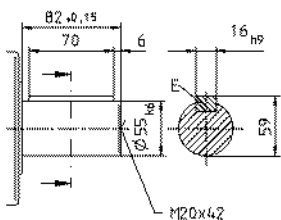
SP+

MC

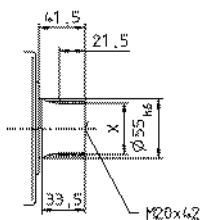
MC-L

Alternatives: Output shaft variants

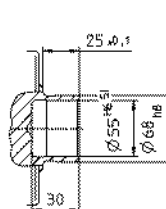
Output shaft with key in mm
E = key as per DIN 6885, sheet 1, form A



Involute gearing DIN 5480 in mm
X = W 55 x 2 x 30 x 26 x 6m, DIN 5480



Shaft mounted
Mounted via shrink disc



Non-tolerated dimensions ± 1 mm

- 1) Check motor shaft fit.
- 2) Min./Max. permissible motor shaft length.
Longer motor shafts are adaptable, please contact us.
- 3) The dimensions depend on the motor.
- 4) Smaller motor shaft diameter is compensated by a bushing with a minimum thickness of 1 mm.
- 5) Tolerance h6 for mounted shaft.



CAD data is available under www.wittenstein-alpha.com



Motor mounting according to operating manual

SP+ 180 MC HIGH SPEED 2-stage

				2-stage										
Ratio ^{a)}		<i>i</i>		16	20	25	28	35	40	50	70	100		
Max. acceleration torque (max. 1000 cycles per hour)		<i>T</i> _{2B}	Nm	880	880	880	880	880	880	880	880	700		
			in.lb	7788	7788	7788	7788	7788	7788	7788	7788	6195		
cymex®-optimized nominal torque (please contact us regarding the design)		<i>T</i> _{2Ncym}	Nm	–	–	–	–	–	–	–	–	–		
			in.lb											
Nominal output torque (with <i>n</i> _{2N})		<i>T</i> _{2N}	Nm	600	600	600	600	600	600	600	600	600		
			in.lb	5310	5310	5310	5310	5310	5310	5310	5310	5310		
Emergency stop torque (permitted 1000 times during the service life of the gearhead)		<i>T</i> _{2Not}	Nm	2750	2750	2750	2750	2750	2750	2750	2750	2200		
			in.lb	24338	24338	24338	24338	24338	24338	24338	24338	19470		
Nominal input speed (with <i>T</i> _{2N} and 20°C ambient temperature) ^{b)}		<i>n</i> _{1N}	rpm	4500	4500	4500	4500	4500	4500	4500	4500	4500		
Max. input speed		<i>n</i> _{1Max}	rpm	6000	6000	6000	6000	6000	6000	6000	6000	6000		
Mean no load running torque (with <i>n</i> ₁ = 2000 rpm and 20°C gearhead temperature) ^{c)}		<i>T</i> ₀₁₂	Nm	3.2	2.6	2.3	1.9	1.7	1.4	1.2	1.0	0.9		
			in.lb	28.3	23.0	20.4	16.8	15.0	12.4	10.6	8.9	8.0		
Max. torsional backlash		<i>j</i> _t	arcmin	Standard ≤ 6 / Reduced ≤ 4										
Torsional rigidity		<i>C</i> _{t21}	Nm/ arcmin	175										
			in.lb/ arcmin	149										
Max. axial force ^{d)}		<i>F</i> _{2AMax}	N	14150										
			lb _f	3184										
Max. radial force ^{d)}		<i>F</i> _{2RMax}	N	15400										
			lb _f	3465										
Max. tilting moment		<i>M</i> _{2KMax}	Nm	1600										
			in.lb	14160										
Efficiency at full load		η	%	96.5										
Service life (For calculation, see the Chapter "Information")		<i>L</i> _h	h	> 30000										
Weight incl. standard adapter plate		<i>m</i>	kg	36										
			lb _m	80										
Operating noise (with <i>i</i> =100 and <i>n</i> ₁ =3000 rpm no load)		<i>L</i> _{PA}	dB(A)	≤ 66										
Max. permitted housing temperature			°C	+90										
			F	194										
Ambient temperature			°C	-15 to +40										
			F	5 to 104										
Lubrication				Lubricated for life										
Paint				Blue RAL 5002										
Direction of rotation				Motor and gearhead same direction										
Protection class				IP 65										
Moment of inertia (relates to the drive)		K	38	<i>J</i> ₁	kgcm ²	13.5	12.0	11.7	10.6	10.4	9.74	9.68	9.63	9.60
					10 ⁻³ in.lb.s ²	12.0	10.6	10.4	9.34	9.23	8.62	8.57	8.52	8.49
Clamping hub diameter [mm]														

Reduced mass moments of inertia available on request.

^{a)} Other ratios available on request

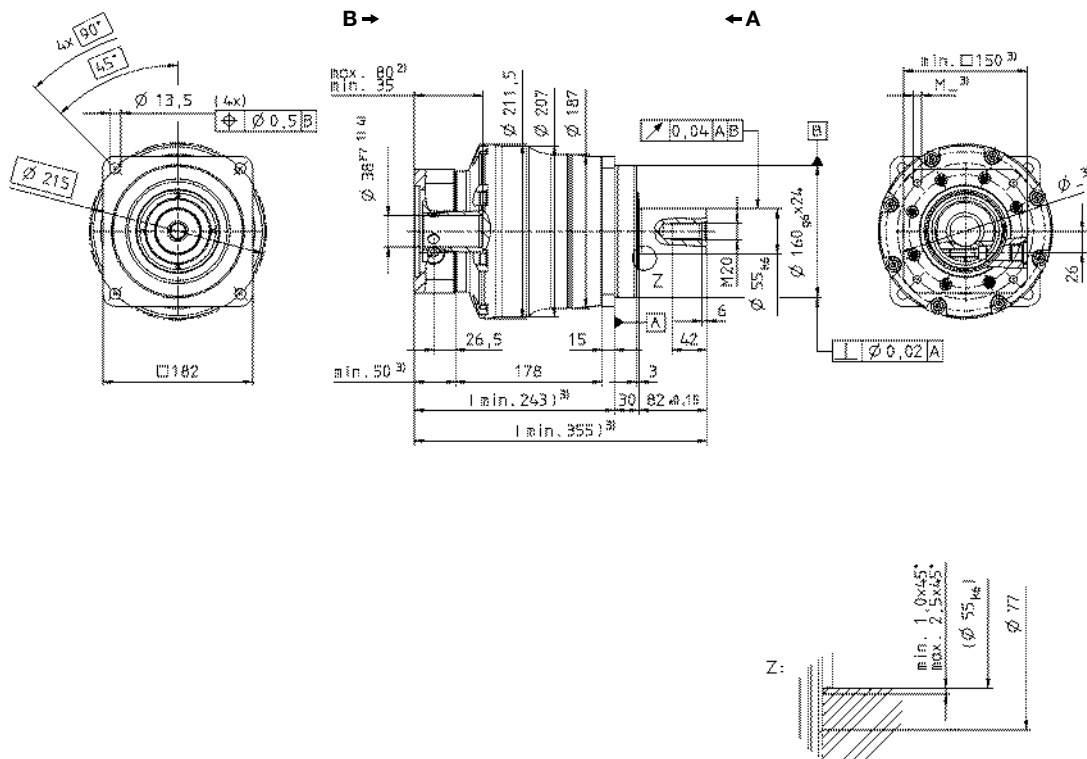
^{b)} For higher ambient temperatures, please reduce input speed

^{c)} Valid for clamping hub diameter of 38 mm

^{d)} Refers to center of the output shaft or flange

Motor shaft diameter [mm]

up to 38 ⁴⁾ (K)
clamping hub
diameter



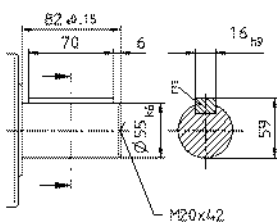
Planetary gearheads High End

 $\frac{d}{ds}$

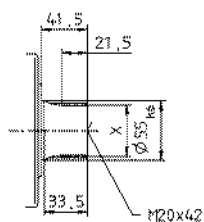
MC

Alternatives: Output shaft variants

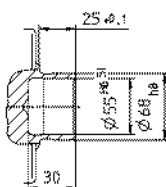
Output shaft with key in mm
E = key as per DIN 6885, sheet 1, form A



Involute gearing DIN 5480 in mm
X = W 55 x 2 x 30 x 26 x 6m, DIN 5480



Shaft mounted
Mounted via shrink disc



Non-tolerated dimensions ± 1 mm

- 1) Check motor shaft fit.
- 2) Min./Max. permissible motor shaft length.
Longer motor shafts are adaptable, please contact us.
- 3) The dimensions depend on the motor.
- 4) Smaller motor shaft diameter is compensated by a bushing with a minimum thickness of 1 mm.
- 5) Tolerance h6 for mounted shaft.



CAD data is available under www.wittenstein-alpha.com



Motor mounting according to operating manual

SP+ 210 MC HIGH SPEED 1-stage

				Standard version MC					Friction optimized version L					
Ratio ^{a)}	<i>i</i>			3	4	5	7	10	3	4	5	7	10	
Max. acceleration torque (max. 1000 cycles per hour)	<i>T</i> _{2B}	Nm		1200	2000	2000	1700	1200	1200	2000	2000	1700	1200	
		in.lb		10620	17700	17700	15045	10620	10620	17700	17700	15045	10620	
cymex®-optimized nominal torque (please contact us regarding the design)	<i>T</i> _{2Ncym}	Nm		- Please contact us -										
		in.lb												
Nominal output torque (with <i>n</i> _{2N})	<i>T</i> _{2N}	Nm		900	1300	1150	1000	800	900	1300	1150	1000	800	
		in.lb		7965	11505	10178	8850	7080	7965	11505	10178	8850	7080	
Emergency stop torque (permitted 1000 times during the service life of the gearhead)	<i>T</i> _{2Not}	Nm		5000	5200	5200	5200	5000	5000	5200	5200	5200	5000	
		in.lb		44250	46020	46020	46020	44250	44250	46020	46020	46020	44250	
Nominal input speed (with <i>T</i> _{2N} and 20°C ambient temperature) ^{b)}	<i>n</i> _{1N}	rpm		2250	2500	3500	3500	3500	2250	2500	3500	3500	3500	
cymex® optimized speed (please contact us regarding the design)	<i>n</i> _{1Ncym}	rpm		–	–	–	–	–	2750	3000	4000	4000	4000	
Max. input speed	<i>n</i> _{1Max}	rpm		3400	6000	6000	6000	6000	6000	6000	6000	6000	6000	
Mean no load running torque (with <i>n</i> ₁ = 2000 rpm and 20°C gearhead temperature) ^{c)}	<i>T</i> ₀₁₂	Nm		13.0	9.0	6.5	4.0	2.5	5.5	4.9	4.6	4.0	3.4	
		in.lb		115.1	79.7	57.5	35.4	22.1	49	43	41	35	30	
Max. torsional backlash	<i>j</i> _t	arcmin		Standard ≤ 4 / Reduced ≤ 2										
Torsional rigidity	<i>C</i> _{t21}	Nm/ arcmin		400										
		in.lb/ arcmin		3540										
Max. axial force ^{d)}	<i>F</i> _{2AMax}	N		30000					8000					
		lb _f		6750					1800					
Max. radial force ^{d)}	<i>F</i> _{2RMax}	N		21000					2500					
		lb _f		4725					563					
Max. tilting moment	<i>M</i> _{2KMax}	Nm		3100					310					
		in.lb		27435					2744					
Efficiency at full load	η	%		98.5					99.0					
Service life (For calculation, see the Chapter "Information")	<i>L</i> _h	h		> 30000										
Weight incl. standard adapter plate	<i>m</i>	kg		56										
		lb _m		124										
Operating noise (with <i>i</i> =10 and <i>n</i> ₁ =2000 rpm no load)	<i>L</i> _{PA}	dB(A)		< 64										
Max. permitted housing temperature			°C	+90										
			F	194										
Ambient temperature			°C	-15 to +40										
			F	5 to 104										
Lubrication				Lubricated for life										
Paint				Blue RAL 5002										
Direction of rotation				Motor and gearhead same direction										
Protection class				IP 65					IP 52					
Moment of inertia (relates to the drive)	N	55	<i>J</i> ₁	kgcm ²	139.0	94.3	76.9	61.5	53.1	139.0	94.3	76.9	61.5	53.1
Clamping hub diameter [mm]				10 ⁻³ in.lb.s ²	123.0	83.5	68.1	54.4	47.0	123.0	83.5	68.1	54.4	47.0

Reduced mass moments of inertia available on request.

^{a)} Other ratios available on request

^{b)} For higher ambient temperatures, please reduce input speed

^{c)} Valid for clamping hub diameter of 55 mm

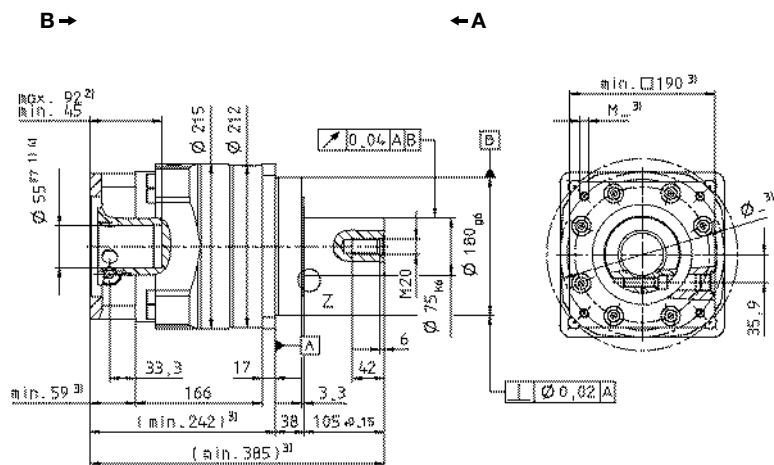
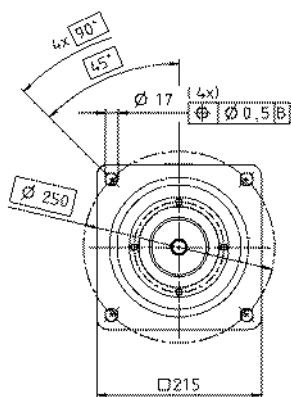
^{d)} Refers to center of the output shaft or flange

View A

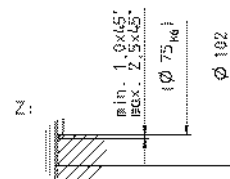
View B

Motor shaft diameter [mm]

up to 55 ⁴⁾ (N)
clamping hub
diameter



Planetary gearheads
High End



SP+

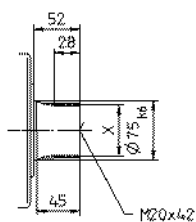
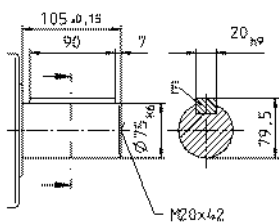
MC

MC-L

Alternatives: Output shaft variants

Output shaft with key in mm
E = key as per DIN 6885, sheet 1, form A

Involute gearing DIN 5480 in mm
X = W 70 x 2 x 30 x 34 x 6 mm, DIN 5480



Non-tolerated dimensions ± 1.5 mm

- 1) Check motor shaft fit.
- 2) Min./Max. permissible motor shaft length.
Longer motor shafts are adaptable, please contact us.
- 3) The dimensions depend on the motor.
- 4) Smaller motor shaft diameter is compensated by a bushing with a minimum thickness of 1 mm.

CAD data is available under www.wittenstein-alpha.com



Motor mounting according to operating manual

SP+ 210 MC HIGH SPEED 2-stage

				2-stage									
Ratio ^{a)}	<i>i</i>			16	20	25	28	35	40	50	70	100	
Max. acceleration torque (max. 1000 cycles per hour)	<i>T</i> _{2B}	Nm		1680	1800	2000	1680	1920	1040	1300	1700	1200	
		in.lb		14868	15930	17700	14868	16992	9204	11505	15045	10620	
cymex®-optimized nominal torque (please contact us regarding the design)	<i>T</i> _{2Ncym}	Nm		- Please contact us -									
		in.lb											
Nominal output torque (with <i>n</i> _N)	<i>T</i> _{2N}	Nm		840	780	975	780	975	800	1000	1000	800	
		in.lb		7434	6903	8629	6903	8629	7080	8850	8850	7080	
Emergency stop torque (permitted 1000 times during the service life of the gearhead)	<i>T</i> _{2Not}	Nm		5200	5200	5200	5200	5200	5200	5200	5200	5000	
		in.lb		46020	46020	46020	46020	46020	46020	46020	46020	44250	
Nominal input speed (with <i>T</i> _{2N} and 20°C ambient temperature) ^{b)}	<i>n</i> _{1N}	rpm		3500	4500	4500	4500	4500	4500	4500	4500	4500	
Max. input speed	<i>n</i> _{1Max}	rpm		6000	6000	6000	6000	6000	6000	6000	6000	6000	
Mean no load running torque (with <i>n</i> ₁ =2000 rpm and 20°C gearhead temperature)	<i>T</i> ₀₁₂	Nm		3.0	2,5	2,5	2,0	2,0	1,5	1,5	1,5	1,5	
		in.lb		27	22	22	18	18	13	13	13	13	
Max. torsional backlash	<i>j</i> _t	arcmin		Standard ≤ 4 / Reduced ≤ 2									
Torsional rigidity	<i>C</i> _{t21}	Nm/ arcmin		400									
		in.lb/ arcmin		3540									
Max. axial force ^{c)}	<i>F</i> _{2AMax}	N		30000									
		lb _f		6750									
Max. radial force ^{c)}	<i>F</i> _{2RMax}	N		21000									
		lb _f		4725									
Max. tilting moment	<i>M</i> _{2KIMax}	Nm		3100									
		in.lb		27435									
Efficiency at full load	η	%		96.5									
Service life (For calculation, see the Chapter "Information")	<i>L</i> _h	h		> 30000									
Weight incl. standard adapter plate	<i>m</i>	kg		53									
		lb _m		117									
Operating noise (with <i>i</i> =10 and <i>n</i> ₁ =2000 rpm no load)	<i>L</i> _{PA}	dB(A)											
Max. permitted housing temperature			°C										
			F										
Ambient temperature			°C	-15 to +40									
			F	32 to 194									
Lubrication				Lubricated for life									
Paint				Blue RAL 5002									
Direction of rotation				Motor and gearhead same direction									
Protection class													
Moment of inertia (relates to the drive)	M	48	<i>J</i> ₁	kgcm ²	34.5	31.5	30.8	30.0	29.7	28.5	28.3	28.1	28.0
				10 ⁻³ in.lb.s ²	30.5	27.9	27.3	26.6	26.3	25.2	25.0	24.9	24.8
Clamping hub diameter (mm)													

Reduced mass moments of inertia available on request.

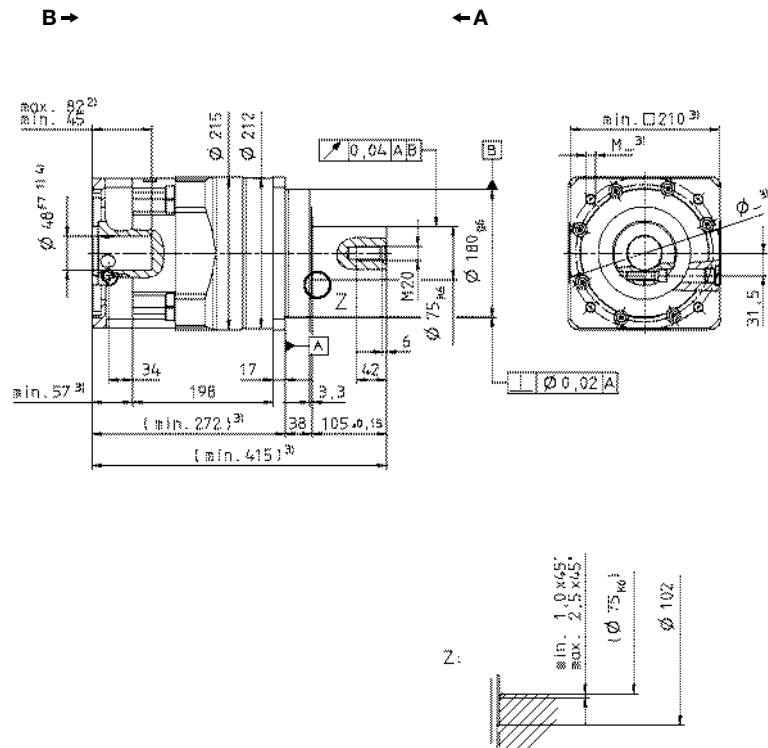
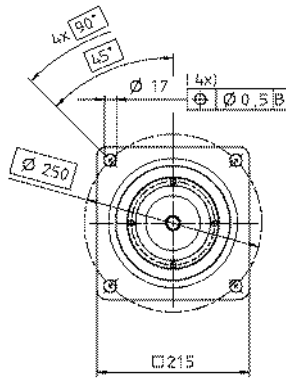
^{a)} Other ratios available on request

^{b)} For higher ambient temperatures, please reduce input speed

^{c)} Refers to center of the output shaft or flange

Motor shaft diameter [mm]

up to 48 ⁴⁾ (M)
clamping hub
diameter



Planetary gearheads
High End

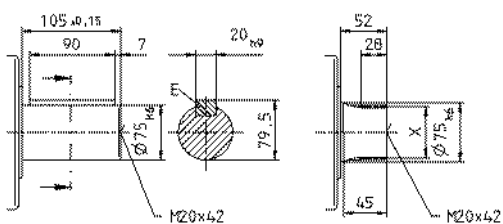
SP+

MC

Alternatives: Output shaft variants

Output shaft with key in mm
E = key as per DIN 6885, sheet 1, form A

Involute gearing DIN 5480 in mm
X = W 70 x 2 x 30 x 34 x 6m, DIN 5480



Non-tolerated dimensions ± 1.5 mm

- 1) Check motor shaft fit.
- 2) Min./Max. permissible motor shaft length.
Longer motor shafts are adaptable, please contact us.
- 3) The dimensions depend on the motor.
- 4) Smaller motor shaft diameter is compensated by a bushing with a minimum thickness of 1 mm.

CAD data is available under www.wittenstein-alpha.com



Motor mounting according to operating manual

SP+ 240 MC HIGH SPEED 1-stage

				Standard version MC					Friction optimized version L					
Ratio ^{a)}	<i>i</i>			3	4	5	7	10	3	4	5	7	10	
Max. acceleration torque (max. 1000 cycles per hour)	<i>T</i> _{2B}	Nm		1750	3500	3600	2700	1800	1750	3500	3600	2700	1800	
		in.lb		15488	30975	31860	23895	15930	15488	30975	31860	23895	15930	
cymex®-optimized nominal torque (please contact us regarding the design)	<i>T</i> _{2Ncym}	Nm		- Please contact us -										
		in.lb												
Nominal output torque (with <i>n</i> _N)	<i>T</i> _{2N}	Nm		1400	1960	1770	1500	1100	1400	1960	1770	1500	1100	
		in.lb		12390	17346	15665	13275	9735	12390	17346	15665	13275	9735	
Emergency stop torque (permitted 1000 times during the service life of the gearhead)	<i>T</i> _{2Not}	Nm		6800	8500	8500	8500	6800	6800	8500	8500	8500	6800	
		in.lb		60180	75225	75225	75225	60180	60180	75225	75225	75225	60180	
Nominal input speed (with <i>T</i> _{2N} and 20°C ambient temperature) ^{b)}	<i>n</i> _{1N}	rpm		1750	2250	3000	3000	3000	1750	2250	3000	3000	3000	
cymex® optimized speed (please contact us regarding the design)	<i>n</i> _{1Ncym}	rpm		–	–	–	–	–	2250	2750	3500	3500	3500	
Max. input speed	<i>n</i> _{1Max}	rpm		3400	4000	5000	5000	5000	3400	5000	5000	5000	5000	
Mean no load running torque (with <i>n</i> ₁ = 2000 rpm and 20°C gearhead temperature) ^{c)}	<i>T</i> ₀₁₂	Nm		24	18	13	7.0	5.0	8.0	7.0	6.0	5.0	4.2	
		in.lb		212	159	115	62	44	71	62	53	44	37	
Max. torsional backlash	<i>j</i> _t	arcmin		Standard ≤ 4 / Reduced ≤ 2										
Torsional rigidity	<i>C</i> _{t21}	Nm/ arcmin		550										
		in.lb/ arcmin		4868										
Max. axial force ^{d)}	<i>F</i> _{2AMax}	N		33000					10000					
		lb _f		7425					2250					
Max. radial force ^{d)}	<i>F</i> _{2RMax}	N		30000					2000					
		lb _f		6750					450					
Max. tilting moment	<i>M</i> _{2KMax}	Nm		5000					280					
		in.lb		44250					2478					
Efficiency at full load	η	%		98.5					99					
Service life (For calculation, see the Chapter “Information”)	<i>L</i> _h	h		> 30000										
Weight incl. standard adapter plate	<i>m</i>	kg		77										
		lb _m		170										
Operating noise (with <i>i</i> =10 and <i>n</i> ₁ = 2000 rpm no load)	<i>L</i> _{PA}	dB(A)		≤ 66										
Max. permitted housing temperature		°C		+90										
		F		194										
Ambient temperature		°C		-15 to +40										
		F		5 to 104										
Lubrication				Lubricated for life										
Paint				Blue RAL 5002										
Direction of rotation				Motor and gearhead same direction										
Protection class				IP 65					IP 52					
Moment of inertia (relates to the drive)	O	60	<i>J</i> ₁	kgcm ²	260.2	198.2	163.0	138.3	124.7	260.2	198.2	163.0	84.4	70.8
Clamping hub diameter [mm]				10 ⁻³ in.lb.s ²	230.3	175.4	144.3	122.4	110.4	230.3	175.4	144.3	74.7	62.7

Reduced mass moments of inertia available on request.

^{a)} Other ratios available on request

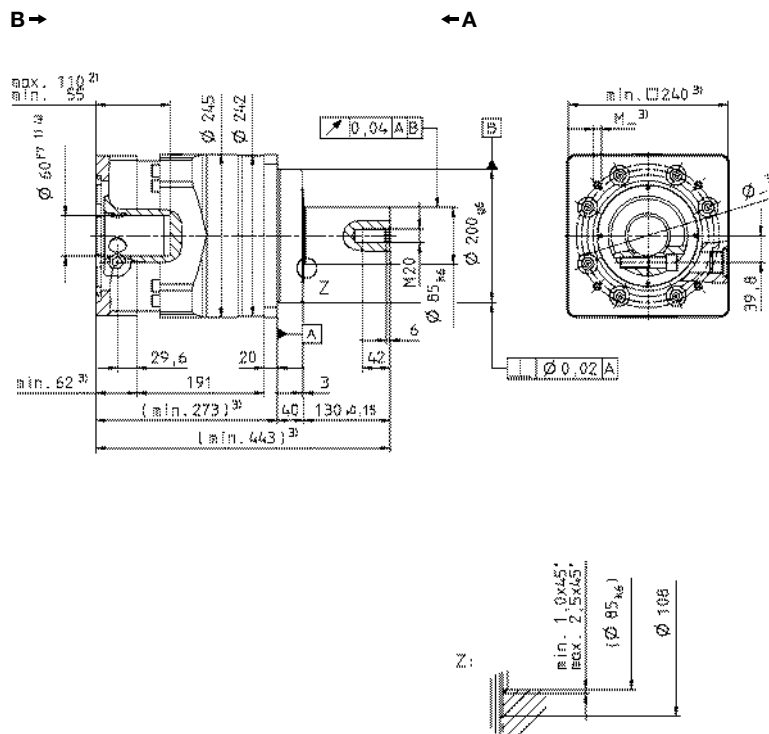
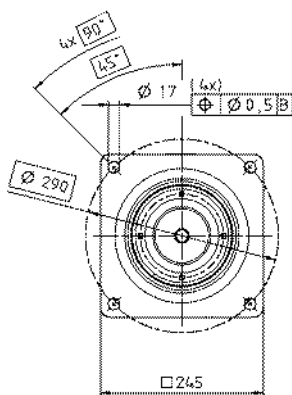
^{b)} For higher ambient temperatures, please reduce input speed

^{c)} Valid for clamping hub diameter of 60 mm

^{d)} Refers to center of the output shaft or flange

Motor shaft diameter [mm]

up to 60 ⁴⁾ (O)
clamping hub
diameter



Planetary gearheads High End

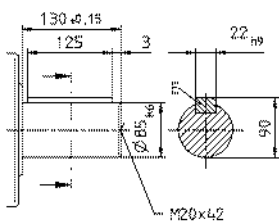
 $\frac{d}{ds}$

MC

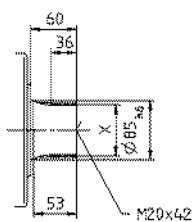
MC-L

Alternatives: Output shaft variants

Output shaft with key in mm
E = key as per DIN 6885, sheet 1, form A



Involute gearing DIN 5480 in mm
X = W 80 x 2 x 30 x 38 x 6m, DIN 5480



Non-tolerated dimensions $\pm 1,5$ mm

- 1) Check motor shaft fit.
- 2) Min./Max. permissible motor shaft length.
Longer motor shafts are adaptable, please contact us.
- 3) The dimensions depend on the motor.
- 4) Smaller motor shaft diameter is compensated by a bushing with a minimum thickness of 1 mm.



CAD data is available under www.wittenstein-alpha.com



Motor mounting according to operating manual

SP+ 240 MC HIGH SPEED 2-stage

				2-stage									
Ratio ^{a)}	<i>i</i>			16	20	25	28	35	40	50	70	100	
Max. acceleration torque (max. 1000 cycles per hour)	<i>T</i> _{2B}	Nm		3500	3500	3600	2900	3600	1680	2100	2700	1800	
		in.lb		30975	30975	31860	25665	31860	14868	18585	23895	15930	
cymex®-optimized nominal torque (please contact us regarding the design)	<i>T</i> _{2Ncym}	Nm		- Please contact us -									
		in.lb											
Nominal output torque (with <i>n</i> _N)	<i>T</i> _{2N}	Nm		1790	1770	1730	1840	1930	1300	1625	1500	1100	
		in.lb		15842	15665	15311	16284	17081	11505	14381	13275	9735	
Emergency stop torque (permitted 1000 times during the service life of the gearhead)	<i>T</i> _{2Not}	Nm		8500	8500	8500	8500	8500	8500	8500	8500	6800	
		in.lb		75225	75225	75225	75225	75225	75225	75225	75225	60180	
Nominal input speed (with <i>T</i> _{2N} and 20°C ambient temperature) ^{b)}	<i>n</i> _{1N}	rpm		3500	4500	4500	4500	4500	4500	4500	4500	4500	
Max. input speed	<i>n</i> _{1Max}	rpm		6000	6000	6000	6000	6000	6000	6000	6000	6000	
Mean no load running torque (with <i>n</i> ₁ = 2000 rpm and 20°C gearhead temperature)	<i>T</i> ₀₁₂	Nm		5,0	4,5	4,0	3,5	3,0	2,5	2,5	2,5	2,0	
		in.lb		44	40	35	31	27	22	22	22	18	
Max. torsional backlash	<i>i</i> _t	arcmin		Standard ≤ 5 / Reduced ≤ 4									
Torsional rigidity	<i>C</i> _{t21}	Nm/ arcmin		550									
		in.lb/ arcmin		4868									
Max. axial force ^{c)}	<i>F</i> _{2AMax}	N		33000									
		lb _f		7425									
Max. radial force ^{c)}	<i>F</i> _{2RMax}	N		30000									
		lb _f		6750									
Max. tilting moment	<i>M</i> _{2KMax}	Nm		5000									
		in.lb		44250									
Efficiency at full load	η	%		96.5									
Service life (For calculation, see the Chapter "Information")	<i>L</i> _h	h		> 30000									
Weight incl. standard adapter plate	<i>m</i>	kg		76									
		lb _m		168									
Operating noise (with <i>i</i> =10 and <i>n</i> ₁ = 2000 rpm no load)	<i>L</i> _{PA}	dB(A)		≤ 66									
Max. permitted housing temperature			°C	+90									
			F	194									
Ambient temperature			°C	-15 to +40									
			F	5 to 104									
Lubrication				Lubricated for life									
Paint				Blue RAL 5002									
Direction of rotation				Motor and gearhead same direction									
Protection class				IP 65									
Moment of inertia (relates to the drive) Clamping hub diameter [mm]	M	48	<i>J</i> ₁	kgcm²	39.2	34.6	33.2	30.5	29.7	28.2	27.9	27.6	27.5
				10 ⁻² in.lb.s²	34.7	30.6	29.4	27.0	26.3	25.0	24.7	24.4	24.3

Reduced mass moments of inertia available on request.

^{a)} Other ratios available on request

^{b)} For higher ambient temperatures, please reduce input speed

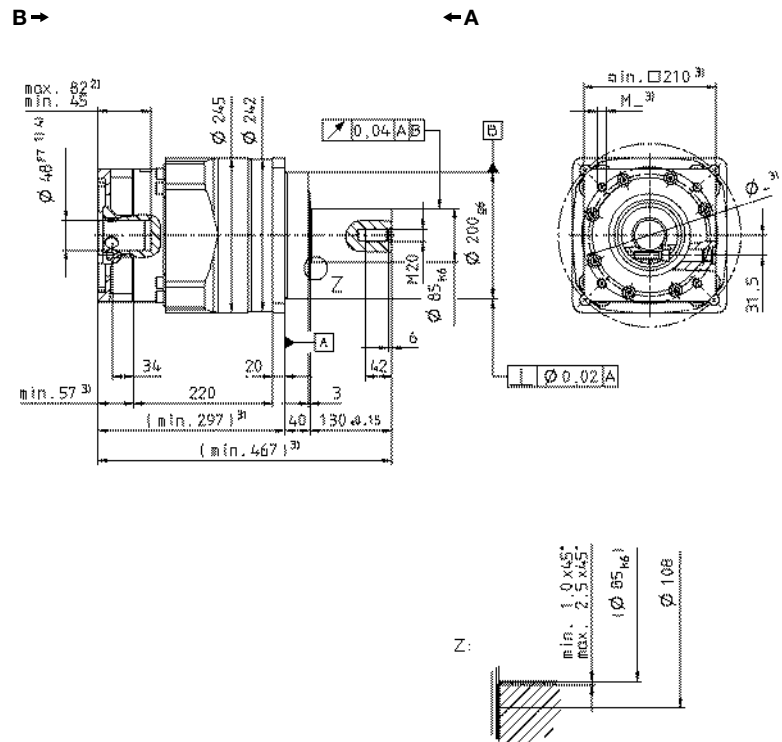
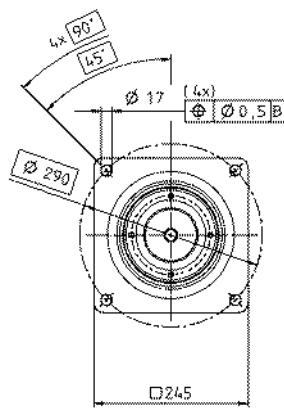
^{c)} Refers to center of the output shaft or flange

View A

View B

Motor shaft diameter [mm]

up to 48 ⁴⁾ (M)
clamping hub
diameter



Planetary gearheads
High End

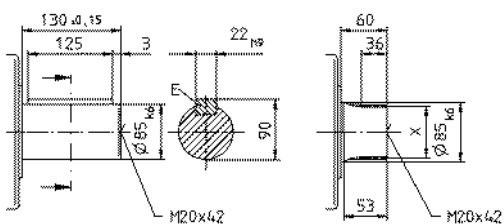
SP+

MC

Alternatives: Output shaft variants

Output shaft with key in mm
E = key as per DIN 6885, sheet 1, form A

Involute gearing DIN 5480 in mm
X = W 80 x 2 x 30 x 38 x 6m, DIN 5480



Non-tolerated dimensions ± 1.5 mm

- 1) Check motor shaft fit.
- 2) Min./Max. permissible motor shaft length.
Longer motor shafts are adaptable, please contact us.
- 3) The dimensions depend on the motor.
- 4) Smaller motor shaft diameter is compensated by a bushing with a minimum thickness of 1 mm.

CAD data is available under www.wittenstein-alpha.com



Motor mounting according to operating manual

Low backlash planetary gearheads Economy



LP+ Generation 3

Economical multitalent

- Low backlash planetary gearhead with output shaft
- Applications in cyclic or continuous operation
- Torsional backlash ≤ 8 arcmin
- Ratio: 3-100

Product highlights

- Large range of ratios
- High nominal speeds
- Optionally available with belt pulley



LPB+ Generation 3

Economical multitalent

- Low backlash planetary gearhead with output flange
- Cyclic or continuous operation
- Torsional backlash ≤ 8 arcmin
- Ratio: 3-100

Product highlights

- Large range of ratios
- High nominal speeds
- Optionally available with belt pulley



Power density ←

Versatile installation

In whatever position you install your gearhead, it always contains the same quantity of grease.

The gearheads are so flexible, you can install them vertically, horizontally or with the output facing upwards or downwards.

Extended boundaries

Our Economy range includes some impressive new additions. In the 070, 090 and 120 sizes, our LP+/LPB+ Generation 3 gearheads feature up to 75% more torque, independent of the ratio!



alphira®

Economical entry-level model

- Low backlash planetary gearhead with output shaft
- Applications in cyclic or continuous operation
- Torsional backlash ≤ 20 arcmin
- Ratio: 4-100

Product highlights

- Lightweight aluminum
- Available from our online shop: www.alphira.de (DE/AT/CH)

Planetary gearheads
Economy



LPB
Generation 3



LPB
Generation 3



alphira®

Just in time

With our Economy range, this is not merely a slogan. With our Economy range products, we set new standards with regard to delivery times and delivery reliability.

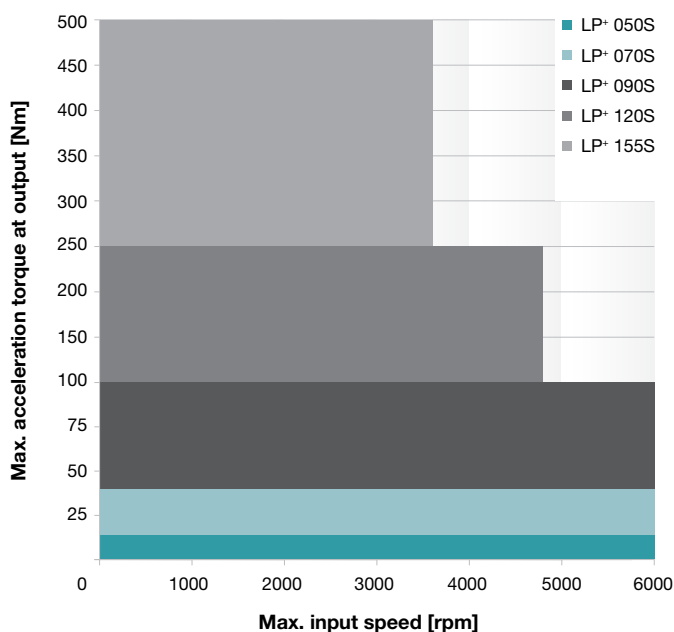
LP⁺/LPB⁺ Generation 3 – Economical multitalent

Low backlash planetary gearheads with output shaft or output flange. The LP⁺/LPB⁺ Generation 3 gearhead series combines maximum quality with economical precision. The LPB⁺ Generation 3 is especially suitable for compact belt drives.

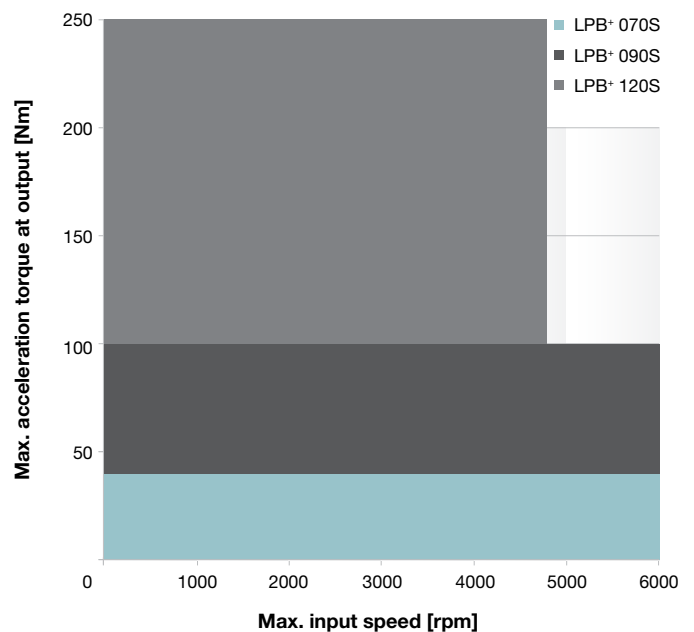


Quick size selection

LP⁺ Generation 3 MF (example for $i = 5$)
For applications in cyclic operation ($DC \leq 60\%$)
or in continuous operation ($DC \geq 60\%$)



LPB⁺ Generation 3 MF (example for $i = 5$)
For applications in cyclic operation ($DC \leq 60\%$)
or in continuous operation ($DC \geq 60\%$)



Versions and Applications

Features	LP+ Generation 3 MF version page 122	LPB+ Generation 3 MF version page 134
Power density	• •	• •
Positioning accuracy	•	• •
High input speeds	• •	• •
Torsional rigidity	•	• •
Space-saving design	• •	• • •

Product features

Ratios ^{c)}		3 – 100	3 – 100
Torsional backlash [arcmin] ^{c)}	Standard	≤ 8	≤ 8
	Reduced	–	–
Output type			
Smooth output shaft		•	
Keywayed output shaft		•	
Output flange			•
Input type			
Motor mounted version		•	•
Type			
Food-grade lubrication ^{a) b)}		•	•
Accessories			
Coupling		•	
Rack		•	
Pinion		•	
Belt pulley			•
B5 flange		•	

^{a)} Power reduction: technical data available upon request

^{b)} Please contact WITTENSTEIN alpha

^{c)} In relation to reference sizes



LP+ 050 MF 1/2-stage

			1-stage				2-stage							
Ratio	<i>i</i>		4	5	7	10	16	20	25	35	50	70	100	
Max. acceleration torque (max. 1000 cycles per hour)	<i>T</i> _{2B}	Nm	13	14	14	13	13	13	14	14	14	14	13	
		in.lb	120	120	120	120	120	120	120	120	120	120	120	
Nominal output torque (with <i>n</i> _N)	<i>T</i> _{2N}	Nm	6	6.5	6.5	6	6	6	6.5	6.5	6.5	6.5	6	
		in.lb	53	58	58	53	53	53	58	58	58	58	53	
Emergency stop torque (permitted 1000 times during the service life of the gearhead)	<i>T</i> _{2Not}	Nm	26	26	26	26	26	26	26	26	26	26	26	
		in.lb	230	230	230	230	230	230	230	230	230	230	230	
Nominal input speed (with <i>T</i> _{2N} and 20°C ambient temperature) ^{a)}	<i>n</i> _{1N}	rpm	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	
Max. input speed	<i>n</i> _{1Max}	rpm	8000	8000	8000	8000	8000	8000	8000	8000	8000	8000	8000	
Mean no load running torque (with <i>n</i> ₁ = 3000 rpm and 20°C gearhead temperature)	<i>T</i> ₀₁₂	Nm	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	
		in.lb	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	
Max. torsional backlash	<i>j</i> _t	arcmin	≤ 10				≤ 13							
Torsional rigidity	<i>C</i> _{t21}	Nm/ arcmin	1.5	1.2	1.2	0.9	1.5	1.5	1.2	1.2	1.2	1.2	0.9	
		in.lb/ arcmin	13	11	11	8	13	13	11	11	11	11	8	
Max. axial force ^{b)}	<i>F</i> _{2AMax}	N	700				700							
		lb _f	160				160							
Max. radial force ^{b)}	<i>F</i> _{2RMax}	N	650				650							
		lb _f	150				150							
Efficiency at full load	η	%	97				95							
Service life (For calculation, see the Chapter “Information”)	<i>L</i> _h	h	> 20000				> 20000							
Weight incl. standard adapter plate	<i>m</i>	kg	0.75				0.95							
		lb _m	1.7				2.1							
Operating noise for i=10 and <i>n</i> ₁ = 3000 rpm without load	<i>L</i> _{PA}	dB(A)	≤ 62											
Max. permitted housing temperature	°C		+90											
	F		194											
Ambient temperature	°C		-15 to +40											
	F		5 to 104											
Lubrication			Lubricated for life											
Paint			Blue RAL 5002											
Direction of rotation			Motor and gearhead same direction											
Protection class			IP 64											
Moment of inertia (relates to the drive)	B	11	<i>J</i> ₁	kgcm ²	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
				10 ⁻³ in.lb.s ²	0.05	0.04	0.04	0.04	0.05	0.04	0.04	0.04	0.04	0.04
Clamping hub diameter (mm)	C	14	<i>J</i> ₁	kgcm ²	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
				10 ⁻³ in.lb.s ²	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2

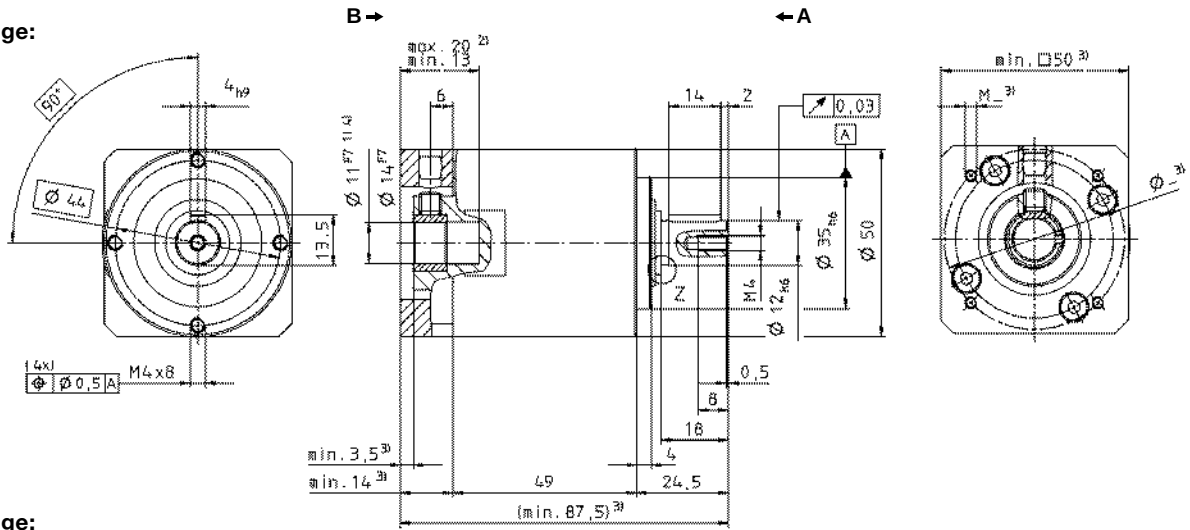
^{a)} For higher ambient temperatures, please reduce input speed

^{b)} Refers to center of the output shaft, if $n_2 = 100$ rpm

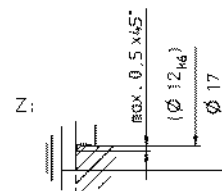
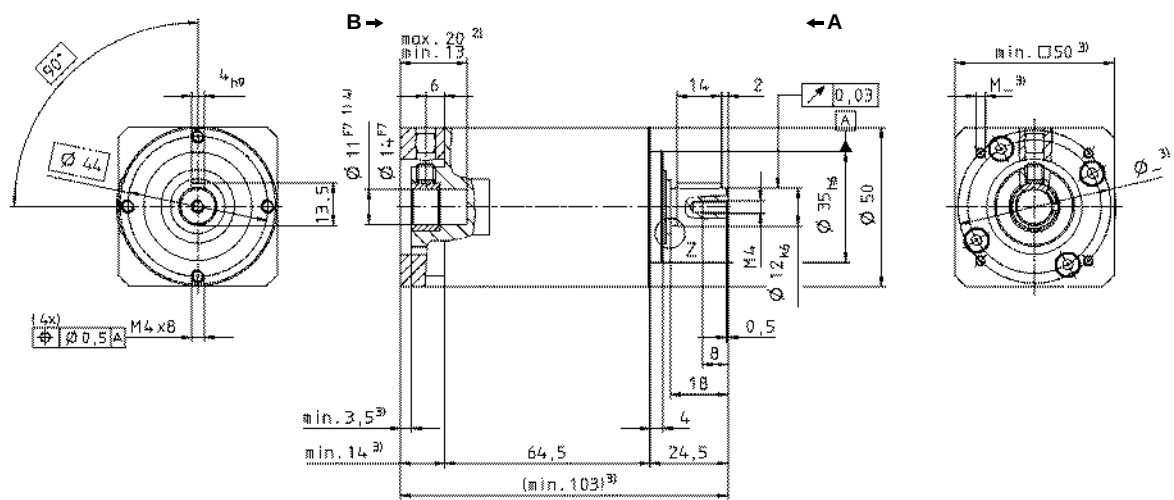
View A

View B

LP+ 1-stage:



LP+ 2-stage:



Non-tolerated dimensions ±1mm

- 1) Check motor shaft fit.
- 2) Min./Max. permissible motor shaft length. Longer motor shafts are adaptable, please contact us.
- 3) The dimensions depend on the motor.
- 4) Smaller motor shaft diameter is compensated by a bushing. Motor shaft diameters up to 14mm available – please contact WITTENSTEIN alpha

CAD data is available under www.wittenstein-alpha.com

Motor mounting according to operating manual

LP+ 070 MF 1/2-stage

			1-stage					2-stage									
Ratio ^{a)}	<i>i</i>		3	4	5	7	10	9	12	16	20	25	30	40	50	70	100
Max. acceleration torque (max. 1000 cycles per hour)	<i>T</i> _{2B}	Nm	55	42	40	40	37	55	55	42	42	40	55	42	40	40	37
		in.lb	490	370	350	350	330	490	490	490	370	350	490	370	350	350	330
Nominal output torque (with <i>n</i> _{IN})	<i>T</i> _{2N}	Nm	29	22	21	21	19	29	29	22	22	21	29	22	21	21	19
		in.lb	260	190	190	190	170	260	260	260	190	190	260	190	190	190	170
Emergency stop torque (permitted 1000 times during the service life of the gearhead)	<i>T</i> _{2Not}	Nm	65	75	75	75	75	75	75	75	75	75	75	75	75	75	75
		in.lb	580	660	660	660	660	660	660	660	660	660	660	660	660	660	660
Nominal input speed (with <i>T</i> _{2N} and 20°C ambient temperature) ^{b)}	<i>n</i> _{1N}	rpm	3700	3700	3700	3700	3700	3700	3700	3700	3700	3700	3700	3700	3700	3700	3700
Max. input speed	<i>n</i> _{1Max}	rpm	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000
Mean no load running torque (with <i>n</i> ₁ = 3000 rpm and 20°C gearhead temperature)	<i>T</i> ₀₁₂	Nm	0.3	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
		in.lb	2.7	2.2	1.8	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	0.9
Max. torsional backlash	<i>j</i> _t	arcmin	≤ 8					≤ 10									
Torsional rigidity	<i>C</i> _{t21}	Nm/ arcmin	4	4	3.3	3.3	2.8	4.0	4.0	4.0	4.0	4.0	4.0	3.3	3.3	3.3	2.8
		in.lb/ arcmin	35	35	29	29	25	35	35	35	35	35	35	29	29	29	25
Max. axial force ^{c)}	<i>F</i> _{2AMax}	N	1550					1550									
		lb _f	349					349									
Max. radial force ^{c)}	<i>F</i> _{2RMax}	N	1450					1450									
		lb _f	326					326									
Efficiency at full load	η	%	97					95									
Service life (For calculation, see the Chapter “Information”)	<i>L</i> _h	h	> 20000					> 20000									
Weight incl. standard adapter plate	<i>m</i>	kg	2.0					2.4									
		lb _m	4.4					5.3									
Operating noise for i=10 and <i>n</i> ₁ = 3000 rpm without load	<i>L</i> _{PA}	dB(A)	≤ 64														
Max. permitted housing temperature	°C		+90														
	F		194														
Ambient temperature	°C		-15 to +40														
	F		5 to 104														
Lubrication			Lubricated for life														
Paint			Blue RAL 5002														
Direction of rotation			Motor and gearhead same direction														
Protection class			IP 64														
Moment of inertia (relates to the drive)	D	16	<i>J</i> ₁	kgcm ²	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
				10 ⁻³ in.lb.s ²	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Clamping hub diameter (mm)	E	19	<i>J</i> ₁	kgcm ²	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
				10 ⁻³ in.lb.s ²	0.5	0.5	0.5	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.4	0.5	0.4

^{a)} Other ratios are available on request: $i = 15, 21, 28$ and 35 .

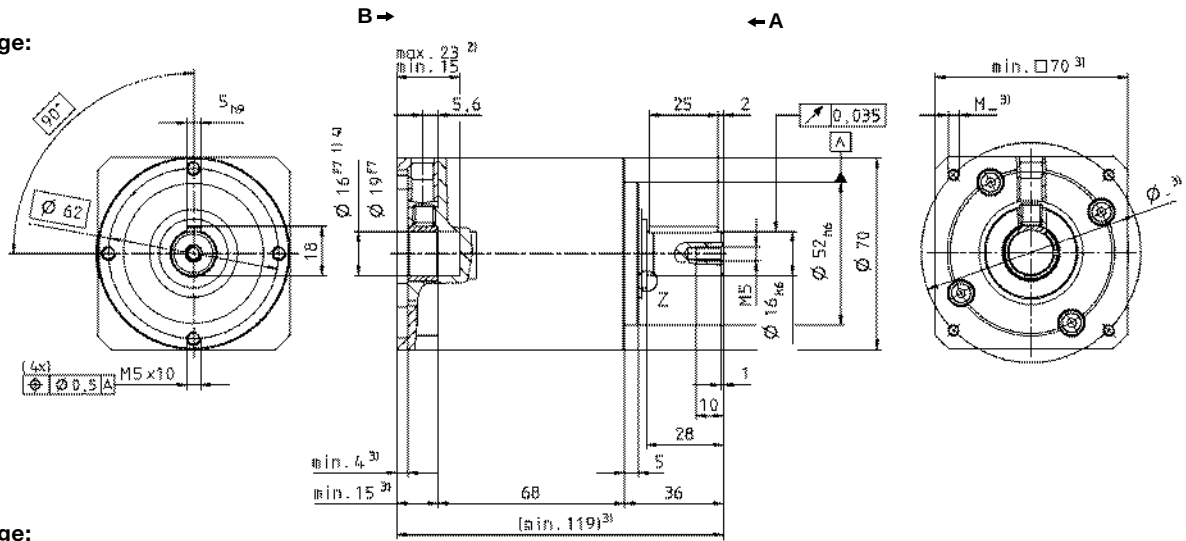
^{b)} For higher ambient temperatures, please reduce input speed

^{c)} Refers to center of the output shaft, if $n_2 = 100$ rpm

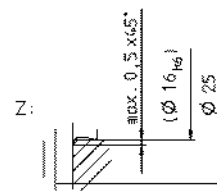
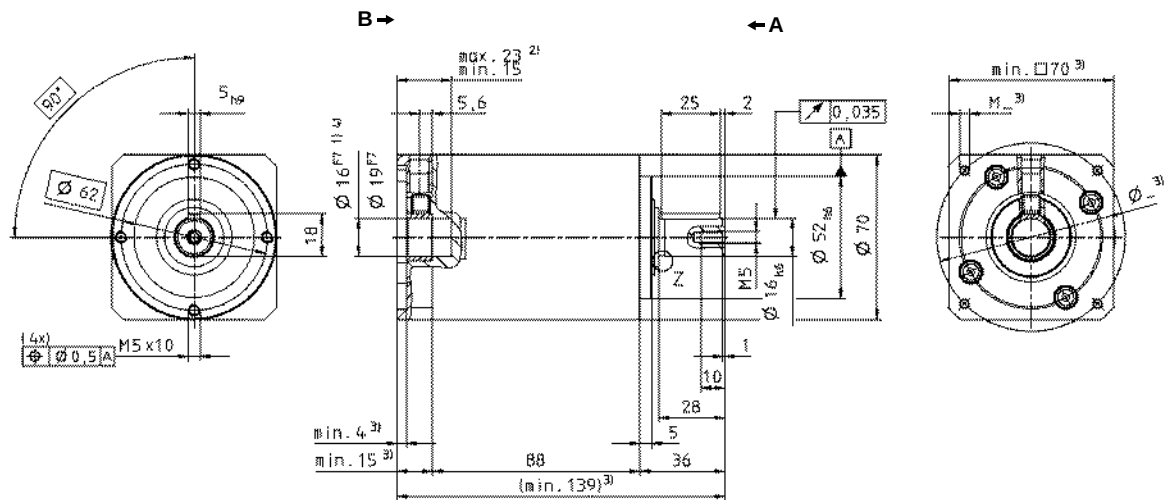
View A

View B

LP+ 1-stage:



LP+ 2-stage:



Non-tolerated dimensions $\pm 1\text{mm}$

- 1) Check motor shaft fit.
- 2) Min./Max. permissible motor shaft length. Longer motor shafts are adaptable, please contact us.
- 3) The dimensions depend on the motor.
- 4) Smaller motor shaft diameter is compensated by a bushing. Motor shaft diameters up to 19mm available – please contact WITTENSTEIN alpha



CAD data is available under www.wittenstein-alpha.com



Motor mounting according to operating manual

LP+ 090 MF 1/2-stage

			1-stage					2-stage										
Ratio ^{a)}	<i>i</i>		3	4	5	7	10	9	12	16	20	25	30	40	50	70	100	
Max. acceleration torque (max. 1000 cycles per hour)	<i>T</i> _{2B}	Nm	125	115	100	100	90	125	125	115	115	100	125	115	100	100	90	
		in.lb	1110	1020	890	890	800	1110	1110	1020	1020	890	1110	1020	890	890	800	
Nominal output torque (with <i>n</i> _{IN})	<i>T</i> _{2N}	Nm	63	58	50	50	45	63	63	58	58	50	63	58	50	50	45	
		in.lb	560	510	440	440	400	560	560	510	510	440	560	510	440	440	400	
Emergency stop torque (permitted 1000 times during the service life of the gearhead)	<i>T</i> _{2Not}	Nm	185	190	190	190	190	190	190	190	190	190	190	190	190	190	190	
		in.lb	1640	1680	1680	1680	1680	1680	1680	1680	1680	1680	1680	1680	1680	1680	1680	
Nominal input speed (with <i>T</i> _{2N} and 20°C ambient temperature) ^{b)}	<i>n</i> _{1N}	rpm	3400	3400	3400	3400	3400	3400	3400	3400	3400	3400	3400	3400	3400	3400	3400	
Max. input speed	<i>n</i> _{1Max}	rpm	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	
Mean no load running torque (with <i>n</i> ₁ = 3000 rpm and 20°C gearhead temperature)	<i>T</i> ₀₁₂	Nm	0.6	0.6	0.5	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	
		in.lb	5.3	4.9	4.4	3.5	3.4	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.2	2.2	2.2	
Max. torsional backlash	<i>j</i> _t	arcmin	≤ 8					≤ 10										
Torsional rigidity	<i>C</i> _{t21}	Nm/ arcmin	12	12	9.5	9.5	8.5	12	12	12	12	9.5	9.5	12	9.5	9.5	8.5	
		in.lb/ arcmin	106	106	84	84	75	106	106	106	106	84	84	106	84	84	75	
Max. axial force ^{c)}	<i>F</i> _{2AMax}	N	1900					1900										
		lb _f	430					430										
Max. radial force ^{c)}	<i>F</i> _{2RMax}	N	2400					2400										
		lb _f	540					540										
Efficiency at full load	η	%	97					95										
Service life (For calculation, see the Chapter “Information”)	<i>L</i> _h	h	> 20000					> 20000										
Weight incl. standard adapter plate	<i>m</i>	kg	4.0					5.0										
		lb _m	8.8					11										
Operating noise for i=10 and <i>n</i> ₁ = 3000 rpm without load	<i>L</i> _{PA}	dB(A)	≤66															
Max. permitted housing temperature		°C	+90															
		F	194															
Ambient temperature		°C	-15 to +40															
		F	5 to 104															
Lubrication			Lubricated for life															
Paint			Blue RAL 5002															
Direction of rotation			Motor and gearhead same direction															
Protection class			IP 64															
Moment of inertia (relates to the drive)	G	24	<i>J</i> ₁	kgcm ²	1.8	1.6	1.6	1.5	1.4	1.5	1.5	1.6	1.6	1.5	1.5	1.4	1.4	1.4
				10 ⁻³ in.lb.s ²	1.6	1.4	1.4	1.3	1.3	1.3	1.3	1.4	1.4	1.3	1.3	1.3	1.3	1.3
Clamping hub diameter (mm)	H	28	<i>J</i> ₁	kgcm ²	2.1	1.9	1.9	1.8	1.7	1.8	1.8	1.9	1.9	1.8	1.8	1.7	1.7	1.7
				10 ⁻³ in.lb.s ²	1.9	1.7	1.6	1.6	1.5	1.6	1.6	1.6	1.6	1.6	1.5	1.5	1.5	1.5

^{a)} Other ratios are available on request: $i = 15, 21, 28$ and 35 .

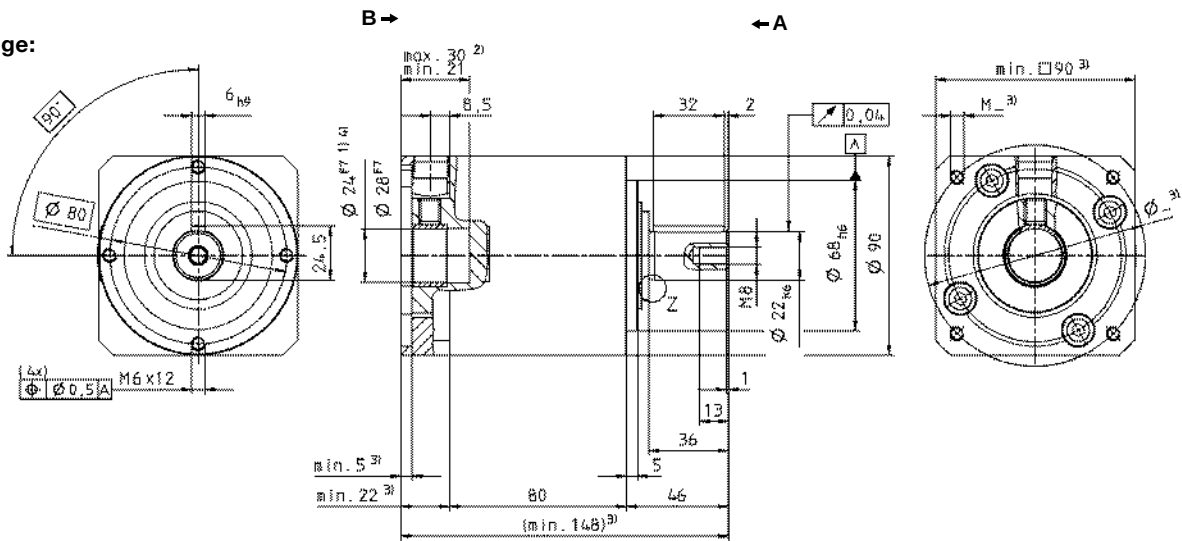
^{b)} For higher ambient temperatures, please reduce input speed

^{c)} Refers to center of the output shaft, if $n_2 = 100$ rpm

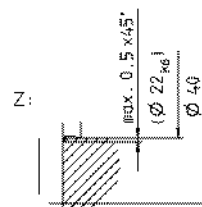
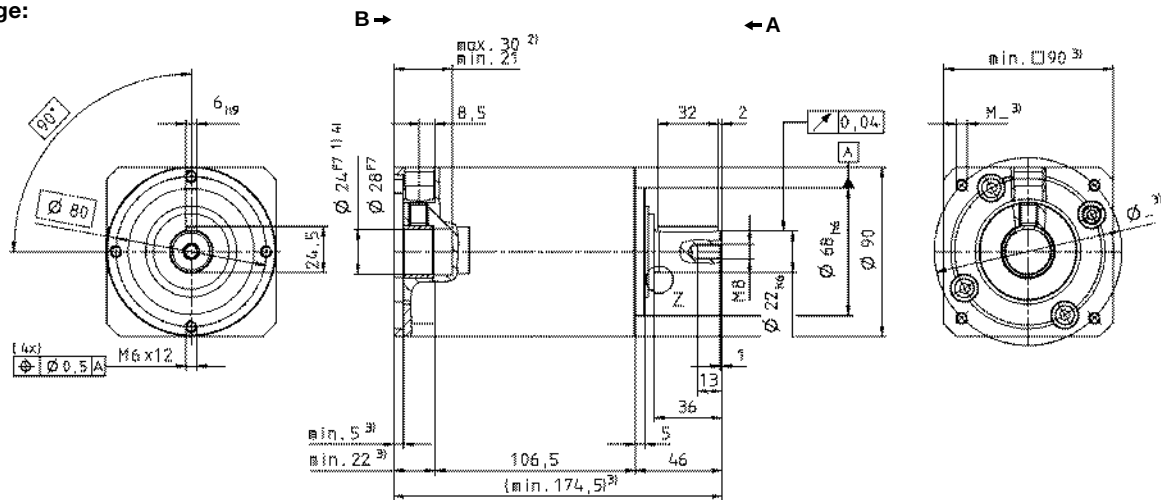
View A

View B

LP+ 1-stage:



LP+ 2-stage:



Non-tolerated dimensions $\pm 1\text{mm}$

- 1) Check motor shaft fit.
- 2) Min./Max. permissible motor shaft length. Longer motor shafts are adaptable, please contact us.
- 3) The dimensions depend on the motor.
- 4) Smaller motor shaft diameter is compensated by a bushing. Motor shaft diameters up to 28mm available – please contact WITTENSTEIN alpha



CAD data is available under www.wittenstein-alpha.com



Motor mounting according to operating manual

LP+ 120 MF 1/2-stage

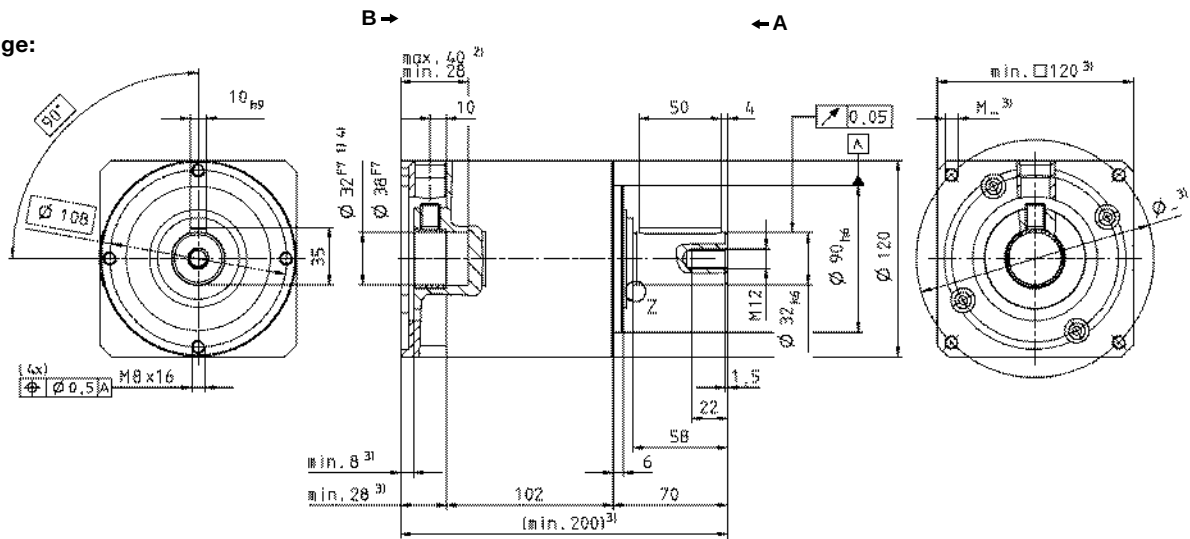
			1-stage					2-stage										
Ratio ^{a)}	<i>i</i>		3	4	5	7	10	9	12	16	20	25	30	40	50	70	100	
Max. acceleration torque (max. 1000 cycles per hour)	<i>T</i> _{2B}	Nm	305	305	250	250	220	305	305	305	305	250	305	305	250	250	220	
		in.lb	2700	2700	2210	2210	1950	2700	2700	2700	2700	2210	2700	2700	2210	2210	1950	
Nominal output torque (with <i>n</i> _{IN})	<i>T</i> _{2N}	Nm	155	155	125	125	110	155	155	155	155	125	155	155	125	125	110	
		in.lb	1370	1370	1110	1110	970	1370	1370	1370	1370	1110	1370	1370	1110	1110	970	
Emergency stop torque (permitted 1000 times during the service life of the gearhead)	<i>T</i> _{2Not}	Nm	400	480	480	480	480	480	480	480	480	480	480	480	480	480	480	
		in.lb	3540	4250	4250	4250	4250	4250	4250	4250	4250	4250	4250	4250	4250	4250	4250	
Nominal input speed (with <i>T</i> _{2N} and 20°C ambient temperature) ^{b)}	<i>n</i> _{1N}	rpm	2600	2600	2600	2600	2600	2600	2600	2600	2600	2600	2600	2600	2600	2600	2600	
Max. input speed	<i>n</i> _{1Max}	rpm	4800	4800	4800	4800	4800	4800	4800	4800	4800	4800	4800	4800	4800	4800	4800	
Mean no load running torque (with <i>n</i> ₁ = 3000 rpm and 20°C gearhead temperature)	<i>T</i> ₀₁₂	Nm	1.1	1.0	0.9	0.8	0.8	0.6	0.6	0.6	0.5	0.5	0.4	0.5	0.4	0.4	0.4	
		in.lb	9.7	8.9	8.0	7.1	7.1	5.3	5.3	4.9	4.4	4.4	3.5	4.4	3.5	3.5	3.5	
Max. torsional backlash	<i>j</i> _t	arcmin	≤ 8					≤ 10										
Torsional rigidity	<i>C</i> _{t21}	Nm/ arcmin	30	30	25	25	22	30	30	30	30	25	25	30	25	25	22	
		in.lb/ arcmin	270	270	220	220	190	270	270	270	270	220	220	270	220	220	190	
Max. axial force ^{c)}	<i>F</i> _{2AMax}	N	4000					4000										
		lb _f	900					900										
Max. radial force ^{c)}	<i>F</i> _{2RMax}	N	4600					4600										
		lb _f	1035					1035										
Efficiency at full load	η	%	97					95										
Service life (For calculation, see the Chapter “Information”)	<i>L</i> _h	h	> 20000					> 20000										
Weight incl. standard adapter plate	<i>m</i>	kg	8.6					11.0										
		lb _m	19.0					24.3										
Operating noise for i=10 and <i>n</i> ₁ = 3000 rpm without load	<i>L</i> _{PA}	dB(A)	≤ 68															
Max. permitted housing temperature		°C	+90															
		F	194															
Ambient temperature		°C	-15 to +40															
		F	5 to 104															
Lubrication			Lubricated for life															
Paint			Blue RAL 5002															
Direction of rotation			Motor and gearhead same direction															
Protection class			IP 64															
Moment of inertia (relates to the drive)	I	32	<i>J</i> ₁	kgcm ²	6.9	5.9	5.6	5.2	5.1	5.4	5.4	5.5	5.5	5.3	5.3	5.0	5.0	5.0
				10 ⁻³ in.lb.s ²	6.1	5.3	4.9	4.6	4.5	4.7	4.7	4.9	4.9	4.7	4.7	4.4	4.4	4.4
Clamping hub diameter (mm)	K	38	<i>J</i> ₁	kgcm ²	7.8	6.8	6.4	6.1	5.9	6.2	6.2	6.4	6.4	6.2	6.2	5.9	5.9	5.9
				10 ⁻³ in.lb.s ²	6.9	6.0	5.7	5.4	5.2	5.5	5.5	5.7	5.7	5.5	5.5	5.2	5.2	5.2

^{a)} Other ratios are available on request: $i = 15, 21, 28$ and 35 .

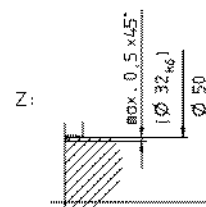
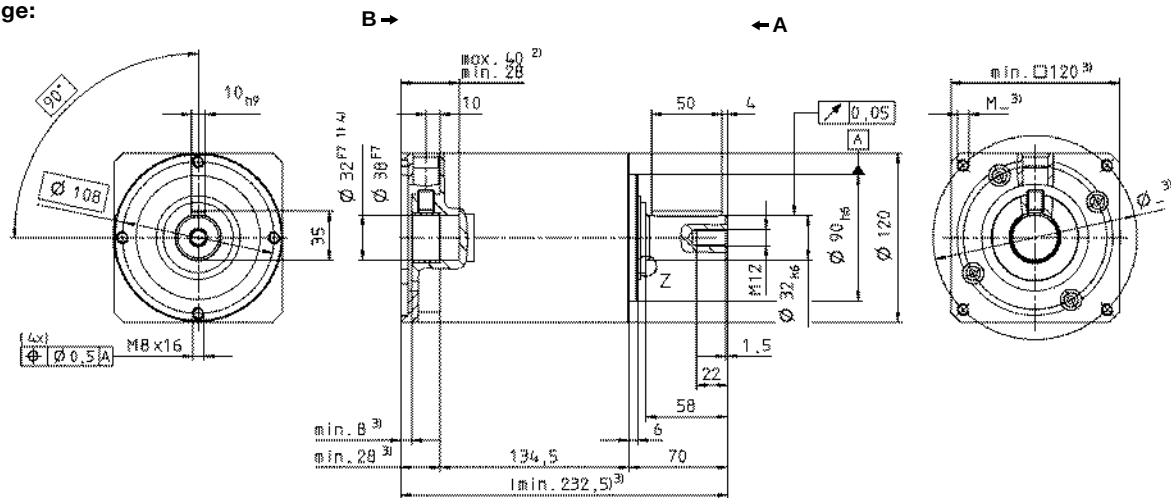
^{b)} For higher ambient temperatures, please reduce input speed

^{c)} Refers to center of the output shaft, if $n_2 = 100$ rpm

LP⁺ 1-stage:



LP⁺ 2-stage:



Non-tolerated dimensions $\pm 1\text{mm}$

- 1) Check motor shaft fit.
 - 2) Min./Max. permissible motor shaft length. Longer motor shafts are adaptable, please contact us.
 - 3) The dimensions depend on the motor.
 - 4) Smaller motor shaft diameter is compensated by a bushing.
- Motor shaft diameters up to 38mm available – please contact WITTENSTEIN alpha

 CAD data is available under www.wittenstein-alpha.com

 Motor mounting according to operating manual

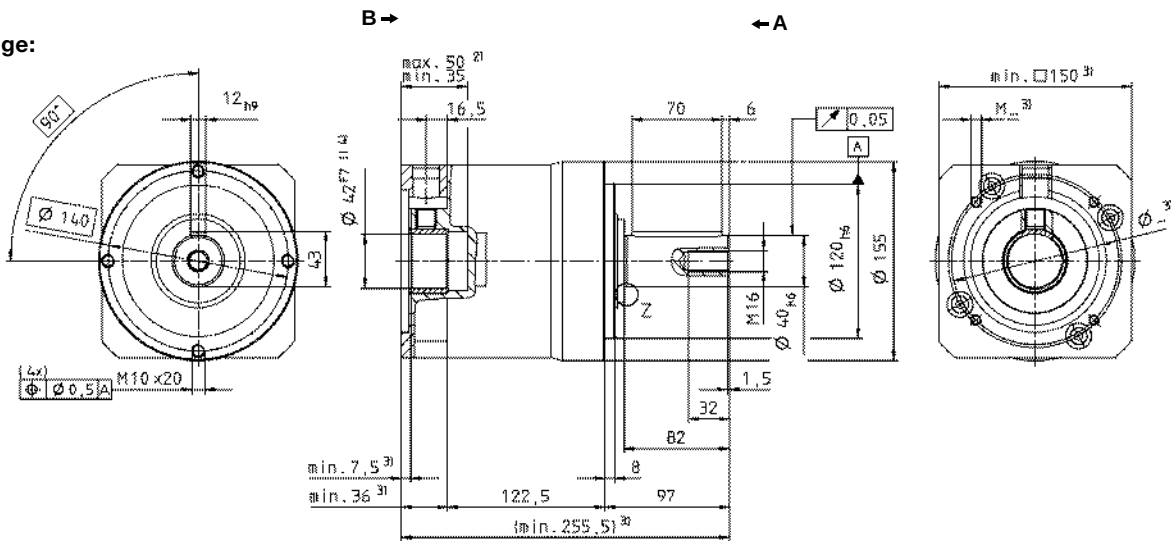
LP+ 155 MF 1/2-stage

				1-stage		2-stage			
Ratio	i		5	10	25	50	100		
Max. acceleration torque (max. 1000 cycles per hour)	T _{2B}	Nm	500	400	500	500	400		
		in.lb	4430	3540	4430	4430	3540		
Nominal output torque (with n _{1N})	T _{2N}	Nm	350	200	350	350	200		
		in.lb	3100	1770	3100	3100	1770		
Emergency stop torque (permitted 1000 times during the service life of the gearhead)	T _{2Not}	Nm	1000	1000	1000	1000	1000		
		in.lb	8850	8850	8850	8850	8850		
Nominal input speed (with T _{2N} and 20°C ambient temperature) ^{a)}	n _{1N}	rpm	2000	2000	2000	2000	2000		
Max. input speed	n _{1Max}	rpm	3600	3600	3600	3600	3600		
Mean no load running torque (with n ₁ = 3000 rpm and 20°C gearhead temperature)	T ₀₁₂	Nm	2.8	2.5	1.0	0.8	0.7		
		in.lb	25	22	8.9	7.1	6.2		
Max. torsional backlash	j _t	arcmin	≤ 8		≤ 10				
Torsional rigidity	C _{t21}	Nm/ arcmin	55	44	55	55	44		
		in.lb/ arcmin	490	390	490	490	390		
Max. axial force ^{b)}	F _{2AMax}	N	6000		6000				
		lb _f	1350		1350				
Max. radial force ^{b)}	F _{2RMax}	N	7500		7500				
		lb _f	1690		1690				
Efficiency at full load	η	%	97		95				
Service life (For calculation, see the Chapter “Information”)	L _h	h	> 20000		> 20000				
Weight incl. standard adapter plate	m	kg	17		21				
		lb _m	38		46				
Operating noise for i=10 and n ₁ = 3000 rpm without load	L _{PA}	dB(A)	≤69						
Max. permitted housing temperature	°C		+90						
	F		194						
Ambient temperature	°C		-15 to +40						
	F		5 to 104						
Lubrication			Lubricated for life						
Paint			Blue RAL 5002						
Direction of rotation			Motor and gearhead same direction						
Protection class			IP 64						
Moment of inertia (relates to the drive)	L	42	J ₁	kgcm ²	17	16	–	–	–
				10 ⁻³ in.lb.s ²	15	14	–	–	–
	I	32	J ₁	kgcm ²	–	–	5.4	5.0	5.0
				10 ⁻³ in.lb.s ²	–	–	4.8	4.4	4.4
Clamping hub diameter (mm)	K	38	J ₁	kgcm ²	–	–	6.3	5.9	5.9
				10 ⁻³ in.lb.s ²	–	–	5.5	5.2	5.2

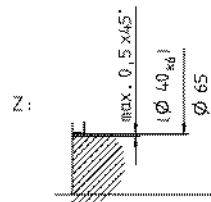
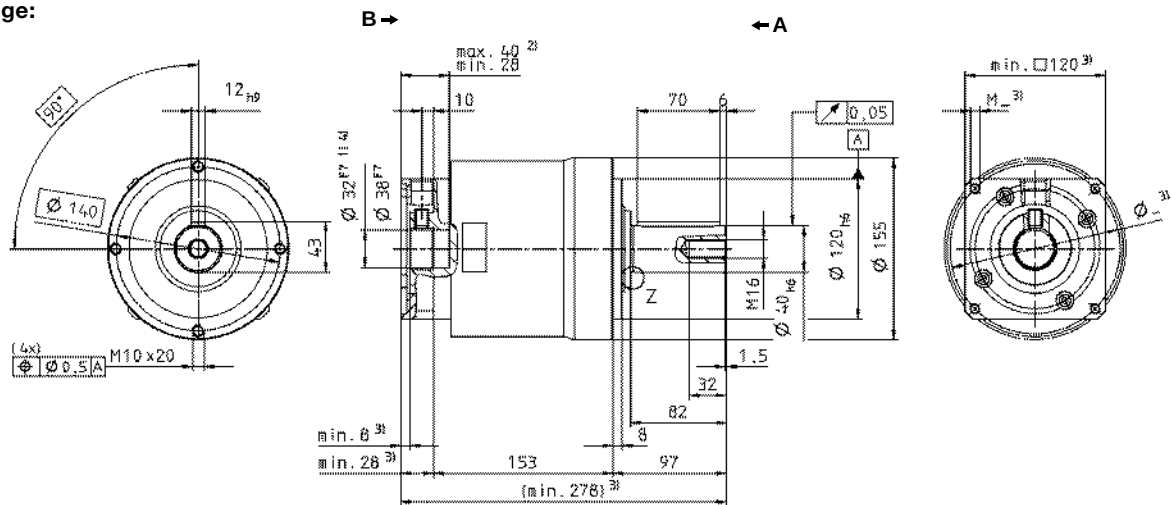
^{a)} For higher ambient temperatures, please reduce input speed

^{b)} Refers to center of the output shaft, if $n_2 = 100$ rpm

LP⁺ 1-stage:



LP⁺ 2-stage:



Non-tolerated dimensions $\pm 1\text{mm}$

- 1) Check motor shaft fit.
- 2) Min./Max. permissible motor shaft length. Longer motor shafts are adaptable, please contact us.
- 3) The dimensions depend on the motor.
- 4) Smaller motor shaft diameter is compensated by a bushing.
LP² 2-stage: Motor shaft diameters up to 38mm available –
please contact WITTENSTEIN alpha



CAD data is available under www.wittenstein-alpha.com



Motor mounting according to operating manual

LPB⁺ 070 MF 1/2-stage

			1-stage					2-stage										
Ratio ^{d)}	<i>i</i>		3	4	5	7	10	9	12	16	20	25	30	40	50	70	100	
Max. acceleration torque (max. 1000 cycles per hour)	<i>T</i> _{2B}	Nm	55	42	40	40	37	55	55	42	42	40	55	42	40	40	37	
		in.lb	490	370	350	350	330	490	490	370	370	350	490	370	350	350	330	
Nominal output torque (with <i>n</i> _{in})	<i>T</i> _{2N}	Nm	29	22	21	21	19	29	29	22	22	21	29	22	21	21	19	
		in.lb	260	190	190	190	170	260	260	190	190	190	260	190	190	190	170	
Emergency stop torque (permitted 1000 times during the service life of the gearhead)	<i>T</i> _{2Not}	Nm	65	75	75	75	75	75	75	75	75	75	75	75	75	75	75	
		in.lb	580	660	660	660	660	660	660	660	660	660	660	660	660	660	660	
Nominal input speed (with <i>T</i> _{2N} and 20°C ambient temperature) ^{a)}	<i>n</i> _{1N}	rpm	3700	3700	3700	3700	3700	3700	3700	3700	3700	3700	3700	3700	3700	3700	3700	
Max. input speed	<i>n</i> _{1Max}	rpm	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	
Mean no load running torque (with <i>n</i> ₁ = 3000 rpm and 20°C gearhead temperature)	<i>T</i> ₀₁₂	Nm	0.3	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	
		in.lb	2.7	2.2	1.8	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	0.9	
Max. torsional backlash	<i>j</i> _t	arcmin	≤ 8					≤ 10										
Torsional rigidity	<i>C</i> _{t21}	Nm/ arcmin	6.4	6.4	4.8	4.8	3.8	6.4	6.4	6.4	6.4	4.8	6.4	6.4	4.8	4.8	3.8	
		in.lb/ arcmin	55	55	40	40	35	55	55	55	55	40	55	55	40	40	35	
Max. axial force ^{b)}	<i>F</i> _{2AMax}	N	1550					1550										
		lb _f	350					350										
Max. radial force ^{c)}	<i>F</i> _{2RMax}	N	3000					3000										
		lb _f	680					680										
Efficiency at full load	η	%	97					95										
Service life (For calculation, see the Chapter "Information")	<i>L</i> _h	h	> 20000					> 20000										
Weight incl. standard adapter plate	<i>m</i>	kg	1.6					2										
		lb _m	3.5					4.4										
Operating noise for i=10 and <i>n</i> ₁ = 3000 rpm without load	<i>L</i> _{PA}	dB(A)	≤64															
Max. permitted housing temperature	°C		+90															
	F		194															
Ambient temperature	°C		-15 to +40															
	F		5 to 104															
Lubrication			Lubricated for life															
Paint			Blue RAL 5002															
Direction of rotation			Motor and gearhead same direction															
Protection class			IP 64															
Moment of inertia (relates to the drive)	D	16	<i>J</i> _i	kgcm ²	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
				10 ⁻³ in.lb.s ²	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Clamping hub diameter (mm)	E	19	<i>J</i> _i	kgcm ²	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
				10 ⁻³ in.lb.s ²	0.5	0.5	0.5	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.4

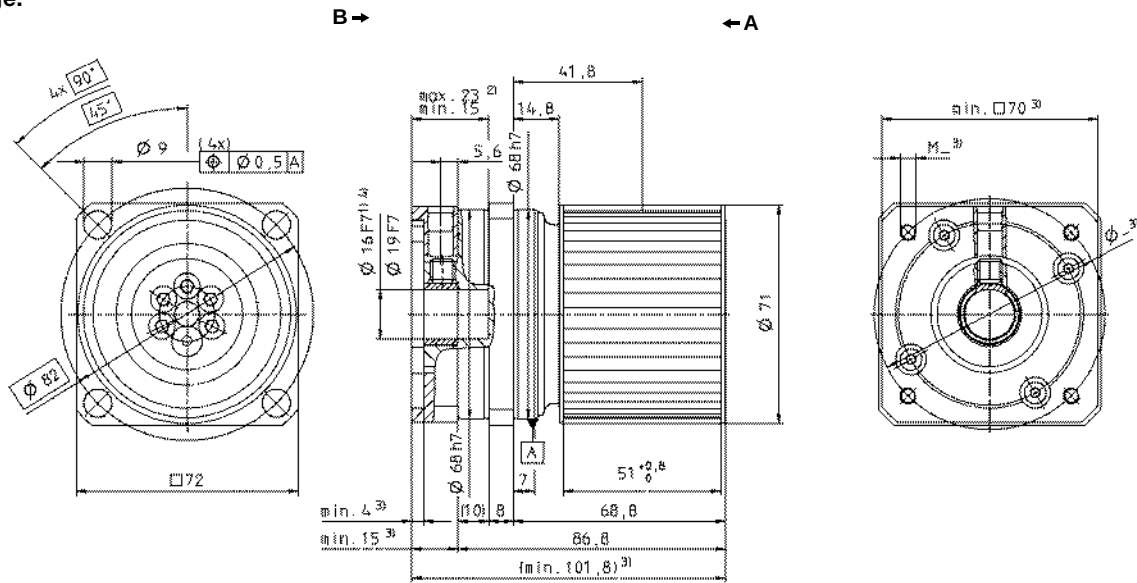
^{a)} For higher ambient temperatures, please reduce input speed

^{b)} Based on the center of the output flange at $n_2 = 100$ rpm

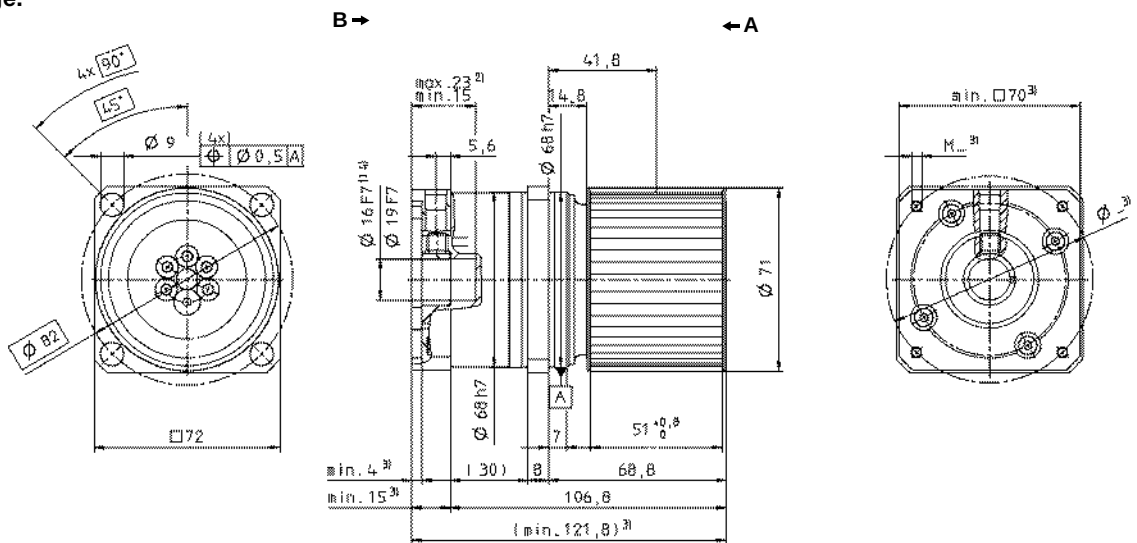
^{c)} With mounted PLPB⁺ belt pulley and 100 rpm

^{d)} Other ratios are available on request: $i = 15, 21, 28$ and 35 .

LPB+ 1-stage:

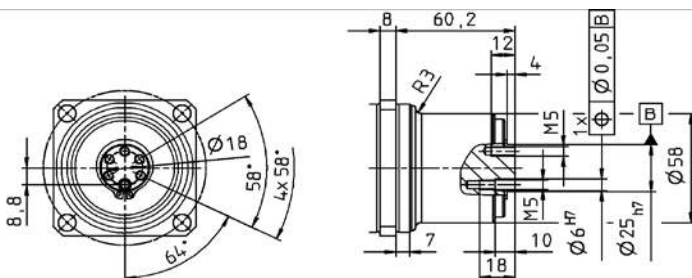


LPB+ 2-stage:



Supplement: Belt pulley PLPB+ (not included in the scope of delivery – please order separately)

Illustration: Output flange without belt pulley



Belt Pulley PLPB+ 070 Profile AT5-0			
Pitch	p	mm	5
Number of teeth	z		43
Circumference	$z \cdot p$	mm/rotation	215
Inertia	J	kgcm ²	3.86
Mass	m	kg	0.48

Non-tolerated dimensions ± 1 mm

- 1) Check motor shaft fit.
- 2) Min./Max. permissible motor shaft length. Longer motor shafts are adaptable, please contact us.
- 3) The dimensions depend on the motor.
- 4) Smaller motor shaft diameter is compensated by a bushing. Motor shaft diameters up to 19mm available – please contact WITTENSTEIN alpha

CAD data is available under www.wittenstein-alpha.com

Motor mounting according to operating manual

LPB⁺ 090 MF 1/2-stage

			1-stage						2-stage									
Ratio ^{d)}	<i>i</i>		3	4	5	7	10	9	12	16	20	25	30	40	50	70	100	
Max. acceleration torque (max. 1000 cycles per hour)	<i>T</i> _{2B}	Nm	125	115	100	100	90	125	125	115	115	100	125	115	100	100	90	
		in.lb	1110	1020	890	890	800	1110	1110	1020	1020	890	1110	1020	890	890	800	
Nominal output torque (with <i>n</i> _{1N})	<i>T</i> _{2N}	Nm	63	58	50	50	45	63	63	58	58	50	63	58	50	50	45	
		in.lb	560	510	440	440	400	560	560	510	510	440	560	510	440	440	400	
Emergency stop torque (permitted 1000 times during the service life of the gearhead)	<i>T</i> _{2Not}	Nm	185	190	190	190	190	190	190	190	190	190	190	190	190	190	190	
		in.lb	1640	1680	1680	1680	1680	1680	1680	1680	1680	1680	1680	1680	1680	1680	1680	
Nominal input speed (with <i>T</i> _{2N} and 20°C ambient temperature) ^{a)}	<i>n</i> _{1N}	rpm	3400	3400	3400	3400	3400	3400	3400	3400	3400	3400	3400	3400	3400	3400	3400	
Max. input speed	<i>n</i> _{1Max}	rpm	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	
Mean no load running torque (with <i>n</i> ₁ = 3000 rpm and 20°C gearhead temperature)	<i>T</i> ₀₁₂	Nm	0.6	0.6	0.5	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	
		in.lb	5.3	4.9	4.4	3.5	3.4	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.2	2.2	2.2	
Max. torsional backlash	<i>j</i> _t	arcmin	≤ 8						≤ 10									
Torsional rigidity	<i>C</i> _{t21}	Nm/ arcmin	20	20	14	14	12	20	20	20	20	14	20	20	14	14	12	
		in.lb/ arcmin	180	180	120	120	110	180	180	180	180	120	180	180	120	120	110	
Max. axial force ^{b)}	<i>F</i> _{2AMax}	N	1900						1900									
		lb _f	430						430									
Max. radial force ^{c)}	<i>F</i> _{2RMax}	N	4300						4300									
		lb _f	970						970									
Efficiency at full load	η	%	97						95									
Service life (For calculation, see the Chapter "Information")	<i>L</i> _n	h	> 20000						> 20000									
Weight incl. standard adapter plate	<i>m</i>	kg	3.3						4.3									
		lb _m	7.3						10									
Operating noise for i=10 and <i>n</i> ₁ = 3000 rpm without load	<i>L</i> _{PA}	dB(A)	≤ 66															
Max. permitted housing temperature		°C	+90															
		F	194															
Ambient temperature		°C	-15 to +40															
		F	5 to 104															
Lubrication			Lubricated for life															
Paint			Blue RAL 5002															
Direction of rotation			Motor and gearhead same direction															
Protection class			IP 64															
Moment of inertia (relates to the drive)	G	24	<i>J</i> ₁	kgcm ²	1.8	1.6	1.5	1.5	1.4	1.5	1.5	1.6	1.6	1.5	1.5	1.4	1.4	1.4
				10 ⁻³ in.lb.s ²	1.6	1.4	1.4	1.3	1.3	1.3	1.3	1.4	1.4	1.3	1.3	1.3	1.3	1.3
Clamping hub diameter (mm)	H	28	<i>J</i> ₁	kgcm ²	2	1.9	1.8	1.8	1.7	1.8	1.8	1.9	1.9	1.8	1.8	1.7	1.7	1.7
				10 ⁻³ in.lb.s ²	1.9	1.7	1.6	1.6	1.5	1.6	1.6	1.6	1.6	1.6	1.6	1.5	1.5	1.5

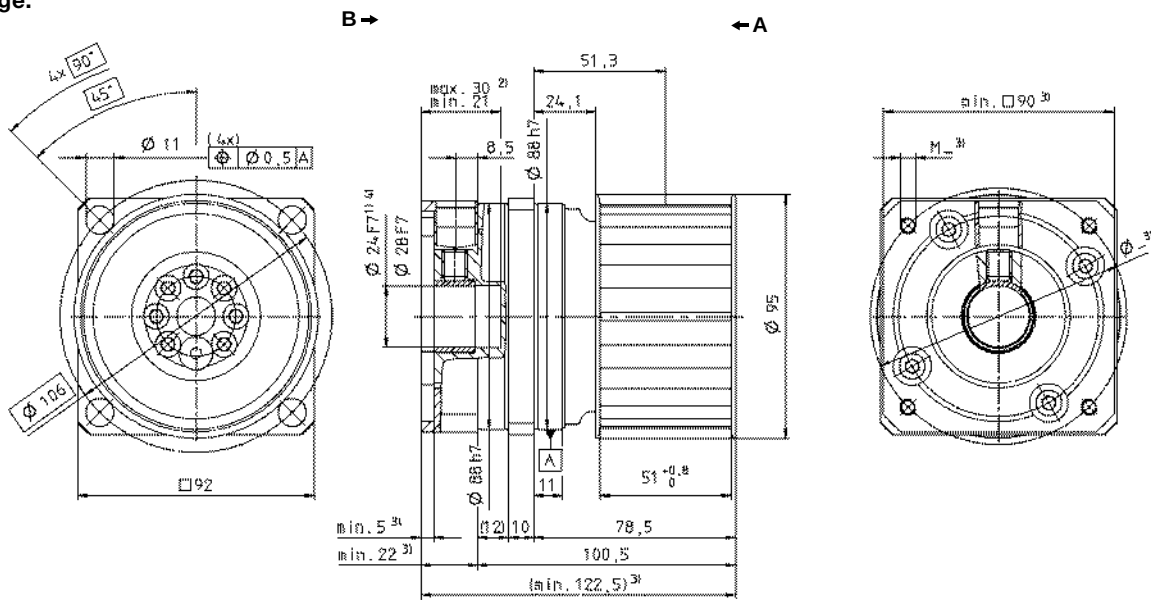
^{a)} For higher ambient temperatures, please reduce input speed

^{b)} Based on the center of the output flange at $n_2 = 100$ rpm

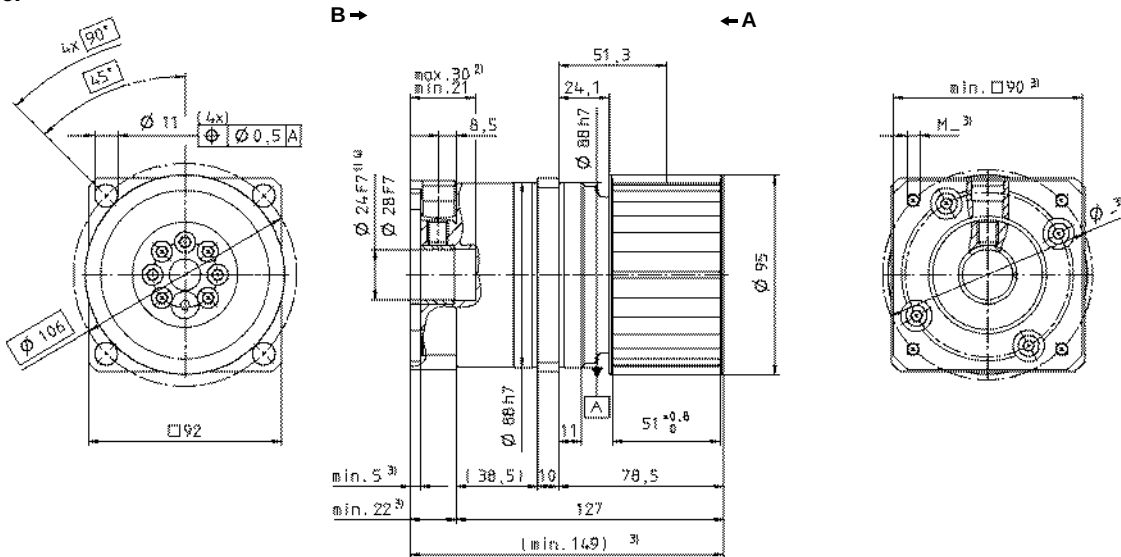
^{c)} With mounted PLPB⁺ belt pulley and 100 rpm

^{d)} Other ratios are available on request: $i = 15, 21, 28$ and 35 .

LPB⁺ 1-stage:

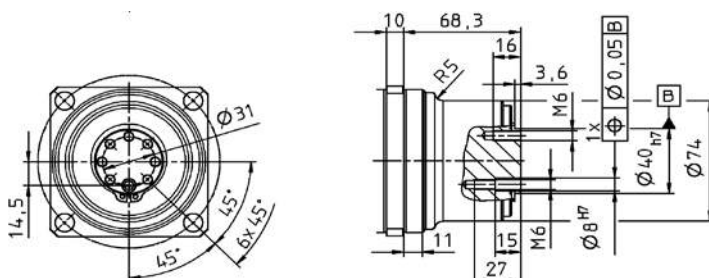


LPB⁺ 2-stage:



Supplement: Belt pulley PLPB⁺ (not included in the scope of delivery – please order separately)

Illustration: Output flange without belt pulley



Belt Pulley PLPB ⁺ 090 Profile AT10-0			
Pitch	p	mm	10
Number of teeth	z		28
Circumference	$z \cdot p$	mm/rotation	280
Inertia	J	kgcm ²	10.95
Mass	m	kg	0.82

Non-tolerated dimensions ± 1 mm

- 1) Check motor shaft fit.
- 2) Min./Max. permissible motor shaft length. Longer motor shafts are adaptable, please contact us.
- 3) The dimensions depend on the motor.
- 4) Smaller motor shaft diameter is compensated by a bushing. Motor shaft diameters up to 28mm available – please contact WITTENSTEIN alpha

CAD data is available under www.wittenstein-alpha.com

Motor mounting according to operating manual

LPB⁺ 120 MF 1/2-stage

			1-stage					2-stage											
Ratio ^{d)}	<i>i</i>		3	4	5	7	10	9	12	16	20	25	30	40	50	70	100		
Max. acceleration torque (max. 1000 cycles per hour)	<i>T</i> _{2B}	Nm	305	305	250	250	220	305	305	305	305	250	305	305	250	250	220		
		in.lb	2700	2700	2210	2210	1950	2700	2700	2700	2700	2210	2700	2700	2210	2210	1950		
Nominal output torque (with <i>n</i> _m)	<i>T</i> _{2N}	Nm	155	155	125	125	110	155	155	155	155	125	155	155	125	125	110		
		in.lb	1370	1370	1110	1110	970	1370	1370	1370	1370	1110	1370	1370	1110	1110	970		
Emergency stop torque (permitted 1000 times during the service life of the gearhead)	<i>T</i> _{2Not}	Nm	400	480	480	480	480	480	480	480	480	480	480	480	480	480	480		
		in.lb	3540	4250	4250	4250	4250	4250	4250	4250	4250	4250	4250	4250	4250	4250	4250		
Nominal input speed (with <i>T</i> _{2N} and 20°C ambient temperature) ^{a)}	<i>n</i> _{1N}	rpm	2600	2600	2600	2600	2600	2600	2600	2600	2600	2600	2600	2600	2600	2600	2600		
Max. input speed	<i>n</i> _{1Max}	rpm	4800	4800	4800	4800	4800	4800	4800	4800	4800	4800	4800	4800	4800	4800	4800		
Mean no load running torque (with <i>n</i> ₁ = 3000 rpm and 20°C gearhead temperature)	<i>T</i> ₀₁₂	Nm	1.1	1.0	0.9	0.8	0.8	0.6	0.6	0.6	0.5	0.5	0.4	0.5	0.4	0.4	0.4		
		in.lb	9.7	8.9	8.0	7.1	7.1	5.3	5.3	4.9	4.4	4.4	3.5	4.4	3.5	3.5	3.5		
Max. torsional backlash	<i>j</i> _t	arcmin	≤ 8					≤ 10											
Torsional rigidity	<i>C</i> _{t21}	Nm/ arcmin	47	47	36	36	30	47	47	47	47	36	47	47	36	36	30		
		in.lb/ arcmin	420	420	320	320	270	420	420	420	420	320	420	420	320	320	270		
Max. axial force ^{b)}	<i>F</i> _{2AMax}	N	4000					4000											
		lb _f	900					900											
Max. radial force ^{c)}	<i>F</i> _{2RMax}	N	9500					9500											
		lb _f	2140					2140											
Efficiency at full load	η	%	97					95											
Service life (For calculation, see the Chapter "Information")	<i>L</i> _n	h	> 20000					> 20000											
Weight incl. standard adapter plate	<i>m</i>	kg	7.3					9.7											
		lb _m	16					21											
Operating noise for i=10 and <i>n</i> ₁ = 3000 rpm without load	<i>L</i> _{PA}	dB(A)	≤ 68																
Max. permitted housing temperature		°C	+90																
		F	194																
Ambient temperature		°C	-15 to +40																
		F	5 to 104																
Lubrication			Lubricated for life																
Paint			Blue RAL 5002																
Direction of rotation			Motor and gearhead same direction																
Protection class			IP 64																
Moment of inertia (relates to the drive)	I	32	<i>J</i> ₁	kgcm ²	6.8	5.9	5.6	5.2	5.1	5.4	5.4	5.5	5.5	5.3	5.3	5.0	5.0	5.0	5.0
				10 ⁻³ in.lb.s ²	6.1	5.2	4.9	4.6	4.5	4.7	4.7	4.9	4.9	4.7	4.7	4.4	4.4	4.4	4.4
Clamping hub diameter (mm)	K	38	<i>J</i> ₁	kgcm ²	7.7	6.8	6.4	6.1	5.9	6.2	6.2	6.4	6.4	6.2	6.2	5.9	5.9	5.9	5.9
				10 ⁻³ in.lb.s ²	6.8	6.0	5.7	5.4	5.2	5.5	5.5	5.7	5.7	5.5	5.5	5.2	5.2	5.2	5.2

^{a)} For higher ambient temperatures, please reduce input speed

^{b)} Based on the center of the output flange at $n_2 = 100$ rpm

^{c)} With mounted PLPB⁺ belt pulley and 100 rpm

^{d)} Other ratios are available on request: $i = 28$.

← A



139

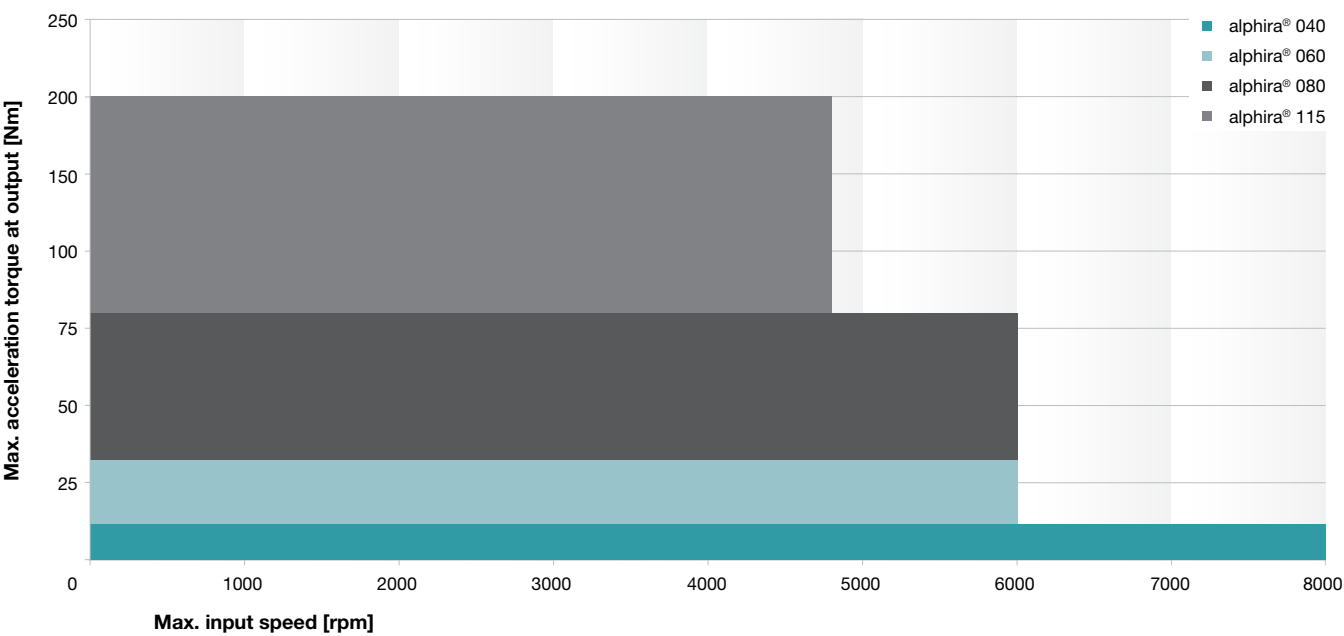
alphira® – Economical entry-level model



The low backlash planetary gearhead with output shaft. This economical entry level model is suitable for simple applications. The alphira® impresses through its quality, availability, and reliability.

Quick size selection

alphira® (example for $i = 5$)
For applications in cyclic operation ($DC \leq 60\%$) or continuous operation ($DC \geq 60\%$)



Versions and Applications

Features	alphira® MO version Catalog page 142
Power density	•
Positioning accuracy	•
High input speeds	• •
Torsional rigidity	•
Space-saving design	• •
Low weight	• • •

Product features

Ratios ^{c)}		4 – 100
Torsional backlash [arcmin] ^{c)}	Standard	≤ 20
	Reduced	–
Output type		
Keywayed output shaft		•
Input type		
Motor mounted version		•
Type		
Food-grade lubrication ^{a) b)}		•
Accessories		
Coupling		•
B5 flange		•

^{a)} Power reduction: technical data available upon request ^{b)} Please contact WITTENSTEIN alpha ^{c)} In relation to reference sizes

Planetary gearheads
Economy



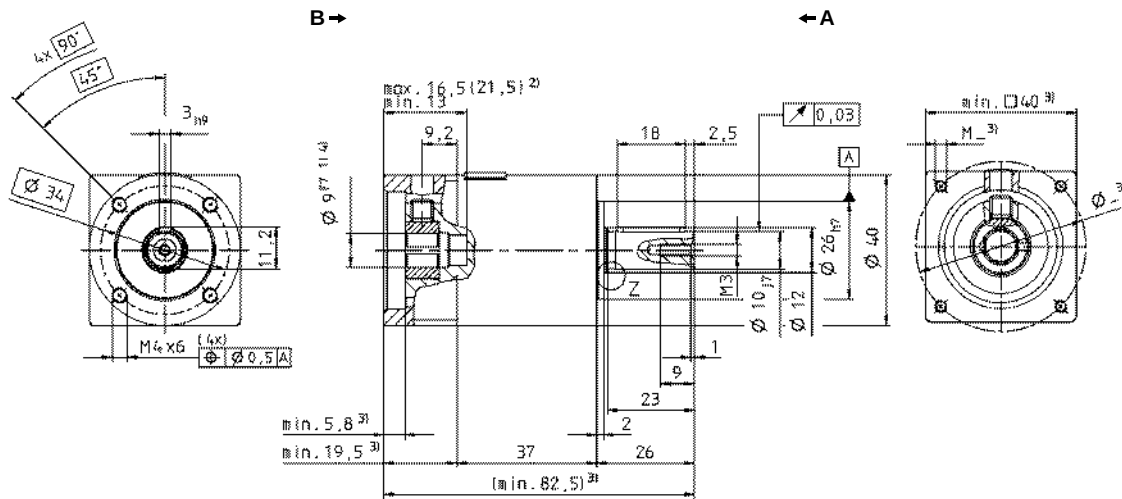
alphira® 040 1/2-stage

			1-stage				2-stage						
Ratio	<i>i</i>		4	5	7	10	16	20	25	35	50	70	100
Max. acceleration torque (max. 1000 cycles per hour)	<i>T</i> _{2B}	Nm	10.5	11.5	11.5	10.5	10.5	10.5	11.5	11.5	11.5	11.5	10.5
		in.lb	93	102	102	93	93	93	102	102	102	102	93
Nominal output torque (with <i>n</i> _m)	<i>T</i> _{2N}	Nm	5.2	5.7	5.7	5.2	5.2	5.2	5.7	5.7	5.7	5.7	5.2
		in.lb	46	50	50	46	46	46	50	50	50	50	46
Emergency stop torque (permitted 1000 times during the service life of the gearhead)	<i>T</i> _{2Not}	Nm	26	26	26	26	26	26	26	26	26	26	26
		in.lb	230	230	230	230	230	230	230	230	230	230	230
Nominal input speed (with <i>T</i> _{2N} and 20°C ambient temperature) ^{a)}	<i>n</i> _{1N}	rpm	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000
Max. input speed	<i>n</i> _{1Max}	rpm	8000	8000	8000	8000	8000	8000	8000	8000	8000	8000	8000
Mean no load running torque (with <i>n</i> ₁ = 3000 rpm and 20°C gearhead temperature)	<i>T</i> ₀₁₂	Nm	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
		in.lb	0.05	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44
Max. torsional backlash	<i>j</i> _t	arcmin	≤ 20				≤ 25						
Torsional rigidity	<i>C</i> _{t21}	Nm/ arcmin	0.58	0.58	0.58	0.52	0.58	0.58	0.58	0.58	0.58	0.58	0.52
		in.lb/ arcmin	5.1	5.1	5.1	4.6	5.1	5.1	5.1	5.1	5.1	5.1	4.6
Max. axial force ^{b)}	<i>F</i> _{2AMax}	N	230				230						
		lb _f	51				51						
Max. radial force ^{b)}	<i>F</i> _{2RMax}	N	200				200						
		lb _f	45				45						
Efficiency at full load	η	%	97				95						
Service life (For calculation, see the Chapter “Information”)	<i>L</i> _h	h	> 20000				> 20000						
Weight incl. standard adapter plate	<i>m</i>	kg	0.31				0.52						
		lb _m	0.69				1.15						
Operating noise (with <i>n</i> ₁ = 3000 rpm no load)	<i>L</i> _{PA}	dB(A)	≤ 66										
Max. permitted housing temperature	°C		+90										
	F		194										
Ambient temperature	°C		-15 to +40										
	F		5 to 104										
Lubrication			Lubricated for life										
Paint			Aluminum										
Direction of rotation			Motor and gearhead same direction										
Protection class			IP 64										
Moment of inertia (relates to the drive)	<i>J</i> _I	kgcm²	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
		10 ⁻³ in.lb.s²	0.036	0.036	0.036	0.036	0.036	0.036	0.036	0.036	0.036	0.036	0.036

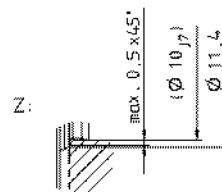
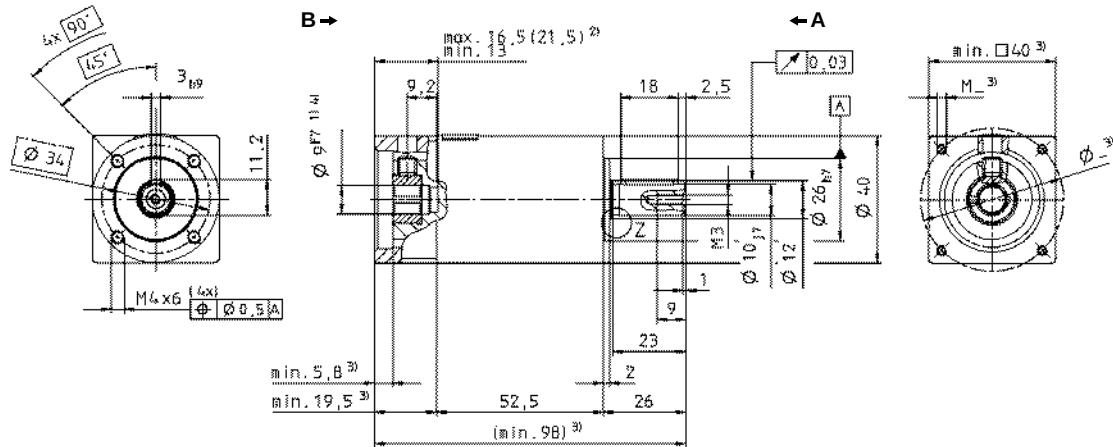
^{a)} For higher ambient temperatures, please reduce input speed

^{b)} Relates to center of the output shaft or flange, at 100 rpm

1-stage:



2-stage:



Non-tolerated dimensions ±1mm

- 1) Check motor shaft fit.
- 2) Min./Max. permissible motor shaft length. Longer motor shafts are adaptable, please contact us.
- 3) The dimensions depend on the motor.
- 4) Smaller motor shaft diameter is compensated by a bushing.

 CAD data is available under www.wittenstein-alpha.com

 Motor mounting according to operating manual

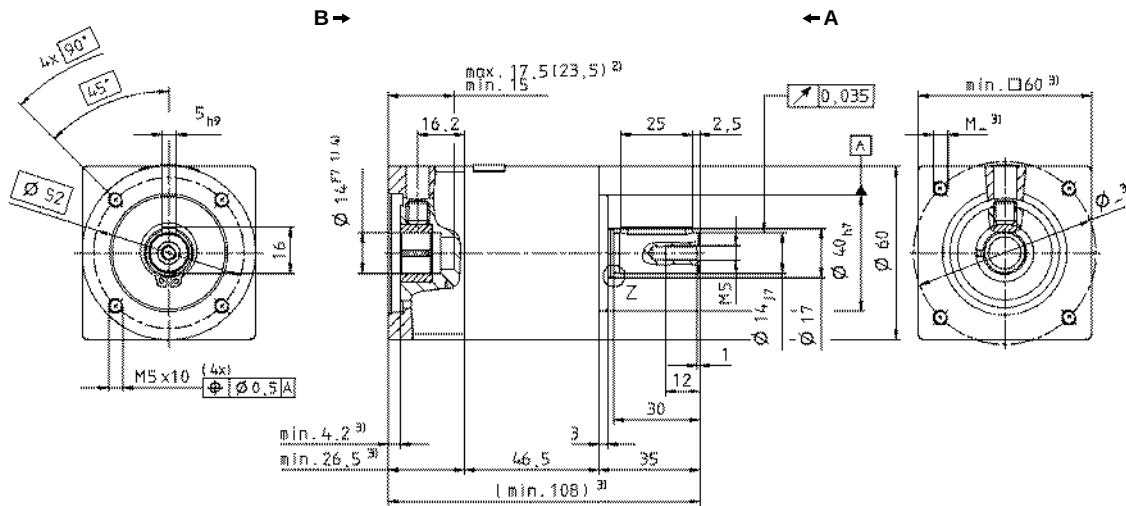
alphira® 060 1/2-stage

			1-stage				2-stage						
Ratio	<i>i</i>		4	5	7	10	16	20	25	35	50	70	100
Max. acceleration torque (max. 1000 cycles per hour)	<i>T</i> _{2B}	Nm	32	32	32	29	32	32	32	32	32	32	29
		in.lb	283	283	283	257	283	283	283	283	283	283	257
Nominal output torque (with <i>n</i> _m)	<i>T</i> _{2N}	Nm	16	16	16	15	16	16	16	16	16	16	15
		in.lb	142	142	142	133	142	142	142	142	142	142	133
Emergency stop torque (permitted 1000 times during the service life of the gearhead)	<i>T</i> _{2Not}	Nm	75	75	75	75	75	75	75	75	75	75	75
		in.lb	664	664	664	664	664	664	664	664	664	664	664
Nominal input speed (with <i>T</i> _{2N} and 20°C ambient temperature) ^{a)}	<i>n</i> _{1N}	rpm	3700	3700	3700	3700	3700	3700	3700	3700	3700	3700	3700
Max. input speed	<i>n</i> _{1Max}	rpm	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000
Mean no load running torque (with <i>n</i> ₁ = 3000 rpm and 20°C gearhead temperature)	<i>T</i> ₀₁₂	Nm	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11
		in.lb	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Max. torsional backlash	<i>j</i> _t	arcmin	≤ 20				≤ 25						
Torsional rigidity	<i>C</i> _{L21}	Nm/ arcmin	2.1	2.1	2.1	1.9	2.1	2.1	2.1	2.1	2.1	2.1	1.9
		in.lb/ arcmin	19	19	19	17	19	19	19	19	19	19	17
Max. axial force ^{b)}	<i>F</i> _{2AMax}	N	750				750						
		lb _f	169				169						
Max. radial force ^{b)}	<i>F</i> _{2RMax}	N	650				650						
		lb _f	146				146						
Efficiency at full load	η	%	97				95						
Service life (For calculation, see the Chapter “Information”)	<i>L</i> _h	h	> 20000				> 20000						
Weight incl. standard adapter plate	<i>m</i>	kg	0.88				1.1						
		lb _m	1.9				2.4						
Operating noise (with <i>n</i> ₁ = 3000 rpm no load)	<i>L</i> _{PA}	dB(A)	≤ 68										
Max. permitted housing temperature	°C		+90										
	F		194										
Ambient temperature	°C		-15 to +40										
	F		5 to 104										
Lubrication			Lubricated for life										
Paint			Aluminum										
Direction of rotation			Motor and gearhead same direction										
Protection class			IP 64										
Moment of inertia (relates to the drive)	<i>J</i> _I	kgcm ²	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17
		10 ⁻³ in.lb.s ²	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15

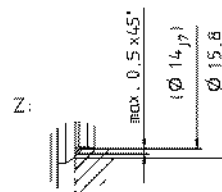
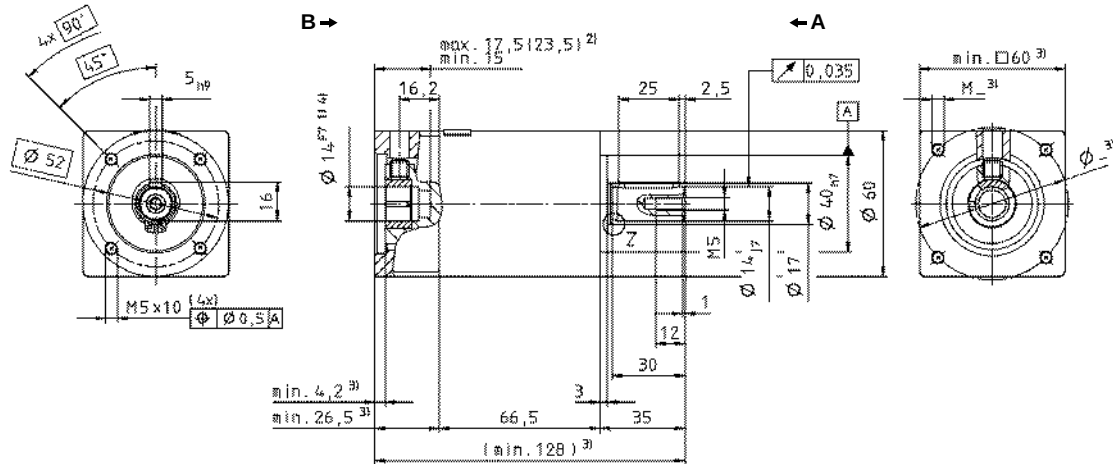
^{a)} For higher ambient temperatures, please reduce input speed

^{b)} Relates to center of the output shaft or flange, at 100 rpm

1-stage:



2-stage:



Non-tolerated dimensions $\pm 1\text{mm}$

- 1) Check motor shaft fit.
- 2) Min./Max. permissible motor shaft length. Longer motor shafts are adaptable, please contact us.
- 3) The dimensions depend on the motor.
- 4) Smaller motor shaft diameter is compensated by a bushing.

CAD data is available under www.wittenstein-alpha.com

Motor mounting according to operating manual

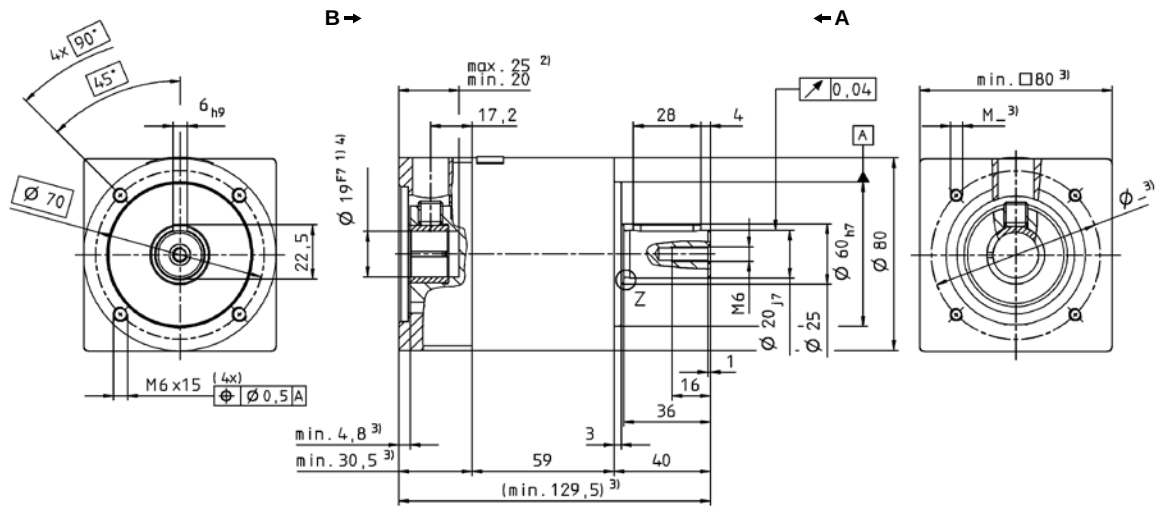
alphira® 080 1/2-stage

			1-stage				2-stage						
Ratio	<i>i</i>		4	5	7	10	16	20	25	35	50	70	100
Max. acceleration torque (max. 1000 cycles per hour)	<i>T</i> _{2B}	Nm	80	80	80	72	80	80	80	80	80	80	72
		in.lb	708	708	708	637	708	708	708	708	708	708	637
Nominal output torque (with <i>n</i> _m)	<i>T</i> _{2N}	Nm	40	40	40	35	40	40	40	40	40	40	35
		in.lb	354	354	354	310	354	354	354	354	354	354	310
Emergency stop torque (permitted 1000 times during the service life of the gearhead)	<i>T</i> _{2Not}	Nm	190	190	190	190	190	190	190	190	190	190	190
		in.lb	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682
Nominal input speed (with <i>T</i> _{2N} and 20°C ambient temperature) ^{a)}	<i>n</i> _{1N}	rpm	3400	3400	3400	3400	3400	3400	3400	3400	3400	3400	3400
Max. input speed	<i>n</i> _{1Max}	rpm	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000
Mean no load running torque (with <i>n</i> _l = 3000 rpm and 20°C gearhead temperature)	<i>T</i> ₀₁₂	Nm	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28
		in.lb	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
Max. torsional backlash	<i>j</i> _t	arcmin	≤ 20				≤ 25						
Torsional rigidity	<i>C</i> _{t21}	Nm/ arcmin	6.1	6.1	6.1	5.5	6.1	6.1	6.1	6.1	6.1	6.1	5.5
		in.lb/ arcmin	54	54	54	49	54	54	54	54	54	54	49
Max. axial force ^{b)}	<i>F</i> _{2AMax}	N	1600				1600						
		lb _f	360				360						
Max. radial force ^{b)}	<i>F</i> _{2RMax}	N	1200				1200						
		lb _f	270				270						
Efficiency at full load	η	%	97				95						
Service life (For calculation, see the Chapter “Information”)	<i>L</i> _h	h	> 20000				> 20000						
Weight incl. standard adapter plate	<i>m</i>	kg	2.1				2.8						
		lb _m	4.6				6.2						
Operating noise (with <i>n</i> _l = 3000 rpm no load)	<i>L</i> _{PA}	dB(A)	≤ 70										
Max. permitted housing temperature	°C		+90										
	F		194										
Ambient temperature	°C		-15 to +40										
	F		5 to 104										
Lubrication			Lubricated for life										
Paint			Aluminum										
Direction of rotation			Motor and gearhead same direction										
Protection class			IP 64										
Moment of inertia (relates to the drive)	<i>J</i> _I	kgcm²	0.54	0.54	0.54	0.54	0.54	0.54	0.54	0.54	0.54	0.54	0.54
		10 ⁻³ in.lb.s²	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48

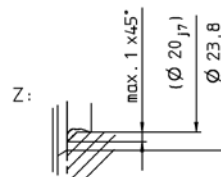
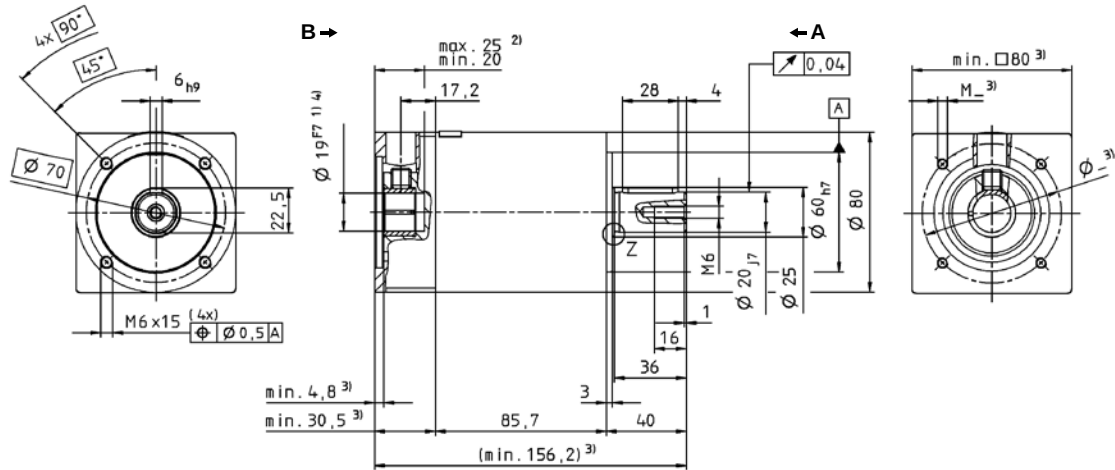
^{a)} For higher ambient temperatures, please reduce input speed

^{b)} Relates to center of the output shaft or flange, at 100 rpm

1-stage:



2-stage:



Non-tolerated dimensions $\pm 1\text{mm}$

- 1) Check motor shaft fit.
- 2) Min./Max. permissible motor shaft length. Longer motor shafts are adaptable, please contact us.
- 3) The dimensions depend on the motor.
- 4) Smaller motor shaft diameter is compensated by a bushing.

 CAD data is available under www.wittenstein-alpha.com

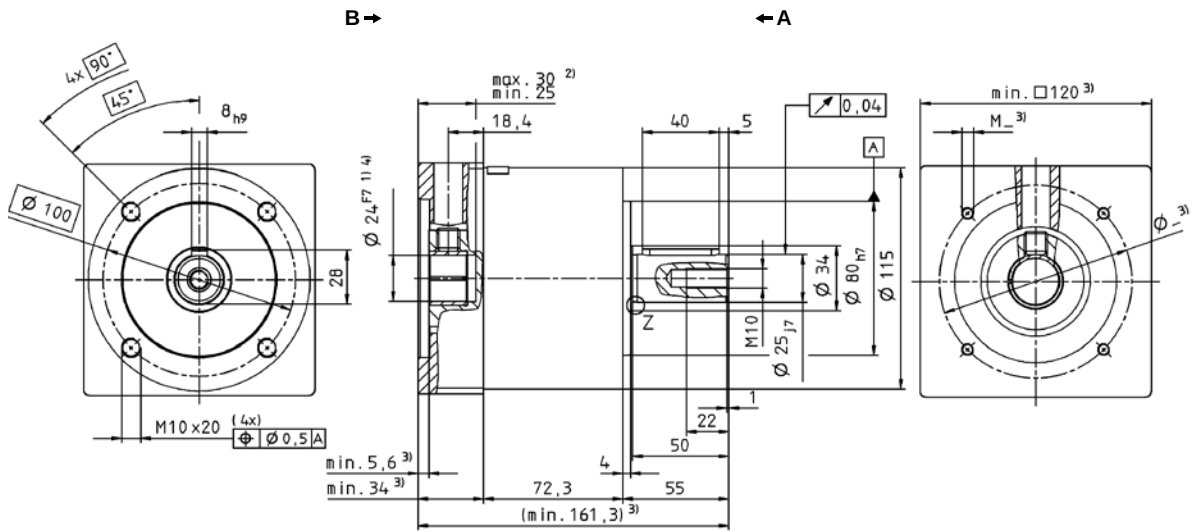
 Motor mounting according to operating manual

			1-stage				2-stage						
Ratio	<i>i</i>		4	5	7	10	16	20	25	35	50	70	100
Max. acceleration torque (max. 1000 cycles per hour)	<i>T</i> _{2B}	Nm	200	200	200	180	200	200	200	200	200	200	180
		in.lb	1770	1770	1770	1593	1770	1770	1770	1770	1770	1770	1593
Nominal output torque (with <i>n</i>_{3N})	<i>T</i> _{2N}	Nm	100	100	100	90	100	100	100	100	100	100	90
		in.lb	885	885	885	797	885	885	885	885	885	885	797
Emergency stop torque (permitted 1000 times during the service life of the gearhead)	<i>T</i> _{2Not}	Nm	480	480	480	480	480	480	480	480	480	480	480
		in.lb	4248	4248	4248	4248	4248	4248	4248	4248	4248	4248	4248
Nominal input speed (with <i>T</i>_{2N} and 20°C ambient temperature) ^{a)}	<i>n</i> _{1N}	rpm	2600	2600	2600	2600	2600	2600	2600	2600	2600	2600	2600
Max. input speed	<i>n</i> _{1Max}	rpm	4800	4800	4800	4800	4800	4800	4800	4800	4800	4800	4800
Mean no load running torque (with <i>n</i>₁ = 3000 rpm and 20°C gearhead temperature)	<i>T</i> ₀₁₂	Nm	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
		in.lb	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4
Max. torsional backlash	<i>j</i> _t	arcmin	≤ 20				≤ 25						
Torsional rigidity	<i>C</i> _{t21}	Nm/ arcmin	16.5	16.5	16.5	14.5	16.5	16.5	16.5	16.5	16.5	16.5	14.5
		in.lb/ arcmin	146	146	146	128	146	146	146	146	146	146	128
Max. axial force ^{b)}	<i>F</i> _{2AMax}	N	2100				2100						
		lb _f	472				472						
Max. radial force ^{b)}	<i>F</i> _{2RMMax}	N	1550				1550						
		lb _f	349				349						
Efficiency at full load	η	%	97				95						
Service life (For calculation, see the Chapter "Information")	<i>L</i> _h	h	> 20000				> 20000						
Weight incl. standard adapter plate	<i>m</i>	kg	5.2				6.9						
		lb _m	11.5				15.2						
Operating noise (with <i>n</i>₁ = 3000 rpm no load)	<i>L</i> _{PA}	dB(A)	≤ 72										
Max. permitted housing temperature	°C		+90										
	F		194										
Ambient temperature	°C		-15 to +40										
	F		5 to 104										
Lubrication			Lubricated for life										
Paint			Aluminum										
Direction of rotation			Motor and gearhead same direction										
Protection class			IP 64										
Moment of inertia (relates to the drive)	<i>J</i> _i	kgcm ²	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
		10 ⁻³ in.lb.s ²	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6

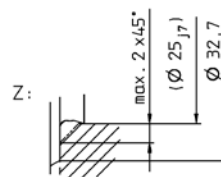
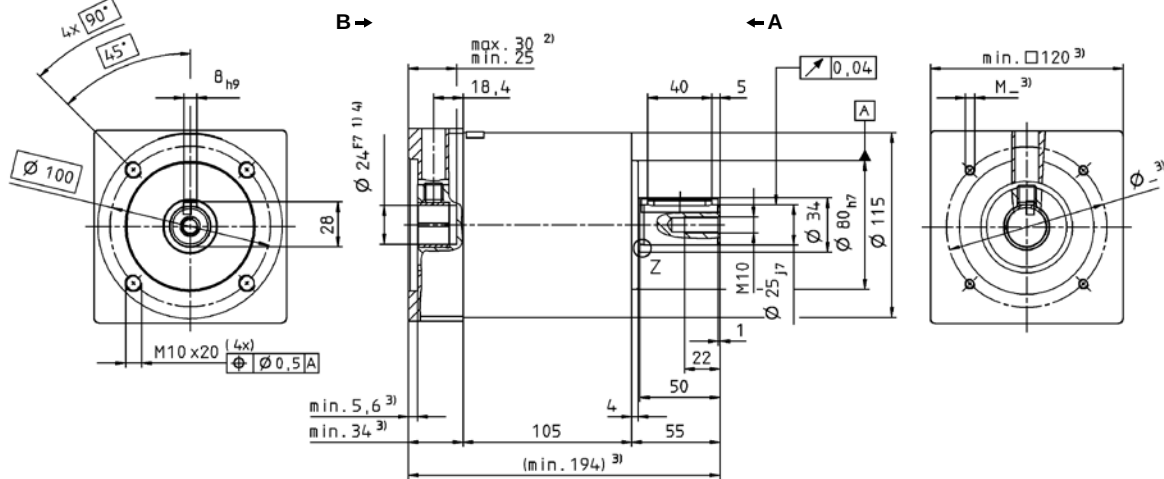
^{a)} For higher ambient temperatures, please reduce input speed

^{b)} Relates to center of the output shaft or flange, at 100 rpm

1-stage:



2-stage:



Non-tolerated dimensions $\pm 1\text{mm}$

- 1) Check motor shaft fit.
- 2) Min./Max. permissible motor shaft length. Longer motor shafts are adaptable, please contact us.
- 3) The dimensions depend on the motor.
- 4) Smaller motor shaft diameter is compensated by a bushing.

 CAD data is available under www.wittenstein-alpha.com

 Motor mounting according to operating manual

Servo right-angle gearheads High End



RPK+

Around corners with power and precision

- Low backlash hypoid gearhead with output flange
- Cyclic operation
- Torsional backlash: ≤ 1 arcmin
- Ratio: 48-5,500

Product highlights:

- High torsional rigidity
- High axial and radial forces
- Easy installation
- Optimized for rack and pinion applications



TK+, TPK+ and TPK+ HIGH TORQUE

Space-saving right-angle precision with output flange

- Low backlash right-angle gearhead with output flange
- Applications in cyclic or continuous operation
- Torsional backlash: ≤ 1.3 arcmin
- Ratio: 3-10,000

Product highlights:

- Large range of ratios
- High torque capacity (MA)
- Optionally available as a hollow shaft version
- Flexibility thanks to various output configurations



SK+ and SPK+

Space-saving right-angle precision with output shaft

- Low backlash hypoid gearhead with output shaft
- Applications in cyclic or continuous operation
- Torsional backlash < 2 arcmin
- Ratio: 3-10,000

Product highlights:

- Diverse range of transmission ratios
- Flexibility thanks to various types of output

Power density ←

Increased productivity

Do you need a machine that operates at maximum productivity? Your servo right-angle gearhead offers 200% more torque, 100% faster speeds than equivalent products and thus creates the perfect conditions for maximum manufacturing efficiency.

Simple and convenient

From an optimized design with our cymex® software to the classic, patented WITTENSTEIN alpha motor mounting and oil/grease volume adapted to each model – WITTENSTEIN alpha right-angle gearheads make your life so much easier.



HG+

Precise hollow shaft solution

- Low backlash hypoid gearhead with hollow shaft
- Applications in cyclic or continuous operation
- Torsional backlash: ≤ 4 arcmin
- Ratio: 3-100

Product highlights:

- Hollow shaft version
- Flexibility thanks to various types of output



SC+ / SPC+ / TPC+

High performance with low ratios

- Low backlash bevel gears with output shaft or output flange
- Applications in cyclic or continuous operation
- Torsional backlash ≤ 2 arcmin
- Ratio: 1-20

Product highlights:

- High power density
- High output speeds
- Efficiency 97%



V-Drive+

Strong torque but quiet running

- Low backlash servo worm gearhead with output shaft, hollow shaft and hollow shaft flange
- Applications in cyclic or continuous operation
- Torsional backlash: ≤ 2 arcmin
- Ratios: 4-40

Product highlights:

- Hollow shaft version
- Single-stage up to $i=40$
- Smooth running
- Good synchronization

Reliable and accurate

The low torsional backlash and high torsional rigidity of your WITTENSTEIN alpha right-angle gearhead assure maximum positioning accuracy of your drives and precision of your machines – even during highly dynamic operation up to 50,000 cycles/hour.

Maximum durability

Your WITTENSTEIN alpha right-angle gearhead is extremely reliable due to the overall design and 100% WITTENSTEIN alpha inspections: **“mount and forget”**. A length compensation feature integrated in your WITTENSTEIN alpha right-angle gearhead as standard maximizes the lifespan of your servo motor during high-speed continuous operation.

Right-angle gearheads
High End



RPK



TK+ / TPK+



SK+ / SPK+



HG+



SC+ / SPC+ / TPC+



V-Drive+

RPK⁺ – Around the corner with power and precision

Sets standards in terms of power density, modularity and easy installation.

The new standard, also available as a right-angle version

Low backlash hypoid gearhead with output flange. The RPK⁺ impresses through its extremely high torsional rigidity, compactness and power density. Thanks to their easy installation and ability to absorb high axial and radial forces, these gearheads are ideal for rack and pinion applications.



The RPK⁺ 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

Performance data for right-angle version

Torsional backlash [arcmin]	< 3
Ratios [-]	66-5,500
Max. torque [N]	10,000
Max. input speed [rpm]	6,000
Efficiency [%]	≤ 92



The geometry of the RPK⁺ output flange is perfectly adapted to the high power density.



The RPK⁺ high performance right-angle gearhead is optimized for rack and pinion applications.

High Performance Linear System

For use where the individual requirements far exceed what has previously been possible. Compared to the industry standard, the values have been improved by 150% on average!

The integrated slots reduce the design and installation requirements to a minimum.

The pinions, which are specially adapted to the gearhead enable the transmission of maximum moving forces.

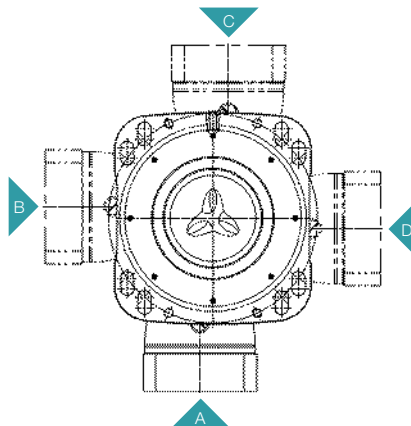
Further information is available in the High Performance Linear System catalog or on the Internet at www.rack-pinion.com

Performance data for linear system

Positioning accuracy [μm]	< 5*
Ratios [-]	66-5,500
Max. moving force per drive [N]	112,000
Movement speed [m/min]	30
Efficiency [%]	≤ 92

* Direct measuring system required

Flexibility during installation



Right-angle gearheads
High End



RPK-



The RPK⁺ is also available as the RPM⁺ actuator version. The RPM⁺ combines the advantages of the RPK⁺ series in an even more compact design. Thanks to its special design, the permanently excited servo motor ensures maximum power density.



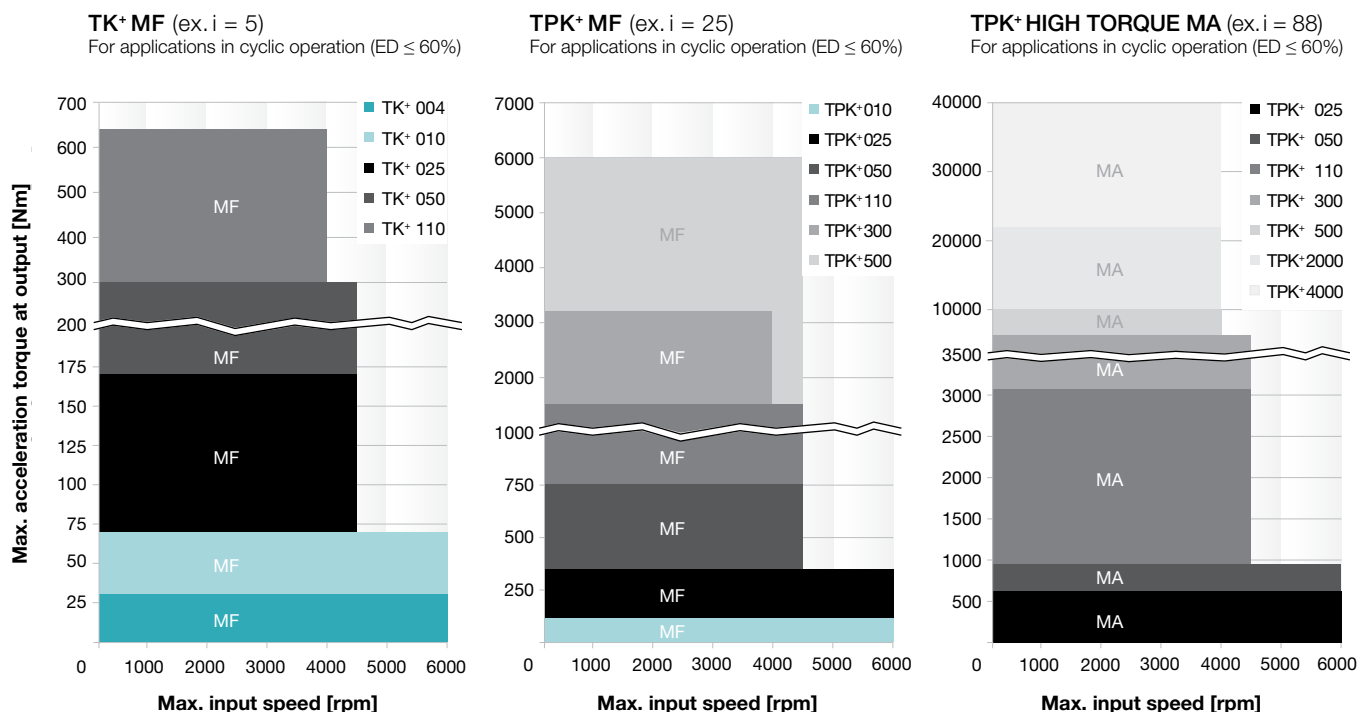
Sets standards in terms of power density, modularity and easy installation.

TK⁺/TPK⁺/TPK⁺ HIGH TORQUE – Space-saving right-angle precision with output flange



The representatives of our versatile hypoid gearhead with TP⁺ compatible output flange and hollow shaft. TPK⁺/TPK⁺ HIGH TORQUE gearheads with planetary stage are especially suitable for high-precision applications requiring higher power and torsional rigidity.

Quick size selection



Versions and Applications

Features	TK ⁺ MF version page 156	TPK ⁺ MF version page 166	TPK ⁺ HIGH TORQUE MA version page 192
Power density	• •	• •	• • •
Positioning accuracy (e.g clamped drives)	• •	• • •	• • •
Highly dynamic applications	• • •	• • •	• • •
Torsional rigidity	• •	• •	• • •

Product features

Ratios ^{c)}		3 - 100	12 - 10000	66 - 5500
Torsional backlash [arcmin] ^{c)}	Standard	≤ 4	≤ 4	≤ 1,3
	Reduced	-	≤ 2	-
Output type				
Smooth output shaft, rear side		•	•	•
Keywayed output shaft, rear side		•	•	•
Output flange			•	•
Hollow shaft interface, rear side Connected via shrink disc		•	•	•
Flanged hollow shaft		•		
Closed cover, rear side		•	•	•
System output with pinion			•	•
Input type				
Motor mounted version		•	•	•
Type				
ATEX ^{a)}		•		
Food-grade lubrication ^{a) b)}		•	•	•
Corrosion resistant ^{a) b)}		•	•	•
Accessories				
Coupling		•	•	•
Rack		•	•	•
Pinion		•	•	•
Shrink disc		•	•	•
torqXis sensor flange		•	•	•
Flange shaft		•	•	•
Intermediate plate for cooling connection		•	•	•
Spindle system		•		

^{a)} Power reduction: technical data available upon request ^{b)} Please contact WITTENSTEIN alpha ^{c)} In relation to reference sizes

Right-angle gearheads
High End



MF

MA

TK⁺ 004 MF 1/2-stage

				1-stage					2-stage									
Ratio ^{a)}	<i>i</i>			3	4	5	7	10	12	16	20	25	28	35	40	50	70	100
Max. acceleration torque (max. 1000 cycles per hour)	<i>T</i> _{2B}	Nm		30	30	30	25	20	30	30	30	30	30	30	30	30	25	20
		in.lb		266	266	266	221	177	266	266	266	266	266	266	266	266	221	177
Nominal output torque (with <i>n</i> _{IN})	<i>T</i> _{2N}	Nm		22	22	22	20	15	22	22	22	22	22	22	22	20	15	
		in.lb		195	195	195	177	133	195	195	195	195	195	195	195	195	177	133
Emergency stop torque (permitted 1000 times during the service life of the gearhead)	<i>T</i> _{2Not}	Nm		40	50	50	45	40	50	50	50	50	50	50	50	45	40	
		in.lb		354	443	443	398	354	443	443	443	443	443	443	443	443	398	354
Nominal input speed (with <i>T</i> _{2N} and 20 °C ambient temperature) ^{b), c)}	<i>n</i> _{1N}	rpm		2200	2400	2700	2700	2700	4400	4400	4400	4400	4400	4400	4400	4800	5500	5500
Max. continuous speed (with 20 % <i>T</i> _{2N} and 20 °C ambient temperature)	<i>n</i> _{1Ncym}	rpm		2700	3100	3600	3100	3100	5000	5000	5000	5000	5000	5000	5000	5000	5500	5500
Max. input speed	<i>n</i> _{1Max}	rpm		6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000
Mean no load running torque (with <i>n</i> ₁ = 3000 rpm and 20 °C gearhead temperature) ^{d)}	<i>T</i> ₀₁₂	Nm		1.4	1.3	1.2	1.4	1.3	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	
		in.lb		12.4	11.5	10.6	12.4	11.5	1.8	1.8	1.8	1.8	1.8	1.8	0.9	0.9	0.9	
Max. torsional backlash	<i>j</i> _t	arcmin		≤ 5														
Torsional rigidity	<i>C</i> _{t21}	Nm/ arcmin		2.6	2.8	3.0	2.6	2.3	2.8	2.8	2.8	2.8	2.8	2.8	2.8	3.0	2.6	2.3
		in.lb/ arcmin		23	25	26	23	20	25	25	25	25	25	25	25	26	23	20
Max. axial force ^{e)}	<i>F</i> _{2AMax}	N		2400														
		lb _f		540														
Max. radial force ^{e)}	<i>F</i> _{2RMax}	N		2700														
		lb _f		608														
Max. tilting moment	<i>M</i> _{2KMax}	Nm		251														
		in.lb		2220														
Efficiency at full load	η	%		96					94									
Service life (For calculation, see the Chapter "Information")	<i>L</i> _h	h		> 20000														
Weight incl. standard adapter plate	<i>m</i>	kg		2.9					3.2									
		lb _m		6.4					7.1									
Operating noise (with <i>n</i> ₁ = 3000 rpm no load)	<i>L</i> _{PA}	dB(A)		≤ 64														
Max. permitted housing temperature		°C		+90														
		F		+194														
Ambient temperature		°C		0 to +40														
		F		32 to 104														
Lubrication				Lubricated for life														
Paint				Blue RAL 5002														
Direction of rotation				Motor and gearhead opposite directions														
Protection class				IP 65														
Moment of inertia (relates to the drive) Clamping hub diameter [mm]	B	11	<i>J</i> ₁	kgcm ²	–	–	–	–	–	0.09	0.09	0.08	0.07	0.06	0.06	0.06	0.06	0.06
				10 ⁻³ in.lb.s ²	–	–	–	–	–	0.08	0.08	0.07	0.07	0.06	0.06	0.05	0.05	0.05
	C	14	<i>J</i> ₁	kgcm ²	0.57	0.46	0.41	0.37	0.35	0.21	0.20	0.19	0.19	0.18	0.18	0.17	0.17	0.17
				10 ⁻³ in.lb.s ²	0.50	0.41	0.36	0.33	0.31	0.18	0.18	0.17	0.16	0.16	0.16	0.15	0.15	0.15
	E	19	<i>J</i> ₁	kgcm ²	0.92	0.82	0.76	0.72	0.70	–	–	–	–	–	–	–	–	–
				10 ⁻³ in.lb.s ²	0.81	0.72	0.68	0.64	0.62	–	–	–	–	–	–	–	–	–

Please contact us for information on the best configuration for S1 conditions of use (continuous operation).

^{a)} Other ratios available on request

^{b)} Higher speeds are possible if the nominal torque is reduced

^{c)} For higher ambient temperatures, please reduce input speed

^{d)} Idling torques decrease during operation

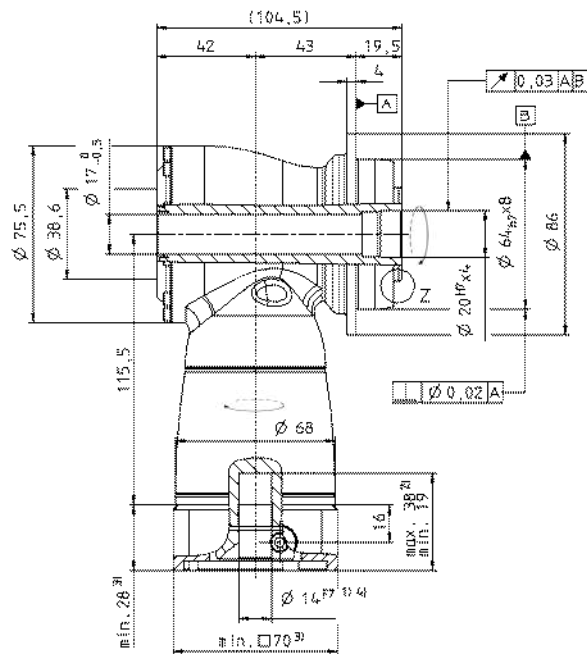
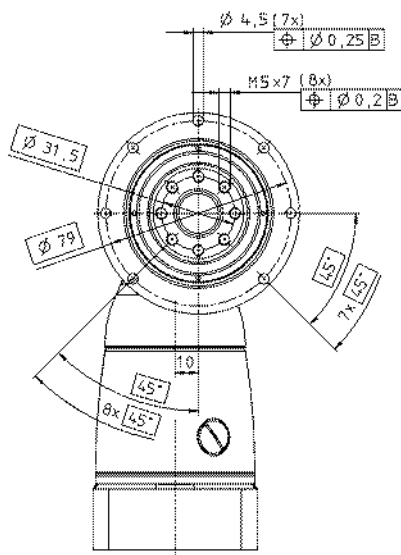
^{e)} Refers to center of the output shaft or flange

All technical data for front output side applies.

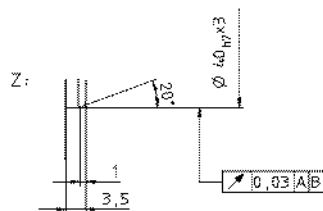
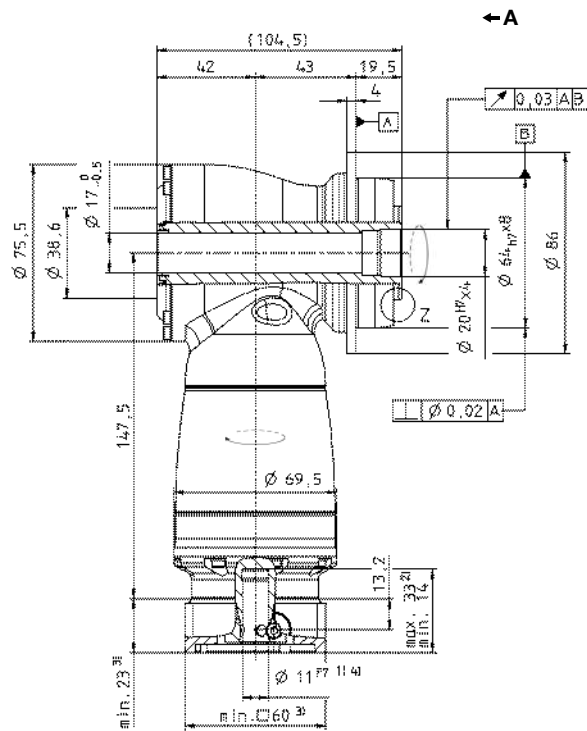
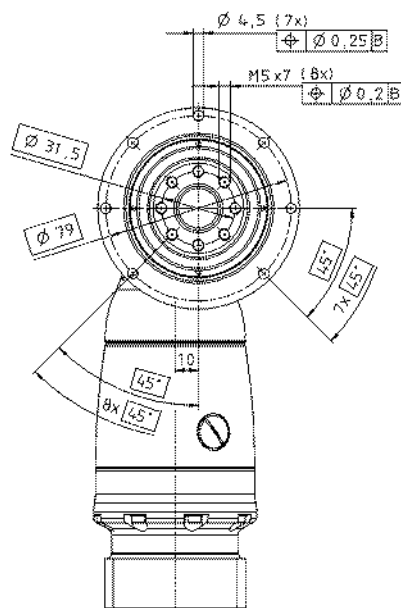
Technical data for rearward output versions, see page 422.

View A

1-stage:



2-stage:



See technical data sheet for available clamping hub diameters (mass moment of inertia). Dimensions available on request.

Non-tolerated dimensions ± 1 mm

- 1) Check motor shaft fit.
- 2) Min./Max. permissible motor shaft length. Longer motor shafts are adaptable, please contact us.
- 3) The dimensions depend on the motor.
- 4) Smaller motor shaft diameter is compensated by a bushing with a minimum thickness of 1 mm.

CAD data is available under www.wittenstein-alpha.com

Motor mounting according to operating manual

Right-angle gearheads
High End

TK

TK+ 010 MF 1/2-stage

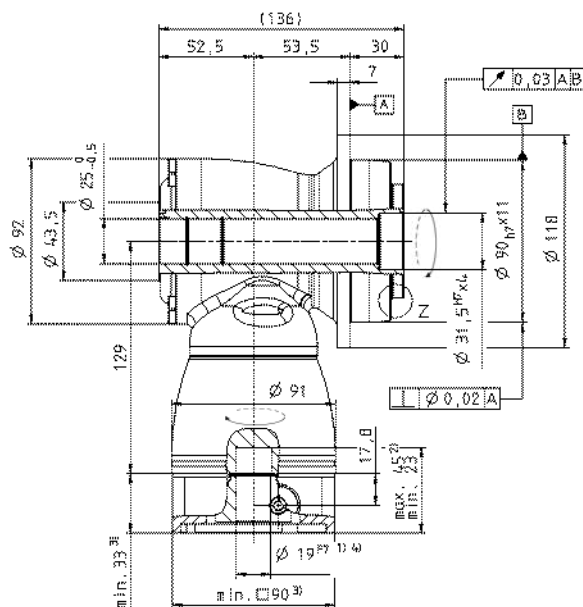
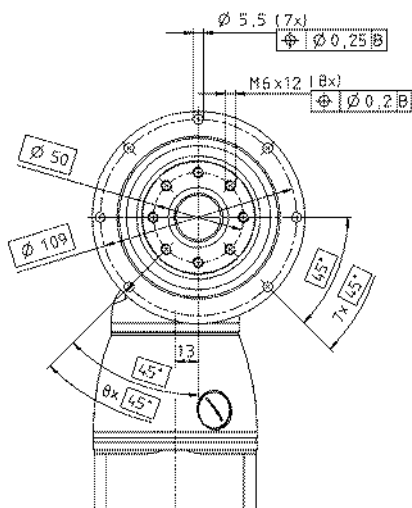
				1-stage					2-stage										
Ratio ^{a)}	<i>i</i>			3	4	5	7	10	12	16	20	25	28	35	40	50	70	100	
Max. acceleration torque (max. 1000 cycles per hour)	<i>T</i> _{2B}	Nm		70	70	70	60	50	70	70	70	70	70	70	70	70	60	50	
		in.lb		620	620	620	531	443	620	620	620	620	620	620	620	620	620	531	443
Nominal output torque (with <i>n</i> _{1N})	<i>T</i> _{2N}	Nm		50	50	50	45	40	50	50	50	50	50	50	50	50	45	40	
		in.lb		443	443	443	398	354	443	443	443	443	443	443	443	443	443	398	354
Emergency stop torque (permitted 1000 times during the service life of the gearhead)	<i>T</i> _{2Not}	Nm		95	115	115	110	100	115	115	115	115	115	115	115	115	110	100	
		in.lb		841	1018	1018	974	885	1018	1018	1018	1018	1018	1018	1018	1018	1018	974	885
Nominal input speed (with <i>T</i> _{2N} and 20 °C ambient temperature) ^{b), c)}	<i>n</i> _{1N}	rpm		2100	2200	2500	2500	2500	3500	3500	3500	3500	3500	3500	3500	3800	4500	4500	
Max. continuous speed (with 20 % <i>T</i> _{2N} and 20 °C ambient temperature)	<i>n</i> _{1Ncym}	rpm		2700	3100	3600	3100	3100	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	
Max. input speed	<i>n</i> _{1Max}	rpm		6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	
Mean no load running torque (with <i>n</i> ₁ = 3000 rpm and 20 °C gearhead temperature) ^{d)}	<i>T</i> ₀₁₂	Nm		2.4	2.0	1.8	2.4	2.2	0.4	0.4	0.3	0.3	0.3	0.3	0.1	0.1	0.1	0.1	
		in.lb		21	18	16	21	19	3.5	3.5	2.7	2.7	2.7	2.7	2.7	0.9	0.9	0.9	0.9
Max. torsional backlash	<i>j</i> _t	arcmin		≤ 4															
Torsional rigidity	<i>C</i> _{t21}	Nm/ arcmin		6.0	7.0	8.0	8.0	8.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	8.0	8.0	8.0	
		in.lb/ arcmin		53	62	71	71	71	62	62	62	62	62	62	62	71	71	71	
Max. axial force ^{e)}	<i>F</i> _{2AMax}	N		3400															
		lb _f		765															
Max. radial force ^{e)}	<i>F</i> _{2RMax}	N		4000															
		lb _f		900															
Max. tilting moment	<i>M</i> _{2KMax}	Nm		437															
		in.lb		3867															
Efficiency at full load	η	%		96					94										
Service life (For calculation, see the Chapter "Information")	<i>L</i> _h	h		> 20000															
Weight incl. standard adapter plate	<i>m</i>	kg		5.3					6.1										
		lb _m		11.7					13.5										
Operating noise (with <i>n</i> ₁ = 3000 rpm no load)	<i>L</i> _{PA}	dB(A)		≤ 66															
Max. permitted housing temperature		°C		+90															
		F		+194															
Ambient temperature		°C		0 to +40															
		F		32 to 104															
Lubrication				Lubricated for life															
Paint				Blue RAL 5002															
Direction of rotation				Motor and gearhead opposite directions															
Protection class				IP 65															
Moment of inertia (relates to the drive) Clamping hub diameter [mm]	C	14	<i>J</i> _i	kgcm ²	–	–	–	–	–	0.31	0.28	0.24	0.23	0.21	0.20	0.19	0.18	0.18	0.18
				10 ⁻³ in.lb.s ²															
	E	19	<i>J</i> _i	kgcm ²	1.81	1.39	1.18	1.02	0.93	0.75	0.72	0.68	0.68	0.63	0.63	0.63	0.63	0.63	0.63
				10 ⁻³ in.lb.s ²	1.60	1.23	1.05	0.90	0.82	0.64	0.64	0.61	0.60	0.59	0.55	0.56	0.56	0.55	0.55
	H	28	<i>J</i> _i	kgcm ²	3.22	2.80	2.60	2.43	2.34	–	–	–	–	–	–	–	–	–	–
				10 ⁻³ in.lb.s ²	2.85	2.48	2.30	2.15	2.07	–	–	–	–	–	–	–	–	–	–

Please contact us for information on the best configuration for S1 conditions of use (continuous operation).

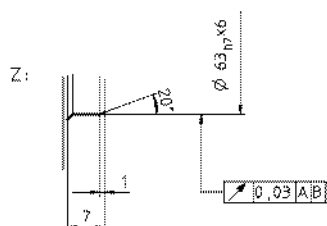
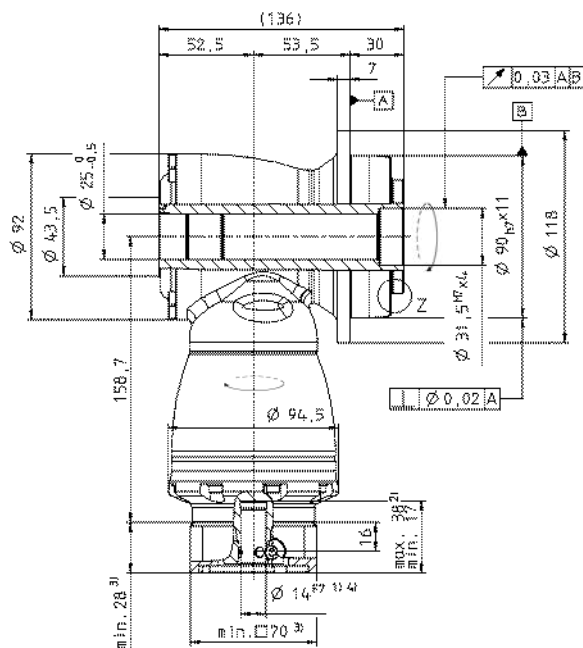
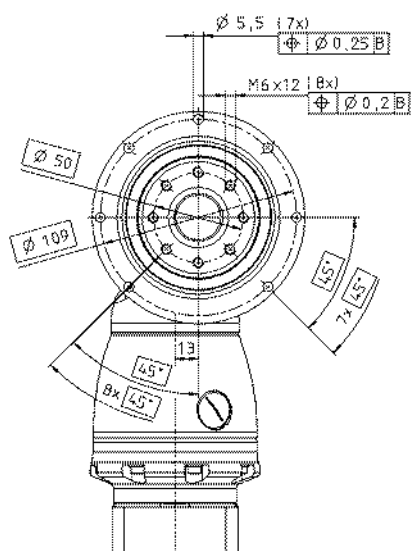
- ^{a)} Other ratios available on request
- ^{b)} Higher speeds are possible if the nominal torque is reduced
- ^{c)} For higher ambient temperatures, please reduce input speed
- ^{d)} Idling torques decrease during operation
- ^{e)} Refers to center of the output shaft or flange

All technical data for front output side applies.
Technical data for rearward output versions, see page 422.

← A



← A



 Motor mounting according to operating manual

TK⁺ 025 MF 1/2-stage

				1-stage					2-stage														
Ratio ^{a)}				<i>i</i>		3	4	5	7	10	12	16	20	25	28	35	40	50	70	100			
Max. acceleration torque (max. 1000 cycles per hour)				<i>T</i> _{2B}	Nm	170	170	170	145	125	170	170	170	170	170	170	170	170	145	125			
					in.lb	1505	1505	1505	1283	1106	1505	1505	1505	1505	1505	1505	1505	1505	1505	1283	1106		
Nominal output torque (with <i>n</i> _{2N})				<i>T</i> _{2N}	Nm	100	100	100	90	80	100	100	100	100	100	100	100	100	90	80			
					in.lb	885	885	885	797	708	885	885	885	885	885	885	885	885	885	797	708		
Emergency stop torque (permitted 1000 times during the service life of the gearhead)				<i>T</i> _{2Not}	Nm	220	260	260	255	250	260	260	260	260	260	260	260	260	255	250			
					in.lb	1947	2301	2301	2257	2213	2301	2301	2301	2301	2301	2301	2301	2301	2301	2257	2213		
Nominal input speed (with <i>T</i> _{2N} and 20 °C ambient temperature) ^{b), c)}				<i>n</i> _{1N}	rpm	2000	2100	2400	2200	2200	3100	3100	3100	3100	3100	3100	3100	3500	4200	4200			
Max. continuous speed (with 20 % <i>T</i> _{2N} and 20 °C ambient temperature)				<i>n</i> _{1N_{oym}}	rpm	2700	3000	3400	3000	3000	4000	4000	4000	4000	4000	4000	4000	4000	4200	4200			
Max. input speed				<i>n</i> _{1Max}	rpm	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500			
Mean no load running torque (with <i>n</i> ₁ =3000 rpm and 20 °C gearhead temperature) ^{d)}				<i>T</i> ₀₁₂	Nm	4.6	3.6	2.8	4.2	3.4	0.7	0.7	0.6	0.5	0.5	0.4	0.2	0.2	0.2	0.2			
					in.lb	41	32	25	37	30	6.2	6.2	5.3	4.4	4.4	3.5	1.8	1.8	1.8	1.8	1.8		
Max. torsional backlash				<i>j</i> _t	arcmin	≤ 4																	
Torsional rigidity				<i>C</i> _{t21}	Nm/ arcmin	12	13	16	16	16	13	13	13	13	13	13	13	13	16	16	16		
					in.lb/ arcmin	106	115	142	142	142	115	115	115	115	115	115	115	115	115	142	142	142	
Max. axial force ^{e)}				<i>F</i> _{2AMax}	N	5700																	
					lb _f	1283																	
Max. radial force ^{e)}				<i>F</i> _{2RMax}	N	6300																	
					lb _f	1418																	
Max. tilting moment				<i>M</i> _{2KMax}	Nm	833																	
					in.lb	7370																	
Efficiency at full load				η	%		96					94											
Service life (For calculation, see the Chapter "Information")				<i>L</i> _h	h		> 20000																
Weight incl. standardadapter plate				<i>m</i>	kg	8.9					10.6												
					lb _m	20					23												
Operating noise (with <i>n</i> ₁ =3000 rpm no load)				<i>L</i> _{PA}	dB(A)		≤ 66																
Max. permitted housing temperature					°C	+90																	
					F	+194																	
Ambient temperature					°C	0 to +40																	
					F	32 to 104																	
Lubrication					Lubricated for life																		
Paint					Blue RAL 5002																		
Direction of rotation					Motor and gearhead opposite directions																		
Protection class					IP 65																		
Moment of inertia (relates to the drive) Clamping hub diameter [mm]				E	19	<i>J</i> ₁	kgcm ²	–	–	–	–	–	1.08	1.01	0.88	0.85	0.76	0.75	0.70	0.69	0.69	0.68	
							10 ⁻³ in.lb.s ²	–	–	–	–	–	0.96	0.89	0.78	0.75	0.67	0.66	0.62	0.66	0.61	0.60	
				G	24	<i>J</i> ₁	kgcm ²	–	–	–	–	–	2.65	2.57	2.44	2.42	2.32	2.31	2.26	2.25	2.25	2.25	
							10 ⁻³ in.lb.s ²	–	–	–	–	–	2.34	2.28	2.16	2.14	2.06	2.05	2.00	2.00	1.99	1.99	
				H	28	<i>J</i> ₁	kgcm ²	5.50	4.30	3.60	3.10	2.90	–	–	–	–	–	–	–	–	–	–	–
							10 ⁻³ in.lb.s ²	4.83	3.77	3.22	2.77	2.54	–	–	–	–	–	–	–	–	–	–	–
				K	38	<i>J</i> ₁	kgcm ²	12.7	11.5	10.9	10.4	10.1	–	–	–	–	–	–	–	–	–	–	–
							10 ⁻³ in.lb.s ²	11.2	10.2	9.63	9.19	8.95	–	–	–	–	–	–	–	–	–	–	–

Please contact us for information on the best configuration for S1 conditions of use (continuous operation).

^{a)} Other ratios available on request

^{b)} Higher speeds are possible if the nominal torque is reduced

^{c)} For higher ambient temperatures, please reduce input speed

^{d)} Idling torques decrease during operation

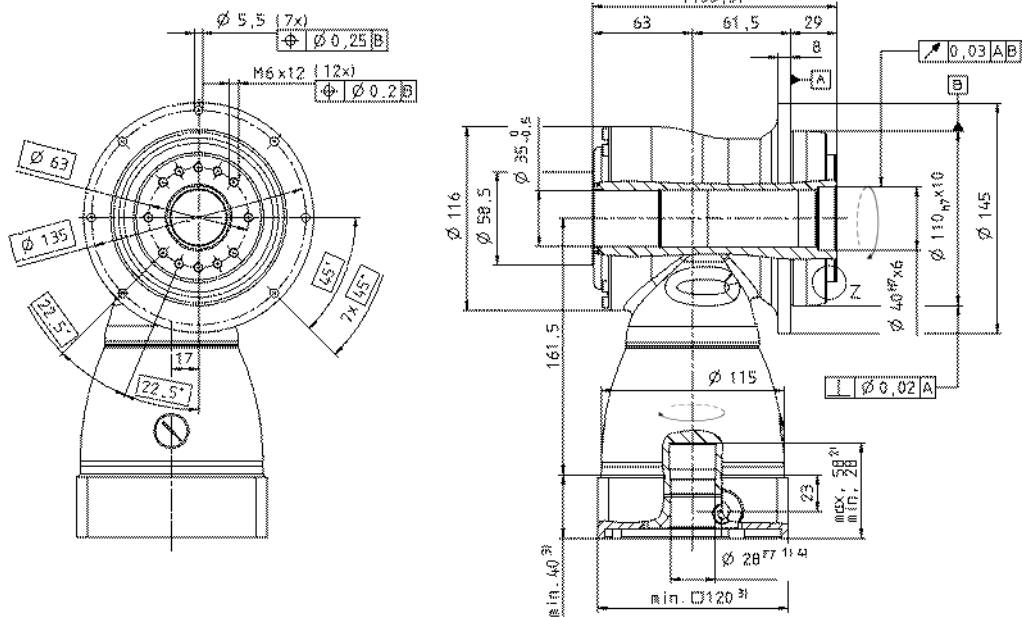
^{e)} Refers to center of the output shaft or flange

All technical data for front output side applies.

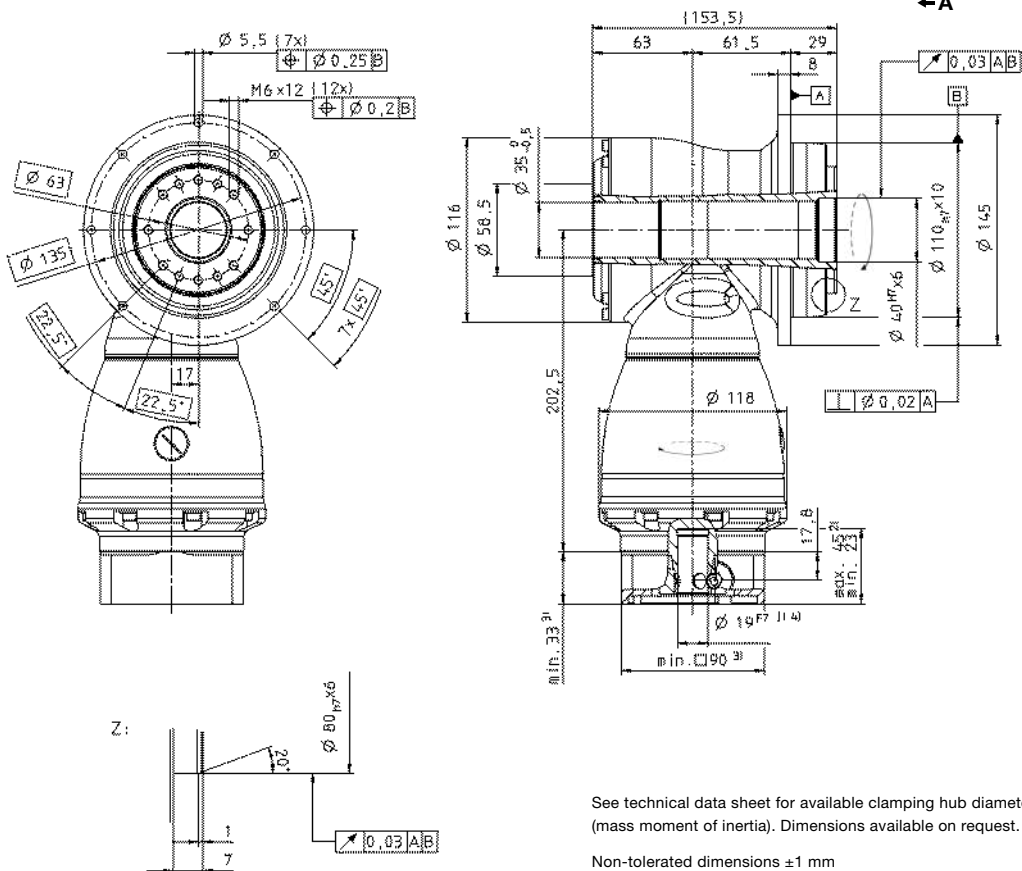
Technical data for rearward output versions, see page 422.

View A

1-stage:



2-stage:



See technical data sheet for available clamping hub diameters (mass moment of inertia). Dimensions available on request.

Non-tolerated dimensions ± 1 mm

- 1) Check motor shaft fit.
- 2) Min./Max. permissible motor shaft length. Longer motor shafts are adaptable, please contact us.
- 3) The dimensions depend on the motor.
- 4) Smaller motor shaft diameter is compensated by a bushing with a minimum thickness of 1 mm.

CAD data is available under www.wittenstein-alpha.com

Motor mounting according to operating manual

Right-angle gearheads
High End

TK

TK+ 050 MF 1/2-stage

				1-stage					2-stage										
Ratio ^{a)}	<i>i</i>		3	4	5	7	10	12	16	20	25	28	35	40	50	70	100		
Max. acceleration torque (max. 1000 cycles per hour)	<i>T</i> _{2B}	Nm	300	300	300	250	210	300	300	300	300	300	300	300	300	250	210		
		in.lb	2655	2655	2655	2213	1859	2655	2655	2655	2655	2655	2655	2655	2655	2655	2213	1859	
Nominal output torque (with <i>n</i> _{1N})	<i>T</i> _{2N}	Nm	190	190	190	175	160	190	190	190	190	190	190	190	190	175	160		
		in.lb	1682	1682	1682	1549	1416	1682	1682	1682	1682	1682	1682	1682	1682	1682	1549	1416	
Emergency stop torque (permitted 1000 times during the service life of the gearhead)	<i>T</i> _{2Not}	Nm	400	500	500	450	400	500	500	500	500	500	500	500	500	450	400		
		in.lb	3540	4425	4425	3983	3540	4425	4425	4425	4425	4425	4425	4425	4425	4425	3983	3540	
Nominal input speed (with <i>T</i> _{2N} and 20 °C ambient temperature) ^{b), c)}	<i>n</i> _{1N}	rpm	1700	1800	2000	1800	1800	2900	2900	2900	2900	2900	2900	2900	3200	3200	3900		
Max. continuous speed (with 20 % <i>T</i> _{2N} and 20 °C ambient temperature)	<i>n</i> _{1Ncym}	rpm	2200	2500	2800	2500	2500	4000	4000	4000	4000	4000	4000	4000	4200	4200	4200		
Max. input speed	<i>n</i> _{1Max}	rpm	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500		
Mean no load running torque (with <i>n</i> ₁ = 3000 rpm and 20 °C gearhead temperature) ^{d)}	<i>T</i> ₀₁₂	Nm	8.4	6.2	5.4	9.0	6.6	1.7	1.1	0.8	0.6	0.6	0.5	0.5	0.4	0.4	0.4		
		in.lb	74	55	48	80	58	15.0	9.7	7.1	5.3	5.3	4.4	4.4	3.5	3.5	3.5		
Max. torsional backlash	<i>j</i> _t	arcmin	≤ 4																
Torsional rigidity	<i>C</i> _{t21}	Nm/ arcmin	36	40	46	44	42	40	40	40	40	40	40	40	46	44	42		
		in.lb/ arcmin	315	356	405	387	376	356	356	356	356	356	356	356	405	387	376		
Max. axial force ^{e)}	<i>F</i> _{2AMax}	N	9900																
		lb _f	2228																
Max. radial force ^{e)}	<i>F</i> _{2RMax}	N	9500																
		lb _f	2138																
Max. tilting moment	<i>M</i> _{2KMax}	Nm	1692																
		in.lb	14974																
Efficiency at full load	η	%	96					94											
Service life (For calculation, see the Chapter "Information")	<i>L</i> _h	h	> 20000																
Weight incl. standardadapter plate	<i>m</i>	kg	22					26											
		lb _m	49					57											
Operating noise (with <i>n</i> ₁ = 3000 rpm no load)	<i>L</i> _{PA}	dB(A)	≤ 68																
Max. permitted housing temperature		°C	+90																
		F	+194																
Ambient temperature		°C	0 to +40																
		F	32 to 104																
Lubrication			Lubricated for life																
Paint			Blue RAL 5002																
Direction of rotation			Motor and gearhead opposite directions																
Protection class			IP 65																
Moment of inertia (relates to the drive) Clamping hub diameter [mm]	G	24	<i>J</i> ₁	kgcm ²	–	–	–	–	–	4.43	3.97	3.36	3.22	2.82	2.75	2.50	2.47	2.44	2.42
				10 ⁻³ in.lb.s ²															
	K	38	<i>J</i> ₁	kgcm ²	28.4	21.0	17.6	14.7	13.1	11.3	10.9	10.3	10.1	9.74	9.66	9.41	9.38	9.35	9.33
				10 ⁻³ in.lb.s ²	25.1	18.6	15.5	13.0	11.6	10.0	9.63	9.09	8.96	8.62	8.55	8.33	8.30	8.28	8.26

Please contact us for information on the best configuration for S1 conditions of use (continuous operation).

^{a)} Other ratios available on request

^{b)} Higher speeds are possible if the nominal torque is reduced

^{c)} For higher ambient temperatures, please reduce input speed

^{d)} Idling torques decrease during operation

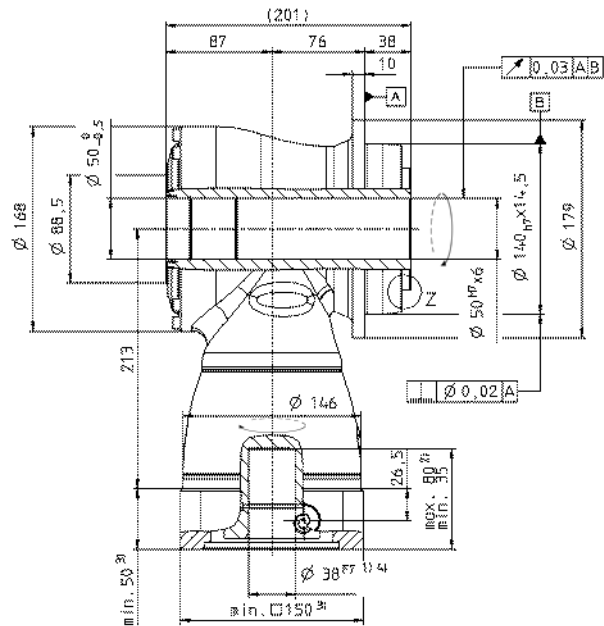
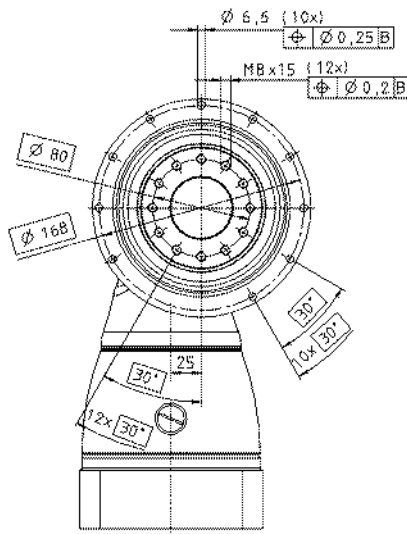
^{e)} Refers to center of the output shaft or flange

All technical data for front output side applies.

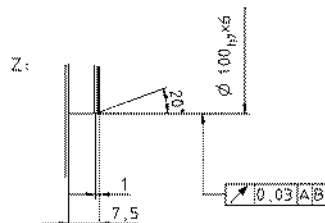
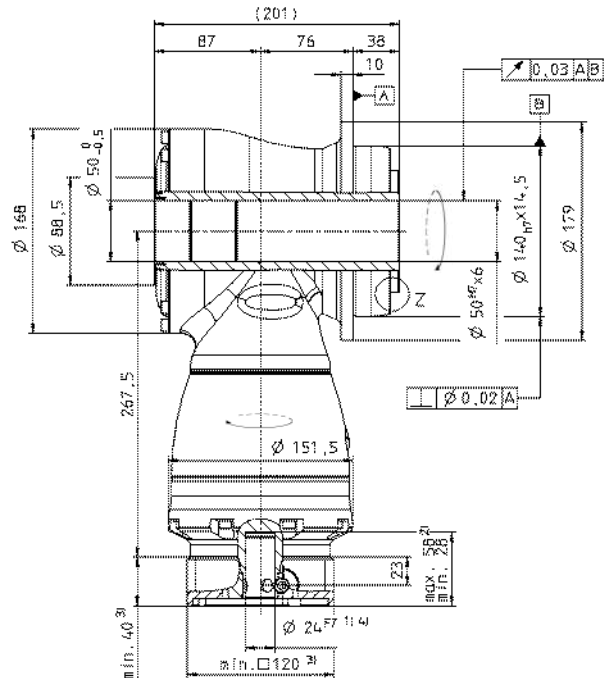
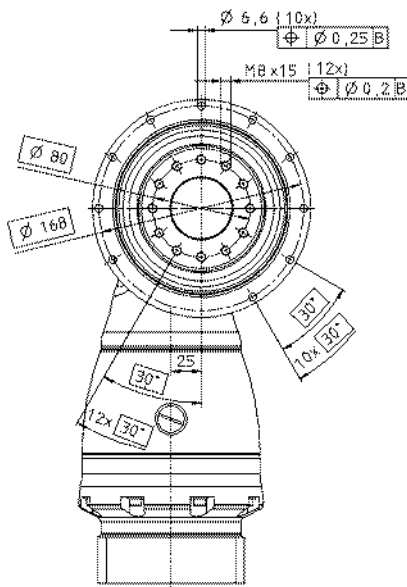
Technical data for rearward output versions, see page 422.

View A

1-stage:



2-stage:



See technical data sheet for available clamping hub diameters (mass moment of inertia). Dimensions available on request.

Non-tolerated dimensions ± 1 mm

- 1) Check motor shaft fit.
- 2) Min./Max. permissible motor shaft length. Longer motor shafts are adaptable, please contact us.
- 3) The dimensions depend on the motor.
- 4) Smaller motor shaft diameter is compensated by a bushing with a minimum thickness of 1 mm.

CAD data is available under www.wittenstein-alpha.com

Motor mounting according to operating manual

Right-angle gearheads
High End

TK

TK⁺ 110 MF 1/2-stage

				1-stage					2-stage										
Ratio ^{a)}	<i>i</i>		3	4	5	7	10	12	16	20	25	28	35	40	50	70	100		
Max. acceleration torque (max. 1000 cycles per hour)	<i>T</i> _{2B}	Nm	640	640	640	550	470	640	640	640	640	640	640	640	640	550	470		
		in.lb	5664	5664	5664	4868	4160	5664	5664	5664	5664	5664	5664	5664	5664	5664	4868	4160	
Nominal output torque (with <i>n</i> _{in})	<i>T</i> _{2N}	Nm	400	400	400	380	360	400	400	400	400	400	400	400	400	380	360		
		in.lb	3540	3540	3540	3363	3186	3540	3540	3540	3540	3540	3540	3540	3540	3540	3363	3186	
Emergency stop torque (permitted 1000 times during the service life of the gearhead)	<i>T</i> _{2Not}	Nm	900	1050	1050	970	900	1050	1050	1050	1050	1050	1050	1050	1050	970	900		
		in.lb	7965	9293	9293	8585	7965	9293	9293	9293	9293	9293	9293	9293	9293	9293	8585	7965	
Nominal input speed (with <i>T</i> _{2N} and 20 °C ambient temperature) ^{b), c)}	<i>n</i> _{1N}	rpm	1400	1600	1800	1600	1600	2700	2700	2700	2700	2700	2700	2700	2900	3200	3400		
Max. continuous speed (with 20 % <i>T</i> _{2N} and 20 °C ambient temperature)	<i>n</i> _{1Ncym}	rpm	1800	2100	2500	2200	2200	3500	3500	3500	3500	3500	3500	3500	3500	3800	3800		
Max. input speed	<i>n</i> _{1Max}	rpm	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000		
Mean no load running torque (with <i>n</i> ₁ =3000 rpm and 20 °C gearhead temperature) ^{d)}	<i>T</i> ₀₁₂	Nm	17.5	14.5	12.0	18.0	15.0	3.6	2.8	2.2	1.9	1.6	1.4	1.1	1.1	1.1	1.1		
		in.lb	155	128	106	159	133	31.9	24.8	19.5	16.8	14.2	12.4	9.7	9.7	9.7	9.7		
Max. torsional backlash	<i>j</i> _t	arcmin	≤ 4																
Torsional rigidity	<i>C</i> _{t21}	Nm/ arcmin	76	87	99	97	96	87	87	87	87	87	87	87	99	97	96		
		in.lb/ arcmin	676	766	874	860	847	766	766	766	766	766	766	766	874	860	847		
Max. axial force ^{e)}	<i>F</i> _{2AMax}	N	14200																
		lb _f	3195																
Max. radial force ^{e)}	<i>F</i> _{2RMax}	N	14700																
		lb _f	3308																
Max. tilting moment	<i>M</i> _{2KMax}	Nm	3213																
		in.lb	28435																
Efficiency at full load	η	%	96					94											
Service life (For calculation, see the Chapter "Information")	<i>L</i> _h	h	> 20000																
Weight incl. standardadapter plate	<i>m</i>	kg	48					54											
		lb _m	106					119											
Operating noise (with <i>n</i> ₁ = 3000 rpm no load)	<i>L</i> _{PA}	dB(A)	≤ 68																
Max. permitted housing temperature		°C	+90																
		F	+194																
Ambient temperature		°C	0 to +40																
		F	32 to 104																
Lubrication			Lubricated for life																
Paint			Blue RAL 5002																
Direction of rotation			Motor and gearhead opposite directions																
Protection class			IP 65																
Moment of inertia (relates to the drive) Clamping hub diameter [mm]	K	38	<i>J</i> _i	kgcm ²	–	–	–	–	–	16.8	14.8	12.9	12.3	11.2	10.9	10.3	10.1	10.0	9.93
				10 ⁻³ in.lb.s ²	–	–	–	–	–	14.8	13.1	11.4	10.9	9.88	9.63	9.08	8.95	8.84	8.79
	M	48	<i>J</i> _i	kgcm ²	96.5	64.6	50.5	38.2	31.8	31.5	29.5	27.6	27.0	25.9	25.6	25.0	24.8	24.7	24.6
				10 ⁻³ in.lb.s ²	85.4	57.2	44.7	33.8	28.1	27.9	26.1	24.4	23.9	22.9	22.6	22.1	22.0	21.9	21.8

Please contact us for information on the best configuration for S1 conditions of use (continuous operation).

^{a)} Other ratios available on request

^{b)} Higher speeds are possible if the nominal torque is reduced

^{c)} For higher ambient temperatures, please reduce input speed

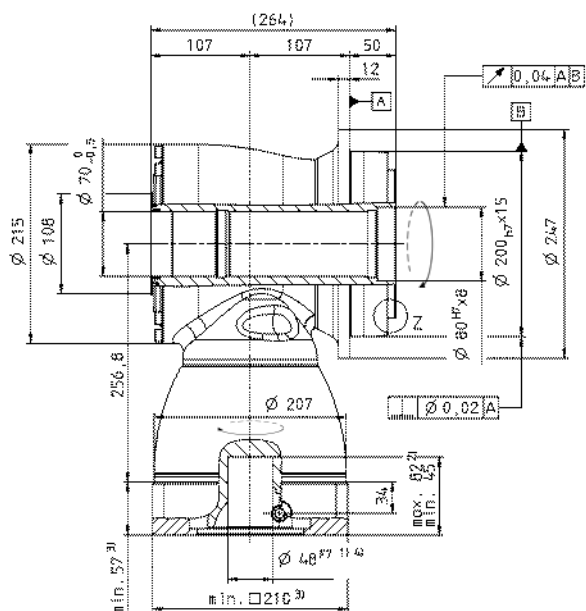
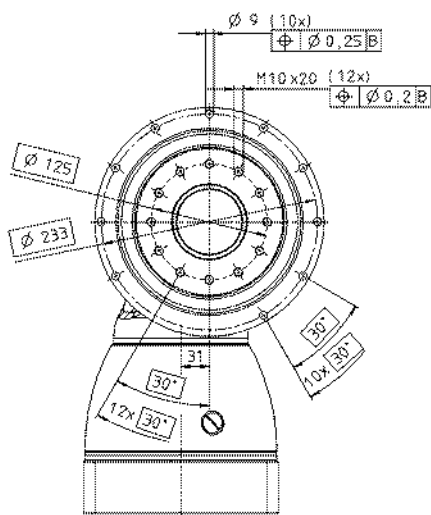
^{d)} Idling torques decrease during operation

^{e)} Refers to center of the output shaft or flange

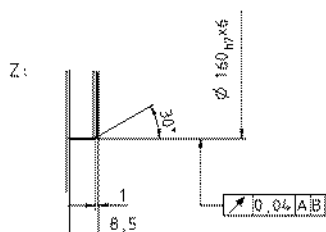
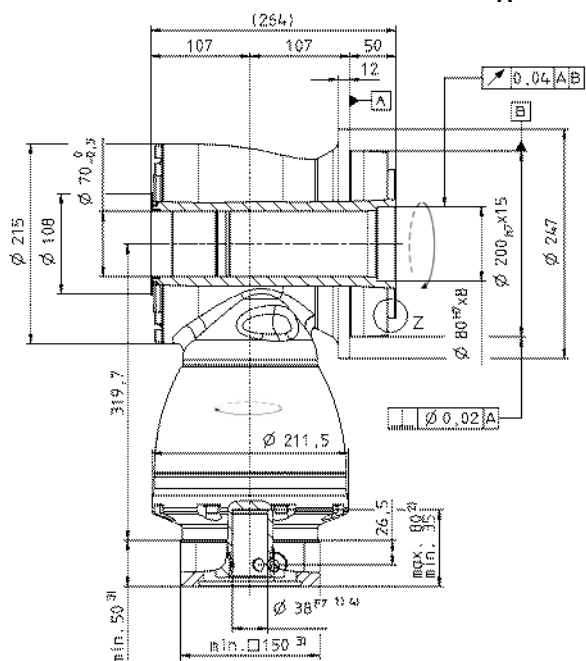
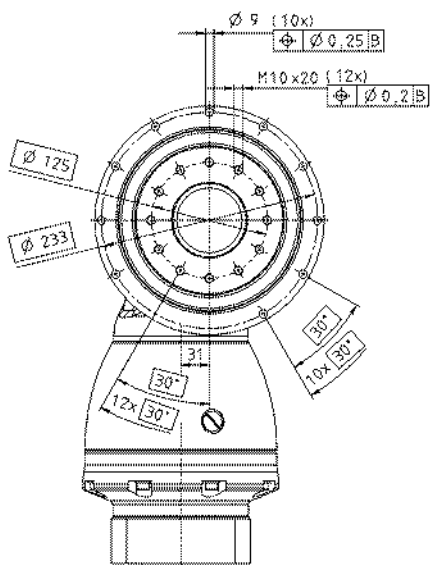
All technical data for front output side applies.

Technical data for rearward output versions, see page 422.

← A



← A



- 1) Check motor shaft fit.
- 2) Min./Max. permissible motor shaft length. Longer motor shafts are adaptable, please contact us.
- 3) The dimensions depend on the motor.
- 4) Smaller motor shaft diameter is compensated by a bushing with a minimum thickness of 1 mm.

 Motor mounting according to operating manual

Right-angle gearheads High End

TK⁺

TPK+ 010 MF 2-stage

					2-stage										
Ratio ^{a)}	<i>i</i>		12	16	20	25	28	35	40	49	50	70	100		
Max. acceleration torque (max. 1000 cycles per hour)	<i>T</i> _{2B}	Nm	120	120	130	130	130	130	80	130	100	130	100		
		in.lb	1.062	1.062	1.151	1.151	1.151	1.151	708	1.151	885	1.151	885		
Nominal output torque (with <i>n</i> _{in})	<i>T</i> _{2N}	Nm	75	75	75	75	75	75	60	75	75	75	60		
		in.lb	664	664	664	664	664	664	531	664	664	664	531		
Emergency stop torque (permitted 1000 times during the service life of the gearhead)	<i>T</i> _{2Not}	Nm	160	200	250	250	250	250	160	250	200	250	250		
		in.lb	1416	1770	2213	2213	2213	2213	1416	2213	1770	2213	2213		
Nominal input speed (with <i>T</i> _{2N} and 20 °C ambient temperature) ^{b), c)}	<i>n</i> _{1N}	rpm	2000	2400	2400	2700	2400	2500	2500	2500	2500	2500	2500		
Max. continuous speed (with 20 % <i>T</i> _{2N} and 20 °C ambient temperature)	<i>n</i> _{1Ncym}	rpm	3000	3400	3400	3800	3400	3200	3200	3200	3200	3200	3200		
Max. input speed	<i>n</i> _{1Max}	rpm	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000		
Mean no load running torque (with <i>n</i> ₁ =3000 rpm and 20 °C gearhead temperature) ^{d)}	<i>T</i> ₀₁₂	Nm	1.5	1.3	1.2	1.2	1.2	1.3	1.3	1.3	1.3	1.3	1.3		
		in.lb	13.3	11.5	10.6	10.6	10.6	11.5	11.5	11.5	11.5	11.5	11.5		
Max. torsional backlash	<i>j</i> _t	arcmin	Standard ≤ 5 / Reduced ≤ 3												
Torsional rigidity	<i>C</i> _{t21}	Nm/ arcmin	16	16	20	21	23	24	15	23	19	22	27		
		in.lb/ arcmin	142	142	177	186	204	212	133	204	168	195	239		
Tilting rigidity	<i>C</i> _{2K}	Nm/ arcmin	225												
		in.lb/ arcmin	1991												
Max. axial force ^{e)}	<i>F</i> _{2AMax}	N	2150												
		lb _f	484												
Max. tilting moment	<i>M</i> _{2KMax}	Nm	235												
		in.lb	2080												
Efficiency at full load	η	%	94												
Service life (For calculation, see the Chapter "Information")	<i>L</i> _h	h	> 20000												
Weight incl. standard adapter plate	<i>m</i>	kg	5.2												
		lb _m	11.5												
Operating noise (with <i>n</i> ₁ = 3000 rpm no load)	<i>L</i> _{PA}	dB(A)	≤ 66												
Max. permitted housing temperature		°C	+90												
		F	+194												
Ambient temperature		°C	0 to +40												
		F	32 to 104												
Lubrication			Lubricated for life												
Paint			Blue RAL 5002												
Direction of rotation			Motor and gearhead opposite directions												
Protection class			IP 65												
Moment of inertia (relates to the drive) Clamping hub diameter [mm]	C	14	<i>J</i> _I	kgcm ²	0.55	0.46	0.44	0.39	0.43	0.36	0.34	0.37	0.34	0.34	0.34
				10 ⁻³ in.lb.s ²	0.49	0.40	0.39	0.35	0.38	0.32	0.30	0.33	0.30	0.30	0.30
	E	19	<i>J</i> _I	kgcm ²	0.90	0.81	0.79	0.75	0.78	0.71	0.70	0.72	0.70	0.69	0.69
				10 ⁻³ in.lb.s ²	0.80	0.72	0.70	0.66	0.69	0.63	0.62	0.64	0.62	0.61	0.61

Please contact us for information on the best configuration for S1 conditions of use (continuous operation).

^{a)} Other ratios up to $i=1000$ available on request

^{b)} Higher speeds are possible if the nominal torque is reduced

^{c)} For higher ambient temperatures, please reduce input speed

^{d)} Idling torques decrease during operation

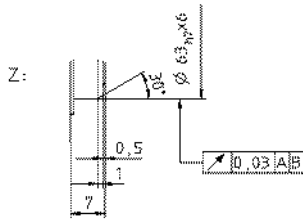
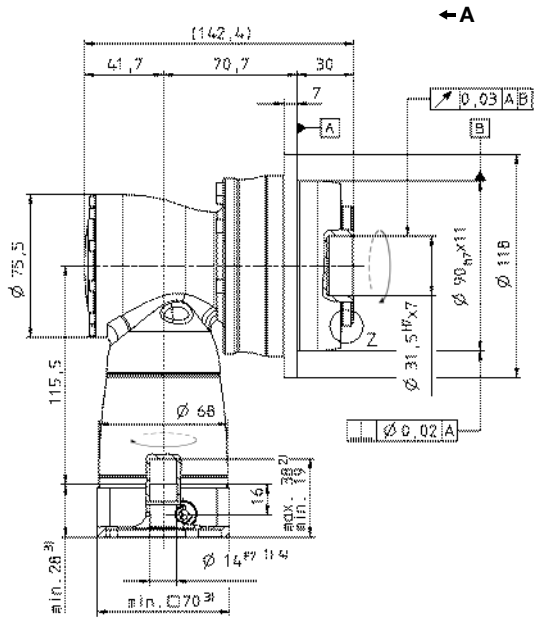
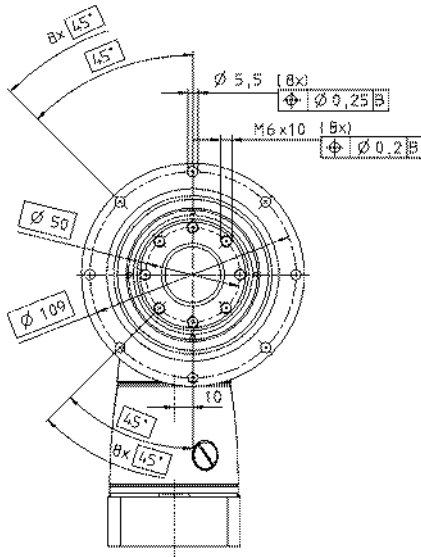
^{e)} Refers to center of the output shaft or flange

All technical data for front output side applies.

Technical data for rearward output versions, see page 422.

View A

2-stage:



See technical data sheet for available clamping hub diameters (mass moment of inertia). Dimensions available on request.

Non-tolerated dimensions ± 1 mm

- 1) Check motor shaft fit.
- 2) Min./Max. permissible motor shaft length. Longer motor shafts are adaptable, please contact us.
- 3) The dimensions depend on the motor.
- 4) Smaller motor shaft diameter is compensated by a bushing with a minimum thickness of 1 mm.

CAD data is available under www.wittenstein-alpha.com

Motor mounting according to operating manual

TPK+ 010 MF 3-stage

			3-stage													
Ratio ^{a)}	<i>i</i>		64	84	100	125	140	175	200	250	280	350	400	500	700	1000
Max. acceleration torque (max. 1000 cycles per hour)	<i>T</i> _{2B}	Nm	120	120	130	130	130	130	130	130	130	130	80	100	130	100
		in.lb	1062	1062	1151	1151	1151	1151	1151	1151	1151	1151	708	885	1151	885
Nominal output torque (with <i>n</i> _N)	<i>T</i> _{2N}	Nm	85	85	90	90	90	90	90	90	75	90	60	75	90	60
		in.lb	752	752	797	797	797	797	797	797	664	797	531	664	797	531
Emergency stop torque (permitted 1000 times during the service life of the gearhead)	<i>T</i> _{2Not}	Nm	200	160	250	250	250	250	250	250	250	250	160	200	250	250
		in.lb	1770	1416	2213	2213	2213	2213	2213	2213	2213	2213	1416	1770	2213	2213
Nominal input speed (with <i>T</i> _{2N} and 20 °C ambient temperature) b), c)	<i>n</i> _{1N}	rpm	4400	4400	4400	4400	4400	4400	4400	4800	4400	4800	5500	5500	5500	5500
Max. continuous speed (with 20 % <i>T</i> _{2N} and 20 °C ambient temperature)	<i>n</i> _{1Ncym}	rpm	5000	5000	5000	5000	5000	5000	5000	5000	5000	5500	5500	5500	5500	5500
Max. input speed	<i>n</i> _{1Max}	rpm	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000
Mean no load running torque (with <i>n</i> ₁ =3000 rpm and 20 °C gearhead temperature) d)	<i>T</i> ₀₁₂	Nm	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
		in.lb	2.7	2.7	2.7	2.7	2.7	2.7	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
Max. torsional backlash	<i>j</i> _t	arcmin	Standard ≤ 5 / Reduced ≤ 3													
Torsional rigidity	<i>C</i> _{t21}	Nm/ arcmin	16	16	20	21	20	21	20	21	23	24	15	19	22	27
		in.lb/ arcmin	142	142	177	186	177	186	177	186	204	212	133	168	195	239
Tilting rigidity	<i>C</i> _{2K}	Nm/ arcmin	225													
		in.lb/ arcmin	1991													
Max. axial force ^{e)}	<i>F</i> _{2AMax}	N	2150													
		lb _f	484													
Max. tilting moment	<i>M</i> _{2KMax}	Nm	235													
		in.lb	2080													
Efficiency at full load	<i>η</i>	%	92													
Service life (For calculation, see the Chapter "Information")	<i>L</i> _h	h	> 20000													
Weight incl. standard adapter plate	<i>m</i>	kg	5,5													
		lb _m	12,2													
Operating noise (with <i>n</i> ₁ = 3000 rpm no load)	<i>L</i> _{PA}	dB(A)	≤ 66													
Max. permitted housing temperature		°C	+90													
		F	+194													
Ambient temperature		°C	0 to +40													
		F	32 to 104													
Lubrication			Lubricated for life													
Paint			Blue RAL 5002													
Direction of rotation			Motor and gearhead opposite directions													
Protection class			IP 65													
Moment of inertia (relates to the drive) Clamping hub diameter [mm]	B	11	<i>J</i> ₁	kgcm ²	0.09	0.07	0.08	0.07	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
				10 ⁻³ in.lb.s ²	0.08	0.06	0.07	0.06	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
	C	14	<i>J</i> ₁	kgcm ²	0.20	0.18	0.19	0.19	0.18	0.18	0.17	0.17	0.17	0.17	0.17	0.17
				10 ⁻³ in.lb.s ²	0.18	0.16	0.17	0.17	0.16	0.16	0.15	0.15	0.15	0.15	0.15	0.15

Please contact us for information on the best configuration for S1 conditions of use (continuous operation).

^{a)} Other ratios available on request

^{b)} Higher speeds are possible if the nominal torque is reduced

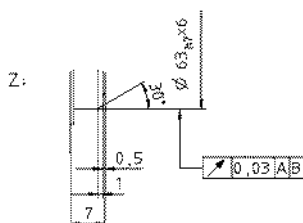
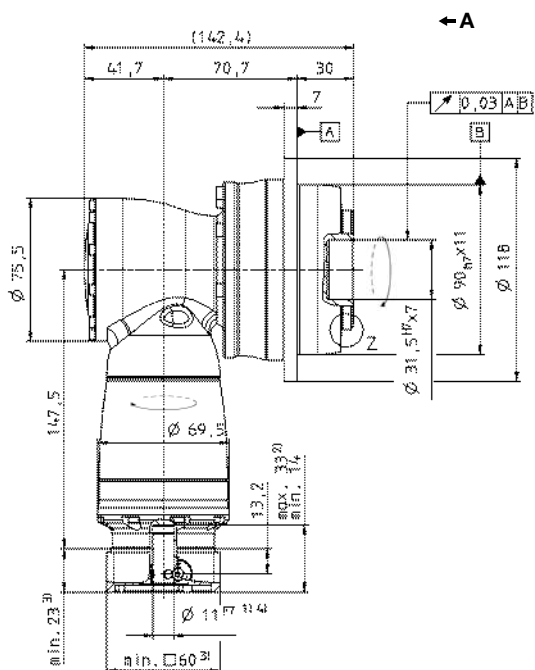
^{c)} For higher ambient temperatures, please reduce input speed

^{d)} Idling torques decrease during operation

^{e)} Refers to center of the output shaft or flange

All technical data for front output side applies.

Technical data for rearward output versions, see page 422.



MF

 Motor mounting according to operating manual

TPK+ 025 MF 2-stage

			2-stage										
Ratio ^{a)}	<i>i</i>		12	16	20	25	28	35	40	49	50	70	100
Max. acceleration torque (max. 1000 cycles per hour)	T_{2B}	Nm	280	280	350	350	350	330	330	330	265	400	400
		in.lb	2478	2478	3098	3098	3098	2921	1770	2921	2213	2921	2345
Nominal output torque (with n_m)	T_{2N}	Nm	170	170	170	170	170	170	160	170	170	170	120
		in.lb	1505	1505	1505	1505	1505	1505	1416	1505	1505	1505	1062
Emergency stop torque (permitted 1000 times during the service life of the gearhead)	T_{2Not}	Nm	400	575	575	500	625	625	400	625	500	625	625
		in.lb	3540	5089	5089	5089	5531	5531	3540	5531	4425	5531	5531
Nominal input speed (with T_{2N} and 20 °C ambient temperature) ^{b), c)}	n_{1N}	rpm	2000	2400	2400	2700	2400	2500	2500	2500	2500	2500	2500
Max. continuous speed (with 20 % T_{2N} and 20 °C ambient temperature)	$n_{1N_{cym}}$	rpm	3000	3400	3400	3800	3400	3200	3200	3200	3200	3200	3200
Max. input speed	n_{1Max}	rpm	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000
Mean no load running torque (with $n_1=3000$ rpm and 20 °C gearhead temperature) ^{d)}	T_{012}	Nm	2.5	2.1	2.0	1.8	2.0	1.8	2.0	2.2	2.0	2.0	2.0
		in.lb	22.1	18.6	17.7	15.9	17.7	15.9	17.7	19.5	17.7	17.7	17.7
Max. torsional backlash	j_t	arcmin	Standard ≤ 4 / Reduced ≤ 2										
Torsional rigidity	C_{t21}	Nm/ arcmin	40	42	53	55	59	60	44	60	55	60	56
		in.lb/ arcmin	354	372	469	487	522	531	389	531	487	531	496
Tilting rigidity	C_{2K}	Nm/ arcmin	550										
		in.lb/ arcmin	4868										
Max. axial force ^{e)}	F_{2AMax}	N	4150										
		lb _f	934										
Max. tilting moment	M_{2KMax}	Nm	413										
		in.lb	3655										
Efficiency at full load	η	%	94										
Service life (For calculation, see the Chapter "Information")	L_h	h	> 20000										
Weight incl. standard adapter plate	m	kg	9.0										
		lb _m	19.9										
Operating noise (with $n_1 = 3000$ rpm no load)	L_{PA}	dB(A)	≤ 68										
Max. permitted housing temperature		°C	+90										
		F	+194										
Ambient temperature		°C	0 to +40										
		F	32 to 104										
Lubrication			Lubricated for life										
Paint			Blue RAL 5002										
Direction of rotation			Motor and gearhead opposite directions										
Protection class			IP 65										
Moment of inertia (relates to the drive) Clamping hub diameter [mm]	E 19	J_1	kgcm ²	1.43	1.18	1.16	1.04	1.14	0.94	0.89	0.95	0.89	0.89
			10 ⁻³ in.lb.s ²	1.27	1.04	1.02	0.92	1.01	0.83	0.79	0.84	0.79	0.78
	H 28	J_1	kgcm ²	2.85	2.59	2.57	2.45	2.56	2.40	2.31	2.37	2.30	2.30
			10 ⁻³ in.lb.s ²	2.52	2.29	2.27	2.17	2.26	2.08	2.04	2.10	2.04	2.04

Please contact us for information on the best configuration for S1 conditions of use (continuous operation).

^{a)} Other ratios up to i=1000 available on request

^{b)} Higher speeds are possible if the nominal torque is reduced

^{c)} For higher ambient temperatures, please reduce input speed

^{d)} Idling torques decrease during operation

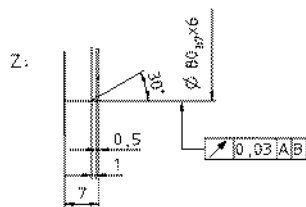
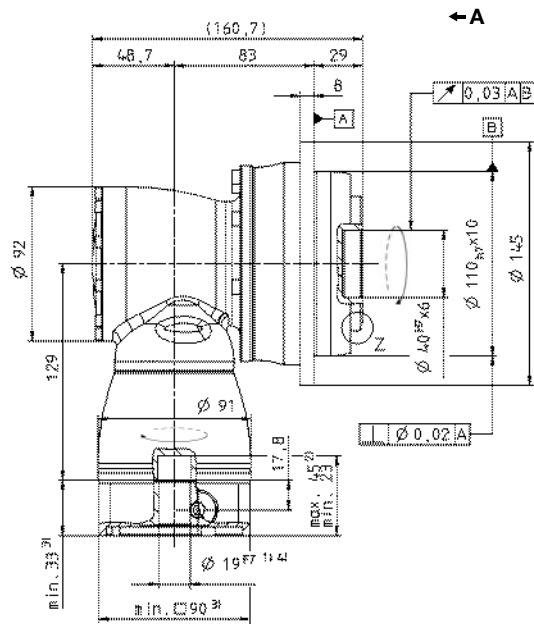
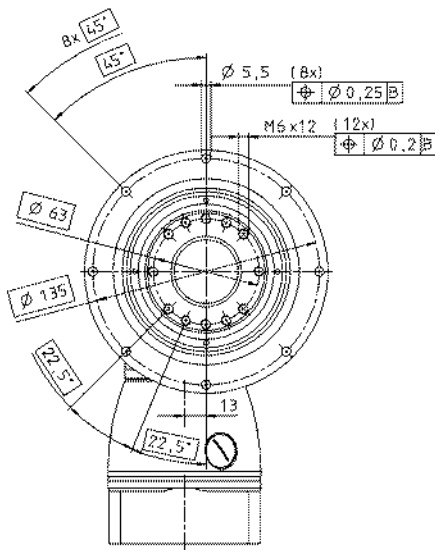
^{e)} Refers to center of the output shaft or flange

All technical data for front output side applies.

Technical data for rearward output versions, see page 422.

View A

2-stage:



Right-angle gearheads
High End

TPK

MF

See technical data sheet for available clamping hub diameters (mass moment of inertia). Dimensions available on request.

Non-tolerated dimensions ± 1 mm

- 1) Check motor shaft fit.
- 2) Min./Max. permissible motor shaft length. Longer motor shafts are adaptable, please contact us.
- 3) The dimensions depend on the motor.
- 4) Smaller motor shaft diameter is compensated by a bushing with a minimum thickness of 1 mm.

CAD data is available under www.wittenstein-alpha.com

Motor mounting according to operating manual

TPK+ 025 MF 3-stage

					3-stage												
Ratio ^{a)}	<i>i</i>		64	84	100	125	140	175	200	250	280	350	400	500	700	1000	
Max. acceleration torque (max. 1000 cycles per hour)	<i>T</i> _{2B}	Nm	280	280	350	350	350	350	350	350	350	330	200	250	330	265	
		in.lb	2478	2478	3098	3098	3098	3098	3098	3098	3098	3098	2921	1770	2213	2921	2345
Nominal output torque (with <i>n</i> _{in})	<i>T</i> _{2N}	Nm	200	170	200	200	200	200	200	200	210	200	160	200	200	120	
		in.lb	1770	1505	1770	1770	1770	1770	1770	1770	1770	1859	1770	1416	1770	1770	1062
Emergency stop torque (permitted 1000 times during the service life of the gearhead)	<i>T</i> _{2Not}	Nm	460	400	575	575	575	575	575	575	625	625	400	500	625	625	
		in.lb	4071	3540	5089	5089	5089	5089	5089	5089	5089	5531	5531	3540	4425	5531	5531
Nominal input speed (with <i>T</i> _{2N} and 20 °C ambient temperature) ^{b), c)}	<i>n</i> _{1N}	rpm	3500	3500	3500	3500	3500	3500	3500	3800	3500	3800	4500	4500	4500	4500	
Max. continuous speed (with 20 % <i>T</i> _{2N} and 20 °C ambient temperature)	<i>n</i> _{1Nsym}	rpm	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	
Max. input speed	<i>n</i> _{1Max}	rpm	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	
Mean no load running torque (with <i>n</i> ₁ = 3000 rpm and 20 °C gearhead temperature) ^{d)}	<i>T</i> ₀₁₂	Nm	0.4	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	
		in.lb	3.5	2.7	2.7	2.7	2.7	2.7	2.7	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
Max. torsional backlash	<i>j</i> _t	arcmin	Standard ≤ 4 / Reduced ≤ 2														
Torsional rigidity	<i>C</i> _{t21}	Nm/ arcmin	42	40	53	55	53	55	53	55	59	60	44	55	60	56	
		in.lb/ arcmin	372	354	469	487	469	487	469	487	522	531	389	487	531	496	
Tilting rigidity	<i>C</i> _{2K}	Nm/ arcmin	550														
		in.lb/ arcmin	4868														
Max. axial force ^{e)}	<i>F</i> _{2AMax}	N	4150														
		lb _f	934														
Max. tilting moment	<i>M</i> _{2KMax}	Nm	413														
		in.lb	3655														
Efficiency at full load	η	%	92														
Service life (For calculation, see the Chapter "Information")	<i>L</i> _h	h	> 20000														
Weight incl. standard adapter plate	<i>m</i>	kg	9,8														
		lb _m	21,7														
Operating noise (with <i>n</i> ₁ = 3000 rpm no load)	<i>L</i> _{PA}	dB(A)	≤ 68														
Max. permitted housing temperature		°C	+90														
		F	+194														
Ambient temperature		°C	0 to +40														
		F	32 to 104														
Lubrication			Lubricated for life														
Paint			Blue RAL 5002														
Direction of rotation			Motor and gearhead opposite directions														
Protection class			IP 65														
Moment of inertia (relates to the drive) Clamping hub diameter [mm]	C	14	<i>J</i> _i	kgcm ²	0.28	0.23	0.24	0.23	0.21	0.20	0.19	0.18	0.19	0.18	0.18	0.18	0.18
				10 ⁻³ in.lb.s ²	0.25	0.20	0.21	0.20	0.19	0.18	0.17	0.16	0.17	0.16	0.16	0.16	0.16
	E	19	<i>J</i> _i	kgcm ²	0.72	0.63	0.68	0.68	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63
				10 ⁻³ in.lb.s ²	0.64	0.56	0.60	0.60	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56

Please contact us for information on the best configuration for S1 conditions of use (continuous operation).

^{a)} Other ratios available on request

^{b)} Higher speeds are possible if the nominal torque is reduced

^{c)} For higher ambient temperatures, please reduce input speed

^{d)} Idling torques decrease during operation

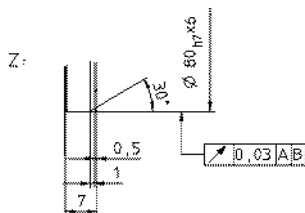
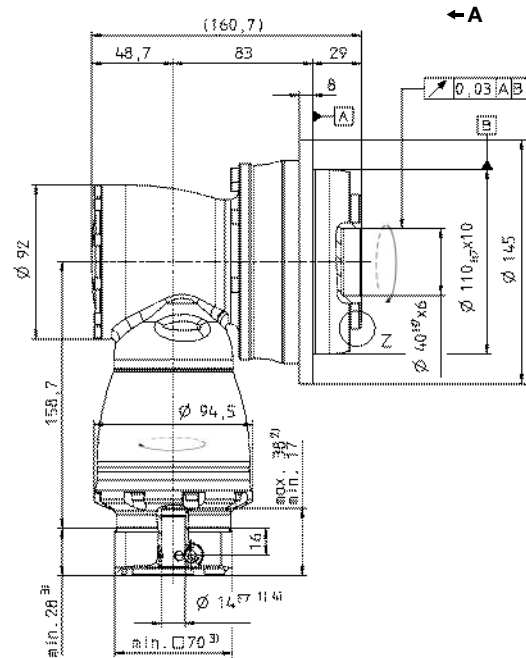
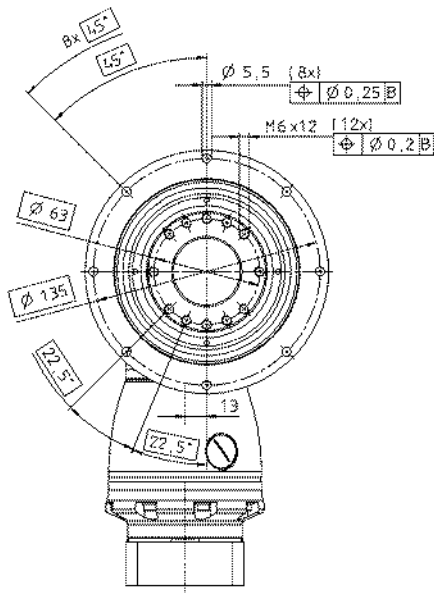
^{e)} Refers to center of the output shaft or flange

All technical data for front output side applies.

Technical data for rearward output versions, see page 422.

View A

3-stage:



See technical data sheet for available clamping hub diameters (mass moment of inertia). Dimensions available on request.

Non-tolerated dimensions ± 1 mm

- 1) Check motor shaft fit.
- 2) Min./Max. permissible motor shaft length. Longer motor shafts are adaptable, please contact us.
- 3) The dimensions depend on the motor.
- 4) Smaller motor shaft diameter is compensated by a bushing with a minimum thickness of 1 mm.

CAD data is available under www.wittenstein-alpha.com

Motor mounting according to operating manual

TPK+ 050 MF 2-stage

				2-stage												
Ratio ^{a)}				<i>i</i>	12	16	20	25	28	35	40	49	50	70	100	
Max. acceleration torque (max. 1000 cycles per hour)				<i>T</i> _{2B}	Nm	680	680	750	750	700	700	500	700	625	700	540
					in.lb	6018	6018	6638	6638	6195	6416	4425	6195	5531	6195	4779
Nominal output torque (with <i>n</i> _m)				<i>T</i> _{2N}	Nm	370	370	370	370	370	370	320	370	370	370	240
					in.lb	3275	3275	3275	3275	3275	3275	2832	3275	3275	3275	2124
Emergency stop torque (permitted 1000 times during the service life of the gearhead)				<i>T</i> _{2Not}	Nm	1000	1000	1250	1250	1250	1250	1000	1250	1250	1250	1250
					in.lb	8850	8850	11063	11063	11063	11063	8850	11063	11063	11063	11063
Nominal input speed (with <i>T</i> _{2N} and 20 °C ambient temperature) ^{b), c)}				<i>n</i> _{1N}	rpm	1900	2300	2300	2600	2300	2300	2300	2300	2300	2300	2300
Max. continuous speed (with 20 % <i>T</i> _{2N} and 20 °C ambient temperature)				<i>n</i> _{1Ncym}	rpm	2700	3100	3100	3500	3100	3000	3000	3000	3000	3000	3000
Max. input speed				<i>n</i> _{1Max}	rpm	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500
Mean no load running torque (with <i>n</i> _i = 3000 rpm and 20 °C gearhead temperature) ^{d)}				<i>T</i> ₀₁₂	Nm	4.0	3.7	3.6	2.8	3.5	2.8	3.1	3.9	3.1	3.1	3.1
					in.lb	35.4	32.7	31.9	24.8	31.0	24.8	27.4	34.5	27.4	27.4	27.4
Max. torsional backlash				<i>j</i> _t	arcmin	Standard ≤ 4 / Reduced ≤ 2										
Torsional rigidity				<i>C</i> _{t21}	Nm/ arcmin	87	91	111	119	123	127	96	127	115	125	112
					in.lb/ arcmin	770	805	982	1053	1089	1124	850	1124	1018	1106	991
Tilting rigidity				<i>C</i> _{2K}	Nm/ arcmin	560										
					in.lb/ arcmin	4956										
Max. axial force ^{e)}				<i>F</i> _{2AMax}	N	6130										
					lb _f	1379										
Max. tilting moment				<i>M</i> _{2KMax}	Nm	1295										
					in.lb	11461										
Efficiency at full load				η	%	94										
Service life (For calculation, see the Chapter "Information")				<i>L</i> _h	h	> 20000										
Weight incl. standard adapter platee				<i>m</i>	kg	17.0										
					lb _m	38										
Operating noise (with <i>n</i> _i = 3000 rpm no load)				<i>L</i> _{PA}	dB(A)	≤ 68										
Max. permitted housing temperature					°C	+90										
					F	+194										
Ambient temperature					°C	0 to +40										
					F	32 to 104										
Lubrication				Lubricated for life												
Paint				Blue RAL 5002												
Direction of rotation				Motor and gearhead opposite directions												
Protection class				IP 65												
Moment of inertia (relates to the drive) Clamping hub diameter [mm]	H	28	<i>J</i> _i	kgcm ²	4.56	3.76	3.71	3.28	3.66	3.00	2.79	3.10	2.78	2.77	2.77	
				10 ⁻³ in.lb.s ²	4.04	3.32	3.28	2.90	3.24	2.61	2.47	2.74	2.46	2.45	2.45	
	K	38	<i>J</i> _i	kgcm ²	11.7	10.9	10.9	10.4	10.8	10.3	9.95	10.4	9.94	9.94	9.93	
				10 ⁻³ in.lb.s ²	10.38	9.67	9.62	9.24	9.58	8.96	8.81	9.20	8.80	8.80	8.79	

Please contact us for information on the best configuration for S1 conditions of use (continuous operation).

^{a)} Other ratios up to $i=1000$ available on request

^{b)} Higher speeds are possible if the nominal torque is reduced

^{c)} For higher ambient temperatures, please reduce input speed

^{d)} Idling torques decrease during operation

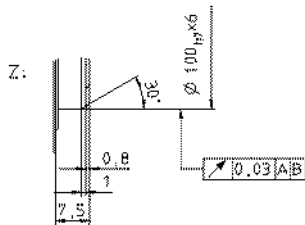
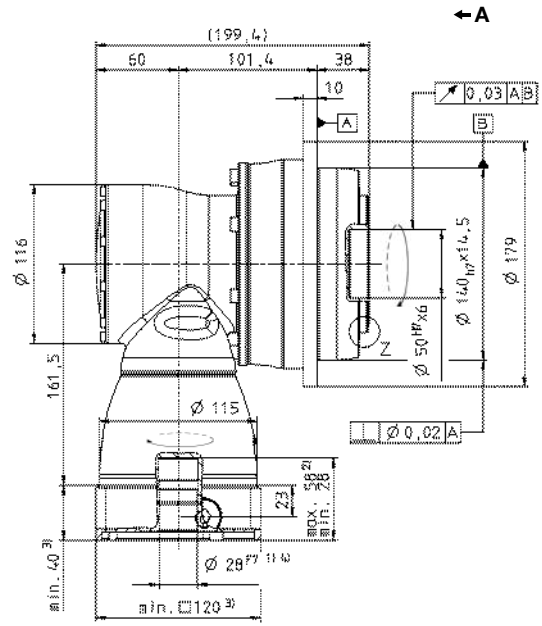
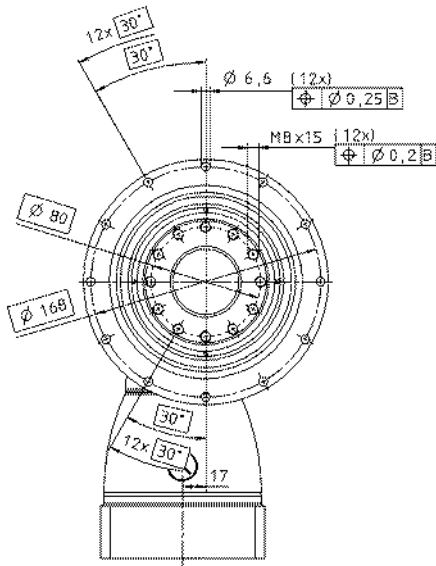
^{e)} Refers to center of the output shaft or flange

All technical data for front output side applies.

Technical data for rearward output versions, see page 422.

View A

2-stage:



See technical data sheet for available clamping hub diameters (mass moment of inertia). Dimensions available on request.

Non-tolerated dimensions ± 1 mm

- 1) Check motor shaft fit.
- 2) Min./Max. permissible motor shaft length. Longer motor shafts are adaptable, please contact us.
- 3) The dimensions depend on the motor.
- 4) Smaller motor shaft diameter is compensated by a bushing with a minimum thickness of 1 mm.

 CAD data is available under www.wittenstein-alpha.com

 Motor mounting according to operating manual

TPK+ 050 MF 3-stage

			3-stage													
Ratio ^{a)}	<i>i</i>		64	84	100	125	140	175	200	250	280	350	400	500	700	1000
Max. acceleration torque (max. 1000 cycles per hour)	T_{2B}	Nm	680	680	750	750	750	750	750	750	700	700	500	625	700	540
		in.lb	6018	6018	6638	6638	6638	6638	6638	6638	6195	6195	4425	5531	6195	4779
Nominal output torque (with n_{in})	T_{2N}	Nm	400	400	400	400	400	400	400	400	400	400	320	370	400	240
		in.lb	3540	3540	3540	3540	3540	3540	3540	3540	3540	3540	2832	3275	3540	2124
Emergency stop torque (permitted 1000 times during the service life of the gearhead)	T_{2Not}	Nm	1000	1000	1250	1250	1250	1250	1250	1250	1250	1250	1000	1250	1250	1250
		in.lb	8850	8850	11063	11063	11063	11063	11063	11063	11063	11063	8850	11063	11063	11063
Nominal input speed (with T_{2N} and 20 °C ambient temperature) ^{b), c)}	n_{1N}	rpm	3100	3100	3100	3100	3100	3100	3100	3500	3100	3500	4200	4200	4200	4200
Max. continuous speed (with 20 % T_{2N} and 20 °C ambient temperature)	n_{1Ncym}	rpm	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4200	4200	4200	4200
Max. input speed	n_{1Max}	rpm	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500
Mean no load running torque (with $n_1=3000$ rpm and 20 °C gearhead temperature) ^{d)}	T_{012}	Nm	0.7	0.4	0.6	0.5	0.5	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
		in.lb	6.2	3.5	5.3	4.4	4.4	3.5	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7
Max. torsional backlash	j_t	arcmin	Standard ≤ 4 / Reduced ≤ 2													
Torsional rigidity	C_{t21}	Nm/ arcmin	91	87	111	119	111	119	111	119	123	127	95	115	125	112
		in.lb/ arcmin	805	770	982	1053	982	1053	982	1053	1089	1124	841	1018	1106	991
Tilting rigidity	C_{2K}	Nm/ arcmin	560													
		in.lb/ arcmin	4956													
Max. axial force ^{e)}	F_{2AMax}	N	6130													
		lb _f	1379													
Max. tilting moment	M_{2KMax}	Nm	1295													
		in.lb	11461													
Efficiency at full load	η	%	92													
Service life (For calculation, see the Chapter "Information")	L_h	h	> 20000													
Weight incl. standard adapter plate	m	kg	18,7													
		lb _m	41,3													
Operating noise (with $n_1=3000$ rpm no load)	L_{PA}	dB(A)	≤ 68													
Max. permitted housing temperature		°C	+90													
		F	+194													
Ambient temperature		°C	0 to +40													
		F	32 to 104													
Lubrication			Lubricated for life													
Paint			Blue RAL 5002													
Direction of rotation			Motor and gearhead opposite directions													
Protection class			IP 65													
Moment of inertia (relates to the drive) Clamping hub diameter [mm]	E	19	J_1	kgcm ²	1.01	0.76	0.88	0.85	0.76	0.75	0.70	0.69	0.70	0.69	0.69	0.69
				10 ⁻³ in.lb.s ²	0.89	0.67	0.78	0.75	0.67	0.66	0.62	0.61	0.62	0.61	0.61	0.61
	G	24	J_1	kgcm ²	2.57	2.32	2.44	2.42	2.32	2.31	2.26	2.25	2.26	2.25	2.25	2.25
				10 ⁻³ in.lb.s ²	2.27	2.05	2.16	2.14	2.05	2.04	2.00	1.99	2.00	1.99	1.99	1.99

Please contact us for information on the best configuration for S1 conditions of use (continuous operation).

^{a)} Other ratios available on request

^{b)} Higher speeds are possible if the nominal torque is reduced

^{c)} For higher ambient temperatures, please reduce input speed

^{d)} Idling torques decrease during operation

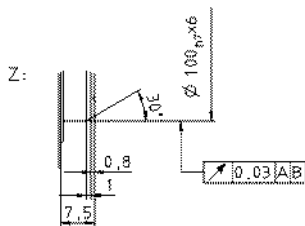
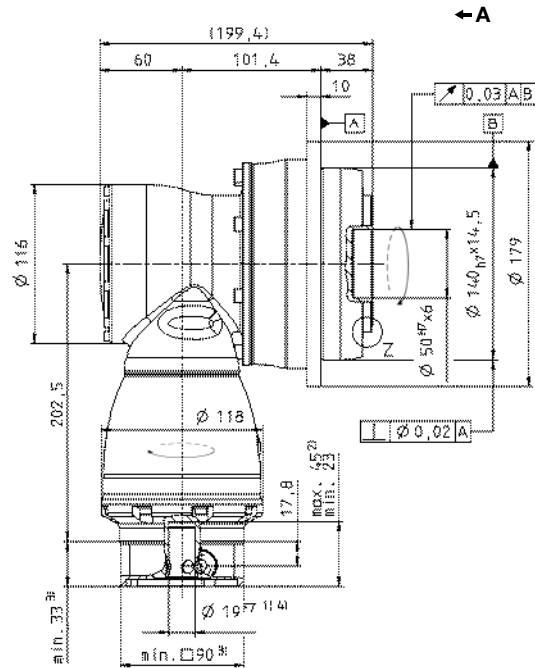
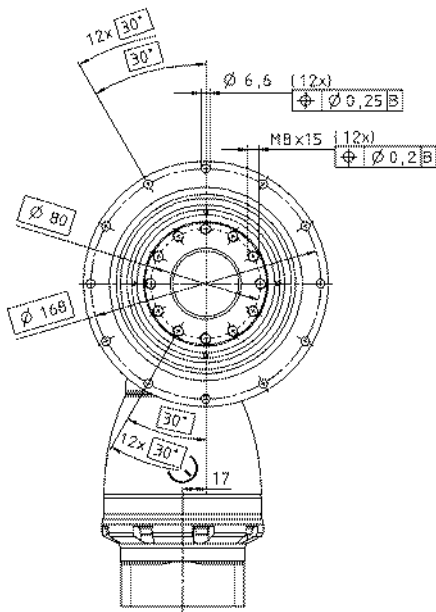
^{e)} Refers to center of the output shaft or flange

All technical data for front output side applies.

Technical data for rearward output versions, see page 422.

View A

3-stage:



See technical data sheet for available clamping hub diameters (mass moment of inertia). Dimensions available on request.

Non-tolerated dimensions ± 1 mm

- 1) Check motor shaft fit.
- 2) Min./Max. permissible motor shaft length. Longer motor shafts are adaptable, please contact us.
- 3) The dimensions depend on the motor.
- 4) Smaller motor shaft diameter is compensated by a bushing with a minimum thickness of 1 mm.

 CAD data is available under www.wittenstein-alpha.com

 Motor mounting according to operating manual

TPK+ 110 MF 2-stage

					2-stage									
Ratio ^{a)}	<i>i</i>		12	16	20	25	28	35	40	49	50	70	100	
Max. acceleration torque (max. 1000 cycles per hour)	<i>T</i> _{2B}	Nm	1200	1200	1500	1500	1600	1600	840	1600	1050	1470	1400	
		in.lb	10620	10620	13275	13275	14160	14160	7434	14160	9293	13010	12390	
Nominal output torque (with <i>n</i> _m)	<i>T</i> _{2N}	Nm	700	700	750	750	750	750	640	750	750	750	750	
		in.lb	6195	6195	6638	6638	6638	6638	5664	6638	6638	6638	6638	
Emergency stop torque (permitted 1000 times during the service life of the gearhead)	<i>T</i> _{2Not}	Nm	1600	2000	2500	2500	2750	2750	1600	2750	2000	2750	2750	
		in.lb	14160	17700	22125	22125	24338	24338	14160	24338	17700	24338	24338	
Nominal input speed (with <i>T</i> _{2N} and 20 °C ambient temperature) ^{b), c)}	<i>n</i> _{1N}	rpm	1600	1900	1900	2100	1900	2100	2100	2100	2100	2100	2100	
Max. continuous speed (with 20 % <i>T</i> _{2N} and 20 °C ambient temperature)	<i>n</i> _{1Ncym}	rpm	2300	2600	2600	2800	2600	3000	3000	3000	3000	3000	3000	
Max. input speed	<i>n</i> _{1Max}	rpm	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	
Mean no load running torque (with <i>n</i> ₁ = 3000 rpm and 20 °C gearhead temperature) ^{d)}	<i>T</i> ₀₁₂	Nm	9.0	6.5	6.5	5.5	6.0	6.0	6.0	8.0	6.0	6.0	6.0	
		in.lb	79.7	57.5	57.5	48.7	53.1	53.1	53.1	70.8	53.1	53.1	53.1	
Max. torsional backlash	<i>j</i> _t	arcmin	Standard ≤ 4 / Reduced ≤ 2											
Torsional rigidity	<i>C</i> _{t21}	Nm/ arcmin	253	269	336	346	400	407	274	410	341	404	389	
		in.lb/ arcmin	2239	2381	2974	3062	3540	3602	2425	3629	3018	3575	3443	
Tilting rigidity	<i>C</i> _{2K}	Nm/ arcmin	1452											
		in.lb/ arcmin	12850											
Max. axial force ^{e)}	<i>F</i> _{2AMax}	N	10050											
		lb _f	2261											
Max. tilting moment	<i>M</i> _{2KMax}	Nm	3064											
		in.lb	27116											
Efficiency at full load	η	%	94											
Service life (For calculation, see the Chapter "Information")	<i>L</i> _h	h	> 20000											
Weight incl. standard adapter plate	<i>m</i>	kg	41.0											
		lb _m	91											
Operating noise (with <i>n</i> ₁ = 3000 rpm no load)	<i>L</i> _{PA}	dB(A)	≤ 70											
Max. permitted housing temperature		°C	+90											
		F	+194											
Ambient temperature		°C	0 to +40											
		F	32 to 104											
Lubrication			Lubricated for life											
Paint			Blue RAL 5002											
Direction of rotation			Motor and gearhead opposite directions											
Protection class			IP 65											
Moment of inertia (relates to the drive) Clamping hub diameter [mm]	K	38	<i>J</i> _f	kgcm ²	24.3	19.0	18.7	16.1	18.5	15.7	12.8	17.5	12.7	12.7
				10 ⁻³ in.lb.s ²	21.5	16.8	16.6	14.2	16.4	12.3	11.3	15.5	11.3	11.2

Please contact us for information on the best configuration for S1 conditions of use (continuous operation).

^{a)} Other ratios up to $i=1000$ available on request

^{b)} Higher speeds are possible if the nominal torque is reduced

^{c)} For higher ambient temperatures, please reduce input speed

^{d)} Idling torques decrease during operation

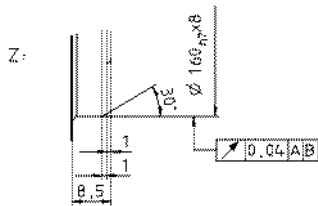
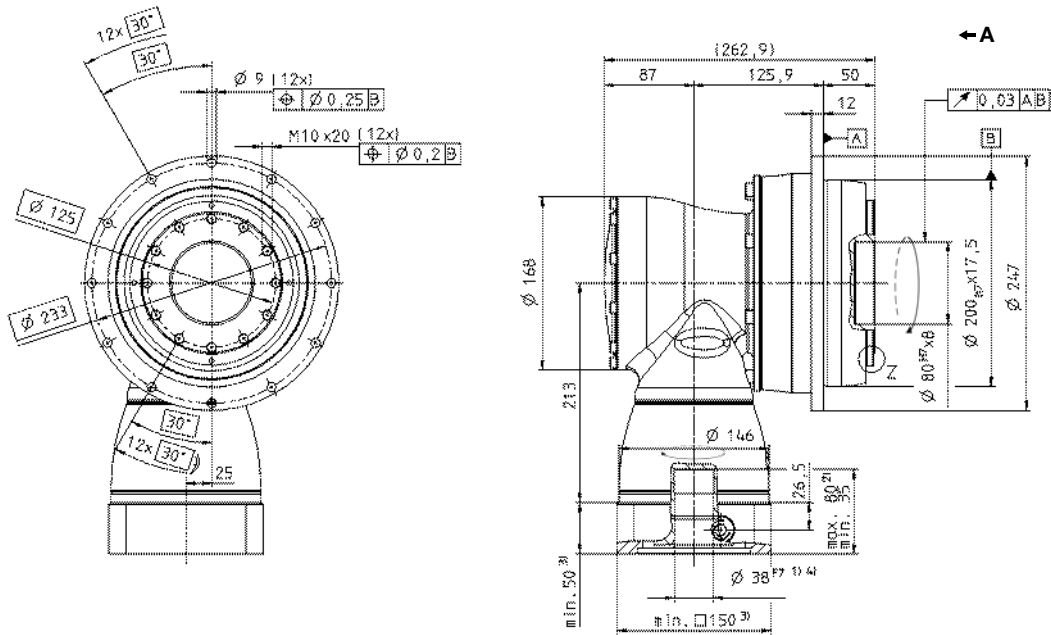
^{e)} Refers to center of the output shaft or flange

All technical data for front output side applies.

Technical data for rearward output versions, see page 422.

View A

2-stage:



Right-angle gearheads
High End

TPK

MF

See technical data sheet for available clamping hub diameters (mass moment of inertia). Dimensions available on request.

Non-tolerated dimensions ± 1 mm

- 1) Check motor shaft fit.
- 2) Min./Max. permissible motor shaft length. Longer motor shafts are adaptable, please contact us.
- 3) The dimensions depend on the motor.
- 4) Smaller motor shaft diameter is compensated by a bushing with a minimum thickness of 1 mm.

 CAD data is available under www.wittenstein-alpha.com

 Motor mounting according to operating manual

TPK+ 110 MF 3-stage

		3-stage														
Ratio ^{a)}	<i>i</i>		64	84	100	125	140	175	200	250	280	350	400	500	700	1000
Max. acceleration torque (max. 1000 cycles per hour)	<i>T</i> _{2B}	Nm	1200	1200	1500	1500	1500	1500	1500	1500	1600	1600	840	1050	1470	1400
		in.lb	10620	10620	13275	13275	13275	13275	13275	13275	14160	14160	7434	9293	13010	12390
Nominal output torque (with <i>n</i> _{IN})	<i>T</i> _{2N}	Nm	700	700	950	950	950	950	950	950	1120	1250	640	750	1120	800
		in.lb	6195	6195	8408	8408	8408	8408	8408	8408	9912	11063	5664	6638	9912	7080
Emergency stop torque (permitted 1000 times during the service life of the gearhead)	<i>T</i> _{2Not}	Nm	1600	1600	2500	2500	2500	2500	2500	2500	2750	2750	1600	2000	2750	2750
		in.lb	14160	14160	22125	22125	22125	22125	22125	22125	24338	24338	14160	17700	24338	24338
Nominal input speed (with <i>T</i> _{2N} and 20 °C ambient temperature) b), c)	<i>n</i> _{1N}	rpm	2900	2900	2900	2900	2900	2900	2900	3200	2900	3200	3900	3900	3900	3900
Max. continuous speed (with 20 % <i>T</i> _{2N} and 20 °C ambient temperature)	<i>n</i> _{1Ncym}	rpm	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4200	4200	4200	4200
Max. input speed	<i>n</i> _{1Max}	rpm	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500
Mean no load running torque (with <i>n</i> ₁ = 3000 rpm and 20 °C gearhead temperature) d)	<i>T</i> ₀₁₂	Nm	1	0.5	0.8	0.6	0.6	0.5	0.5	0.4	0.5	0.4	0.4	0.4	0.4	0.4
		in.lb	8.9	4.4	7.1	5.3	5.3	4.4	4.4	3.5	4.4	3.5	3.5	3.5	3.5	3.5
Max. torsional backlash	<i>j</i> _t	arcmin	Standard ≤ 4 / Reduced ≤ 2													
Torsional rigidity	<i>C</i> _{t21}	Nm/ arcmin	269	252	336	346	336	346	336	346	400	407	274	341	404	389
		in.lb/ arcmin	2381	2230	2974	3062	2974	3062	2974	3062	3540	3602	2425	3018	3575	3443
Tilting rigidity	<i>C</i> _{2K}	Nm/ arcmin	1452													
		in.lb/ arcmin	12850													
Max. axial force ^{e)}	<i>F</i> _{2AMax}	N	10050													
		lb _f	2261													
Max. tilting moment	<i>M</i> _{2KMax}	Nm	3064													
		in.lb	27116													
Efficiency at full load	<i>η</i>	%	92													
Service life (For calculation, see the Chapter "Information")	<i>L</i> _h	h	> 20000													
Weight incl. standard adapter plate	<i>m</i>	kg	45,4													
		lb _m	100,3													
Operating noise (with <i>n</i> ₁ = 3000 rpm no load)	<i>L</i> _{PA}	dB(A)	≤ 70													
Max. permitted housing temperature		°C	+90													
		F	+194													
Ambient temperature		°C	0 to +40													
		F	32 to 104													
Lubrication			Lubricated for life													
Paint			Blue RAL 5002													
Direction of rotation			Motor and gearhead opposite directions													
Protection class			IP 65													
Moment of inertia (relates to the drive) Clamping hub diameter [mm]	G	24	<i>J</i> ₁	kgcm ²	3.97	2.82	3.36	3.22	2.82	2.75	2.50	2.47	2.50	2.44	2.42	2.42
				10 ⁻³ in.lb.s ²	3.51	2.50	2.97	2.85	2.50	2.43	2.21	2.19	2.21	2.16	2.14	2.14
	K	38	<i>J</i> ₁	kgcm ²	10.90	9.74	10.30	10.10	9.74	9.66	9.41	9.38	9.41	9.38	9.33	9.33
				10 ⁻³ in.lb.s ²	9.65	8.62	9.12	8.94	8.62	8.55	8.33	8.30	8.33	8.30	8.26	8.26

Please contact us for information on the best configuration for S1 conditions of use (continuous operation).

^{a)} Other ratios available on request

^{b)} Higher speeds are possible if the nominal torque is reduced

^{c)} For higher ambient temperatures, please reduce input speed

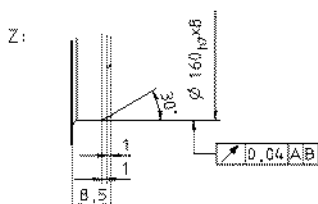
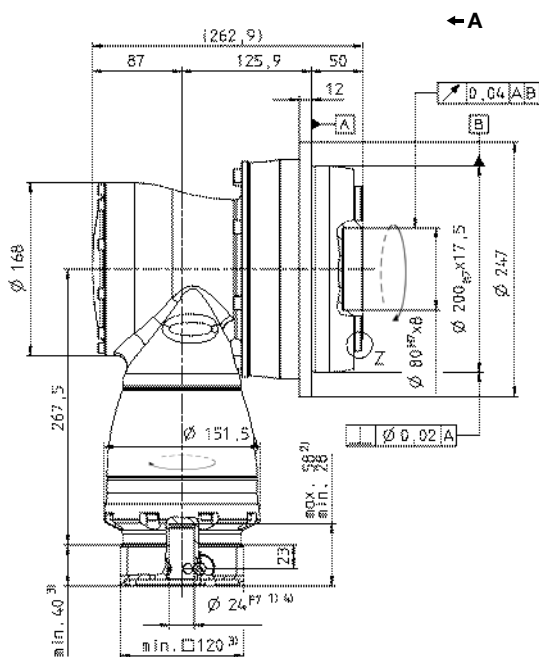
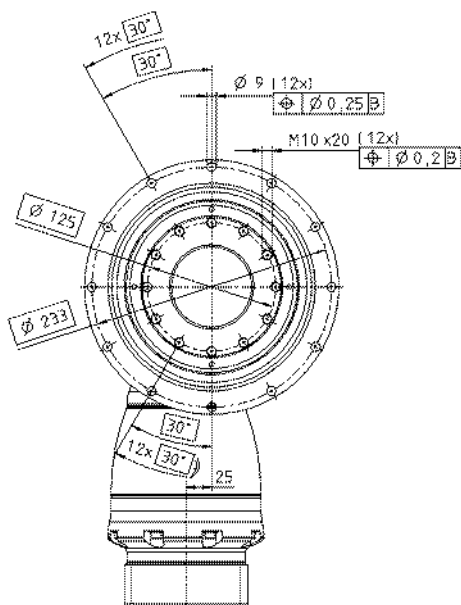
^{d)} Idling torques decrease during operation

^{e)} Refers to center of the output shaft or flange

All technical data for front output side applies.

Technical data for rearward output versions, see page 422.

3-stage:



Right-angle gearheads High End

TPK⁺

MF

See technical data sheet for available clamping hub diameters (mass moment of inertia). Dimensions available on request.

Non-tolerated dimensions ± 1 mm

- 1) Check motor shaft fit.
- 2) Min./Max. permissible motor shaft length. Longer motor shafts are adaptable, please contact us.
- 3) The dimensions depend on the motor.
- 4) Smaller motor shaft diameter is compensated by a bushing with a minimum thickness of 1 mm.



 CAD data is available under www.wittenstein-alpha.com



 Motor mounting according to operating manual

TPK+ 300 MF 2-stage

				2-stage											
Ratio ^{a)}				<i>i</i>		15	20	25	35	49	50	70	100		
Max. acceleration torque (max. 1000 cycles per hour)				<i>T</i> _{2B}	Nm	3200	3200	3200	3300	3300	2350	3300	2800		
					in.lb	28320	28320	28320	29205	29205	20798	29205	24780		
Nominal output torque (with <i>n</i> _{IN})				<i>T</i> _{2N}	Nm	2000	2000	2000	1800	1800	1800	1800	1600		
					in.lb	17.700	17.700	17.700	15.930	15.930	15.930	15.930	14.160		
Emergency stop torque (permitted 1000 times during the service life of the gearhead)				<i>T</i> _{2Not}	Nm	4500	5250	5250	7350	6800	4500	6300	8750		
					in.lb	39825	46463	46463	65048	60180	39825	55755	77438		
Nominal input speed (with <i>T</i> _{2N} and 20 °C ambient temperature) ^{b), c)}				<i>n</i> _{1N}	rpm	1500	1700	1900	1900	1700	1700	1700	1700		
Max. continuous speed (with 20 % <i>T</i> _{2N} and 20 °C ambient temperature)				<i>n</i> _{1Ncym}	rpm	1900	2300	2700	2700	2400	2400	2400	2400		
Max. input speed				<i>n</i> _{1Max}	rpm	4000	4000	4000	4000	4000	4000	4000	4000		
Mean no load running torque (with <i>n</i> ₁ = 3000 rpm and 20 °C gearhead temperature) ^{d)}				<i>T</i> ₀₁₂	Nm	18.5	15.0	13.0	12.0	12.0	15.0	14.0	13.0		
					in.lb	163.7	132.8	115.1	106.2	106.2	132.8	123.9	115.1		
Max. torsional backlash				<i>j</i> _t	arcmin	Standard ≤ 4 / Reduced ≤ 2									
Torsional rigidity				<i>C</i> _{t21}	Nm/ arcmin	615	640	664	730	728	658	727	642		
					in.lb/ arcmin	5.443	5.664	5.876	6.461	6.443	5.823	6.434	5.682		
Tilting rigidity				<i>C</i> _{2K}	Nm/ arcmin	5560									
					in.lb/ arcmin	49206									
Max. axial force ^{e)}				<i>F</i> _{2AMax}	N	33000									
					lb _f	7425									
Max. tilting moment				<i>M</i> _{2KMax}	Nm	5900									
					in.lb	52215									
Efficiency at full load				η	%	94									
Service life (For calculation, see the Chapter "Information")				<i>L</i> _h	h	> 20000									
Weight incl. standard adapter plate				<i>m</i>	kg	83									
					lb _m	183									
Operating noise (with <i>n</i> ₁ = 3000 rpm no load)				<i>L</i> _{PA}	dB(A)	≤ 71									
Max. permitted housing temperature					°C	+90									
					F	+194									
Ambient temperature					°C	0 to +40									
					F	32 to 104									
Lubrication				Lubricated for life											
Paint				Blue RAL 5002											
Direction of rotation				Motor and gearhead opposite directions											
Protection class				IP 65											
Moment of inertia (relates to the drive) Clamping hub diameter [mm]				<i>M</i>	48	<i>J</i> ₁	kgcm²	74.00	52.00	43.00	43.00	35.00	30.00	30.00	30.00
							10 ⁻³ in.lb.s²	65.49	46.02	38.06	38.06	30.98	26.55	26.55	26.55

Please contact us for information on the best configuration for S1 conditions of use (continuous operation).

^{a)} Other ratios available on request

^{b)} Higher speeds are possible if the nominal torque is reduced

^{c)} For higher ambient temperatures, please reduce input speed

^{d)} Idling torques decrease during operation

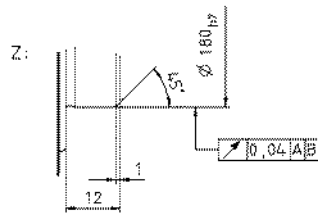
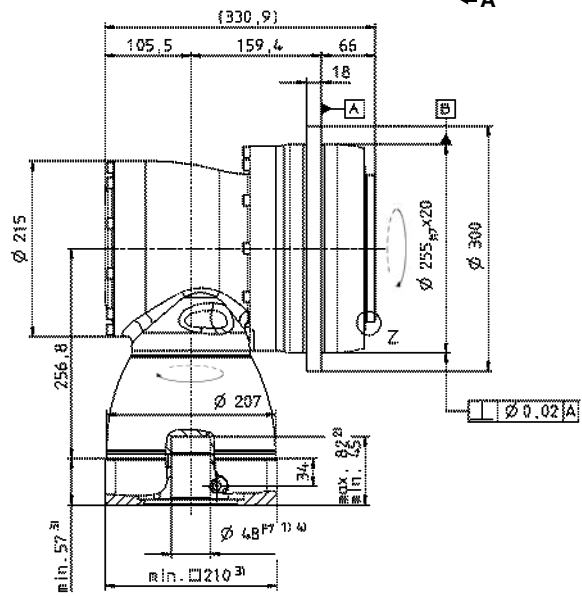
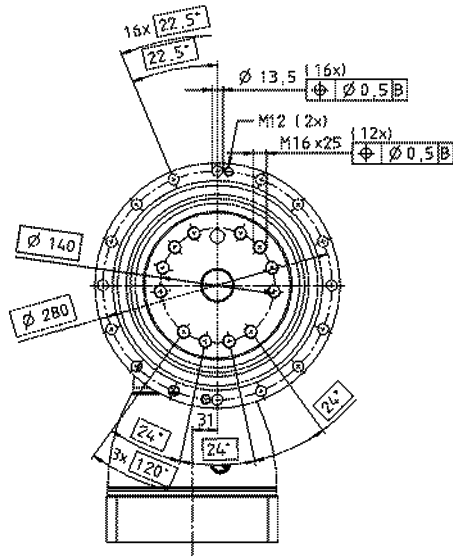
^{e)} Refers to center of the output shaft or flange

All technical data for front output side applies.

Technical data for rearward output versions, see page 422.

View A

2-stage:



Right-angle gearheads
High End

TPK

MF

See technical data sheet for available clamping hub diameters (mass moment of inertia). Dimensions available on request.

Non-tolerated dimensions ± 1 mm

- 1) Check motor shaft fit.
- 2) Min./Max. permissible motor shaft length. Longer motor shafts are adaptable, please contact us.
- 3) The dimensions depend on the motor.
- 4) Smaller motor shaft diameter is compensated by a bushing with a minimum thickness of 1 mm.

 CAD data is available under www.wittenstein-alpha.com

 Motor mounting according to operating manual

TPK+ 300 MF 3-stage

					3-stage											
Ratio ^{a)}	<i>i</i>		63	100	125	140	175	200	250	280	350	500	700	1000		
Max. acceleration torque (max. 1000 cycles per hour)	<i>T</i> _{2B}	Nm	3300	3200	3200	3200	3200	3200	3200	3300	3300	2350	3300	2800		
		in.lb	29205	28320	28320	28320	28320	28320	28320	28320	29205	29205	20798	29205	24780	
Nominal output torque (with <i>n</i> _N)	<i>T</i> _{2N}	Nm	1800	2000	2000	2000	2000	2000	2000	1800	1800	1800	1800	1600		
		in.lb	15.930	17.700	17.700	17.700	17.700	17.700	17.700	17.700	15.930	15.930	15.930	15.930	14.160	
Emergency stop torque (permitted 1000 times during the service life of the gearhead)	<i>T</i> _{2Not}	Nm	6300	5250	5250	5250	5250	5250	5250	7350	7350	4500	6300	8750		
		in.lb	55755	46463	46463	46463	46463	46463	46463	46463	65048	65048	39825	55755	77438	
Nominal input speed (with <i>T</i> _{2N} and 20 °C ambient temperature) ^{b), c)}	<i>n</i> _{1N}	rpm	2700	2700	2700	2700	2700	2700	2900	2700	2900	3400	3400	3400		
Max. continuous speed (with 20 % <i>T</i> _{2N} and 20 °C ambient temperature)	<i>n</i> _{1Ncym}	rpm	3200	3500	3500	3500	3500	3500	3500	3500	3500	3800	3800	3800		
Max. input speed	<i>n</i> _{1Max}	rpm	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000		
Mean no load running torque (with <i>n</i> ₁ = 3000 rpm and 20 °C gearhead temperature) ^{d)}	<i>T</i> ₀₁₂	Nm	5.4	3.0	2.5	2.1	1.9	1.5	1.4	1.3	1.2	1.1	1.1	1.0		
		in.lb	47.8	26.6	22.1	18.6	16.8	13.3	12.4	0.0	10.6	9.7	9.7	8.9		
Max. torsional backlash	<i>j</i> _t	arcmin	Standard ≤ 4 / Reduced ≤ 2													
Torsional rigidity	<i>C</i> _{t21}	Nm/ arcmin	699	640	664	640	664	640	664	715	730	658	727	642		
		in.lb/ arcmin	6.186	5.664	5.876	5.664	5.876	5.664	5.876	6.328	6.461	5.823	6.434	5.682		
Tilting rigidity	<i>C</i> _{2K}	Nm/ arcmin	5560													
		in.lb/ arcmin	49210													
Max. axial force ^{e)}	<i>F</i> _{2AMax}	N	33000													
		lb _f	7425													
Max. tilting moment	<i>M</i> _{2KMax}	Nm	5900													
		in.lb	52215													
Efficiency at full load	η	%	92													
Service life (For calculation, see the Chapter "Information")	<i>L</i> _h	h	> 20000													
Weight incl. standard adapter plate	<i>m</i>	kg	87													
		lb _m	192													
Operating noise (with <i>n</i> ₁ = 3000 rpm no load)	<i>L</i> _{PA}	dB(A)	≤ 71													
Max. permitted housing temperature		°C	+90													
		F	+194													
Ambient temperature		°C	0 to +40													
		F	32 to 104													
Lubrication			Lubricated for life													
Paint			Blue RAL 5002													
Direction of rotation			Motor and gearhead opposite directions													
Protection class			IP 65													
Moment of inertia (relates to the drive) Clamping hub diameter [mm]	K	38	<i>J</i> ₁	kgcm ²	17.80	14.10	12.10	11.00	10.80	10.20	10.10	10.10	10.00	9.90	9.90	9.90
				10 ⁻³ in.lb.s ²	15.75	12.48	10.71	9.74	9.56	9.03	8.94	8.94	8.85	8.76	8.76	8.76
	M	48	<i>J</i> ₁	kgcm ²	32.50	28.80	26.80	25.70	25.50	24.90	24.80	24.90	24.80	24.60	24.60	24.60
				10 ⁻³ in.lb.s ²	28.76	25.49	23.72	22.74	22.57	22.04	21.95	22.04	21.95	21.77	21.77	21.77

Please contact us for information on the best configuration for S1 conditions of use (continuous operation).

^{a)} Other ratios available on request

^{b)} Higher speeds are possible if the nominal torque is reduced

^{c)} For higher ambient temperatures, please reduce input speed

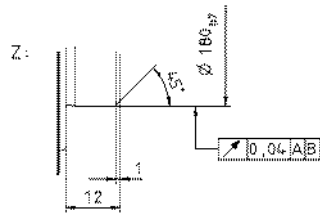
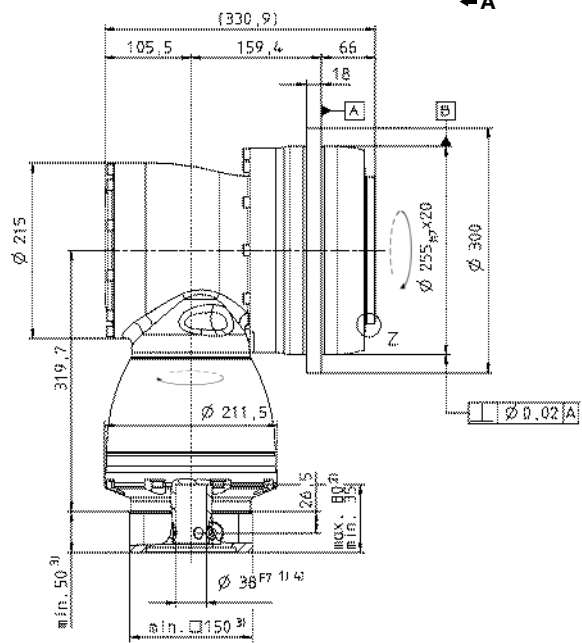
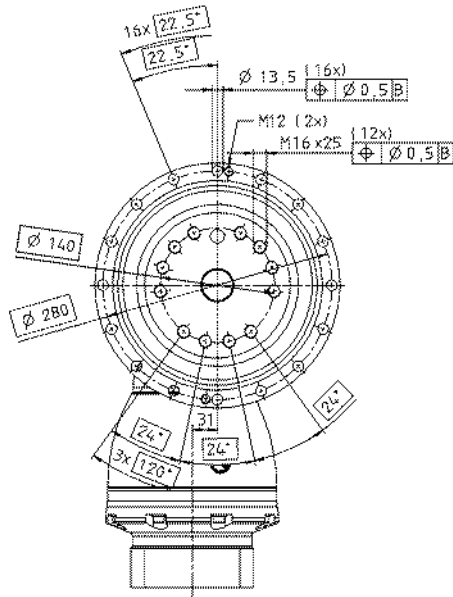
^{d)} Idling torques decrease during operation

^{e)} Refers to center of the output shaft or flange

All technical data for front output side applies.

Technical data for rearward output versions, see page 422.

3-stage:



Right-angle gearheads
High End

TPK⁺

MF

See technical data sheet for available clamping hub diameters (mass moment of inertia). Dimensions available on request.

Non-tolerated dimensions ± 1 mm

- 1) Check motor shaft fit.
- 2) Min./Max. permissible motor shaft length. Longer motor shafts are adaptable, please contact us.
- 3) The dimensions depend on the motor.
- 4) Smaller motor shaft diameter is compensated by a bushing with a minimum thickness of 1 mm.



 CAD data is available under www.wittenstein-alpha.com



 Motor mounting according to operating manual

TPK+ 500 MF 3-stage

		3-stage										
Ratio ^{a)}	<i>i</i>		100	125	140	175	200	250	350	500	700	1000
Max. acceleration torque (max. 1000 cycles per hour)	T_{2B}	Nm	6000	6000	5000	6000	4200	5250	6000	4500	5000	4800
		in.lb	53100	53100	44250	53100	37170	46463	53100	39825	44250	42480
Nominal output torque (with n_{1N})	T_{2N}	Nm	3350	3800	3350	3800	3350	3800	3800	2900	2800	2900
		in.lb	29648	33630	29648	33630	29648	33630	33630	25665	24780	25665
Emergency stop torque (permitted 1000 times during the service life of the gearhead)	T_{2Not}	Nm	10000	12500	9000	11250	8000	10000	14000	15000	15000	15000
		in.lb	88500	110625	79650	99563	70800	88500	123900	132750	132750	132750
Nominal input speed (with T_{2N} and 20 °C ambient temperature) ^{b), c)}	n_{1N}	rpm	2100	2100	1900	1900	1900	1900	1900	1900	1900	1900
Max. continuous speed (with 20 % T_{2N} and 20 °C ambient temperature)	n_{1NoyM}	rpm	2900	2900	2600	2600	2600	2600	2600	2600	2600	2600
Max. input speed	n_{1Max}	rpm	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500
Mean no load running torque (with $n_1=3000$ rpm and 20 °C gearhead temperature) ^{d)}	T_{012}	Nm	5.5	5.5	8.5	8.5	6.0	6.0	6.0	6.0	6.0	6.0
		in.lb	48.7	48.7	75.2	75.2	53.1	53.1	53.1	53.1	53.1	53.1
Max. torsional backlash	j_t	arcmin	Standard $\leq 3,3$ / Reduced $\leq 2,3$									
Torsional rigidity	C_{t21}	Nm/ arcmin	1250	1350	1250	1350	1250	1350	1350	1280	1240	1050
		in.lb/ arcmin	11063	11948	11063	11948	11063	11948	11948	11328	10974	9293
Tilting rigidity	C_{2K}	Nm/ arcmin	9480									
		in.lb/ arcmin	83898									
Max. axial force ^{e)}	F_{2AMax}	N	50000									
		lb _f	11250									
Max. tilting moment	M_{2KMax}	Nm	8800									
		in.lb	77880									
Efficiency at full load	η	%	92									
Service life (For calculation, see the Chapter "Information")	L_h	h	> 20000									
Weight incl. standard adapter plate	<i>m</i>	kg	96									
		lb _m	212									
Operating noise (with $n_1=3000$ rpm no load)	L_{PA}	dB(A)	≤ 71									
Max. permitted housing temperature		°C	+90									
		F	+194									
Ambient temperature		°C	0 to +40									
		F	32 to 104									
Lubrication			Lubricated for life									
Paint			Blue RAL 5002									
Direction of rotation			Motor and gearhead opposite directions									
Protection class			IP 65									
Moment of inertia (relates to the drive) Clamping hub diameter [mm]	K	38	J_1	kgcm ²	16.70	16.70	16.50	16.50	16.40	16.40	16.40	16.40
				10 ⁻³ in.lb.s ²	14.78	14.78	14.60	14.60	14.51	14.51	14.51	14.51

Please contact us for information on the best configuration for S1 conditions of use (continuous operation).

^{a)} Other ratios available on request

^{b)} Higher speeds are possible if the nominal torque is reduced

^{c)} For higher ambient temperatures, please reduce input speed

^{d)} Idling torques decrease during operation

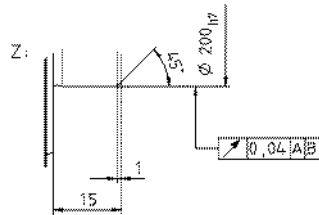
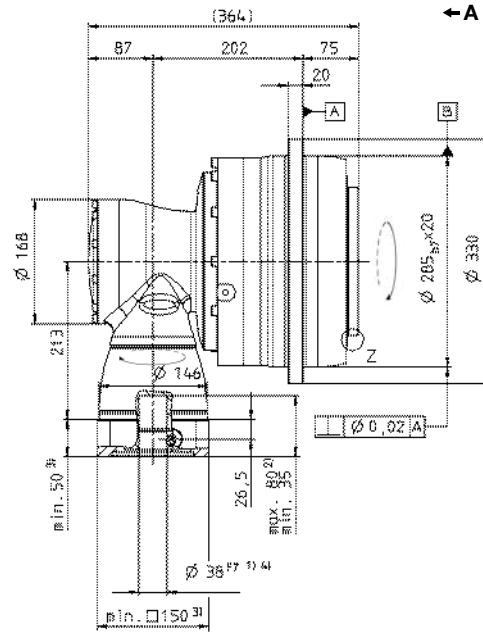
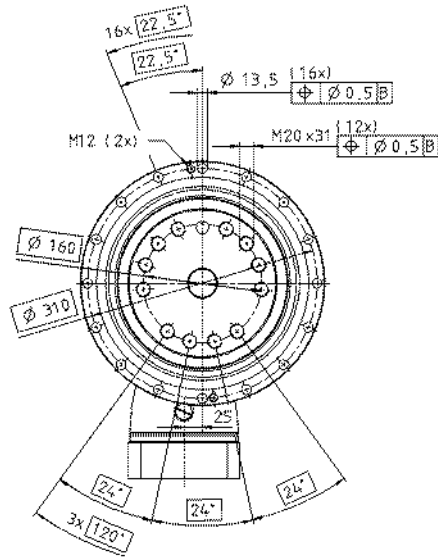
^{e)} Refers to center of the output shaft or flange

All technical data for front output side applies.

Technical data for rearward output versions, see page 422.

View A

3-stage:



Right-angle gearheads
High End

TPK

MF

See technical data sheet for available clamping hub diameters (mass moment of inertia). Dimensions available on request.

Non-tolerated dimensions ± 1 mm

- 1) Check motor shaft fit.
- 2) Min./Max. permissible motor shaft length. Longer motor shafts are adaptable, please contact us.
- 3) The dimensions depend on the motor.
- 4) Smaller motor shaft diameter is compensated by a bushing with a minimum thickness of 1 mm.



CAD data is available under www.wittenstein-alpha.com



Motor mounting according to operating manual

TPK+ 500 MF 4-stage i=180-1000

					4-stage											
Ratio ^{a)}	<i>i</i>		180	240	300	375	420	500	560	600	700	800	875	1000		
Max. acceleration torque (max. 1000 cycles per hour)	<i>T</i> _{2B}	Nm	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000		
		in.lb	53100	53100	53100	53100	53100	53100	53100	53100	53100	53100	53100	53100		
Nominal output torque (with <i>n</i> _N)	<i>T</i> _{2N}	Nm	3350	3350	3350	3800	3350	3350	3350	3350	3350	3350	3800	3350		
		in.lb	29648	29648	29648	33630	29648	29648	29648	29648	29648	29648	33630	29648		
Emergency stop torque (permitted 1000 times during the service life of the gearhead)	<i>T</i> _{2Not}	Nm	10000	10000	10000	12500	10000	10000	10000	10000	10000	10000	12500	10000		
		in.lb	88500	88500	88500	110625	88500	88500	88500	88500	88500	88500	110625	88500		
Nominal input speed (with <i>T</i> _{2N} and 20 °C ambient temperature) ^{b), c)}	<i>n</i> _{1N}	rpm	2700	2900	2900	2900	2900	2900	2900	2900	2900	2900	2900	3200		
Max. continuous speed (with 20 % <i>T</i> _{2N} and 20 °C ambient temperature)	<i>n</i> _{1Ncym}	rpm	3800	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4200		
Max. input speed	<i>n</i> _{1Max}	rpm	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500		
Mean no load running torque (with <i>n</i> ₁ = 3000 rpm and 20 °C gearhead temperature) ^{d)}	<i>T</i> ₀₁₂	Nm	3.4	2.5	1.6	1.4	1.1	1	1	0.8	0.8	0.7	0.7	0.6		
		in.lb	30.1	22.1	14.2	12.4	9.7	8.9	8.9	7.1	7.1	6.2	6.2	5.3		
Max. torsional backlash	<i>j</i> _t	arcmin	Standard ≤ 3,3 / Reduced ≤ 2,3													
Torsional rigidity	<i>C</i> _{t21}	Nm/ arcmin	1250	1250	1250	1300	1250	1350	1250	1250	1262	1250	1350	1250		
		in.lb/ arcmin	11063	11063	11063	11505	11063	11948	11063	11063	11169	11063	11948	11063		
Tilting rigidity	<i>C</i> _{2K}	Nm/ arcmin	9480													
		in.lb/ arcmin	83906													
Max. axial force ^{e)}	<i>F</i> _{2AMax}	N	50000													
		lb _f	11250													
Max. tilting moment	<i>M</i> _{2KMax}	Nm	8800													
		in.lb	77880													
Efficiency at full load	η	%	90													
Service life (For calculation, see the Chapter "Information")	<i>L</i> _h	h	> 20000													
Weight incl. standard adapter plate	<i>m</i>	kg	99													
		lb _m	219													
Operating noise (with <i>n</i> ₁ = 3000 rpm no load)	<i>L</i> _{PA}	dB(A)	≤ 71													
Max. permitted housing temperature		°C	+90													
		F	+194													
Ambient temperature		°C	0 to +40													
		F	32 to 104													
Lubrication			Lubricated for life													
Paint			Blue RAL 5002													
Direction of rotation			Motor and gearhead opposite directions													
Protection class			IP 65													
Moment of inertia (relates to the drive) Clamping hub diameter [mm]	G	24	<i>J</i> ₁	kgcm ²	5.93	4.29	3.33	3.32	2.81	3.19	2.80	2.50	2.74	2.49	2.74	2.46
				10 ⁻³ in.lb.s ²	5.25	3.79	2.95	2.94	2.49	2.82	2.48	2.21	2.42	2.20	2.42	2.18
	K	38	<i>J</i> ₁	kgcm ²	12.84	11.18	10.24	10.23	9.72	10.10	9.71	9.41	9.65	9.40	9.65	9.37
				10 ⁻³ in.lb.s ²	11.37	9.89	9.06	9.06	8.60	8.94	8.59	8.33	8.54	8.32	8.54	8.29

Please contact us for information on the best configuration for S1 conditions of use (continuous operation).

^{a)} Other ratios available on request

^{b)} Higher speeds are possible if the nominal torque is reduced

^{c)} For higher ambient temperatures, please reduce input speed

^{d)} Idling torques decrease during operation

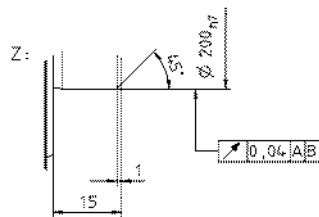
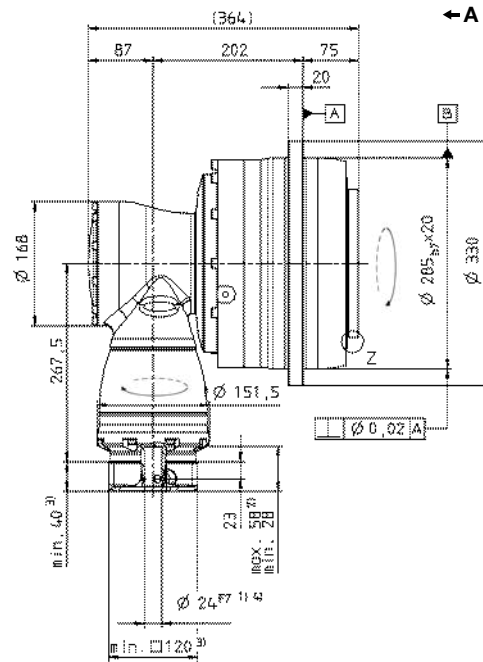
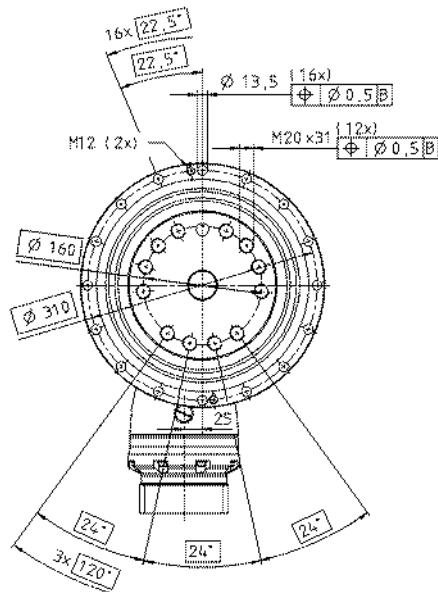
^{e)} Refers to center of the output shaft or flange

All technical data for front output side applies.

Technical data for rearward output versions, see page 422.

View A

4-stage:



Right-angle gearheads
High End

TPK

MF

See technical data sheet for available clamping hub diameters (mass moment of inertia). Dimensions available on request.

Non-tolerated dimensions ± 1 mm

- 1) Check motor shaft fit.
- 2) Min./Max. permissible motor shaft length. Longer motor shafts are adaptable, please contact us.
- 3) The dimensions depend on the motor.
- 4) Smaller motor shaft diameter is compensated by a bushing with a minimum thickness of 1 mm.

 CAD data is available under www.wittenstein-alpha.com

 Motor mounting according to operating manual

TPK+ 500 MF 4-stage i=1225-10000

			4-stage								
Ratio ^{a)}	<i>i</i>		1225	1400	1750	2000	2800	3500	5000	7000	10000
Max. acceleration torque (max. 1000 cycles per hour)	T_{2B}	Nm	6000	6000	6000	4200	5000	6000	4500	5000	4800
		in.lb	53100	53100	53100	37170	44250	53100	39825	44250	42480
Nominal output torque (with n_{IN})	T_{2N}	Nm	3800	3800	3800	3200	2800	3800	2900	2800	2900
		in.lb	33630	33630	33630	28320	24780	33630	25665	24780	25665
Emergency stop torque (permitted 1000 times during the service life of the gearhead)	T_{2Not}	Nm	15000	15000	15000	8000	11200	14000	15000	15000	15000
		in.lb	132750	132750	132750	70800	99120	123900	132750	132750	132750
Nominal input speed (with T_{2N} and 20 °C ambient temperature) b), c)	n_{1N}	rpm	2900	2900	3200	3900	3900	3900	3900	3900	3900
Max. continuous speed (with 20 % T_{2N} and 20 °C ambient temperature)	n_{1Ncym}	rpm	4000	4000	4200	4200	4200	4200	4200	4200	4200
Max. input speed	n_{1Max}	rpm	4500	4500	4500	4500	4500	4500	4500	4500	4500
Mean no load running torque (with $n_1=3000$ rpm and 20 °C gearhead temperature) d)	T_{012}	Nm	0.6	0.6	0.4	0.4	0.4	0.4	0.4	0.4	0.4
		in.lb	5.3	5.3	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Max. torsional backlash	j_t	arcmin	Standard $\leq 3,3$ / Reduced $\leq 2,3$								
Torsional rigidity	C_{t21}	Nm/ arcmin	1350	1350	1350	1250	1250	1350	1250	1250	1050
		in.lb/ arcmin	11948	11948	11948	11063	11063	11948	11063	11063	9293
Tilting rigidity	C_{2K}	Nm/ arcmin	9480								
		in.lb/ arcmin	83906								
Max. axial force ^{e)}	F_{2AMax}	N	50000								
		lb _f	11250								
Max. tilting moment	M_{2KMax}	Nm	8800								
		in.lb	77880								
Efficiency at full load	η	%	90								
Service life (For calculation, see the Chapter "Information")	L_h	h	> 20000								
Weight incl. standard adapter plate	m	kg	99								
		lb _m	219								
Operating noise (with $n_1=3000$ rpm no load)	L_{PA}	dB(A)	≤ 71								
Max. permitted housing temperature		°C	+90								
		F	+194								
Ambient temperature		°C	0 to +40								
		F	32 to 104								
Lubrication			Lubricated for life								
Paint			Blue RAL 5002								
Direction of rotation			Motor and gearhead opposite directions								
Protection class			IP 65								
Moment of inertia (relates to the drive) Clamping hub diameter [mm]	G	24	J_1	kgcm ²	2.73	2.49	2.46	2.42	2.42	2.42	2.42
				10 ⁻³ in.lb.s ²	2.42	2.20	2.17	2.14	2.14	2.14	2.14
	K	38	J_1	kgcm ²	9.64	9.40	9.37	9.33	9.33	9.33	9.33
				10 ⁻³ in.lb.s ²	8.53	8.32	8.29	8.26	8.26	8.26	8.26

Please contact us for information on the best configuration for S1 conditions of use (continuous operation).

^{a)} Other ratios available on request

^{b)} Higher speeds are possible if the nominal torque is reduced

^{c)} For higher ambient temperatures, please reduce input speed

^{d)} Idling torques decrease during operation

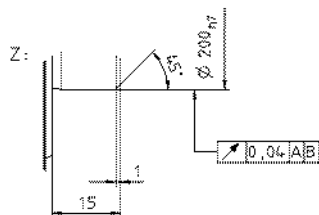
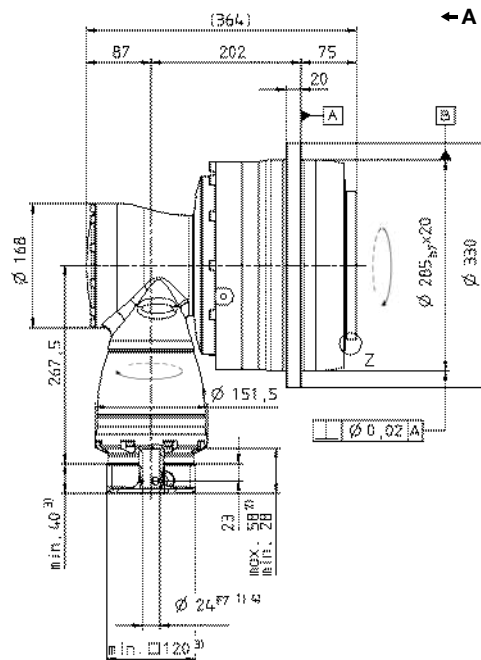
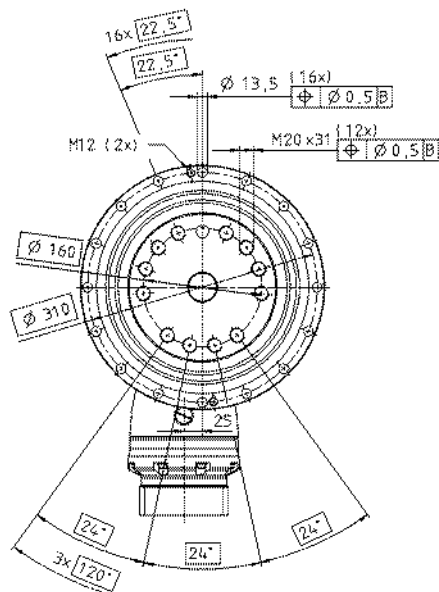
^{e)} Refers to center of the output shaft or flange

All technical data for front output side applies.

Technical data for rearward output versions, see page 422.

View A

4-stage:



Right-angle gearheads
High End

TPK

MF

See technical data sheet for available clamping hub diameters (mass moment of inertia). Dimensions available on request.

Non-tolerated dimensions ± 1 mm

- 1) Check motor shaft fit.
- 2) Min./Max. permissible motor shaft length. Longer motor shafts are adaptable, please contact us.
- 3) The dimensions depend on the motor.
- 4) Smaller motor shaft diameter is compensated by a bushing with a minimum thickness of 1 mm.

 CAD data is available under www.wittenstein-alpha.com

 Motor mounting according to operating manual

TPK+ 025 MA HIGH TORQUE 3-/4-stage

			3-stage							4-stage									
Ratio ^{a)}	<i>i</i>		66	88	110	137.5	154	220	385	330	462	577.5	770	1078	1540	2695	3850	5500	
Max. acceleration torque (max. 1000 cycles per hour)	<i>T</i> _{2B}	Nm	530	530	530	530	530	440	530	530	530	530	530	530	530	530	530	530	
		in.lb	4691	4691	4691	4691	4691	3894	4691	4691	4691	4691	4691	4691	4691	4691	4691	4691	
Nominal output torque (with <i>n</i> _{in})	<i>T</i> _{2N}	Nm	375	375	375	375	375	330	375	375	375	375	375	375	375	375	375	375	
		in.lb	3319	3319	3319	3319	3319	2921	3319	3319	3319	3319	3319	3319	3319	3319	3319	3319	
Emergency stop torque (permitted 1000 times during the service life of the gearhead)	<i>T</i> _{2Not}	Nm	880	1100	1100	1100	990	880	1200	880	1200	1100	1200	1200	1200	1200	1200	1200	
		in.lb	7788	9735	9735	9735	8762	7788	10620	7788	10620	9735	10620	10620	10620	10620	10620	10620	
Nominal input speed (with <i>T</i> _{2N} and 20 °C ambient temperature) ^{b), c)}	<i>n</i> _{1N}	rpm	2400	2600	2900	2900	2900	2900	2900	4300	4300	4300	4300	4300	4300	5400	5400	5400	
Max. continuous speed (with 20 % <i>T</i> _{2N} and 20 °C ambient temperature)	<i>n</i> _{1Ncym}	rpm	2800	3300	3800	3800	3300	3300	3300	4800	4800	4800	4800	4800	4800	5400	5400	5400	
Max. input speed	<i>n</i> _{1Max}	rpm	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	
Mean no load running torque (with <i>n</i> ₁ = 3000 rpm and 20 °C gearhead temperature) ^{d)}	<i>T</i> ₀₁₂	Nm	1.6	1.4	1.2	1.2	1.4	1.2	1.2	0.3	0.3	0.2	0.2	0.2	0.1	0.1	0.1	0.1	
		in.lb	13.9	12.2	10.8	10.6	12.0	10.7	10.4	2.4	2.4	2.2	2.1	2.0	1.1	1.0	1.0	0.9	
Max. torsional backlash	<i>j</i> _t	arcmin	≤1.3																
Torsional rigidity	<i>C</i> _{t21}	Nm/ arcmin	95	95	96	99	95	94	101	95	101	98	98	102	102	101	101	98	
		in.lb/ arcmin	838	842	846	874	838	829	894	838	897	869	872	899	899	897	894	869	
Tilting rigidity	<i>C</i> _{2K}	Nm/ arcmin	550																
		in.lb/ arcmin	4868																
Max. axial force ^{e)}	<i>F</i> _{2AMax}	N	4150																
		lb _f	934																
Max. tilting moment	<i>M</i> _{2KMax}	Nm	550																
		in.lb	4868																
Efficiency at full load	η	%	92							90									
Service life (For calculation, see the Chapter "Information")	<i>L</i> _h	h	> 20.000																
Weight incl. standard adapter plate	<i>m</i>	kg	-																
		lb _m	-																
Operating noise (with <i>n</i> ₁ = 3000 rpm no load)	<i>L</i> _{PA}	dB(A)	≤ 66																
		°C	+90																
Max. permitted housing temperature		F	+194																
		°C	0 to +40																
Ambient temperature		F	32 to 104																
		Lubricated for life																	
Paint	Blue RAL 5002																		
Direction of rotation	Motor and gearhead opposite directions																		
Protection class	IP 65																		
Moment of inertia (relates to the drive) Clamping hub diameter [mm]	B	11	<i>J</i> ₁	kgcm ²	-	-	-	-	-	-	0.08	0.09	0.06	0.06	0.06	0.06	0.06	0.06	
				10 ⁻³ in.lb.in ²	-	-	-	-	-	-	0.07	0.08	0.06	0.06	0.06	0.06	0.05	0.05	0.05
	C	14	<i>J</i> ₁	kgcm ²	0.56	0.46	0.41	0.40	0.37	0.35	0.34	0.19	0.20	0.18	0.18	0.18	0.17	0.17	
				10 ⁻³ in.lb.in ²	0.50	0.41	0.36	0.36	0.33	0.31	0.31	0.17	0.18	0.16	0.16	0.16	0.15	0.15	0.15
	E	19	<i>J</i> ₁	kgcm ²	0.91	0.81	0.76	0.76	0.72	0.70	0.70	-	-	-	-	-	-	-	-
				10 ⁻³ in.lb.in ²	0.81	0.72	0.67	0.67	0.64	0.62	0.62	-	-	-	-	-	-	-	-

Please contact us for information on the best configuration for S1 conditions of use (continuous operation).

^{a)} Other ratios available on request

^{b)} Higher speeds are possible if the nominal torque is reduced

^{c)} For higher ambient temperatures, please reduce input speed

^{d)} Idling torques decrease during operation

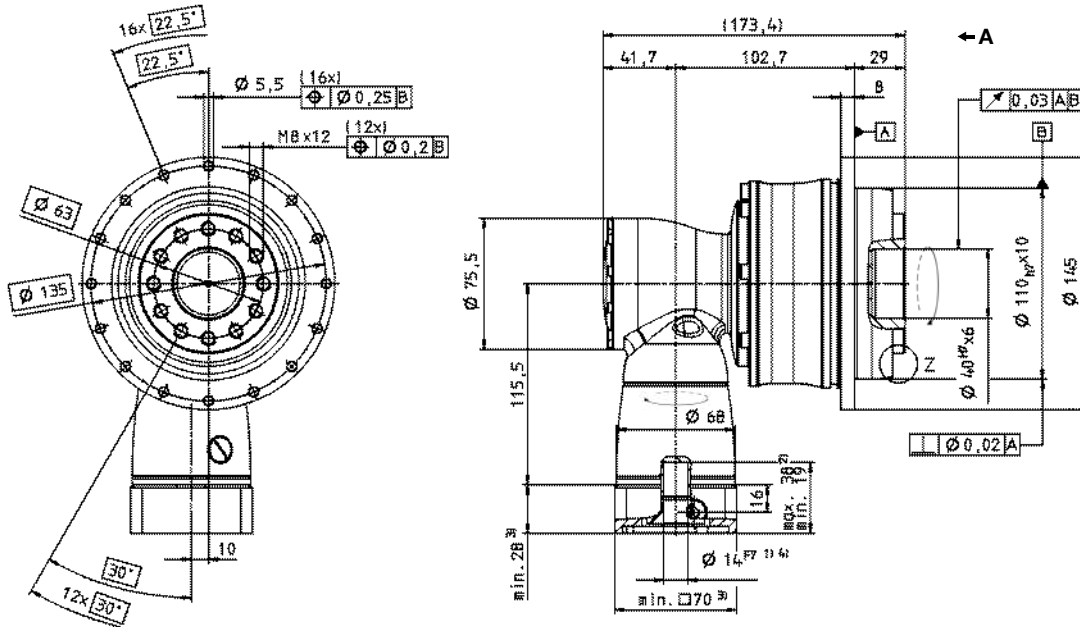
^{e)} Refers to center of the output shaft or flange

All technical data for front output side applies.

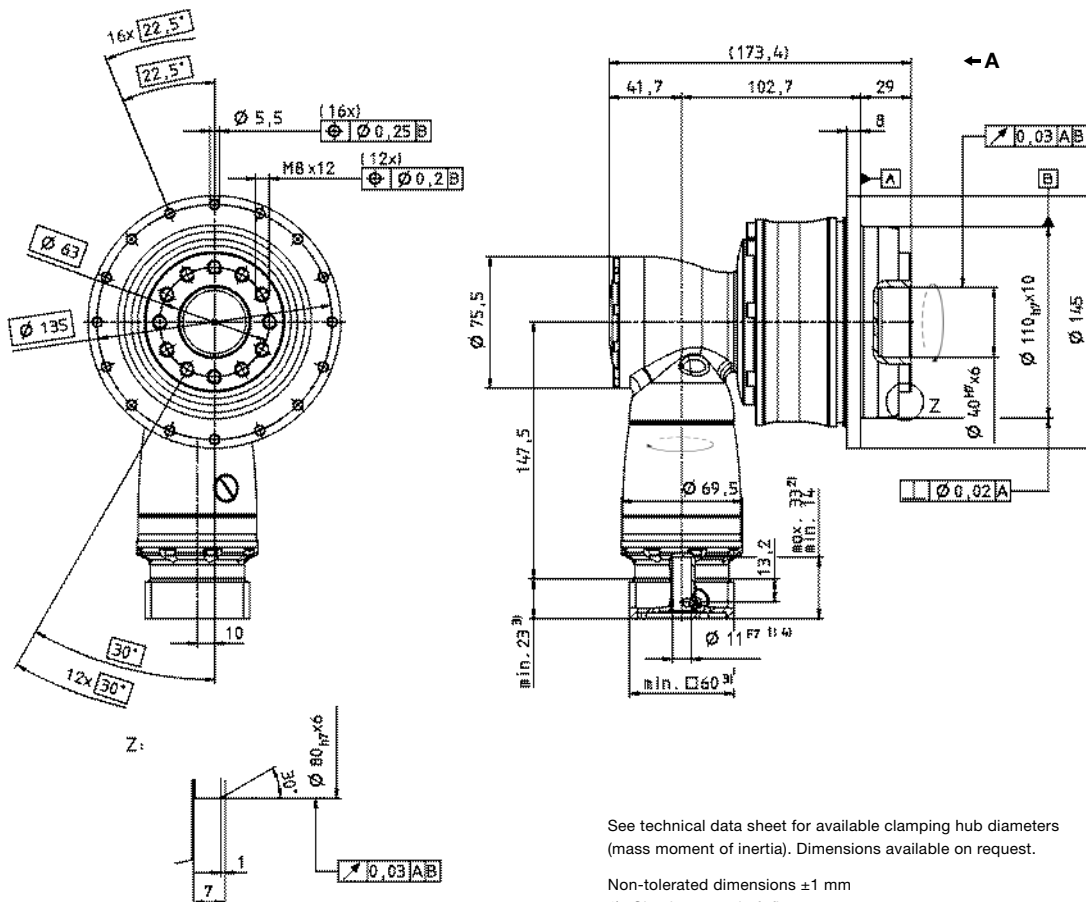
Technical data for rearward output versions, see page 422.

View A

3-stage:



4-stage:



See technical data sheet for available clamping hub diameters (mass moment of inertia). Dimensions available on request.

Non-tolerated dimensions ± 1 mm

- 1) Check motor shaft fit.
- 2) Min./Max. permissible motor shaft length. Longer motor shafts are adaptable, please contact us.
- 3) The dimensions depend on the motor.
- 4) Smaller motor shaft diameter is compensated by a bushing with a minimum thickness of 1 mm.

CAD data is available under www.wittenstein-alpha.com

Motor mounting according to operating manual

Right-angle gearheads
High End

TPK

MA

TPK+ 050 MA HIGH TORQUE 3/4-stage

				3-stage							4-stage													
Ratio ^{a)}				<i>i</i>		66	88	110	137,5	154	220	385	330	462	577,5	770	1078	1540	2695	3850	5500			
Max. acceleration torque (max. 1000 cycles per hour)				<i>T</i> _{2B}	Nm	950	950	950	950	950	950	950	950	950	950	950	950	950	950	950	950	950		
					in.lb	8408	8408	8408	8408	8408	8408	8408	8408	8408	8408	8408	8408	8408	8408	8408	8408	8408	8408	
Nominal output torque (with <i>n</i> _{IN})				<i>T</i> _{2N}	Nm	675	675	675	675	675	675	675	675	675	675	675	675	675	675	675	675	675		
					in.lb	5.974	5.974	5.974	5.974	5.974	5.974	5.974	5.974	5.974	5.974	5.974	5.974	5.974	5.974	5.974	5.974	5.974	5.974	
Emergency stop torque (permitted 1000 times during the service life of the gearhead)				<i>T</i> _{2Not}	Nm	2100	2375	2375	2375	2375	2200	2375	2100	2375	2375	2375	2375	2375	2375	2375	2375	2375		
					in.lb	18585	21019	21019	21019	21019	19470	21019	18585	21019	21019	21019	21019	21019	21019	21019	21019	21019	21019	
Nominal input speed (with <i>τ</i> _{2N} and 20 °C ambient temperature) ^{b), c)}				<i>n</i> _{1N}	rpm	2200	2400	2700	2700	2700	2700	2700	3400	3400	3400	3400	3400	3400	4400	4400	4400			
Max. continuous speed (with 20 % <i>T</i> _{2N} and 20 °C ambient temperature)				<i>n</i> _{1Ncym}	rpm	2800	3300	3800	3800	3300	3300	3300	4300	4300	4300	4300	4300	4300	4400	4400	4400			
Max. input speed				<i>n</i> _{1Max}	rpm	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000			
Mean no load running torque (with <i>n</i> ₁ = 3000 rpm and 20 °C gearhead temperature) ^{d)}				<i>T</i> ₀₁₂	Nm	2.9	2.4	2.0	2.1	2.4	2.1	2.0	0.4	0.5	0.3	0.3	0.3	0.2	0.1	0.1	0.1			
					in.lb	25.7	21.0	18.1	18.4	21.1	18.3	17.7	3.4	4.1	3.0	2.7	2.4	1.3	1.1	1.1	1.0			
Max. torsional backlash				<i>j</i> _t	arcmin	≤ 1,3																		
Torsional rigidity				<i>C</i> _{t21}	Nm/ arcmin	202	203	205	210	205	205	215	202	214	208	209	214	214	215	215	217			
					in.lb/ arcmin	1785	1798	1810	1857	1810	1810	1900	1785	1891	1840	1849	1896	1896	1900	1900	1924			
Tilting rigidity				<i>C</i> _{2K}	Nm/ arcmin	560																		
					in.lb/ arcmin	4956																		
Max. axial force ^{e)}				<i>F</i> _{2AMax}	N	6130																		
					lb _f	1379																		
Max. tilting moment				<i>M</i> _{2KMax}	Nm	1335																		
					in.lb	11815																		
Efficiency at full load				η	%	92							90											
Service life (For calculation, see the Chapter "Information")				<i>L</i> _h	h	> 20000																		
Weight incl. standardadapter plate				<i>m</i>	kg	-																		
					lb _m																			
Operating noise (with <i>n</i> ₁ = 3000 rpm no load)				<i>L</i> _{PA}	dB(A)	≤ 68																		
Max. permitted housing temperature					°C	+90																		
					F	+194																		
Ambient temperature					°C	0 to +40																		
					F	32 to 104																		
Lubrication					Lubricated for life																			
Paint					Blue RAL 5002																			
Direction of rotation					Motor and gearhead opposite directions																			
Protection class					IP 65																			
Moment of inertia (relates to the drive) Clamping hub diameter [mm]				E	19	<i>J</i> ₁	kgcm ²	-	-	-	-	-	-	0,24	0,29	0,20	0,20	0,20	0,19	0,18	0,18	0,18		
							10 ⁻³ in.lb.s ²	-	-	-	-	-	-	0,21	0,26	0,18	0,18	0,18	0,16	0,16	0,16	0,16		
				G	24	<i>J</i> ₁	kgcm ²	1,65	1,30	1,13	1,11	0,99	0,91	0,90	0,68	0,73	0,63	0,63	0,63	0,63	0,63	0,63	0,63	0,63
							10 ⁻³ in.lb.s ²	1,46	1,15	1,00	0,98	0,87	0,81	0,80	0,61	0,65	0,56	0,56	0,56	0,56	0,56	0,55	0,55	0,55
				H	28	<i>J</i> ₁	kgcm ²	3,07	2,71	2,54	2,53	2,40	2,33	2,32	-	-	-	-	-	-	-	-	-	-
							10 ⁻³ in.lb.s ²	2,72	2,40	2,25	2,24	2,13	2,06	2,05	-	-	-	-	-	-	-	-	-	-

Please contact us for information on the best configuration for S1 conditions of use (continuous operation).

^{a)} Other ratios available on request

^{b)} Higher speeds are possible if the nominal torque is reduced

^{c)} For higher ambient temperatures, please reduce input speed

^{d)} Idling torques decrease during operation

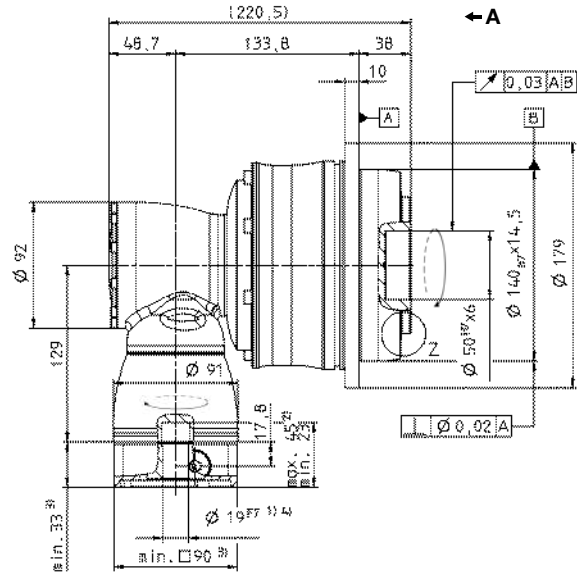
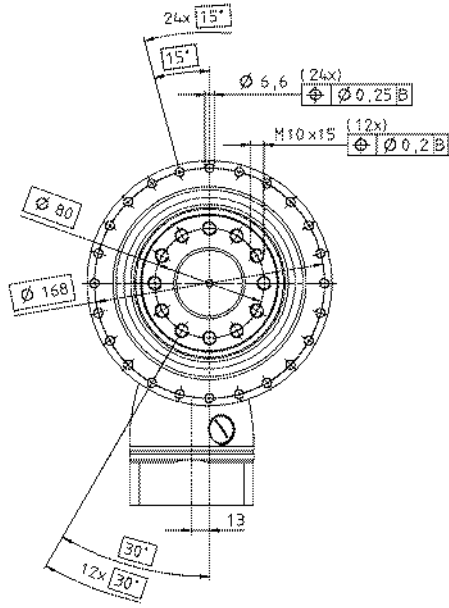
^{e)} Refers to center of the output shaft or flange

All technical data for front output side applies.

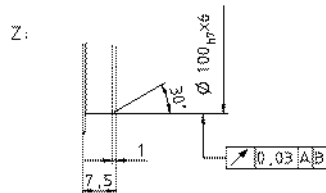
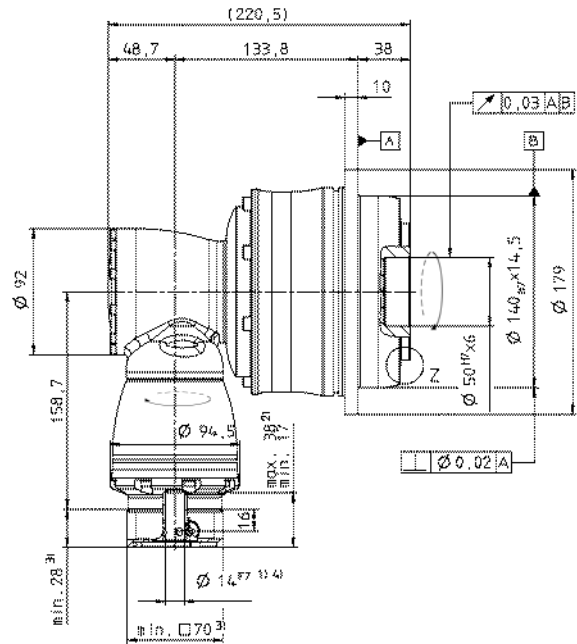
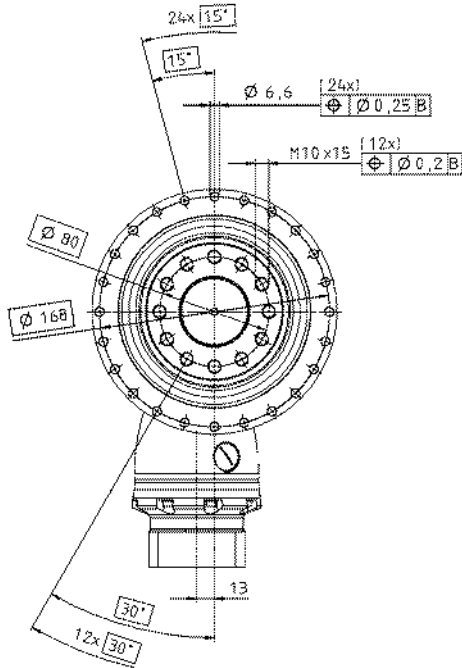
Technical data for rearward output versions, see page 422.

View A

3-stage:



4-stage:



See technical data sheet for available clamping hub diameters (mass moment of inertia). Dimensions available on request.

Non-tolerated dimensions ± 1 mm

- 1) Check motor shaft fit.
- 2) Min./Max. permissible motor shaft length. Longer motor shafts are adaptable, please contact us.
- 3) The dimensions depend on the motor.
- 4) Smaller motor shaft diameter is compensated by a bushing with a minimum thickness of 1 mm.

CAD data is available under www.wittenstein-alpha.com

Motor mounting according to operating manual

Right-angle gear heads
High End

TPK

MA

TPK+ 110 MA HIGH TORQUE 3/4-stage

				3-stage							4-stage												
Ratio ^{a)}				<i>i</i>		66	88	110	137,5	154	220	385	330	462	577,5	770	1078	1540	2695	3850	5500		
Max. acceleration torque (max. 1000 cycles per hour)				<i>T</i> _{2B}	Nm	3100	3100	3100	3100	3100	2750	3100	3100	3100	3100	3100	3100	3100	3100	3100	2000		
					in.lb	27435	27435	27435	27435	27435	24338	27435	27435	27435	27435	27435	27435	27435	27435	27435	27435	17700	
Nominal output torque (with <i>n</i> _{2N})				<i>T</i> _{2N}	Nm	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650	1400		
					in.lb	14603	14603	14603	14603	14603	14603	14603	14603	14603	14603	14603	14603	14603	14603	14603	14603	12390	
Emergency stop torque (permitted 1000 times during the service life of the gearhead)				<i>T</i> _{2Not}	Nm	4800	5700	5700	6500	5600	5500	6500	4800	6500	6000	6500	6500	6500	6500	6500	6500		
					in.lb	42480	50445	50445	57525	49560	48675	57525	42480	57525	53100	57525	57525	57525	57525	57525	57525	57525	
Nominal input speed (with <i>T</i> _{2N} and 20 °C ambient temperature) ^{b), c)}				<i>n</i> _{1N}	rpm	2100	2300	2600	2600	2400	2400	2400	3000	3000	3000	3000	3000	3000	4100	4100	4100		
Max. continuous speed (with 20 % <i>T</i> _{2N} and 20 °C ambient temperature)				<i>n</i> _{1Ncym}	rpm	2800	3200	3600	3600	3200	3200	3200	3800	3800	3800	3800	3800	3800	4100	4100	4100		
Max. input speed				<i>n</i> _{1Max}	rpm	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500		
Mean no load running torque (with <i>n</i> ₁ = 3000 rpm and 20 °C gearhead temperature) ^{d)}				<i>T</i> ₀₁₂	Nm	6.0	4.6	3.6	3.4	4.4	3.5	3.3	0.9	1.0	0.7	0.6	0.6	0.3	0.3	0.2	0.2		
					in.lb	53.1	40.7	31.9	30.1	38.9	31.0	29.2	8.0	8.9	6.2	5.3	5.3	2.7	2.7	1.8	1.8		
Max. torsional backlash				<i>j</i> _t	arcmin	≤ 1,3																	
Torsional rigidity				<i>C</i> _{t21}	Nm/ arcmin	634	642	654	675	654	648	687	634	682	662	667	685	685	689	687	658		
					in.lb/ arcmin	5614	5681	5789	5976	5789	5739	6083	5614	6037	5855	5902	6062	6062	6101	6083	5822		
Tilting rigidity				<i>C</i> _{2K}	Nm/ arcmin	1452																	
					in.lb/ arcmin	12850																	
Max. axial force ^{e)}				<i>F</i> _{2AMax}	N	10050																	
					lb _f	2261																	
Max. tilting moment				<i>M</i> _{2KMax}	Nm	3280																	
					in.lb	29028																	
Efficiency at full load				η	%		92						90										
Service life (For calculation, see the Chapter "Information")				<i>L</i> _h	h		> 20000																
Weight incl. standardadapter plate				<i>m</i>	kg	-																	
					lb _m																		
Operating noise (with <i>n</i> ₁ = 3000 rpm no load)				<i>L</i> _{PA}	dB(A)		≤ 70																
Max. permitted housing temperature					°C	+90																	
					F	+194																	
Ambient temperature					°C	0 to +40																	
					F	32 to 104																	
Lubrication					Lubricated for life																		
Paint					Blue RAL 5002																		
Direction of rotation					Motor and gearhead opposite directions																		
Protection class					IP 65																		
Moment of inertia (relates to the drive) Clamping hub diameter [mm]				E	19	<i>J</i> _I	kgcm ²	-	-	-	-	-	-	0.89	1.06	0.76	0.76	0.76	0.69	0.68	0.68	0.68	
							10 ⁻³ in.lb.s ²	-	-	-	-	-	-	-	0.79	0.94	0.68	0.67	0.67	0.61	0.61	0.60	0.60
				G	24	<i>J</i> _I	kgcm ²	-	-	-	-	-	-	-	2.46	2.63	2.33	2.32	2.32	2.26	2.25	2.25	2.25
							10 ⁻³ in.lb.s ²	-	-	-	-	-	-	-	2.17	2.33	2.06	2.06	2.05	2.00	1.99	1.99	1.99
				H	28	<i>J</i> _I	kgcm ²	5.48	4.27	3.64	3.58	3.14	2.87	2.84	-	-	-	-	-	-	-	-	-
							10 ⁻³ in.lb.s ²	4.85	3.78	3.22	3.17	2.78	2.54	2.51	-	-	-	-	-	-	-	-	-
				K	38	<i>J</i> _I	kgcm ²	12.72	11.52	10.89	10.83	10.39	10.12	10.09	-	-	-	-	-	-	-	-	-
							10 ⁻³ in.lb.s ²	11.26	10.19	9.64	9.58	9.19	8.95	8.93	-	-	-	-	-	-	-	-	-

Please contact us for information on the best configuration for S1 conditions of use (continuous operation).

^{a)} Other ratios available on request

^{b)} Higher speeds are possible if the nominal torque is reduced

^{c)} For higher ambient temperatures, please reduce input speed

^{d)} Idling torques decrease during operation

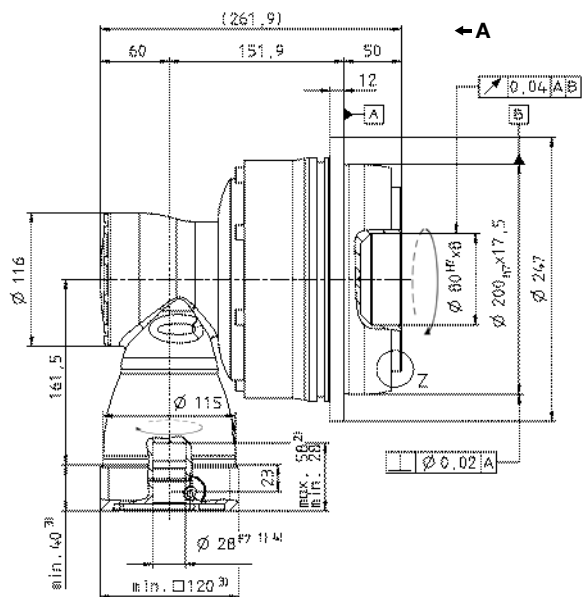
^{e)} Refers to center of the output shaft or flange

All technical data for front output side applies.

Technical data for rearward output versions, see page 422.

Technical drawing of a circular mechanical part, likely a flange or end plate, showing various dimensions and features:

- Outer Diameter:** $\varnothing 233$
- Inner Diameter:** $\varnothing 125$
- Central Hole Diameter:** $\varnothing 9$
- Central Hole Depth:** $24 \times 15^\circ$
- Central Hole Positioning:** $\varnothing 0,25 \text{ B}$ (24x)
- Mounting Holes:** $M12 \times 19$ (12x), $\varnothing 0,2 \text{ B}$
- Mounting Holes Positioning:** $12 \times 30^\circ$
- Mounting Holes Diameter:** $\varnothing 17$
- Mounting Holes Positioning:** 30°



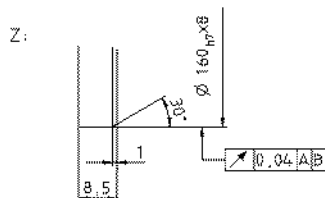
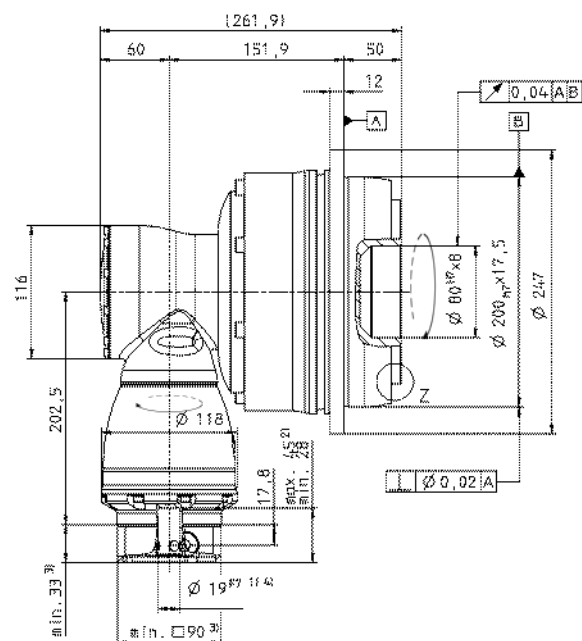
Technical drawing of a circular mechanical component, likely a flange or cover plate, showing top and side views with dimensions and tolerances.

Top View Dimensions:

- Outer diameter: $\varnothing 233$
- Inner diameter: $\varnothing 125$
- Central hole diameter: $\varnothing 9$ (24x) with tolerance $\begin{matrix} \oplus \\ \ominus \end{matrix} \varnothing 0,25 \text{ B}$
- Mounting holes: 12x $\varnothing 0,2 \text{ B}$ (12x) with tolerance $\begin{matrix} \oplus \\ \ominus \end{matrix} \varnothing 0,2 \text{ B}$
- Mounting holes pitch: M12x19
- Mounting holes diameter: $\varnothing 15$
- Mounting holes pitch circle diameter: 24x $\varnothing 15$

Side View Dimensions:

- Flange thickness: 17
- Mounting holes depth: 30°
- Mounting holes diameter: 12x $\varnothing 30$



 CAD data is available under www.wittenstein-alpha.com

Right-angle gearheads High End

TPK⁺

MA

TPK+ 300 MA HIGH TORQUE 3/4-stage

					3-stage							4-stage								
Ratio ^{a)}	<i>i</i>		66	88	110	137.5	154	220	385	330	462	577.5	770	1078	1540	2695	3850	5500		
Max. acceleration torque (max. 1000 cycles per hour)	<i>T</i> _{2B}	Nm	5500	5500	5500	5500	5500	4600	5500	5500	5500	5500	5500	5500	5500	5500	5500	3900		
		in.lb	48675	48675	48675	48675	48675	40710	48675	48675	48675	48675	48675	48675	48675	48675	48675	34515		
Nominal output torque (with <i>n</i> _{1N})	<i>T</i> _{2N}	Nm	3500	3500	3500	3500	3500	3500	3500	3500	3500	3500	3500	3500	3500	3500	3500	3500		
		in.lb	30975	30975	30975	30975	30975	30975	30975	30975	30975	30975	30975	30975	30975	30975	30975	30975		
Emergency stop torque (permitted 1000 times during the service life of the gearhead)	<i>T</i> _{2Not}	Nm	8800	11000	11000	11000	9900	8800	13250	8800	13250	11000	13250	13250	13250	13250	13250	13250		
		in.lb	77880	97350	97350	97350	87615	77880	117263	77880	117263	97350	117263	117263	117263	117263	117263	117263		
Nominal input speed (with <i>T</i> _{2N} and 20 °C ambient temperature) ^{b), c)}	<i>n</i> _{1N}	rpm	1800	1900	2100	2100	1900	1900	1900	2800	2800	2800	2800	2800	2800	3100	3800	3800		
Max. continuous speed (with 20 % <i>T</i> _{2N} and 20 °C ambient temperature)	<i>n</i> _{1Ncym}	rpm	2300	2600	2900	2900	2600	2600	2600	3800	3800	3800	3800	3800	3800	4000	4000	4000		
Max. input speed	<i>n</i> _{1Max}	rpm	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500		
Mean no load running torque (with <i>n</i> ₁ = 3000 rpm and 20 °C gearhead temperature) ^{d)}	<i>T</i> ₀₁₂	Nm	11.0	8.2	6.9	6.5	9.2	6.7	6.4	1.5	2.2	1.0	0.9	0.8	0.6	0.4	0.4	0.4		
		in.lb	97.4	72.6	61.1	57.5	81.4	59.3	56.6	13.3	19.5	8.9	8.0	7.1	5.3	3.5	3.5	3.5		
Max. torsional backlash	<i>j</i> _t	arcmin	Standard ≤ 3,3 / Reduced ≤ 1,8																	
Torsional rigidity	<i>C</i> _{t21}	Nm/ arcmin	1099	1108	1114	960	1114	1111	979	1099	976	953	958	978	978	979	979	989		
		in.lb/ arcmin	9727	9809	9856	8499	9856	9834	8662	9727	8634	8437	8476	8655	8655	8667	8662	8757		
Tilting rigidity	<i>C</i> _{2K}	Nm/ arcmin	5560																	
		in.lb/ arcmin	49210																	
Max. axial force ^{e)}	<i>F</i> _{2AMax}	N	33000																	
		lb _f	7425																	
Max. tilting moment	<i>M</i> _{2KMax}	Nm	6500																	
		in.lb	57525																	
Efficiency at full load	η	%	92							90										
Service life (For calculation, see the Chapter "Information")	<i>L</i> _h	h	> 20000																	
Weight incl. standardadapter plate	<i>m</i>	kg	83							87										
		lb _m	183							192										
Operating noise (with <i>n</i> ₁ = 3000 rpm no load)	<i>L</i> _{PA}	dB(A)	≤ 71																	
Max. permitted housing temperature		°C	+90																	
		F	+194																	
Ambient temperature		°C	0 to +40																	
		F	32 to 104																	
Lubrication			Lubricated for life																	
Paint			Blue RAL 5002																	
Direction of rotation			Motor and gearhead opposite directions																	
Protection class			IP 65																	
Moment of inertia (relates to the drive)	G	24	<i>J</i> ₁	kgcm ²	-	-	-	-	-	-	-	3.32	4.24	2.80	2.79	2.79	2.49	2.43	2.42	2.42
				10 ⁻³ in.lb.s ²	-	-	-	-	-	-	-	-	2.94	3.75	2.48	2.47	2.47	2.20	2.15	2.14
Clamping hub diameter [mm]	K	38	<i>J</i> ₁	kgcm ²	26.04	19.71	16.71	16.58	14.26	12.89	12.83	10.23	11.15	9.71	9.70	9.70	9.40	9.34	9.33	9.33
				10 ⁻³ in.lb.s ²	23.05	17.44	14.78	14.67	12.62	11.41	11.36	9.06	9.87	8.59	8.59	8.58	8.32	8.27	8.26	8.26

Please contact us for information on the best configuration for S1 conditions of use (continuous operation).

^{a)} Other ratios available on request

^{b)} Higher speeds are possible if the nominal torque is reduced

^{c)} For higher ambient temperatures, please reduce input speed

^{d)} Idling torques decrease during operation

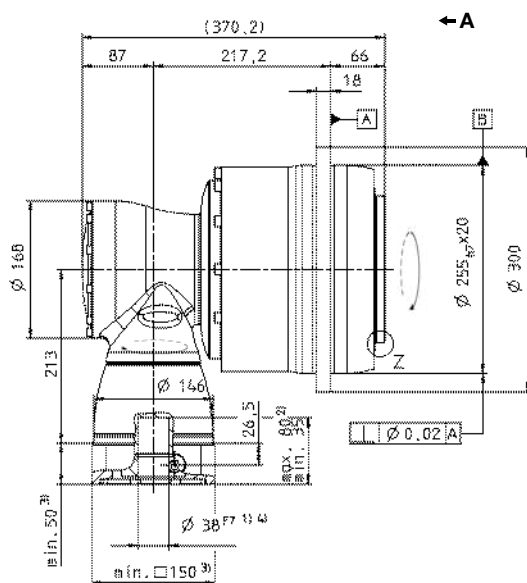
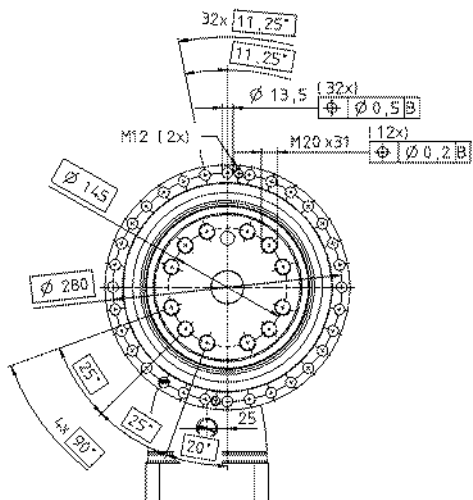
^{e)} Refers to center of the output shaft or flange

All technical data for front output side applies.

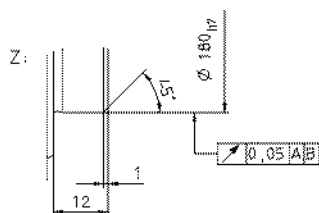
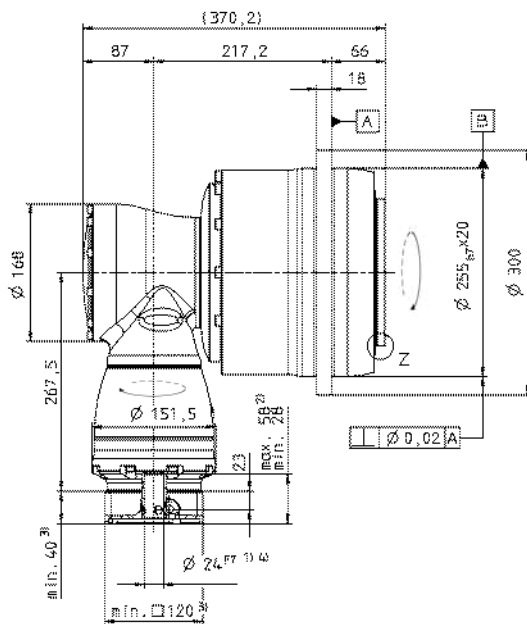
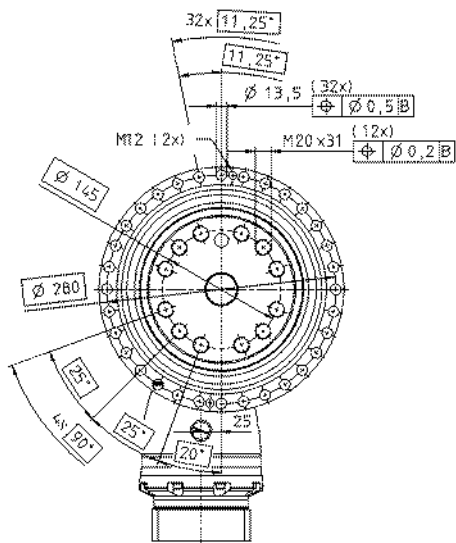
Technical data for rearward output versions, see page 422.

View A

3-stage:



4-stage:



See technical data sheet for available clamping hub diameters (mass moment of inertia). Dimensions available on request.

Non-tolerated dimensions ± 1 mm

- 1) Check motor shaft fit.
- 2) Min./Max. permissible motor shaft length. Longer motor shafts are adaptable, please contact us.
- 3) The dimensions depend on the motor.
- 4) Smaller motor shaft diameter is compensated by a bushing with a minimum thickness of 1 mm.

CAD data is available under www.wittenstein-alpha.com

Motor mounting according to operating manual

Right-angle gearheads
High End

TPK

MA

TPK+ 500 MA HIGH TORQUE 3/4-stage

				3-stage								4-stage																
Ratio ^{a)}				<i>i</i>		66	88	110	137,5	154	220	385	330	462	577,5	770	1078	1540	2695	3850	5500							
Max. acceleration torque (max. 1000 cycles per hour)				<i>T</i> _{2B}	Nm	10000	10000	10000	10000	10000	10000	10000	10000	10000	10000	10000	10000	10000	10000	10000	10000	7200						
					in.lb	88500	88500	88500	88500	88500	88500	88500	88500	88500	88500	88500	88500	88500	88500	88500	88500	88500	88500	63720				
Nominal output torque (with <i>n</i> _{in})				<i>T</i> _{2N}	Nm	5400	5400	5400	5400	5400	5400	5400	5400	5400	5400	5400	5400	5400	5400	5400	5400	5400						
					in.lb	47790	47790	47790	47790	47790	47790	47790	47790	47790	47790	47790	47790	47790	47790	47790	47790	47790	47790	47790				
Emergency stop torque (permitted 1000 times during the service life of the gearhead)				<i>T</i> _{2Not}	Nm	19800	23000	23000	25000	21300	19800	25000	19800	25000	25000	25000	25000	25000	25000	25000	25000	25000						
					in.lb	175230	203550	203550	221250	188505	175230	221250	175230	221250	221250	221250	221250	221250	221250	221250	221250	221250	221250	221250				
Nominal input speed (with <i>T</i> _{2N} and 20 °C ambient temperature) ^{b), c)}				<i>n</i> _{1N}	rpm	1500	1700	1900	1900	1700	1700	1700	2600	2600	2600	2600	2600	2600	3100	3300	3300							
Max. continuous speed (with 20% <i>T</i> _{2N} and 20 °C ambient temperature)				<i>n</i> _{1Ncym}	rpm	1800	2200	2600	2600	2300	2300	3100	3300	3300	3300	3300	3300	3300	3600	3600	3600							
Max. input speed				<i>n</i> _{1Max}	rpm	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000							
Mean no load running torque (with <i>n</i> _i = 3000 rpm and 20 °C gearhead temperature) ^{d)}				<i>T</i> ₀₁₂	Nm	20.5	16.5	13.6	12.8	17.6	14.3	13.7	3.0	4.0	2.0	1.8	1.7	1.2	1.1	1.0	1.0							
					in.lb	181.4	146.0	120.4	113.3	155.8	126.6	121.2	26.6	35.4	17.7	15.9	15.0	10.6	9.7	8.9	8.9	8.9						
Max. torsional backlash				<i>j</i> _t	arcmin	Standard ≤3,3 / Reduced ≤1,8																						
Torsional rigidity				<i>C</i> _{t21}	Nm/ arcmin	1879	1890	1901	1747	1899	1898	1772	1879	1766	1735	1742	1770	1770	1772	1772	1786							
					in.lb/ arcmin	16626	16727	16820	15464	16809	16799	15683	16626	15633	15359	15413	15662	15662	15686	15686	15683	15808						
Tilting rigidity				<i>C</i> _{2K}	Nm/ arcmin	9480																						
					in.lb/ arcmin	83906																						
Max. axial force ^{e)}				<i>F</i> _{2AMax}	N	50000																						
					lb _f	11250																						
Max. tilting moment				<i>M</i> _{2KMax}	Nm	9500																						
					in.lb	84075																						
Efficiency at full load				η	%								92								90							
Service life (For calculation, see the Chapter "Information")				<i>L</i> _h	h		> 20000																					
Weight incl. standardadapter plate				<i>m</i>	kg	120								124														
					lb _m	265								274														
Operating noise (with <i>n</i> _i = 3000 rpm no load)				<i>L</i> _{PA}	dB(A)		≤ 71																					
Max. permitted housing temperature					°C	+90																						
					F	+194																						
Ambient temperature					°C	0 to +40																						
					F	32 to 104																						
Lubrication						Lubricated for life																						
Paint						Blue RAL 5002																						
Direction of rotation						Motor and gearhead opposite directions																						
Protection class						IP 65																						
Moment of inertia (relates to the drive) Clamping hub diameter [mm]		K	38	<i>J</i> _i	kgcm ²	-	-	-	-	-	-	-	12.43	15.36	10.93	10.92	10.91	10.13	9.95	9.91	9.91							
					10 ⁻⁴ in.lb.s ²	-	-	-	-	-	-	-	11.00	13.59	9.67	9.66	9.66	8.96	8.81	8.77	8.77							
		M	48	<i>J</i> _i	kgcm ²	75.54	52.83	42.94	42.67	34.37	29.87	29.73	27.14	30.07	25.64	25.63	25.62	24.84	24.66	24.62	24.62							
					10 ⁻⁴ in.lb.s ²	66.85	46.76	38.01	37.76	30.41	26.43	26.31	24.02	26.61	22.69	22.68	22.68	21.98	21.83	21.79	21.79							

Please contact us for information on the best configuration for S1 conditions of use (continuous operation).

a) Other ratios available on request

b) Higher speeds are possible if the nominal torque is reduced

c) For higher ambient temperatures, please reduce input speed

d) Idling torques decrease during operation

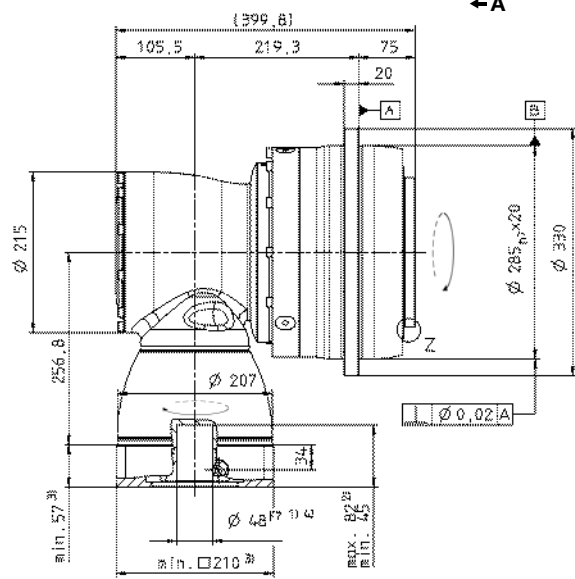
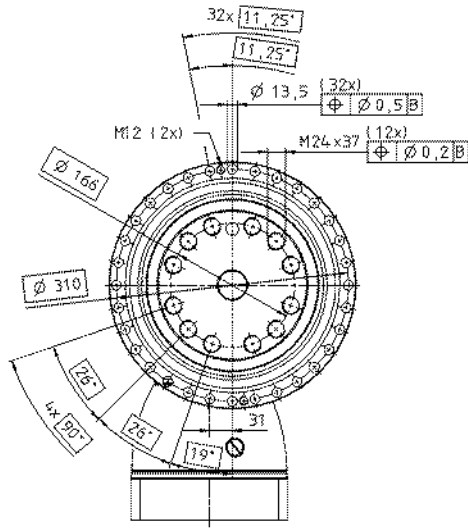
^{e)} Refers to center of the output shaft or flange

All technical data for front output side applies.

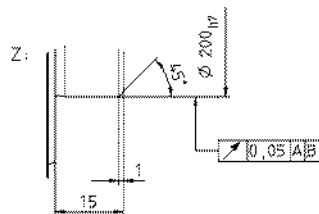
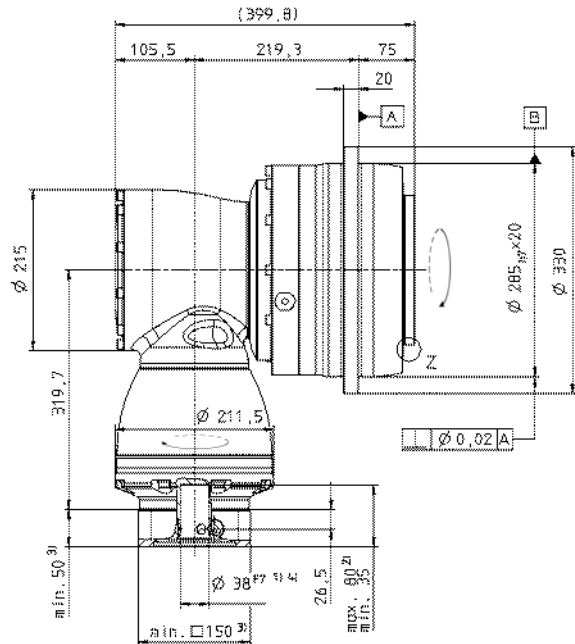
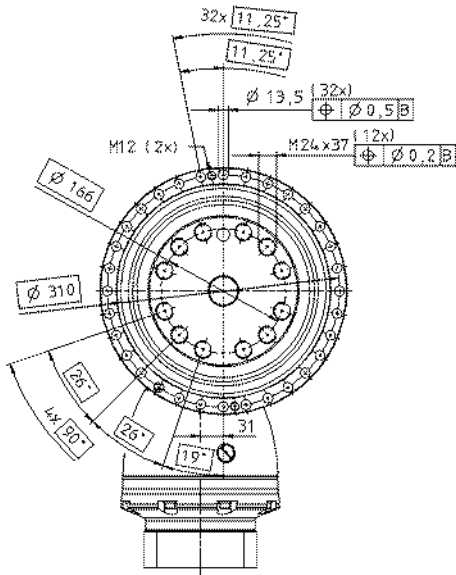
Technical data for rearward output versions, see page 422.

View A

3-stage:



4-stage:



See technical data sheet for available clamping hub diameters (mass moment of inertia). Dimensions available on request.

Non-tolerated dimensions ± 1 mm

- 1) Check motor shaft fit.
- 2) Min./Max. permissible motor shaft length. Longer motor shafts are adaptable, please contact us.
- 3) The dimensions depend on the motor.
- 4) Smaller motor shaft diameter is compensated by a bushing with a minimum thickness of 1 mm.

CAD data is available under www.wittenstein-alpha.com

Motor mounting according to operating manual

Right-angle gearheads
High End

TPK

MA

SK⁺/SPK⁺ –

Space-saving right-angle precision with output shaft

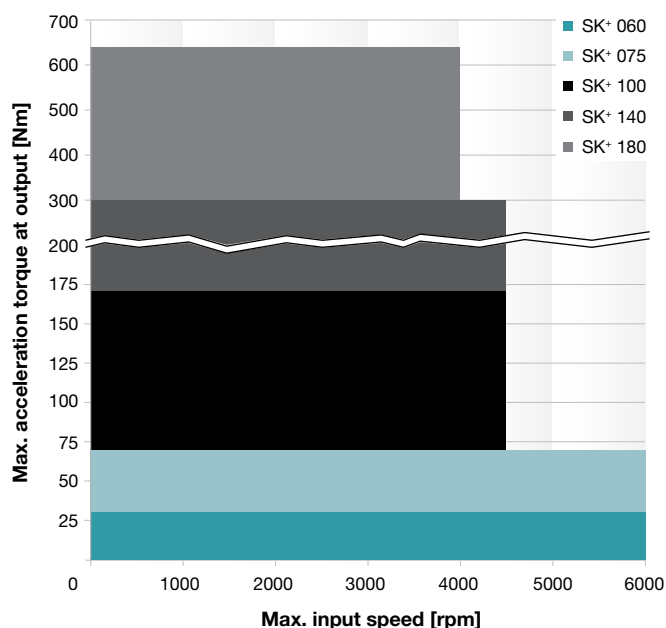


The representatives of our versatile hypoid gearhead with SP⁺ compatible output shaft. SPK⁺ gearheads with planetary stage are especially suitable for high-precision applications requiring higher power and torsional rigidity.

Quick size selection

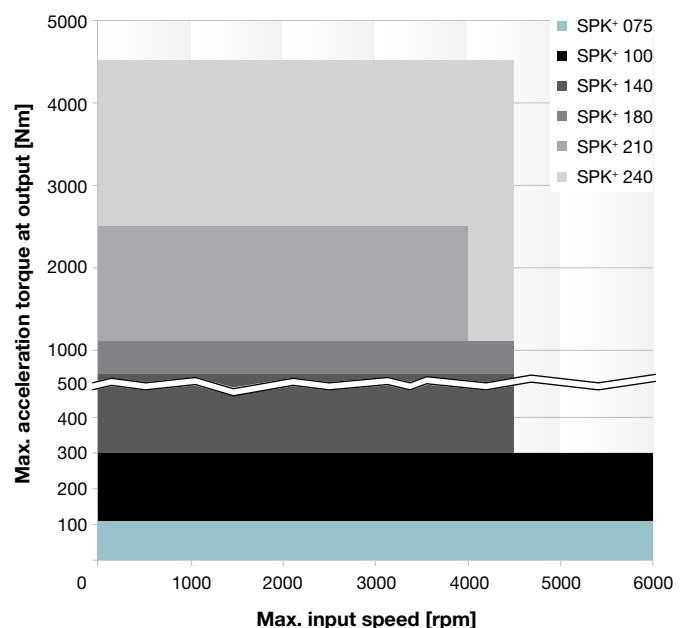
SK⁺ MF (example for $i = 5$)

For applications in cyclic operation ($DC \leq 60\%$)
or continuous operation ($DC \geq 60\%$)



SPK⁺ MF (example for $i = 25$)

For applications in cyclic operation ($DC \leq 60\%$)
or continuous operation ($DC \geq 60\%$)



Versions and Applications

Features	SK ⁺ MF version page 204	SPK ⁺ MF version page 214
Power density	••	••
Positioning accuracy (e.g. clamped drives)	••	•••
Highly dynamic applications	••	••
Torsional rigidity	••	••

Product features

Ratios ^{c)}		3 – 100	12 – 10000
Torsional backlash [arcmin] ^{c)}	Standard	≤ 4	≤ 4
	Reduced	–	≤ 2
Output type			
Smooth output shaft		•	•
Smooth output shaft, rear side		•	•
Keywayed output shaft		•	•
Keywayed output shaft, rear side		•	•
Output shaft with involute gearing		•	•
Hollow shaft interface, rear side Connected via shrink disc		•	•
Mounted shaft Connected via shrink disc			•
Closed cover, rear side		•	•
Input type			
Motor mounted version		•	•
Type			
ATEX ^{a)}		•	
Food-grade lubrication ^{a) b)}		•	•
Corrosion resistant ^{a) b)}		•	•
Accessories			
Coupling		•	•
Rack		•	•
Pinion		•	•
Shrink disc		•	•
torqXis sensor flange		•	•
Intermediate plate for cooling connection		•	•

^{a)} Power reduction; technical data available upon request

^{b)} Please contact WITTENSTEIN alpha

^{c)} In relation to reference sizes

Right-angle gearheads
High End



SK+ 060 MF 1/2-stage

					1-stage						2-stage							
Ratio ^{a)}	<i>i</i>		3	4	5	7	10	12	16	20	25	28	35	40	50	70	100	
Max. acceleration torque (max. 1000 cycles per hour)	<i>T</i> _{2B}	Nm	30	30	30	25	20	30	30	30	30	30	30	30	30	25	20	
		in.lb	266	266	266	221	177	266	266	266	266	266	266	266	266	266	221	177
Nominal output torque (with <i>n</i> _N)	<i>T</i> _{2N}	Nm	22	22	22	20	15	22	22	22	22	22	22	22	22	20	15	
		in.lb	195	195	195	177	133	195	195	195	195	195	195	195	195	195	177	133
Emergency stop torque (permitted 1000 times during the service life of the gearhead)	<i>T</i> _{2Not}	Nm	40	50	50	45	40	50	50	50	50	50	50	50	50	45	40	
		in.lb	354	443	443	398	354	443	443	443	443	443	443	443	443	443	398	354
Nominal input speed (with <i>T</i> _{2N} and 20°C ambient temperature) ^{b), c)}	<i>n</i> _{1N}	rpm	2500	2700	3000	3000	3000	4400	4400	4400	4400	4400	4400	4400	4800	5500	5500	
Max. continuous speed (with 20% <i>T</i> _{2N} and 20°C ambient temperature)	<i>n</i> _{1Ncym}	rpm	3000	3500	4000	3500	3500	5000	5000	5000	5000	5000	5000	5000	5000	5500	5500	
Max. input speed	<i>n</i> _{1Max}	rpm	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	
Mean no load running torque (with <i>n</i> ₁ = 3000 rpm and 20°C gearhead temperature) ^{d)}	<i>T</i> ₀₁₂	Nm	1.2	1.1	1.0	1.2	1.1	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	
		in.lb	10.6	9.7	8.9	10.6	9.7	1.8	1.8	1.8	1.8	1.8	1.8	0.9	0.9	0.9	0.9	
Max. torsional backlash	<i>j</i> _t	arcmin	≤ 5															
Torsional rigidity	<i>C</i> _{t21}	Nm/ arcmin	2.0	2.1	2.2	2.0	1.8	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.0	1.8	
		in.lb/ arcmin	18	19	19	18	16	19	19	19	19	19	19	19	19	18	16	
Max. axial force ^{e)}	<i>F</i> _{2AMax}	N	2400															
		lb _f	540															
Max. radial force ^{e)}	<i>F</i> _{2RMax}	N	2700															
		lb _f	608															
Max. tilting moment	<i>M</i> _{2KMax}	Nm	251															
		in.lb	2220															
Efficiency at full load	η	%	96						94									
Service life (For calculation, see the Chapter "Information")	<i>L</i> _h	h	> 20000															
Weight incl. standard adapter plate	<i>m</i>	kg	2.9						3.2									
		lb _m	6.4						7.1									
Operating noise (with <i>n</i> ₁ = 3000 rpm no load)	<i>L</i> _{PA}	dB(A)	≤ 64															
Max. permitted housing temperature		°C	+90															
		F	194															
Ambient temperature		°C	0 to +40															
		F	32 to 104															
Lubrication			Lubricated for life															
Paint			Blue RAL 5002															
Direction of rotation			Motor and gearhead opposite directions															
Protection class			IP 65															
Moment of inertia (relates to the drive) Clamping hub diameter [mm]	B	11	<i>J</i> ₁	kgcm ²	–	–	–	–	–	0.09	0.09	0.07	0.07	0.06	0.06	0.06	0.06	0.06
				10 ⁻³ in.lb.s ²	–	–	–	–	–	0.08	0.08	0.07	0.06	0.06	0.06	0.05	0.05	0.05
	C	14	<i>J</i> ₁	kgcm ²	0.52	0.44	0.40	0.36	0.34	0.20	0.20	0.19	0.19	0.18	0.18	0.17	0.17	0.17
				10 ⁻³ in.lb.s ²	0.46	0.39	0.35	0.32	0.30	0.18	0.18	0.17	0.16	0.16	0.16	0.15	0.15	0.15
	E	19	<i>J</i> ₁	kgcm ²	0.87	0.79	0.75	0.71	0.70	–	–	–	–	–	–	–	–	–
				10 ⁻³ in.lb.s ²	0.77	0.70	0.66	0.63	0.62	–	–	–	–	–	–	–	–	–

Please contact us for information on the best configuration for S1 conditions of use (continuous operation).

^{a)} Other ratios available on request

^{b)} Higher speeds are possible if the nominal torque is reduced

^{c)} For higher ambient temperatures, please reduce input speed

^{d)} Idling torques decrease during operation

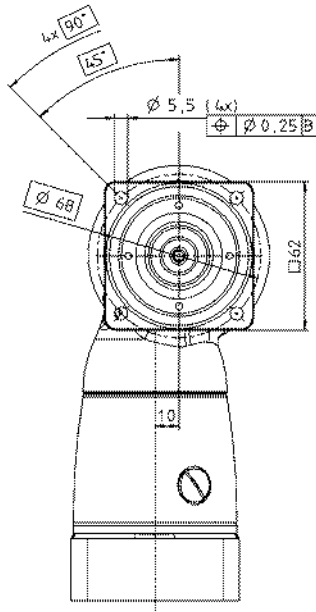
^{e)} Refers to center of the output shaft or flange

All technical data for front output side applies.

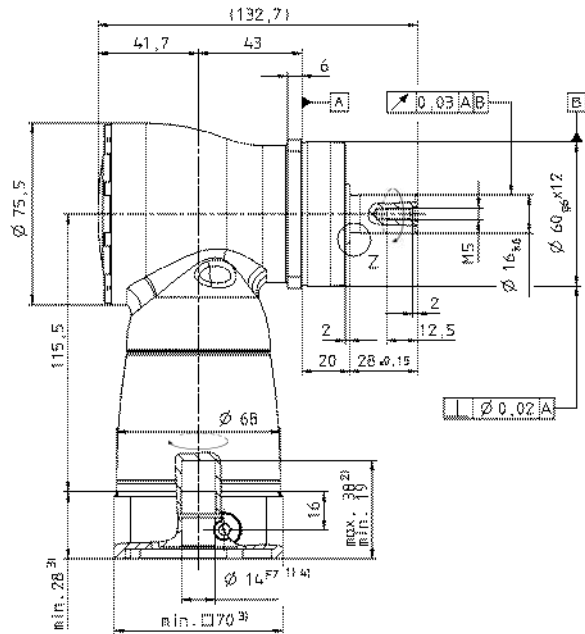
Technical data for rearward output versions, see page 422.

View A

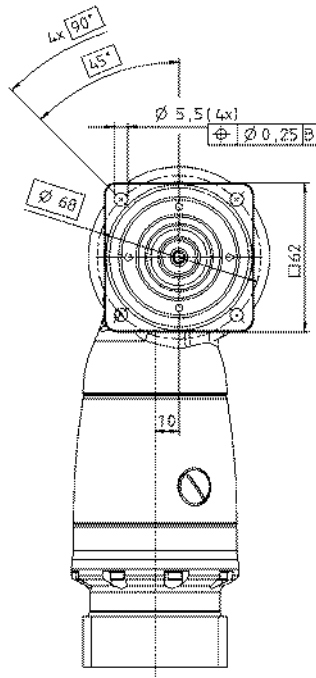
1-stage:



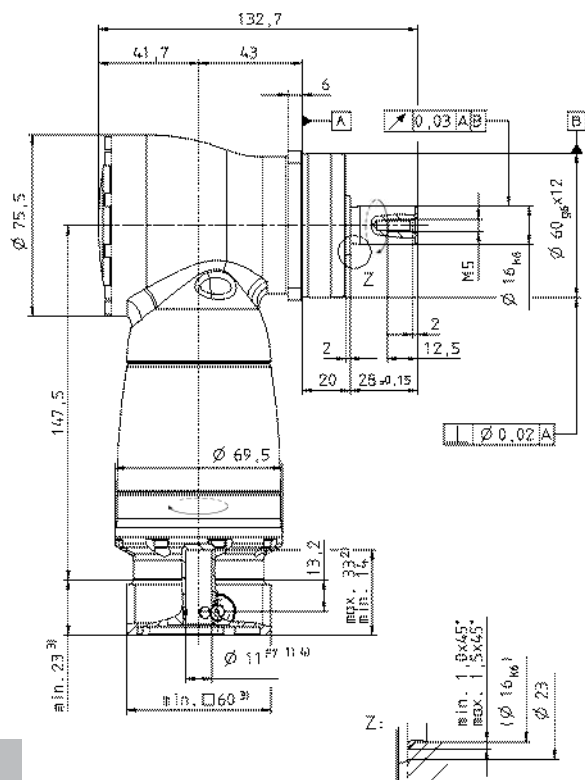
← A



2-stage:

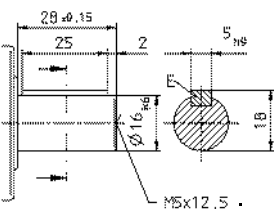


← A

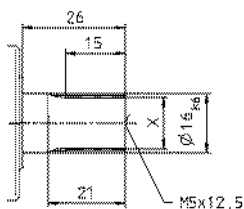


Alternatives: Output shaft variants

Keywayed output shaft in mm
E = key as per DIN 6885, sheet 1, form A



Involute gearing DIN 5480
X = W 16 x 0.8 x 30 x 18 x 6m, DIN 5480



See technical data sheet for available clamping hub diameters (mass moment of inertia). Dimensions available on request.

Non-tolerated dimensions ± 1 mm

- 1) Check motor shaft fit.
- 2) Min./Max. permissible motor shaft length. Longer motor shafts are adaptable, please contact us.
- 3) The dimensions depend on the motor.
- 4) Smaller motor shaft diameter is compensated by a bushing with a minimum thickness of 1 mm.



CAD data is available under
<http://www.wittenstein-alpha.de/en/info-and-cad-finder.html>



Motor mounting according to operating manual

Right-angle gearheads
High End

SK

SK⁺ 075 MF 1/2-stage

				1-stage					2-stage										
Ratio ^{a)}	<i>i</i>			3	4	5	7	10	12	16	20	25	28	35	40	50	70	100	
Max. acceleration torque (max. 1000 cycles per hour)	<i>T</i> _{2B}	Nm	70	70	70	60	50	70	70	70	70	70	70	70	70	70	60	50	
		in.lb	620	620	620	531	443	620	620	620	620	620	620	620	620	620	531	443	
Nominal output torque (with <i>n</i> _N)	<i>T</i> _{2N}	Nm	50	50	50	45	40	50	50	50	50	50	50	50	50	50	45	40	
		in.lb	443	443	443	398	354	443	443	443	443	443	443	443	443	443	398	354	
Emergency stop torque (permitted 1000 times during the service life of the gearhead)	<i>T</i> _{2Not}	Nm	95	115	115	110	100	115	115	115	115	115	115	115	115	115	110	100	
		in.lb	841	1018	1018	974	885	1018	1018	1018	1018	1018	1018	1018	1018	1018	974	885	
Nominal input speed (with <i>T</i> _{2N} and 20°C ambient temperature) ^{b), c)}	<i>n</i> _{1N}	rpm	2300	2500	2800	2800	2800	3500	3500	3500	3500	3500	3500	3500	3500	3800	4500	4500	
Max. continuous speed (with 20% <i>T</i> _{2N} and 20°C ambient temperature)	<i>n</i> _{1Ncym}	rpm	3000	3500	4000	3500	3500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	
Max. input speed	<i>n</i> _{1Max}	rpm	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	
Mean no load running torque (with <i>n</i> ₁ = 3000 rpm and 20°C gearhead temperature) ^{d)}	<i>T</i> ₀₁₂	Nm	2.0	1.7	1.5	2.0	1.8	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	
		in.lb	18	15	13	18	16	2.7	2.7	1.8	1.8	1.8	1.8	1.8	0.9	0.9	0.9	0.9	
Max. torsional backlash	<i>j</i> _t	arcmin	≤ 4																
Torsional rigidity	<i>C</i> _{t21}	Nm/ arcmin	5.0	5.5	6.0	6.0	6.0	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	6.0	6.0	6.0	
		in.lb/ arcmin	44	49	53	53	53	49	49	49	49	49	49	49	49	53	53	53	
Max. axial force ^{e)}	<i>F</i> _{2AMax}	N	3400																
		lb _f	765																
Max. radial force ^{e)}	<i>F</i> _{2RMax}	N	4000																
		lb _f	900																
Max. tilting moment	<i>M</i> _{2KMax}	Nm	437																
		in.lb	3867																
Efficiency at full load	η	%	96					94											
Service life (For calculation, see the Chapter "Information")	<i>L</i> _h	h	> 20000																
Weight incl. standard adapter plate	<i>m</i>	kg	4.8					5.4											
		lb _m	10.6					11.9											
Operating noise (with <i>n</i> ₁ = 3000 rpm no load)	<i>L</i> _{PA}	dB(A)	≤ 66																
Max. permitted housing temperature		°C	+90																
		F	194																
Ambient temperature		°C	0 to +40																
		F	32 to 104																
Lubrication			Lubricated for life																
Paint			Blue RAL 5002																
Direction of rotation			Motor and gearhead opposite directions																
Protection class			IP 65																
Moment of inertia (relates to the drive) Clamping hub diameter [mm]	C	14	<i>J</i> ₁	kgcm ²	–	–	–	–	–	0.28	0.27	0.23	0.23	0.20	0.20	0.18	0.18	0.18	0.18
				10 ⁻³ in.lb.s ²	–	–	–	–	–	0.25	0.24	0.21	0.20	0.18	0.18	0.16	0.16	0.16	0.16
	E	19	<i>J</i> ₁	kgcm ²	1.46	1.19	1.06	0.95	0.90	0.73	0.71	0.68	0.67	0.63	0.62	0.63	0.63	0.63	0.63
				10 ⁻³ in.lb.s ²	1.29	1.05	0.94	0.84	0.79	0.64	0.63	0.60	0.59	0.55	0.55	0.56	0.55	0.55	0.55
	H	28	<i>J</i> ₁	kgcm ²	2.88	2.61	2.47	2.37	2.31	–	–	–	–	–	–	–	–	–	–
				10 ⁻³ in.lb.s ²	2.55	2.31	2.19	2.10	2.04	–	–	–	–	–	–	–	–	–	–

Please contact us for information on the best configuration for S1 conditions of use (continuous operation).

^{a)} Other ratios available on request

^{b)} Higher speeds are possible if the nominal torque is reduced

^{c)} For higher ambient temperatures, please reduce input speed

^{d)} Idling torques decrease during operation

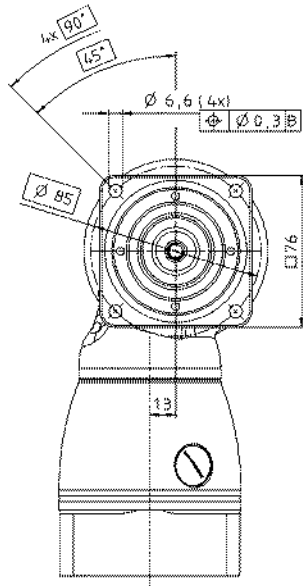
^{e)} Refers to center of the output shaft or flange

All technical data for front output side applies.

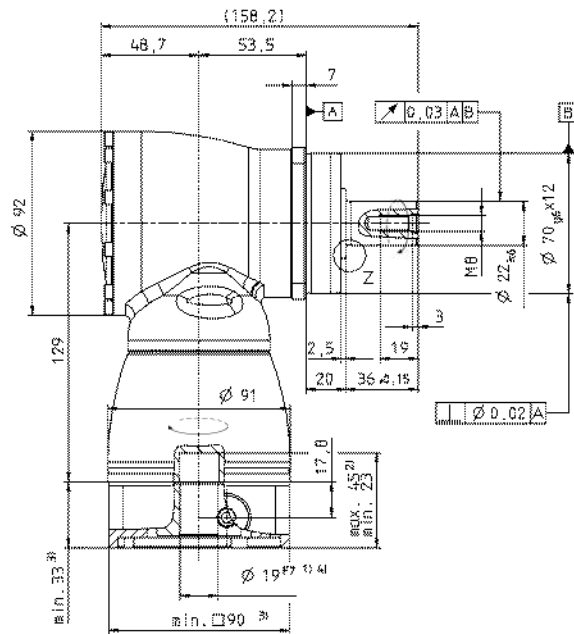
Technical data for rearward output versions, see page 422.

View A

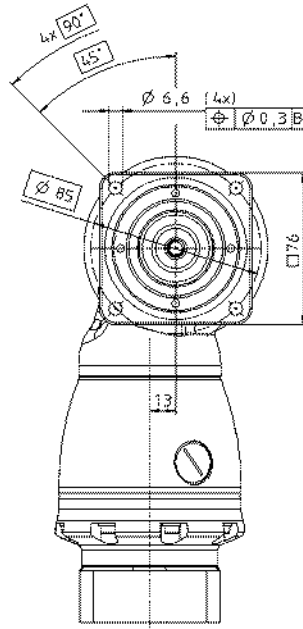
1-stage:



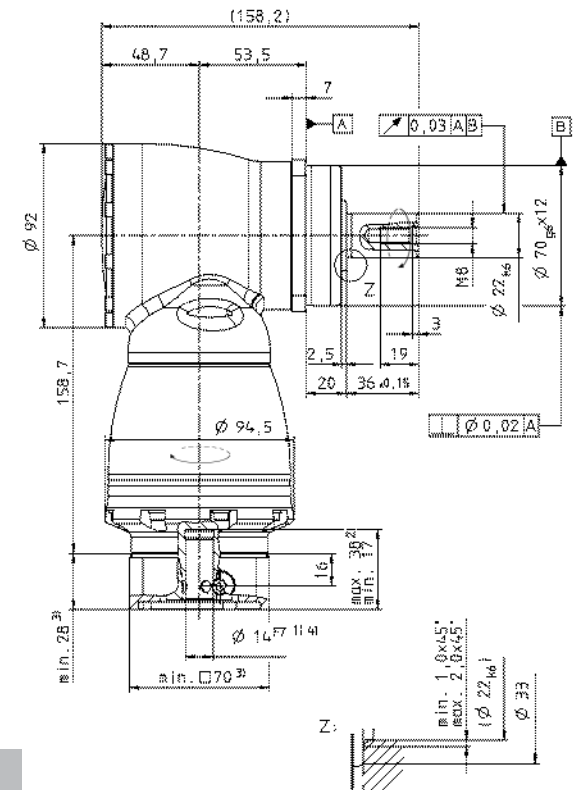
← A



2-stage:

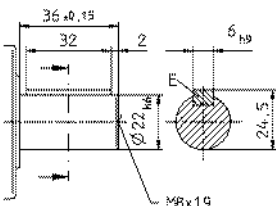


← A

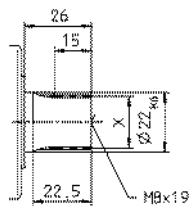


Alternatives: Output shaft variants

Keywayed output shaft in mm
E = key as per DIN 6885, sheet 1, form A



Involute gearing DIN 5480 in mm
X = W 22 x 1.25 x 30 x 16 x 6 m



See technical data sheet for available clamping hub diameters (mass moment of inertia). Dimensions available on request.

Non-tolerated dimensions ± 1 mm

- 1) Check motor shaft fit.
- 2) Min./Max. permissible motor shaft length. Longer motor shafts are adaptable, please contact us.
- 3) The dimensions depend on the motor.
- 4) Smaller motor shaft diameter is compensated by a bushing with a minimum thickness of 1 mm.



CAD data is available under
<http://www.wittenstein-alpha.de/en/info-and-cad-finder.html>



Motor mounting according to operating manual

Right-angle gearheads
High End

SK

SK⁺ 100 MF 1/2-stage

				1-stage					2-stage													
Ratio ^{a)}				<i>i</i>		3	4	5	7	10	12	16	20	25	28	35	40	50	70	100		
Max. acceleration torque (max. 1000 cycles per hour)				<i>T</i> _{2B}	Nm	170	170	170	145	125	170	170	170	170	170	170	170	170	145	125		
					in.lb	1505	1505	1505	1283	1106	1505	1505	1505	1505	1505	1505	1505	1505	1505	1283	1106	
Nominal output torque (with <i>n</i> _{2N})				<i>T</i> _{2N}	Nm	100	100	100	90	80	100	100	100	100	100	100	100	100	90	80		
					in.lb	885	885	885	797	708	885	885	885	885	885	885	885	885	885	797	708	
Emergency stop torque (permitted 1000 times during the service life of the gearhead)				<i>T</i> _{2Not}	Nm	220	260	260	255	250	260	260	260	260	260	260	260	260	255	250		
					in.lb	1947	2301	2301	2257	2213	2301	2301	2301	2301	2301	2301	2301	2301	2301	2257	2213	
Nominal input speed (with <i>T</i> _{2N} and 20°C ambient temperature) ^{b), c)}				<i>n</i> _{1N}	rpm	2200	2400	2700	2500	2500	3100	3100	3100	3100	3100	3100	3100	3500	4200	4200		
Max. continuous speed (with 20% <i>T</i> _{2N} and 20°C ambient temperature)				<i>n</i> _{1Ncym}	rpm	3000	3400	3800	3400	3400	4000	4000	4000	4000	4000	4000	4000	4000	4200	4200		
Max. input speed				<i>n</i> _{1Max}	rpm	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500		
Mean no load running torque (with <i>n</i> ₁ =3000 rpm and 20°C gearhead temperature) ^{d)}				<i>T</i> ₀₁₂	Nm	3.8	3.0	2.3	3.5	2.8	0.6	0.6	0.5	0.4	0.4	0.3	0.2	0.2	0.2	0.2		
					in.lb	34	27	20	31	25	5.3	5.3	4.4	3.5	3.5	2.7	1.8	1.8	1.8	1.8	1.8	
Max. torsional backlash				<i>j</i> _t	arcmin	≤ 4																
Torsional rigidity				<i>C</i> _{t21}	Nm/ arcmin	10	11	13	13	13	11	11	11	11	11	11	11	13	13	13		
					in.lb/ arcmin	89	97	115	115	115	97	97	97	97	97	97	97	97	115	115	115	
Max. axial force ^{e)}				<i>F</i> _{2AMax}	N	5700																
					lb _f	1283																
Max. radial force ^{e)}				<i>F</i> _{2RMax}	N	6300																
					lb _f	1418																
Max. tilting moment				<i>M</i> _{2KMax}	Nm	833																
					in.lb	7370																
Efficiency at full load				η	%		96					94										
Service life (For calculation, see the Chapter "Information")				<i>L</i> _h	h		> 20000															
Weight incl. standardadapter plate				<i>m</i>	kg	9.3					10.0											
					lb _m	21					22											
Operating noise (with <i>n</i> ₁ =3000 rpm no load)				<i>L</i> _{PA}	dB(A)		≤ 66															
Max. permitted housing temperature					°C	+90																
					F	194																
Ambient temperature					°C	0 to +40																
					F	32 to 104																
Lubrication					Lubricated for life																	
Paint					Blue RAL 5002																	
Direction of rotation					Motor and gearhead opposite directions																	
Protection class					IP 65																	
Moment of inertia (relates to the drive) Clamping hub diameter [mm]				E	19	<i>J</i> ₁	kgcm ²	–	–	–	–	–	1.02	0.97	0.86	0.84	0.75	0.74	0.69	0.69	0.68	0.68
							10 ⁻³ in.lb.s ²	–	–	–	–	–	0.91	0.86	0.76	0.74	0.66	0.66	0.61	0.61	0.60	0.60
				G	24	<i>J</i> ₁	kgcm ²	–	–	–	–	–	2.59	2.54	2.42	2.40	2.31	2.30	2.26	2.25	2.25	2.25
							10 ⁻³ in.lb.s ²	–	–	–	–	–	2.29	2.25	2.14	2.13	2.05	2.04	2.00	1.99	1.99	1.99
				H	28	<i>J</i> ₁	kgcm ²	4.64	3.80	3.34	2.98	2.79	–	–	–	–	–	–	–	–	–	–
							10 ⁻³ in.lb.s ²	4.10	3.36	2.95	2.64	2.47	–	–	–	–	–	–	–	–	–	–
				K	38	<i>J</i> ₁	kgcm ²	11.9	11.0	10.6	10.2	10.0	–	–	–	–	–	–	–	–	–	–
							10 ⁻³ in.lb.s ²	10.5	9.77	9.37	9.05	8.89	–	–	–	–	–	–	–	–	–	–

Please contact us for information on the best configuration for S1 conditions of use (continuous operation).

^{a)} Other ratios available on request

^{b)} Higher speeds are possible if the nominal torque is reduced

^{c)} For higher ambient temperatures, please reduce input speed

^{d)} Idling torques decrease during operation

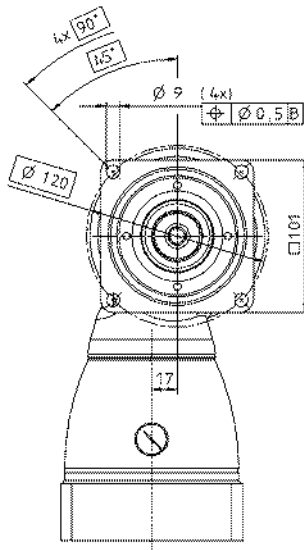
^{e)} Refers to center of the output shaft or flange

All technical data for front output side applies.

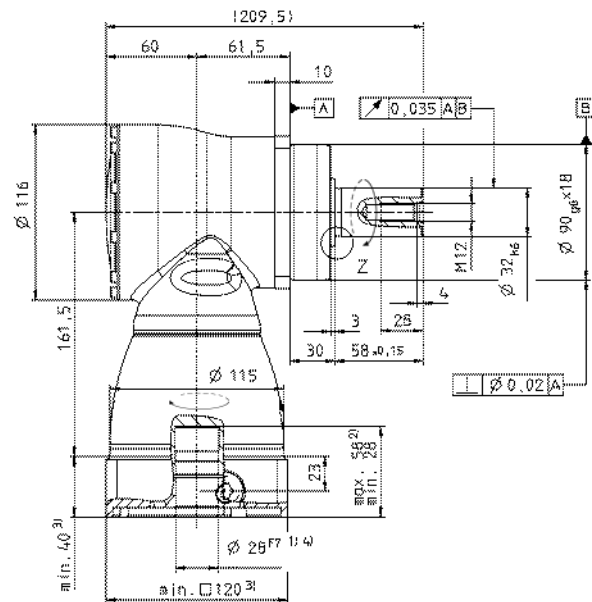
Technical data for rearward output versions, see page 422.

View A

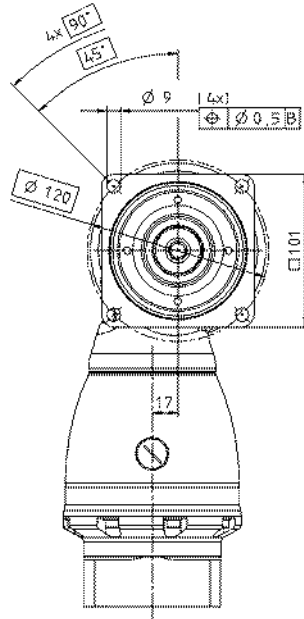
1-stage:



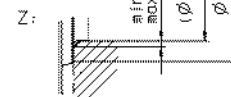
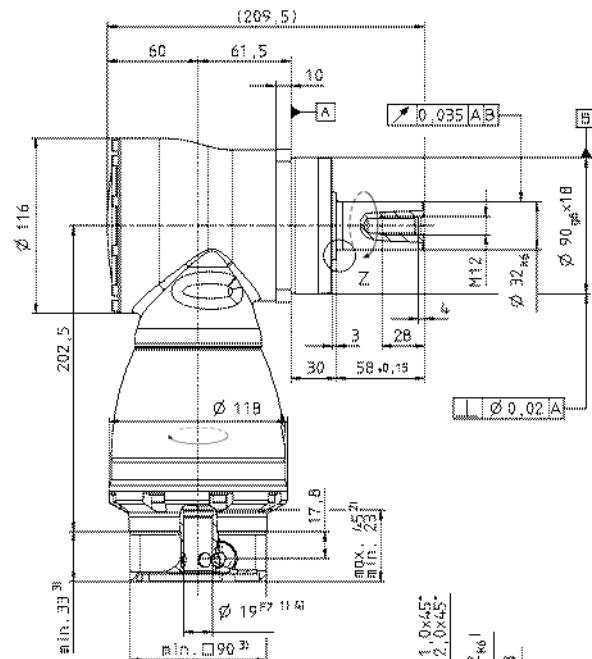
← A



2-stage:



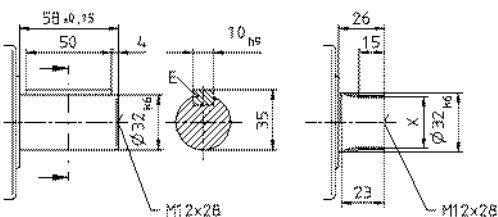
← A



Alternatives: Output shaft variants

Keywayed output shaft in mm
E = key as per DIN 6885, sheet 1, form A

Involute gearing DIN 5480
X = W 32 x 1.25 x 30 x 24 x 6 mm



See technical data sheet for available clamping hub diameters (mass moment of inertia). Dimensions available on request.

Non-tolerated dimensions ± 1 mm

- 1) Check motor shaft fit.
- 2) Min./Max. permissible motor shaft length. Longer motor shafts are adaptable, please contact us.
- 3) The dimensions depend on the motor.
- 4) Smaller motor shaft diameter is compensated by a bushing with a minimum thickness of 1 mm.



CAD data is available under
<http://www.wittenstein-alpha.de/en/info-and-cad-finder.html>



Motor mounting according to operating manual

Right-angle gearheads
High End

SK

SK⁺ 140 MF 1/2-stage

				1-stage					2-stage													
Ratio ^{a)}				<i>i</i>		3	4	5	7	10	12	16	20	25	28	35	40	50	70	100		
Max. acceleration torque (max. 1000 cycles per hour)				<i>T</i> _{2B}	Nm	300	300	300	250	210	300	300	300	300	300	300	300	300	250	210		
					in.lb	2655	2655	2655	2213	1859	2655	2655	2655	2655	2655	2655	2655	2655	2655	2213	1859	
Nominal output torque (with <i>n</i> _{2N})				<i>T</i> _{2N}	Nm	190	190	190	175	160	190	190	190	190	190	190	190	190	175	160		
					in.lb	1682	1682	1682	1549	1416	1682	1682	1682	1682	1682	1682	1682	1682	1682	1549	1419	
Emergency stop torque (permitted 1000 times during the service life of the gearhead)				<i>T</i> _{2Not}	Nm	400	500	500	450	400	500	500	500	500	500	500	500	500	450	400		
					in.lb	3540	4425	4425	3983	3540	4425	4425	4425	4425	4425	4425	4425	4425	4425	3983	3540	
Nominal input speed (with <i>T</i> _{2N} and 20°C ambient temperature) ^{b), c)}				<i>n</i> _{1N}	rpm	1900	2000	2200	2000	2000	2900	2900	2900	2900	2900	2900	2900	3200	3200	3900		
Max. continuous speed (with 20% <i>T</i> _{2N} and 20°C ambient temperature)				<i>n</i> _{1Ncym}	rpm	2500	2800	3100	2800	2800	4000	4000	4000	4000	4000	4000	4000	4200	4200	4200		
Max. input speed				<i>n</i> _{1Max}	rpm	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500		
Mean no load running torque (with <i>n</i> ₁ = 3000 rpm and 20°C gearhead temperature) ^{d)}				<i>T</i> ₀₁₂	Nm	7.0	5.2	4.5	7.5	5.5	1.4	0.9	0.7	0.5	0.5	0.4	0.4	0.3	0.3	0.3		
					in.lb	62	46	40	66	49	12.4	8	6.2	4.4	4.4	3.5	3.5	2.7	2.7	2.7	2.7	
Max. torsional backlash				<i>j</i> _t	arcmin	≤ 4																
Torsional rigidity				<i>C</i> _{t21}	Nm/ arcmin	27	30	32	32	32	29	29	29	29	29	29	29	29	31	31	31	
					in.lb/ arcmin	239	266	283	283	283	257	257	257	257	257	257	257	257	257	274	274	274
Max. axial force ^{e)}				<i>F</i> _{2AMax}	N	9900																
					lb _f	2228																
Max. radial force ^{e)}				<i>F</i> _{2RMax}	N	9500																
					lb _f	2138																
Max. tilting moment				<i>M</i> _{2KMax}	Nm	1692																
					in.lb	14974																
Efficiency at full load				η	%		96					94										
Service life (For calculation, see the Chapter "Information")				<i>L</i> _h	h		> 20000															
Weight incl. standardadapter plate				<i>m</i>	kg	22.6					25.0											
					lb _m	50					55											
Operating noise (with <i>n</i> ₁ = 3000 rpm without load)				<i>L</i> _{PA}	dB(A)		≤ 68															
Max. permitted housing temperature					°C	+90																
					F	194																
Ambient temperature					°C	0 to +40																
					F	32 to 104																
Lubrication					Lubricated for life																	
Paint					Blue RAL 5002																	
Direction of rotation					Motor and gearhead opposite directions																	
Protection class					IP 65																	
Moment of inertia (relates to the drive) Clamping hub diameter [mm]				G	24	<i>J</i> _i	kgcm ²	–	–	–	–	–	4.21	3.85	3.28	3.17	2.78	2.73	2.48	2.46	2.43	2.42
							10 ⁻³ in.lb.s ²	–	–	–	–	–	3.73	3.41	2.90	2.80	2.46	2.41	2.20	2.17	2.15	2.14
				K	38	<i>J</i> _i	kgcm ²	25.0	19.1	16.3	14.1	12.8	11.1	10.7	10.2	10.1	9.69	9.64	9.39	9.37	9.34	9.33
							10 ⁻³ in.lb.s ²	22.1	16.9	14.4	12.4	11.3	9.83	9.51	9.01	8.92	8.58	8.53	8.31	8.29	8.27	8.26

^{a)} Other ratios available on request

^{b)} Higher speeds are possible if the nominal torque is reduced

^{c)} For higher ambient temperatures, please reduce input speed

^{d)} Idling torques decrease during operation

^{e)} Refers to center of the output shaft or flange

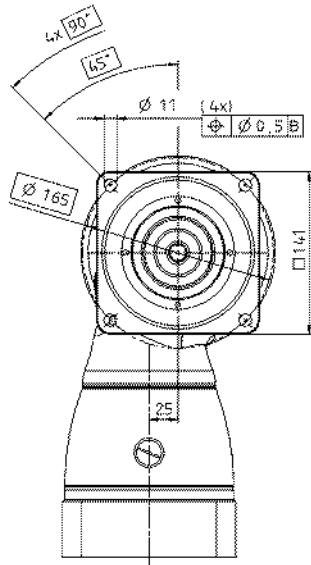
All technical data for front output side applies.

Technical data for rearward output versions, see page 422.

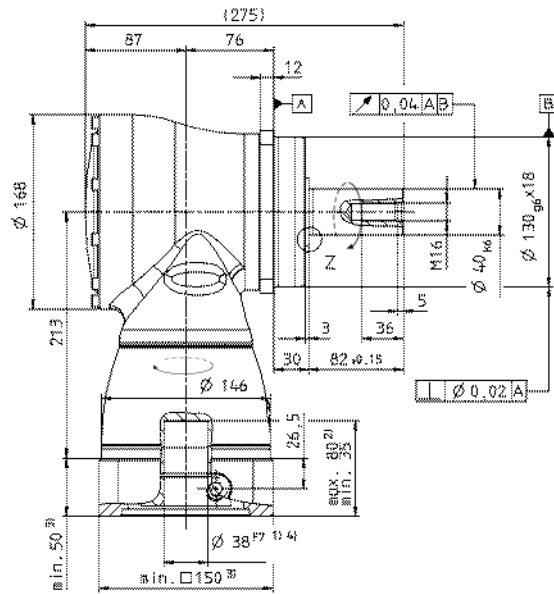
Please contact us for information on the best configuration for S1 conditions of use (continuous operation).

View A

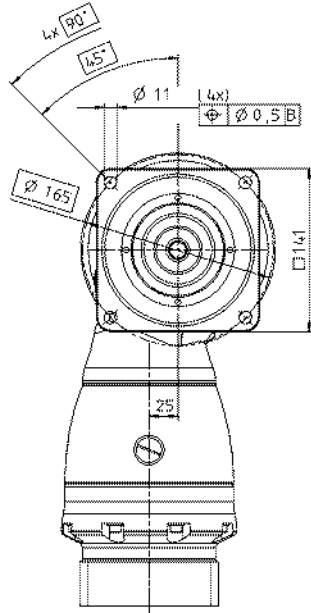
1-stage:



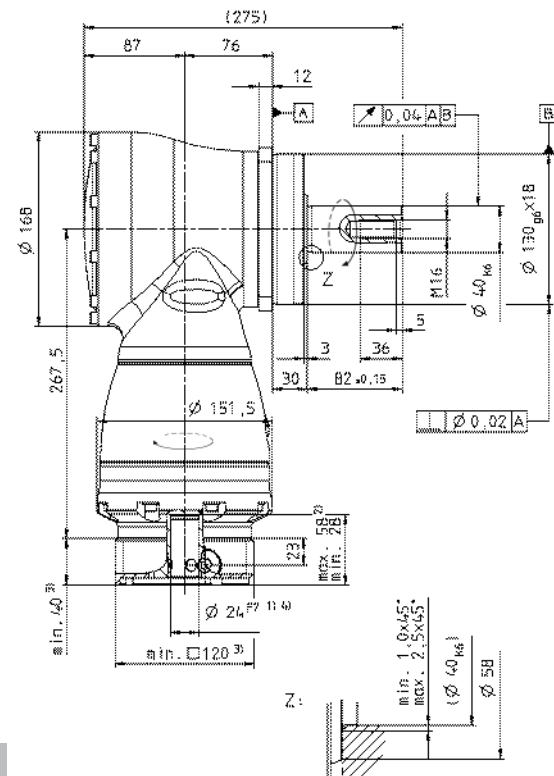
← A



2-stage:



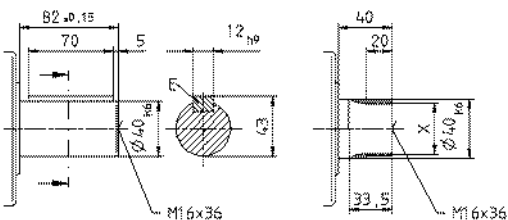
← A



Alternatives: Output shaft variants

Keywayed output shaft in mm
E = key as per DIN 6885, sheet 1, form A

Involute gearing DIN 5480
X = W 40 x 2 x 30 x 18 x 6 mm



See technical data sheet for available clamping hub diameters (mass moment of inertia). Dimensions available on request.

Non-tolerated dimensions ± 1 mm

- 1) Check motor shaft fit.
- 2) Min./Max. permissible motor shaft length. Longer motor shafts are adaptable, please contact us.
- 3) The dimensions depend on the motor.
- 4) Smaller motor shaft diameter is compensated by a bushing with a minimum thickness of 1 mm.



CAD data is available under
<http://www.wittenstein-alpha.de/en/info-and-cad-finder.html>



Motor mounting according to operating manual

Right-angle gearheads
High End

SK

SK⁺ 180 MF 1/2-stage

				1-stage					2-stage										
Ratio ^{a)}	<i>i</i>		3	4	5	7	10	12	16	20	25	28	35	40	50	70	100		
Max. acceleration torque (max. 1000 cycles per hour)	<i>T</i> _{2B}	Nm	640	640	640	550	470	640	640	640	640	640	640	640	640	550	470		
		in.lb	5664	5664	5664	4868	4160	5664	5664	5664	5664	5664	5664	5664	5664	5664	4868	4160	
Nominal output torque (with <i>n</i> _{2N})	<i>T</i> _{2N}	Nm	400	400	400	380	360	400	400	400	400	400	400	400	400	380	360		
		in.lb	3540	3540	3540	3363	3186	3540	3540	3540	3540	3540	3540	3540	3540	3540	3363	3186	
Emergency stop torque (permitted 1000 times during the service life of the gearhead)	<i>T</i> _{2Not}	Nm	900	1050	1050	970	900	1050	1050	1050	1050	1050	1050	1050	1050	970	900		
		in.lb	7965	9293	9293	8585	7965	9293	9293	9293	9293	9293	9293	9293	9293	9293	8585	7965	
Nominal input speed (with <i>T</i> _{2N} and 20°C ambient temperature) ^{b), c)}	<i>n</i> _{1N}	rpm	1600	1800	2000	1800	1800	2700	2700	2700	2700	2700	2700	2700	2900	3200	3400		
Max. continuous speed (with 20% <i>T</i> _{2N} and 20°C ambient temperature)	<i>n</i> _{1Ncym}	rpm	2000	2400	2800	2500	2500	3500	3500	3500	3500	3500	3500	3500	3500	3800	3800		
Max. input speed	<i>n</i> _{1Max}	rpm	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000		
Mean no load running torque (with <i>n</i> ₁ = 3000 rpm and 20°C gearhead temperature) ^{d)}	<i>T</i> ₀₁₂	Nm	14.5	12.0	10.0	15.0	12.5	3.0	2.3	1.8	1.6	1.3	1.2	0.9	0.9	0.9	0.9		
		in.lb	128	106	89	133	111	26.6	20.4	15.9	14.2	11.5	10.6	8.0	8.0	8.0	8.0		
Max. torsional backlash	<i>j</i> _t	arcmin	≤ 4																
Torsional rigidity	<i>C</i> _{t21}	Nm/ arcmin	64	71	79	78	77	71	71	71	71	71	71	71	78	78	78		
		in.lb/ arcmin	566	628	699	690	681	628	628	628	628	628	628	628	690	690	690		
Max. axial force ^{e)}	<i>F</i> _{2AMax}	N	14200																
		lb _f	3195																
Max. radial force ^{e)}	<i>F</i> _{2RMMax}	N	14700																
		lb _f	3308																
Max. tilting moment	<i>M</i> _{2KMax}	Nm	3213																
		in.lb	28435																
Efficiency at full load	η	%	96					94											
Service life (For calculation, see the Chapter "Information")	<i>L</i> _h	h	> 20000																
Weight incl. standardadapter plate	<i>m</i>	kg	45.4					48											
		lb _m	100					106											
Operating noise (with <i>n</i> ₁ = 3000 rpm no load)	<i>L</i> _{PA}	dB(A)	≤ 68																
Max. permitted housing temperature		°C	+90																
		F	194																
Ambient temperature		°C	0 to +40																
		F	32 to 104																
Lubrication			Lubricated for life																
Paint			Blue RAL 5002																
Direction of rotation			Motor and gearhead opposite directions																
Protection class			IP 65																
Moment of inertia (relates to the drive) Clamping hub diameter [mm]	K	38	<i>J</i> ₁	kgcm ²	–	–	–	–	–	15.3	14.0	12.3	12.0	10.9	10.7	10.1	10.0	9.95	9.91
				10 ⁻³ in.lb.s ²															
	M	48	<i>J</i> ₁	kgcm ²	73.3	51.6	42.1	34.0	29.7	30.0	28.7	27.1	26.7	25.6	25.4	24.8	24.7	24.7	24.6
10 ⁻³ in.lb.s ²				64.9	45.6	37.3	30.1	26.3	26.6	25.4	23.9	23.6	22.7	22.5	22.0	21.9	21.8	21.8	

^{a)} Other ratios available on request

^{b)} Higher speeds are possible if the nominal torque is reduced

^{c)} For higher ambient temperatures, please reduce input speed

^{d)} Idling torques decrease during operation

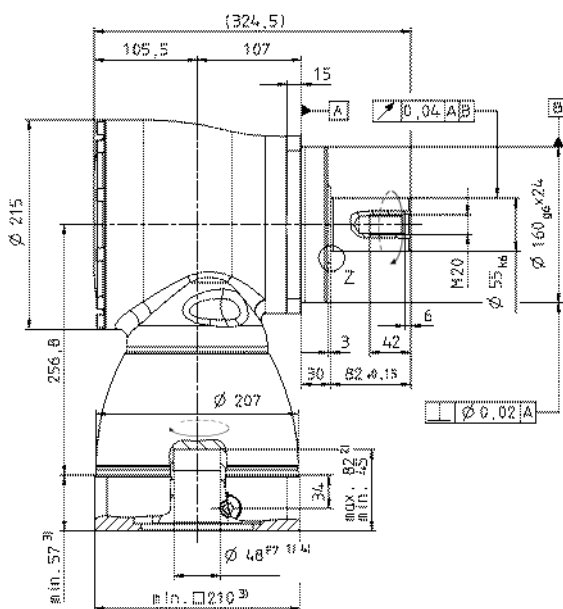
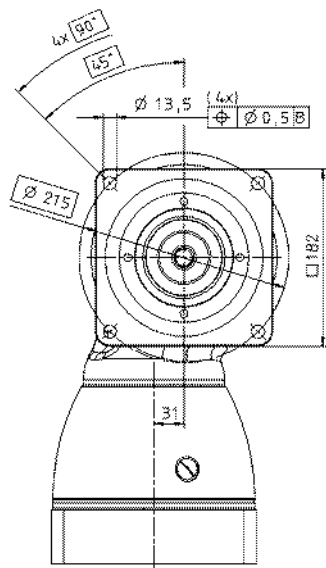
^{e)} Refers to center of the output shaft or flange

All technical data for front output side applies.

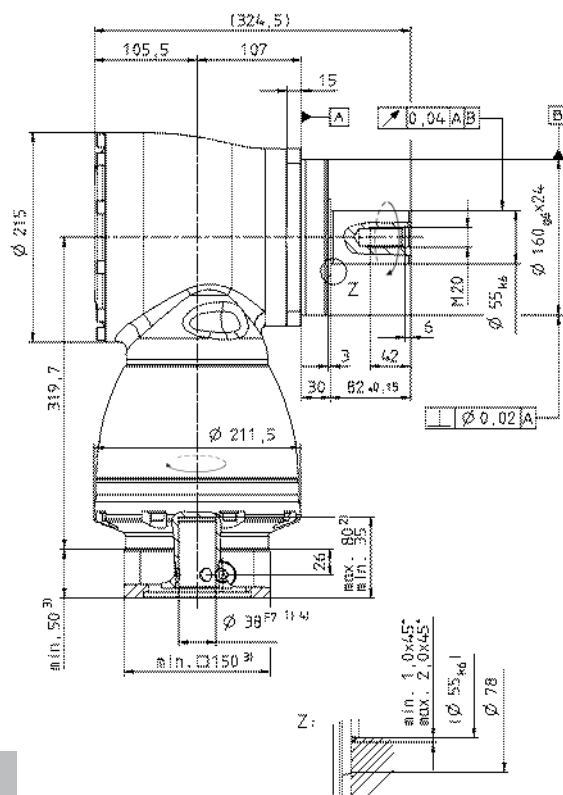
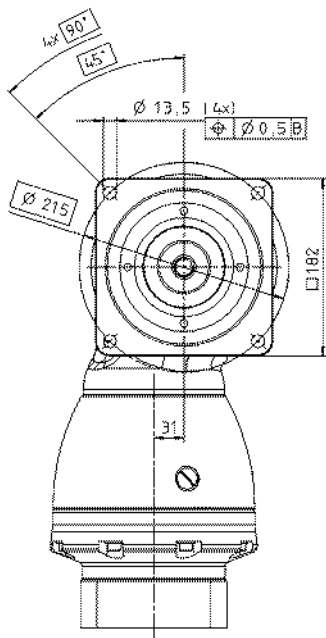
Technical data for rearward output versions, see page 422.

Please contact us for information on the best configuration for S1 conditions of use (continuous operation).

←A



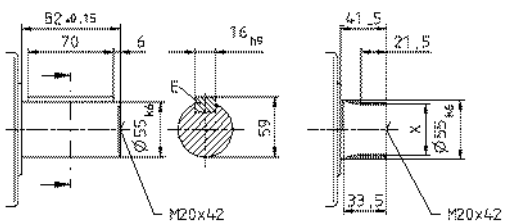
← A



Right-angle gearheads High End

$$S_K^+$$

213



SPK+ 075 MF 2-stage

					2-stage									
Ratio ^{a)}	<i>i</i>		12	16	20	25	28	35	40	50	70	100		
Max. acceleration torque (max. 1000 cycles per hour)	<i>T</i> _{2B}	Nm	110	110	110	110	110	110	80	100	110	90		
		in.lb	974	974	974	974	974	974	974	885	974	797		
Nominal output torque (with <i>n</i> _{1N})	<i>T</i> _{2N}	Nm	75	75	75	75	75	75	60	75	75	52		
		in.lb	664	664	664	664	664	664	664	531	664	664	460	
Emergency stop torque (permitted 1000 times during the service life of the gearhead)	<i>T</i> _{2Not}	Nm	160	160	200	200	250	175	120	150	210	200		
		in.lb	1416	1416	1770	1770	2213	1549	1062	1328	1859	1770		
Nominal input speed (with <i>T</i> _{2N} and 20°C ambient temperature) ^{b), c)}	<i>n</i> _{1N}	rpm	2000	2400	2400	2700	2400	2500	2500	2500	2500	2500		
Max. continuous speed (with 20% <i>T</i> _{2N} and 20°C ambient temperature)	<i>n</i> _{1Ncym}	rpm	3000	3400	3400	3800	3400	3200	3200	3200	3200	3200		
Max. input speed	<i>n</i> _{1Max}	rpm	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000		
Mean no load running torque (with <i>n</i> ₁ =3000 rpm and 20°C gearhead temperature) ^{d)}	<i>T</i> ₀₁₂	Nm	1.5	1.3	1.2	1.2	1.2	1.3	1.3	1.3	1.3	1.3		
		in.lb	13.3	11.5	10.6	10.6	10.6	11.5	11.5	11.5	11.5	11.5		
Max. torsional backlash	<i>j</i> _t	arcmin	Standard ≤ 5 / Reduced ≤ 3											
Torsional rigidity	<i>C</i> _{t21}	Nm/ arcmin	10											
		in.lb/ arcmin	89											
Max. axial force ^{e)}	<i>F</i> _{2AMax}	N	3350											
		lb _f	753											
Max. radial force ^{e)}	<i>F</i> _{2RMax}	N	4000											
		lb _f	900											
Max. tilting moment	<i>M</i> _{2KMax}	Nm	236											
		in.lb	2089											
Efficiency at full load	η	%	94											
Service life (For calculation, see the Chapter "Information")	<i>L</i> _h	h	> 20000											
Weight incl. standard adapter plate	<i>m</i>	kg	5.2											
		lb _m	11.5											
Operating noise (with <i>n</i> ₁ =3000 rpm no load)	<i>L</i> _{PA}	dB(A)	≤ 66											
Max. permitted housing temperature		°C	+90											
		F	194											
Ambient temperature		°C	0 to +40											
		F	32 to 104											
Lubrication			Lubricated for life											
Paint			Blue RAL 5002											
Direction of rotation			Motor and gearhead opposite directions											
Protection class			IP 65											
Moment of inertia (relates to the drive) Clamping hub diameter [mm]	C	14	<i>J</i> ₁	kgcm ²	0.54	0.45	0.44	0.40	0.44	0.36	0.35	0.34	0.34	0.34
				10 ⁻³ in.lb.s ²	0.48	0.40	0.39	0.35	0.39	0.32	0.31	0.30	0.30	0.30
	E	19	<i>J</i> ₁	kgcm ²	0.89	0.80	0.79	0.75	0.79	0.71	0.70	0.70	0.69	0.69
				10 ⁻³ in.lb.s ²	0.79	0.71	0.70	0.66	0.70	0.63	0.62	0.62	0.62	0.61

^{a)} Other ratios up to i=1000 available on request

^{b)} Higher speeds are possible if the nominal torque is reduced

^{c)} For higher ambient temperatures, please reduce input speed

^{d)} Idling torques decrease during operation

^{e)} Refers to center of the output shaft or flange

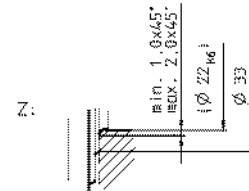
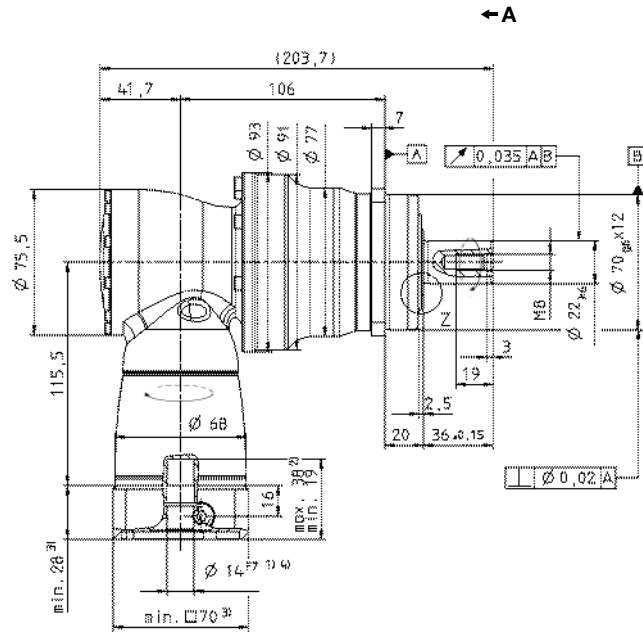
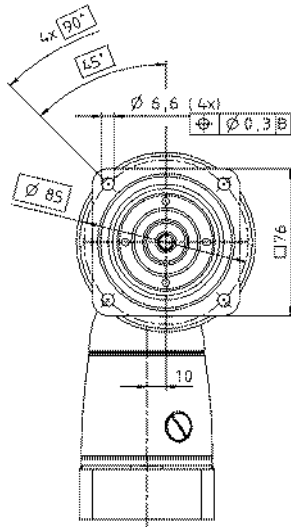
All technical data for front output side applies.

Technical data for rearward output versions, see page 422.

Please contact us for information on the best configuration for S1 conditions of use (continuous operation).

View A

2-stage:

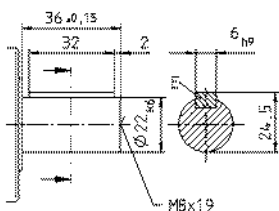


Right-angle gearheads
High End

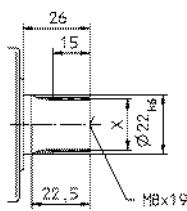
SPK+

Alternatives: Output shaft variants

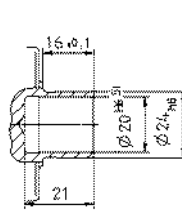
Keywayed output shaft in mm
E = key as per DIN 6885, sheet 1, form A



Involute gearing DIN 5480 in mm
X = W 22 x 1.25 x 30 x 16 x 6m, DIN 5480



Shaft mounted
Mounted via shrink disc



See technical data sheet for available clamping hub diameters (mass moment of inertia). Dimensions available on request.

Non-tolerated dimensions ± 1 mm

- 1) Check motor shaft fit.
- 2) Min./Max. permissible motor shaft length. Longer motor shafts are adaptable, please contact us.
- 3) The dimensions depend on the motor.
- 4) Smaller motor shaft diameter is compensated by a bushing with a minimum thickness of 1 mm.



CAD data is available under
<http://www.wittenstein-alpha.de/en/info-and-cad-finder.html>

Motor mounting according to operating manual

SPK+ 075 MF 3-stage

		3-stage														
Ratio ^{a)}	<i>i</i>		64	84	100	125	140	175	200	250	280	350	400	500	700	1000
Max. acceleration torque (max. 1000 cycles per hour)	T_{2B}	Nm	110	110	110	110	110	110	110	110	110	110	80	100	110	90
		in.lb	974	974	974	974	974	974	974	974	974	974	708	885	974	797
Nominal output torque (with n_{1N})	T_{2N}	Nm	75	75	75	75	75	75	75	75	75	75	60	75	75	52
		in.lb	664	664	664	664	664	664	664	664	664	664	531	664	664	460
Emergency stop torque (permitted 1000 times during the service life of the gearhead)	T_{2Not}	Nm	160	160	200	200	200	200	200	200	250	175	120	150	210	200
		in.lb	1416	1416	1770	1770	1770	1770	1770	1770	2213	1549	1062	1328	1859	1770
Nominal input speed (with T_{2N} and 20°C ambient temperature) ^{b), c)}	n_{1N}	rpm	4400	4400	4400	4400	4400	4400	4400	4800	4400	4800	5500	5500	5500	5500
Max. continuous speed (with 20% T_{2N} and 20°C ambient temperature)	n_{1Ncym}	rpm	5000	5000	5000	5000	5000	5000	5000	5000	5000	5000	5500	5500	5500	5500
Max. input speed	n_{1Max}	rpm	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000
Mean no load running torque (with $n_1=3000$ rpm and 20°C gearhead temperature) ^{d)}	T_{012}	Nm	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
		in.lb	2.7	2.7	2.7	2.7	2.7	2.7	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
Max. torsional backlash	j_t	arcmin	Standard ≤ 5 / Reduced ≤ 3													
Torsional rigidity	C_{t21}	Nm/ arcmin	10													
		in.lb/ arcmin	89													
Max. axial force ^{e)}	F_{2AMax}	N	3350													
		lb _f	754													
Max. radial force ^{e)}	F_{2RMax}	N	4000													
		lb _f	900													
Max. tilting moment	M_{2KMax}	Nm	236													
		in.lb	2089													
Efficiency at full load	η	%	92													
Service life (For calculation, see the Chapter "Information")	L_h	h	> 20000													
Weight incl. standard adapter plate	m	kg	5.5													
		lb _m	12.2													
Operating noise (with $n_1=3000$ rpm no load)	L_{PA}	dB(A)	≤ 66													
Max. permitted housing temperature		°C	+90													
		F	194													
Ambient temperature		°C	0 to +40													
		F	32 to 104													
Lubrication			Lubricated for life													
Paint			Blue RAL 5002													
Direction of rotation			Motor and gearhead opposite directions													
Protection class			IP 65													
Moment of inertia (relates to the drive) Clamping hub diameter [mm]	B	11	J_1	kgcm ²	0.09	0.07	0.08	0.07	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
				10 ⁻³ in.lb.in ²	0.08	0.06	0.07	0.06	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
	C	14	J_1	kgcm ²	0.20	0.18	0.19	0.19	0.18	0.18	0.17	0.17	0.17	0.17	0.17	0.17
				10 ⁻³ in.lb.in ²	0.18	0.16	0.17	0.17	0.16	0.16	0.15	0.15	0.15	0.15	0.15	0.15

^{a)} Other ratios up to i=1000 available on request

^{b)} Higher speeds are possible if the nominal torque is reduced

^{c)} For higher ambient temperatures, please reduce input speed

^{d)} Idling torques decrease during operation

^{e)} Refers to center of the output shaft or flange

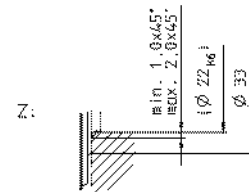
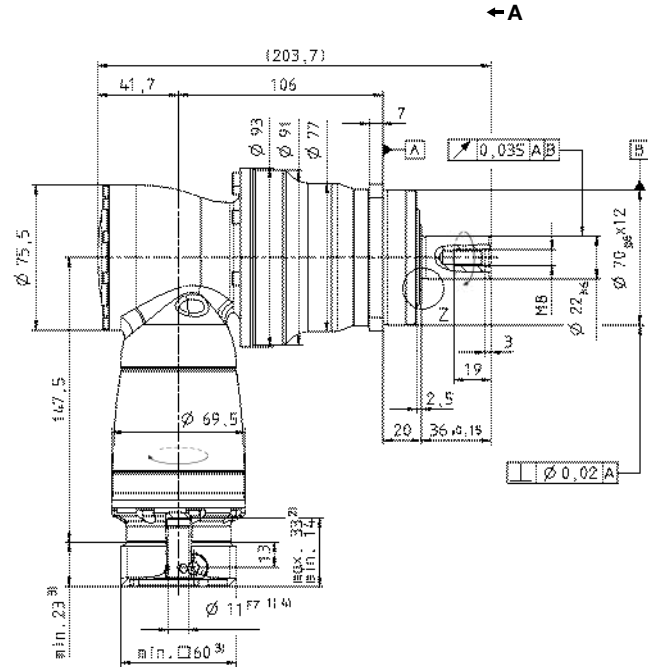
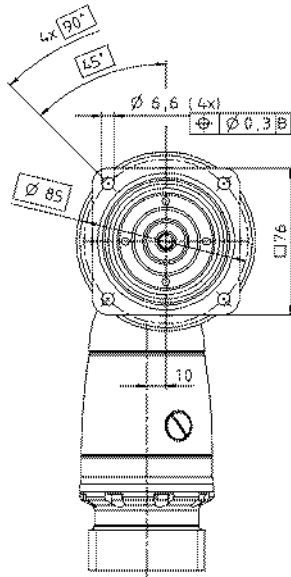
All technical data for front output side applies.

Technical data for rearward output versions, see page 422.

Please contact us for information on the best configuration for S1 conditions of use (continuous operation).

View A

3-stage:

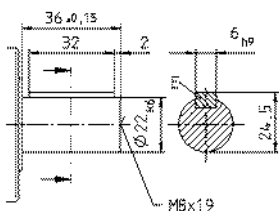


Right-angle gearheads
High End

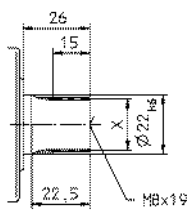
SPK+

Alternatives: Output shaft variants

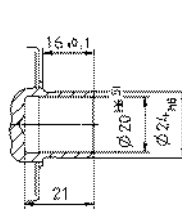
Keywayed output shaft in mm
E = key as per DIN 6885, sheet 1, form A



Involute gearing DIN 5480 in mm
X = W 22 x 1.25 x 30 x 16 x 6m, DIN 5480



Shaft mounted
Mounted via shrink disc



See technical data sheet for available clamping hub diameters (mass moment of inertia). Dimensions available on request.

Non-tolerated dimensions ± 1 mm

- 1) Check motor shaft fit.
- 2) Min./Max. permissible motor shaft length. Longer motor shafts are adaptable, please contact us.
- 3) The dimensions depend on the motor.
- 4) Smaller motor shaft diameter is compensated by a bushing with a minimum thickness of 1 mm.



CAD data is available under
<http://www.wittenstein-alpha.de/en/info-and-cad-finder.html>



Motor mounting according to operating manual

SPK+ 100 MF 2-stage

			2-stage									
Ratio ^{a)}	<i>i</i>		12	16	20	25	28	35	40	50	70	100
Max. acceleration torque (max. 1000 cycles per hour)	T_{2B}	Nm	280	280	300	300	300	300	200	250	300	225
		in.lb	2478	2478	2655	2655	2655	2655	1770	2213	2655	1991
Nominal output torque (with n_{1N})	T_{2N}	Nm	180	180	175	175	170	175	160	175	170	120
		in.lb	1593	1593	1549	1549	1505	1549	1416	1549	1505	1062
Emergency stop torque (permitted 1000 times during the service life of the gearhead)	T_{2Not}	Nm	400	400	500	500	625	500	400	500	625	500
		in.lb	3540	3540	4425	4425	5531	4425	3540	4425	5531	4425
Nominal input speed (with T_{2N} and 20°C ambient temperature) ^{b), c)}	n_{1N}	rpm	2000	2400	2400	2700	2400	2500	2500	2500	2500	2500
Max. continuous speed (with 20% T_{2N} and 20°C ambient temperature)	$n_{1N_{cym}}$	rpm	3000	3400	3400	3800	3400	3200	3200	3200	3200	3200
Max. input speed	n_{1Max}	rpm	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000
Mean no load running torque (with $n_1=3000$ rpm and 20°C gearhead temperature) ^{d)}	T_{012}	Nm	2.5	2.1	2.0	1.8	2.0	2.2	2.0	2.0	2.0	2.0
		in.lb	22.1	18.6	17.7	15.9	17.7	19.5	17.7	17.7	17.7	17.7
Max. torsional backlash	j_t	arcmin	Standard ≤ 4 / Reduced ≤ 2									
Torsional rigidity	C_{t21}	Nm/ arcmin	31									
		in.lb/ arcmin	274									
Max. axial force ^{e)}	F_{2AMax}	N	5650									
		lb _f	1271									
Max. radial force ^{e)}	F_{2RMax}	N	6300									
		lb _f	1418									
Max. tilting moment	M_{2KMax}	Nm	487									
		in.lb	4310									
Efficiency at full load	η	%	94									
Service life (For calculation, see the Chapter "Information")	L_h	h	> 20000									
Weight incl. standard adapter plate	m	kg	9.7									
		lb _m	21.4									
Operating noise (with $n_1=3000$ rpm no load)	L_{PA}	dB(A)	≤ 68									
Max. permitted housing temperature		°C	+90									
		F	194									
Ambient temperature		°C	0 to +40									
		F	32 to 104									
Lubrication			Lubricated for life									
Paint			Blue RAL 5002									
Direction of rotation			Motor and gearhead opposite directions									
Protection class			IP 65									
Moment of inertia (relates to the drive) Clamping hub diameter [mm]	E 19	J_1	kgcm ²	1.48	1.20	1.17	1.05	1.15	0.95	0.90	0.89	0.89
			10 ⁻³ in.lb.s ²	1.31	1.06	1.04	0.93	1.02	0.84	0.79	0.79	0.78
	H 28	J_1	kgcm ²	2.89	2.62	2.59	2.46	2.56	2.36	2.31	2.31	2.30
			10 ⁻³ in.lb.s ²	2.56	2.31	2.29	2.18	2.27	2.09	2.05	2.04	2.04

^{a)} Other ratios up to i=1000 available on request

^{b)} Higher speeds are possible if the nominal torque is reduced

^{c)} For higher ambient temperatures, please reduce input speed

^{d)} Idling torques decrease during operation

^{e)} Refers to center of the output shaft or flange

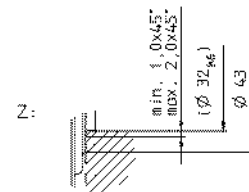
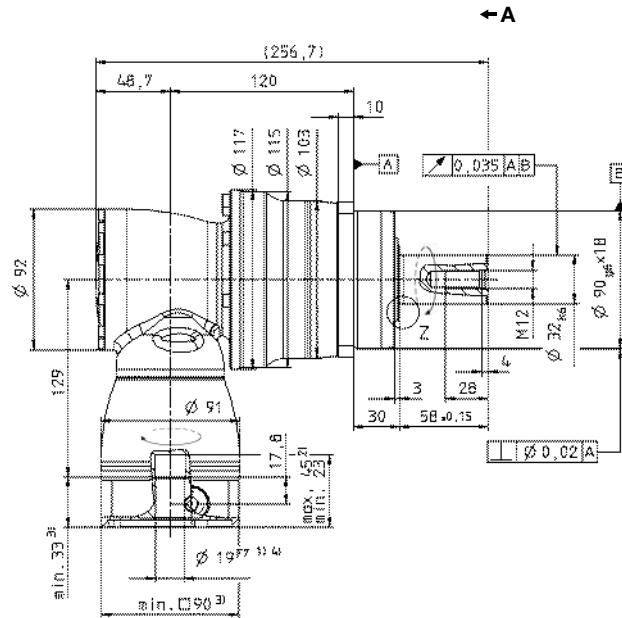
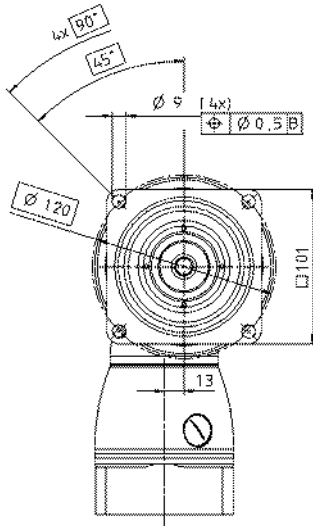
All technical data for front output side applies.

Technical data for rearward output versions, see page 422.

Please contact us for information on the best configuration for S1 conditions of use (continuous operation).

View A

2-stage:

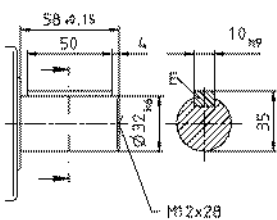


Right-angle gearheads
High End

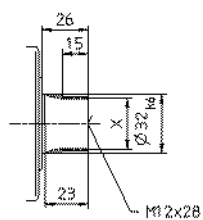
SPK+

Alternatives: Output shaft variants

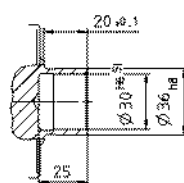
Keywayed output shaft in mm
E = key as per DIN 6885, sheet 1, form A



Involute gearing DIN 5480 in mm
X = W 32 x 1.25 x 30 x 24 x 6m, DIN 5480



Shaft mounted
Mounted via shrink disc



See technical data sheet for available clamping hub diameters (mass moment of inertia). Dimensions available on request.

Non-tolerated dimensions ±1 mm

- 1) Check motor shaft fit.
- 2) Min./Max. permissible motor shaft length. Longer motor shafts are adaptable, please contact us.
- 3) The dimensions depend on the motor.
- 4) Smaller motor shaft diameter is compensated by a bushing with a minimum thickness of 1 mm.



CAD data is available under
<http://www.wittenstein-alpha.de/en/info-and-cad-finder.html>

Motor mounting according to operating manual

SPK+ 100 MF 3-stage

					3-stage												
Ratio ^{a)}	<i>i</i>		64	84	100	125	140	175	200	250	280	350	400	500	700	1000	
Max. acceleration torque (max. 1000 cycles per hour)	<i>T</i> _{2B}	Nm	280	280	300	300	300	300	300	300	300	300	200	250	300	225	
		in.lb	2478	2478	2655	2655	2655	2655	2655	2655	2655	2655	1770	2213	2655	1991	
Nominal output torque (with <i>n</i> _{1N})	<i>T</i> _{2N}	Nm	180	180	175	175	175	175	175	175	170	175	160	175	170	120	
		in.lb	1593	1593	1549	1549	1549	1549	1549	1549	1505	1549	1416	1549	1505	1062	
Emergency stop torque (permitted 1000 times during the service life of the gearhead)	<i>T</i> _{2Not}	Nm	400	400	500	500	500	500	500	500	625	500	400	500	625	500	
		in.lb	3540	3540	4425	4425	4425	4425	4425	4425	5531	4425	3540	4425	5531	4425	
Nominal input speed (with <i>T</i> _{2N} and 20°C ambient temperature) ^{b), c)}	<i>n</i> _{1N}	rpm	3500	3500	3500	3500	3500	3500	3500	3800	3500	3800	4500	4500	4500	4500	
Max. continuous speed (with 20% <i>T</i> _{2N} and 20°C ambient temperature)	<i>n</i> _{1Ncym}	rpm	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	
Max. input speed	<i>n</i> _{1Max}	rpm	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	
Mean no load running torque (with <i>n</i> ₁ = 3000 rpm and 20°C gearhead temperature) ^{d)}	<i>T</i> ₀₁₂	Nm	0.4	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	
		in.lb	3.5	2.7	2.7	2.7	2.7	2.7	2.7	1.8	1.8	1.8	1.8	1.8	1.8	1.8	
Max. torsional backlash	<i>j</i> _t	arcmin	Standard ≤ 4 / Reduced ≤ 2														
Torsional rigidity	<i>C</i> _{t21}	Nm/ arcmin	31														
		in.lb/ arcmin	274														
Max. axial force ^{e)}	<i>F</i> _{2AMax}	N	5650														
		lb _f	1271														
Max. radial force ^{e)}	<i>F</i> _{2RMax}	N	6300														
		lb _f	1418														
Max. tilting moment	<i>M</i> _{2KMax}	Nm	487														
		in.lb	4310														
Efficiency at full load	η	%	92														
Service life (For calculation, see the Chapter "Information")	<i>L</i> _h	h	> 20000														
Weight incl. standard adapter plate	<i>m</i>	kg	10.3														
		lb _m	22.8														
Operating noise (with <i>n</i> ₁ = 3000 rpm no load)	<i>L</i> _{PA}	dB(A)	≤ 68														
Max. permitted housing temperature		°C	+90														
		F	194														
Ambient temperature		°C	0 to +40														
		F	32 to 104														
Lubrication			Lubricated for life														
Paint			Blue RAL 5002														
Direction of rotation			Motor and gearhead opposite directions														
Protection class			IP 65														
Moment of inertia (relates to the drive) Clamping hub diameter [mm]	C	14	<i>J</i> _i	kgcm ²	0.28	0.23	0.24	0.23	0.21	0.20	0.19	0.18	0.19	0.18	0.18	0.18	0.18
				10 ⁻³ in.lb.s ²	0.25	0.20	0.21	0.20	0.19	0.18	0.17	0.16	0.17	0.16	0.16	0.16	0.16
	E	19	<i>J</i> _i	kgcm ²	0.72	0.63	0.68	0.68	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63
				10 ⁻³ in.lb.s ²	0.64	0.56	0.60	0.60	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56

^{a)} Other ratios up to i=1000 available on request

^{b)} Higher speeds are possible if the nominal torque is reduced

^{c)} For higher ambient temperatures, please reduce input speed

^{d)} Idling torques decrease during operation

^{e)} Refers to center of the output shaft or flange

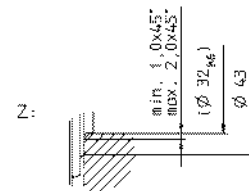
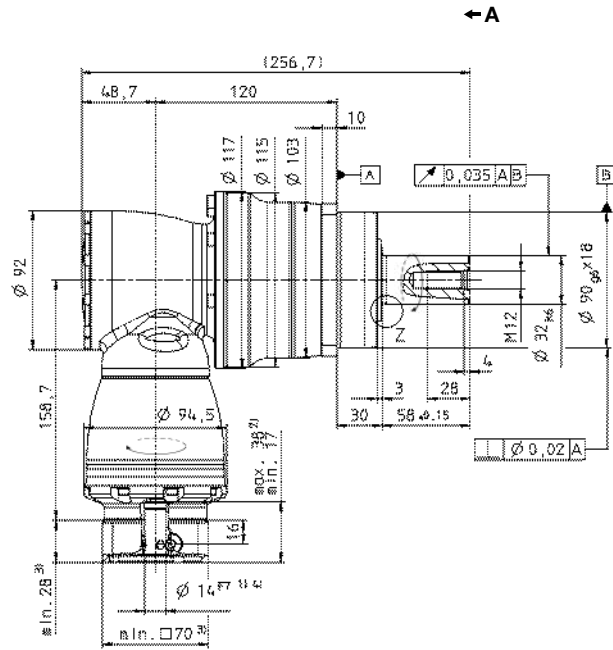
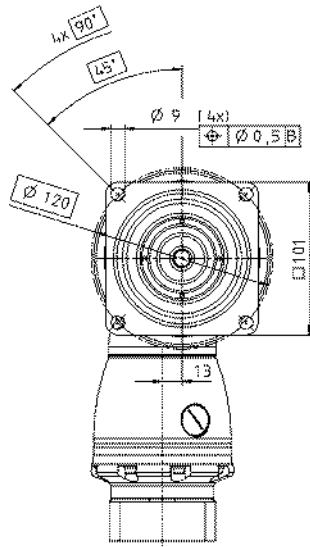
All technical data for front output side applies.

Technical data for rearward output versions, see page 422.

Please contact us for information on the best configuration for S1 conditions of use (continuous operation).

View A

3-stage:

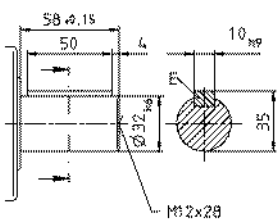


Right-angle gearheads
High End

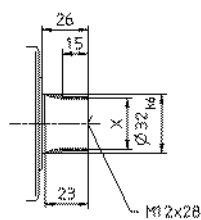
SPK+

Alternatives: Output shaft variants

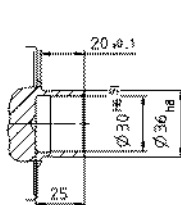
Keywayed output shaft in mm
E = key as per DIN 6885, sheet 1, form A



Involute gearing DIN 5480 in mm
X = W 32 x 1.25 x 30 x 24 x 6m, DIN 5480



Shaft mounted
Mounted via shrink disc



See technical data sheet for available clamping hub diameters (mass moment of inertia). Dimensions available on request.

Non-tolerated dimensions ± 1 mm

- 1) Check motor shaft fit.
- 2) Min./Max. permissible motor shaft length. Longer motor shafts are adaptable, please contact us.
- 3) The dimensions depend on the motor.
- 4) Smaller motor shaft diameter is compensated by a bushing with a minimum thickness of 1 mm.



CAD data is available under
<http://www.wittenstein-alpha.de/en/info-and-cad-finder.html>

Motor mounting according to operating manual

SPK+ 140 MF 2-stage

			2-stage											
Ratio ^{a)}	<i>i</i>		12	16	20	25	28	35	40	50	70	100		
Max. acceleration torque (max. 1000 cycles per hour)	<i>T</i> _{2B}	Nm	600	600	600	600	600	600	500	600	600	480		
		in.lb	5310	5310	5310	5310	5310	5310	4425	5310	5310	4248		
Nominal output torque (with <i>n</i> _{1N})	<i>T</i> _{2N}	Nm	360	360	360	360	360	360	320	360	360	220		
		in.lb	3186	3186	3186	3186	3186	3186	2832	3186	3186	1947		
Emergency stop torque (permitted 1000 times during the service life of the gearhead)	<i>T</i> _{2Not}	Nm	1000	1000	1250	1250	1250	1250	1000	1250	1250	1000		
		in.lb	8850	8850	11063	11063	11063	11063	8850	11063	11063	8850		
Nominal input speed (with <i>T</i> _{2N} and 20°C ambient temperature) ^{b), c)}	<i>n</i> _{1N}	rpm	1900	2300	2300	2600	2300	2300	2300	2300	2300	2300		
Max. continuous speed (with 20% <i>T</i> _{2N} and 20°C ambient temperature)	<i>n</i> _{1Ncym}	rpm	2700	3100	3100	3500	3100	3000	3000	3000	3000	3000		
Max. input speed	<i>n</i> _{1Max}	rpm	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500		
Mean no load running torque (with <i>n</i> ₁ = 3000 rpm and 20°C gearhead temperature) ^{d)}	<i>T</i> ₀₁₂	Nm	4.0	3.7	3.6	2.8	3.5	3.9	3.1	3.1	3.1	3.1		
		in.lb	35.4	32.7	31.9	24.8	31	34.5	27.4	27.4	27.4	27.4		
Max. torsional backlash	<i>j</i> _t	arcmin	Standard ≤ 4 / Reduced ≤ 2											
Torsional rigidity	<i>C</i> _{t21}	Nm/ arcmin	53											
		in.lb/ arcmin	469											
Max. axial force ^{e)}	<i>F</i> _{2AMax}	N	9870											
		lb _f	2221											
Max. radial force ^{e)}	<i>F</i> _{2RMax}	N	9450											
		lb _f	2126											
Max. tilting moment	<i>M</i> _{2KMax}	Nm	952											
		in.lb	8425											
Efficiency at full load	η	%	94											
Service life (For calculation, see the Chapter "Information")	<i>L</i> _h	h	> 20000											
Weight incl. standard adapter plate	<i>m</i>	kg	20											
		lb _m	44											
Operating noise (with <i>n</i> ₁ = 3000 rpm no load)	<i>L</i> _{PA}	dB(A)	≤ 68											
Max. permitted housing temperature		°C	+90											
		F	194											
Ambient temperature		°C	0 to +40											
		F	32 to 104											
Lubrication			Lubricated for life											
Paint			Blue RAL 5002											
Direction of rotation			Motor and gearhead opposite directions											
Protection class			IP 65											
Moment of inertia (relates to the drive) Clamping hub diameter [mm]	H	28	<i>J</i> ₁	kgcm ²	4.68	3.82	3.75	3.31	3.68	2.97	2.80	2.79	2.78	2.77
				10 ⁻³ in.lb.s ²	4.14	3.38	3.32	2.93	3.26	2.63	2.48	2.47	2.46	2.45
	K	38	<i>J</i> ₁	kgcm ²	11.8	11.0	10.9	10.5	10.9	10.1	9.96	9.95	9.94	9.94
				10 ⁻³ in.lb.s ²	10.5	9.73	9.66	9.27	9.60	8.97	8.82	8.81	8.80	8.79

^{a)} Other ratios up to i=1000 available on request

^{b)} Higher speeds are possible if the nominal torque is reduced

^{c)} For higher ambient temperatures, please reduce input speed

^{d)} Idling torques decrease during operation

^{e)} Refers to center of the output shaft or flange

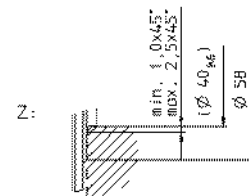
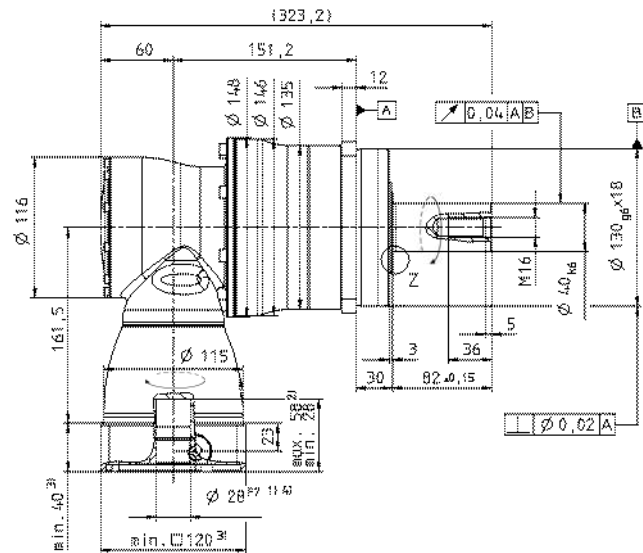
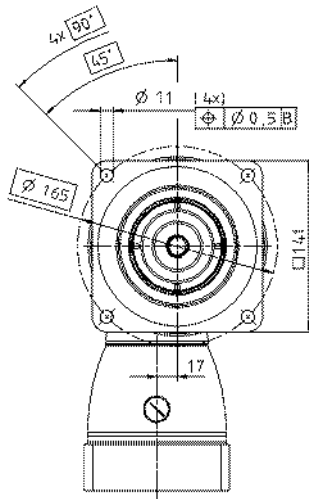
All technical data for front output side applies.

Technical data for rearward output versions, see page 422.

Please contact us for information on the best configuration for S1 conditions of use (continuous operation).

View A

2-stage:

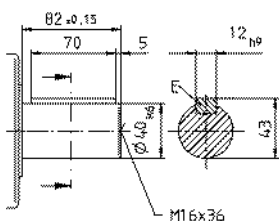


Right-angle gearheads
High End

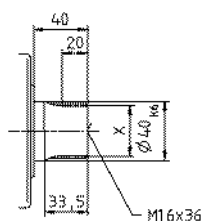
SPK+

Alternatives: Output shaft variants

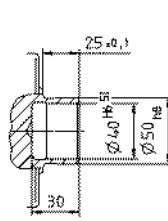
Keywayed output shaft in mm
E = key as per DIN 6885, sheet 1, form A



Involute gearing DIN 5480 in mm
X = W 40 x 2 x 30 x 18 x 6m, DIN 5480



Shaft mounted
Mounted via shrink disc



See technical data sheet for available clamping hub diameters (mass moment of inertia). Dimensions available on request.

Non-tolerated dimensions ±1 mm

- 1) Check motor shaft fit.
- 2) Min./Max. permissible motor shaft length. Longer motor shafts are adaptable, please contact us.
- 3) The dimensions depend on the motor.
- 4) Smaller motor shaft diameter is compensated by a bushing with a minimum thickness of 1 mm.



CAD data is available under
<http://www.wittenstein-alpha.de/en/info-and-cad-finder.html>



Motor mounting according to operating manual

SPK+ 140 MF 3-stage

					3-stage												
Ratio ^{a)}	<i>i</i>		64	84	100	125	140	175	200	250	280	350	400	500	700	1000	
Max. acceleration torque (max. 1000 cycles per hour)	<i>T</i> _{2B}	Nm	600	600	600	600	600	600	600	600	600	600	500	600	600	480	
		in.lb	5310	5310	5310	5310	5310	5310	5310	5310	5310	5310	5310	4425	5310	5310	4248
Nominal output torque (with <i>n</i> _{1N})	<i>T</i> _{2N}	Nm	360	360	360	360	360	360	360	360	360	360	320	360	360	220	
		in.lb	3186	3186	3186	3186	3186	3186	3186	3186	3186	3186	3186	2832	3186	3186	1947
Emergency stop torque (permitted 1000 times during the service life of the gearhead)	<i>T</i> _{2Not}	Nm	1000	1000	1250	1250	1250	1250	1250	1250	1250	1250	1000	1250	1250	1000	
		in.lb	8850	8850	11063	11063	11063	11063	11063	11063	11063	11063	11063	8850	11063	11063	8850
Nominal input speed (with <i>T</i> _{2N} and 20°C ambient temperature) ^{b), c)}	<i>n</i> _{1N}	rpm	3100	3100	3100	3100	3100	3100	3100	3500	3100	3500	4200	4200	4200	4200	
Max. continuous speed (with 20% <i>T</i> _{2N} and 20°C ambient temperature)	<i>n</i> _{1Ncym}	rpm	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4200	4200	4200	4200	
Max. input speed	<i>n</i> _{1Max}	rpm	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	
Mean no load running torque (with <i>n</i> ₁ = 3000 rpm and 20°C gearhead temperature) ^{d)}	<i>T</i> ₀₁₂	Nm	0.7	0.4	0.6	0.5	0.5	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	
		in.lb	6.2	3.5	5.3	4.4	4.4	3.5	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7
Max. torsional backlash	<i>j</i> _t	arcmin	Standard ≤ 4 / Reduced ≤ 2														
Torsional rigidity	<i>C</i> _{t21}	Nm/ arcmin	53														
		in.lb/ arcmin	469														
Max. axial force ^{e)}	<i>F</i> _{2AMax}	N	9870														
		lb _f	2221														
Max. radial force ^{e)}	<i>F</i> _{2RMax}	N	9450														
		lb _f	2126														
Max. tilting moment	<i>M</i> _{2KMax}	Nm	952														
		in.lb	8425														
Efficiency at full load	η	%	92														
Service life (For calculation, see the Chapter "Information")	<i>L</i> _h	h	> 20000														
Weight incl. standard adapter plate	<i>m</i>	kg	20.7														
		lb _m	45.7														
Operating noise (with <i>n</i> ₁ = 3000 rpm no load)	<i>L</i> _{PA}	dB(A)	< 68														
Max. permitted housing temperature		°C	+90														
		F	194														
Ambient temperature		°C	0 to +40														
		F	32 to 104														
Lubrication			Lubricated for life														
Paint			Blue RAL 5002														
Direction of rotation			Motor and gearhead opposite directions														
Protection class			IP 65														
Moment of inertia (relates to the drive) Clamping hub diameter [mm]	E	19	<i>J</i> _i	kgcm ²	1.01	0.76	0.88	0.85	0.76	0.75	0.70	0.69	0.70	0.69	0.69	0.69	0.69
				10 ⁻³ in.lb.in ²	0.89	0.67	0.78	0.75	0.67	0.66	0.62	0.61	0.62	0.61	0.61	0.61	0.61
	G	24	<i>J</i> _i	kgcm ²	2.57	2.32	2.44	2.42	2.32	2.31	2.26	2.25	2.26	2.25	2.25	2.25	2.25
				10 ⁻³ in.lb.in ²	2.27	2.05	2.16	2.14	2.05	2.04	2.00	1.99	2.00	1.99	1.99	1.99	1.99

^{a)} Other ratios up to i=1000 available on request

^{b)} Higher speeds are possible if the nominal torque is reduced

^{c)} For higher ambient temperatures, please reduce input speed

^{d)} Idling torques decrease during operation

^{e)} Refers to center of the output shaft or flange

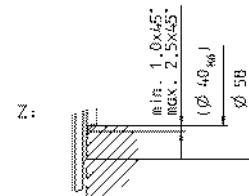
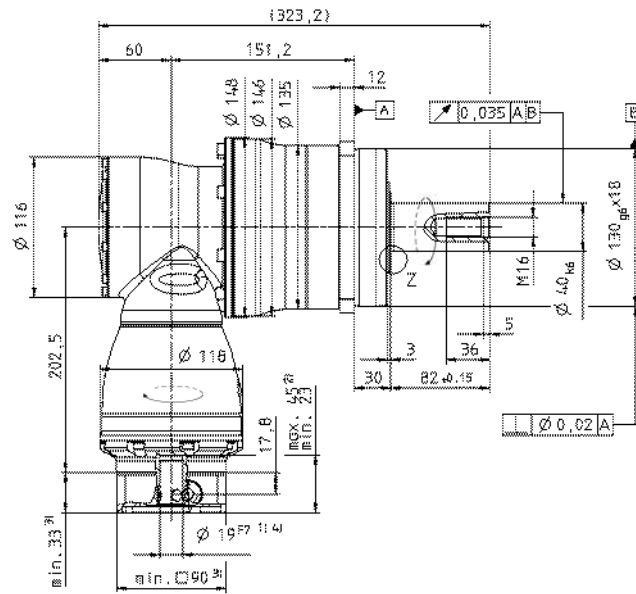
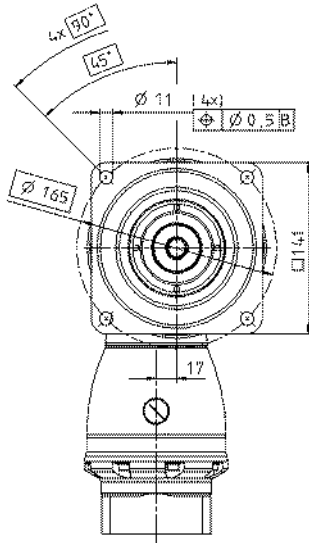
All technical data for front output side applies.

Technical data for rearward output versions, see page 422.

Please contact us for information on the best configuration for S1 conditions of use (continuous operation).

View A

3-stage:

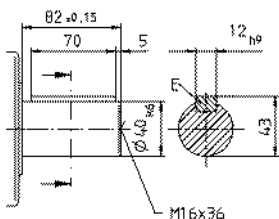


Right-angle gearheads
High End

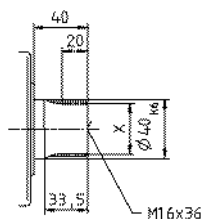
SPK+

Alternatives: Output shaft variants

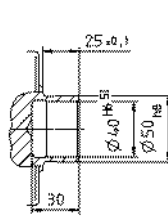
Keywayed output shaft in mm
E = key as per DIN 6885, sheet 1, form A



Involute gearing DIN 5480 in mm
X = W 40 x 2 x 30 x 18 x 6m, DIN 5480



Shaft mounted
Mounted via shrink disc



See technical data sheet for available clamping hub diameters (mass moment of inertia). Dimensions available on request.

Non-tolerated dimensions ± 1 mm

- 1) Check motor shaft fit.
- 2) Min./Max. permissible motor shaft length. Longer motor shafts are adaptable, please contact us.
- 3) The dimensions depend on the motor.
- 4) Smaller motor shaft diameter is compensated by a bushing with a minimum thickness of 1 mm.



CAD data is available under
<http://www.wittenstein-alpha.de/en/info-and-cad-finder.html>

Motor mounting according to operating manual

SPK+ 180 MF 2-stage

				2-stage													
Ratio ^{a)}				<i>i</i>		12	16	20	25	28	35	40	50	70	100		
Max. acceleration torque (max. 1000 cycles per hour)				<i>T</i> _{2B}	Nm	1100	1100	1100	1100	1100	1100	840	1050	1100	880		
					in.lb	9735	9735	9735	9735	9735	9735	7434	9293	9735	7788		
Nominal output torque (with <i>n</i> _{2N})				<i>T</i> _{2N}	Nm	750	750	750	750	750	750	640	750	750	750		
					in.lb	6638	6638	6638	6638	6638	6638	6638	5664	6638	6638	6638	
Emergency stop torque (permitted 1000 times during the service life of the gearhead)				<i>T</i> _{2Not}	Nm	1600	1600	2000	2000	2750	2000	1600	2000	2750	2200		
					in.lb	14160	14160	17700	17700	24338	17700	14160	17700	24338	19470		
Nominal input speed (with <i>T</i> _{2N} and 20°C ambient temperature) ^{b), c)}				<i>n</i> _{1N}	rpm	1600	1900	1900	2100	1900	2100	2100	2100	2100	2100		
Max. continuous speed (with 20% <i>T</i> _{2N} and 20°C ambient temperature)				<i>n</i> _{1Ncym}	rpm	2300	2600	2600	2800	2600	3000	3000	3000	3000	3000		
Max. input speed				<i>n</i> _{1Max}	rpm	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500		
Mean no load running torque (with <i>n</i> ₁ = 3000 rpm and 20°C gearhead temperature) ^{d)}				<i>T</i> ₀₁₂	Nm	9.0	6.5	6.5	5.5	6.0	8.0	6.0	6.0	6.0	6.0		
					in.lb	79.7	57.5	57.5	48.7	53.1	70.8	53.1	53.1	53.1	53.1	53.1	
Max. torsional backlash				<i>j</i> _t	arcmin	Standard ≤ 4 / Reduced ≤ 2											
Torsional rigidity				<i>C</i> _{t21}	Nm/ arcmin	175											
					in.lb/ arcmin	1549											
Max. axial force ^{e)}				<i>F</i> _{2AMax}	N	14150											
					lb _f	3184											
Max. radial force ^{e)}				<i>F</i> _{2RMax}	N	14700											
					lb _f	3308											
Max. tilting moment				<i>M</i> _{2KMax}	Nm	1600											
					in.lb	14160											
Efficiency at full load				η	%	94											
Service life (For calculation, see the Chapter "Information")				<i>L</i> _h	h	> 20000											
Weight incl. standardadapter plate				<i>m</i>	kg	45											
					lb _m	99											
Operating noise (with <i>n</i> ₁ = 3000 rpm no load)				<i>L</i> _{PA}	dB(A)	≤ 70											
Max. permitted housing temperature					°C	+90											
					F	194											
Ambient temperature					°C	0 to +40											
					F	32 to 104											
Lubrication					Lubricated for life												
Paint					Blue RAL 5002												
Direction of rotation					Motor and gearhead opposite directions												
Protection class					IP 65												
Moment of inertia (relates to the drive) Clamping hub diameter [mm]				<i>K</i>	38	<i>J</i> _f	kgcm ²	24.7	19.5	19.0	16.3	18.6	14.0	12.9	12.8	12.7	12.7
							10 ⁻¹ in.lb.s ²	21.9	17.2	16.8	14.4	16.5	12.4	11.4	11.3	11.3	11.2

^{a)} Other ratios up to $i=1000$ available on request

^{b)} Higher speeds are possible if the nominal torque is reduced

^{c)} For higher ambient temperatures, please reduce input speed

^{d)} Idling torques decrease during operation

^{e)} Refers to center of the output shaft or flange

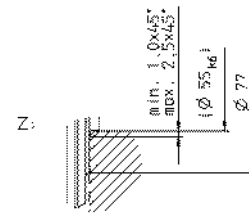
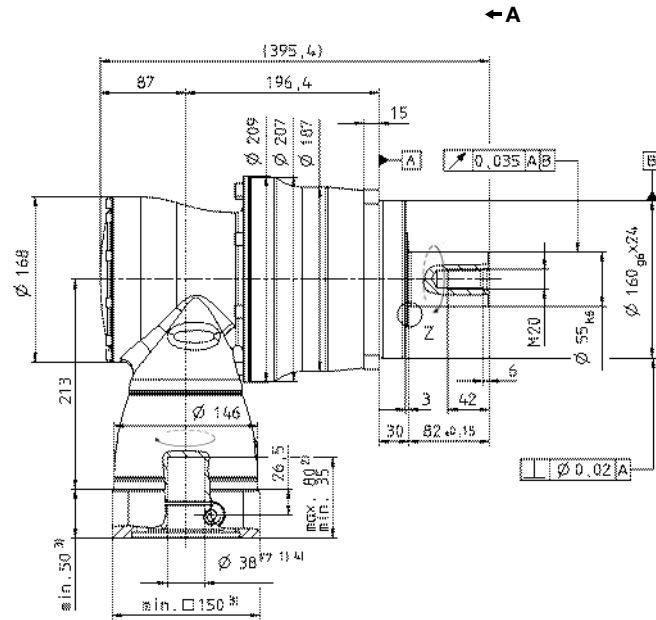
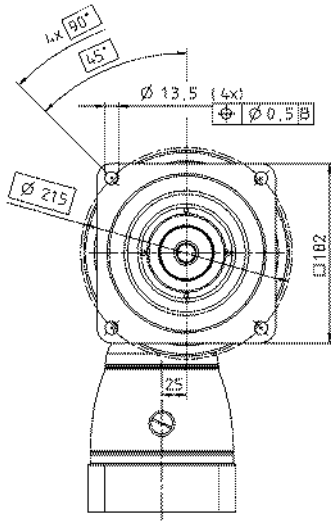
All technical data for front output side applies.

Technical data for rearward output versions, see page 422.

Please contact us for information on the best configuration for S1 conditions of use (continuous operation).

View A

2-stage:

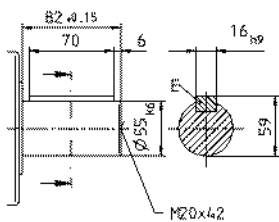


Right-angle gearheads
High End

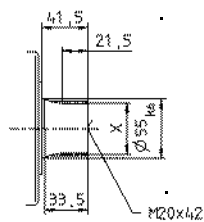
SPK+

Alternatives: Output shaft variants

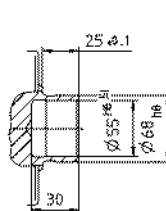
Keywayed output shaft in mm
E = key as per DIN 6885, sheet 1, form A



Involute gearing DIN 5480 in mm
X = W 55 x 2 x 30 x 26 x 6m, DIN 5480



Shaft mounted
Mounted via shrink disc



See technical data sheet for available clamping hub diameters (mass moment of inertia). Dimensions available on request.

Non-tolerated dimensions ± 1 mm

- 1) Check motor shaft fit.
- 2) Min./Max. permissible motor shaft length. Longer motor shafts are adaptable, please contact us.
- 3) The dimensions depend on the motor.
- 4) Smaller motor shaft diameter is compensated by a bushing with a minimum thickness of 1 mm.



CAD data is available under
<http://www.wittenstein-alpha.de/en/info-and-cad-finder.html>
Motor mounting according to operating manual

SPK+ 180 MF 3-stage

				3-stage															
Ratio ^{a)}				<i>i</i>	64	84	100	125	140	175	200	250	280	350	400	500	700	1000	
Max. acceleration torque (max. 1000 cycles per hour)				<i>T</i> _{2B}	Nm	1100	1100	1100	1100	1100	1100	1100	1100	1100	840	1050	1100	880	
					in.lb	9735	9735	9735	9735	9735	9735	9735	9735	9735	9735	9735	7434	9293	9735
Nominal output torque (with <i>n</i> _{2N})				<i>T</i> _{2N}	Nm	750	750	750	750	750	750	750	750	750	640	750	750	750	
					in.lb	6638	6638	6638	6638	6638	6638	6638	6638	6638	6638	6638	5664	6638	6638
Emergency stop torque (permitted 1000 times during the service life of the gearhead)				<i>T</i> _{2Not}	Nm	1600	1600	2000	2000	2000	2000	2000	2000	2750	2000	1600	2000	2750	2200
					in.lb	14160	14160	17700	17700	17700	17700	17700	17700	17700	24338	17700	14160	17700	24338
Nominal input speed (with <i>T</i> _{2N} and 20°C ambient temperature) ^{b), c)}				<i>n</i> _{1N}	rpm	2900	2900	2900	2900	2900	2900	3200	2900	3200	3900	3900	3900	3900	
Max. continuous speed (with 20% <i>T</i> _{2N} and 20°C ambient temperature)				<i>n</i> _{1Ncym}	rpm	4000	4000	4000	4000	4000	4000	4000	4000	4000	4200	4200	4200	4200	
Max. input speed				<i>n</i> _{1Max}	rpm	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	
Mean no load running torque (with <i>n</i> ₁ = 3000 rpm and 20°C gearhead temperature) ^{d)}				<i>T</i> ₀₁₂	Nm	1	0.5	0.8	0.6	0.6	0.5	0.5	0.4	0.5	0.4	0.4	0.4	0.4	
					in.lb	8.9	4.4	7.1	5.3	5.3	4.4	4.4	3.5	4.4	3.5	3.5	3.5	3.5	3.5
Max. torsional backlash				<i>j</i> _t	arcmin	Standard ≤ 4 / Reduced ≤ 2													
Torsional rigidity				<i>C</i> _{t21}	Nm/ arcmin	175													
					in.lb/ arcmin	1549													
Max. axial force ^{e)}				<i>F</i> _{2AMax}	N	14150													
					lb _f	3184													
Max. radial force ^{e)}				<i>F</i> _{2RMax}	N	14700													
					lb _f	3308													
Max. tilting moment				<i>M</i> _{2KMax}	Nm	1600													
					in.lb	14160													
Efficiency at full load				η	%	92													
Service life (For calculation, see the Chapter "Information")				<i>L</i> _h	h	> 20000													
Weight incl. standardadapter plate				<i>m</i>	kg	47.4													
					lb _m	104.8													
Operating noise (with <i>n</i> ₁ = 3000 rpm no load)				<i>L</i> _{PA}	dB(A)	< 70													
Max. permitted housing temperature					°C	+90													
					F	194													
Ambient temperature					°C	0 to +40													
					F	32 to 104													
Lubrication					Lubricated for life														
Paint					Blue RAL 5002														
Direction of rotation					Motor and gearhead opposite directions														
Protection class					IP 65														
Moment of inertia (relates to the drive) Clamping hub diameter [mm]	G	24	<i>J</i> ₁	kgcm ²	3.97	2.82	3.36	3.22	2.82	2.75	2.50	2.47	2.50	2.44	2.42	2.42	2.42	2.42	
				10 ⁻³ in.lb.in ²	3.51	2.50	2.97	2.85	2.50	2.43	2.21	2.19	2.21	2.16	2.14	2.14	2.14	2.14	
	K	38	<i>J</i> ₁	kgcm ²	10.90	9.74	10.30	10.10	9.74	9.66	9.41	9.38	9.41	9.38	9.33	9.33	9.33	9.33	
				10 ⁻³ in.lb.in ²	9.65	8.62	9.12	8.94	8.62	8.55	8.33	8.30	8.33	8.30	8.26	8.26	8.26	8.26	

^{a)} Other ratios up to i=1000 available on request

^{b)} Higher speeds are possible if the nominal torque is reduced

^{c)} For higher ambient temperatures, please reduce input speed

^{d)} Idling torques decrease during operation

^{e)} Refers to center of the output shaft or flange

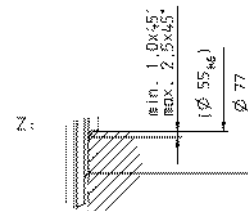
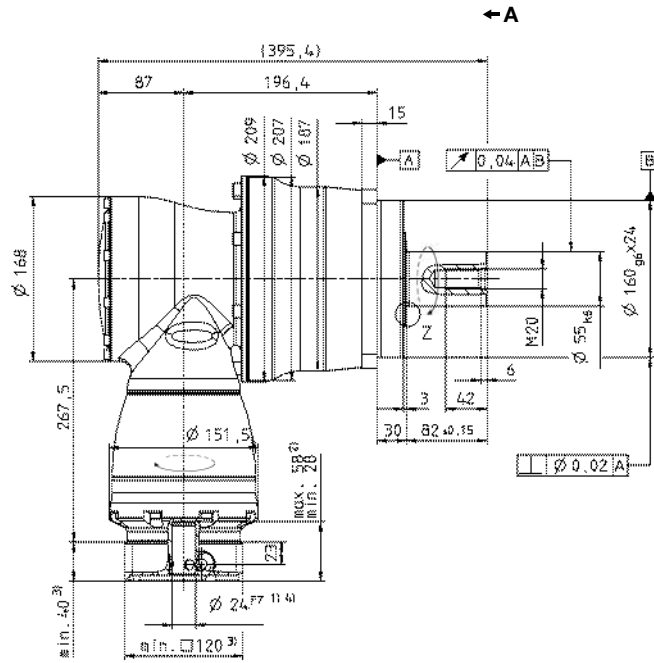
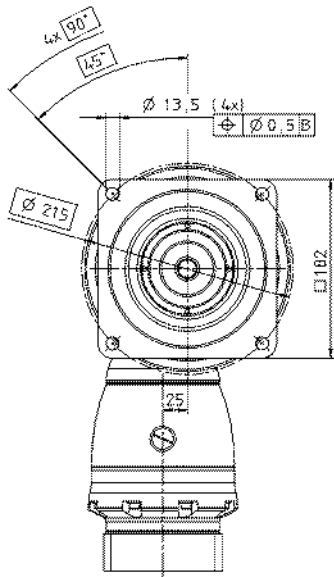
All technical data for front output side applies.

Technical data for rearward output versions, see page 422.

Please contact us for information on the best configuration for S1 conditions of use (continuous operation).

View A

3-stage:

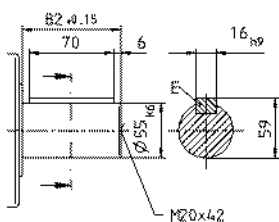


Right-angle gearheads
High End

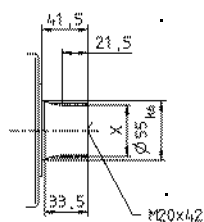
SPK+

Alternatives: Output shaft variants

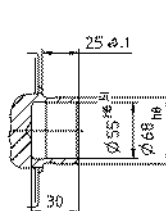
Keywayed output shaft in mm
E = key as per DIN 6885, sheet 1, form A



Involute gearing DIN 5480 in mm
X = W 55 x 2 x 30 x 26 x 6m, DIN 5480



Shaft mounted
Mounted via shrink disc



See technical data sheet for available clamping hub diameters (mass moment of inertia). Dimensions available on request.

Non-tolerated dimensions ± 1 mm

- 1) Check motor shaft fit.
- 2) Min./Max. permissible motor shaft length. Longer motor shafts are adaptable, please contact us.
- 3) The dimensions depend on the motor.
- 4) Smaller motor shaft diameter is compensated by a bushing with a minimum thickness of 1 mm.



CAD data is available under
<http://www.wittenstein-alpha.de/en/info-and-cad-finder.html>

Motor mounting according to operating manual

SPK+ 210 MF 2-stage

				2-stage											
Ratio ^{a)}				<i>i</i>		12	16	20	25	28	35	40	50	70	100
Max. acceleration torque (max. 1000 cycles per hour)				<i>T</i> _{2B}	Nm	2500	2500	2500	2500	2400	2400	1850	2300	2400	1900
					in.lb	22125	22125	22125	22125	21240	21240	16373	20355	21240	16815
Nominal output torque (with <i>n</i> _{in})				<i>T</i> _{2N}	Nm	1500	1500	1500	1500	1400	1500	1400	1500	1400	1000
					in.lb	13.275	13275	13275	13275	12390	13275	12390	13275	12390	8850
Emergency stop torque (permitted 1000 times during the service life of the gearhead)				<i>T</i> _{2Not}	Nm	3600	4200	5200	5200	5200	5200	3600	4500	5200	5000
					in.lb	31860	37170	46020	46020	46020	46020	31860	39825	46020	44250
Nominal input speed (with <i>T</i> _{2N} and 20°C ambient temperature) ^{b), c)}				<i>n</i> _{1N}	rpm	1500	1700	1700	1900	1700	1900	1700	1700	1700	1700
Max. continuous speed (with 20 % <i>T</i> _{2N} and 20°C ambient temperature)				<i>n</i> _{1Ncym}	rpm	1900	2300	2300	2700	2300	2700	2400	2400	2400	2400
Max. input speed				<i>n</i> _{1Max}	rpm	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000
Mean no load running torque (with <i>n</i> ₁ = 3000 rpm and 20°C gearhead temperature) ^{d)}				<i>T</i> ₀₁₂	Nm	18.5	17.0	15.0	13.0	14.0	12.0	15.0	15.0	14.0	13.0
					in.lb	163.7	150.5	132.8	115.1	123.9	106.2	132.8	132.8	123.9	115.1
Max. torsional backlash				<i>j</i> _t	arcmin	Standard ≤4 / Reduced ≤2									
Torsional rigidity				<i>C</i> _{t21}	Nm/ arcmin	300	300	300	300	300	300	300	300	300	300
					in.lb/ arcmin	2.655	2.655	2.655	2.655	2.655	2.655	2.655	2.655	2.655	2.655
Max. axial force ^{e)}				<i>F</i> _{2AMax}	N	30000									
					lb _f	6750									
Max. radial force ^{e)}				<i>F</i> _{2RMax}	N	21000									
					lb _f	4725									
Max. tilting moment				<i>M</i> _{2KMax}	Nm	3100									
					in.lb	27435									
Efficiency at full load				η	%	94									
Service life (For calculation, see the Chapter "Information")				<i>L</i> _h	h	> 20000									
Weight incl. standard adapter plate				<i>m</i>	kg	82									
					lb _m	181									
Operating noise (with <i>n</i> ₁ = 3000 rpm no load)				<i>L</i> _{PA}	dB(A)	≤ 71									
Max. permitted housing temperature					°C	+90									
					F	194									
Ambient temperature					°C	0 to +40									
					F	32 to 104									
Lubrication					Lubricated for life										
Paint					Blue RAL 5002										
Direction of rotation					Motor and gearhead opposite directions										
Protection class					IP 65										
Moment of inertia (relates to the drive) Clamping hub diameter [mm]		M	48	<i>J</i> ₁	kgcm²	78.80	54.60	53.00	43.40	51.50	42.20	30.20	30.00	29.80	29.80
					10 ⁻³ in.lb.s²	69.74	48.32	46.91	38.41	45.58	37.35	26.73	26.55	26.37	26.37

^{a)} Other ratios available on request

^{b)} Higher speeds are possible if the nominal torque is reduced

^{c)} For higher ambient temperatures, please reduce input speed

^{d)} Idling torques decrease during operation

^{e)} Refers to center of the output shaft or flange

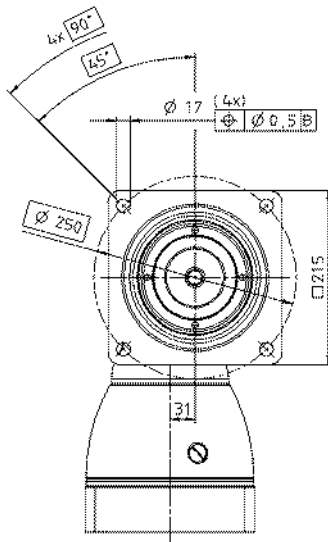
All technical data for front output side applies.

Technical data for rearward output versions, see page 422.

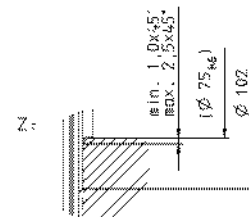
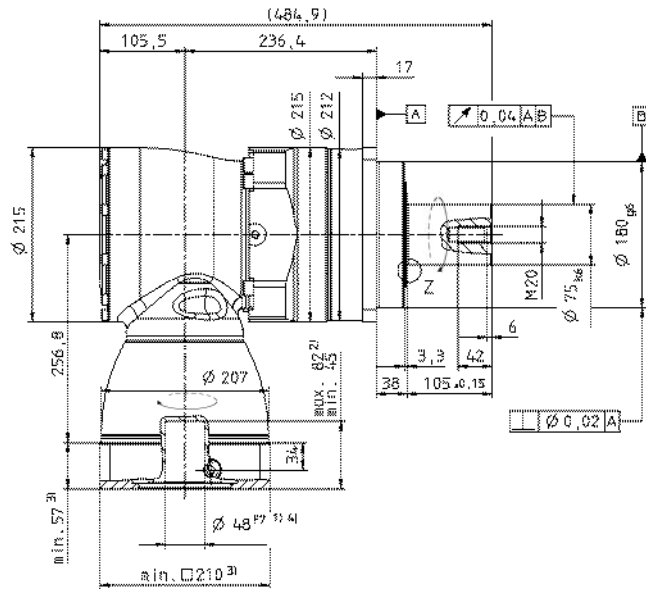
Please contact us for information on the best configuration for S1 conditions of use (continuous operation).

View A

2-stage:



← A



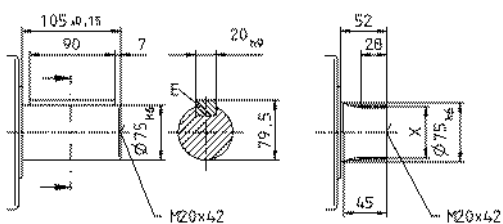
Right-angle gearheads
High End

SPK+

Alternatives: Output shaft variants

Keywayed output shaft in mm
E = key as per DIN 6885, sheet 1, form A

Involute gearing DIN 5480 in mm
X = W 70 x 2 x 30 x 34 x 6m, DIN 5480



See technical data sheet for available clamping hub diameters (mass moment of inertia). Dimensions available on request.

Non-tolerated dimensions ± 1 mm

- 1) Check motor shaft fit.
- 2) Min./Max. permissible motor shaft length. Longer motor shafts are adaptable, please contact us.
- 3) The dimensions depend on the motor.
- 4) Smaller motor shaft diameter is compensated by a bushing with a minimum thickness of 1 mm.



CAD data is available under
<http://www.wittenstein-alpha.de/en/info-and-cad-finder.html>



Motor mounting according to operating manual

SPK+ 210 MF 3-stage

			3-stage													
Ratio ^{a)}	<i>i</i>		64	84	100	125	140	175	200	250	280	350	400	500	700	1000
Max. acceleration torque (max. 1000 cycles per hour)	<i>T</i> _{2B}	Nm	2400	2400	2500	2500	2500	2500	2500	2500	2400	2400	1900	2350	2400	1900
		in.lb	21240	21240	22125	22125	22125	22125	22125	22125	21240	21240	16815	20798	21240	16815
Nominal output torque (with <i>n</i> _{in})	<i>T</i> _{2N}	Nm	1500	1500	1500	1500	1500	1500	1500	1500	1400	1400	1500	1500	1400	1000
		in.lb	13275	13275	13275	13275	13275	13275	13275	13275	12390	12390	13275	13275	12390	8850
Emergency stop torque (permitted 1000 times during the service life of the gearhead)	<i>T</i> _{2Not}	Nm	4200	3600	5200	5200	5200	5200	5200	5200	5200	5200	3600	4500	5200	5000
		in.lb	37170	31860	46020	46020	46020	46020	46020	46020	46020	46020	31860	39825	46020	44250
Nominal input speed (with <i>T</i> _{2N} and 20°C ambient temperature) ^{b), c)}	<i>n</i> _{1N}	rpm	2700	2700	2700	2700	2700	2700	2700	2900	2700	2900	3400	3400	3400	3400
Max. continuous speed (with 20 % <i>T</i> _{2N} and 20°C ambient temperature)	<i>n</i> _{1Ncym}	rpm	3500	3500	3500	3500	3500	3500	3500	3500	3500	3500	3500	3500	3800	3800
Max. input speed	<i>n</i> _{1Max}	rpm	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000
Mean no load running torque (with <i>n</i> ₁ =3000 rpm and 20°C gearhead temperature) ^{d)}	<i>T</i> ₀₁₂	Nm	2.4	1.2	1.9	1.7	1.3	1.3	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
		in.lb	21.2	10.6	16.8	15.0	11.5	11.5	8.9	8.9	8.9	8.9	8.9	8.9	8.9	8.9
Max. torsional backlash	<i>j</i> _t	arcmin	Standard ≤4 / Reduced ≤2													
Torsional rigidity	<i>C</i> _{t21}	Nm/ arcmin	300	300	300	300	300	300	300	300	300	300	300	300	300	300
		in.lb/ arcmin	2.655	2.655	2.655	2.655	2.655	2.655	2.655	2.655	2.655	2.655	2.655	2.655	2.655	2.655
Max. axial force ^{e)}	<i>F</i> _{2AMax}	N	30000													
		lb _f	6750													
Max. radial force ^{e)}	<i>F</i> _{2RMax}	N	21000													
		lb _f	4725													
Max. tilting moment	<i>M</i> _{2KMax}	Nm	3100													
		in.lb	27435													
Efficiency at full load	<i>η</i>	%	92													
Service life (For calculation, see the Chapter "Information")	<i>L</i> _h	h	> 20000													
Weight incl. standard adapter plate	<i>m</i>	kg	86													
		lb _m	190													
Operating noise (with <i>n</i> ₁ = 3000 rpm no load)	<i>L</i> _{PA}	dB(A)	≤ 71													
Max. permitted housing temperature		°C	+90													
		F	194													
Ambient temperature		°C	0 to +40													
		F	32 to 104													
Lubrication			Lubricated for life													
Paint			Blue RAL 5002													
Direction of rotation			Motor and gearhead opposite directions													
Protection class			IP 65													
Moment of inertia (relates to the drive) Clamping hub diameter [mm]	K	38	<i>J</i> ₁	kgcm ²	14.00	10.90	12.30	12.00	10.90	10.70	10.10	10.00	10.10	10.00	9.90	9.90
				10 ⁻³ in.lb.s ²	12.39	9.65	10.89	10.62	9.65	9.47	8.94	8.85	8.94	8.85	8.76	8.76
	M	48	<i>J</i> ₁	kgcm ²	28.70	25.60	27.10	26.70	26.70	25.60	24.80	24.70	24.80	24.70	24.60	24.60
				10 ⁻³ in.lb.s ²	25.40	22.66	23.98	23.63	23.63	22.66	21.95	21.86	21.95	21.86	21.77	21.77

^{a)} Other ratios available on request

^{b)} Higher speeds are possible if the nominal torque is reduced

^{c)} For higher ambient temperatures, please reduce input speed

^{d)} Idling torques decrease during operation

^{e)} Refers to center of the output shaft or flange

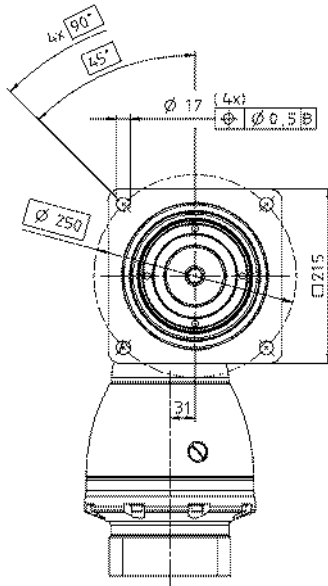
All technical data for front output side applies.

Technical data for rearward output versions, see page 422.

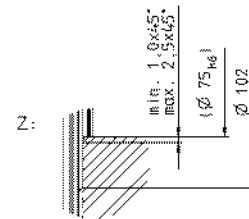
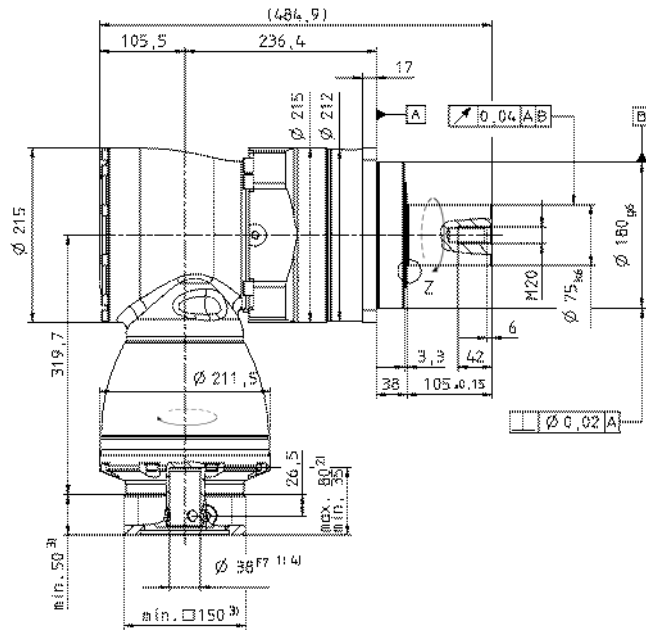
Please contact us for information on the best configuration for S1 conditions of use (continuous operation).

View A

3-stage:



← A



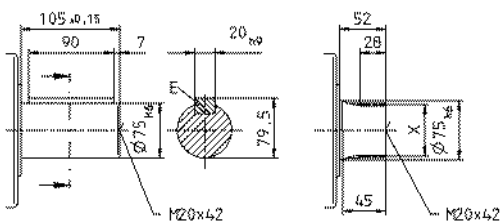
Right-angle gearheads
High End

SPK+

Alternatives: Output shaft variants

Keywayed output shaft in mm
E = key as per DIN 6885, sheet 1, form A

Involute gearing DIN 5480 in mm
X = W 70 x 2 x 30 x 34 x 6m, DIN 5480



See technical data sheet for available clamping hub diameters (mass moment of inertia). Dimensions available on request.

Non-tolerated dimensions ± 1 mm

- 1) Check motor shaft fit.
- 2) Min./Max. permissible motor shaft length. Longer motor shafts are adaptable, please contact us.
- 3) The dimensions depend on the motor.
- 4) Smaller motor shaft diameter is compensated by a bushing with a minimum thickness of 1 mm.



CAD data is available under
<http://www.wittenstein-alpha.de/en/info-and-cad-finder.html>



Motor mounting according to operating manual

SPK+ 240 MF 3-stage

			3-stage													
Ratio ^{a)}	<i>i</i>		48	64	100	125	140	175	200	250	280	350	400	500	700	1000
Max. acceleration torque (max. 1000 cycles per hour)	<i>T</i> _{2B}	Nm	4500	4500	4500	4500	4500	4500	4500	4500	4300	4500	4000	4300	4300	3400
		in.lb	39825	39825	39825	39825	39825	39825	39825	39825	38055	39825	35400	38055	38055	30090
Nominal output torque (with <i>n</i> _{in})	<i>T</i> _{2N}	Nm	2500	2500	2500	2500	2500	2500	2500	2500	2300	2500	2500	2500	2300	1700
		in.lb	22125	22125	22125	22125	22125	22125	22125	22125	20355	22125	22125	22125	20355	15045
Emergency stop torque (permitted 1000 times during the service life of the gearhead)	<i>T</i> _{2Not}	Nm	6400	8000	8500	8500	8500	8500	8500	8500	8500	8500	8500	8500	8500	6800
		in.lb	56640	70800	75225	75225	75225	75225	75225	75225	75225	75225	75225	75225	75225	60180
Nominal input speed (with <i>T</i> _{2N} and 20°C ambient temperature) ^{b), c)}	<i>n</i> _{1N}	rpm	1800	1900	1900	2100	1900	2100	2100	2100	2100	2100	2100	2100	2100	2100
Max. continuous speed (with 20 % <i>T</i> _{2N} and 20°C ambient temperature)	<i>n</i> _{1Ncym}	rpm	2000	2200	2600	2600	2300	2300	2300	2300	2300	2300	2300	2300	2300	2300
Max. input speed	<i>n</i> _{1Max}	rpm	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500
Mean no load running torque (with <i>n</i> ₁ = 3000 rpm and 20°C gearhead temperature) ^{d)}	<i>T</i> ₀₁₂	Nm	11.0	8.0	7.0	7.0	8.0	8.0	7.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
		in.lb	94.3	70.8	62.0	62.0	70.8	70.8	62.0	53.1	53.1	53.1	53.1	53.1	53.1	53.1
Max. torsional backlash	<i>j</i> _t	arcmin	Standard ≤ 5,5 / Reduced ≤ 3,5													
Torsional rigidity	<i>C</i> _{t21}	Nm/ arcmin	510	510	510	510	510	510	510	510	510	510	510	510	510	510
		in.lb/ arcmin	4.514	4.514	4.514	4.514	4.514	4.514	4.514	4.514	4.514	4.514	4.514	4.514	4.514	4.514
Max. axial force ^{e)}	<i>F</i> _{2AMax}	N	33000													
		lb _f	7425													
Max. radial force ^{e)}	<i>F</i> _{2RMax}	N	30000													
		lb _f	6750													
Max. tilting moment	<i>M</i> _{2KMax}	Nm	5000													
		in.lb	44250													
Efficiency at full load	<i>η</i>	%	92													
Service life (For calculation, see the Chapter "Information")	<i>L</i> _h	h	> 20000													
Weight incl. standard adapter plate	<i>m</i>	kg	93													
		lb _m	206													
Operating noise (with <i>n</i> ₁ = 3000 rpm no load)	<i>L</i> _{PA}	dB(A)	≤ 71													
Max. permitted housing temperature		°C	+90													
		F	194													
Ambient temperature		°C	0 to +40													
		F	32 to 104													
Lubrication			Lubricated for life													
Paint			Blue RAL 5002													
Direction of rotation			Motor and gearhead opposite directions													
Protection class			IP 65													
Moment of inertia (relates to the drive) Clamping hub diameter [mm]	<i>K</i>	38	<i>J</i> _i	kgcm ²	26.5	20.00	17.00	17.00	15.00	15.00	13.00	13.00	13.00	13.00	13.00	13.00
				10 ⁻³ in.lb.s ²	23.40	17.70	15.05	15.05	13.28	13.28	11.51	11.51	11.51	11.51	11.51	11.51

^{a)} Other ratios available on request

^{b)} Higher speeds are possible if the nominal torque is reduced

^{c)} For higher ambient temperatures, please reduce input speed

^{d)} Idling torques decrease during operation

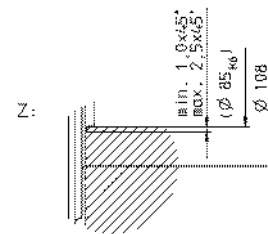
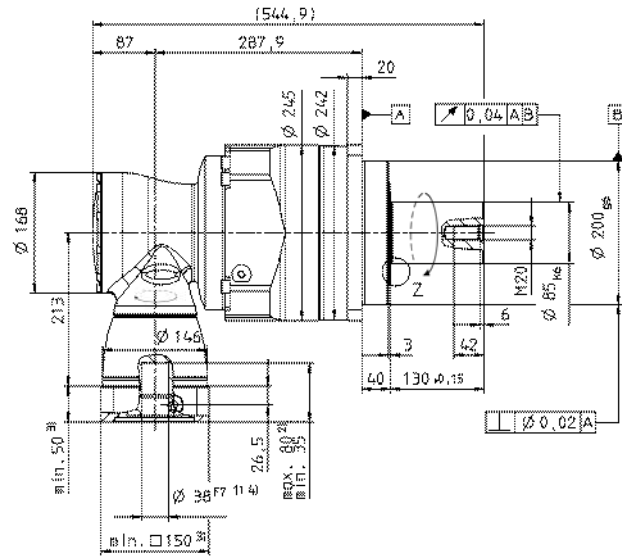
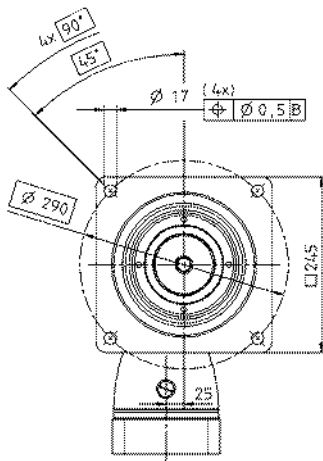
^{e)} Refers to center of the output shaft or flange

All technical data for front output side applies.

Technical data for rearward output versions, see page 422.

Please contact us for information on the best configuration for S1 conditions of use (continuous operation).

3-stage:

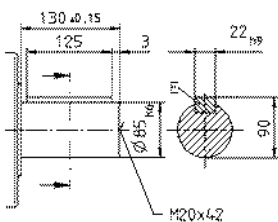


Right-angle gearheads
High End

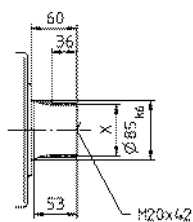
SPK⁺

Alternatives: Output shaft variants

Keywayed output shaft in mm
E = key as per DIN 6885, sheet 1, form A



Involute gearing DIN 5480 in mm
X = W 80 x 2 x 30 x 38 x 6m, DIN 5480



See technical data sheet for available clamping hub diameters (mass moment of inertia). Dimensions available on request.

Non-tolerated dimensions ± 1 mm

- 1) Check motor shaft fit.
- 2) Min./Max. permissible motor shaft length. Longer motor shafts are adaptable, please contact us.
- 3) The dimensions depend on the motor.
- 4) Smaller motor shaft diameter is compensated by a bushing with a minimum thickness of 1 mm.



CAD data is available under
<http://www.wittenstein-alpha.de/en/info-and-cad-finder.html>



Motor mounting according to operating manual

SPK+ 240 MF 4-stage i=144-1000

					4-stage												
Ratio ^{a)}	<i>i</i>		144	192	256	300	375	420	500	560	600	700	800	875	1000		
Max. acceleration torque (max. 1000 cycles per hour)	<i>T</i> _{2B}	Nm	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500		
		in.lb	39825	39825	39825	39825	39825	39825	39825	39825	39825	39825	39825	39825	39825	39825	
Nominal output torque (with <i>n</i>_{in})	<i>T</i> _{2N}	Nm	2500	2500	2500	2500	2500	2500	2500	2500	2500	2500	2500	2500	2500		
		in.lb	22125	22125	22125	22125	22125	22125	22125	22125	22125	22125	22125	22125	22125	22125	
Emergency stop torque (permitted 1000 times during the service life of the gearhead)	<i>T</i> _{2Not}	Nm	8000	8000	8000	8500	8500	8500	8500	8500	8500	8500	8500	8500	8500		
		in.lb	70800	70800	70800	75225	75225	75225	75225	75225	75225	75225	75225	75225	75225	75225	
Nominal input speed (with <i>T</i>_{2N} and 20°C ambient temperature) ^{b), c)}	<i>n</i> _{1N}	rpm	2700	2900	2900	2900	2900	2900	2900	2900	2900	2900	2900	2900	3200		
Max. continuous speed (with 20 % <i>T</i>_{2N} and 20°C ambient temperature)	<i>n</i> _{1Ncym}	rpm	3800	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4200		
Max. input speed	<i>n</i> _{1Max}	rpm	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500		
Mean no load running torque (with <i>n</i>₁ = 3000 rpm and 20°C gearhead temperature) ^{d)}	<i>T</i> ₀₁₂	Nm	3.2	2.3	1.6	1.3	0.7	0.9	0.9	0.8	0.7	0.7	0.6	0.6	0.5		
		in.lb	28.3	20.4	14.2	11.5	6.2	8.0	8.0	7.1	6.2	6.2	5.3	5.3	4.4		
Max. torsional backlash	<i>j</i> _t	arcmin	Standard ≤5,5 / Reduced ≤3,5														
Torsional rigidity	<i>C</i> _{t21}	Nm/ arcmin	510	510	510	510	510	510	510	510	510	510	510	510	510		
		in.lb/ arcmin	4.514	4.514	4.514	4.514	4.514	4.514	4.514	4.514	4.514	4.514	4.514	4.514	4.514		
Max. axial force ^{e)}	<i>F</i> _{2AMax}	N	33000														
		lb _f	7425														
Max. radial force ^{e)}	<i>F</i> _{2RMax}	N	30000														
		lb _f	6750														
Max. tilting moment	<i>M</i> _{2KMax}	Nm	5000														
		in.lb	44250														
Efficiency at full load	η	%	90														
Service life (For calculation, see the Chapter "Information")	<i>L</i> _h	h	> 20000														
Weight incl. standard adapter plate	<i>m</i>	kg	96														
		lb _m	212														
Operating noise (with <i>n</i>₁ = 3000 rpm no load)	<i>L</i> _{PA}	dB(A)	≤ 71														
Max. permitted housing temperature		°C	+90														
		F	194														
Ambient temperature		°C	0 to +40														
		F	32 to 104														
Lubrication			Lubricated for life														
Paint			Blue RAL 5002														
Direction of rotation			Motor and gearhead opposite directions														
Protection class			IP 65														
Moment of inertia (relates to the drive) Clamping hub diameter [mm]	G	24	<i>J</i> _f	kgcm ²	5.96	4.30	3.90	3.32	3.31	2.80	3.18	2.80	2.49	2.73	2.49	2.73	2.46
				10 ⁻³ in.lb.s ²	5.28	3.81	3.45	2.94	2.93	2.48	2.82	2.47	2.21	2.42	2.20	2.42	2.18
	K	38	<i>J</i> _f	kgcm ²	12.87	11.19	10.81	10.23	10.22	9.72	10.09	9.71	9.40	9.65	9.40	9.65	9.37
				10 ⁻³ in.lb.s ²	11.39	9.91	9.57	9.05	9.05	8.60	8.93	8.59	8.32	8.54	8.32	8.54	8.29

^{a)} Other ratios available on request

^{b)} Higher speeds are possible if the nominal torque is reduced

^{c)} For higher ambient temperatures, please reduce input speed

^{d)} Idling torques decrease during operation

^{e)} Refers to center of the output shaft or flange

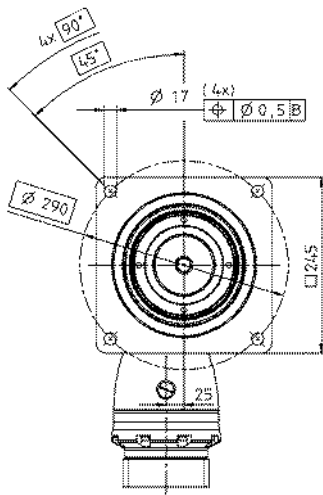
All technical data for front output side applies.

Technical data for rearward output versions, see page 422.

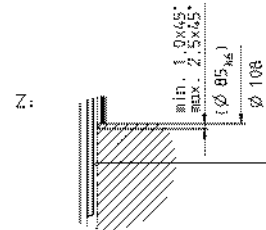
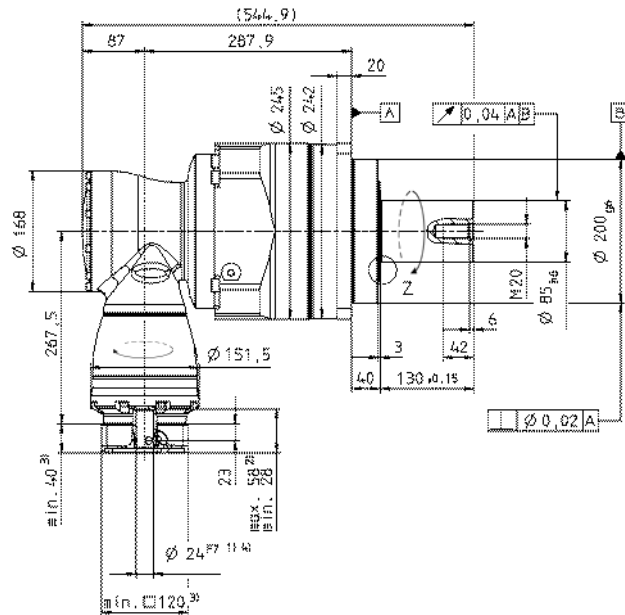
Please contact us for information on the best configuration for S1 conditions of use (continuous operation).

View A

4-stage:



← A

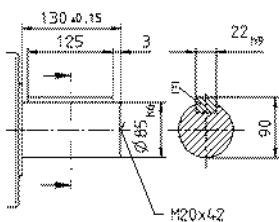


Right-angle gearheads
High End

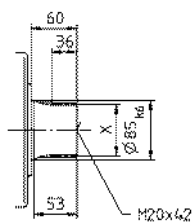
SPK+

Alternatives: Output shaft variants

Keywayed output shaft in mm
E = key as per DIN 6885, sheet 1, form A



Involute gearing DIN 5480 in mm
X = W 80 x 2 x 30 x 38 x 6m, DIN 5480



See technical data sheet for available clamping hub diameters (mass moment of inertia). Dimensions available on request.

Non-tolerated dimensions ± 1 mm

- 1) Check motor shaft fit.
- 2) Min./Max. permissible motor shaft length. Longer motor shafts are adaptable, please contact us.
- 3) The dimensions depend on the motor.
- 4) Smaller motor shaft diameter is compensated by a bushing with a minimum thickness of 1 mm.



CAD data is available under
<http://www.wittenstein-alpha.de/en/info-and-cad-finder.html>



Motor mounting according to operating manual

SPK+ 240 MF 4-stage i=1225-10000

			4-stage								
Ratio ^{a)}	<i>i</i>		1225	1400	1750	2000	2800	3500	5000	7000	10000
Max. acceleration torque (max. 1000 cycles per hour)	<i>T</i> _{2B}	Nm	4500	4500	4500	4200	4300	4500	4300	4300	3400
		in.lb	39825	39825	39825	37170	38055	39825	38055	38055	30090
Nominal output torque (with <i>n</i> _{in})	<i>T</i> _{2N}	Nm	2500	2500	2500	2500	2300	2500	2500	2300	1700
		in.lb	22125	22125	22125	22125	20355	22125	22125	20355	15045
Emergency stop torque (permitted 1000 times during the service life of the gearhead)	<i>T</i> _{2Not}	Nm	8500	8500	8500	8000	8500	8500	8500	8500	6800
		in.lb	75225	75225	75225	70800	75225	75225	75225	75225	60180
Nominal input speed (with <i>T</i> _{2N} and 20°C ambient temperature) ^{b), c)}	<i>n</i> _{1N}	rpm	2900	2900	3200	3900	3900	3900	3900	3900	3900
Max. continuous speed (with 20 % <i>T</i> _{2N} and 20°C ambient temperature)	<i>n</i> _{1Ncym}	rpm	4000	4000	4200	4200	4200	4200	4200	4200	4200
Max. input speed	<i>n</i> _{1Max}	rpm	4500	4500	4500	4500	4500	4500	4500	4500	4500
Mean no load running torque (with <i>n</i> ₁ =3000 rpm and 20°C gearhead temperature) ^{d)}	<i>T</i> ₀₁₂	Nm	0.6	0.6	0.4	0.4	0.4	0.4	0.4	0.3	0.3
		in.lb	5.3	5.3	3.5	3.5	3.5	3.5	3.5	2.7	2.7
Max. torsional backlash	<i>j</i> _t	arcmin	Standard ≤5,5 / Reduced ≤3,5								
Torsional rigidity	<i>C</i> _{t21}	Nm/ arcmin	510	510	510	510	510	510	510	510	510
		in.lb/ arcmin	4.514	4.514	4.514	4.514	4.514	4.514	4.514	4.514	4.514
Max. axial force ^{e)}	<i>F</i> _{2AMax}	N	33000								
		lb _f	7425								
Max. radial force ^{e)}	<i>F</i> _{2RMax}	N	30000								
		lb _f	6750								
Max. tilting moment	<i>M</i> _{2KMax}	Nm	5000								
		in.lb	44250								
Efficiency at full load	<i>η</i>	%	90								
Service life (For calculation, see the Chapter "Information")	<i>L</i> _h	h	> 20000								
Weight incl. standard adapter plate	<i>m</i>	kg	96								
		lb _m	212								
Operating noise (with <i>n</i> ₁ = 3000 rpm no load)	<i>L</i> _{PA}	dB(A)	≤ 71								
Max. permitted housing temperature		°C	+90								
		F	194								
Ambient temperature		°C	0 to +40								
		F	32 to 104								
Lubrication			Lubricated for life								
Paint			Blue RAL 5002								
Direction of rotation			Motor and gearhead opposite directions								
Protection class			IP 65								
Moment of inertia (relates to the drive) Clamping hub diameter [mm]	G	24	<i>J</i> _I	kgcm ²	2.73	2.49	2.46	2.42	2.42	2.42	2.42
				10 ⁻³ in.lb.s ²	2.42	2.20	2.17	2.14	2.14	2.14	2.14
	K	38	<i>J</i> _I	kgcm ²	9.64	9.40	9.37	9.33	9.33	9.33	9.33
				10 ⁻³ in.lb.s ²	8.53	8.32	8.29	8.26	8.26	8.26	8.26

^{a)} Other ratios available on request

^{b)} Higher speeds are possible if the nominal torque is reduced

^{c)} For higher ambient temperatures, please reduce input speed

^{d)} Idling torques decrease during operation

^{e)} Refers to center of the output shaft or flange

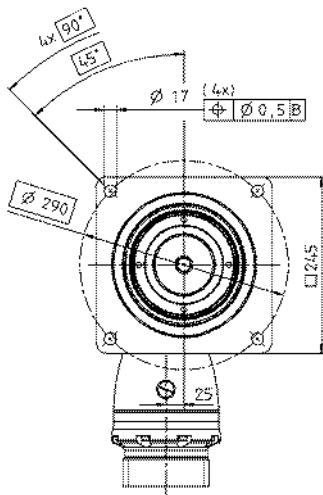
All technical data for front output side applies.

Technical data for rearward output versions, see page 422.

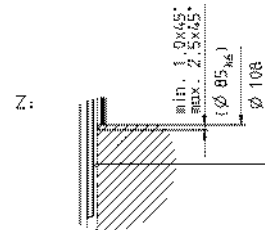
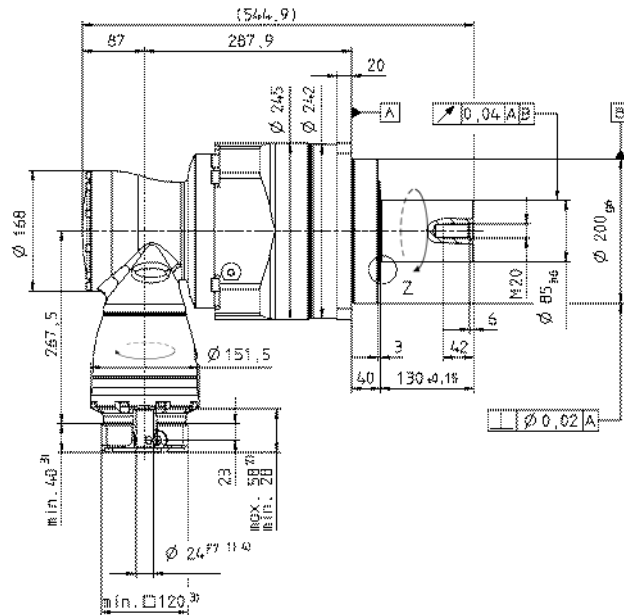
Please contact us for information on the best configuration for S1 conditions of use (continuous operation).

View A

4-stage:



← A

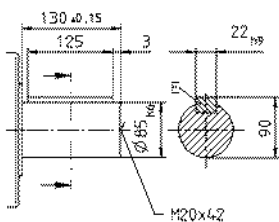


Right-angle gearheads
High End

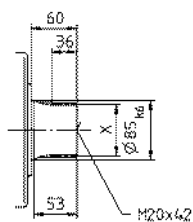
SPK+

Alternatives: Output shaft variants

Keywayed output shaft in mm
E = key as per DIN 6885, sheet 1, form A



Involute gearing DIN 5480 in mm
X = W 80 x 2 x 30 x 38 x 6m, DIN 5480



See technical data sheet for available clamping hub diameters (mass moment of inertia). Dimensions available on request.

Non-tolerated dimensions ±1 mm

- 1) Check motor shaft fit.
- 2) Min./Max. permissible motor shaft length. Longer motor shafts are adaptable, please contact us.
- 3) The dimensions depend on the motor.
- 4) Smaller motor shaft diameter is compensated by a bushing with a minimum thickness of 1 mm.



CAD data is available under
<http://www.wittenstein-alpha.de/en/info-and-cad-finder.html>



Motor mounting according to operating manual

HG⁺ – Precise hollow shaft solution



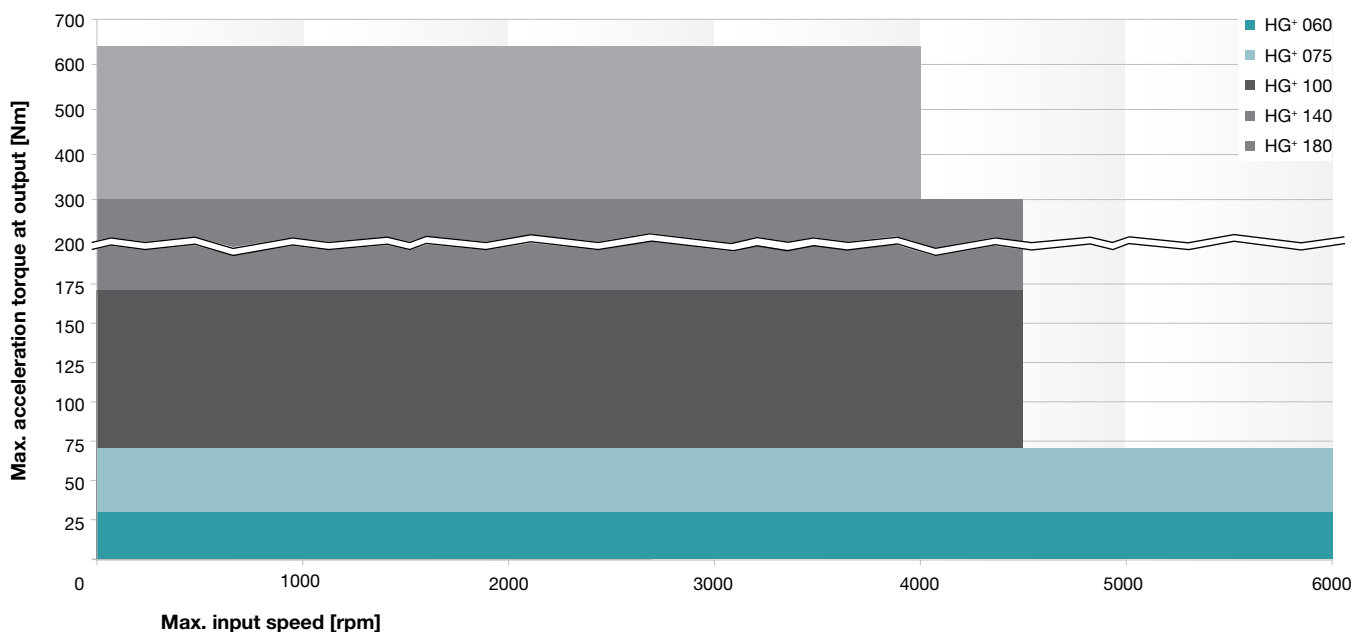
The successor to our versatile hypoid gearhead with hollow shaft on one/both sides.

With the HG⁺, low torsional backlash and high torsional rigidity assure maximum positioning accuracy of your drives and precision of your machines – even during highly dynamic operation.

Quick size selection

HG⁺ MF (example for $i = 5$)

For applications in cyclic operation ($DC \leq 60\%$) or continuous operation ($DC \geq 60\%$)



Versions and Applications

Features	HG ⁺ MF version page 242
Power density	••
Positioning accuracy (e.g. clamped drives)	••
Highly dynamic applications	••

Product features

Ratios ^{a)}		3 – 100
Torsional backlash [arcmin] ^{a)}	Standard	≤ 4
	Reduced	–
Output type		
Smooth output shaft, rear side		•
Keywayed output shaft, rear side		•
Hollow shaft interface Connected via shrink disc		•
Hollow shaft interface, rear side Connected via shrink disc		•
Closed cover, rear side		•
Input type		
Motor mounted version		•
Type		
ATEX ^{a)}		•
Food-grade lubrication ^{a) b)}		•
Corrosion resistant ^{a) b)}		•
Accessories		
Coupling		•
Shrink disc		•
torqXis sensor flange		•
Intermediate plate for cooling connection		•

^{a)} Power reduction: technical data available upon request

^{b)} Please contact WITTENSTEIN alpha

^{c)} In relation to reference sizes

Right-angle gearheads
High End



HG+ 060 MF 1/2-stage

					1-stage					2-stage								
Ratio ^{a)}	<i>i</i>		3	4	5	7	10	12	16	20	25	28	35	40	50	70	100	
Max. acceleration torque (max. 1000 cycles per hour)	<i>T</i> _{2B}	Nm	30	30	30	25	20	30	30	30	30	30	30	30	30	25	20	
		in.lb	266	266	266	221	177	266	266	266	266	266	266	266	266	266	221	177
Nominal output torque (with <i>n</i> _{2N})	<i>T</i> _{2N}	Nm	22	22	22	20	15	22	22	22	22	22	22	22	22	20	15	
		in.lb	195	195	195	177	133	195	195	195	195	195	195	195	195	195	177	133
Emergency stop torque (permitted 1000 times during the service life of the gearhead)	<i>T</i> _{2Not}	Nm	40	50	50	45	40	50	50	50	50	50	50	50	50	45	40	
		in.lb	354	443	443	398	354	443	443	443	443	443	443	443	443	443	398	354
Nominal input speed (with <i>T</i> _{2N} and 20°C ambient temperature) ^{b), c)}	<i>n</i> _{1N}	rpm	2500	2700	3000	3000	3000	4400	4400	4400	4400	4400	4400	4400	4800	5500	5500	
Max. continuous speed (with 20% <i>T</i> _{2N} and 20°C ambient temperature)	<i>n</i> _{1Ncym}	rpm	3000	3500	4000	3500	3500	5000	5000	5000	5000	5000	5000	5000	5000	5500	5500	
Max. input speed	<i>n</i> _{1Max}	rpm	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	
Mean no load running torque (with <i>n</i> ₁ = 3000 rpm and 20°C gearhead temperature) ^{d)}	<i>T</i> ₀₁₂	Nm	1.3	1.2	1.1	1.3	1.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	
		in.lb	11.5	10.6	9.7	11.5	10.6	1.8	1.8	1.8	1.8	1.8	1.8	1.8	0.9	0.9	0.9	0.9
Max. torsional backlash	<i>j</i> _t	arcmin	≤ 5															
Torsional rigidity	<i>C</i> _{t21}	Nm/ arcmin	2.2	2.3	2.4	2.2	1.9	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.2	1.9
		in.lb/ arcmin	19	20	21	19	17	20	20	20	20	20	20	20	20	21	19	17
Max. axial force ^{e)}	<i>F</i> _{2AMax}	N	2400															
		lb _f	540															
Max. radial force ^{e)}	<i>F</i> _{2RMax}	N	2700															
		lb _f	608															
Max. tilting moment	<i>M</i> _{2KMax}	Nm	251															
		in.lb	2220															
Efficiency at full load	η	%	96					94										
Service life (For calculation, see the Chapter "Information")	<i>L</i> _h	h	> 20000															
Weight incl. standard adapter plate	<i>m</i>	kg	2.9					3.2										
		lb _m	6.4					7.1										
Operating noise (with <i>n</i> ₁ = 3000 rpm no load)	<i>L</i> _{PA}	dB(A)	≤ 64															
Max. permitted housing temperature	°C		+90															
	F		194															
Ambient temperature	°C		0 to +40															
	F		32 to 104															
Lubrication			Lubricated for life															
Paint			Blue RAL 5002															
Direction of rotation			Motor and gearhead opposite directions															
Protection class			IP 65															
Moment of inertia (relates to the drive) Clamping hub diameter [mm]	B	11	<i>J</i> ₁	kgcm ²	–	–	–	–	–	0.09	0.09	0.07	0.07	0.06	0.06	0.06	0.06	0.06
				10 ⁻³ in.lb.s ²	–	–	–	–	–	0.08	0.08	0.07	0.06	0.06	0.06	0.05	0.05	0.05
	C	14	<i>J</i> ₁	kgcm ²	0.52	0.44	0.40	0.36	0.34	0.20	0.20	0.19	0.19	0.18	0.18	0.17	0.17	0.17
				10 ⁻³ in.lb.s ²	0.46	0.39	0.35	0.32	0.30	0.18	0.18	0.17	0.16	0.16	0.16	0.15	0.15	0.15
	E	19	<i>J</i> ₁	kgcm ²	0.87	0.79	0.75	0.71	0.70	–	–	–	–	–	–	–	–	–
				10 ⁻³ in.lb.s ²	0.77	0.70	0.66	0.63	0.62	–	–	–	–	–	–	–	–	–

Please contact us for information on the best configuration for S1 conditions of use (continuous operation).

^{a)} Other ratios available on request

^{b)} Higher speeds are possible if the nominal torque is reduced

^{c)} For higher ambient temperatures, please reduce input speed

^{d)} Idling torques decrease during operation

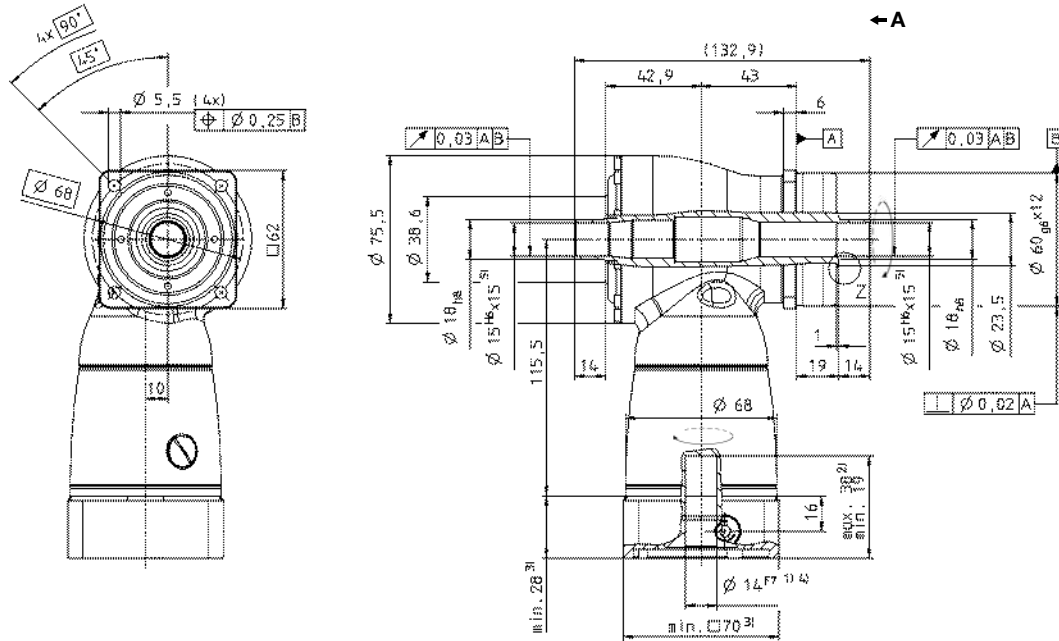
^{e)} Refers to center of the output shaft or flange

All technical data for front output side applies.

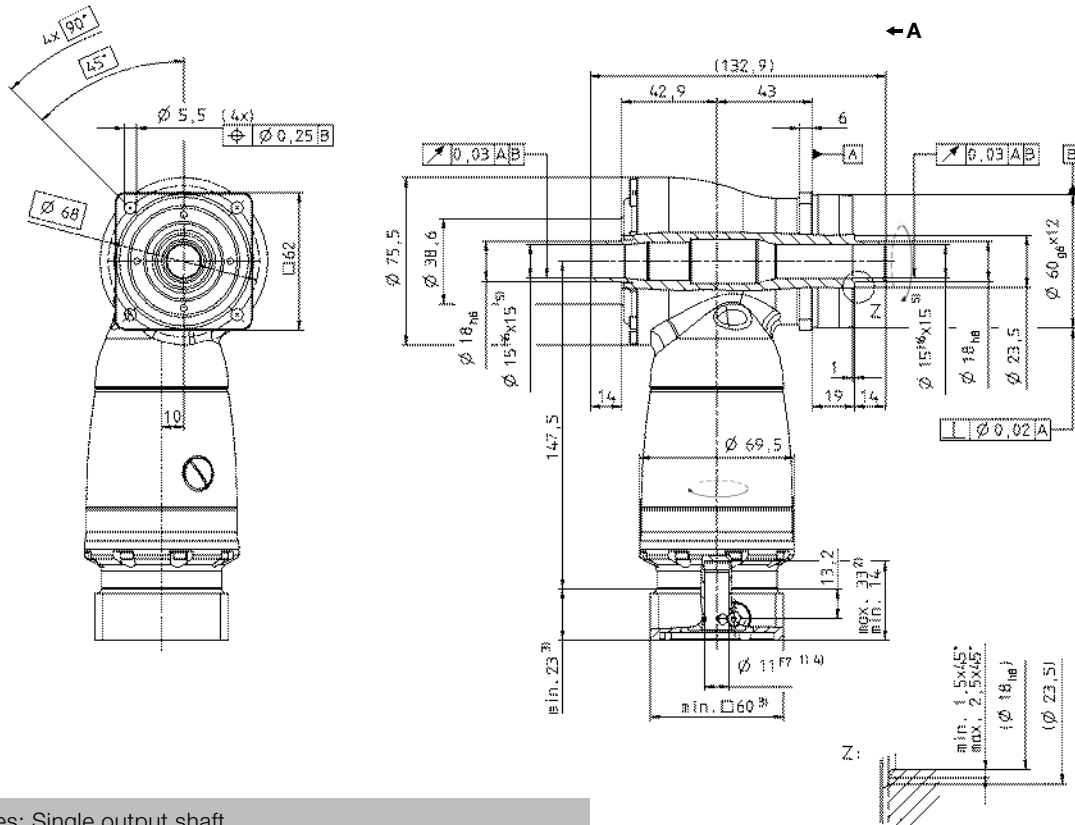
Technical data for rearward output versions, see page 422.

View A

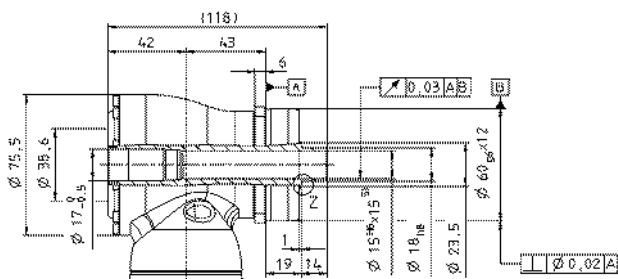
1-stage:



2-stage:



Alternatives: Single output shaft



See technical data sheet for available clamping hub diameters (mass moment of inertia). Dimensions available on request.

Non-tolerated dimensions ± 1 mm

- 1) Check motor shaft fit.
- 2) Min./Max. permissible motor shaft length. Longer motor shafts are adaptable, please contact us.
- 3) The dimensions depend on the motor.
- 4) Smaller motor shaft diameter is compensated by a bushing with a minimum thickness of 1 mm.
- 5) Tolerance h6 for mounted shaft.

CAD data is available under www.wittenstein-alpha.com

Motor mounting according to operating manual

Right-angle gearheads
High End

HG⁺

HG+ 075 MF 1/2-stage

				1-stage					2-stage										
Ratio ^{a)}		<i>i</i>		3	4	5	7	10	12	16	20	25	28	35	40	50	70	100	
Max. acceleration torque (max. 1000 cycles per hour)		<i>T</i> _{2B}	Nm	70	70	70	60	50	70	70	70	70	70	70	70	70	60	50	
			in.lb	620	620	620	531	443	620	620	620	620	620	620	620	620	620	531	443
Nominal output torque (with <i>n</i> _{1N})		<i>T</i> _{2N}	Nm	50	50	50	45	40	50	50	50	50	50	50	50	50	45	40	
			in.lb	443	443	443	398	354	443	443	443	443	443	443	443	443	443	398	354
Emergency stop torque (permitted 1000 times during the service life of the gearhead)		<i>T</i> _{2Not}	Nm	95	115	115	110	100	115	115	115	115	115	115	115	115	110	100	
			in.lb	841	1018	1018	974	885	1018	1018	1018	1018	1018	1018	1018	1018	1018	974	885
Nominal input speed (with <i>T</i> _{2N} and 20°C ambient temperature) ^{b), c)}		<i>n</i> _{1N}	rpm	2300	2500	2800	2800	2800	3500	3500	3500	3500	3500	3500	3500	3800	4500	4500	
Max. continuous speed (with 207% <i>T</i> _{2N} and 20°C ambient temperature)		<i>n</i> _{1Ncont}	rpm	3000	3500	4000	3500	3500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	
Max. input speed		<i>n</i> _{1Max}	rpm	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	
Mean no load running torque (with <i>n</i> ₁ = 3000 rpm and 20°C gearhead temperature) ^{d)}		<i>T</i> ₀₁₂	Nm	2.2	1.9	1.7	2.2	2.0	0.3	0.3	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	
			in.lb	19	17	15	19	18	2.7	2.7	1.8	1.8	1.8	1.8	1.8	0.9	0.9	0.9	0.9
Max. torsional backlash		<i>j</i> _t	arcmin	≤ 4															
Torsional rigidity		<i>C</i> _{t21}	Nm/ arcmin	5.3	5.9	6.7	6.6	6.5	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9	6.7	6.6	6.5
			in.lb/ arcmin	47	52	60	58	57	52	52	52	52	52	52	52	52	59	58	58
Max. axial force ^{e)}		<i>F</i> _{2AMax}	N	3400															
			lb _f	765															
Max. radial force ^{e)}		<i>F</i> _{2RMax}	N	4000															
			lb _f	900															
Max. tilting moment		<i>M</i> _{2KMax}	Nm	437															
			in.lb	3867															
Efficiency at full load		η	%	96					94										
Service life (For calculation, see the Chapter "Information")		<i>L</i> _h	h	> 20000															
Weight incl. standard adapter plate		<i>m</i>	kg	4.8					5.1										
			lb _m	10.6					11.3										
Operating noise (with <i>n</i> ₁ = 3000 rpm no load)		<i>L</i> _{PA}	dB(A)	≤ 66															
Max. permitted housing temperature			°C	+90															
			F	194															
Ambient temperature			°C	0 to +40															
			F	32 to 104															
Lubrication				Lubricated for life															
Paint				Blue RAL 5002															
Direction of rotation				Motor and gearhead opposite directions															
Protection class				IP 65															
Moment of inertia (relates to the drive) Clamping hub diameter [mm]	C	14	<i>J</i> ₁	kgcm ²	–	–	–	–	–	0.28	0.27	0.23	0.23	0.20	0.20	0.18	0.18	0.18	0.18
				10 ⁻³ in.lb.s ²						0.25	0.24	0.21	0.20	0.18	0.18	0.16	0.16	0.16	0.16
	E	19	<i>J</i> ₁	kgcm ²	1.46	1.19	1.06	0.95	0.90	0.73	0.71	0.68	0.67	0.63	0.62	0.63	0.63	0.63	0.63
				10 ⁻³ in.lb.s ²	1.29	1.05	0.94	0.84	0.79	0.64	0.63	0.60	0.59	0.55	0.55	0.56	0.55	0.55	0.55
	H	28	<i>J</i> ₁	kgcm ²	2.86	2.60	2.47	2.36	2.31	–	–	–	–	–	–	–	–	–	–
				10 ⁻³ in.lb.s ²	2.53	2.30	2.19	2.09	2.04	–	–	–	–	–	–	–	–	–	–

Please contact us for information on the best configuration for S1 conditions of use (continuous operation).

^{a)} Other ratios available on request

^{b)} Higher speeds are possible if the nominal torque is reduced

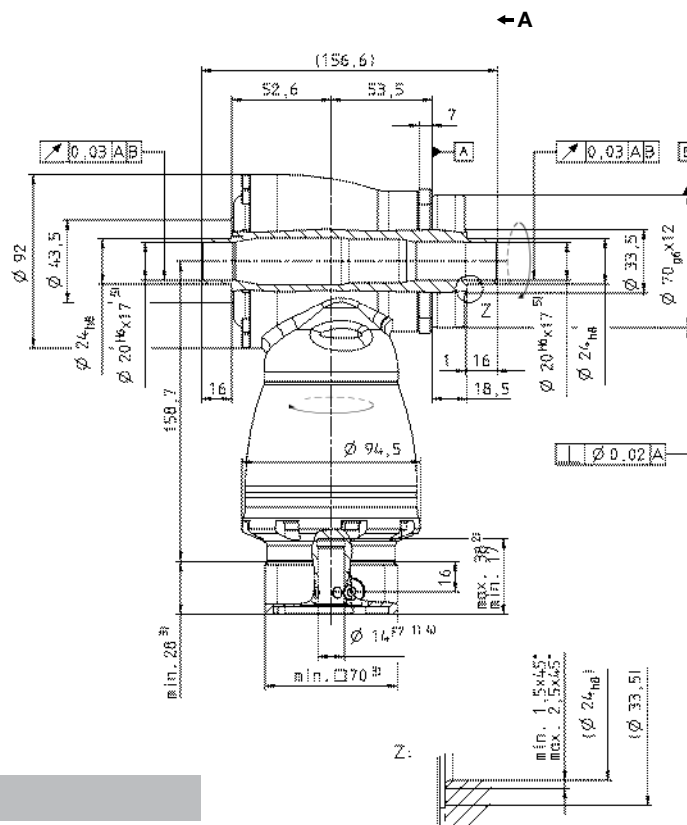
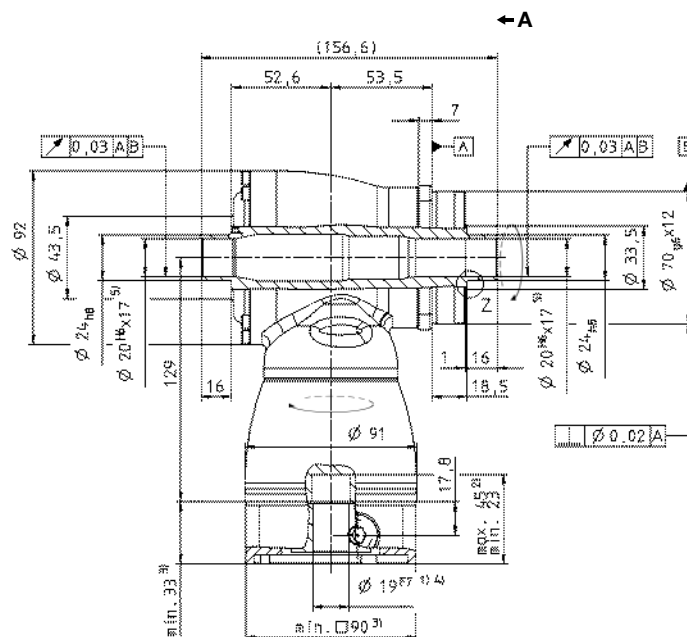
^{c)} For higher ambient temperatures, please reduce input speed

^{d)} Idling torques decrease during operation

^{e)} Refers to center of the output shaft or flange

All technical data for front output side applies.

Technical data for rearward output versions, see page 422.



Technical drawing of a mechanical part, likely a valve or actuator, showing a cross-section and a side view. The drawing includes dimensions such as 52.7, 53.5, 140.71, 92, 43.5, 25.5, 16, 18.5, 20, 24, 33.5, 70, and 70x12. It also features surface texture symbols like 0.03, 0.02, and 0.02 A B, and a section line A-A.

- 1) Check motor shaft fit.
- 2) Min./Max. permissible motor shaft length. Longer motor shafts are adaptable, please contact us.
- 3) The dimensions depend on the motor.
- 4) Smaller motor shaft diameter is compensated by a bushing with a minimum thickness of 1 mm.
- 5) Tolerance h6 for mounted shaft.

 Warning

245

HG⁺ 100 MF 1/2-stage

				1-stage					2-stage										
Ratio ^{a)}	<i>i</i>			3	4	5	7	10	12	16	20	25	28	35	40	50	70	100	
Max. acceleration torque (max. 1000 cycles per hour)	<i>T</i> _{2B}	Nm		170	170	170	145	125	170	170	170	170	170	170	170	170	145	125	
		in.lb		1505	1505	1505	1283	1106	1505	1505	1505	1505	1505	1505	1505	1505	1283	1106	
Nominal output torque (with <i>n</i>_{1N})	<i>T</i> _{2N}	Nm		100	100	100	90	80	100	100	100	100	100	100	100	100	90	80	
		in.lb		885	885	885	797	708	885	885	885	885	885	885	885	885	797	708	
Emergency stop torque (permitted 1000 times during the service life of the gearhead)	<i>T</i> _{2Not}	Nm		220	260	260	255	250	260	260	260	260	260	260	260	260	255	250	
		in.lb		1947	2301	2301	2257	2213	2301	2301	2301	2301	2301	2301	2301	2301	2257	2213	
Nominal input speed (with <i>T</i>_{2N} and 20°C ambient temperature) ^{b), c)}	<i>n</i> _{1N}	rpm		2200	2400	2700	2500	2500	3100	3100	3100	3100	3100	3100	3100	3500	4200	4200	
Max. continuous speed (with 20% <i>T</i>_{2N} and 20°C ambient temperature)	<i>n</i> _{1Ncym}	rpm		3000	3400	3800	3400	3400	4000	4000	4000	4000	4000	4000	4000	4000	4200	4200	
Max. input speed	<i>n</i> _{1Max}	rpm		4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	
Mean no load running torque (with <i>n</i>₁ = 3000 rpm and 20°C gearhead temperature) ^{d)}	<i>T</i> ₀₁₂	Nm		4.2	3.3	2.5	3.9	3.1	0.7	0.7	0.6	0.4	0.4	0.3	0.2	0.2	0.2	0.2	
		in.lb		37	29	22	35	27	6.2	6.2	5.3	3.5	3.5	2.7	1.8	1.8	1.8	1.8	
Max. torsional backlash	<i>j</i> _t	arcmin		≤ 4															
Torsional rigidity	<i>C</i> _{t21}	Nm/ arcmin		10.7	12.1	14.0	14.2	14.4	12.1	12.1	12.1	12.1	12.1	12.1	12.1	14.0	14.2	14.4	
		in.lb/ arcmin		95	107	124	126	127	107	107	107	107	107	107	107	124	126	127	
Max. axial force ^{e)}	<i>F</i> _{2AMax}	N		5700															
		lb _f		1283															
Max. radial force ^{e)}	<i>F</i> _{2RMax}	N		6300															
		lb _f		1418															
Max. tilting moment	<i>M</i> _{2KMax}	Nm		833															
		in.lb		7370															
Efficiency at full load	η	%		96					94										
Service life (For calculation, see the Chapter "Information")	<i>L</i> _h	h		> 20000															
Weight incl. standard adapter plate	<i>m</i>	kg		9.3					9.5										
		lb _m		21					21										
Operating noise (with <i>n</i>₁ = 3000 rpm no load)	<i>L</i> _{PA}	dB(A)		≤ 66															
Max. permitted housing temperature	°C		+90																
	F		194																
Ambient temperature	°C		0 to +40																
	F		32 to 104																
Lubrication			Lubricated for life																
Paint			Blue RAL 5002																
Direction of rotation			Motor and gearhead opposite directions																
Protection class			IP 65																
Moment of inertia (relates to the drive) Clamping hub diameter [mm]	E	19	<i>J</i> ₁	kgcm ²	–	–	–	–	–	1.02	0.97	0.86	0.84	0.75	0.74	0.69	0.69	0.68	0.68
				10 ⁻³ in.lb.s ²	–	–	–	–	–	0.91	0.86	0.76	0.74	0.66	0.66	0.61	0.61	0.60	0.60
	G	24	<i>J</i> ₁	kgcm ²	–	–	–	–	–	2.59	2.54	2.42	2.40	2.31	2.30	2.26	2.25	2.25	2.25
				10 ⁻³ in.lb.s ²	–	–	–	–	–	2.29	2.25	2.14	2.13	2.05	2.04	2.00	1.99	1.99	1.99
	H	28	<i>J</i> ₁	kgcm ²	4.64	3.80	3.34	2.98	2.79	–	–	–	–	–	–	–	–	–	–
				10 ⁻³ in.lb.s ²	4.10	3.36	2.95	2.64	2.47	–	–	–	–	–	–	–	–	–	–
	K	38	<i>J</i> ₁	kgcm ²	11.8	11.0	10.6	10.2	10.0	–	–	–	–	–	–	–	–	–	–
				10 ⁻³ in.lb.s ²	10.4	9.73	9.34	9.04	8.88	–	–	–	–	–	–	–	–	–	–

Please contact us for information on the best configuration for S1 conditions of use (continuous operation).

^{a)} Other ratios available on request

^{b)} Higher speeds are possible if the nominal torque is reduced

^{c)} For higher ambient temperatures, please reduce input speed

^{d)} Idling torques decrease during operation

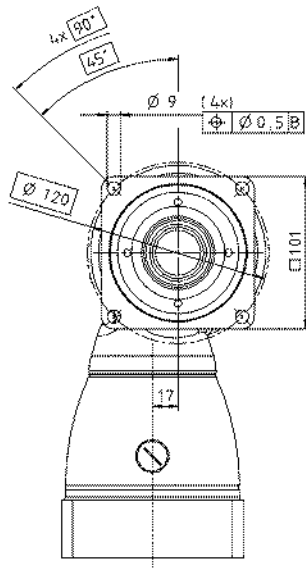
^{e)} Refers to center of the output shaft or flange

All technical data for front output side applies.

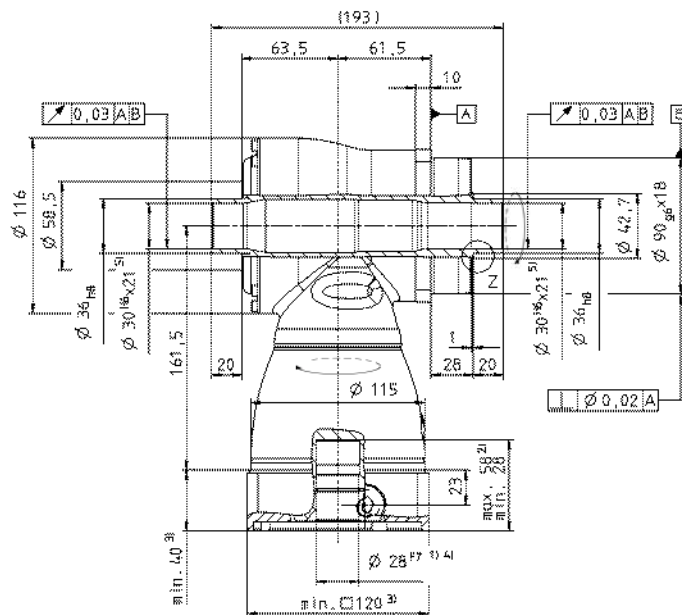
Technical data for rearward output versions, see page 422.

View A

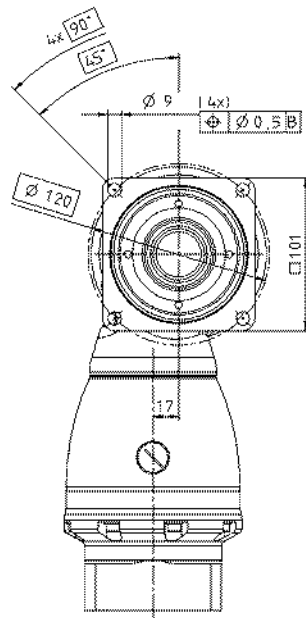
1-stage:



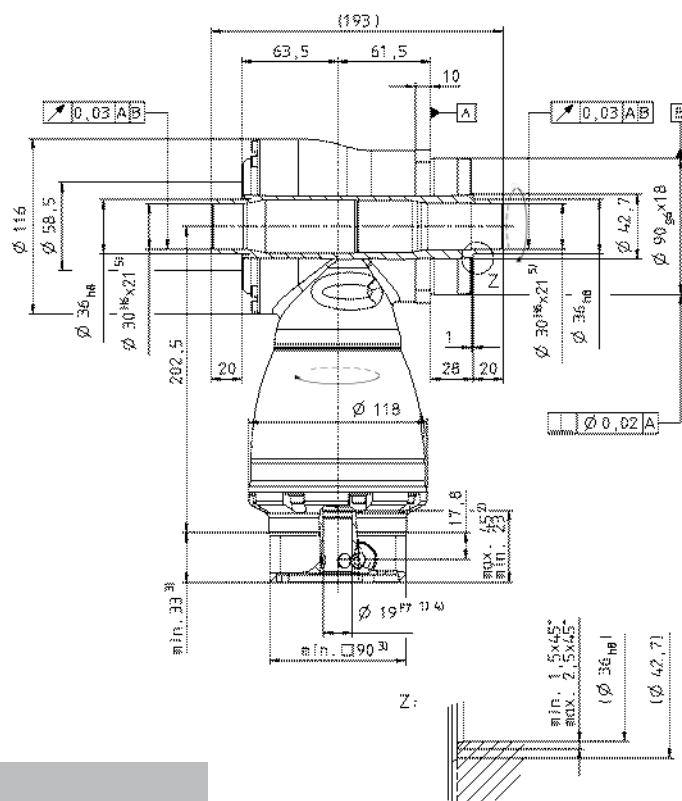
← A



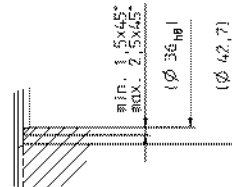
2-stage:



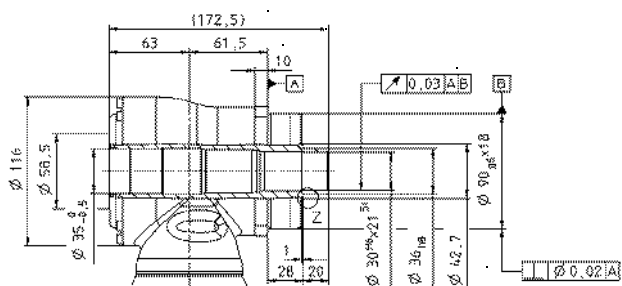
← A



Z:



Alternatives: Single output shaft



See technical data sheet for available clamping hub diameters (mass moment of inertia). Dimensions available on request.

Non-tolerated dimensions ± 1 mm

- 1) Check motor shaft fit.
- 2) Min./Max. permissible motor shaft length. Longer motor shafts are adaptable, please contact us.
- 3) The dimensions depend on the motor.
- 4) Smaller motor shaft diameter is compensated by a bushing with a minimum thickness of 1 mm.
- 5) Tolerance h6 for mounted shaft.

CAD data is available under www.wittenstein-alpha.com

Motor mounting according to operating manual

Right-angle gearheads
High End

HG+

HG⁺ 140 MF 1/2-stage

				1-stage					2-stage										
Ratio ^{a)}	<i>i</i>		3	4	5	7	10	12	16	20	25	28	35	40	50	70	100		
Max. acceleration torque (max. 1000 cycles per hour)	<i>T</i> _{2B}	Nm	300	300	300	250	210	300	300	300	300	300	300	300	300	250	210		
		in.lb	2655	2655	2655	2213	1859	2655	2655	2655	2655	2655	2655	2655	2655	2655	2213	1859	
Nominal output torque (with <i>n</i> _{1N})	<i>T</i> _{2N}	Nm	190	190	190	175	160	190	190	190	190	190	190	190	190	175	160		
		in.lb	1682	1682	1682	1549	1416	1682	1682	1682	1682	1682	1682	1682	1682	1682	1549	1416	
Emergency stop torque (permitted 1000 times during the service life of the gearhead)	<i>T</i> _{2Not}	Nm	400	500	500	450	400	500	500	500	500	500	500	500	500	450	400		
		in.lb	3540	4425	4425	3983	3540	4425	4425	4425	4425	4425	4425	4425	4425	4425	3983	3540	
Nominal input speed (with <i>T</i> _{2N} and 20°C ambient temperature) ^{b), c)}	<i>n</i> _{1N}	rpm	1900	2000	2200	2000	2000	2900	2900	2900	2900	2900	2900	2900	3200	3200	3900		
Max. continuous speed (with 20% <i>T</i> _{2N} and 20°C ambient temperature)	<i>n</i> _{1Ncym}	rpm	2500	2800	3100	2800	2800	4000	4000	4000	4000	4000	4000	4000	4200	4200	4200		
Max. input speed	<i>n</i> _{1Max}	rpm	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500		
Mean no load running torque (with <i>n</i> ₁ = 3000 rpm and 20°C gearhead temperature) ^{d)}	<i>T</i> ₀₁₂	Nm	7.7	5.7	5.0	8.3	6.1	1.5	1.0	0.8	0.6	0.6	0.4	0.4	0.3	0.3	0.3		
		in.lb	68	50	44	73	54	13.3	8.9	7.1	5.3	5.3	3.5	3.5	2.7	2.7	2.7		
Max. torsional backlash	<i>j</i> _t	arcmin	≤ 4																
Torsional rigidity	<i>C</i> _{t21}	Nm/ arcmin	32	36	41	39	38	36	36	36	36	36	36	36	41	39	38		
		in.lb/ arcmin	287	321	360	346	337	319	319	319	319	319	319	319	363	345	336		
Max. axial force ^{e)}	<i>F</i> _{2AMax}	N	9900																
		lb _f	2228																
Max. radial force ^{e)}	<i>F</i> _{2RMax}	N	9500																
		lb _f	2138																
Max. tilting moment	<i>M</i> _{2KMax}	Nm	1692																
		in.lb	14974																
Efficiency at full load	η	%	96					94											
Service life (For calculation, see the Chapter "Information")	<i>L</i> _h	h	> 20000																
Weight incl. standardadapter plate	<i>m</i>	kg	22.6					24											
		lb _m	50					53											
Operating noise (with <i>n</i> ₁ = 3000 rpm no load)	<i>L</i> _{PA}	dB(A)	≤ 68																
Max. permitted housing temperature		°C	+90																
		F	194																
Ambient temperature		°C	0 to +40																
		F	32 to 104																
Lubrication			Lubricated for life																
Paint			Blue RAL 5002																
Direction of rotation			Motor and gearhead opposite directions																
Protection class			IP 65																
Moment of inertia (relates to the drive) Clamping hub diameter [mm]	G	24	<i>J</i> ₁	kgcm ²	–	–	–	–	–	4.20	3.84	3.27	3.16	2.78	2.73	2.48	2.45	2.43	2.42
				10 ⁻³ in.lb.s ²						3.71	3.40	2.90	2.80	2.46	2.41	2.20	2.17	2.15	2.14
	K	38	<i>J</i> ₁	kgcm ²	25.0	19.1	16.3	14.1	12.8	11.1	10.7	10.2	10.1	9.69	9.64	9.39	9.37	9.34	9.33
				10 ⁻³ in.lb.s ²	22.1	16.9	14.4	12.4	11.3	9.83	9.51	9.01	8.92	8.58	8.53	8.31	8.29	8.27	8.26

Please contact us for information on the best configuration for S1 conditions of use (continuous operation).

^{a)} Other ratios available on request

^{b)} Higher speeds are possible if the nominal torque is reduced

^{c)} For higher ambient temperatures, please reduce input speed

^{d)} Idling torques decrease during operation

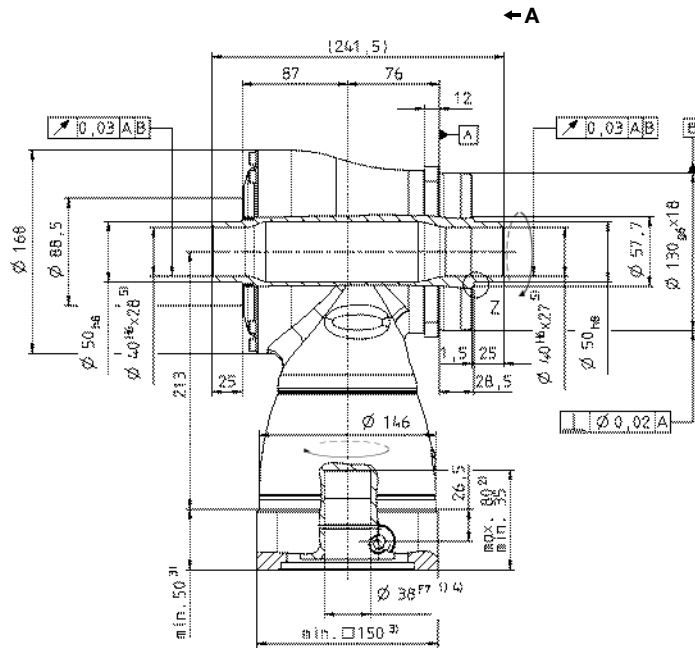
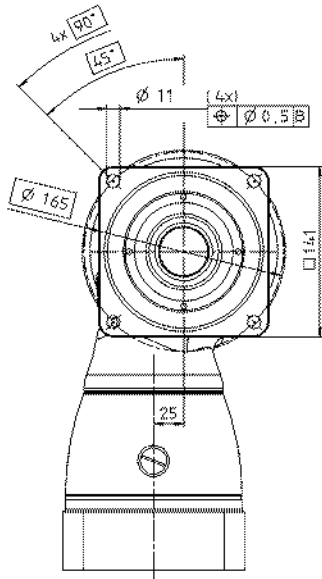
^{e)} Refers to center of the output shaft or flange

All technical data for front output side applies.

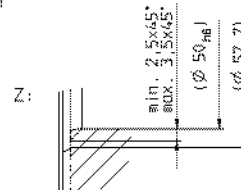
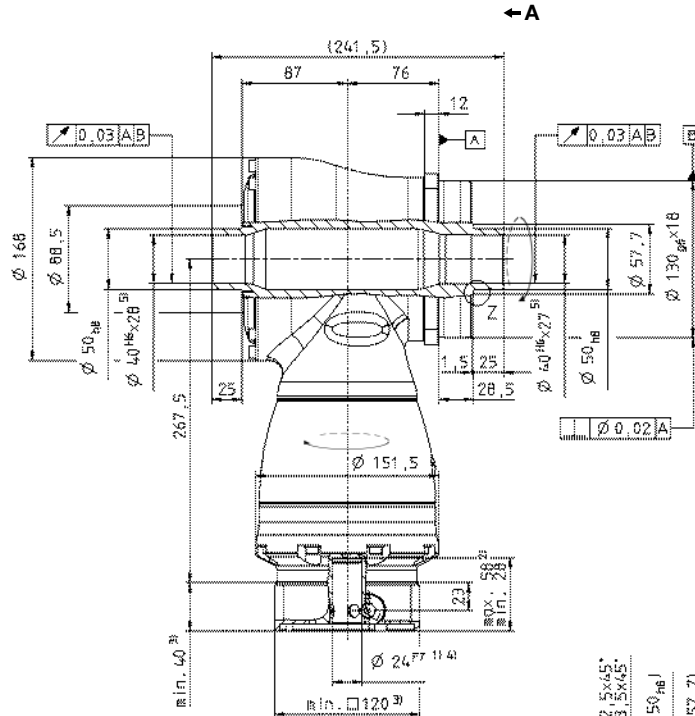
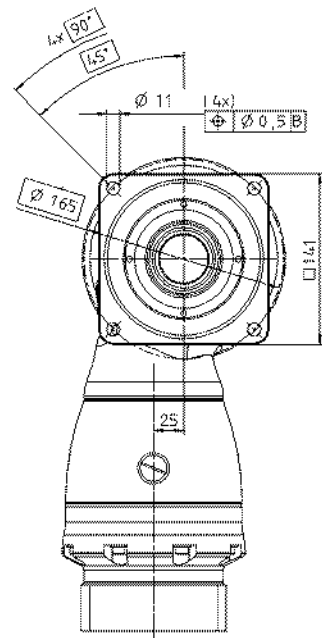
Technical data for rearward output versions, see page 422.

View A

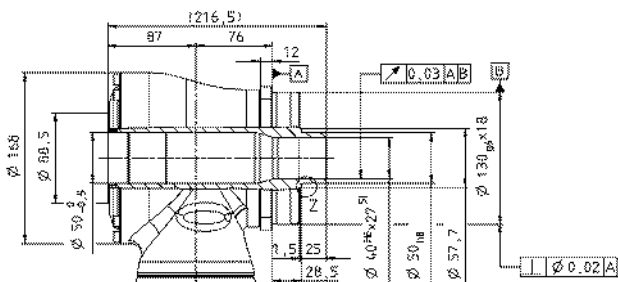
1-stage:



2-stage:



Alternatives: Single output shaft



See technical data sheet for available clamping hub diameters (mass moment of inertia). Dimensions available on request.

Non-tolerated dimensions ± 1 mm

- 1) Check motor shaft fit.
- 2) Min./Max. permissible motor shaft length. Longer motor shafts are adaptable, please contact us.
- 3) The dimensions depend on the motor.
- 4) Smaller motor shaft diameter is compensated by a bushing with a minimum thickness of 1 mm.
- 5) Tolerance h6 for mounted shaft.

CAD data is available under www.wittenstein-alpha.com

Motor mounting according to operating manual

Right-angle gearheads
High End

HG+

HG+ 180 MF 1/2-stage

				1-stage					2-stage										
Ratio ^{a)}	<i>i</i>		3	4	5	7	10	12	16	20	25	28	35	40	50	70	100		
Max. acceleration torque (max. 1000 cycles per hour)	<i>T</i> _{2B}	Nm	640	640	640	550	470	640	640	640	640	640	640	640	640	550	470		
		in.lb	5664	5664	5664	4868	4160	5664	5664	5664	5664	5664	5664	5664	5664	5664	4868	4160	
Nominal output torque (with <i>n</i>_{1N})	<i>T</i> _{2N}	Nm	400	400	400	380	360	400	400	400	400	400	400	400	400	380	360		
		in.lb	3540	3540	3540	3363	3186	3540	3540	3540	3540	3540	3540	3540	3540	3540	3363	3186	
Emergency stop torque (permitted 1000 times during the service life of the gearhead)	<i>T</i> _{2Not}	Nm	900	1050	1050	970	900	1050	1050	1050	1050	1050	1050	1050	1050	970	900		
		in.lb	7965	9293	9293	8585	7965	9293	9293	9293	9293	9293	9293	9293	9293	9293	8585	7965	
Nominal input speed (with <i>T</i>_{2N} and 20°C ambient temperature) ^{b), c)}	<i>n</i> _{1N}	rpm	1600	1800	2000	1800	1800	2700	2700	2700	2700	2700	2700	2700	2900	3200	3400		
Max. continuous speed (with 20% <i>T</i>_{2N} and 20°C ambient temperature)	<i>n</i> _{1Ncym}	rpm	2000	2400	2800	2500	2500	3500	3500	3500	3500	3500	3500	3500	3500	3800	3800		
Max. input speed	<i>n</i> _{1Max}	rpm	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000		
Mean no load running torque (with <i>n</i>₁ = 3000 rpm and 20°C gearhead temperature) ^{d)}	<i>T</i> ₀₁₂	Nm	16.0	13.0	11.0	16.5	14.0	3.3	2.5	2.0	1.8	1.4	1.3	1.0	1.0	1.0	1.0		
		in.lb	142	115	97	146	124	29.2	22.1	17.7	15.9	12.4	11.5	8.9	8.9	8.9	8.9		
Max. torsional backlash	<i>j</i> _t	arcmin	≤ 4																
Torsional rigidity	<i>C</i> _{t21}	Nm/ arcmin	71	80	91	89	88	80	80	80	80	80	80	80	91	89	88		
		in.lb/ arcmin	633	711	803	791	780	708	708	708	708	708	708	708	805	788	779		
Max. axial force ^{e)}	<i>F</i> _{2AMax}	N	14200																
		lb _f	3195																
Max. radial force ^{e)}	<i>F</i> _{2RMax}	N	14700																
		lb _f	3308																
Max. tilting moment	<i>M</i> _{2KMax}	Nm	3213																
		in.lb	28435																
Efficiency at full load	η	%	96					94											
Service life (For calculation, see the Chapter "Information")	<i>L</i> _h	h	> 20000																
Weight incl. standardadapter plate	<i>m</i>	kg	45.4					47											
		lb _m	100					104											
Operating noise (with <i>n</i>₁ = 3000 rpm no load)	<i>L</i> _{PA}	dB(A)	≤ 68																
Max. permitted housing temperature		°C	+90																
		F	194																
Ambient temperature		°C	0 to +40																
		F	32 to 104																
Lubrication			Lubricated for life																
Paint			Blue RAL 5002																
Direction of rotation			Motor and gearhead opposite directions																
Protection class			IP 65																
Moment of inertia (relates to the drive) Clamping hub diameter [mm]	K	38	<i>J</i> ₁	kgcm ²	–	–	–	–	–	15.3	13.9	12.3	12.0	10.9	10.7	10.1	10.0	9.95	9.91
				10 ⁻³ in.lb.s ²	–	–	–	–	–	13.5	12.3	10.9	10.6	9.65	9.48	8.96	8.88	8.80	8.77
	M	48	<i>J</i> ₁	kgcm ²	73.3	51.6	42.1	34.0	29.7	30.0	28.7	27.0	26.7	25.6	25.4	24.8	24.7	24.7	24.6
				10 ⁻³ in.lb.s ²	64.9	45.6	37.3	30.1	26.3	26.6	25.4	23.9	23.6	22.7	22.5	22.0	21.9	21.8	21.8

Please contact us for information on the best configuration for S1 conditions of use (continuous operation).

^{a)} Other ratios available on request

^{b)} Higher speeds are possible if the nominal torque is reduced

^{c)} For higher ambient temperatures, please reduce input speed

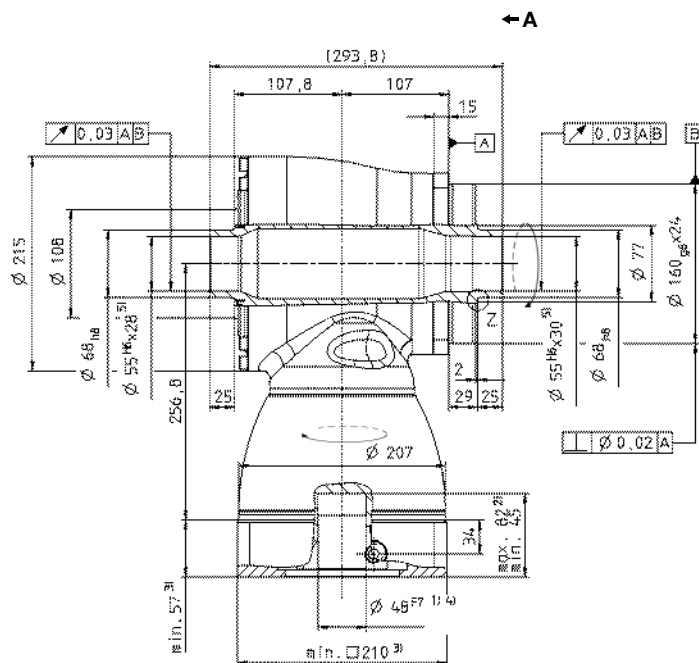
^{d)} Idling torques decrease during operation

^{e)} Refers to center of the output shaft or flange

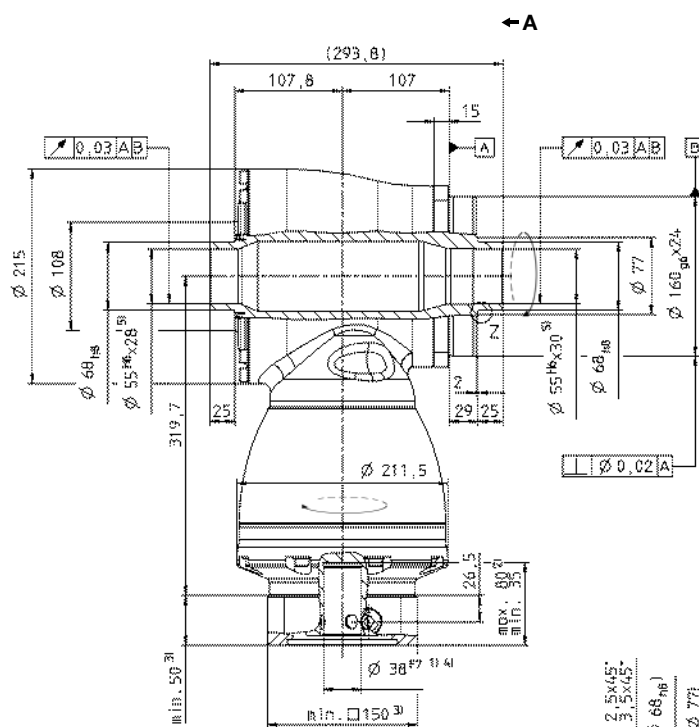
All technical data for front output side applies.

Technical data for rearward output versions, see page 422.

1-stage:



2-stage:



Technical drawing of a mechanical part, likely a shaft or axle, showing a cross-section with various dimensions and tolerances. The drawing includes a front view and a side view. Key dimensions include overall length 125.8, section lengths 107 and 107, a 15mm offset, and diameters 70.8, 75, 160, and 160. Surface finish symbols are present, such as 0.03 A and 0.02 A. A section line A-A is indicated.

- 1) Check motor shaft fit.
- 2) Min./Max. permissible motor shaft length. Longer motor shafts are adaptable, please contact us.
- 3) The dimensions depend on the motor.
- 4) Smaller motor shaft diameter is compensated by a bushing with a minimum thickness of 1 mm.
- 5) Tolerance h6 for mounted shaft.

Right-angle gearheads High End

 HG^+

SC⁺/SPC⁺/TPC⁺ – High performance with low ratios

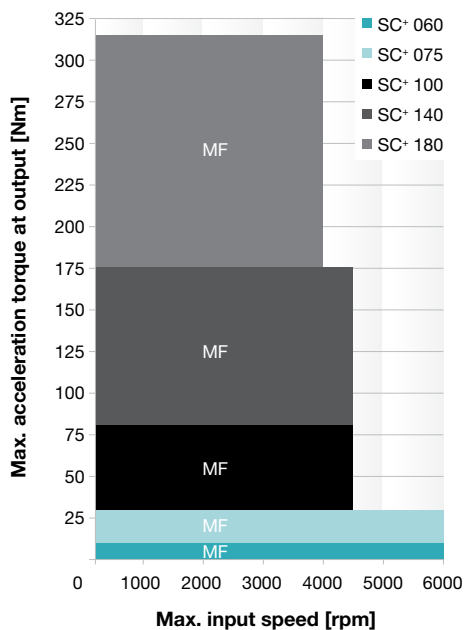


Low backlash right-angle gear-heads with output shaft or output flange. This gearhead series is used in dynamic applications with low transmission ratios and demanding requirements with regard to precision, torque, and efficiency.

Quick size selection

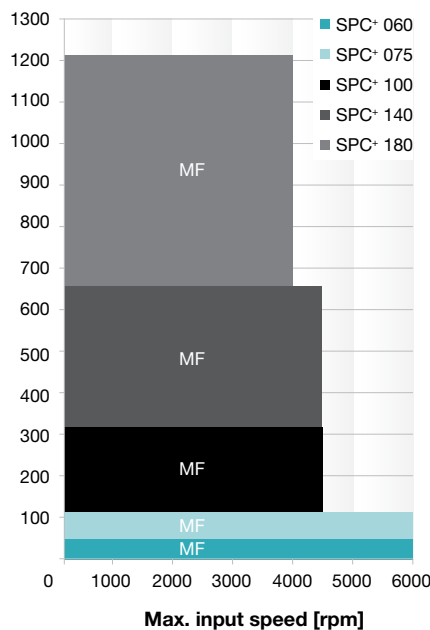
SC⁺ MF (example for $i = 1$)

For applications in cyclic operation (duty cycle $\leq 60\%$) or continuous operation (duty cycle $\geq 60\%$)



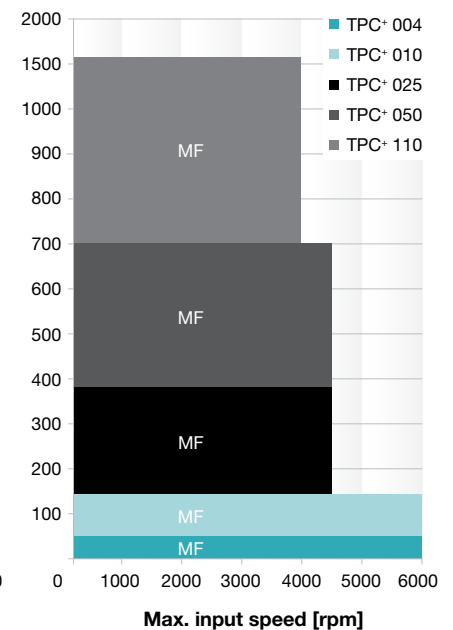
SPC⁺ MF (example for $i = 5$)

For applications in cyclic operation (duty cycle $\leq 60\%$) or continuous operation (duty cycle $\geq 60\%$)



TPC⁺ MF (example for $i = 5$)

For applications in cyclic operation (duty cycle $\leq 60\%$) or continuous operation (duty cycle $\geq 60\%$)



Versions and their uses

Features	SC ⁺ MF version Catalog page 254	SPC ⁺ MF version Catalog page 264	TPC ⁺ MF version Catalog page 274
Power density	• • •	• • •	• • •
Positioning accuracy (e.g. clamped drives)	• •	• • •	• • •
Highly dynamic applications	• •	• •	• •
High output speeds	• • •	• •	• •

Product features

Ratios ^{c)}		1 - 2	4 - 20	4 - 20
Backlash [arcmin] ^{c)}	Standard	≤ 4	≤ 4	≤ 4
	Reduced	-	≤ 2	≤ 2
Output type				
Smooth output shaft		•	•	
Keywayed output shaft		•	•	
Output shaft with involute toothing			•	
Mounted shaft			•	
Output flange				•
System output with pinion				•
Input type				
Motor attachment version		•	•	•
Model				
Food-grade lubrication ^{a) b)}		•	•	•
Accessories				
Coupling		•	•	•
Rack		•	•	•
Pinion		•	•	•
Shrink disk			•	

^{a)} Power reduction: Technical data available upon request

^{b)} Please contact WITTENSTEIN alpha

^{c)} Based on reference sizes

Right-angle gearheads
High End



SC+ 060 MF 1-stage

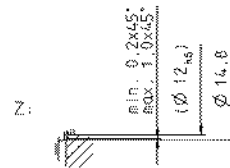
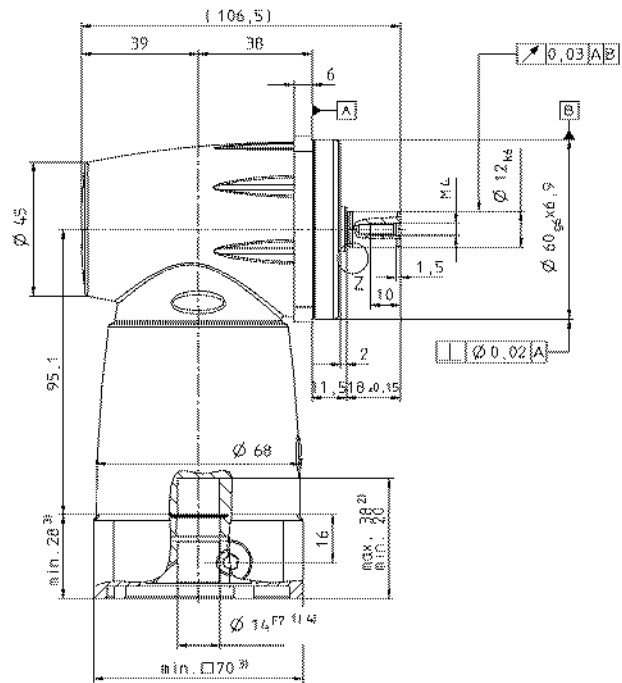
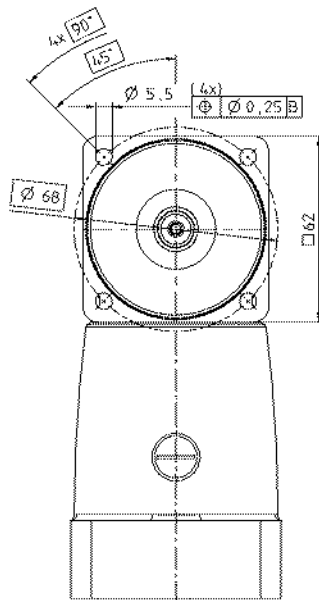
					1-stage				
Ratio		i		1		2			
Max. acceleration torque (max. 1000 cycles per hour)		T _{2B}	Nm		10		10		
			in.lb		89		89		
Nominal output torque (with n_N)		T _{2N}	Nm		7		7		
			in.lb		62		62		
Emergency stop torque (permitted 1000 times during the service life of the gearhead)		T _{2Not}	Nm		25		25		
			in.lb		221		221		
Nominal input speed (with T_{2N} and 20°C ambient temperature)		n _{1N} rpm		5000		5500			
Max. input speed		n _{1max} rpm		6000		6000			
Mean no-load running torque (with n₁=3000 rpm and 20°C gearhead temperature)		T ₀₁₂	Nm		0.5		0.3		
			in.lb		4.4		2.7		
Max. torsional backlash		j _t arcmin		≤ 5					
Torsional rigidity		C ₁₂₁	Nm/ arcmin		0.4		0.6		
			in.lb/ arcmin		3.5		5.3		
Max. axial force		F _{2AMax}	N		500				
			lb _f		113				
Max. radial force		F _{2RMax}	N		950				
			lb _f		214				
Max. tilting moment		M _{2KMax}	Nm		71				
			in.lb		628				
Efficiency at full load		η %		97					
Service life		L _h h		> 20000					
Weight (incl. ADP)		m	kg		1.9				
			lb _m		4.2				
Operating noise (with n1=3000 rpm no load)		L _{PA} db(A)		≤ 66					
Max. permitted housing temperature		°C		+90					
		F		194					
Ambient temperature		°C		0 to +40					
		F		32 to 104					
Lubrication				Lubricated for life					
Paint				no paint					
Mounting position				any					
Direction of rotation				Motor and gearhead same direction					
Protection class				IP 65					
Moment of inertia (relates to the drive)		C	14	J _I	kgcm ²	0.66		0.42	
					10 ⁻³ in.lb.s ²	0.58		0.37	
Clamping hub diameter [mm]		E	19	J _I	kgcm ²	0.99		0.75	
					10 ⁻³ in.lb.s ²	0.88		0.66	

Please contact us for information on the best configuration for S1 conditions of use (continuous operation).

- ^{a)} Other ratios available on request
- ^{b)} Higher speeds are possible if the nominal torque is reduced
- ^{c)} For higher ambient temperatures, please reduce input speed
- ^{d)} Idling torques decrease during operation
- ^{e)} Refers to center of the output shaft or flange

View A

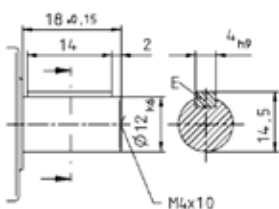
1-stage:



Right-angle gearheads
High End

Alternatives: Output shaft variants

Keywayed output shaft in mm
E = key as per DIN 6885, sheet 1, form A



See technical data sheet for available clamping hub diameters (mass moment of inertia). Dimensions available on request.

Non-tolerated dimensions ± 1 mm

- 1) Check motor shaft fit.
- 2) Min./Max. permissible motor shaft length. Longer motor shafts are adaptable, please contact us.
- 3) The dimensions depend on the motor.
- 4) Smaller motor shaft diameter is compensated by a bushing with a minimum thickness of 1 mm.



CAD data is available under
<http://www.wittenstein-alpha.de/en/info-and-cad-finder.html>



Motor mounting according to operating manual

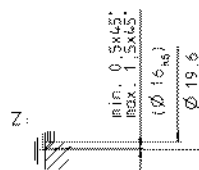
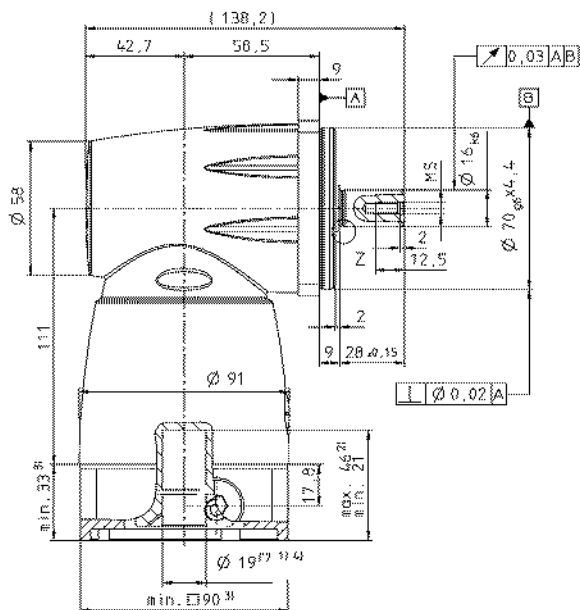
SC+

SC⁺ 075 MF 1-stage

				1-stage				
Ratio			<i>i</i>		1	2		
Max. acceleration torque (max. 1000 cycles per hour)			<i>T</i> _{2B}	Nm	30	30		
				in.lb	266	266		
Nominal output torque (with <i>n</i> _{1N})			<i>T</i> _{2N}	Nm	20	20		
				in.lb	177	177		
Emergency stop tourque (permitted 1000 times during the service life of the gearhead)			<i>T</i> _{2Not}	Nm	48	62		
				in.lb	425	549		
Nominal input speed (with <i>T</i> _{2N} and 20°C ambient temperature)			<i>n</i> _{1N}	rpm	2600	4000		
Max. input speed			<i>n</i> _{1max}	rpm	6000	6000		
Mean no-load running torque (with <i>n</i> ₁ =3000 rpm and 20°C gearhead temperature)			<i>T</i> ₀₁₂	Nm	0.9	0.3		
				in.lb	8.0	2.7		
Max. torsional backlash			<i>j</i> _t	arcmin	≤ 4			
Torsional rigidity			<i>C</i> _{t21}	Nm/ arcmin	1.0	1.5		
				in.lb/ arcmin	8.9	13.3		
Max. axial force			<i>F</i> _{2AMax}	N	700			
				lb _f	158			
Max. radial force			<i>F</i> _{2RMax}	N	1300			
				lb _f	293			
Max. tilting moment			<i>M</i> _{2KMax}	Nm	131			
				in.lb	1159			
Efficiency at full load			η	%	97			
Service life			<i>L</i> _h	h	> 20000			
Weight (incl. ADP)			<i>m</i>	kg	3.6			
				lb _m	8.0			
Operating noise (with <i>n</i> 1=3000 rpm no load)			<i>L</i> _{PA}	db(A)	≤ 68			
Max. permitted housing temperature				°C	+90			
				F	194			
Ambient temperature				°C	0 to +40			
				F	32 to 104			
Lubrication					Lubricated for life			
Paint					no paint			
Mounting position					any			
Direction of rotation					Motor and gearhead same direction			
Protection class					IP 65			
Moment of inertia (relates to the drive)			E	19	<i>J</i> ₁	kgcm ²	1.99	1.19
						10 ⁻³ in.lb.s ²	1.76	1.05
Clamping hub diameter [mm]			H	28	<i>J</i> ₁	kgcm ²	3.43	2.63
						10 ⁻³ in.lb.s ²	3.04	2.33

Please contact us for information on the best configuration for S1 conditions of use (continuous operation).

- ^{a)} Other ratios available on request
- ^{b)} Higher speeds are possible if the nominal torque is reduced
- ^{c)} For higher ambient temperatures, please reduce input speed
- ^{d)} Idling torques decrease during operation
- ^{e)} Refers to center of the output shaft or flange



Right-angle gearheads High End

Technical drawing of a mechanical part. The drawing shows a side view and a cross-section. Dimensions include: 28 ± 0,15, 25, 2, 16 ± 0,08, 18, and 5. The cross-section is labeled with 'MSx12,5' and '5 MP'.

$$\text{SC}^+$$

SC⁺ 100 MF 1-stage

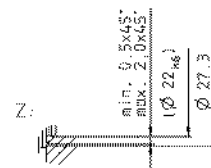
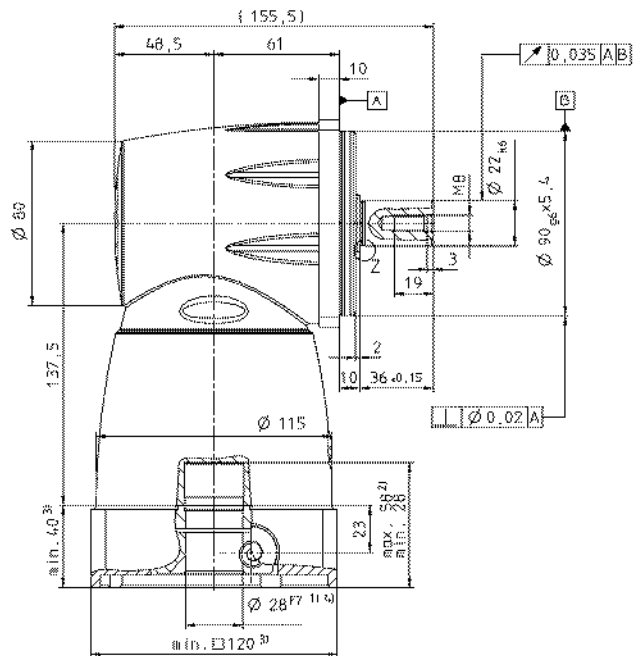
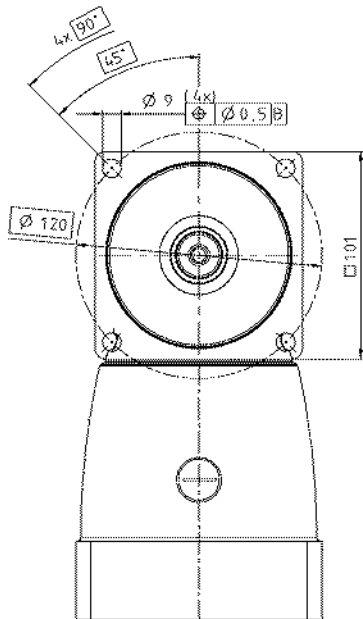
				1-stage			
Ratio		i		1		2	
Max. acceleration torque (max. 1000 cycles per hour)		T _{2B}	Nm	81		81	
			in.lb	717		717	
Nominal output torque (with n _{1N})		T _{2N}	Nm	50		50	
			in.lb	443		443	
Emergency stop tourque (permitted 1000 times during the service life of the gearhead)		T _{2Not}	Nm	135		200	
			in.lb	1195		1770	
Nominal input speed (with T _{2N} and 20°C ambient temperature)		n _{1N}	rpm	2500		2800	
Max. input speed		n _{1max}	rpm	4500		4500	
Mean no-load running torque (with n ₁ =3000 rpm and 20°C gearhead temperature)		T ₀₁₂	Nm	2.5		1.5	
			in.lb	22.1		13.3	
Max. torsional backlash		j _t	arcmin	≤ 4			
Torsional rigidity		C ₁₂₁	Nm/ arcmin	2.9		4.6	
			in.lb/ arcmin	25.7		40.7	
Max. axial force		F _{2AMax}	N	1900			
			lb _f	428			
Max. radial force		F _{2RMax}	N	3800			
			lb _f	855			
Max. tilting moment		M _{2KMax}	Nm	439			
			in.lb	3885			
Efficiency at full load		η	%	97			
Service life		L _h	h	> 20000			
Weight (incl. ADP)		m	kg	7.0			
			lb _m	15.5			
Operating noise (with n1=3000 rpm no load)		L _{PA}	db(A)	≤ 68			
Max. permitted housing temperature			°C	+90			
			F	194			
Ambient temperature			°C	0 to +40			
			F	32 to 104			
Lubrication				Lubricated for life			
Paint				no paint			
Mounting position				any			
Direction of rotation				Motor and gearhead same direction			
Protection class				IP 65			
Moment of inertia (relates to the drive)		H	28	J ₁	kgcm ²	7.1	4.8
					10 ⁻³ in.lb.s ²	6.28	4.25
Clamping hub diameter [mm]		K	38	J ₁	kgcm ²	14.2	11.9
					10 ⁻³ in.lb.s ²	12.57	10.53

Please contact us for information on the best configuration for S1 conditions of use (continuous operation).

- ^{a)} Other ratios available on request
- ^{b)} Higher speeds are possible if the nominal torque is reduced
- ^{c)} For higher ambient temperatures, please reduce input speed
- ^{d)} Idling torques decrease during operation
- ^{e)} Refers to center of the output shaft or flange

View A

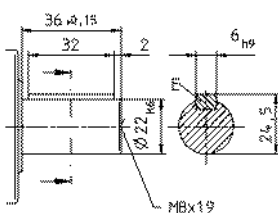
1-stage:



Right-angle gearheads
High End

Alternatives: Output shaft variants

Keywayed output shaft in mm
E = key as per DIN 6885, sheet 1, form A



See technical data sheet for available clamping hub diameters (mass moment of inertia). Dimensions available on request.

Non-tolerated dimensions ± 1 mm

- 1) Check motor shaft fit.
- 2) Min./Max. permissible motor shaft length. Longer motor shafts are adaptable, please contact us.
- 3) The dimensions depend on the motor.
- 4) Smaller motor shaft diameter is compensated by a bushing with a minimum thickness of 1 mm.



CAD data is available under
<http://www.wittenstein-alpha.de/en/info-and-cad-finder.html>



Motor mounting according to operating manual

SC+

SC⁺ 140 MF 1-stage

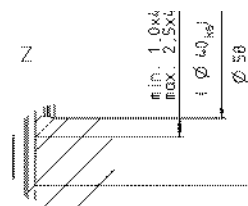
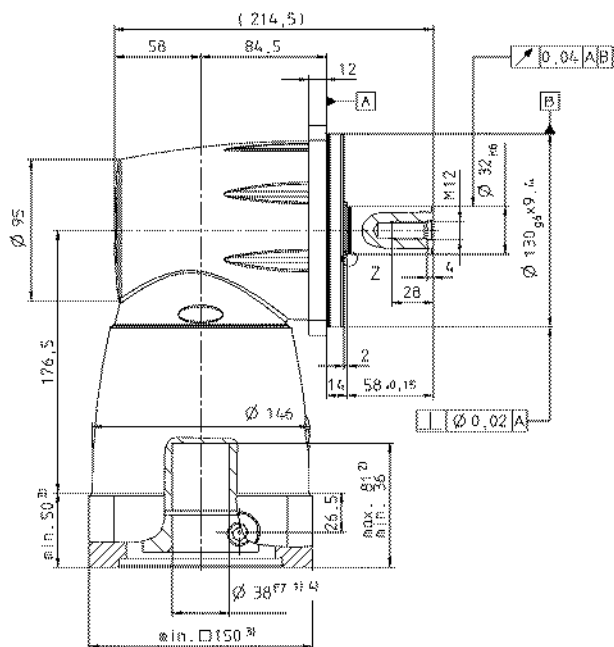
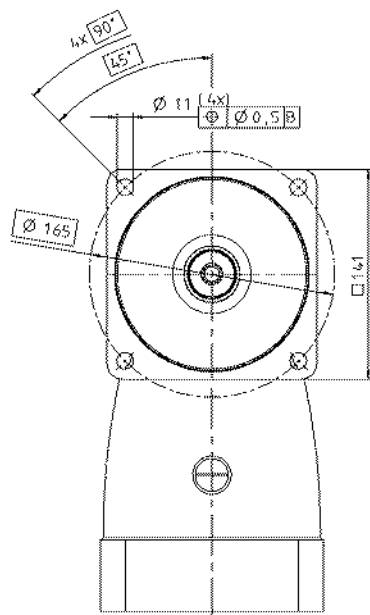
				1-stage	
Ratio	<i>i</i>			1	2
Max. acceleration torque (max. 1000 cycles per hour)	T_{2B}	Nm		175	175
		in.lb		1549	1549
Nominal output torque (with n_{1N})	T_{2N}	Nm		110	110
		in.lb		974	974
Emergency stop torque (permitted 1000 times during the service life of the gearhead)	T_{2Not}	Nm		240	310
		in.lb		2124	2744
Nominal input speed (with T_{2N} and 20°C ambient temperature)	n_{1N}	rpm		1600	2100
Max. input speed	n_{1max}	rpm		4500	4500
Mean no-load running torque (with $n_1=3000$ rpm and 20°C gearhead temperature)	T_{012}	Nm		4.0	1.7
		in.lb		35.4	15.0
Max. torsional backlash	j_t	arcmin		≤ 4	
Torsional rigidity	C_{121}	Nm/ arcmin		6.4	9.1
		in.lb/ arcmin		56.6	80.5
Max. axial force	F_{2AMax}	N		3000	
		lb _f		675	
Max. radial force	F_{2RMax}	N		6000	
		lb _f		1350	
Max. tilting moment	M_{2KMax}	Nm		957	
		in.lb		8469	
Efficiency at full load	η	%		97	
Service life	L_h	h		> 20000	
Weight (incl. ADP)	m	kg		14.7	
		lb _m		32.5	
Operating noise (with $n_1=3000$ rpm no load)	L_{PA}	db(A)		≤ 70	
Max. permitted housing temperature		°C		+90	
		F		194	
Ambient temperature		°C		0 to +40	
		F		32 to 104	
Lubrication				Lubricated for life	
Paint				no paint	
Mounting position				any	
Direction of rotation				Motor and gearhead same direction	
Protection class				IP 65	
Moment of inertia (relates to the drive) Clamping hub diameter [mm]	K	38	J_1 kgcm ²	41.3	21.3
			10^{-3} in.lb.s ²	36.55	18.85

Please contact us for information on the best configuration for S1 conditions of use (continuous operation).

- ^{a)} Other ratios available on request
- ^{b)} Higher speeds are possible if the nominal torque is reduced
- ^{c)} For higher ambient temperatures, please reduce input speed
- ^{d)} Idling torques decrease during operation
- ^{e)} Refers to center of the output shaft or flange

View A

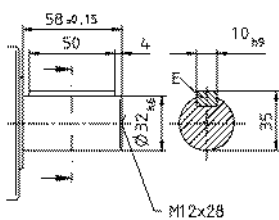
1-stage:



Right-angle gearheads
High End

Alternatives: Output shaft variants

Keywayed output shaft in mm
E = key as per DIN 6885, sheet 1, form A



See technical data sheet for available clamping hub diameters (mass moment of inertia). Dimensions available on request.

Non-tolerated dimensions ± 1 mm

- 1) Check motor shaft fit.
- 2) Min./Max. permissible motor shaft length. Longer motor shafts are adaptable, please contact us.
- 3) The dimensions depend on the motor.
- 4) Smaller motor shaft diameter is compensated by a bushing with a minimum thickness of 1 mm.



CAD data is available under
<http://www.wittenstein-alpha.de/en/info-and-cad-finder.html>



Motor mounting according to operating manual

SC+

SC⁺ 180 MF 1-stage

				1-stage	
Ratio	<i>i</i>			1	2
Max. acceleration torque (max. 1000 cycles per hour)	T_{2B}	Nm		315	315
		in.lb		2788	2788
Nominal output torque (with n_{1N})	T_{2N}	Nm		200	200
		in.lb		1770	1770
Emergency stop torque (permitted 1000 times during the service life of the gearhead)	T_{2Not}	Nm		390	685
		in.lb		3452	6062
Nominal input speed (with T_{2N} and 20°C ambient temperature)	n_{1N}	rpm		1200	1500
Max. input speed	n_{1max}	rpm		4000	4000
Mean no load running torque (with $n_1=3000$ rpm and 20°C gearhead temperature)	T_{012}	Nm		9.5	5.5
		in.lb		84.1	48.7
Max. torsional backlash	j_t	arcmin		≤ 3	
Torsional rigidity	C_{121}	Nm/ arcmin		13	22
		in.lb/ arcmin		115.1	194.7
Max. axial force	F_{2AMax}	N		4500	
		lb _f		1013	
Max. radial force	F_{2RMax}	N		9000	
		lb _f		2025	
Max. tilting moment	M_{2KMax}	Nm		1910	
		in.lb		16904	
Efficiency at full load	η	%		97	
Service life	L_h	h		> 20000	
Weight (incl. ADP)	m	kg		31.4	
		lb _m		69.4	
Operating noise (with $n_1=3000$ rpm no load)	L_{PA}	db(A)		≤ 70	
Max. permitted housing temperature		°C		+90	
		F		194	
Ambient temperature		°C		0 to +40	
		F		32 to 104	
Lubrication				Lubricated for life	
Paint				no paint	
Mounting position				any	
Direction of rotation				Motor and gearhead same direction	
Protection class				IP 65	
Moment of inertia (relates to the drive) Clamping hub diameter [mm]	M	48	J_1 kgcm ²	99.5	46.7
			10^{-3} in.lb.s ²	88.06	41.33

Please contact us for information on the best configuration for S1 conditions of use (continuous operation).

^{a)} Other ratios available on request

^{b)} Higher speeds are possible if the nominal torque is reduced

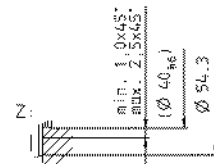
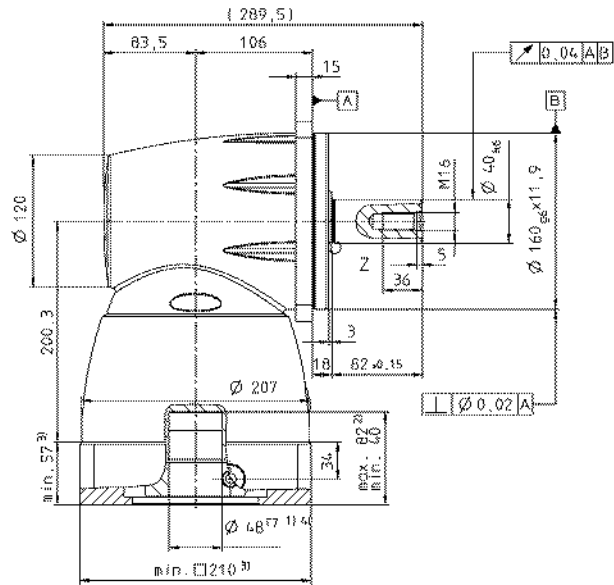
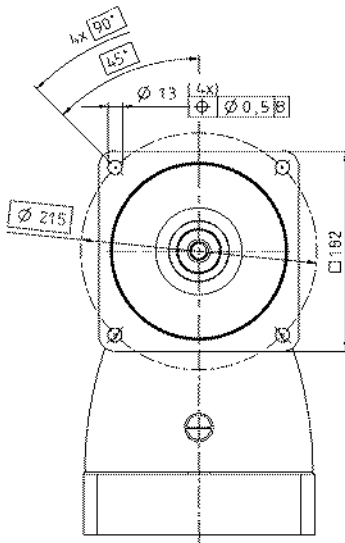
^{c)} For higher ambient temperatures, please reduce input speed

^{d)} Idling torques decrease during operation

^{e)} Refers to center of the output shaft or flange

View A

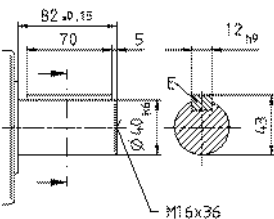
1-stage:



Right-angle gearheads
High End

Alternatives: Output shaft variants

Keywayed output shaft in mm
E = key as per DIN 6885, sheet 1, form A



See technical data sheet for available clamping hub diameters (mass moment of inertia). Dimensions available on request.

Non-tolerated dimensions ± 1 mm

- 1) Check motor shaft fit.
- 2) Min./Max. permissible motor shaft length. Longer motor shafts are adaptable, please contact us.
- 3) The dimensions depend on the motor.
- 4) Smaller motor shaft diameter is compensated by a bushing with a minimum thickness of 1 mm.



CAD data is available under
<http://www.wittenstein-alpha.de/en/info-and-cad-finder.html>



Motor mounting according to operating manual

SC+

SPC+ 060 MF 2-stage

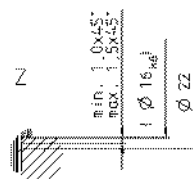
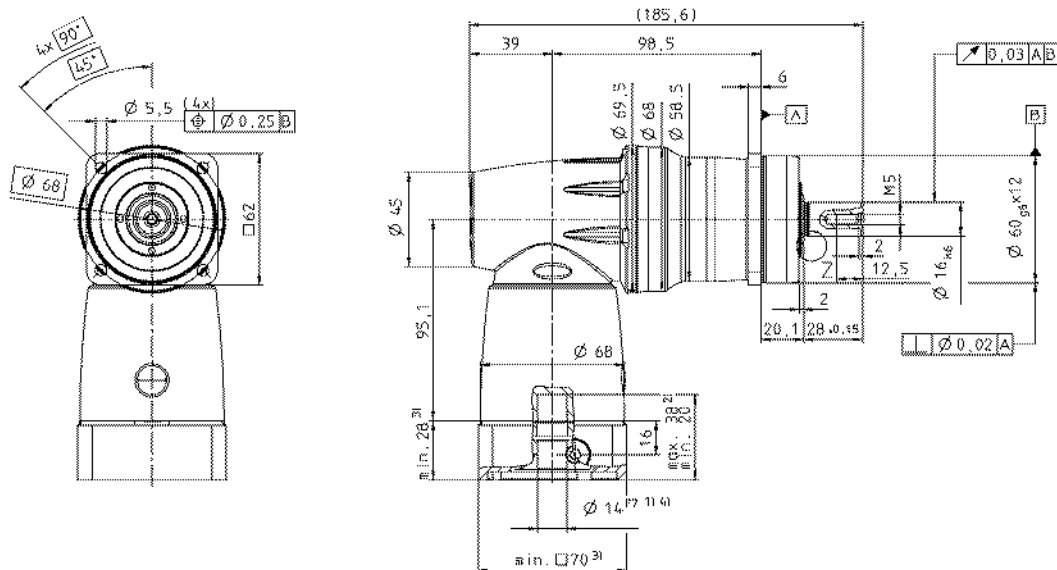
					2-stage						
Ratio		i			4	5	7	8	10	14	20
Max. acceleration torque (max. 1000 cycles per hour)		T _{2B}	Nm		40	42	42	40	42	42	32
				in.lb	354	372	372	354	372	372	283
Nominal output torque (with n_{1N})		T _{2N}	Nm		26	26	26	26	26	26	17
				in.lb	230	230	230	230	230	230	150
Emergency stop tourque (permitted 1000 times during the service life of the gearhead)		T _{2Not}	Nm		100	100	100	100	100	100	80
				in.lb	885	885	885	885	885	885	708
Nominal input speed (with T_{2N} and 20°C ambient temperature)		n _{1N}	rpm		3000	3000	3200	3400	3400	3600	3600
Max. input speed		n _{1max}	rpm		6000	6000	6000	6000	6000	6000	6000
Mean no-load running torque (with n₁=3000 rpm and 20°C gearhead temperature)		T ₀₁₂	Nm		1.2	1.1	0.9	0.6	0.6	0.5	0.4
				in.lb	11	10	8	5	5	4	4
Max. torsional backlash		j _t	arcmin		Standard ≤ 5 / Reduced ≤ 3						
Torsional rigidity		C _{t21}	Nm/ arcmin		2.4	2.7	3.1	2.7	3.0	3.2	3.3
				in.lb/ arcmin	21	24	27	24	27	28	29
Max. axial force		F _{2AMax}	N		2400						
				lb _f	540						
Max. radial force		F _{2RMax}	N		2800						
				lb _f	630						
Max. tilting moment		M _{2KMax}	Nm		152						
				in.lb	1345.2						
Efficiency at full load		η	%		95						
Service life		L _h	h		> 20000						
Weight (incl. ADP)		m	kg		3.1						
				lb _m	6.851						
Operating noise (with n1=3000 rpm no load)		L _{PA}	db(A)		≤ 68						
Max. permitted housing temperature			°C		+90						
				F	194						
Ambient temperature			°C		0 to +40						
				F	32 to 104						
Lubrication					Lubricated for life						
Paint					Blue RAL 5002						
Mounting position					any						
Direction of rotation					Motor and gearhead same direction						
Protection class					IP 65						
Moment of inertia (relates to the drive)	C	14	J _i	kgcm ²	0.72	0.7	0.66	0.44	0.43	0.43	0.43
				10 ⁻³ in.lb.s ²	0.64	0.62	0.58	0.39	0.38	0.38	0.38
Clamping hub diameter [mm]	E	19	J _i	kgcm ²	1.05	1.03	0.99	0.77	0.76	0.76	0.75
				10 ⁻³ in.lb.s ²	0.93	0.91	0.88	0.68	0.67	0.67	0.66

Please contact us for information on the best configuration for S1 conditions of use (continuous operation).

- ^{a)} Other ratios available on request
- ^{b)} Higher speeds are possible if the nominal torque is reduced
- ^{c)} For higher ambient temperatures, please reduce input speed
- ^{d)} Idling torques decrease during operation
- ^{e)} Refers to center of the output shaft or flange

View A

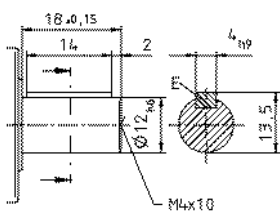
2-stage:



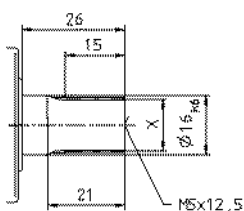
Right-angle gearheads
High End

Alternatives: Output shaft variants

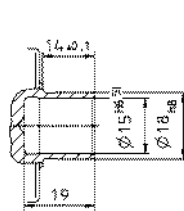
Keywayed output shaft in mm
E = key as per DIN 6885, sheet 1, form A



Involute gearing DIN 5480 in mm
X = W 16 x 0,8 x 30 x 18 x 6m, DIN 5480



Shaft mounted
Mounted via shrink disc



See technical data sheet for available clamping hub diameters (mass moment of inertia). Dimensions available on request.

Non-tolerated dimensions ±1 mm

- 1) Check motor shaft fit.
- 2) Min./Max. permissible motor shaft length. Longer motor shafts are adaptable, please contact us.
- 3) The dimensions depend on the motor.
- 4) Smaller motor shaft diameter is compensated by a bushing with a minimum thickness of 1 mm.

CAD data is available under
<http://www.wittenstein-alpha.de/en/info-and-cad-finder.html>



Motor mounting according to operating manual

SPC+ 075 MF 2-stage

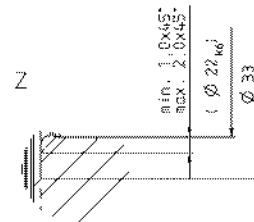
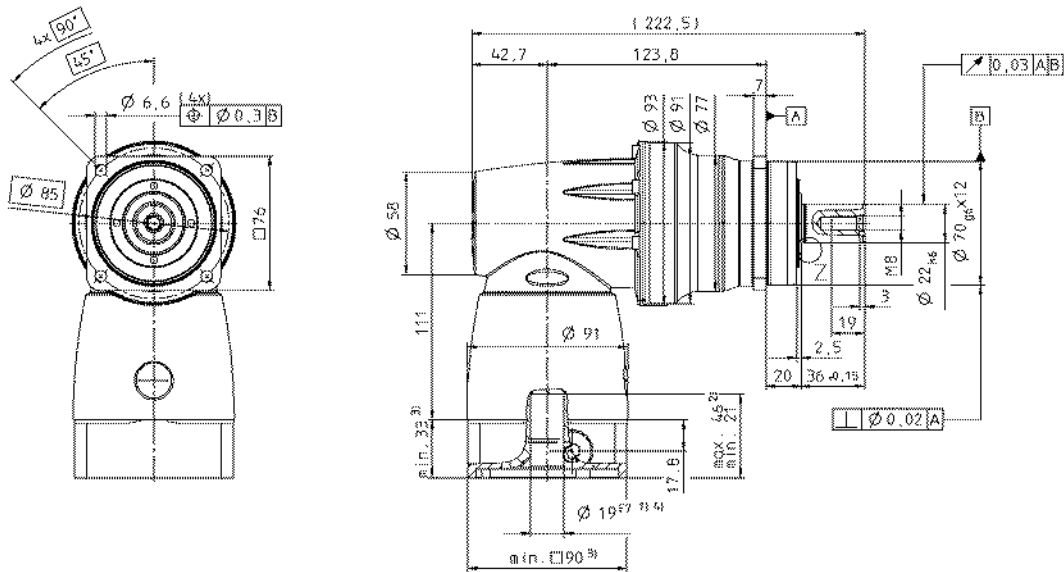
				2-stage							
Ratio		<i>i</i>		4	5	7	8	10	14	20	
Max. acceleration torque (max. 1000 cycles per hour)		<i>T</i> _{2B}	Nm	110	110	110	110	110	110	95	
			in.lb	974	974	974	974	974	974	841	
Nominal output torque (with n_{1N})		<i>T</i> _{2N}	Nm	75	75	75	75	75	75	52	
			in.lb	664	664	664	664	664	664	460	
Emergency stop tourque (permitted 1000 times during the service life of the gearhead)		<i>T</i> _{2Not}	Nm	195	245	250	250	250	250	200	
			in.lb	1726	2168	2213	2213	2213	2213	1770	
Nominal input speed (with T_{2N} and 20°C ambient temperature)		<i>n</i> _{1N}	rpm	2200	2200	2400	2650	2650	2800	2800	
Max. input speed		<i>n</i> _{1max}	rpm	6000	6000	6000	6000	6000	6000	6000	
Mean no-load running torque (with n₁=3000 rpm and 20°C gearhead temperature)		<i>T</i> ₀₁₂	Nm	2.3	2.0	1.7	1.0	0.9	0.7	0.6	
			in.lb	20	18	15	9	8	6	5	
Max. torsional backlash		<i>j</i> _t	arcmin	Standard ≤ 4 / Reduced ≤ 2							
Torsional rigidity		<i>C</i> _{t21}	Nm/ arcmin	6.6	7.5	8.6	7.6	8.3	9.1	9.5	
			in.lb/ arcmin	58	66	76	67	73	81	84	
Max. axial force		<i>F</i> _{2AMax}	N	3350							
			lb _f	753.75							
Max. radial force		<i>F</i> _{2RMMax}	N	4200							
			lb _f	945							
Max. tilting moment		<i>M</i> _{2KMax}	Nm	236							
			in.lb	2088.6							
Efficiency at full load		η	%	95							
Service life		<i>L</i> _h	h	> 20000							
Weight (incl. ADP)		<i>m</i>	kg	5.9							
			lb _m	13.039							
Operating noise (with n1=3000 rpm no load)		<i>L</i> _{PA}	db(A)	≤ 68							
Max. permitted housing temperature			°C	+90							
			F	194							
Ambient temperature			°C	0 to +40							
			F	32 to 104							
Lubrication				Lubricated for life							
Paint				Blue RAL 5002							
Mounting position				any							
Direction of rotation				Motor and gearhead same direction							
Protection class				IP 65							
Moment of inertia (relates to the drive)	E	19	<i>J</i> _i	kgcm ²	2.23	2.15	1.99	1.25	1.23	1.21	1.2
				10 ⁻³ in.lb.s ²	1.97	1.90	1.76	1.11	1.09	1.07	1.06
Clamping hub diameter [mm]	H	28	<i>J</i> _i	kgcm ²	3.66	3.59	3.43	2.68	2.67	2.65	2.64
				10 ⁻³ in.lb.s ²	3.24	3.18	3.04	2.37	2.36	2.35	2.34

Please contact us for information on the best configuration for S1 conditions of use (continuous operation).

- ^{a)} Other ratios available on request
- ^{b)} Higher speeds are possible if the nominal torque is reduced
- ^{c)} For higher ambient temperatures, please reduce input speed
- ^{d)} Idling torques decrease during operation
- ^{e)} Refers to center of the output shaft or flange

View A

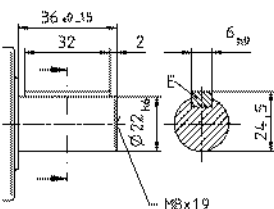
2-stage:



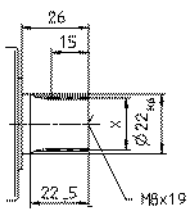
Right-angle gearheads
High End

Alternatives: Output shaft variants

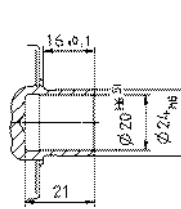
Keywayed output shaft in mm
E = key as per DIN 6885, sheet 1, form A



Involute gearing DIN 5480 in mm
X = W 16 x 0.8 x 30 x 18 x 6 mm, DIN 5480



Shaft mounted
Mounted via shrink disc



See technical data sheet for available clamping hub diameters (mass moment of inertia). Dimensions available on request.

Non-tolerated dimensions ± 1 mm

- 1) Check motor shaft fit.
- 2) Min./Max. permissible motor shaft length. Longer motor shafts are adaptable, please contact us.
- 3) The dimensions depend on the motor.
- 4) Smaller motor shaft diameter is compensated by a bushing with a minimum thickness of 1 mm.



CAD data is available under
<http://www.wittenstein-alpha.de/en/info-and-cad-finder.html>



Motor mounting according to operating manual

SPC+ 100 MF 2-stage

				2-stage							
Ratio		i		4	5	7	8	10	14	20	
Max. acceleration torque (max. 1000 cycles per hour)		T _{2B}	Nm	315	315	315	315	315	315	235	
			in.lb	2788	2788	2788	2788	2788	2788	2080	
Nominal output torque (with n_{1N})		T _{2N}	Nm	180	175	170	180	175	170	120	
			in.lb	1593	1549	1505	1593	1549	1505	1062	
Emergency stop tourque (permitted 1000 times during the service life of the gearhead)		T _{2Not}	Nm	540	625	625	625	625	625	500	
			in.lb	4779	5531	5531	5531	5531	5531	4425	
Nominal input speed (with T_{2N} and 20°C ambient temperature)		n _{1N}	rpm	2000	2000	2200	2300	2300	2400	2400	
Max. input speed		n _{1max}	rpm	4500	4500	4500	4500	4500	4500	4500	
Mean no-load running torque (with n₁=3000 rpm and 20°C gearhead temperature)		T ₀₁₂	Nm	5.2	4.9	4.1	2.9	2.7	2.3	2.2	
			in.lb	46	43	36	26	24	20	19	
Max. torsional backlash		j _t	arcmin	Standard ≤ 4 / Reduced ≤ 2							
Torsional rigidity		C _{t21}	Nm/ arcmin	20.0	23.0	26.0	24.0	26.0	28.0	30.0	
			in.lb/ arcmin	177	204	230	212	230	248	266	
Max. axial force		F _{2AMax}	N	5650							
			lb _f	1271.25							
Max. radial force		F _{2RMax}	N	6600							
			lb _f	1485							
Max. tilting moment		M _{2KMax}	Nm	487							
			in.lb	4309.95							
Efficiency at full load		η	%	95							
Service life		L _h	h	> 20000							
Weight (incl. ADP)		m	kg	11.7							
			lb _m	25.857							
Operating noise (with n1=3000 rpm no load)		L _{PA}	db(A)	≤ 68							
Max. permitted housing temperature		°C		+90							
		F		194							
Ambient temperature		°C		0 to +40							
		F		32 to 104							
Lubrication				Lubricated for life							
Paint				Blue RAL 5002							
Mounting position				any							
Direction of rotation				Motor and gearhead same direction							
Protection class				IP 65							
Moment of inertia (relates to the drive)	H	28	J _i	kgcm ²	8	7.6	7	5	4.9	4.9	4.8
				10 ⁻³ in.lb.s ²	7.08	6.73	6.20	4.43	4.34	4.34	4.25
Clamping hub diameter [mm]	K	38	J _i	kgcm ²	15	14.7	14.1	12.1	12	11.9	11.9
				10 ⁻³ in.lb.s ²	13.28	13.01	12.48	10.71	10.62	10.53	10.53

Please contact us for information on the best configuration for S1 conditions of use (continuous operation).

^{a)} Other ratios available on request

^{b)} Higher speeds are possible if the nominal torque is reduced

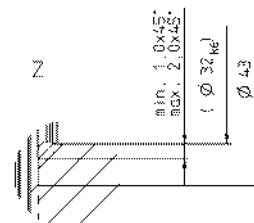
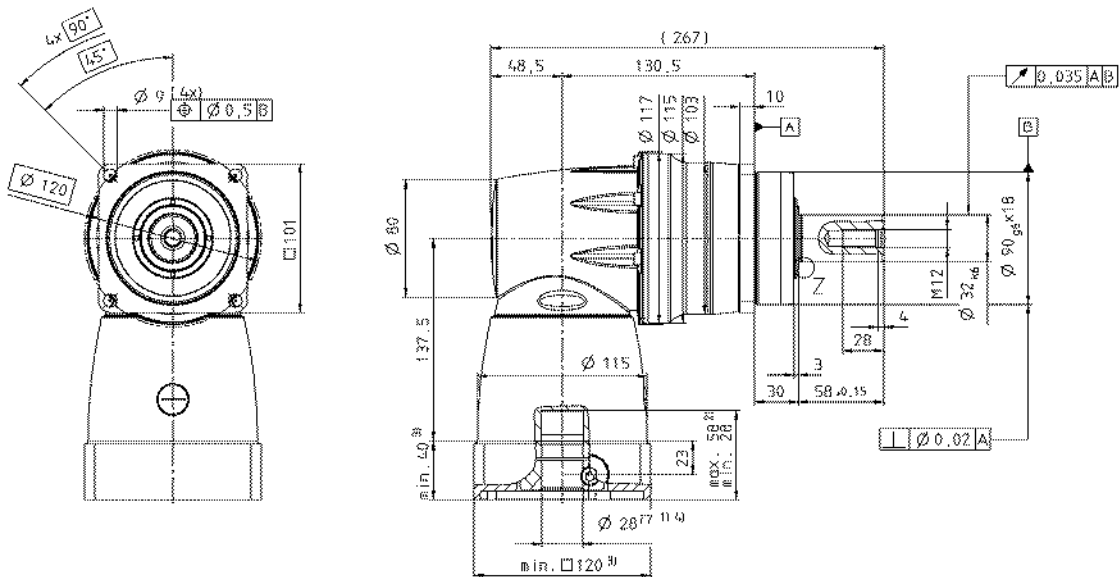
^{c)} For higher ambient temperatures, please reduce input speed

^{d)} Idling torques decrease during operation

^{e)} Refers to center of the output shaft or flange

View A

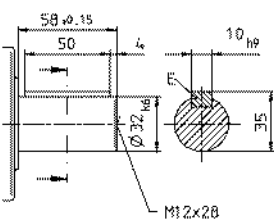
2-stage:



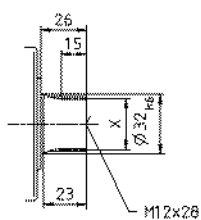
Right-angle gearheads
High End

Alternatives: Output shaft variants

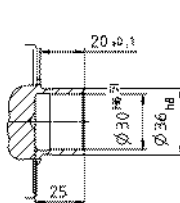
Keywayed output shaft in mm
E = key as per DIN 6885, sheet 1, form A



Involute gearing DIN 5480 in mm
X = W 16 x 0,8 x 30 x 18 x 6 mm, DIN 5480



Shaft mounted
Mounted via shrink disc



See technical data sheet for available clamping hub diameters (mass moment of inertia). Dimensions available on request.

Non-tolerated dimensions ± 1 mm

- 1) Check motor shaft fit.
- 2) Min./Max. permissible motor shaft length. Longer motor shafts are adaptable, please contact us.
- 3) The dimensions depend on the motor.
- 4) Smaller motor shaft diameter is compensated by a bushing with a minimum thickness of 1 mm.



CAD data is available under
<http://www.wittenstein-alpha.de/en/info-and-cad-finder.html>



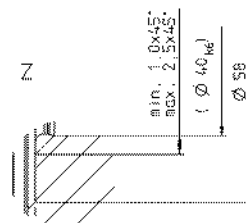
Motor mounting according to operating manual

SPC+ 140 MF 2-stage

				2-stage							
Ratio	i		4	5	7	8	10	14	20		
Max. acceleration torque (max. 1000 cycles per hour)	T _{2B}	Nm	660	660	660	660	660	660	530		
		in.lb	5841	5841	5841	5841	5841	5841	4691		
Nominal output torque (with n _{1N})	T _{2N}	Nm	360	360	360	360	360	360	220		
		in.lb	3186	3186	3186	3186	3186	3186	1947		
Emergency stop tourque (permitted 1000 times during the service life of the gearhead)	T _{2Not}	Nm	960	1200	1250	1250	1250	1250	1000		
		in.lb	8496	10620	11063	11063	11063	11063	8850		
Nominal input speed (with T _{2N} and 20°C ambient temperature)	n _{1N}	rpm	1300	1300	1400	1500	1500	1600	1600		
Max. input speed	n _{1max}	rpm	4500	4500	4500	4500	4500	4500	4500		
Mean no-load running torque (with n ₁ =3000 rpm and 20°C gearhead temperature)	T ₀₁₂	Nm	9.8	8.7	7.4	4.6	4.0	3.4	2.9		
		in.lb	87	77	65	41	35	30	26		
Max. torsional backlash	j _t	arcmin	Standard ≤ 4 / Reduced ≤ 2								
Torsional rigidity	C _{t21}	Nm/ arcmin	37.0	41.0	46.0	41.0	45.0	48.0	51.0		
		in.lb/ arcmin	327	363	407	363	398	425	451		
Max. axial force	F _{2AMax}	N	9870								
		lb _f	2220.75								
Max. radial force	F _{2RMax}	N	9900								
		lb _f	2227.5								
Max. tilting moment	M _{2KMax}	Nm	952								
		in.lb	8425.2								
Efficiency at full load	η	%	95								
Service life	L _h	h	> 20000								
Weight (incl. ADP)	m	kg	24.7								
		lb _m	54.587								
Operating noise (with n1=3000 rpm no load)	L _{PA}	db(A)	≤ 70								
Max. permitted housing temperature	°C		+90								
	F		194								
Ambient temperature	°C		0 to +40								
	F		32 to 104								
Lubrication			Lubricated for life								
Paint			Blue RAL 5002								
Mounting position			any								
Direction of rotation			Motor and gearhead same direction								
Protection class			IP 65								
Moment of inertia (relates to the drive)	K	38	J ₁	kgcm²	30.6	29.7	27.9	18.9	18.7	18.5	18.4
				10 ⁻³ in.lb.s²	27.08	26.28	24.69	16.73	16.55	16.37	16.28
Clamping hub diameter [mm]											

Please contact us for information on the best configuration for S1 conditions of use (continuous operation).

- ^{a)} Other ratios available on request
- ^{b)} Higher speeds are possible if the nominal torque is reduced
- ^{c)} For higher ambient temperatures, please reduce input speed
- ^{d)} Idling torques decrease during operation
- ^{e)} Refers to center of the output shaft or flange

[illegible]

Right-angle gearheads High End

271

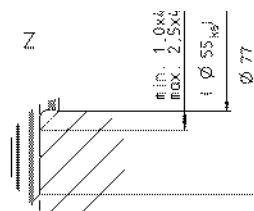
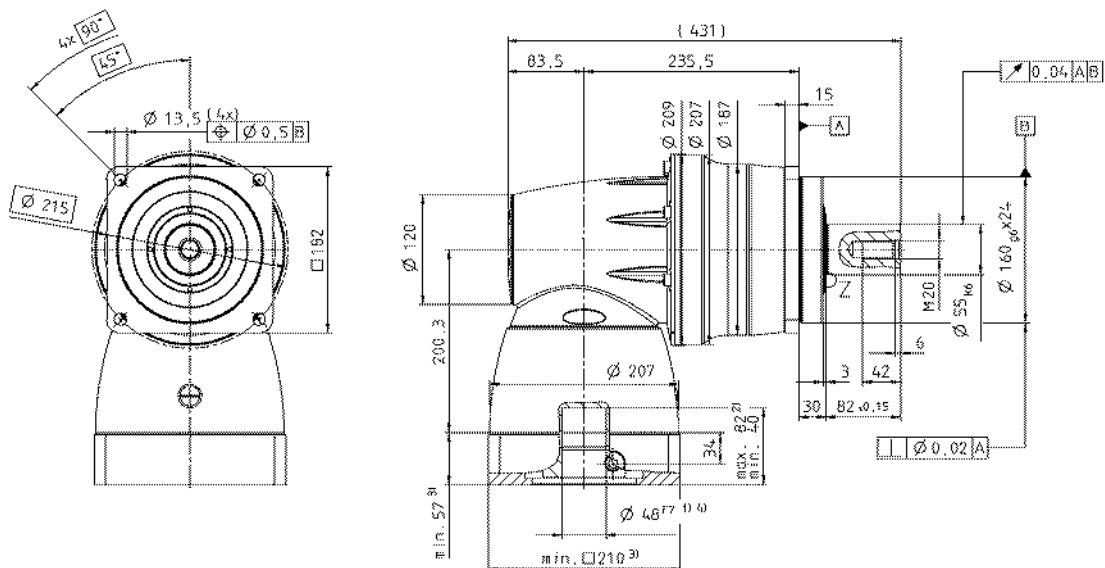
SPC+ 180 MF 2-stage

				2-stage								
Ratio		<i>i</i>		4	5	7	8	10	14	20		
Max. acceleration torque (max. 1000 cycles per hour)		<i>T</i> _{2B}	Nm	1210	1210	1210	1210	1210	1210	970		
			in.lb	10709	10709	10709	10709	10709	10709	8585		
Nominal output torque (with n_N)		<i>T</i> _{2N}	Nm	750	750	750	750	750	750	750		
			in.lb	6638	6638	6638	6638	6638	6638	6638		
Emergency stop tourque (permitted 1000 times during the service life of the gearhead)		<i>T</i> _{2Not}	Nm	1560	1955	2735	2750	2750	2750	2200		
			in.lb	13806	17302	24205	24338	24338	24338	19470		
Nominal input speed (with T_{2N} and 20°C ambient temperature)		<i>n</i> _{1N}	rpm	1000	1000	1100	1200	1200	1300	1300		
Max. input speed		<i>n</i> _{1max}	rpm	4000	4000	4000	4000	4000	4000	4000		
Mean no-load running torque (with n₁=3000 rpm and 20°C gearhead temperature)		<i>T</i> ₀₁₂	Nm	20.5	18.5	16.5	11.0	10.0	9.0	8.0		
			in.lb	181	164	146	97	89	80	71		
Max. torsional backlash		<i>j</i> _t	arcmin	Standard ≤ 4 / Reduced ≤ 2								
Torsional rigidity		<i>C</i> _{t21}	Nm/ arcmin	104.0	122.0	143.0	130.0	144.0	157.0	166.0		
			in.lb/ arcmin	920	1080	1266	1151	1274	1389	1469		
Max. axial force		<i>F</i> _{2AMax}	N	14150								
			lb _f	3183.75								
Max. radial force		<i>F</i> _{2RMax}	N	15400								
			lb _f	3465								
Max. tilting moment		<i>M</i> _{2KMax}	Nm	1600								
			in.lb	14160								
Efficiency at full load		η	%	95								
Service life		<i>L</i> _h	h	> 20000								
Weight (incl. ADP)		<i>m</i>	kg	54.7								
			lb _m	120.887								
Operating noise (with n1=3000 rpm no load)		<i>L</i> _{PA}	db(A)	≤ 70								
Max. permitted housing temperature			°C	+90								
			F	194								
Ambient temperature			°C	0 to +40								
			F	32 to 104								
Lubrication				Lubricated for life								
Paint				Blue RAL 5002								
Mounting position				any								
Direction of rotation				Motor and gearhead same direction								
Protection class				IP 65								
Moment of inertia (relates to the drive)		M	48	<i>J</i> _i	kgcm ²	109.5	105	94.7	49.2	48.1	46.9	46.2
					10 ⁻³ in.lb.s ²	96.91	92.93	83.81	43.54	42.57	41.51	40.89
Clamping hub diameter [mm]												

Please contact us for information on the best configuration for S1 conditions of use (continuous operation).

- ^{a)} Other ratios available on request
- ^{b)} Higher speeds are possible if the nominal torque is reduced
- ^{c)} For higher ambient temperatures, please reduce input speed
- ^{d)} Idling torques decrease during operation
- ^{e)} Refers to center of the output shaft or flange

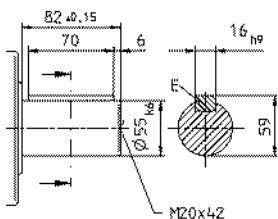
2-stage:



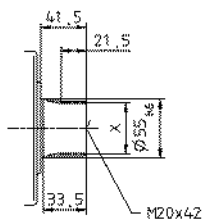
Right-angle gearheads High End

Alternatives: Output shaft variants

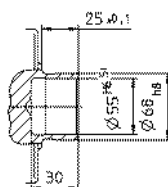
Keywayed output shaft in mm
E = key as per DIN 6885, sheet 1, form A



Involute gearing DIN 5480 in mm
X = W 16 x 0,8 x 30 x 18 x 6m, DIN 5480



Shaft mounted
Mounted via shrink disc



See technical data sheet for available clamping hub diameters (mass moment of inertia). Dimensions available on request.

Non-tolerated dimensions ± 1 mm

- 1) Check motor shaft fit.
- 2) Min./Max. permissible motor shaft length. Longer motor shafts are adaptable, please contact us.
- 3) The dimensions depend on the motor.
- 4) Smaller motor shaft diameter is compensated by a bushing with a minimum thickness of 1 mm.



CAD data is available under
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Motor mounting according to operating manual

TPC+ 004 MF 2-stage

				2-stage						
Ratio	<i>i</i>			4	5	7	8	10	14	20
Max. acceleration torque (max. 1000 cycles per hour)	T_{2B}	Nm		40	50	55	40	50	55	35
		in.lb		354	443	487	354	443	487	310
Nominal output torque (with n_{1N})	T_{2N}	Nm		28	28	28	28	28	28	18
		in.lb		248	248	248	248	248	248	159
Emergency stop torque (permitted 1000 times during the service life of the gearhead)	T_{2Not}	Nm		100	100	100	100	100	100	100
		in.lb		885	885	885	885	885	885	885
Nominal input speed (with T_{2N} and 20°C ambient temperature)	n_{1N}	rpm		2900	2900	3100	3400	3400	3600	3600
Max. input speed	n_{1max}	rpm		6000	6000	6000	6000	6000	6000	6000
Mean no-load running torque (with $n_1=3000$ rpm and 20°C gearhead temperature)	T_{012}	Nm		1.5	1.3	1.1	0.8	0.7	0.6	0.5
		in.lb		13	12	10	7	6	5	4
Max. torsional backlash	j_t	arcmin		Standard ≤ 5 / Reduced ≤ 3						
Torsional rigidity	C_{t21}	Nm/ arcmin		4.8	6.2	7.6	6.1	7.4	8.5	7.3
		in.lb/ arcmin		42	55	67	54	65	75	65
Tilting rigidity	C_{2K}	Nm/ arcmin		-						
		in.lb/ arcmin		-						
Max. axial force	F_{2AMax}	N		1630.0						
		lb _f		366.8						
Max. tilting moment	M_{2KMax}	Nm		110.0						
		in.lb		973.5						
Efficiency at full load	η	%		95.0						
Service life	L_h	h		> 20000						
Weight (incl. ADP)	m	kg		2.6						
		lb _m		5.7						
Operating noise (with $n_1=3000$ rpm no load)	L_{PA}	db(A)		≤ 68						
Max. permitted housing temperature		°C		+90						
		F		194						
Ambient temperature		°C		0 to +40						
		F		32 to 104						
Lubrication				Lubricated for life						
Paint				Blue RAL 5002						
Mounting position				any						
Direction of rotation				Motor and gearhead same direction						
Protection class				IP 65						
Moment of inertia (relates to the drive)	C	14	J_1	kgcm ²	0.72	0.7	0.66	0.44	0.43	0.43
				10 ⁻³ in.lb.s ²	0.64	0.62	0.58	0.39	0.38	0.38
Clamping hub diameter [mm]	E	19	J_1	kgcm ²	1.05	1.03	0.99	0.77	0.76	0.75
				10 ⁻³ in.lb.s ²	0.93	0.91	0.88	0.68	0.67	0.66

Please contact us for information on the best configuration for S1 conditions of use (continuous operation).

^{a)} Other ratios available on request

^{b)} Higher speeds are possible if the nominal torque is reduced

^{c)} For higher ambient temperatures, please reduce input speed

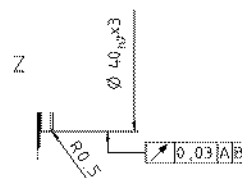
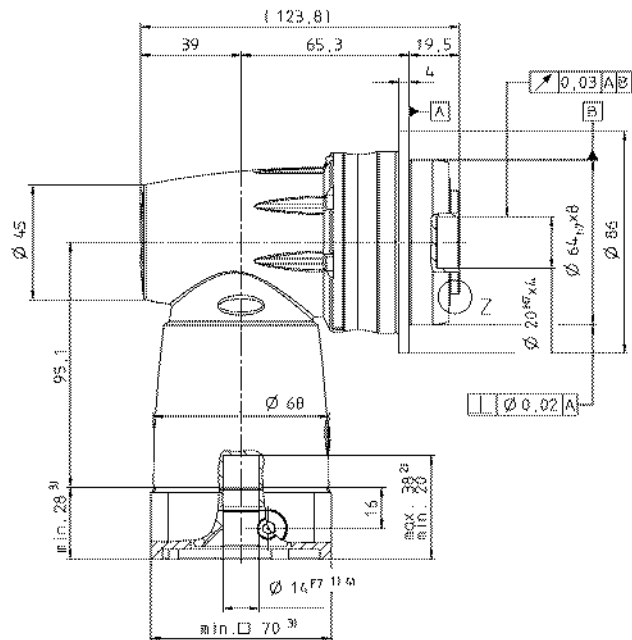
^{d)} Idling torques decrease during operation

^{e)} Refers to center of the output shaft or flange

Technical drawing of a circular mechanical part, likely a flange or a mounting plate. The drawing shows a top view (Fig. 1) and a side view (Fig. 2). The main dimensions are:

- Outer diameter: $\varnothing 79$
- Inner diameter: $\varnothing 31.5$
- Flange thickness: 4.5
- Central hole diameter: $\varnothing 0.25$
- Hole in the flange: $8 \times \varnothing 0.25$
- Hole in the center: $8 \times \varnothing 0.25$

The drawing is labeled "Fig. 1" and "Fig. 2".

Right-angle gearheads
High EndTPC⁺

275

TPC+ 010 MF 2-stage

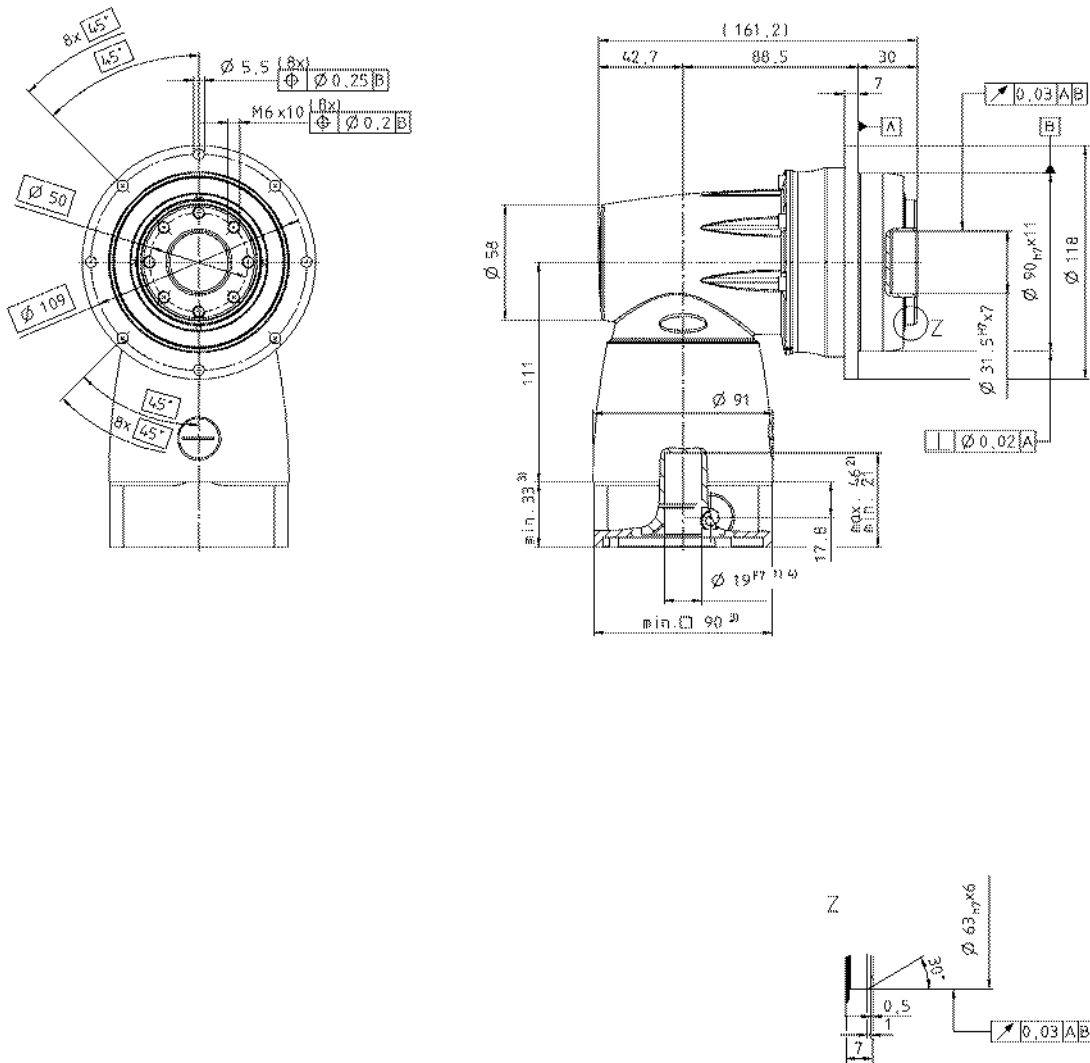
				2-stage							
Ratio		i		4	5	7	8	10	14	20	
Max. acceleration torque (max. 1000 cycles per hour)		T _{2B}	Nm	120	143	143	120	143	143	105	
			in.lb	1062	1266	1266	1062	1266	1266	929	
Nominal output torque (with n_{1N})		T _{2N}	Nm	75	75	75	75	75	75	60	
			in.lb	664	664	664	664	664	664	531	
Emergency stop tourque (permitted 1000 times during the service life of the gearhead)		T _{2Not}	Nm	195	245	250	250	250	250	250	
			in.lb	1726	2168	2213	2213	2213	2213	2213	
Nominal input speed (with T_{2N} and 20°C ambient temperature)		n _{1N}	rpm	2100	2100	2300	2650	2650	2800	2800	
Max. input speed		n _{1max}	rpm	6000	6000	6000	6000	6000	6000	6000	
Mean no-load running torque (with n₁=3000 rpm and 20°C gearhead temperature)		T ₀₁₂	Nm	2.5	2.2	1.9	1.1	1.0	0.8	0.7	
			in.lb	22	19	17	10	9	7	6	
Max. torsional backlash		j _t	arcmin	Standard ≤ 4 / Reduced ≤ 2							
Torsional rigidity		C _{t21}	Nm/ arcmin	12.0	16.0	20.0	16.0	20.0	23.0	21.0	
			in.lb/ arcmin	106	142	177	142	177	204	186	
Tilting rigidity		C _{2K}	Nm/ arcmin	225							
			in.lb/ arcmin	1991							
Max. axial force		F _{2AMax}	N	2150							
			lb _f	484							
Max. tilting moment		M _{2KMax}	Nm	270							
			in.lb	2390							
Efficiency at full load		η	%	95							
Service life		L _h	h	> 20000							
Weight (incl. ADP)		m	kg	6							
			lb _m	13							
Operating noise (with n1=3000 rpm no load)		L _{PA}	db(A)	≤ 68							
Max. permitted housing temperature		°C		+90							
		F		194							
Ambient temperature		°C		0 to +40							
		F		32 to 104							
Lubrication				Lubricated for life							
Paint				Blue RAL 5002							
Mounting position				any							
Direction of rotation				Motor and gearhead same direction							
Protection class				IP 65							
Moment of inertia (relates to the drive)	E	19	J _i	kgcm ²	2.41	2.27	1.99	1.29	1.26	122	1.21
				10 ⁻³ in.lb.s ²	2.13	2.01	1.76	1.14	1.12	107.97	1.07
Clamping hub diameter [mm]	H	28	J _i	kgcm ²	3.85	3.71	3.43	2.73	2.7	2.66	2.64
				10 ⁻³ in.lb.s ²	3.41	3.28	3.04	2.42	2.39	2.35	2.34

Please contact us for information on the best configuration for S1 conditions of use (continuous operation).

- ^{a)} Other ratios available on request
- ^{b)} Higher speeds are possible if the nominal torque is reduced
- ^{c)} For higher ambient temperatures, please reduce input speed
- ^{d)} Idling torques decrease during operation
- ^{e)} Refers to center of the output shaft or flange

View A

2-stage:



See technical data sheet for available clamping hub diameters (mass moment of inertia). Dimensions available on request.

Non-tolerated dimensions ± 1 mm

- 1) Check motor shaft fit.
- 2) Min./Max. permissible motor shaft length. Longer motor shafts are adaptable, please contact us.
- 3) The dimensions depend on the motor.
- 4) Smaller motor shaft diameter is compensated by a bushing with a minimum thickness of 1 mm.



CAD data is available under
<http://www.wittenstein-alpha.de/en/info-and-cad-finder.html>



Motor mounting according to operating manual

TPC+ 025 MF 2-stage

				2-stage							
Ratio		<i>i</i>		4	5	7	8	10	14	20	
Max. acceleration torque (max. 1000 cycles per hour)		<i>T</i> _{2B}	Nm	320	380	330	320	380	330	265	
			in.lb	2832	3363	2921	2832	3363	2921	2345	
Nominal output torque (with n_{1N})		<i>T</i> _{2N}	Nm	170	170	170	170	170	170	120	
			in.lb	1505	1505	1505	1505	1505	1505	1062	
Emergency stop tourque (permitted 1000 times during the service life of the gearhead)		<i>T</i> _{2Not}	Nm	540	625	625	625	625	625	625	
			in.lb	4779	5531	5531	5531	5531	5531	5531	
Nominal input speed (with T_{2N} and 20°C ambient temperature)		<i>n</i> _{1N}	rpm	1900	1900	2100	2300	2300	2400	2400	
Max. input speed		<i>n</i> _{1max}	rpm	4500	4500	4500	4500	4500	4500	4500	
Mean no-load running torque (with n₁=3000 rpm and 20°C gearhead temperature)		<i>T</i> ₀₁₂	Nm	5.8	5.2	4.5	3.2	2.9	2.5	2.2	
			in.lb	51	46	40	28	26	22	19	
Max. torsional backlash		<i>j</i> _t	arcmin	Standard ≤ 4 / Reduced ≤ 2							
Torsional rigidity		<i>C</i> _{t21}	Nm/ arcmin	33.0	43.0	53.0	45.0	56.0	61.0	57.0	
			in.lb/ arcmin	292	381	469	398	496	540	504	
Tilting rigidity		<i>C</i> _{2K}	Nm/ arcmin	550							
			in.lb/ arcmin	4868							
Max. axial force		<i>F</i> _{2AMax}	N	4150							
			lb _f	934							
Max. tilting moment		<i>M</i> _{2KMax}	Nm	440							
			in.lb	3894							
Efficiency at full load		η	%	95							
Service life		<i>L</i> _h	h	> 20000							
Weight (incl. ADP)		<i>m</i>	kg	11							
			lb _m	23							
Operating noise (with n1=3000 rpm no load)		<i>L</i> _{PA}	db(A)	≤ 68							
Max. permitted housing temperature			°C	+90							
			F	194							
Ambient temperature			°C	0 to +40							
			F	32 to 104							
Lubrication				Lubricated for life							
Paint				Blue RAL 5002							
Mounting position				any							
Direction of rotation				Motor and gearhead same direction							
Protection class				IP 65							
Moment of inertia (relates to the drive)	H	28	<i>J</i> _i	kgcm ²	8.3	7.9	7	5.1	5	4.9	4.8
				10 ⁻³ in.lb.s ²	7.35	6.99	6.20	4.51	4.43	4.34	4.25
Clamping hub diameter [mm]	K	38	<i>J</i> _i	kgcm ²	15.4	14.9	14.1	12.2	12.1	12	11.9
				10 ⁻³ in.lb.s ²	13.63	13.19	12.48	10.80	10.71	10.62	10.53

Please contact us for information on the best configuration for S1 conditions of use (continuous operation).

^{a)} Other ratios available on request

^{b)} Higher speeds are possible if the nominal torque is reduced

^{c)} For higher ambient temperatures, please reduce input speed

^{d)} Idling torques decrease during operation

^{e)} Refers to center of the output shaft or flange

Technical drawing of a circular mechanical part, likely a flange or end plate, showing dimensions and tolerances. The drawing includes a top view and a side view.

Top View Dimensions:

- Outer diameter: $\varnothing 135$
- Inner diameter: $\varnothing 63$
- Central hole diameter: $\varnothing 5.5$
- Inner ring hole diameter: $\varnothing 0.25$
- Outer ring hole diameter: $\varnothing 0.2$
- Inner ring hole pitch: $M6 \times 12$
- Outer ring hole pitch: $12 \times$
- Inner ring hole diameter: $\varnothing 0.25$
- Outer ring hole diameter: $\varnothing 0.2$

Side View Dimensions:

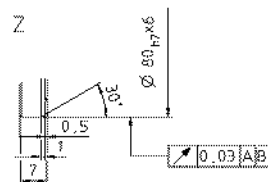
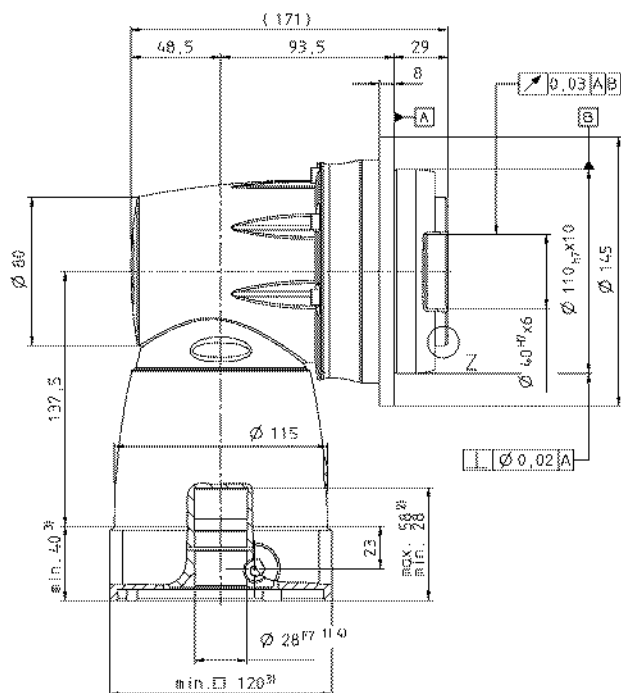
- Outer diameter: $\varnothing 135$
- Inner diameter: $\varnothing 63$
- Central hole diameter: $\varnothing 5.5$
- Inner ring hole diameter: $\varnothing 0.25$
- Outer ring hole diameter: $\varnothing 0.2$
- Inner ring hole pitch: $M6 \times 12$
- Outer ring hole pitch: $12 \times$
- Inner ring hole diameter: $\varnothing 0.25$
- Outer ring hole diameter: $\varnothing 0.2$

Angles:

- Top view angle: 45°
- Side view angle: 22.5°

Other Features:

- Central hole: $\varnothing 5.5$
- Inner ring hole: $\varnothing 0.25$
- Outer ring hole: $\varnothing 0.2$
- Inner ring hole pitch: $M6 \times 12$
- Outer ring hole pitch: $12 \times$
- Inner ring hole diameter: $\varnothing 0.25$
- Outer ring hole diameter: $\varnothing 0.2$

Right-angle gearheads
High EndTPC⁺

279

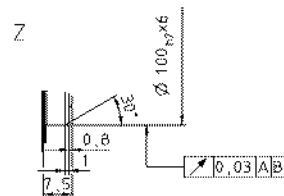
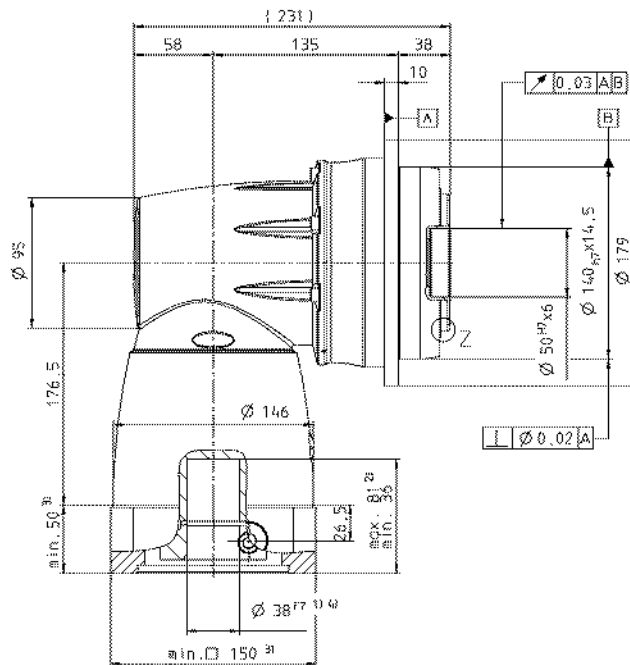
TPC+ 050 MF 2-stage

				2-stage							
Ratio	<i>i</i>			4	5	7	8	10	14	20	
Max. acceleration torque (max. 1000 cycles per hour)	<i>T</i> _{2B}	Nm		700	700	700	700	700	700	540	
		in.lb		6195	6195	6195	6195	6195	6195	4779	
Nominal output torque (with <i>n</i>_N)	<i>T</i> _{2N}	Nm		370	370	370	370	370	370	240	
		in.lb		3275	3275	3275	3275	3275	3275	2124	
Emergency stop tourque (permitted 1000 times during the service life of the gearhead)	<i>T</i> _{2Not}	Nm		960	1200	1250	1250	1250	1250	1250	
		in.lb		8496	10620	11063	11063	11063	11063	11063	
Nominal input speed (with <i>T</i>_{2N} and 20°C ambient temperature)	<i>n</i> _{1N}	rpm		1200	1200	1300	1500	1500	1600	1600	
Max. input speed	<i>n</i> _{1max}	rpm		4500	4500	4500	4500	4500	4500	4500	
Mean no-load running torque (with <i>n</i>₁=3000 rpm and 20°C gearhead temperature)	<i>T</i> ₀₁₂	Nm		12.0	10.5	8.8	5.7	5.0	4.1	3.4	
		in.lb		106	93	78	50	44	36	30	
Max. torsional backlash	<i>j</i> _t	arcmin		Standard ≤ 4 / Reduced ≤ 2							
Torsional rigidity	<i>C</i> ₁₂₁	Nm/ arcmin		73.0	93.0	111.0	93.0	113.0	124.0	111.0	
		in.lb/ arcmin		646	823	982	823	1000	1097	982	
Tilting rigidity	<i>C</i> _{2K}	Nm/ arcmin		560							
		in.lb/ arcmin		4956							
Max. axial force	<i>F</i> _{2AMax}	N		6130							
		lb _f		1379							
Max. tilting moment	<i>M</i> _{2KMax}	Nm		1335							
		in.lb		11815							
Efficiency at full load	η	%		95							
Service life	<i>L</i> _h	h		> 20000							
Weight (incl. ADP)	<i>m</i>	kg		22							
		lb _m		48							
Operating noise (with <i>n</i>₁=3000 rpm no load)	<i>L</i> _{PA}	db(A)		≤ 70							
Max. permitted housing temperature			°C	+90							
			F	194							
Ambient temperature			°C	0 to +40							
			F	32 to 104							
Lubrication				Lubricated for life							
Paint				Blue RAL 5002							
Mounting position				any							
Direction of rotation				Motor and gearhead same direction							
Protection class				IP 65							
Moment of inertia (relates to the drive)	K	38	<i>J</i> ₁	kgcm ²	32.3	30.8	27.90	19.4	19.00	18.7	18.50
Clamping hub diameter [mm]				10 ⁻³ in.lb.s ²	28.59	27.26	24.69	17.17	16.82	16.55	16.37

Please contact us for information on the best configuration for S1 conditions of use (continuous operation).

- ^{a)} Other ratios available on request
- ^{b)} Higher speeds are possible if the nominal torque is reduced
- ^{c)} For higher ambient temperatures, please reduce input speed
- ^{d)} Idling torques decrease during operation
- ^{e)} Refers to center of the output shaft or flange

Technical drawing of a circular mechanical component, likely a flange or end plate, showing a top view. The drawing includes concentric circles representing different diameters: an outer diameter of 168, a middle diameter of 80, and an inner diameter of 6.6. There are 12 holes arranged in a circular pattern with a diameter of 0.25. A central hole has a diameter of 0.7. The drawing also shows a 30-degree angle and a 12x30 dimension. A section line is indicated by a dashed line and a circle with the letter 'A'.

Right-angle gearheads
High EndTPC⁺

281

TPC+ 110 MF 2-stage

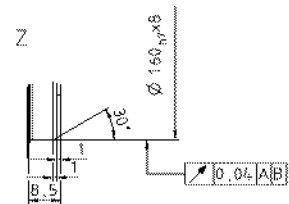
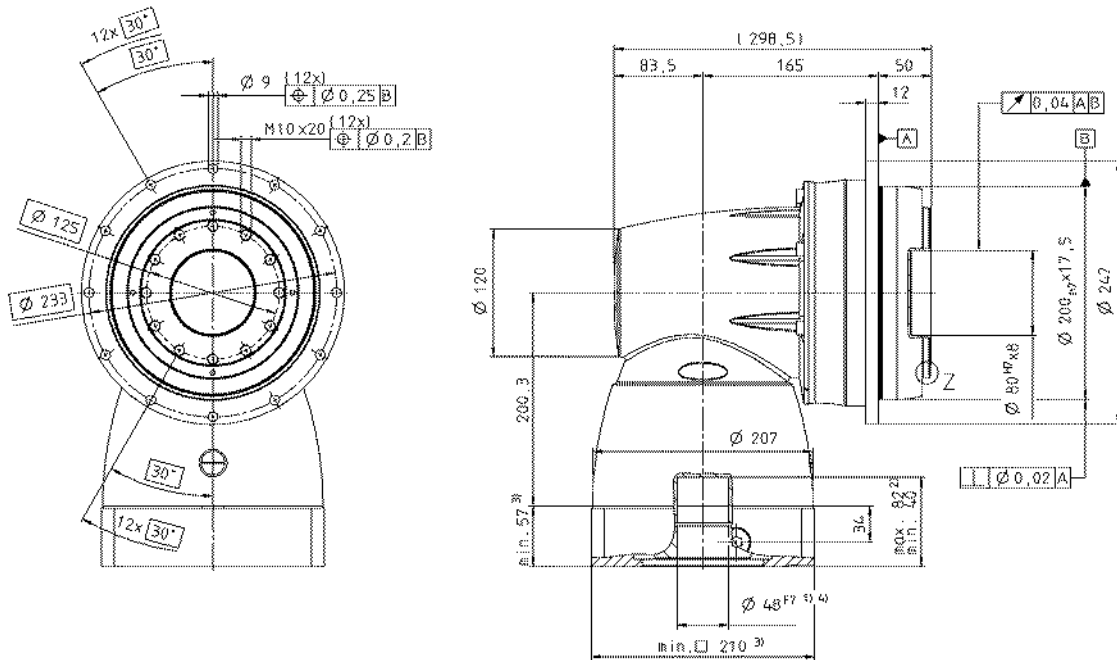
				2-stage								
Ratio		<i>i</i>		4	5	7	8	10	14	20		
Max. acceleration torque (max. 1000 cycles per hour)		<i>T</i> _{2B}	Nm	1260	1575	1600	1260	1575	1600	1400		
			in.lb	11151	13939	14160	11151	13939	14160	12390		
Nominal output torque (with <i>n</i> _N)		<i>T</i> _{2N}	Nm	700	750	750	700	750	750	750		
			in.lb	6195	6638	6638	6195	6638	6638	6638		
Emergency stop tourque (permitted 1000 times during the service life of the gearhead)		<i>T</i> _{2Not}	Nm	1560	1955	2735	2750	2750	2750	2750		
			in.lb	13806	17302	24205	24338	24338	24338	24338		
Nominal input speed (with <i>T</i> _{2N} and 20°C ambient temperature)		<i>n</i> _{1N}	rpm	900	900	1000	1200	1200	1300	1300		
Max. input speed		<i>n</i> _{1max}	rpm	4000	4000	4000	4000	4000	4000	4000		
Mean no-load running torque (with <i>n</i> ₁ =3000 rpm and 20°C gearhead temperature)		<i>T</i> ₀₁₂	Nm	25.0	22.0	19.0	13.5	12.0	10.0	9.0		
			in.lb	221	195	168	119	106	89	80		
Max. torsional backlash		<i>j</i> _t	arcmin	Standard ≤ 4 / Reduced ≤ 2								
Torsional rigidity		<i>C</i> ₁₂₁	Nm/ arcmin	181.0	242.0	324.0	278.0	345.0	407.0	390.0		
			in.lb/ arcmin	1602	2142	2867	2460	3053	3602	3452		
Tilting rigidity		<i>C</i> _{2K}	Nm/ arcmin	1452								
			in.lb/ arcmin	12850								
Max. axial force		<i>F</i> _{2AMax}	N	10050								
			lb _f	2261								
Max. tilting moment		<i>M</i> _{2KMax}	Nm	3280								
			in.lb	29028								
Efficiency at full load		η	%	95								
Service life		<i>L</i> _h	h	> 20000								
Weight (incl. ADP)		<i>m</i>	kg	51								
			lb _m	112								
Operating noise (with n1=3000 rpm no load)		<i>L</i> _{PA}	db(A)	≤ 70								
Max. permitted housing temperature			°C	+90								
			F	194								
Ambient temperature			°C	0 to +40								
			F	32 to 104								
Lubrication				Lubricated for life								
Paint				Blue RAL 5002								
Mounting position				any								
Direction of rotation				Motor and gearhead same direction								
Protection class				IP 65								
Moment of inertia (relates to the drive)		M	48	<i>J</i> ₁	kgcm ²	121.2	112.6	94.7	52.1	50	47.9	46.7
					10 ⁻³ in.lb.s ²	107.26	99.65	83.81	46.11	44.25	42.39	41.33
Clamping hub diameter [mm]												

Please contact us for information on the best configuration for S1 conditions of use (continuous operation).

- ^{a)} Other ratios available on request
- ^{b)} Higher speeds are possible if the nominal torque is reduced
- ^{c)} For higher ambient temperatures, please reduce input speed
- ^{d)} Idling torques decrease during operation
- ^{e)} Refers to center of the output shaft or flange

View A

2-stage:



Right-angle gearheads
High End

TPC+

See technical data sheet for available clamping hub diameters (mass moment of inertia). Dimensions available on request.

Non-tolerated dimensions ± 1 mm

- 1) Check motor shaft fit.
- 2) Min./Max. permissible motor shaft length. Longer motor shafts are adaptable, please contact us.
- 3) The dimensions depend on the motor.
- 4) Smaller motor shaft diameter is compensated by a bushing with a minimum thickness of 1 mm.



CAD data is available under
<http://www.wittenstein-alpha.de/en/info-and-cad-finder.html>



Motor mounting according to operating manual

V-Drive⁺ – Powerful torque but quiet running

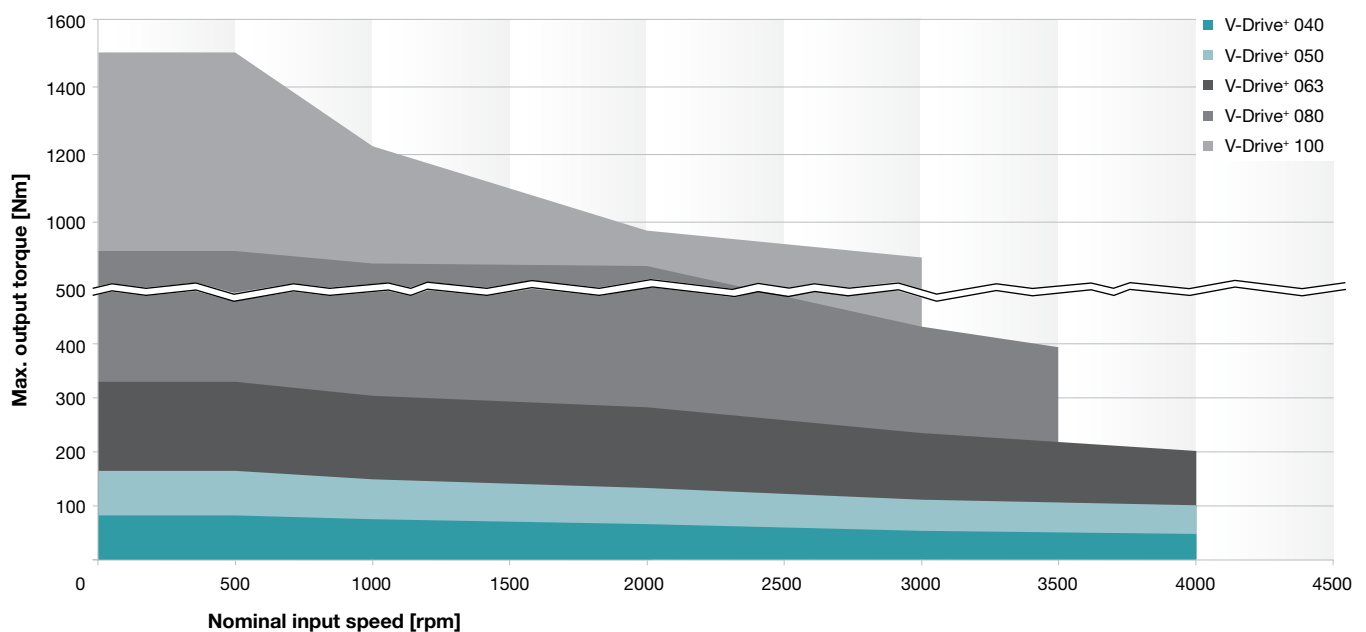
Servo worm gearhead with solid shaft, hollow shaft, and hollow shaft flange outputs. The V-Drive⁺ impresses with its high power density and low torsional backlash. It is especially suitable for continuous duty applications.



Quick size selection

V-Drive⁺ (example for $i = 28$)

For applications in cyclic operation ($DC \leq 60\%$) or continuous operation ($DC \geq 60\%$)



Versions and Applications

Features	VDT+ with flange shaft page 286	VDH+ with smooth/keyed hollow shaft page 294	VDS+ with smooth/keyed shaft or involute shaft page 304
Power density	• •	• •	• •
Positioning accuracy	• •	• •	• •
Torsional rigidity	• • •	• •	• •
Smooth-running	• • •	• • •	• • •

Product features

Ratios	4 – 40	4 – 40	4 – 40
Torsional backlash [arcmin]	≤ 3	≤ 3	≤ 3
Output type			
Smooth output shaft			•
Keywayed output shaft			•
Output shaft with involute gearing			•
Output flange	•		
Hollow shaft interface Connected via shrink disc		•	
Hollow shaft interface, rear side Connected via shrink disc		•	
Flanged hollow shaft	•		
Shaft on both sides			•
Input type			
Motor mounted version	•	•	•
Type			
Food-grade lubrication	•	•	•
Corrosion resistant ^{a)}	•	•	•
Accessories			
Coupling	•		•
Rack	•		•
Pinion	•		•
Shrink disc		•	
Flange shaft	•		

^{a)} Please contact WITTENSTEIN alpha

Right-angle gearheads
High End

VDT+

VDH+

VDS+



V-Drive+

VDT+ 050 1-stage

			1-stage					
Ratio	<i>i</i>		4	7	10	16	28	40
$n_{IN}=500$ rpm	T_{2Max}	Nm	124	132	148	154	165	158
		in.lb	1097	1168	1310	1363	1460	1398
	T_{2Servo}	Nm	54	71	74	81	90	74
		in.lb	478	628	655	717	797	655
$n_{IN}=1000$ rpm	η	%	92	89	86	82	72	64
	T_{2Max}	Nm	124	130	136	140	151	142
		in.lb	1097	1151	1204	1239	1336	1257
$n_{IN}=2000$ rpm	T_{2Servo}	Nm	58	76	80	88	97	81
		in.lb	513	673	708	779	858	717
	η	%	94	91	89	85	77	69
$n_{IN}=3000$ rpm	T_{2Max}	Nm	88	106	112	120	134	122
		in.lb	779	938	991	1062	1186	1080
	T_{2Servo}	Nm	60	78	82	89	99	83
		in.lb	531	690	726	788	876	735
$n_{IN}=4000$ rpm	η	%	95	93	91	88	75	75
	T_{2Max}	Nm	72	86	95	106	112	108
		in.lb	637	761	841	938	991	956
Emergency stop torque	T_{2Servo}	Nm	59	77	81	88	97	81
		in.lb	522	681	717	779	858	717
	η	%	96	94	93	90	83	78
Max. input speed	n_{1Max}	rpm	6000					
Mean no load running torque ^{a)} (With $n_{IN}=3000$ min ⁻¹ and 20° C gear temperature)	T_{012}	Nm	1,3	1,2	1,2	1,1	1	0,9
		in.lb	11,5	10,6	10,6	9,7	8,9	8,0
Max. torsional backlash	j_t	arcmin	≤3					
Torsional rigidity	C_{t21}	Nm/arcmin	17					
		in.lb/arcmin	150					
Max. axial force ^{b)}	F_{2AMax}	N	5000					
		lb _f	1125					
Max. radial force ^{b)}	F_{2RMax}	N	3800					
		lb _f	855					
Max. tilting moment	M_{2KMax}	Nm	409					
		in.lb	3620					
Tilting rigidity	C_{2K}	Nm/arcmin	504					
		in.lb/arcmin	4460					
Service life (For calculation see "Information")	L_h	h	> 20000					
Weight incl. standard adapter plate	m	kg	8,8					
		lb _m	19,4					
Operating noise (with $n_{IN}=3000$ rpm no load)	L_{PA}	dB(A)	≤ 62					
Max. permitted housing temperature		°C	+90					
		F	194					
Ambient temperature		°C	-15 to +40					
		F	5 to 104					
Lubrication			Synthetic transmission oil					
Paint			None					
Direction of rotation			See drawing					
Protection class			IP 65					
Moment of inertia (relates to the drive)	J_t	kgcm ²	2,59	2,12	1,98	1,86	1,82	1,86
		10 ⁻³ in.lb.s ²	2,29	1,87	1,75	1,64	1,61	1,65

^{a)} Idling torques decrease during operation

^{b)} Refers to center of the output shaft or flange

V-Drive⁺

- 1) Check motor shaft fit.
- 2) Min./Max. permissible motor shaft length.
Longer motor shafts are adaptable, please contact us.
- 3) The dimensions depend on the motor.
- 4) Smaller motor shaft diameter is compensated by a bushing with a minimum thickness of 1 mm.
- 5) Output side

 CAD data is available under www.wittenstein-alpha.com

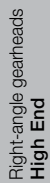
 Motor mounting according to operating manual

VDT+ 063 1-stage

			1-stage					
Ratio	i		4	7	10	16	28	40
n _{IN} =500 rpm	T _{2Max}	Nm	302	314	315	320	328	324
		in.lb	2673	2779	2788	2832	2903	2867
	T _{2Servo}	Nm	198	210	225	221	229	226
		in.lb	1752	1859	1991	1956	2027	2000
η	%	93	91	88	83	74	68	
n _{IN} =1000 rpm	T _{2Max}	Nm	264	284	290	298	304	301
		in.lb	2336	2513	2567	2637	2690	2664
	T _{2Servo}	Nm	192	228	240	238	245	241
		in.lb	1699	2018	2124	2106	2168	2133
η	%	94	93	91	86	78	73	
n _{IN} =2000 rpm	T _{2Max}	Nm	202	243	262	271	282	278
		in.lb	1788	2151	2319	2398	2496	2460
	T _{2Servo}	Nm	174	212	230	238	248	243
		in.lb	1540	1876	2036	2106	2195	2151
η	%	96	94	93	89	83	78	
n _{IN} =3000 rpm	T _{2Max}	Nm	164	190	202	209	235	231
		in.lb	1451	1682	1788	1850	2080	2044
	T _{2Servo}	Nm	128	166	184	209	198	194
		in.lb	1133	1469	1628	1850	1752	1717
η	%	96	95	94	91	85	81	
n _{IN} =4000 rpm	T _{2Max}	Nm	128	148	164	175	201	198
		in.lb	1133	1310	1451	1549	1779	1752
	T _{2Servo}	Nm	104	132	152	175	165	162
		in.lb	920	1168	1345	1549	1460	1434
η	%	97	96	94	92	86	83	
Emergency stop torque	T _{2Not}	Nm in.lb	460 4071	484 4283	491 4345	494 4372	518 4584	447 3956
Max. input speed	n _{1Max}	rpm	4500					
Mean no load running torque ^{a)} (With n _i =3000 min ⁻¹ and 20° C gear temperature)	T ₀₁₂	Nm in.lb	2,1 18,6	1,9 16,8	1,8 15,9	1,7 15,0	1,6 14,2	1,4 12,4
Max. torsional backlash	j _t	arcmin	≤3					
Torsional rigidity	C _{t21}	Nm/arcmin	50					
		in.lb/arcmin	443					
Max. axial force ^{b)}	F _{2AMax}	N	8250					
		lb _f	1856					
Max. radial force ^{b)}	F _{2RMax}	N	6000					
		lb _f	1350					
Max. tilting moment	M _{2KMax}	Nm	843					
		in.lb	7461					
Tilting rigidity	C _{2K}	Nm/arcmin	603					
		in.lb/arcmin	5337					
Service life (For calculation see "Information")	L _h	h	> 20000					
Weight incl. standard adapter plate	m	kg	14,5					
		lb _m	32					
Operating noise (with n _i = 3000 rpm no load)	L _{PA}	dB(A)	≤ 64					
Max. permitted housing temperature		°C	+90					
		F	194					
Ambient temperature		°C	-15 to +40					
		F	5 to 104					
Lubrication			Synthetic transmission oil					
Paint			None					
Direction of rotation			See drawing					
Protection class			IP 65					
Moment of inertia (relates to the drive)	J _I	kgcm ²	7.45	6.02	5.65	5.49	5.42	5.36
		10 ⁻³ in.lb.s ²	6.60	5.33	5.00	4.86	4.80	4.75

^{a)} Idling torques decrease during operation

^{b)} Refers to center of the output shaft or flange

V-Drive⁺

- 1) Check motor shaft fit.
- 2) Min./Max. permissible motor shaft length.
Longer motor shafts are adaptable, please contact us.
- 3) The dimensions depend on the motor.
- 4) Smaller motor shaft diameter is compensated by a bushing with a minimum thickness of 1 mm.
- 5) Output side

 CAD data is available under www.wittenstein-alpha.com

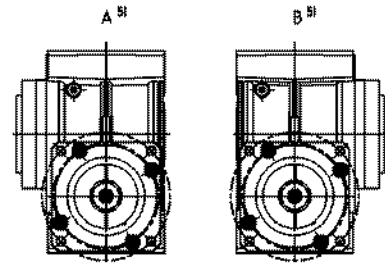
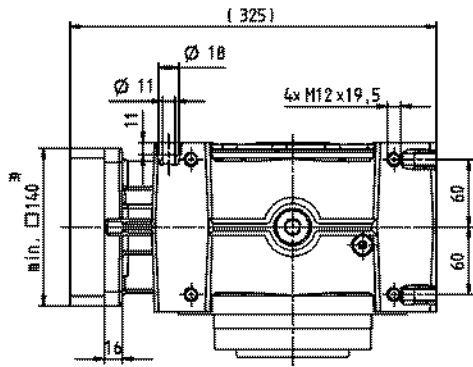
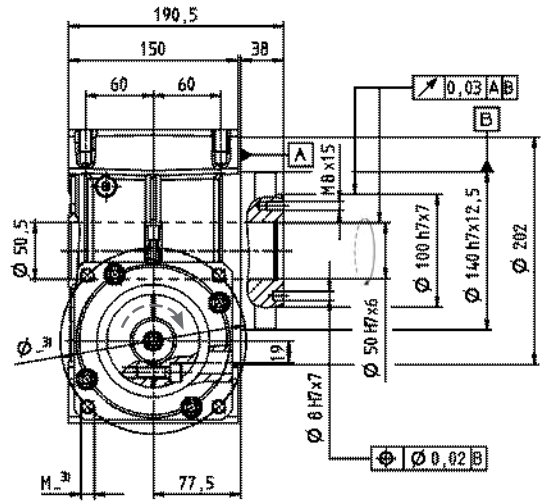
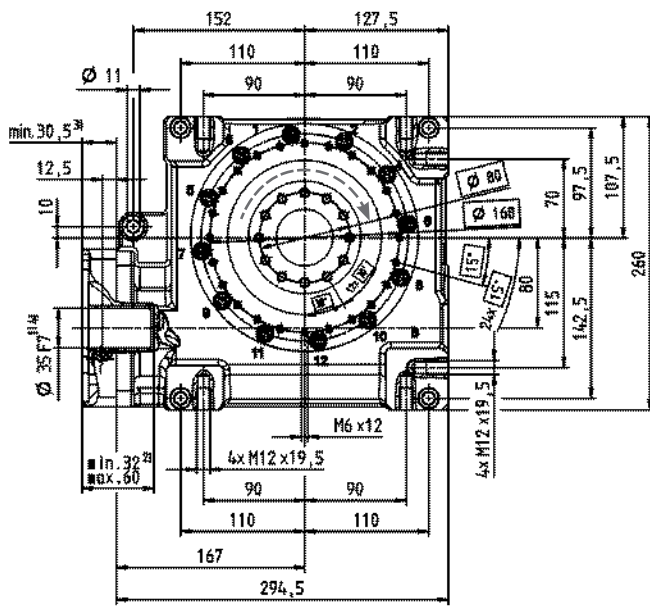
 Motor mounting according to operating manual

VDT+ 080 1-stage

			1-stage					
Ratio	<i>i</i>		4	7	10	16	28	40
$n_{IN}=500$ rpm	T_{2Max}	Nm	578	646	672	702	785	676
		in.lb	5115	5717	5947	6213	6947	5983
	T_{2Servo}	Nm	469	601	613	677	764	631
		in.lb	4151	5319	5425	5991	6761	5584
$n_{IN}=1000$ rpm	η	%	94	92	89	86	77	70
	T_{2Max}	Nm	514	602	588	656	698	613
		in.lb	4549	5328	5204	5806	6177	5425
$n_{IN}=2000$ rpm	T_{2Servo}	Nm	491	574	561	625	665	584
		in.lb	4345	5080	4965	5531	5885	5168
	η	%	95	93	91	88	81	74
$n_{IN}=3000$ rpm	T_{2Max}	Nm	350	435	431	500	536	470
		in.lb	3098	3850	3814	4425	4744	4160
	T_{2Servo}	Nm	335	415	411	476	511	448
		in.lb	2965	3673	3637	4213	4522	3965
$n_{IN}=3500$ rpm	η	%	96	95	93	89	84	79
	T_{2Max}	Nm	259	336	334	400	433	380
		in.lb	2292	2974	2956	3540	3832	3363
Emergency stop torque	T_{2Servo}	Nm	247	320	319	381	413	362
		in.lb	2186	2832	2823	3372	3655	3204
	η	%	97	96	94	92	86	81
Max. input speed	T_{2Max}	Nm	227	299	300	362	394	346
		in.lb	2009	2646	2655	3204	3487	3062
	T_{2Servo}	Nm	217	285	286	345	376	330
		in.lb	1920	2522	2531	3053	3328	2921
Max. torsional backlash	η	%	97	96	94	92	87	82
Emergency stop torque	T_{Not}	Nm	938	993	963	1005	1064	941
		in.lb	8301	8788	8523	8894	9416	8328
Max. input speed	n_{1Max}	rpm	4000					
Mean no load running torque ^{a)} (With $n_1=3000$ min ⁻¹ and 20° C gear temperature)	T_{012}	Nm	3,6	3,5	3,4	3,2	3	2,8
		in.lb	31,9	31,0	30,1	28,3	26,6	24,8
Max. torsional backlash	j_t	arcmin	≤3					
Torsional rigidity	C_{t21}	Nm/arcmin	113					
		in.lb/arcmin	1000					
Max. axial force ^{b)}	F_{2AMax}	N	13900					
		lb _f	3128					
Max. radial force ^{b)}	F_{2RMax}	N	9000					
		lb _f	2025					
Max. tilting moment	M_{2KMax}	Nm	1544					
		in.lb	13664					
Tilting rigidity	C_{2K}	Nm/arcmin	1178					
		in.lb/arcmin	10425					
Service life (For calculation see "Information")	L_h	h	> 20000					
Weight incl. standard adapter plate	m	kg	31					
		lb _m	68,5					
Operating noise (with $n_1=3000$ rpm no load)	L_{PA}	dB(A)	≤ 66					
Max. permitted housing temperature		°C	+90					
		F	194					
Ambient temperature		°C	-15 to +40					
		F	5 to 104					
Lubrication			Synthetic transmission oil					
Paint			None					
Direction of rotation			See drawing					
Protection class			IP 65					
Moment of inertia (relates to the drive)	J_t	kgcm ²	23,99	18,64	18,23	16,54	16,32	16,94
		10 ⁻⁴ in.lb.s ²	21,23	16,49	16,13	14,64	14,44	14,99

^{a)} Idling torques decrease during operation

^{b)} Refers to center of the output shaft or flange



Right-angle gearheads
High End

 VDT^+

Non-tolerated dimensions ± 1 mm

- 1) Check motor shaft fit.
- 2) Min./Max. permissible motor shaft length.
Longer motor shafts are adaptable, please contact us.
- 3) The dimensions depend on the motor.
- 4) Smaller motor shaft diameter is compensated by a bushing with a minimum thickness of 1 mm.
- 5) Output side

 CAD data is available under www.wittenstein-alpha.com

 Motor mounting according to operating manual

V-Drive⁺

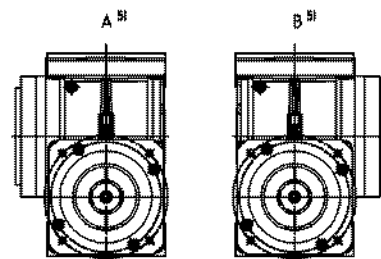
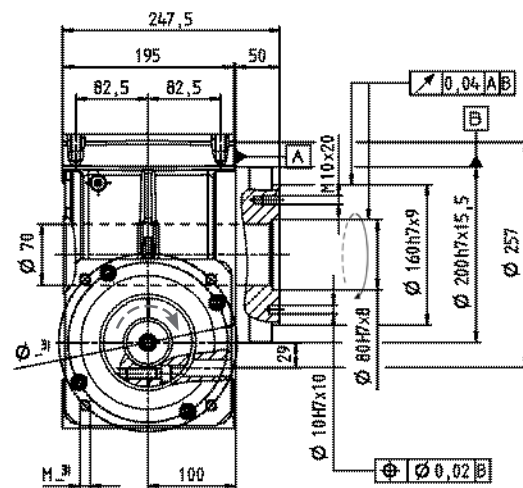
VDT+ 100 1-stage

			1-stage					
Ratio	i		4	7	10	16	28	40
n _{IN} =500 rpm	T _{2Max}	Nm	1184	1336	1377	1392	1505	1376
		in.lb	10478	11824	12186	12319	13319	12178
	T _{2Servo}	Nm	1155	1304	1343	1359	1469	1343
		in.lb	10222	11540	11886	12027	13001	11886
	η	%	95	93	91	87	80	76
n _{IN} =1000 rpm	T _{2Max}	Nm	905	1070	1122	1140	1251	1162
		in.lb	8009	9470	9930	10089	11071	10284
	T _{2Servo}	Nm	883	1044	1095	1113	1221	1134
		in.lb	7815	9239	9691	9850	10806	10036
	η	%	95	94	92	88	82	79
n _{IN} =2000 rpm	T _{2Max}	Nm	595	748	807	830	930	883
		in.lb	5266	6620	7142	7346	8231	7815
	T _{2Servo}	Nm	581	730	788	810	908	862
		in.lb	5142	6461	6974	7169	8036	7629
	η	%	96	95	94	91	86	82
n _{IN} =3000 rpm ^{c)}	T _{2Max}	Nm	430	564	621	644	735	709
		in.lb	3806	4991	5496	5699	6505	6275
	T _{2Servo}	Nm	420	551	606	629	718	692
		in.lb	3717	4876	5363	5567	6354	6124
	η	%	97	96	95	92	87	84
n _{IN} =3500 rpm	T _{2Max}	Nm	–	–	–	–	–	–
		in.lb	–	–	–	–	–	–
	T _{2Servo}	Nm	–	–	–	–	–	–
		in.lb	–	–	–	–	–	–
η	%	–	–	–	–	–	–	
Emergency stop torque	T _{2Not}	Nm	1819	1932	1940	1955	2073	1856
in.lb		16098	17098	17169	17302	18346	16426	
Max. input speed	n _{1Max}	rpm	3500					
Mean no load running torque ^{a)} (With n ₁ =3000 min ⁻¹ and 20° C gear temperature)	T ₀₁₂	Nm	9,8	8,1	7,4	6,7	5,8	5
		in.lb	86,7	71,7	65,5	59,3	51,3	44,3
Max. torsional backlash	j _t	arcmin	≤3					
Torsional rigidity	C _{t21}	Nm/arcmin	213					
		in.lb/arcmin	1885					
Max. axial force ^{b)}	F _{2AMax}	N	19500					
		lb _f	4388					
Max. radial force ^{b)}	F _{2RMax}	N	14000					
		lb _f	3150					
Max. tilting moment	M _{2KMax}	Nm	3059					
		in.lb	27072					
Tilting rigidity	C _{2K}	Nm/arcmin	2309					
		in.lb/arcmin	20435					
Service life (For calculation see "Information")	L _h	h	> 20000					
Weight incl. standardadapter plate	m	kg	62					
		lb _m	137					
Operating noise (with n ₁ = 3000 rpm no load)	L _{PA}	dB(A)	≤ 70					
Max. permitted housing temperature		°C	+90					
		F	194					
Ambient temperature		°C	-15 to +40					
		F	5 to 104					
Lubrication			Synthetic transmission oil					
Paint			None					
Direction of rotation			See drawing					
Protection class			IP 65					
Moment of inertia (relates to the drive)	J _i	kgcm ²	83,51	64,27	59,95	59,40	56,32	56,49
		10 ⁻³ in.lb.s ²	73.90	56.88	53.06	52.56	49.85	50.00

^{a)} Idling torques decrease during operation

^{b)} Refers to center of the output shaft or flange

^{c)} Reduce by 20% in S1 operation at 20°C ambient temperature.

VDT⁺

- 1) Check motor shaft fit.
- 2) Min./Max. permissible motor shaft length.
Longer motor shafts are adaptable, please contact us.
- 3) The dimensions depend on the motor.
- 4) Smaller motor shaft diameter is compensated by a bushing with a minimum thickness of 1 mm.
- 5) Output side

 Motor mounting according to operating manual

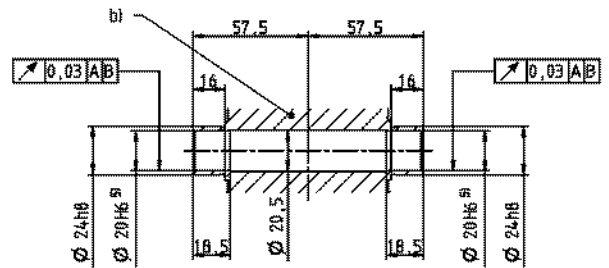
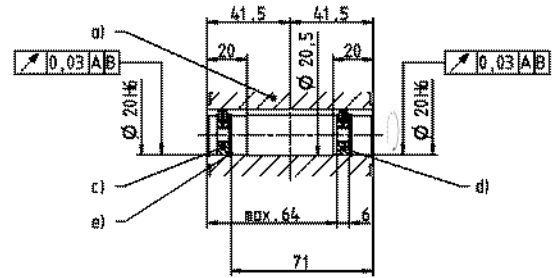
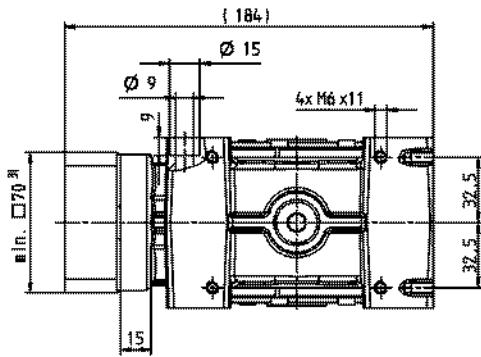
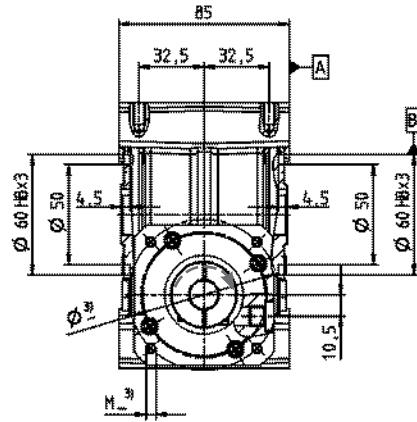
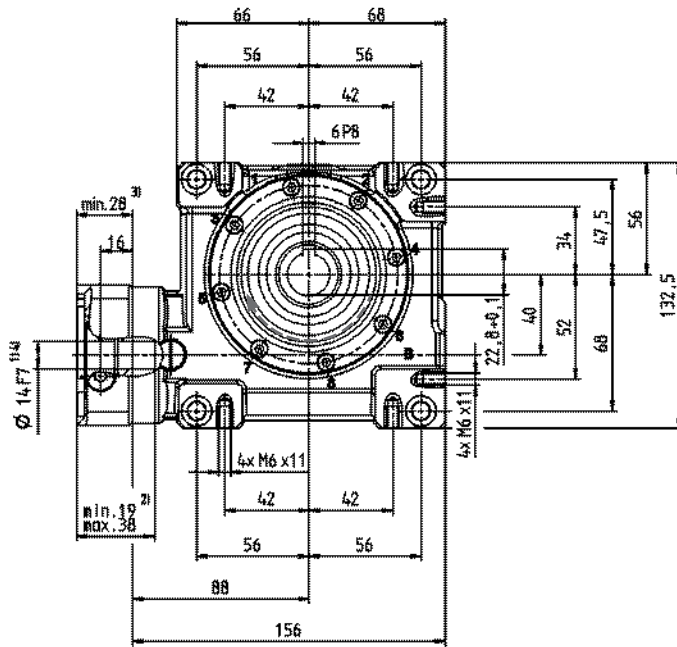
293

VDH+ 040 1-stage

				1-stage						
Ratio		i		4	7	10	16	28	40	
n _{IN} =500 rpm	T _{2Max}	Nm		60	75	83	86	91	83	
		in.lb		531	664	735	761	805	735	
	T _{2Servo}	Nm		17	24	25	26	29	25	
		in.lb		150	212	221	230	257	221	
	η	%		93	90	88	82	73	67	
n _{IN} =1000 rpm	T _{2Max}	Nm		45	60	68	75	75	76	
		in.lb		398	531	602	664	664	673	
	T _{2Servo}	Nm		19	26	28	29	32	28	
		in.lb		168	230	248	257	283	248	
	η	%		94	92	90	86	77	73	
n _{IN} =2000 rpm	T _{2Max}	Nm		35	50	54	59	63	65	
		in.lb		310	443	478	522	558	575	
	T _{2Servo}	Nm		19	26	28	29	33	29	
		in.lb		168	230	248	257	292	257	
	η	%		96	94	92	88	81	77	
n _{IN} =3000 rpm	T _{2Max}	Nm		30	42	46	51	53	56	
		in.lb		266	372	407	451	469	496	
	T _{2Servo}	Nm		19	26	28	29	32	28	
		in.lb		168	230	248	257	283	248	
	η	%		96	95	93	90	83	79	
n _{IN} =4000 rpm	T _{2Max}	Nm		28	38	43	44	47	50	
		in.lb		248	336	381	389	416	443	
	T _{2Servo}	Nm		19	25	27	28	31	27	
		in.lb		168	221	239	248	274	239	
	η	%		96	95	94	91	84	81	
Emergency stop torque		T _{2Not}	Nm	118	126	125	129	134	122	
			in.lb	1044	1115	1106	1142	1186	1080	
Max. input speed		n _{1Max}	rpm	6000						
Mean no load running torque ^{a)} (With n ₁ =3000 min ⁻¹ and 20° C gear temperature)		T ₀₁₂	Nm	0,8	0,7	0,5	0,5	0,4	0,4	
			in.lb	7,1	6,2	4,4	4,4	3,5	3,5	
Max. torsional backlash		j _t	arcmin	≤3						
Torsional rigidity		C _{t21}	Nm/arcmin	4,5						
			in.lb/arcmin	40						
Max. axial force ^{b)}		F _{2AMax}	N	3000						
			lb _f	675						
Max. radial force ^{b)}		F _{2RMax}	N	2400						
			lb _f	540						
Max. tilting moment		M _{2KMax}	Nm	205						
			in.lb	1814						
Service life (For calculation see "Information")		L _h	h	> 20000						
Weight incl. standard adapter plate		m	kg	4,0						
			lb _m	8,8						
Operating noise (with n ₁ = 3000 rpm no load)		L _{PA}	dB(A)	≤ 54						
Max. permitted housing temperature			°C	+90						
			F	194						
Ambient temperature			°C	-15 to +40						
			F	5 to 104						
Lubrication				Synthetic transmission oil						
Paint				None						
Direction of rotation				See drawing						
Protection class				IP 65						
Moment of inertia (relates to the drive) Moments of inertia for motor shaft diameter 14 and 19 mm	C	14	J _i	kgcm ²	0.52	0.38	0.34	0.32	0.32	0.31
				10 ⁻³ in.lb.s ²	0.46	0.34	0.30	0.28	0.28	0.27
	E	19	J _i	kgcm ²	0.54	0.40	0.37	0.35	0.34	0.33
				10 ⁻³ in.lb.s ²	0.48	0.35	0.33	0.31	0.30	0.29

^{a)} Idling torques decrease during operation

^{b)} Refers to center of the output shaft or flange



- a) Hollow shaft, keywayed
- b) Hollow shaft, smooth
- c) End disc for screw M6
- d) End disc as forcing washer for screw M8
- e) Locking ring – DIN 472

Non-tolerated dimensions ± 1 mm

- 1) Check motor shaft fit.
- 2) Min./Max. permissible motor shaft length.
Longer motor shafts are adaptable, please contact us.
- 3) The dimensions depend on the motor.
- 4) Smaller motor shaft diameter is compensated by a bushing with a minimum thickness of 1 mm. Motor shaft diameters up to 19 mm available – please contact WITTENSTEIN alpha.
- 5) Tolerance h6 for mounted shaft.

 CAD data is available under www.wittenstein-alpha.com

 Motor mounting according to operating manual

Right-angle gearheads High End

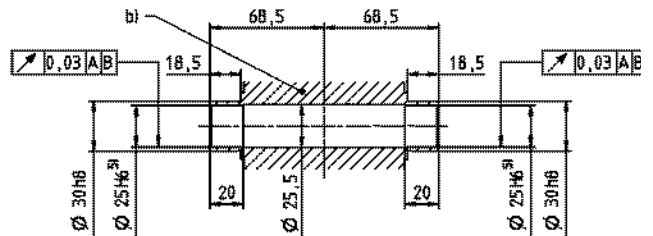
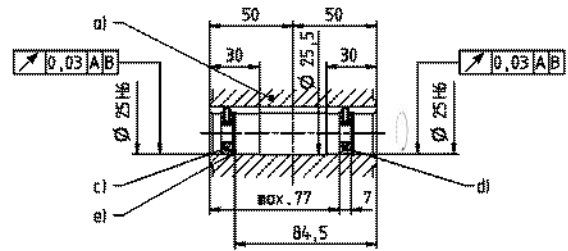
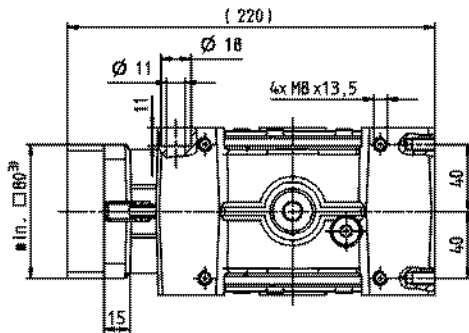
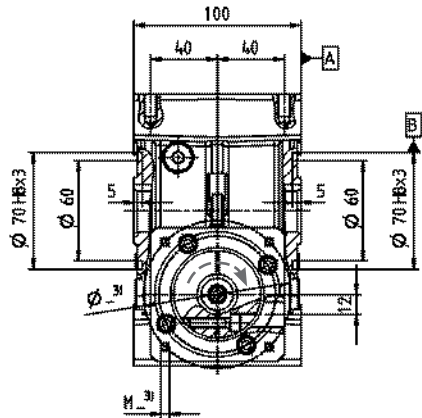
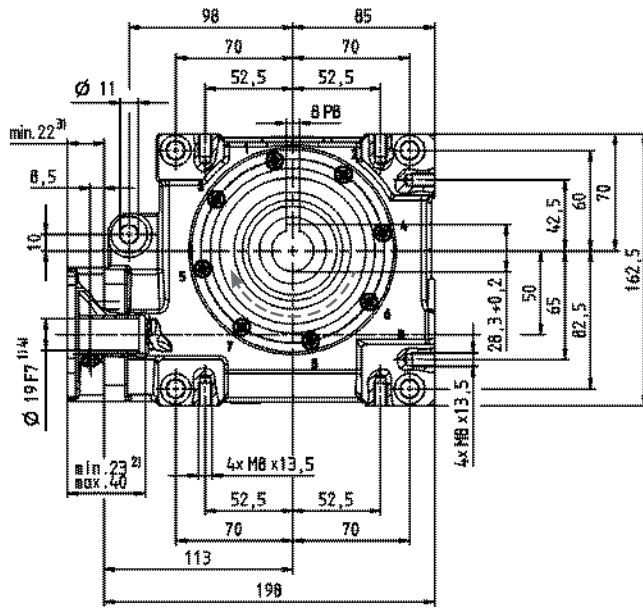
 VDH^+ V-Drive⁺

VDH+ 050 1-stage

			1-stage					
Ratio	<i>i</i>		4	7	10	16	28	40
$n_{IN}=500$ rpm	T_{2Max}	Nm	124	132	148	154	165	158
		in.lb	1097	1168	1310	1363	1460	1398
	T_{2Servo}	Nm	54	71	74	81	90	74
		in.lb	478	628	655	717	797	655
$n_{IN}=1000$ rpm	η	%	92	89	86	82	72	64
	T_{2Max}	Nm	124	130	136	140	151	142
		in.lb	1097	1151	1204	1239	1336	1257
$n_{IN}=2000$ rpm	T_{2Servo}	Nm	58	76	80	88	97	81
		in.lb	513	673	708	779	858	717
	η	%	94	91	89	85	77	69
$n_{IN}=3000$ rpm	T_{2Max}	Nm	88	106	112	120	134	122
		in.lb	779	938	991	1062	1186	1080
	T_{2Servo}	Nm	60	78	82	89	99	83
		in.lb	531	690	726	788	876	735
$n_{IN}=4000$ rpm	η	%	95	93	91	88	75	75
	T_{2Max}	Nm	72	86	95	106	112	108
		in.lb	637	761	841	938	991	956
Emergency stop torque	T_{2Servo}	Nm	59	77	81	88	97	81
		in.lb	522	681	717	779	858	717
	η	%	96	94	93	90	83	78
Max. input speed	T_{2Max}	Nm	62	77	83	92	102	95
		in.lb	549	681	735	814	903	841
	T_{2Servo}	Nm	58	76	79	87	96	80
		in.lb	513	673	699	770	850	708
Mean no load running torque ^{a)} (With $n_i=3000$ min ⁻¹ and 20° C gear temperature)	η	%	96	95	93	91	85	80
	T_{Not}	Nm	230	242	242	250	262	236
		in.lb	2036	2142	2142	2213	2319	2089
Max. torsional backlash	i_t	arcmin	6000					
Torsional rigidity	C_{t21}	Nm/arcmin	1,3	1,2	1,2	1,1	1	0,9
		in.lb/arcmin	11,5	10,6	10,6	9,7	8,9	8,0
Max. axial force ^{b)}	F_{2AMax}	N	≤3					
		lb _f	8					
Max. radial force ^{b)}	F_{2RMax}	N	71					
		lb _f	5000					
Max. tilting moment	M_{2KMax}	N	1125					
		in.lb	3800					
Service life (For calculation see "Information")	L_h	Nm	855					
		in.lb	409					
Weight incl. standard adapter plate	m	h	> 20000					
		kg	7,4					
Operating noise (with $n_i=3000$ rpm no load)	L_{PA}	lb _m	16,4					
		dB(A)	≤ 62					
Max. permitted housing temperature		°C	+90					
		F	194					
Ambient temperature		°C	-15 to +40					
		F	5 to 104					
Lubrication			Synthetic transmission oil					
Paint			None					
Direction of rotation			See drawing					
Protection class			IP 65					
Moment of inertia (relates to the drive)	J_I	kgcm ²	2.31	2.02	1.93	1.84	1.81	1.86
		10 ⁻³ in.lb.s ²	2.04	1.79	1.71	1.63	1.60	1.64

^{a)} Idling torques decrease during operation

^{b)} Refers to center of the output shaft or flange



- a) Hollow shaft, keywayed
- b) Hollow shaft, smooth
- c) End disc for screw M10
- d) End disc as forcing washer for screw M12
- e) Locking ring – DIN 472

Non-tolerated dimensions ± 1 mm

- 1) Check motor shaft fit.
- 2) Min./Max. permissible motor shaft length.
Longer motor shafts are adaptable, please contact us.
- 3) The dimensions depend on the motor.
- 4) Smaller motor shaft diameter is compensated by a bushing with a minimum thickness of 1 mm.
- 5) Tolerance h6 for mounted shaft.



 CAD data is available under www.wittenstein-alpha.com

 Motor mounting according to operating manual

Right-angle gearheads
High End

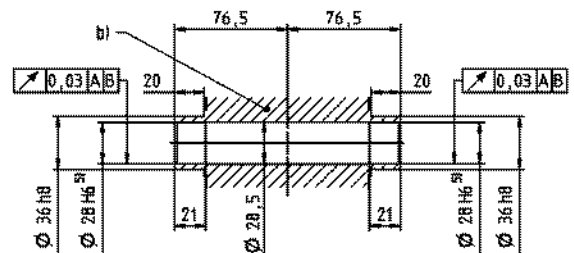
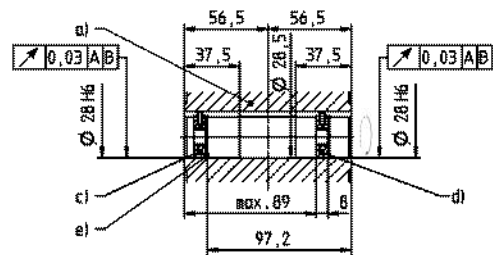
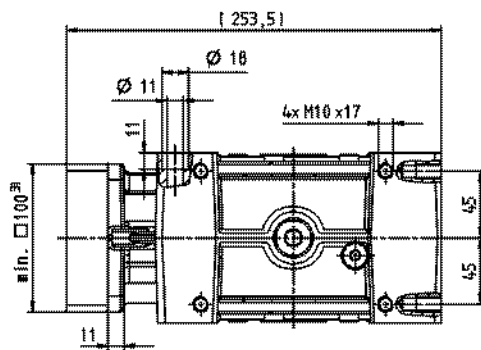
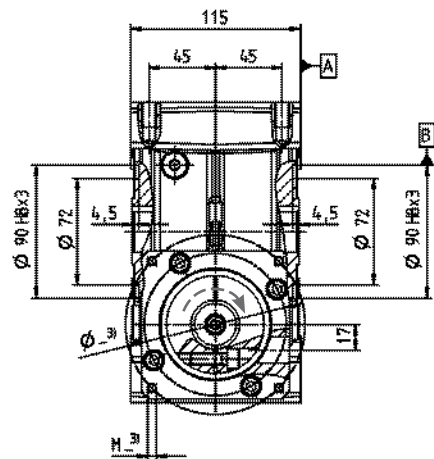
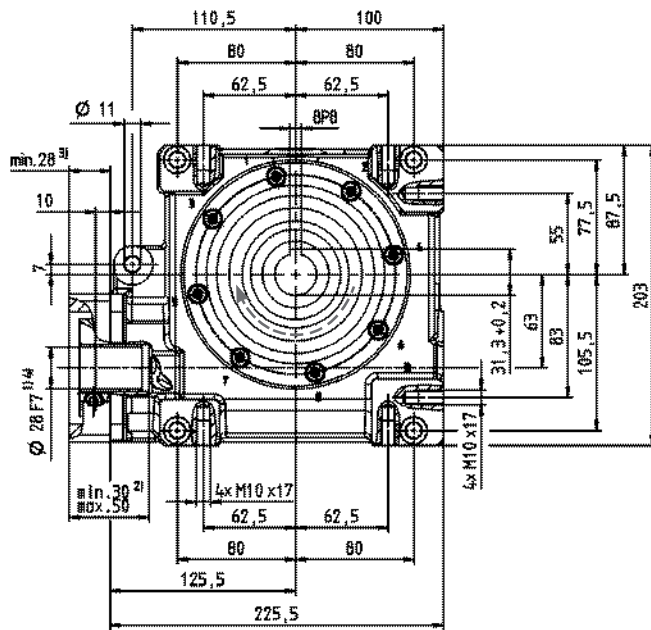
 VDH^+ V-Drive⁺

VDH+ 063 1-stage

			1-stage					
Ratio	<i>i</i>		4	7	10	16	28	40
$n_{IN}=500$ rpm	T_{2Max}	Nm	302	314	315	320	328	324
		in.lb	2673	2779	2788	2832	2903	2867
	T_{2Servo}	Nm	198	210	225	221	229	226
		in.lb	1752	1859	1991	1956	2027	2000
$n_{IN}=1000$ rpm	T_{2Max}	Nm	264	284	290	298	304	301
		in.lb	2336	2513	2567	2637	2690	2664
	T_{2Servo}	Nm	192	228	240	238	245	241
		in.lb	1699	2018	2124	2106	2168	2133
$n_{IN}=2000$ rpm	T_{2Max}	Nm	202	243	262	271	282	278
		in.lb	1788	2151	2319	2398	2496	2460
	T_{2Servo}	Nm	174	212	230	238	248	243
		in.lb	1540	1876	2036	2106	2195	2151
$n_{IN}=3000$ rpm	T_{2Max}	Nm	164	190	202	209	235	231
		in.lb	1451	1682	1788	1850	2080	2044
	T_{2Servo}	Nm	128	166	184	209	198	194
		in.lb	1133	1469	1628	1850	1752	1717
$n_{IN}=4000$ rpm	T_{2Max}	Nm	128	148	164	175	201	198
		in.lb	1133	1310	1451	1549	1779	1752
	T_{2Servo}	Nm	104	132	152	175	165	162
		in.lb	920	1168	1345	1549	1460	1434
Emergency stop torque	T_{2Not}	Nm	460	484	491	494	518	447
		in.lb	4071	4283	4345	4372	4584	3956
Max. input speed	n_{1Max}	rpm	4500					
Mean no load running torque ^{a)} (With $n_1=3000$ min ⁻¹ and 20° C gear temperature)	T_{012}	Nm	2,1	1,9	1,8	1,7	1,6	1,4
		in.lb	18,6	16,8	15,9	15,0	14,2	12,4
Max. torsional backlash	j_t	arcmin	≤3					
Torsional rigidity	C_{t21}	Nm/arcmin	28					
		in.lb/arcmin	248					
Max. axial force ^{b)}	F_{2AMax}	N	8250					
		lb _f	1856					
Max. radial force ^{b)}	F_{2RMax}	N	6000					
		lb _f	1350					
Max. tilting moment	M_{2KMax}	Nm	843					
		in.lb	7461					
Service life (For calculation see "Information")	L_h	h	> 20000					
Weight incl. standard adapter plate	m	kg	12					
		lb _m	26,5					
Operating noise (with $n_1=3000$ rpm no load)	L_{PA}	dB(A)	≤ 64					
Max. permitted housing temperature		°C	+90					
		F	194					
Ambient temperature		°C	-15 to +40					
		F	5 to 104					
Lubrication			Synthetic transmission oil					
Paint			None					
Direction of rotation			See drawing					
Protection class			IP 65					
Moment of inertia (relates to the drive)	J_1	kgcm ²	6.68	5.77	5.53	5.44	5.40	5.35
		10 ⁻³ in.lb.s ²	5.91	5.11	4.89	4.81	4.78	4.74

^{a)} Idling torques decrease during operation

^{b)} Refers to center of the output shaft or flange



- a) Hollow shaft, keywayed
- b) Hollow shaft, smooth
- c) End disc for screw M10
- d) End disc as forcing washer for screw M12
- e) Locking ring – DIN 472

Non-tolerated dimensions ± 1 mm

- 1) Check motor shaft fit.
- 2) Min./Max. permissible motor shaft length.
Longer motor shafts are adaptable, please contact us.
- 3) The dimensions depend on the motor.
- 4) Smaller motor shaft diameter is compensated by a bushing with a minimum thickness of 1 mm.
- 5) Tolerance h6 for mounted shaft.

CAD data is available under www.wittenstein-alpha.com

Motor mounting according to operating manual

Right-angle gearheads
High End

VDH⁺

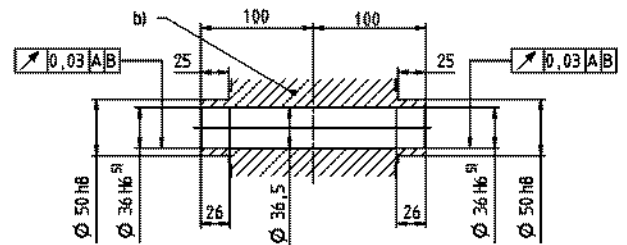
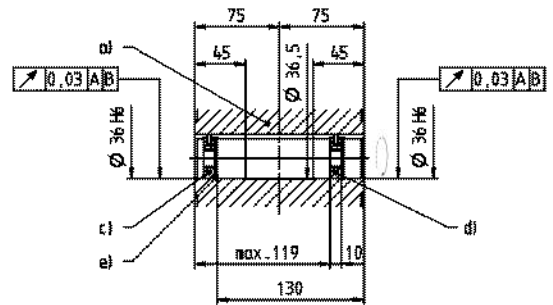
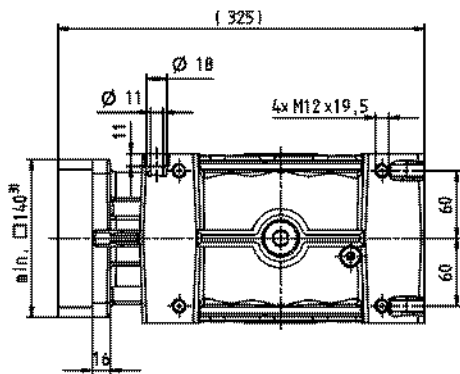
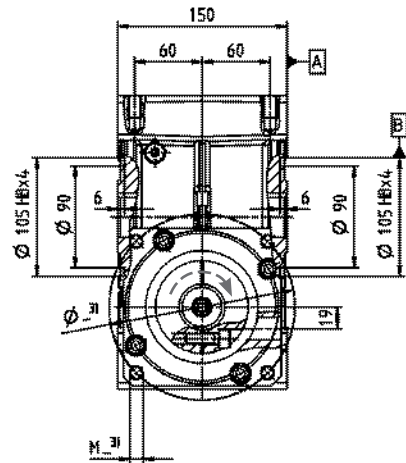
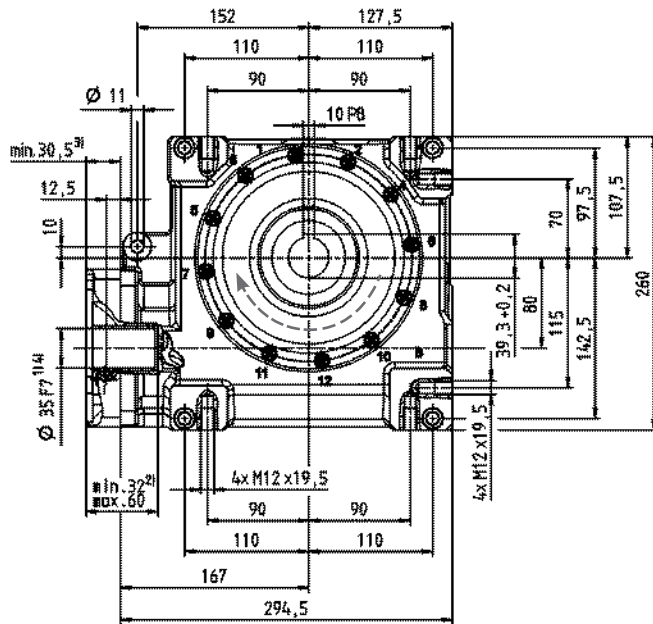
V-Drive⁺

VDH+ 080 1-stage

			1-stage					
Ratio	<i>i</i>		4	7	10	16	28	40
$n_{IN}=500$ rpm	T_{2Max}	Nm	578	646	672	702	785	676
		in.lb	5115	5717	5947	6213	6947	5983
	T_{2Servo}	Nm	469	601	613	677	764	631
		in.lb	4151	5319	5425	5991	6761	5584
$n_{IN}=1000$ rpm	η	%	94	92	89	86	77	70
	T_{2Max}	Nm	514	602	588	656	698	613
		in.lb	4549	5328	5204	5806	6177	5425
$n_{IN}=2000$ rpm	T_{2Servo}	Nm	491	574	561	625	665	584
		in.lb	4345	5080	4965	5531	5885	5168
	η	%	95	93	91	88	81	74
$n_{IN}=3000$ rpm	T_{2Max}	Nm	350	435	431	500	536	470
		in.lb	3098	3850	3814	4425	4744	4160
	T_{2Servo}	Nm	335	415	411	476	511	448
		in.lb	2965	3673	3637	4213	4522	3965
$n_{IN}=3500$ rpm	η	%	96	95	93	89	84	79
	T_{2Max}	Nm	259	336	334	400	433	380
		in.lb	2292	2974	2956	3540	3832	3363
Emergency stop torque	T_{2Servo}	Nm	247	320	319	381	413	362
		in.lb	2186	2832	2823	3372	3655	3204
	η	%	97	96	94	92	86	81
Max. input speed	T_{2Max}	Nm	227	299	300	362	394	346
		in.lb	2009	2646	2655	3204	3487	3062
	T_{2Servo}	Nm	217	285	286	345	376	330
		in.lb	1920	2522	2531	3053	3328	2921
Mean no load running torque ^{a)} (With $n_{IN}=3000$ min ⁻¹ and 20° C gear temperature)	T_{012}	%	97	96	94	92	87	82
Max. torsional backlash	T_{Not}	Nm	938	993	963	1005	1064	941
		in.lb	8301	8788	8523	8894	9416	8328
Max. input speed	n_{1Max}	rpm	4000					
Mean no load running torque ^{a)} (With $n_{IN}=3000$ min ⁻¹ and 20° C gear temperature)	T_{012}	Nm	3,6	3,5	3,4	3,2	3	2,8
		in.lb	31,9	31,0	30,1	28,3	26,6	24,8
Max. torsional backlash	j_t	arcmin	≤3					
Torsional rigidity	C_{t21}	Nm/arcmin	78					
		in.lb/arcmin	690					
Max. axial force ^{b)}	F_{2AMax}	N	13900					
		lb _f	3128					
Max. radial force ^{b)}	F_{2RMax}	N	9000					
		lb _f	2025					
Max. tilting moment	M_{2KMax}	Nm	1544					
		in.lb	13664					
Service life (For calculation see "Information")	L_h	h	> 20000					
Weight incl. standard adapter plate	m	kg	26					
		lb _m	57,5					
Operating noise (with $n_{IN}=3000$ rpm no load)	L_{PA}	dB(A)	≤ 66					
Max. permitted housing temperature		°C	+90					
		F	194					
Ambient temperature		°C	-15 to +40					
		F	5 to 104					
Lubrication			Synthetic transmission oil					
Paint			None					
Direction of rotation			See drawing					
Protection class			IP 65					
Moment of inertia (relates to the drive)	J_I	kgcm ²	21.31	17.76	17.80	16.38	16.27	16.91
		10 ⁻³ in.lb.s ²	18.86	15.72	15.75	14.49	14.40	14.97

^{a)} Idling torques decrease during operation

^{b)} Refers to center of the output shaft or flange



- a) Hollow shaft, keywayed
- b) Hollow shaft, smooth
- c) End disc for screw M12
- d) End disc as forcing washer for screw M16
- e) Locking ring – DIN 472

Non-tolerated dimensions ± 1 mm

- 1) Check motor shaft fit.
- 2) Min./Max. permissible motor shaft length.
Longer motor shafts are adaptable, please contact us.
- 3) The dimensions depend on the motor.
- 4) Smaller motor shaft diameter is compensated by a bushing with a minimum thickness of 1 mm.
- 5) Tolerance h6 for mounted shaft.

CAD data is available under www.wittenstein-alpha.com

Motor mounting according to operating manual

Right-angle gearheads
High End

VDH+

V-Drive+

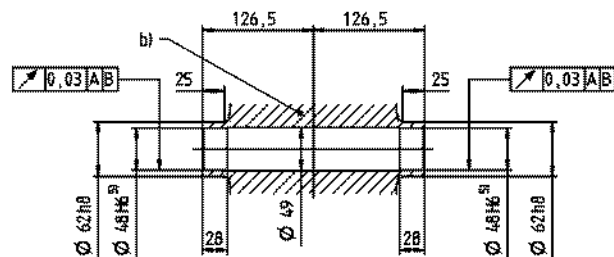
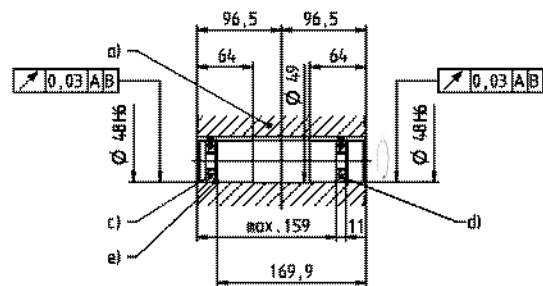
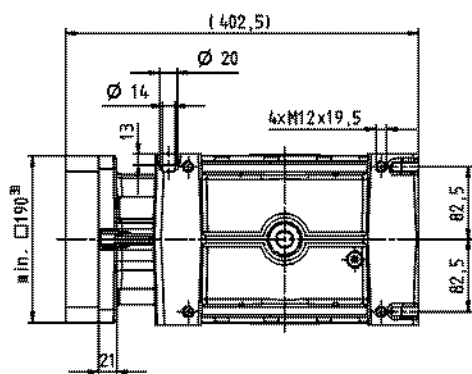
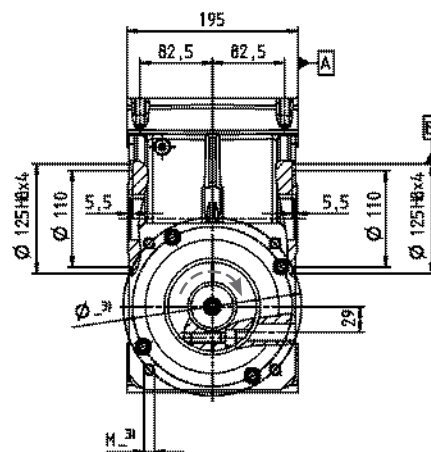
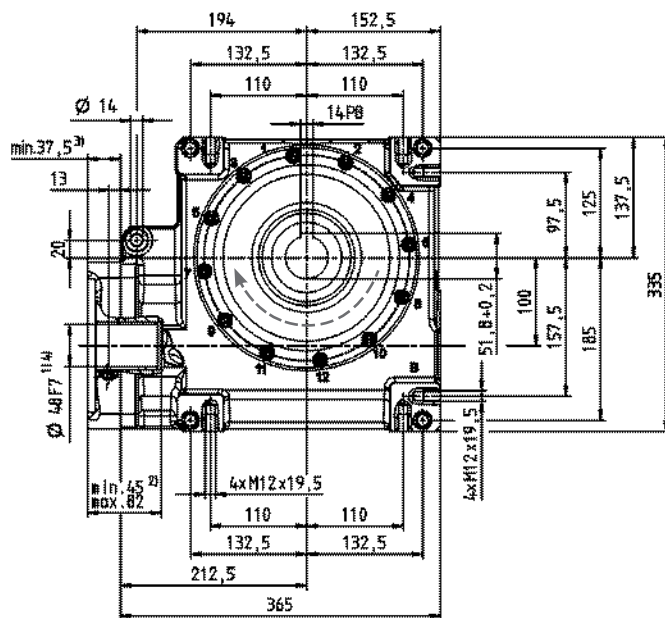
VDH+ 100 1-stage

			1-stage					
Ratio	<i>i</i>		4	7	10	16	28	40
$n_{IN}=500$ rpm	T_{2Max}	Nm	1184	1336	1377	1392	1505	1376
		in.lb	10478	11824	12186	12319	13319	12178
	T_{2Servo}	Nm	1155	1304	1343	1359	1469	1343
		in.lb	10222	11540	11886	12027	13001	11886
	η	%	95	93	91	87	80	76
$n_{IN}=1000$ rpm	T_{2Max}	Nm	905	1070	1122	1140	1251	1162
		in.lb	8009	9470	9930	10089	11071	10284
	T_{2Servo}	Nm	883	1044	1095	1113	1221	1134
		in.lb	7815	9239	9691	9850	10806	10036
	η	%	95	94	92	88	82	79
$n_{IN}=2000$ rpm	T_{2Max}	Nm	595	748	807	830	930	883
		in.lb	5266	6620	7142	7346	8231	7815
	T_{2Servo}	Nm	581	730	788	810	908	862
		in.lb	5142	6461	6974	7169	8036	7629
	η	%	96	95	94	91	86	82
$n_{IN}=3000$ rpm ^{c)}	T_{2Max}	Nm	430	564	621	644	735	709
		in.lb	3806	4991	5496	5699	6505	6275
	T_{2Servo}	Nm	420	551	606	629	718	692
		in.lb	3717	4876	5363	5567	6354	6124
	η	%	97	96	95	92	87	84
$n_{IN}=3500$ rpm	T_{2Max}	Nm	–	–	–	–	–	–
		in.lb	–	–	–	–	–	–
	T_{2Servo}	Nm	–	–	–	–	–	–
		in.lb	–	–	–	–	–	–
	η	%	–	–	–	–	–	–
Emergency stop torque	T_{2Not}	Nm	1819	1932	1940	1955	2073	1856
		in.lb	16098	17098	17169	17302	18346	16426
Max. input speed	n_{1Max}	rpm	3500					
Mean no load running torque ^{a)} (With $n_1=3000$ min ⁻¹ and 20° C gear temperature)	T_{012}	Nm	9,8	8,1	7,4	6,7	5,8	5
		in.lb	86,7	71,7	65,5	59,3	51,3	44,3
Max. torsional backlash	j_t	arcmin	≤3					
Torsional rigidity	C_{t21}	Nm/arcmin	153					
		in.lb/arcmin	1354					
Max. axial force ^{b)}	F_{2AMax}	N	19500					
		lb _f	4388					
Max. radial force ^{b)}	F_{2RMax}	N	14000					
		lb _f	3150					
Max. tilting moment	M_{2KMax}	Nm	3059					
		in.lb	27072					
Service life (For calculation see "Information")	L_h	h	> 20000					
Weight incl. standard adapter plate	m	kg	50					
		lb _m	110,5					
Operating noise (with $n_1=3000$ rpm no load)	L_{PA}	dB(A)	≤ 70					
Max. permitted housing temperature		°C	+90					
		F	194					
Ambient temperature		°C	-15 to +40					
		F	5 to 104					
Lubrication			Synthetic transmission oil					
Paint			None					
Direction of rotation			See drawing					
Protection class			IP 65					
Moment of inertia (relates to the drive)	J_1	kgcm ²	65.82	56.27	54.34	55.19	52.72	53.04
		10 ⁻³ in.lb.s ²	58.25	49.80	48.09	48.84	46.66	46.94

^{a)} Idling torques decrease during operation

^{b)} Refers to center of the output shaft or flange

^{c)} Reduce by 20% in S1 operation at 20°C ambient temperature.



- a) Hollow shaft, keywayed
- b) Hollow shaft, smooth
- c) End disc for screw M16
- d) End disc as forcing washer for screw M20
- e) Locking ring – DIN 472

Non-tolerated dimensions ± 1 mm

- 1) Check motor shaft fit.
- 2) Min./Max. permissible motor shaft length.
Longer motor shafts are adaptable, please contact us.
- 3) The dimensions depend on the motor.
- 4) Smaller motor shaft diameter is compensated by a bushing with a minimum thickness of 1 mm.
- 5) Tolerance h6 for mounted shaft.

CAD data is available under www.wittenstein-alpha.com

Motor mounting according to operating manual

Right-angle gearheads
High End

VDH+

V-Drive+

VDS+ 050 1-stage

			1-stage					
Ratio	<i>i</i>		4	7	10	16	28	40
$n_{IN}=500$ rpm	T_{2Max}	Nm	124	132	148	154	165	158
		in.lb	1097	1168	1310	1363	1460	1398
	T_{2Servo}	Nm	54	71	74	81	90	74
		in.lb	478	628	655	717	797	655
$n_{IN}=1000$ rpm	η	%	92	89	86	82	72	64
	T_{2Max}	Nm	124	130	136	140	151	142
		in.lb	1097	1151	1204	1239	1336	1257
$n_{IN}=2000$ rpm	T_{2Servo}	Nm	58	76	80	88	97	81
		in.lb	513	673	708	779	858	717
	η	%	94	91	89	85	77	69
$n_{IN}=3000$ rpm	T_{2Max}	Nm	88	106	112	120	134	122
		in.lb	779	938	991	1062	1186	1080
	T_{2Servo}	Nm	60	78	82	89	99	83
		in.lb	531	690	726	788	876	735
$n_{IN}=4000$ rpm	η	%	95	93	91	88	75	75
	T_{2Max}	Nm	72	86	95	106	112	108
		in.lb	637	761	841	938	991	956
Emergency stop torque	T_{2Servo}	Nm	59	77	81	88	97	81
		in.lb	522	681	717	779	858	717
	η	%	96	94	93	90	83	78
Max. input speed	T_{2Max}	Nm	62	77	83	92	102	95
		in.lb	549	681	735	814	903	841
	T_{2Servo}	Nm	58	76	79	87	96	80
		in.lb	513	673	699	770	850	708
Mean no load running torque ^{a)} (With $n_i=3000$ min ⁻¹ and 20° C gear temperature)	η	%	96	95	93	91	85	80
	T_{Not}	Nm	230	242	242	250	262	236
		in.lb	2036	2142	2142	2213	2319	2089
Max. torsional backlash	i_t	arcmin	6000					
Torsional rigidity	C_{t21}	Nm/arcmin	1,3	1,2	1,2	1,1	1	0,9
		in.lb/arcmin	11,5	10,6	10,6	9,7	8,9	8,0
Max. axial force ^{b)}	F_{2AMax}	N	≤ 3					
		lb _f	8					
Max. radial force ^{b)}	F_{2RMax}	N	71					
		lb _f	5000					
Max. tilting moment	M_{2KMax}	N	1125					
		in.lb	3800					
Service life (For calculation see "Information")	L_h	Nm	855					
		in.lb	409					
Weight incl. standard adapter plate	m	h	> 20000					
		kg	8,5					
Operating noise (with $n_i=3000$ rpm no load)	L_{PA}	lb _m	18,8					
		dB(A)	≤ 62					
Max. permitted housing temperature		°C	+90					
		F	194					
Ambient temperature		°C	-15 to +40					
		F	5 to 104					
Lubrication			Synthetic transmission oil					
Paint			None					
Direction of rotation			See drawing					
Protection class			IP 65					
Moment of inertia (relates to the drive)	J_I	kgcm ²	2.27	2.03	1.94	1.84	1.81	1.86
		10 ⁻³ in.lb.s ²	2.01	1.80	1.72	1.63	1.60	1.64

^{a)} Idling torques decrease during operation

^{b)} Refers to center of the output shaft or flange



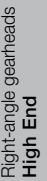
305

VDS+ 063 1-stage

			1-stage					
Ratio	<i>i</i>		4	7	10	16	28	40
$n_{IN}=500$ rpm	T_{2Max}	Nm	302	314	315	320	328	324
		in.lb	2673	2779	2788	2832	2903	2867
	T_{2Servo}	Nm	198	210	225	221	229	226
		in.lb	1752	1859	1991	1956	2027	2000
$n_{IN}=1000$ rpm	T_{2Max}	Nm	264	284	290	298	304	301
		in.lb	2336	2513	2567	2637	2690	2664
	T_{2Servo}	Nm	192	228	240	238	245	241
		in.lb	1699	2018	2124	2106	2168	2133
$n_{IN}=2000$ rpm	T_{2Max}	Nm	202	243	262	271	282	278
		in.lb	1788	2151	2319	2398	2496	2460
	T_{2Servo}	Nm	174	212	230	238	248	243
		in.lb	1540	1876	2036	2106	2195	2151
$n_{IN}=3000$ rpm	T_{2Max}	Nm	164	190	202	209	235	231
		in.lb	1451	1682	1788	1850	2080	2044
	T_{2Servo}	Nm	128	166	184	209	198	194
		in.lb	1133	1469	1628	1850	1752	1717
$n_{IN}=4000$ rpm	T_{2Max}	Nm	128	148	164	175	201	198
		in.lb	1133	1310	1451	1549	1779	1752
	T_{2Servo}	Nm	104	132	152	175	165	162
		in.lb	920	1168	1345	1549	1460	1434
Emergency stop torque	T_{Not}	Nm	460	484	491	494	518	447
		in.lb	4071	4283	4345	4372	4584	3956
Max. input speed	n_{1Max}	rpm	4500					
Mean no load running torque ^{a)} (With $n_1=3000$ min ⁻¹ and 20° C gear temperature)	T_{012}	Nm	2,1	1,9	1,8	1,7	1,6	1,4
		in.lb	18,6	16,8	15,9	15,0	14,2	12,4
Max. torsional backlash	j_t	arcmin	≤3					
Torsional rigidity	C_{t21}	Nm/arcmin	28					
		in.lb/arcmin	248					
Max. axial force ^{b)}	F_{2AMax}	N	8250					
		lb _f	1856					
Max. radial force ^{b)}	F_{2RMax}	N	6000					
		lb _f	1350					
Max. tilting moment	M_{2KMax}	Nm	843					
		in.lb	7461					
Service life (For calculation see "Information")	L_h	h	> 20000					
Weight incl. standard adapter plate	m	kg	15					
		lb _m	33,2					
Operating noise (with $n_1=3000$ rpm no load)	L_{PA}	dB(A)	≤ 64					
Max. permitted housing temperature		°C	+90					
		F	194					
Ambient temperature		°C	-15 to +40					
		F	5 to 104					
Lubrication			Synthetic transmission oil					
Paint			None					
Direction of rotation			See drawing					
Protection class			IP 65					
Moment of inertia (relates to the drive)	J_1	kgcm ²	6.72	5.79	5.54	5.44	5.41	5.35
		10 ⁻³ in.lb.s ²	5.95	5.12	4.90	4.82	4.78	4.74

^{a)} Idling torques decrease during operation

^{b)} Refers to center of the output shaft or flange



Technical drawing of a mechanical component, likely a pump or motor, showing a cross-section with a central shaft and four bolts.

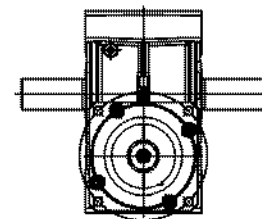
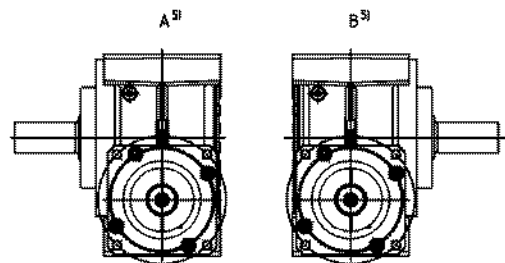
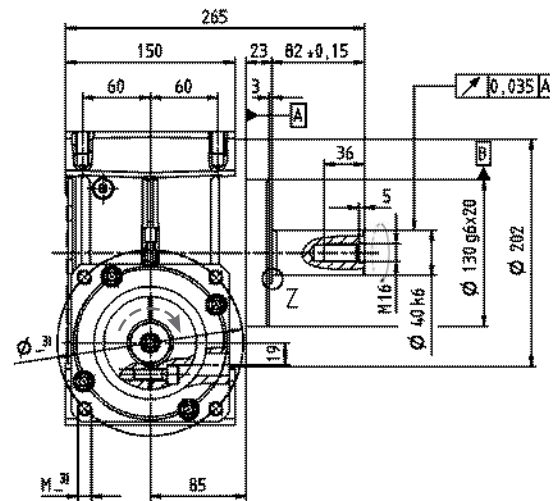
307

VDS+ 080 1-stage

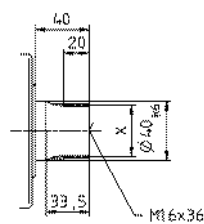
			1-stage					
Ratio	<i>i</i>		4	7	10	16	28	40
$n_{IN}=500$ rpm	T_{2Max}	Nm	578	646	672	702	785	676
		in.lb	5115	5717	5947	6213	6947	5983
	T_{2Servo}	Nm	469	601	613	677	764	631
		in.lb	4151	5319	5425	5991	6761	5584
$n_{IN}=1000$ rpm	T_{2Max}	Nm	514	602	588	656	698	613
		in.lb	4549	5328	5204	5806	6177	5425
	T_{2Servo}	Nm	491	574	561	625	665	584
		in.lb	4345	5080	4965	5531	5885	5168
$n_{IN}=2000$ rpm	T_{2Max}	Nm	350	435	431	500	536	470
		in.lb	3098	3850	3814	4425	4744	4160
	T_{2Servo}	Nm	335	415	411	476	511	448
		in.lb	2965	3673	3637	4213	4522	3965
$n_{IN}=3000$ rpm	T_{2Max}	Nm	259	336	334	400	433	380
		in.lb	2292	2974	2956	3540	3832	3363
	T_{2Servo}	Nm	247	320	319	381	413	362
		in.lb	2186	2832	2823	3372	3655	3204
$n_{IN}=3500$ rpm	T_{2Max}	Nm	227	299	300	362	394	346
		in.lb	2009	2646	2655	3204	3487	3062
	T_{2Servo}	Nm	217	285	286	345	376	330
		in.lb	1920	2522	2531	3053	3328	2921
Emergency stop torque	T_{2Not}	Nm	938	993	963	1005	1064	941
		in.lb						
Max. input speed	n_{1Max}	rpm	4000					
Mean no load running torque ^{a)} (With $n_1=3000$ min ⁻¹ and 20° C gear temperature)	T_{012}	Nm	3,6	3,5	3,4	3,2	3	2,8
		in.lb	31,9	31,0	30,1	28,3	26,6	24,8
Max. torsional backlash	j_t	arcmin	≤3					
Torsional rigidity	C_{t21}	Nm/arcmin	78					
		in.lb/arcmin	690					
Max. axial force ^{b)}	F_{2AMax}	N	13900					
		lb _f	3128					
Max. radial force ^{b)}	F_{2RMax}	N	9000					
		lb _f	2025					
Max. tilting moment	M_{2KMax}	Nm	1544					
		in.lb	13664					
Service life (For calculation see "Information")	L_h	h	> 20000					
Weight incl. standard adapter plate	m	kg	32					
		lb _m	70,7					
Operating noise (with $n_1=3000$ rpm no load)	L_{PA}	dB(A)	≤ 66					
Max. permitted housing temperature		°C	+90					
		F	194					
Ambient temperature		°C	-15 to +40					
		F	5 to 104					
Lubrication			Synthetic transmission oil					
Paint			None					
Direction of rotation			See drawing					
Protection class			IP 65					
Moment of inertia (relates to the drive)	J_I	kgcm ²	20.74	17.57	17.70	16.34	16.25	16.91
		10 ⁻³ in.lb.s ²	18.36	15.55	15.67	14.46	14.38	14.96

^{a)} Idling torques decrease during operation

^{b)} Refers to center of the output shaft or flange



Right-angle gearheads High End

V-Drive⁺

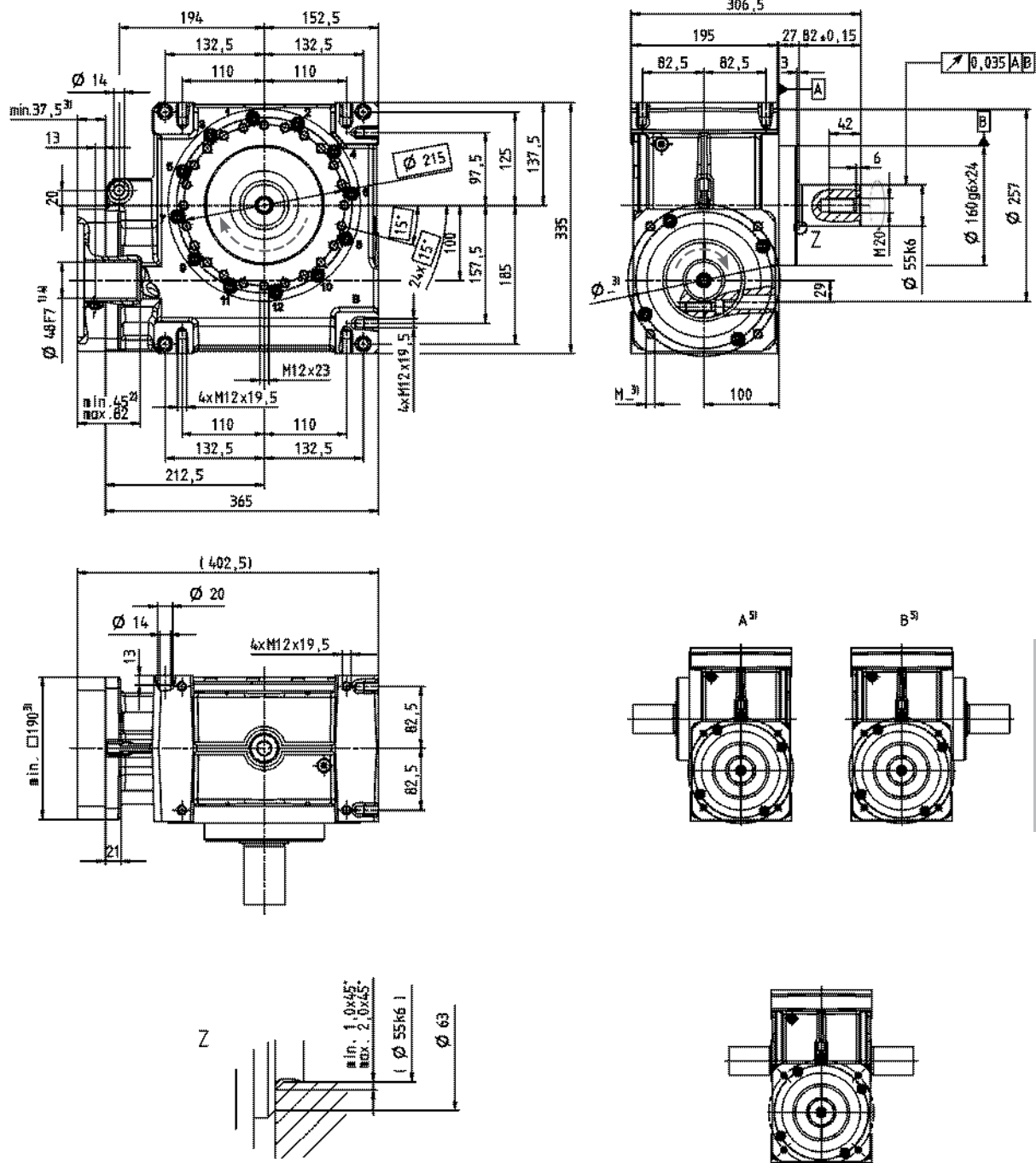
VDS+ 100 1-stage

			1-stage					
Ratio	<i>i</i>		4	7	10	16	28	40
$n_{IN}=500$ rpm	T_{2Max}	Nm	1184	1336	1377	1392	1505	1376
		in.lb	10478	11824	12186	12319	13319	12178
	T_{2Servo}	Nm	1155	1304	1343	1359	1469	1343
		in.lb	10222	11540	11886	12027	13001	11886
	η	%	95	93	91	87	80	76
$n_{IN}=1000$ rpm	T_{2Max}	Nm	905	1070	1122	1140	1251	1162
		in.lb	8009	9470	9930	10089	11071	10284
	T_{2Servo}	Nm	883	1044	1095	1113	1221	1134
		in.lb	7815	9239	9691	9850	10806	10036
	η	%	95	94	92	88	82	79
$n_{IN}=2000$ rpm	T_{2Max}	Nm	595	748	807	830	930	883
		in.lb	5266	6620	7142	7346	8231	7815
	T_{2Servo}	Nm	581	730	788	810	908	862
		in.lb	5142	6461	6974	7169	8036	7629
	η	%	96	95	94	91	86	82
$n_{IN}=3000$ rpm ^{c)}	T_{2Max}	Nm	430	564	621	644	735	709
		in.lb	3806	4991	5496	5699	6505	6275
	T_{2Servo}	Nm	420	551	606	629	718	692
		in.lb	3717	4876	5363	5567	6354	6124
	η	%	97	96	95	92	87	84
$n_{IN}=3500$ rpm	T_{2Max}	Nm	–	–	–	–	–	–
		in.lb	–	–	–	–	–	–
	T_{2Servo}	Nm	–	–	–	–	–	–
		in.lb	–	–	–	–	–	–
	η	%	–	–	–	–	–	–
Emergency stop torque	T_{2Not}	Nm	1819	1932	1940	1955	2073	1856
		in.lb	16098	17098	17169	17302	18346	16426
Max. input speed	n_{1Max}	rpm	3500					
Mean no load running torque ^{a)} (With $n_1=3000$ min ⁻¹ and 20° C gear temperature)	T_{012}	Nm	9,8	8,1	7,4	6,7	5,8	5
		in.lb	86,7	71,7	65,5	59,3	51,3	44,3
Max. torsional backlash	j_t	arcmin	≤3					
Torsional rigidity	C_{t21}	Nm/arcmin	153					
		in.lb/arcmin	1354					
Max. axial force ^{b)}	F_{2AMax}	N	19500					
		lb _f	4388					
Max. radial force ^{b)}	F_{2RMax}	N	14000					
		lb _f	3150					
Max. tilting moment	M_{2KMax}	Nm	3059					
		in.lb	27072					
Service life (For calculation see "Information")	L_h	h	> 20000					
Weight incl. standard adapter plate	m	kg	61					
		lb _m	134,8					
Operating noise (with $n_1=3000$ rpm no load)	L_{PA}	dB(A)	≤ 70					
Max. permitted housing temperature		°C	+90					
		F	194					
Ambient temperature		°C	-15 to +40					
		F	5 to 104					
Lubrication			Synthetic transmission oil					
Paint			None					
Direction of rotation			See drawing					
Protection class			IP 65					
Moment of inertia (relates to the drive)	J_t	kgcm ²	65.59	56.20	54.30	55.17	52.71	53.04
		10 ⁻³ in.lb.s ²	58.05	49.73	48.06	48.83	46.65	46.94

^{a)} Idling torques decrease during operation

^{b)} Refers to center of the output shaft or flange

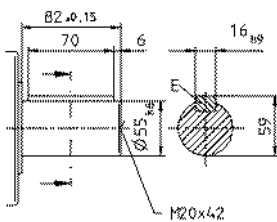
^{c)} Reduce by 20% in S1 operation at 20°C ambient temperature.



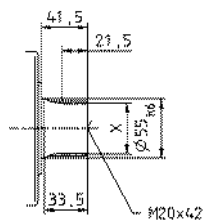
Right-angle gearheads
High End

Alternatives: Output shaft variants

Keywayed output shaft in mm
E = key as per DIN 6885, sheet 1, form A



Involute gearing DIN 5480
X = W 55 x 2 x 30 x 26 x 6 mm



Optional dual-shaft output. Drawings available upon request.
Involute gearing is not possible.

Non-tolerated dimensions ± 1 mm

- 1) Check motor shaft fit.
- 2) Min./Max. permissible motor shaft length.
Longer motor shafts are adaptable, please contact us.
- 3) The dimensions depend on the motor.
- 4) Smaller motor shaft diameter is compensated by a bushing with a minimum thickness of 1 mm.
- 5) Output side

CAD data is available under www.wittenstein-alpha.com

Motor mounting according to operating manual

VDS⁺

V-Drive⁺

Servo right-angle gearheads Economy



LK+/LPK+

Economical right-angle precision

- Low backlash bevel gears with output shaft
- Applications in cyclic or continuous operation
- Torsional backlash: ≤ 8 arcmin
- Ratios: 1-100

Product highlights

- Diverse range of transmission ratios
- High nominal speeds

LPBK+

Economical right-angle precision

- Low backlash bevel gears with output flange
- Applications in cyclic or continuous operation
- Torsional backlash: ≤ 8 arcmin
- Ratios: 3-10

Product highlights

- Diverse range of transmission ratios
- High nominal speeds
- Optionally available with belt pulley

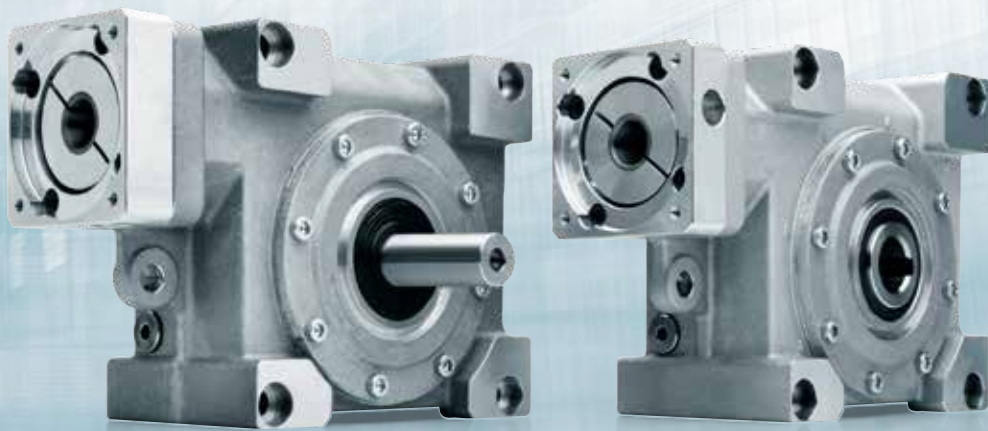
Power density —

Simple and convenient

From an optimized design with our cymex® software to the classic, patented WITTENSTEIN alpha motor mounting and grease volume adapted to each model – WITTENSTEIN alpha right-angle gearheads make your life so much easier.

Reliable and accurate

The low torsional backlash and high torsional rigidity of your WITTENSTEIN alpha right-angle gearhead assure maximum positioning accuracy of your drives and precision of your machines – even during highly dynamic operation up to 50,000 cycles/hour.



V-Drive economy

Economical servo worm

- Low backlash servo worm gearhead with output shaft and hollow shaft
- Applications in cyclic or continuous operation
- Torsional backlash: ≤ 8 arcmin
- Ratios: 4-40

Product highlights:

- Hollow shaft version
- Single-stage up to $i=40$
- Smooth-running

Maximum durability

Your WITTENSTEIN alpha right-angle gearhead is extremely reliable due to the overall design and 100% WITTENSTEIN alpha inspections: **“mount and forget”**. A length compensation feature integrated in your WITTENSTEIN alpha right-angle gearhead as standard maximizes the lifespan of your servo motor during high-speed continuous operation.

Right-angle gearheads
Economy



LK+



LPK+



LPBK+



V-Drive
economy

LK⁺/LPK⁺/LPBK⁺ – Economical right-angle precision



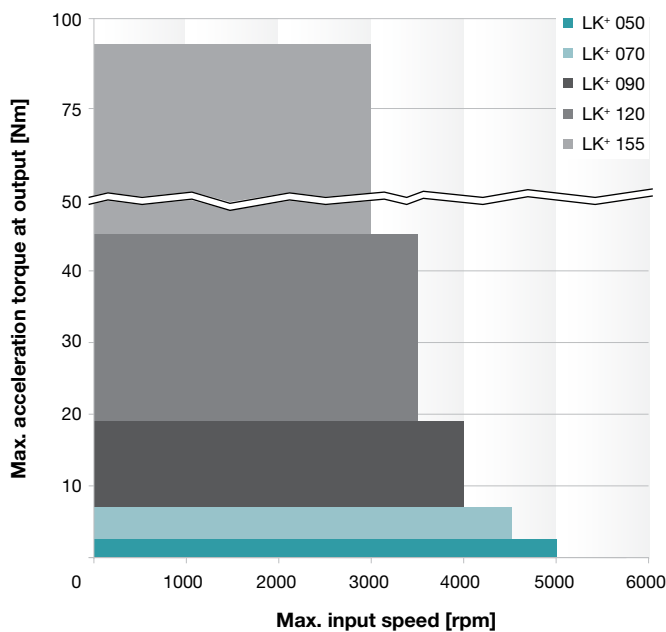
Low backlash right-angle gearheads with output shaft or output flange. This gearhead series is suitable for economical applications.

The LPBK⁺ is especially suitable for compact belt drives.

Quick size selection

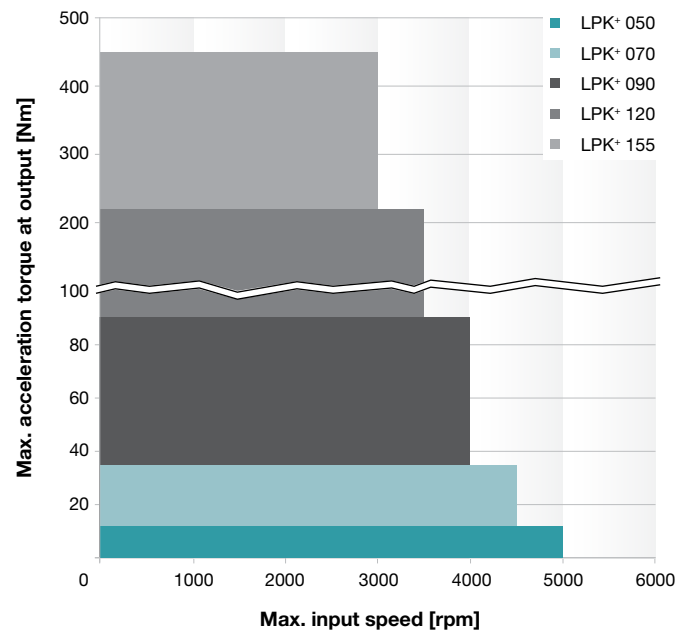
LK⁺ (example for $i = 1$)

For applications in cyclic operation ($DC \leq 60\%$) or continuous operation ($DC \geq 60\%$)



LPK⁺/LPBK⁺ (example for $i = 5$)

For applications in cyclic operation ($DC \leq 60\%$) or continuous operation ($DC \geq 60\%$)



Versions and Applications

Features	LK ⁺ MO version page 316	LPK ⁺ MO version page 326	LPBK ⁺ MO version page 336
Power density	•	• •	• •
Positioning accuracy	•	• •	• •
High input speeds	• •	• •	• •
Torsional rigidity	•	•	• •
Space-saving design	• •	• •	• • •

Product features

Ratios ^{c)}		1 – 1	3 – 100	3 – 10
Torsional backlash [arcmin] ^{c)}	Standard	≤ 15	≤ 12	≤ 12
	Reduced	–	–	–
Output type				
Smooth output shaft			•	
Keywayed output shaft		•	•	
Output flange				•
Input type				
Motor mounted version		•	•	•
Type				
Food-grade lubrication ^{a) b)}		•	•	•
Accessories				
Coupling		•	•	
Rack		•	•	
Belt pulley				•
B5 flange		•	•	

^{a)} Power reduction: technical data available upon request ^{b)} Please contact WITTENSTEIN alpha ^{c)} In relation to reference sizes



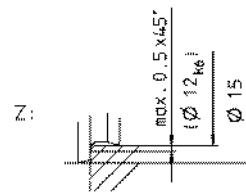
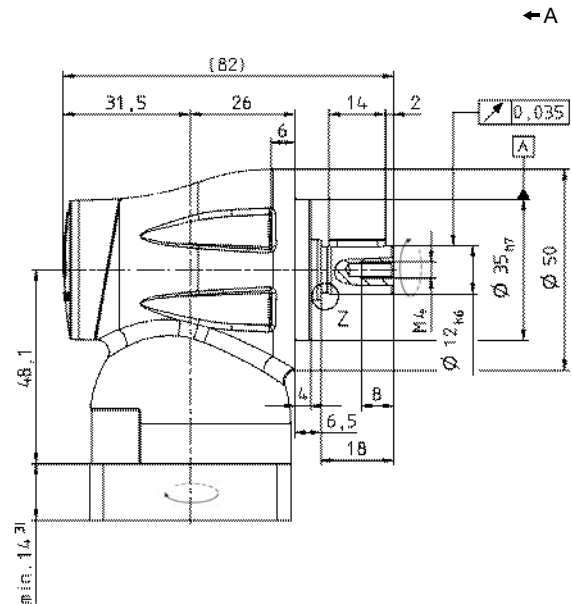
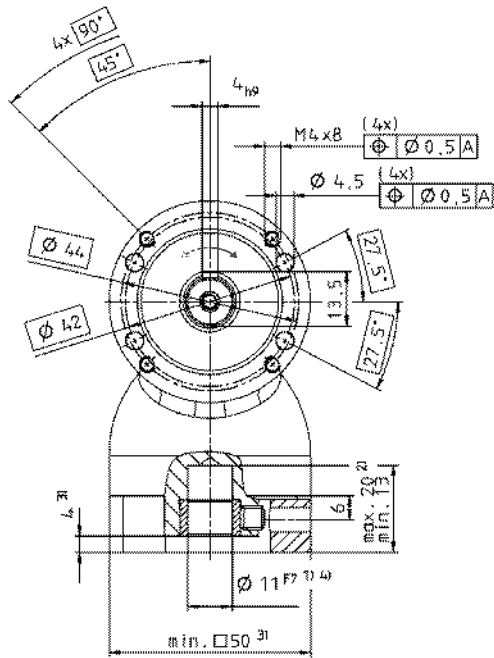
LK+ 050 1-stage

			1-stage
Ratio	i		1
Max. acceleration torque (max. 1000 cycles per hour)	T_{2B}	Nm	2.5
		in.lb	22
Nominal output torque (with n_{1N})	T_{2N}	Nm	1.2
		in.lb	11
Emergency stop torque (permitted 1000 times during the service life of the gearhead)	T_{2Not}	Nm	5
		in.lb	44
Nominal input speed (with T_{2N} and 20°C ambient temperature) ^{a)}	n_{1N}	rpm	3200
Max. input speed	n_{1Max}	rpm	5000
Mean no load running torque (with $n_1 = 3000$ rpm and 20°C gearhead temperature)	T_{012}	Nm	0.2
		in.lb	1.8
Max. torsional backlash	j_t	arcmin	≤ 25
Torsional rigidity	C_{L21}	Nm/ arcmin in.lb/ arcmin	–
Max. axial force ^{b)}	F_{2AMax}	N	100
		lb _f	23
Max. radial force ^{b)}	F_{2RMax}	N	650
		lb _f	146
Efficiency at full load	η	%	95
Service life (For calculation, see the Chapter "Information")	L_h	h	> 20000
Weight incl. standard adapter plate	m	kg lb _m	0.7 1.5
Operating noise (with $n_1 = 3000$ rpm no load)	L_{PA}	dB(A)	≤ 72
Max. permitted housing temperature		°C	+90
		F	194
Ambient temperature		°C	-15 to +40
		F	5 to 104
Lubrication			Lubricated for life
Paint			without
Direction of rotation			Motor and gearhead same direction
Protection class			IP 64
Moment of inertia (relates to the drive)	J_1	kgcm ² 10 ⁻³ in.lb.s ²	0.14 0.12

^{a)} For higher ambient temperatures, please reduce input speed

^{b)} Refers to center of the output shaft, if $n_2 = 1000$ rpm

1-stage:



Right-angle gearheads Economy

 LK^+

Non-tolerated dimensions ± 1 mm

- 1) Check motor shaft fit.
- 2) Min./Max. permissible motor shaft length. Longer motor shafts are adaptable, please contact us.
- 3) The dimensions depend on the motor.
- 4) Smaller motor shaft diameter is compensated by a bushing.



CAD data is available under
<http://www.wittenstein-alpha.de/en/info-and-cad-finder.html>



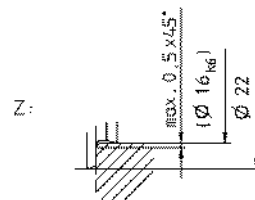
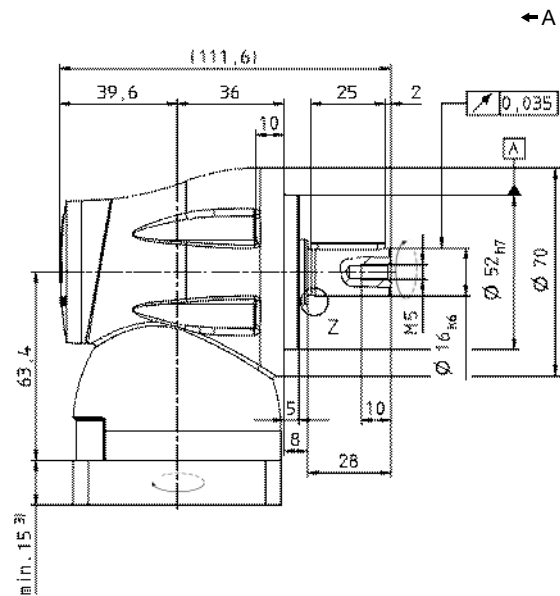
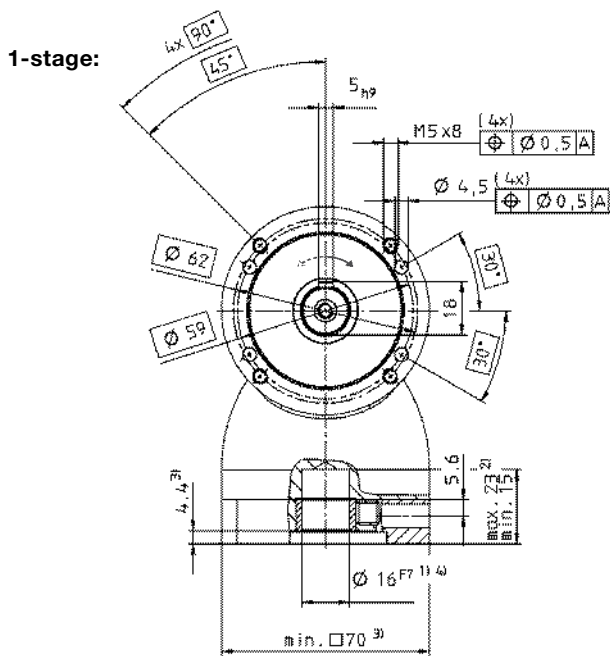
Motor mounting according to operating manual

LK+ 070 1-stage

			1-stage
Ratio	i		1
Max. acceleration torque (max. 1000 cycles per hour)	T_{2B}	Nm	7
		in.lb	60
Nominal output torque (with n_{1N})	T_{2N}	Nm	3.7
		in.lb	33
Emergency stop torque (permitted 1000 times during the service life of the gearhead)	T_{2Not}	Nm	15
		in.lb	130
Nominal input speed (with T_{2N} and 20°C ambient temperature ^{a)})	n_{1N}	rpm	3000
Max. input speed	n_{1Max}	rpm	4500
Mean no load running torque (with $n_1 = 3000$ rpm and 20°C gearhead temperature)	T_{012}	Nm	0.4
		in.lb	3.5
Max. torsional backlash	j_t	arcmin	≤ 20
Torsional rigidity	C_{L21}	Nm/ arcmin in.lb/ arcmin	–
Max. axial force ^{b)}	F_{2AMax}	N	200
		lb _f	45
Max. radial force ^{b)}	F_{2RMax}	N	1450
		lb _f	330
Efficiency at full load	η	%	95
Service life (For calculation, see the Chapter "Information")	L_h	h	> 20000
Weight incl. standard adapter plate	m	kg lb _m	1.9 4.2
Operating noise (with $n_1 = 3000$ rpm no load)	L_{PA}	dB(A)	≤ 73
Max. permitted housing temperature		°C	+90
		F	194
Ambient temperature		°C	-15 to 40
		F	5 to 104
Lubrication			Lubricated for life
Paint			without
Direction of rotation			Motor and gearhead same direction
Protection class			IP 64
Moment of inertia (relates to the drive)	J_1	kgcm ² 10 ⁻¹ in.lb.s ²	0.7 0.6

^{a)} For higher ambient temperatures, please reduce input speed

^{b)} Refers to center of the output shaft, if $n_2 = 1000$ rpm



Right-angle gearheads Economy

 LK^+

Non-tolerated dimensions ± 1 mm

- 1) Check motor shaft fit.
- 2) Min./Max. permissible motor shaft length. Longer motor shafts are adaptable, please contact us.
- 3) The dimensions depend on the motor.
- 4) Smaller motor shaft diameter is compensated by a bushing.



CAD data is available under
<http://www.wittenstein-alpha.de/en/info-and-cad-finder.html>



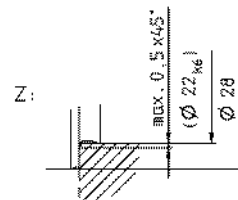
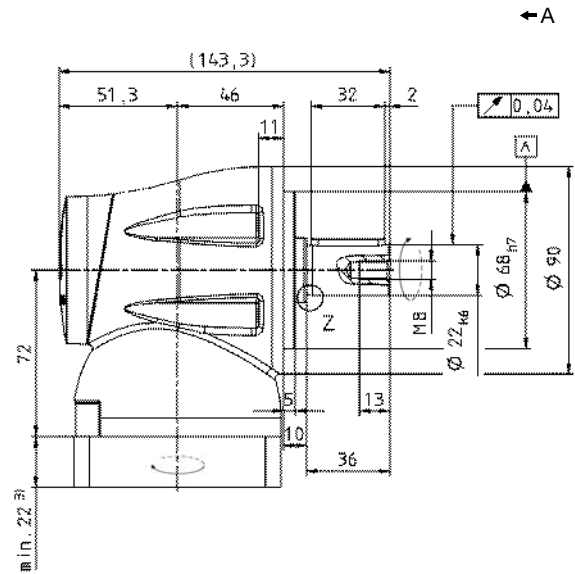
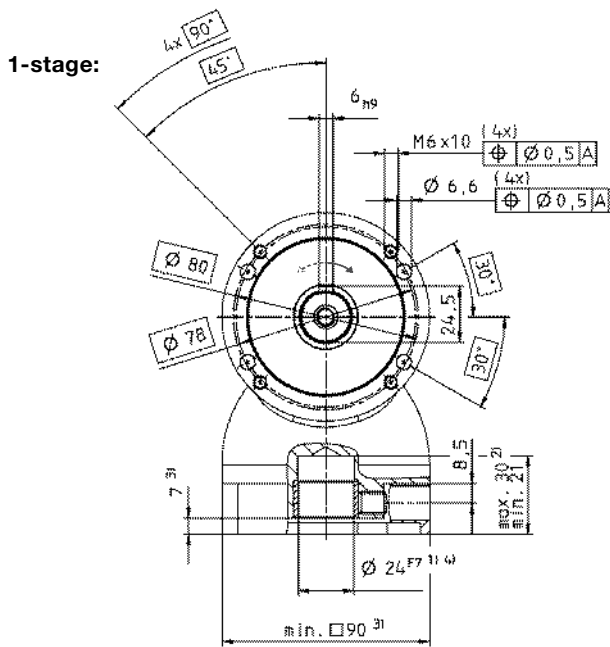
Motor mounting according to operating manual

LK+ 090 1-stage

			1-stage
Ratio	i		1
Max. acceleration torque (max. 1000 cycles per hour)	T_{2B}	Nm	19
		in.lb	170
Nominal output torque (with n_{1N})	T_{2N}	Nm	9.3
		in.lb	82
Emergency stop torque (permitted 1000 times during the service life of the gearhead)	T_{2Not}	Nm	37
		in.lb	330
Nominal input speed (with T_{2N} and 20°C ambient temperature) ^{a)}	n_{1N}	rpm	2700
Max. input speed	n_{1Max}	rpm	4000
Mean no load running torque (with $n_1 = 3000$ rpm and 20°C gearhead temperature)	T_{012}	Nm	0.9
		in.lb	8.0
Max. torsional backlash	j_t	arcmin	≤ 15
Torsional rigidity	C_{L21}	Nm/ arcmin	1.3
		in.lb/ arcmin	11
Max. axial force ^{b)}	F_{2AMax}	N	450
		lb _f	100
Max. radial force ^{b)}	F_{2RMax}	N	2400
		lb _f	540
Efficiency at full load	η	%	95
Service life (For calculation, see the Chapter "Information")	L_h	h	> 20000
Weight incl. standard adapter plate	m	kg	3.2
		lb _m	7.1
Operating noise (with $n_1 = 3000$ rpm no load)	L_{PA}	dB(A)	≤ 76
Max. permitted housing temperature		°C	+90
		F	194
Ambient temperature		°C	-15 to 40
		F	5 to 104
Lubrication			Lubricated for life
Paint			without
Direction of rotation			Motor and gearhead same direction
Protection class			IP 64
Moment of inertia (relates to the drive)	J_1	kgcm ²	3.3
		10 ⁻³ in.lb.s ²	2.9

^{a)} For higher ambient temperatures, please reduce input speed

^{b)} Refers to center of the output shaft, if $n_2 = 1000$ rpm



Non-tolerated dimensions ± 1 mm

- 1) Check motor shaft fit.
- 2) Min./Max. permissible motor shaft length. Longer motor shafts are adaptable, please contact us.
- 3) The dimensions depend on the motor.
- 4) Smaller motor shaft diameter is compensated by a bushing.



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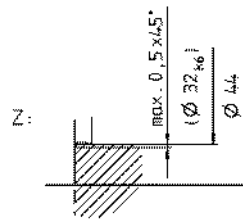
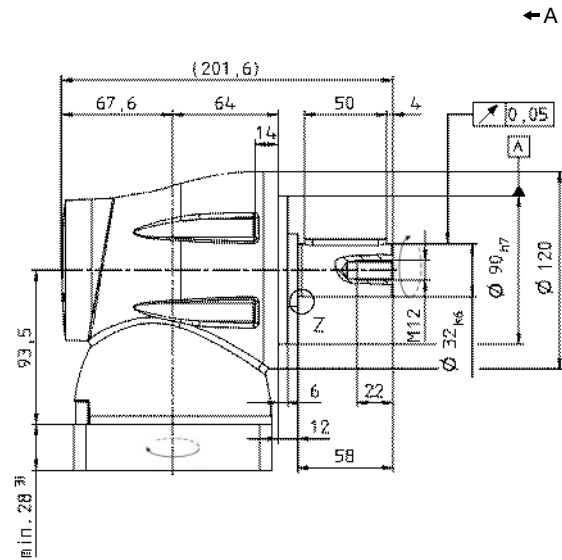
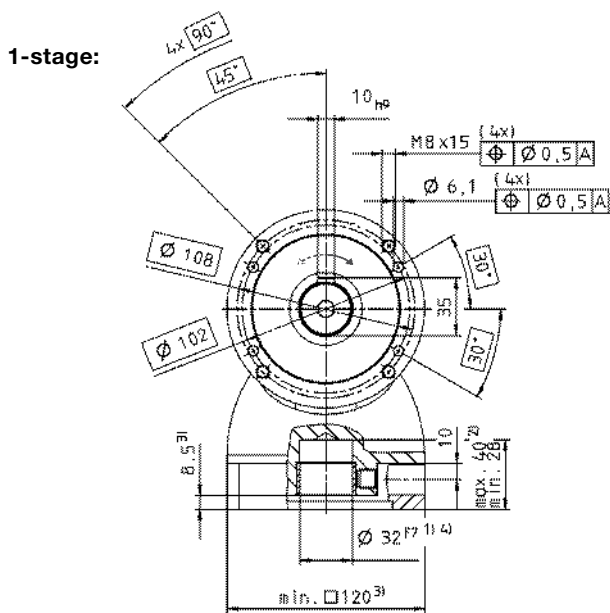
Motor mounting according to operating manual

LK+ 120 1-stage

			1-stage
Ratio	i		1
Max. acceleration torque (max. 1000 cycles per hour)	T_{2B}	Nm	45
		in.lb	400
Nominal output torque (with n_{1N})	T_{2N}	Nm	23
		in.lb	200
Emergency stop torque (permitted 1000 times during the service life of the gearhead)	T_{2Not}	Nm	93
		in.lb	820
Nominal input speed (with T_{2N} and 20°C ambient temperature) ^{a)}	n_{1N}	rpm	2100
Max. input speed	n_{1Max}	rpm	3500
Mean no load running torque (with $n_1 = 3000$ rpm and 20°C gearhead temperature)	T_{012}	Nm	2.5
		in.lb	22
Max. torsional backlash	j_t	arcmin	≤ 10
Torsional rigidity	C_{L21}	Nm/ arcmin in.lb/ arcmin	–
Max. axial force ^{b)}	F_{2AMax}	N	750
		lb _f	170
Max. radial force ^{b)}	F_{2RMax}	N	4600
		lb _f	1040
Efficiency at full load	η	%	95
Service life (For calculation, see the Chapter "Information")	L_h	h	> 20000
Weight incl. standard adapter plate	m	kg lb _m	8.9 20
Operating noise (with $n_1 = 3000$ rpm no load)	L_{PA}	dB(A)	≤ 76
Max. permitted housing temperature		°C	+90
		F	194
Ambient temperature		°C	-15 to 40
		F	5 to 104
Lubrication			Lubricated for life
Paint			without
Direction of rotation			Motor and gearhead same direction
Protection class			IP 64
Moment of inertia (relates to the drive)	J_1	kgcm ² 10 ⁻³ in.lb.s ²	14 12

^{a)} For higher ambient temperatures, please reduce input speed

^{b)} Refers to center of the output shaft, if $n_2 = 1000$ rpm



Right-angle gearheads Economy

 LK^+

Non-tolerated dimensions ± 1 mm

- 1) Check motor shaft fit.
- 2) Min./Max. permissible motor shaft length. Longer motor shafts are adaptable, please contact us.
- 3) The dimensions depend on the motor.
- 4) Smaller motor shaft diameter is compensated by a bushing.



CAD data is available under
<http://www.wittenstein-alpha.de/en/info-and-cad-finder.html>



Motor mounting according to operating manual

LK+ 155 1-stage

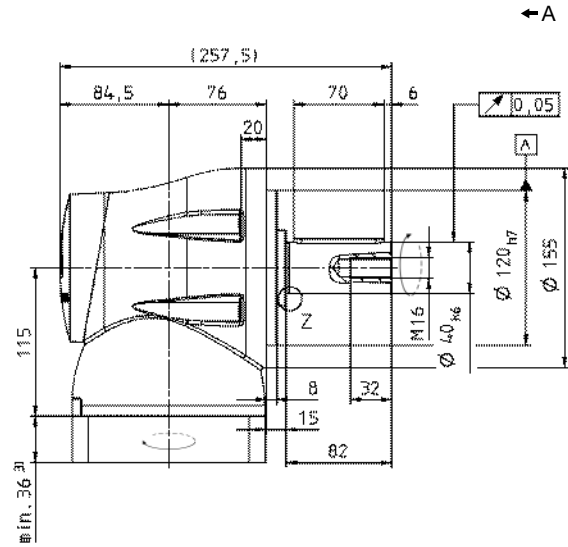
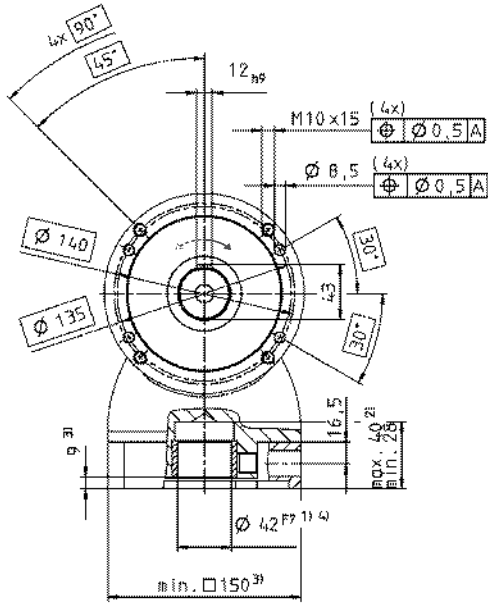
			1-stage
Ratio	i		1
Max. acceleration torque (max. 1000 cycles per hour)	T_{2B}	Nm	93
		in.lb	820
Nominal output torque (with n_{1N})	T_{2N}	Nm	66
		in.lb	580
Emergency stop torque (permitted 1000 times during the service life of the gearhead)	T_{2Not}	Nm	194
		in.lb	1720
Nominal input speed (with T_{2N} and 20°C ambient temperature) ^{a)}	n_{1N}	rpm	1600
Max. input speed	n_{1Max}	rpm	3000
Mean no load running torque (with $n_1 = 3000$ rpm and 20°C gearhead temperature)	T_{012}	Nm	4.5
		in.lb	
Max. torsional backlash	j_t	arcmin	≤ 8
			40
Torsional rigidity	C_{L21}	Nm/ arcmin	–
		in.lb/ arcmin	
Max. axial force ^{b)}	F_{2AMax}	N	1000
		lb _f	225
Max. radial force ^{b)}	F_{2RMax}	N	7500
		lb _f	1690
Efficiency at full load	η	%	95
Service life (For calculation, see the Chapter "Information")	L_h	h	> 20000
Weight incl. standard adapter plate	m	kg	19
		lb _m	42
Operating noise (with $n_1 = 3000$ rpm no load)	L_{PA}	dB(A)	≤ 78
Max. permitted housing temperature		°C	+90
		F	194
Ambient temperature		°C	-15 to 40
		F	5 to 104
Lubrication			Lubricated for life
Paint			without
Direction of rotation			Motor and gearhead same direction
Protection class			IP 64
Moment of inertia (relates to the drive)	J_1	kgcm ²	57
		10 ⁻³ in.lb.s ²	51

^{a)} For higher ambient temperatures, please reduce input speed

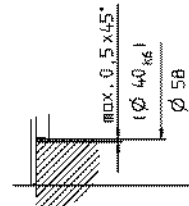
^{b)} Refers to center of the output shaft, if $n_2 = 1000$ rpm

View A

1-stage:



Z:



Non-tolerated dimensions ± 1 mm

- 1) Check motor shaft fit.
- 2) Min./Max. permissible motor shaft length. Longer motor shafts are adaptable, please contact us.
- 3) The dimensions depend on the motor.
- 4) Smaller motor shaft diameter is compensated by a bushing.



CAD data is available under
<http://www.wittenstein-alpha.de/en/info-and-cad-finder.html>



Motor mounting according to operating manual

LPK+ 050 2/3-stage

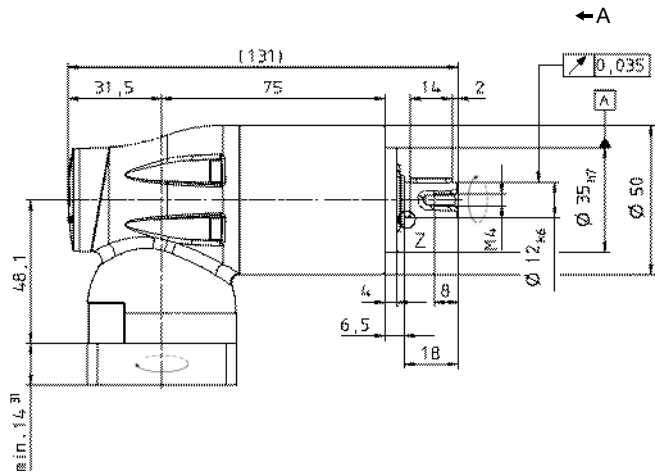
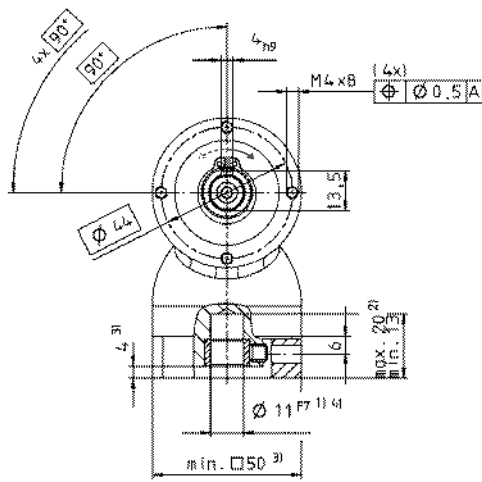
			2-stage				3-stage						
Ratio	<i>i</i>		4	5	7	10	16	20	25	35	50	70	100
Max. acceleration torque (max. 1000 cycles per hour)	<i>T</i> _{2B}	Nm	11	12	12	11	11	11	12	12	12	12	11
		in.lb	100	110	110	100	100	100	110	110	110	110	100
Nominal output torque (with <i>n</i>_{1N})	<i>T</i> _{2N}	Nm	5.2	5.7	5.7	5.2	5.2	5.2	5.7	5.7	5.7	5.7	5.2
		in.lb	46	50	50	46	46	46	50	50	50	50	46
Emergency stop torque (permitted 1000 times during the service life of the gearhead)	<i>T</i> _{2Not}	Nm	26	26	26	26	26	26	26	26	26	26	26
		in.lb	230	230	230	230	230	230	230	230	230	230	230
Nominal input speed (with <i>T</i>_{2N} and 20°C ambient temperature) ^{a)}	<i>n</i> _{1N}	rpm	3200	3200	3200	3200	3200	3200	3200	3200	3200	3200	3200
Max. input speed	<i>n</i> _{1Max}	rpm	5000	5000	5000	5000	5000	5000	5000	5000	5000	5000	5000
Mean no load running torque (with <i>n</i>_i = 3000 rpm and 20°C gearhead temperature)	<i>T</i> ₀₁₂	Nm	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
		in.lb	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
Max. torsional backlash	<i>j</i> _t	arcmin	≤ 16				≤ 15						
Torsional rigidity	<i>C</i> _{t21}	Nm/ arcmin	–				–						
		in.lb/ arcmin											
Max. axial force ^{b)}	<i>F</i> _{2AMax}	N	700				700						
		lb _f	160				160						
Max. radial force ^{b)}	<i>F</i> _{2RMax}	N	650				650						
		lb _f	150				150						
Efficiency at full load	η	%	92				90						
Service life (For calculation, see the Chapter “Information”)	<i>L</i> _h	h	> 20000				> 20000						
Weight incl. standard adapter plate	<i>m</i>	kg	1.4				1.6						
		lb _m	3.1				3.5						
Operating noise (for i = 10 and <i>n</i>_i = 3000 rpm without load)	<i>L</i> _{PA}	dB(A)	≤72										
Max. permitted housing temperature	°C		+90										
	F		194										
Ambient temperature	°C		-15 to 40										
	F		5 to 104										
Lubrication			Lubricated for life										
Paint			Blue RAL 5002										
Direction of rotation			Motor and gearhead same direction										
Protection class			IP 64										
Moment of inertia (relates to the drive)	<i>J</i> _i	kgcm ²	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16
		10 ⁻³ in.lb.s ²	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14

^{a)} For higher ambient temperatures, please reduce input speed

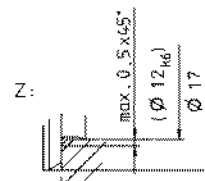
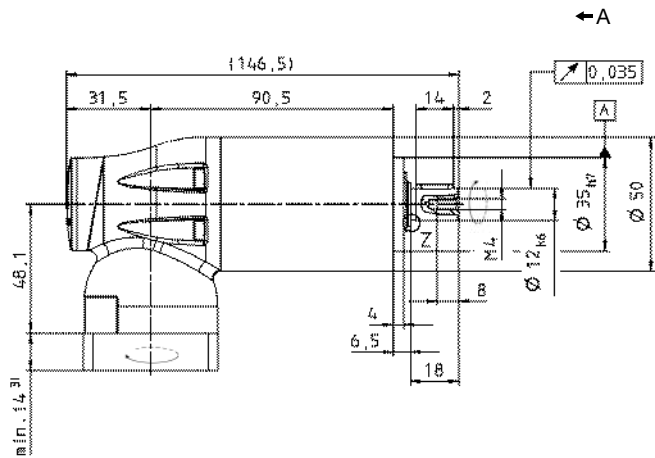
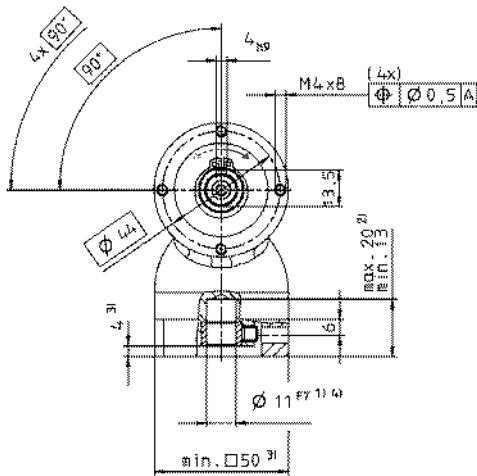
^{b)} Refers to center of the output shaft, if $n_2 = 100$ rpm

View A

2-stage:



3-stage:



Non-tolerated dimensions ± 1 mm

- 1) Check motor shaft fit.
- 2) Min./Max. permissible motor shaft length. Longer motor shafts are adaptable, please contact us.
- 3) The dimensions depend on the motor.
- 4) Smaller motor shaft diameter is compensated by a bushing.



CAD data is available under
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Motor mounting according to operating manual

LPK+ 070 2/3-stage

			2-stage					3-stage						
Ratio ^{c)}	<i>i</i>		3	4	5	7	10	16	20	25	30	50	70	100
Max. acceleration torque (max. 1000 cycles per hour)	<i>T</i> _{2B}	Nm	22	29	35	35	32	35	35	35	32	35	35	32
		in.lb	190	260	310	310	280	310	310	310	280	310	310	280
Nominal output torque (with <i>n</i> _N)	<i>T</i> _{2N}	Nm	11	15	18	18	16.5	18	18	18	16.5	18	18	16.5
		in.lb	100	130	160	160	150	160	160	160	160	160	160	160
Emergency stop torque (permitted 1000 times during the service life of the gearhead)	<i>T</i> _{2Not}	Nm	45	60	75	75	75	75	75	75	75	75	75	75
		in.lb	400	530	664	660	660	660	660	660	660	660	660	660
Nominal input speed (with <i>T</i> _{2N} and 20°C ambient temperature) ^{a)}	<i>n</i> _{1N}	rpm	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000
Max. input speed	<i>n</i> _{1Max}	rpm	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500
Mean no load running torque (with <i>n</i> _i = 3000 rpm and 20°C gearhead temperature)	<i>T</i> ₀₁₂	Nm	0.6	0.55	0.5	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.4
		in.lb	5.3	4.9	4.4	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.5
Max. torsional backlash	<i>j</i> _t	arcmin	≤ 14					≤ 12						
Torsional rigidity	<i>C</i> _{t21}	Nm/ arcmin	1	1,5	2	2	2	3	3	3	3	3	3	3
		in.lb/ arcmin	9	13	17	21	21	27	27	27	25	28	28	25
Max. axial force ^{b)}	<i>F</i> _{2AMax}	N	1550					1550						
		lb _f	350					350						
Max. radial force ^{b)}	<i>F</i> _{2RMax}	N	1450					1450						
		lb _f	330					330						
Efficiency at full load	η	%	92					90						
Service life (For calculation, see the Chapter “Information”)	<i>L</i> _h	h	> 20000					> 20000						
Weight incl. standard adapter plate	<i>m</i>	kg	3.8					4.2						
		lb _m	8.4					9.3						
Operating noise (for i = 10 and <i>n</i> _i = 3000 rpm without load)	<i>L</i> _{PA}	dB(A)	≤73											
Max. permitted housing temperature	°C		+90											
	F		194											
Ambient temperature	°C		-15 to 40											
	F		5 to 104											
Lubrication			Lubricated for life											
Paint			Blue RAL 5002											
Direction of rotation			Motor and gearhead same direction											
Protection class			IP 64											
Moment of inertia (relates to the drive)	<i>J</i> _i	kgcm²	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
		10 ⁻³ in.lb.s²	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75

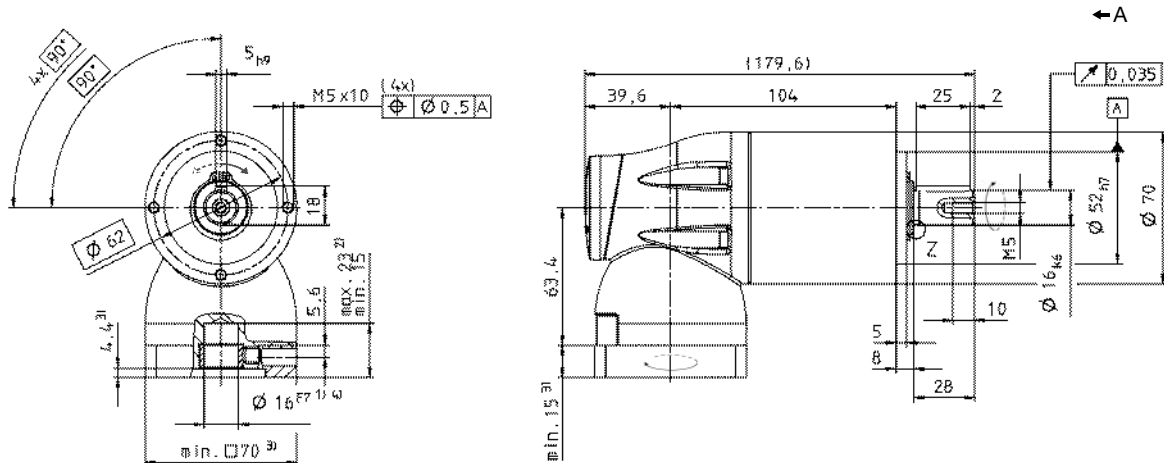
^{a)} For higher ambient temperatures, please reduce input speed

^{b)} Refers to center of the output shaft, if $n_2 = 100$ rpm

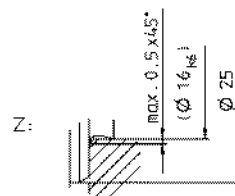
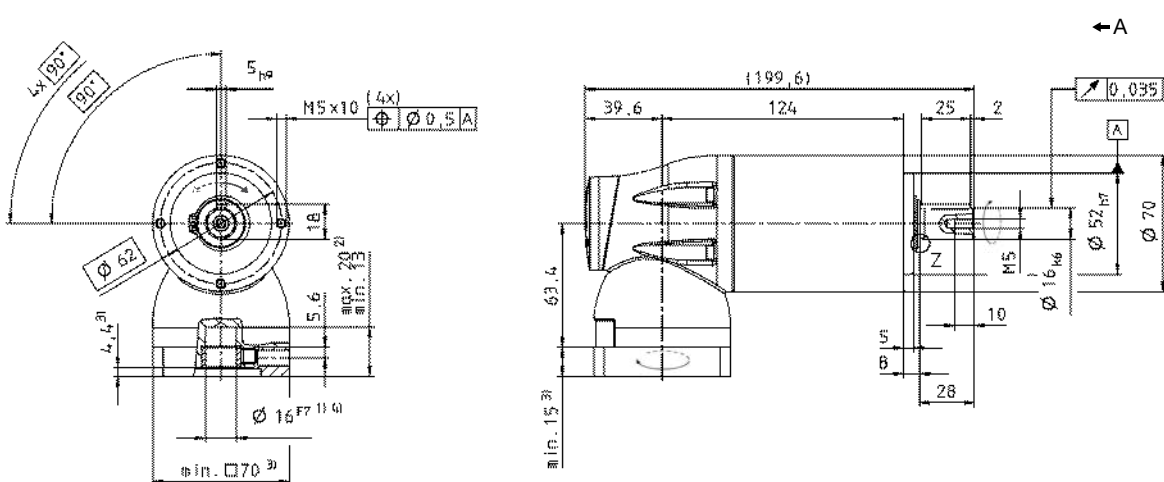
^{c)} Other ratios are available on request: $i = 15, 21, 28$ and 35

View A

2-stage:



3-stage:



Non-tolerated dimensions ± 1 mm

- 1) Check motor shaft fit.
- 2) Min./Max. permissible motor shaft length. Longer motor shafts are adaptable, please contact us.
- 3) The dimensions depend on the motor.
- 4) Smaller motor shaft diameter is compensated by a bushing.



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Motor mounting according to operating manual

LPK+ 090 2/3-stage

			2-stage					3-stage						
Ratio ^{c)}	<i>i</i>		3	4	5	7	10	16	20	25	30	50	70	100
Max. acceleration torque (max. 1000 cycles per hour)	<i>T</i> _{2B}	Nm	56	74	90	90	80	90	90	90	80	90	90	80
		in.lb	500	650	800	800	710	800	800	800	710	800	800	710
Nominal output torque (with <i>n</i> _N)	<i>T</i> _{2N}	Nm	28	37	45	45	40	45	45	45	40	45	45	40
		in.lb	250	330	400	400	350	400	400	400	400	400	400	350
Emergency stop torque (permitted 1000 times during the service life of the gearhead)	<i>T</i> _{2Not}	Nm	110	150	190	190	190	190	190	190	190	190	190	190
		in.lb	970	1330	1680	1680	1680	1680	1680	1680	1680	1680	1680	1680
Nominal input speed (with <i>T</i> _{2N} and 20°C ambient temperature) ^{a)}	<i>n</i> _{1N}	rpm	2700	2700	2700	2700	2700	2700	2700	2700	2700	2700	2700	2700
Max. input speed	<i>n</i> _{1Max}	rpm	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000
Mean no load running torque (with <i>n</i> _i = 3000 rpm and 20°C gearhead temperature)	<i>T</i> ₀₁₂	Nm	1.3	1.3	1.2	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.0
		in.lb	12	11	11	10	10	10	10	10	10	10	10	9
Max. torsional backlash	<i>j</i> _t	arcmin	≤ 12					≤ 11						
Torsional rigidity	<i>C</i> _{L21}	Nm/ arcmin	4.9	6.5	7.3	8.2	8.0	9.2	9.4	9.4	8.4	9.5	9.5	8.5
		in.lb/ arcmin	43	58	65	73	71	81	83	83	74	84	84	75
Max. axial force ^{b)}	<i>F</i> _{2AMax}	N	1900					1900						
		lb _f	430					430						
Max. radial force ^{b)}	<i>F</i> _{2RMax}	N	2400					2400						
		lb _f	540					540						
Efficiency at full load	η	%	92					90						
Service life (For calculation, see the Chapter “Information”)	<i>L</i> _h	h	> 20000					> 20000						
Weight incl. standard adapter plate	<i>m</i>	kg	6.9					7.9						
		lb _m	15					17						
Operating noise (for i = 10 and <i>n</i> _i = 3000 rpm without load)	<i>L</i> _{PA}	dB(A)	≤ 76											
Max. permitted housing temperature	°C		+90											
	F		194											
Ambient temperature	°C		-15 to 40											
	F		5 to 104											
Lubrication			Lubricated for life											
Paint			Blue RAL 5002											
Direction of rotation			Motor and gearhead same direction											
Protection class			IP 64											
Moment of inertia (relates to the drive)	<i>J</i> _i	kgcm²	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1
		10 ⁻³ in.lb.s²	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6

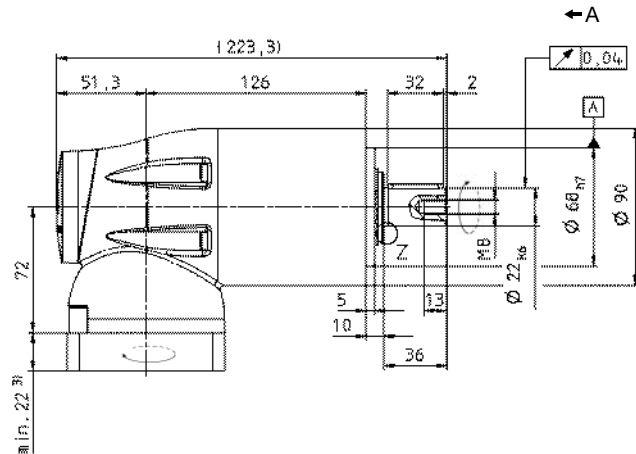
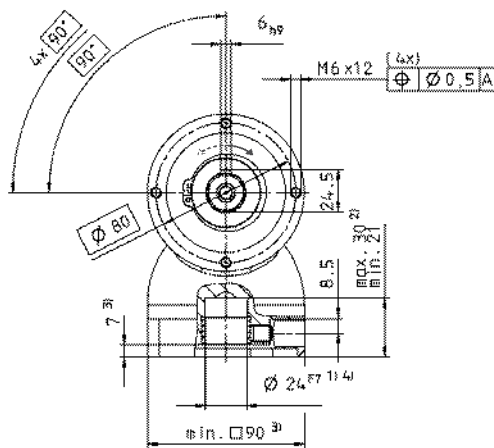
^{a)} For higher ambient temperatures, please reduce input speed

^{b)} Refers to center of the output shaft, if $n_2 = 100$ rpm

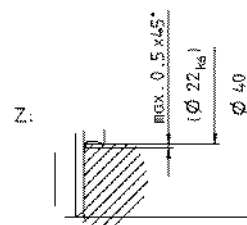
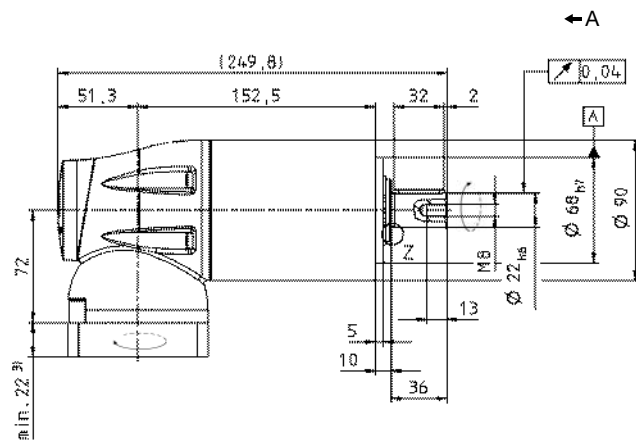
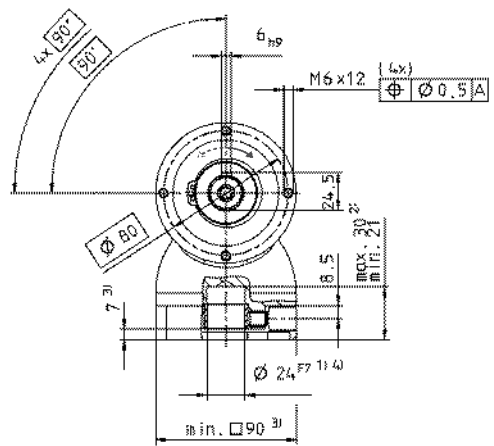
^{c)} Other ratios are available on request: $i = 15, 21, 28$ and 35

View A

2-stage:



3-stage:



Non-tolerated dimensions ± 1 mm

- 1) Check motor shaft fit.
- 2) Min./Max. permissible motor shaft length. Longer motor shafts are adaptable, please contact us.
- 3) The dimensions depend on the motor.
- 4) Smaller motor shaft diameter is compensated by a bushing.



CAD data is available under
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Motor mounting according to operating manual

LPK+ 120 2/3-stage

			2-stage					3-stage						
Ratio ^{c)}	<i>i</i>		3	4	5	7	10	16	20	25	30	50	70	100
Max. acceleration torque (max. 1000 cycles per hour)	<i>T</i> _{2B}	Nm	136	181	220	220	200	220	220	220	200	220	220	200
		in.lb	1200	1600	1950	1950	1770	1950	1950	1950	1770	1950	1950	1770
Nominal output torque (with <i>n</i>_N)	<i>T</i> _{2N}	Nm	68	91	110	110	100	110	110	110	100	110	110	100
		in.lb	600	810	970	970	890	970	970	970	890	970	970	890
Emergency stop torque (permitted 1000 times during the service life of the gearhead)	<i>T</i> _{2Not}	Nm	280	380	480	480	480	480	480	480	480	480	480	480
		in.lb	2500	3400	4200	4200	4200	4200	4200	4200	4200	4200	4200	4200
Nominal input speed (with <i>T</i>_{2N} and 20°C ambient temperature) ^{a)}	<i>n</i> _{1N}	rpm	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Max. input speed	<i>n</i> _{1Max}	rpm	3500	3500	3500	3500	3500	3500	3500	3500	3500	3500	3500	3500
Mean no load running torque (with <i>n</i>_i = 3000 rpm and 20°C gearhead temperature)	<i>T</i> ₀₁₂	Nm	3.5	3.3	3.2	3.1	3.1	2.9	2.8	2.8	2.7	2.7	2.7	2.7
		in.lb	31	29	28	27	27	26	25	25	24	24	24	24
Max. torsional backlash	<i>j</i> _t	arcmin	≤ 11					≤ 11						
Torsional rigidity	<i>C</i> _{t21}	Nm/ arcmin	19	22	23	24	22	25	25	25	22	25	25	22
		in.lb/ arcmin	170	190	210	210	190	220	220	220	190	220	220	190
Max. axial force ^{b)}	<i>F</i> _{2AMax}	N	4000					4000						
		lb _f	900					900						
Max. radial force ^{b)}	<i>F</i> _{2RMax}	N	4600					4600						
		lb _f	1040					1040						
Efficiency at full load	η	%	92					90						
Service life (For calculation, see the Chapter “Information”)	<i>L</i> _h	h	> 20000					> 20000						
Weight incl. standard adapter plate	<i>m</i>	kg	17					19						
		lb _m	37					42						
Operating noise (for i = 10 and <i>n</i>_i = 3000 rpm without load)	<i>L</i> _{PA}	dB(A)	≤ 76											
Max. permitted housing temperature	°C		+90											
	F		194											
Ambient temperature	°C		-15 to 40											
	F		5 to 104											
Lubrication			Lubricated for life											
Paint			Blue RAL 5002											
Direction of rotation			Motor and gearhead same direction											
Protection class			IP 64											
Moment of inertia (relates to the drive)	<i>J</i> _i	kgcm²	17	17	17	17	17	17	17	17	17	17	17	17
		10 ⁻³ in.lb.s²	15	15	15	15	15	15	15	15	15	15	15	15

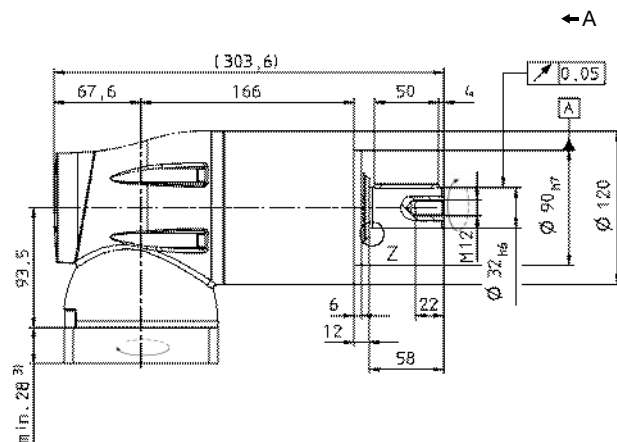
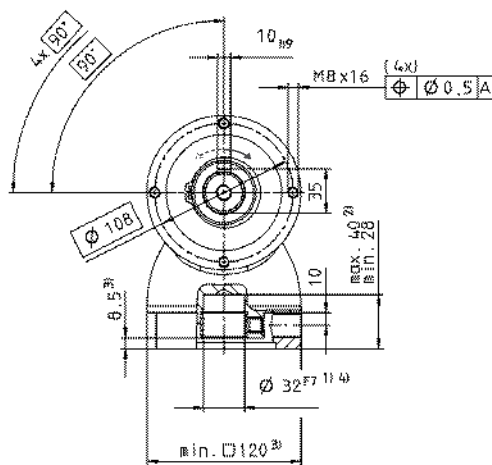
^{a)} For higher ambient temperatures, please reduce input speed

^{b)} Refers to center of the output shaft, if $n_2 = 100$ rpm

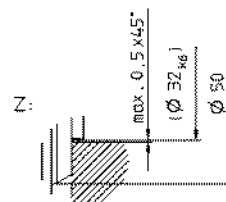
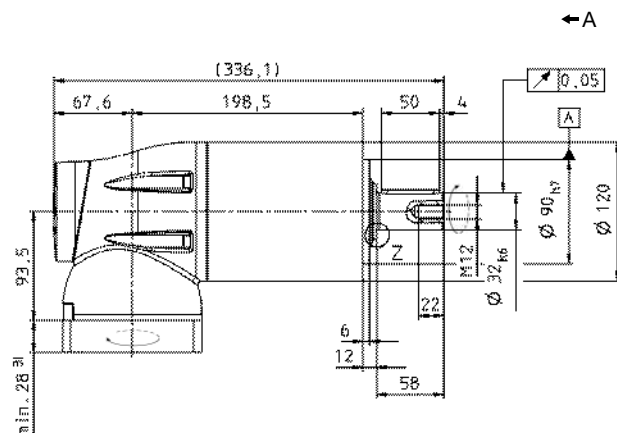
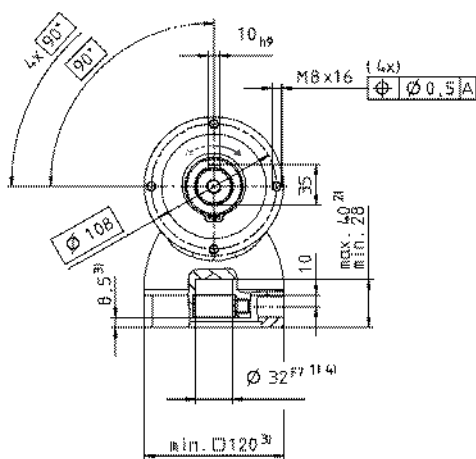
^{c)} Other ratios are available on request: $i = 15, 21, 28$ and 35

View A

2-stage:



3-stage:



Non-tolerated dimensions ± 1 mm

- 1) Check motor shaft fit.
- 2) Min./Max. permissible motor shaft length. Longer motor shafts are adaptable, please contact us.
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- 4) Smaller motor shaft diameter is compensated by a bushing.



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Motor mounting according to operating manual

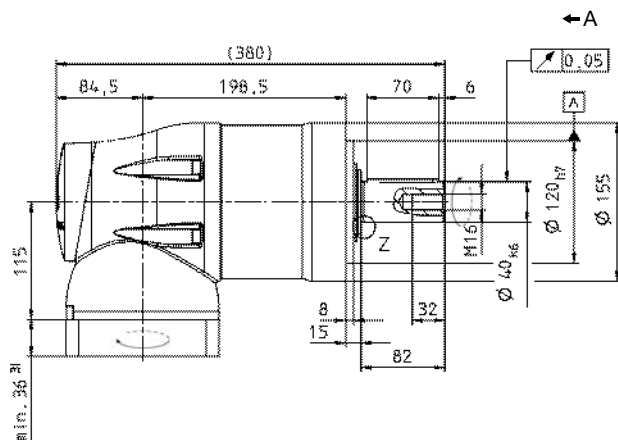
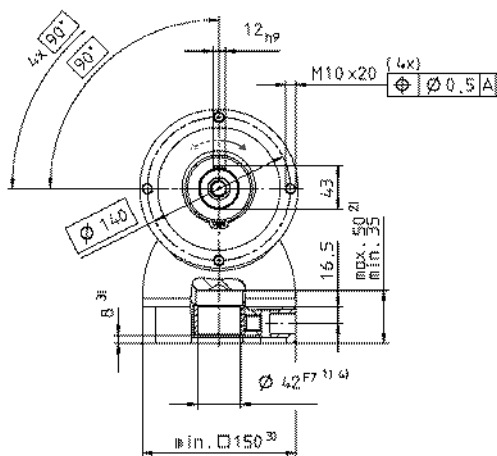
LPK+ 155 2/3-stage

			2-stage		3-stage		
Ratio	<i>i</i>		5	10	25	50	100
Max. acceleration torque (max. 1000 cycles per hour)	T_{2B}	Nm	450	350	450	450	350
		in.lb	4000	3100	4000	4000	3100
Nominal output torque (with n_{1N})	T_{2N}	Nm	320	190	320	320	190
		in.lb	2800	1700	2800	2800	1700
Emergency stop torque (permitted 1000 times during the service life of the gearhead)	T_{2Not}	Nm	1000	1000	1000	1000	1000
		in.lb	8850	8850	8850	8850	8850
Nominal input speed (with T_{2N} and 20°C ambient temperature) ^{a)}	n_{1N}	rpm	1600	1600	1600	1600	1600
Max. input speed	n_{1Max}	rpm	3000	3000	3500	3500	3500
Mean no load running torque (with n_1 = 3000 rpm and 20°C gearhead temperature)	T_{012}	Nm	7.3	7.0	3.5	3.3	3.2
		in.lb					
Max. torsional backlash	j_t	arcmin	≤ 10		≤ 11		
Torsional rigidity	C_{t21}	Nm/ arcmin	44	42	55	55	44
		in.lb/ arcmin	390	370	480	490	390
Max. axial force ^{b)}	F_{2AMax}	N	6000		6000		
		lb _f	1350		1350		
Max. radial force ^{b)}	F_{2RMax}	N	7500		7500		
		lb _f	1690		1690		
Efficiency at full load	η	%	92		90		
Service life (For calculation, see the Chapter “Information”)	L_h	h	> 20000		> 20000		
Weight incl. standard adapter plate	m	kg	35		39		
		lb _m	77		86		
Operating noise (for i = 10 and n_1 = 3000 rpm without load)	L_{PA}	dB(A)	≤ 78				
Max. permitted housing temperature		°C	+90				
		F	194				
Ambient temperature		°C	-15 to 40				
		F	5 to 104				
Lubrication			Lubricated for life				
Paint			Blue RAL 5002				
Direction of rotation			Motor and gearhead same direction				
Protection class			IP 64				
Moment of inertia (relates to the drive)	J_1	kgcm ²	75	75	17	17	17
		10 ⁻³ in.lb.s ²	66	66	15	15	15

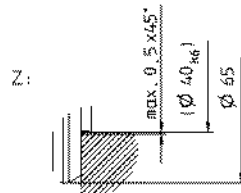
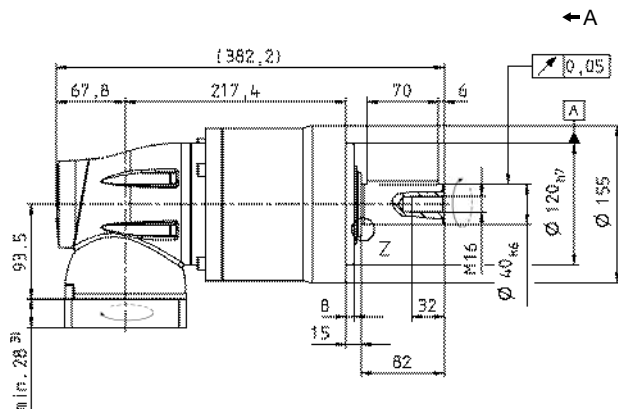
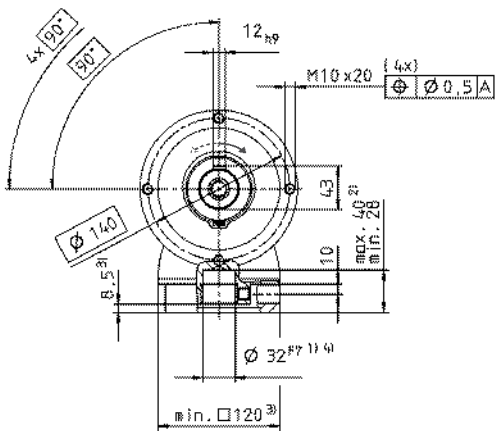
^{a)} For higher ambient temperatures, please reduce input speed

^{b)} Refers to center of the output shaft, if = 100 rpm

2-stage:



3-stage:



Non-tolerated dimensions ± 1 mm

- 1) Check motor shaft fit.
- 2) Min./Max. permissible motor shaft length. Longer motor shafts are adaptable, please contact us.
- 3) The dimensions depend on the motor.
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Motor mounting according to operating manual

LPBK+ 070 2-stage

			2-stage				
Ratio	<i>i</i>		3	4	5	7	10
Max. acceleration torque (max. 1000 cycles per hour)	T_{2B}	Nm	22	29	35	35	32
		in.lb	190	260	310	310	280
Nominal output torque (with n_{1N})	T_{2N}	Nm	11	15	18	18	16.5
		in.lb	100	130	160	160	150
Emergency stop torque (permitted 1000 times during the service life of the gearhead)	T_{2Not}	Nm	45	60	75	75	75
		in.lb	400	530	660	660	660
Nominal input speed (with T_{2N} and 20°C ambient temperature) ^{a)}	n_{1N}	rpm	3000	3000	3000	3000	3000
Max. input speed	n_{1Max}	rpm	4500	4500	4500	4500	4500
Mean no load running torque (with $n_1 = 3000$ rpm and 20°C gearhead temperature)	T_{012}	Nm	0.6	0.55	0.5	0.45	0.45
		in.lb	5.3	4.9	4.4	4.0	4.0
Max. torsional backlash	j_t	arcmin	≤ 14				
Torsional rigidity	C_{L21}	Nm/ arcmin	—	—	—	—	—
		in.lb/ arcmin	—	—	—	—	—
Max. axial force ^{b)}	F_{2AMax}	N	1550				
		lb _f	350				
Max. radial force ^{c)}	F_{2RMax}	N	3000				
		lb _f	680				
Efficiency at full load	η	%	92				
Service life (For calculation, see the Chapter "Information")	L_h	h	> 20000				
Weight incl. standard adapter plate	m	kg	3.4				
		lb _m	7.5				
Operating noise (for $i = 10$ and $n_1 = 3000$ rpm without load)	L_{PA}	dB(A)	≤ 73				
Max. permitted housing temperature		°C	+90				
		F	194				
Ambient temperature		°C	-15 to 40				
		F	5 to 104				
Lubrication			Lubricated for life				
Paint			Blue RAL 5002				
Direction of rotation			Motor and gearhead same direction				
Protection class			IP 64				
Moment of inertia (relates to the drive)	J_1	kgcm ²	0.85	0.85	0.85	0.85	0.85
		10 ⁻³ in.lb.s ²	0.75	0.75	0.75	0.75	0.75

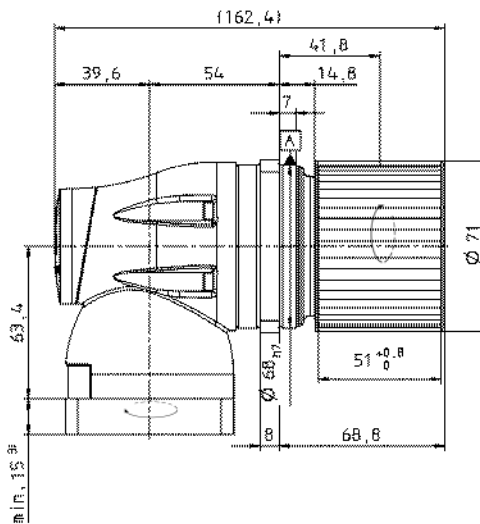
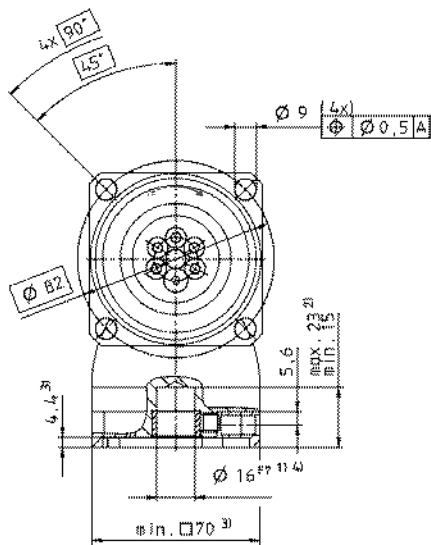
^{a)} For higher ambient temperatures, please reduce input speed

^{b)} Refers to center of the output shaft, if $n_2 = 100$ rpm

^{c)} With mounted PLPB+ belt pulley and 100 rpm

2-stage:

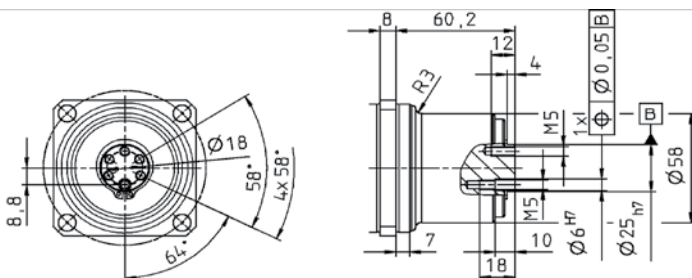
← A



Supplement: Belt pulley PLPB+ (not included in the scope of delivery – please order separately)

Belt Pulley PLPB+ 070 Profile AT5-0			
Pitch	p	mm	5
Number of teeth	z		43
Circumference	$z * p$	mm/rotation	215
Inertia	J	kgcm ²	3.86
Mass	m	kg	0.48

Illustration: Output flange without belt pulley



Non-tolerated dimensions ±1 mm

- 1) Check motor shaft fit.
- 2) Min./Max. permissible motor shaft length. Longer motor shafts are adaptable, please contact us.
- 3) The dimensions depend on the motor.
- 4) Smaller motor shaft diameter is compensated by a bushing.



CAD data is available under
<http://www.wittenstein-alpha.de/en/info-and-cad-finder.html>
 Motor mounting according to operating manual

LPBK+ 090 2-stage

			2-stage				
Ratio	<i>i</i>		3	4	5	7	10
Max. acceleration torque (max. 1000 cycles per hour)	T_{2B}	Nm	56	74	90	90	80
		in.lb	500	650	800	800	710
Nominal output torque (with n_{1N})	T_{2N}	Nm	28	37	45	45	40
		in.lb	250	330	400	400	350
Emergency stop torque (permitted 1000 times during the service life of the gearhead)	T_{2Not}	Nm	110	150	190	190	190
		in.lb	970	1330	1680	1680	1680
Nominal input speed (with T_{2N} and 20°C ambient temperature) ^{a)}	n_{1N}	rpm	2700	2700	2700	2700	2700
Max. input speed	n_{1Max}	rpm	4000	4000	4000	4000	4000
Mean no load running torque (with $n_1 = 3000$ rpm and 20°C gearhead temperature)	T_{012}	Nm	1.3	1.3	1.2	1.1	1.1
		in.lb	12	11	11	10	10
Max. torsional backlash	j_t	arcmin	≤ 12				
Torsional rigidity	C_{L21}	Nm/ arcmin	—	—	—	—	—
		in.lb/ arcmin	—	—	—	—	—
Max. axial force ^{b)}	F_{2AMax}	N	1900				
		lb _f	430				
Max. radial force ^{c)}	F_{2RMax}	N	4300				
		lb _f	970				
Efficiency at full load	η	%	92				
Service life (For calculation, see the Chapter "Information")	L_h	h	> 20000				
Weight incl. standard adapter plate	m	kg	6.2				
		lb _m	14				
Operating noise (for $i = 10$ and $n_1 = 3000$ rpm without load)	L_{PA}	dB(A)	≤ 76				
Max. permitted housing temperature		°C					
		F	194				
Ambient temperature		°C	-15 to 40				
		F	5 to 104				
Lubrication			Lubricated for life				
Paint			Blue RAL 5002				
Direction of rotation			Motor and gearhead same direction				
Protection class			IP 64				
Moment of inertia (relates to the drive)	J_1	kgcm ²	4.1	4.1	4.1	4.1	4.1
		10 ⁻³ in.lb.s ²	3.6	3.6	3.6	3.6	3.6

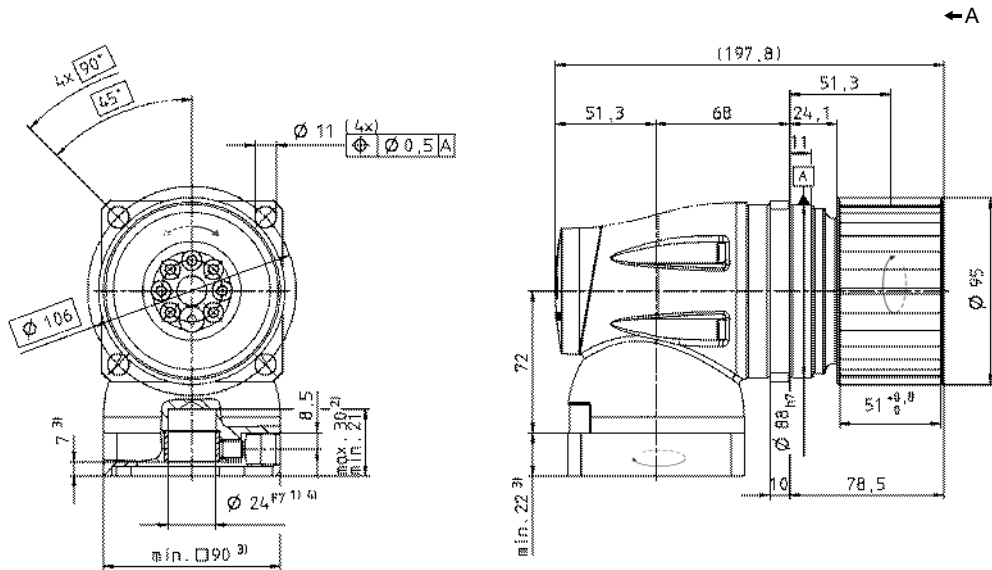
^{a)} For higher ambient temperatures, please reduce input speed

^{b)} Refers to center of the output shaft, if $n_2 = 100$ rpm

^{c)} With mounted PLPB+ belt pulley and 100 rpm

View A

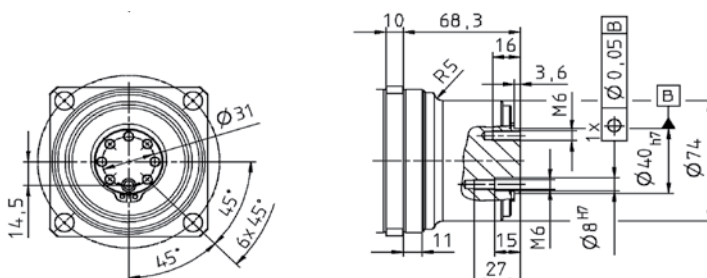
2-stage:



Supplement: Belt pulley PLPB+ (not included in the scope of delivery – please order separately)

Belt Pulley PLPB+ 090 Profile AT10-0			
Pitch	p	mm	10
Number of teeth	z		28
Circumference	$z * p$	mm/rotation	280
Inertia	J	kgcm ²	10.95
Mass	m	kg	0.82

Illustration: Output flange without belt pulley



Non-tolerated dimensions ± 1 mm

- 1) Check motor shaft fit.
- 2) Min./Max. permissible motor shaft length. Longer motor shafts are adaptable, please contact us.
- 3) The dimensions depend on the motor.
- 4) Smaller motor shaft diameter is compensated by a bushing.



CAD data is available under
<http://www.wittenstein-alpha.de/en/info-and-cad-finder.html>
 Motor mounting according to operating manual

LPBK+ 120 2-stage

			2-stage				
Ratio	<i>i</i>		3	4	5	7	10
Max. acceleration torque (max. 1000 cycles per hour)	T_{2B}	Nm	136	181	220	220	200
		in.lb	1200	1600	1950	1950	1770
Nominal output torque (with n_{1N})	T_{2N}	Nm	68	91	110	110	100
		in.lb	600	810	970	970	890
Emergency stop torque (permitted 1000 times during the service life of the gearhead)	T_{2Not}	Nm	280	380	480	480	480
		in.lb	2500	3400	4200	4200	4200
Nominal input speed (with T_{2N} and 20°C ambient temperature) ^{a)}	n_{1N}	rpm	2100	2100	2100	2100	2100
Max. input speed	n_{1Max}	rpm	3500	3500	3500	3500	3500
Mean no load running torque (with $n_1 = 3000$ rpm and 20°C gearhead temperature)	T_{012}	Nm	3,5	3,3	3,2	3,1	3,1
		in.lb	31	29	28	27	27
Max. torsional backlash	j_t	arcmin	≤ 11				
Torsional rigidity	C_{L21}	Nm/ arcmin	—	—	—	—	—
		in.lb/ arcmin	—	—	—	—	—
Max. axial force ^{b)}	F_{2AMax}	N	4000				
		lb _f	900				
Max. radial force ^{c)}	F_{2RMax}	N	9500				
		lb _f	2100				
Efficiency at full load	η	%	92				
Service life (For calculation, see the Chapter "Information")	L_h	h	> 20000				
Weight incl. standard adapter plate	m	kg	16				
		lb _m	34				
Operating noise (for $i = 10$ and $n_1 = 3000$ rpm without load)	L_{PA}	dB(A)	≤ 76				
Max. permitted housing temperature		°C	90				
		F	194				
Ambient temperature		°C	-15 to 40				
		F	5 to 104				
Lubrication			Lubricated for life				
Paint			Blue RAL 5002				
Direction of rotation			Motor and gearhead same direction				
Protection class			IP 64				
Moment of inertia (relates to the drive)	J_i	kgcm ²	17	17	17	17	17
		10 ⁻³ in.lb.s ²	15	15	15	15	15

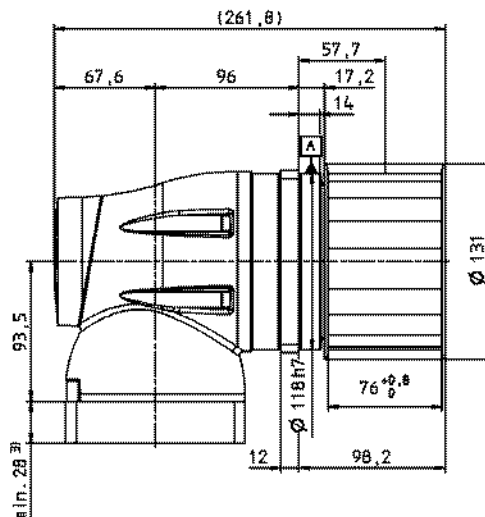
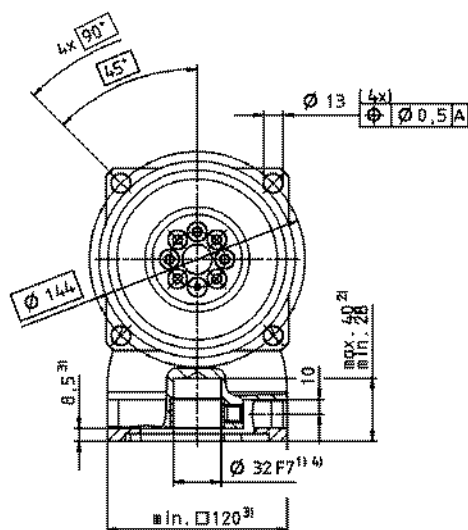
^{a)} For higher ambient temperatures, please reduce input speed

^{b)} Refers to center of the output shaft, if $n_2 = 100$ rpm

^{c)} With mounted PLPB+ belt pulley and 100 rpm

View A

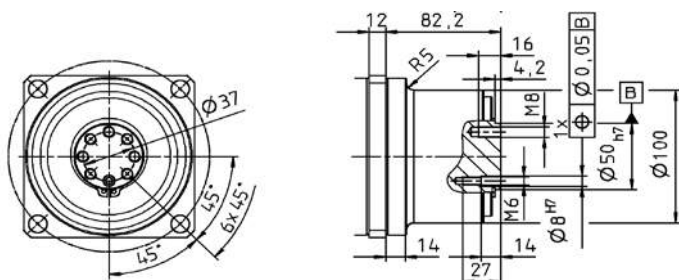
2-stage:



Supplement: Belt pulley PLPB+ (not included in the scope of delivery – please order separately)

Belt Pulley PLPB+ 120 Profile AT20-0			
Pitch	p	mm	20
Number of teeth	z		19
Circumference	$z * p$	mm/rotation	380
Inertia	J	kgcm ²	50.62
Mass	m	kg	2.61

Illustration: Output flange without belt pulley



Non-tolerated dimensions ± 1 mm

- 1) Check motor shaft fit.
- 2) Min./Max. permissible motor shaft length. Longer motor shafts are adaptable, please contact us.
- 3) The dimensions depend on the motor.
- 4) Smaller motor shaft diameter is compensated by a bushing.



CAD data is available under
<http://www.wittenstein-alpha.de/en/info-and-cad-finder.html>
 Motor mounting according to operating manual



V-Drive economy – Economical servo worm



Low backlash servo worm gearheads with output shaft and hollow shaft. The V-Drive economy impresses with its high power density and medium torsional backlash. It is especially suitable for economical applications in continuous operation.

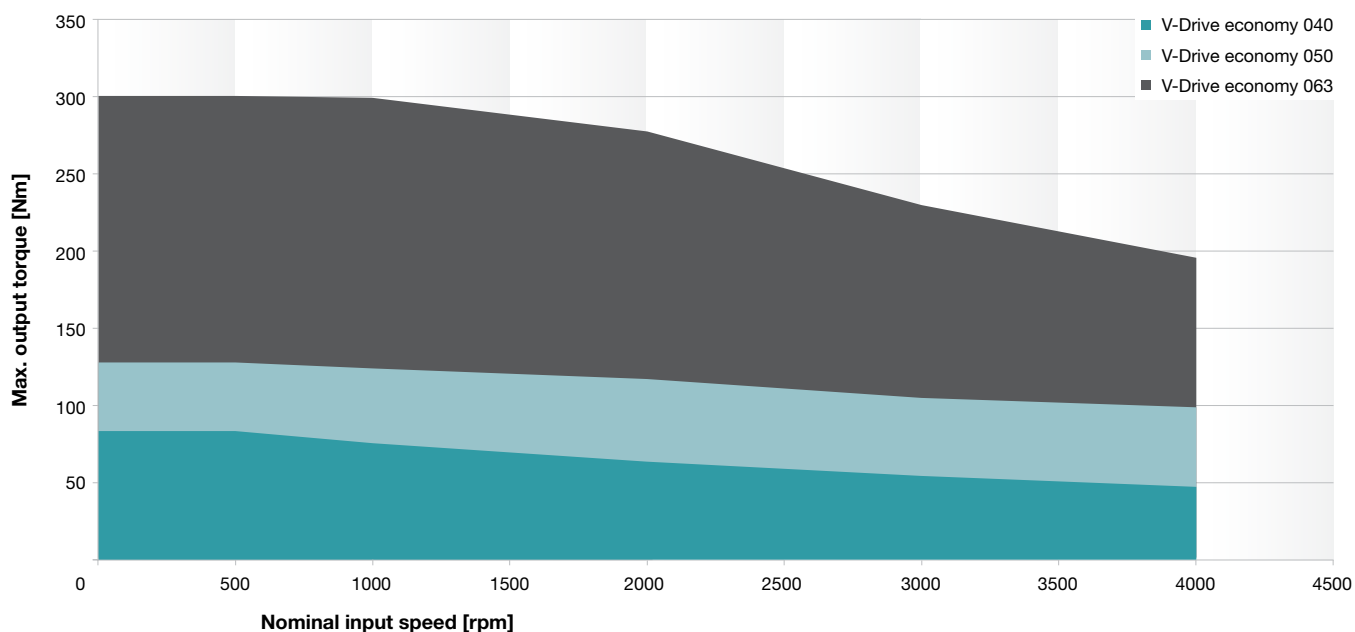
VDHe

VDSa

Quick size selection

V-Drive economy (example for $i = 28$)

For applications in cyclic operation ($DC \leq 60\%$) or continuous operation ($DC \geq 60\%$)



Versions and Applications

Features	VDHe with smooth/keyed hollow shaft page 344	VDSe with smooth/keywayed solid shaft page 350
Power density	• •	• •
Smooth-running	• • •	• • •

Product features

Ratios	4 – 40	4 – 40
Torsional backlash [arcmin]	≤ 8	≤ 8
Output type		
Smooth output shaft		•
Keywayed output shaft		•
Hollow shaft interface Connected via shrink disc	•	
Hollow shaft interface, rear side Connected via shrink disc	•	
Shaft on both sides		•
Input type		
Motor mounted version	•	•
Type		
Food-grade lubrication	•	•
Corrosion resistant ^{a)}	•	•
Accessories		
Coupling		•
Rack		•
Pinion		•
Shrink disc	•	

^{a)} Please contact WITTENSTEIN alpha

Right-angle gearheads
Economy

VDHe

VDSe

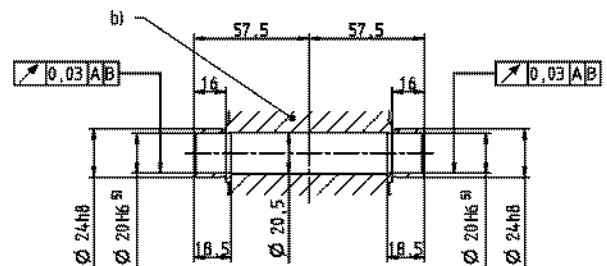
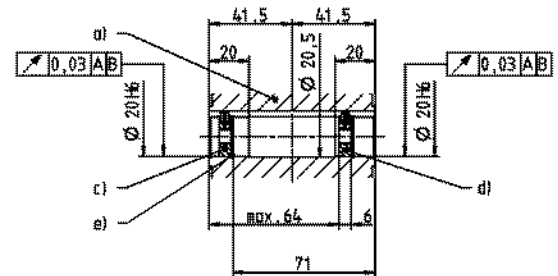
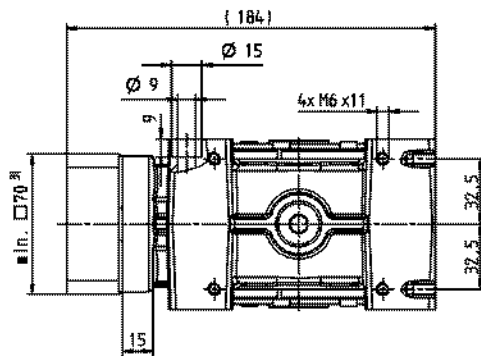
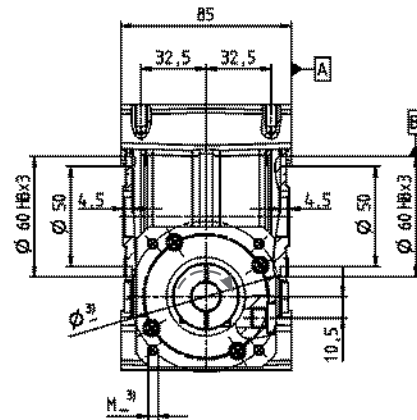
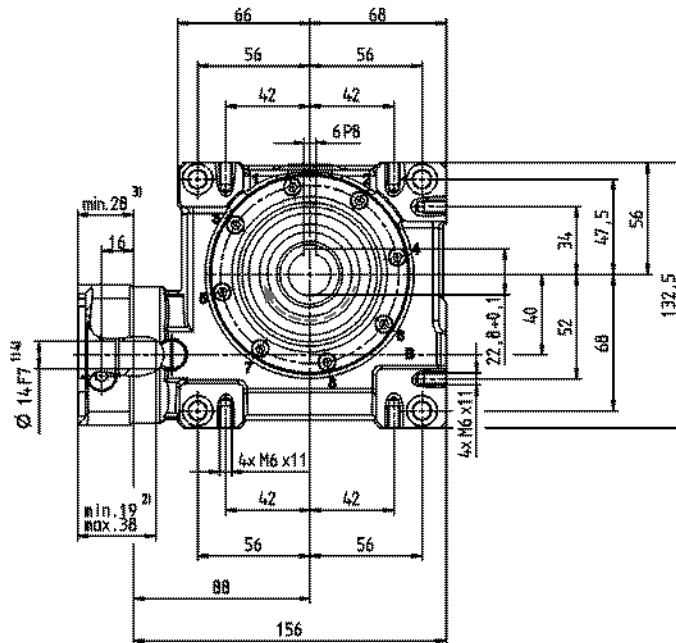


VDH economy 040 1-stage

				1-stage							
Ratio		i		4	7	10	16	28	40		
n _{IN} =500 rpm	T _{2Max}	Nm		60	75	76	79	83	76		
		in.lb		531	664	673	699	735	673		
	T _{2Servo}	Nm		17	24	25	26	29	25		
		in.lb		150	212	221	230	257	221		
	η	%		93	90	88	82	73	67		
n _{IN} =1000 rpm	T _{2Max}	Nm		45	60	68	72	75	70		
		in.lb		398	531	602	637	664	620		
	T _{2Servo}	Nm		19	26	28	29	32	28		
		in.lb		168	230	248	257	283	248		
	η	%		94	92	90	86	77	73		
n _{IN} =2000 rpm	T _{2Max}	Nm		35	50	54	59	63	60		
		in.lb		310	443	478	522	558	531		
	T _{2Servo}	Nm		19	26	28	29	33	29		
		in.lb		168	230	248	257	292	257		
	η	%		96	94	92	88	81	77		
n _{IN} =3000 rpm	T _{2Max}	Nm		30	42	46	51	53	52		
		in.lb		266	372	407	451	469	460		
	T _{2Servo}	Nm		19	26	28	29	32	28		
		in.lb		168	230	248	257	283	248		
	η	%		96	95	93	90	83	79		
n _{IN} =4000 rpm	T _{2Max}	Nm		28	36	40	44	47	46		
		in.lb		248	319	354	389	416	407		
	T _{2Servo}	Nm		19	25	27	28	31	27		
		in.lb		168	221	239	248	274	239		
	η	%		96	95	94	91	84	81		
Emergency stop torque		T _{2Not}	Nm	118	126	125	129	134	122		
			in.lb	1044	1115	1106	1142	1186	1080		
Max. input speed		n _{1Max}	rpm	6000							
Mean no load running torque ^{a)} (With n ₁ =3000 min ⁻¹ and 20° C gear temperature)		T ₀₁₂	Nm	0,8	0,7	0,5	0,5	0,4	0,4		
			in.lb	7,1	6,2	4,4	4,4	3,5	3,5		
Max. torsional backlash		j _t	arcmin	≤8							
Torsional rigidity		C _{t21}	Nm/arcmin	4,5							
			in.lb/arcmin	40							
Max. axial force ^{b)}		F _{2AMax}	N	3000							
			lb _f	675							
Max. radial force ^{b)}		F _{2RMax}	N	2400							
			lb _f	540							
Max. tilting moment		M _{2KMax}	Nm	205							
			in.lb	1814							
Service life (For calculation see "Information")		L _h	h	> 20000							
Weight incl. standardadapter plate		m	kg	4,0							
			lb _m	8,8							
Operating noise (with n ₁ = 3000 rpm no load)		L _{PA}	dB(A)	< 54							
Max. permitted housing temperature			°C	+90							
			F	194							
Ambient temperature			°C	-15 to +40							
			F	5 to 104							
Lubrication				Synthetic transmission oil							
Paint				None							
Direction of rotation				See drawing							
Protection class				IP 65							
Moment of inertia (relates to the drive)		C	14	J _i	kgcm ²	0.52	0.38	0.34	0.32	0.32	0.31
					10 ⁻³ in.lb.s ²	0.46	0.34	0.30	0.28	0.28	0.27
Moments of inertia for motor shaft diameter 14 and 19 mm		E	19	J _i	kgcm ²	0.54	0.40	0.37	0.35	0.34	0.33
					10 ⁻³ in.lb.s ²	0.48	0.35	0.33	0.31	0.30	0.29

^{a)} Idling torques decrease during operation

^{b)} Refers to center of the output shaft or flange



- a) Hollow shaft, keywayed
- b) Hollow shaft, smooth
- c) End disc for screw M6 (on request)
- d) End disc as forcing washer for screw M8 (on request)
- e) Locking ring – DIN 472

Non-tolerated dimensions ± 1 mm

- 1) Check motor shaft fit.
- 2) Min./Max. permissible motor shaft length.
Longer motor shafts are adaptable, please contact us.
- 3) The dimensions depend on the motor.
- 4) Smaller motor shaft diameter is compensated by a bushing with a minimum thickness of 1 mm. Motor shaft diameters up to 19 mm available – please contact WITTENSTEIN alpha.
- 5) Tolerance h6 for mounted shaft.

CAD data is available under www.wittenstein-alpha.com

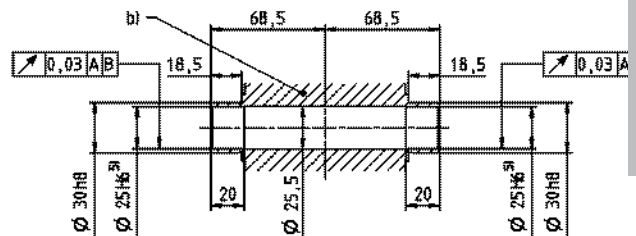
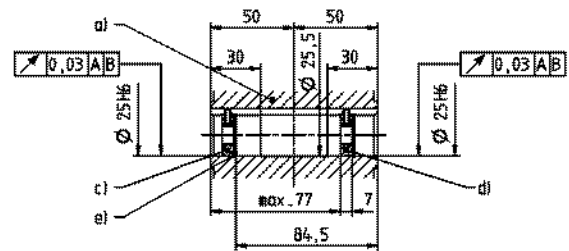
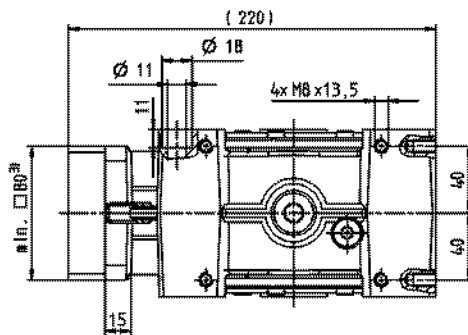
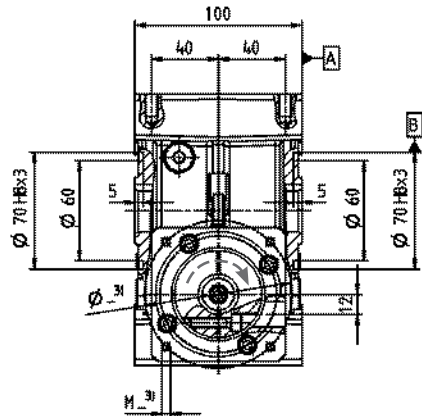
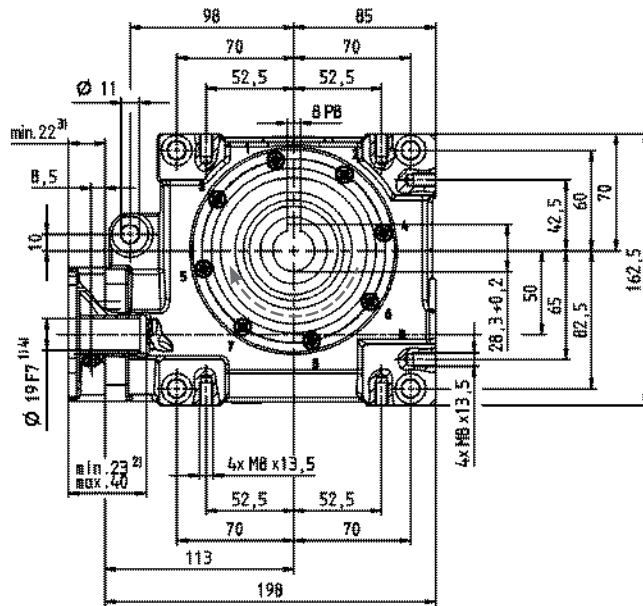
Motor mounting according to operating manual

VDH economy 050 1-stage

			1-stage					
Ratio	<i>i</i>		4	7	10	16	28	40
$n_{IN}=500$ rpm	T_{2Max}	Nm	–	102	111	118	128	116
		in.lb	–	903	982	1044	1133	1027
	T_{2Servo}	Nm	–	62	64	70	78	64
		in.lb	–	549	566	620	690	566
	η	%	–	89	86	82	72	64
$n_{IN}=1000$ rpm	T_{2Max}	Nm	–	103	108	114	124	112
		in.lb	–	912	956	1009	1097	991
	T_{2Servo}	Nm	–	66	70	76	84	70
		in.lb	–	584	620	673	743	620
	η	%	–	91	89	85	77	69
$n_{IN}=2000$ rpm	T_{2Max}	Nm	–	92	97	105	117	103
		in.lb	–	814	858	929	1035	912
	T_{2Servo}	Nm	–	68	71	77	86	72
		in.lb	–	602	628	681	761	637
	η	%	–	93	91	88	75	75
$n_{IN}=3000$ rpm	T_{2Max}	Nm	–	82	88	97	105	95
		in.lb	–	726	779	858	929	841
	T_{2Servo}	Nm	–	67	70	76	84	70
		in.lb	–	593	620	673	743	620
	η	%	–	94	93	90	83	78
$n_{IN}=4000$ rpm	T_{2Max}	Nm	–	77	81	90	99	88
		in.lb	–	681	717	797	876	779
	T_{2Servo}	Nm	–	64	69	75	83	69
		in.lb	–	566	611	664	735	611
	η	%	–	95	93	91	85	80
Emergency stop torque	T_{2Not}	Nm	–	242	242	250	262	236
		in.lb	–	2142	2142	2213	2319	2089
Max. input speed	n_{1Max}	rpm	6000					
Mean no load running torque ^{a)} (With $n_1=3000$ min ⁻¹ and 20° C gear temperature)	T_{012}	Nm	–	1,2	1,2	1,1	1	0,9
		in.lb	–	10,6	10,6	9,7	8,9	8,0
Max. torsional backlash	j_t	arcmin	≤8					
Torsional rigidity	C_{t21}	Nm/arcmin	8					
		in.lb/arcmin	71					
Max. axial force ^{b)}	F_{2AMax}	N	5000					
		lb _f	1125					
Max. radial force ^{b)}	F_{2RMax}	N	3800					
		lb _f	855					
Max. tilting moment	M_{2KMax}	Nm	409					
		in.lb	3620					
Service life (For calculation see "Information")	L_h	h	> 20000					
Weight incl. standardadapter plate	m	kg	7,4					
		lb _m	16,4					
Operating noise (with $n_1=3000$ rpm no load)	L_{PA}	dB(A)	≤ 62					
Max. permitted housing temperature		°C	+90					
		F	194					
Ambient temperature		°C	-15 to +40					
		F	5 to 104					
Lubrication			Synthetic transmission oil					
Paint			None					
Direction of rotation			See drawing					
Protection class			IP 65					
Moment of inertia (relates to the drive)	J_I	kgcm ²	–	2,02	1,93	1,84	1,81	1,86
		10 ⁻³ in.lb.s ²	–	1,79	1,71	1,63	1,60	1,64

^{a)} Idling torques decrease during operation

^{b)} Refers to center of the output shaft or flange



- a) Hollow shaft, keywayed
- b) Hollow shaft, smooth
- c) End disc for screw M10 (on request)
- d) End disc as forcing washer for screw M12 (on request)
- e) Locking ring – DIN 472 (on request)

Non-tolerated dimensions ± 1 mm

- 1) Check motor shaft fit.
- 2) Min./Max. permissible motor shaft length.
Longer motor shafts are adaptable, please contact us.
- 3) The dimensions depend on the motor.
- 4) Smaller motor shaft diameter is compensated by a bushing with a minimum thickness of 1 mm.
- 5) Tolerance h6 for mounted shaft.

CAD data is available under www.wittenstein-alpha.com

Motor mounting according to operating manual

Right-angle gearheads
Economy

VDHe

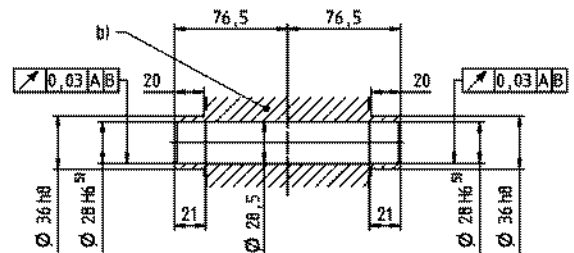
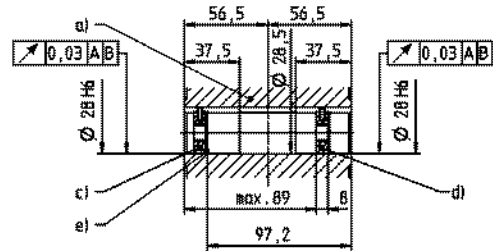
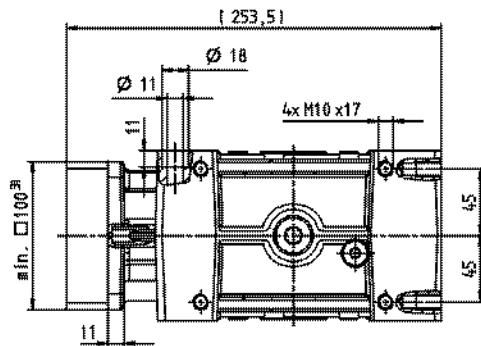
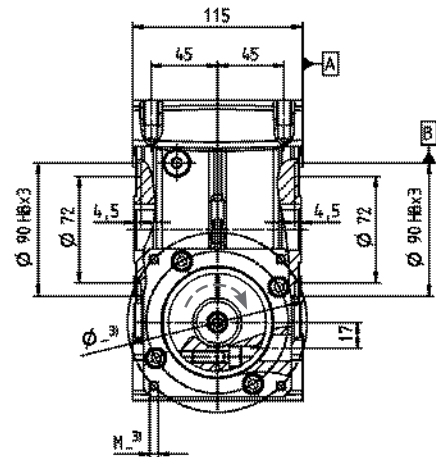
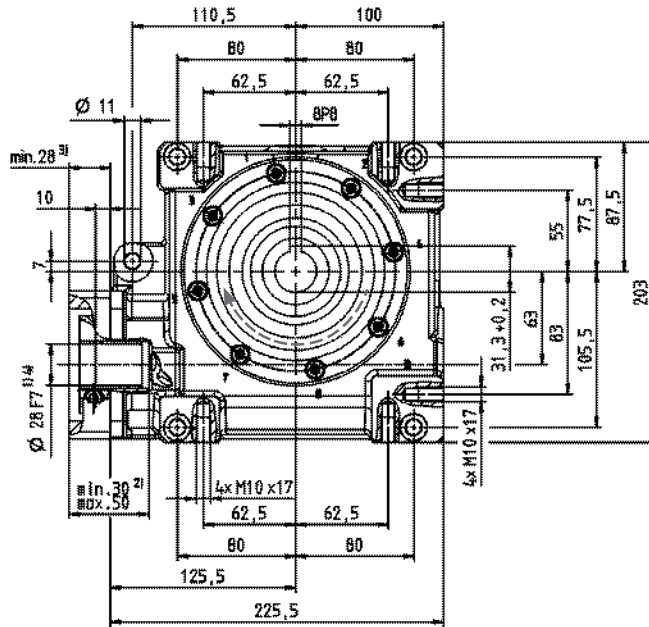
V-Drive
economy

VDH economy 063 1-stage

			1-stage					
Ratio	<i>i</i>		4	7	10	16	28	40
$n_{IN}=500$ rpm	T_{2Max}	Nm	–	264	270	279	301	282
		in.lb	–	2336	2390	2469	2664	2496
	T_{2Servo}	Nm	–	183	195	198	215	201
		in.lb	–	1620	1726	1752	1903	1779
	η	%	–	91	88	83	74	68
$n_{IN}=1000$ rpm	T_{2Max}	Nm	–	256	265	276	299	280
		in.lb	–	2266	2345	2443	2646	2478
	T_{2Servo}	Nm	–	197	208	212	230	215
		in.lb	–	1743	1841	1876	2036	1903
	η	%	–	93	91	86	78	73
$n_{IN}=2000$ rpm	T_{2Max}	Nm	–	234	252	263	277	269
		in.lb	–	2071	2230	2328	2451	2381
	T_{2Servo}	Nm	–	188	203	212	224	217
		in.lb	–	1664	1797	1876	1982	1920
	η	%	–	94	93	89	83	78
$n_{IN}=3000$ rpm	T_{2Max}	Nm	–	183	198	209	230	224
		in.lb	–	1620	1752	1850	2036	1982
	T_{2Servo}	Nm	–	145	163	181	182	177
		in.lb	–	1283	1443	1602	1611	1566
	η	%	–	95	94	91	85	81
$n_{IN}=4000$ rpm	T_{2Max}	Nm	–	146	162	175	196	193
		in.lb	–	1292	1434	1549	1735	1708
	T_{2Servo}	Nm	–	114	134	152	152	149
		in.lb	–	1009	1186	1345	1345	1319
	η	%	–	96	94	92	86	83
Emergency stop torque	T_{2Not}	Nm	–	484	491	494	518	447
		in.lb	–	4283	4345	4372	4584	3956
Max. input speed	n_{1Max}	rpm	4500					
Mean no load running torque ^{a)} (With $n_1=3000$ min ⁻¹ and 20° C gear temperature)	T_{012}	Nm	–	1,9	1,8	1,7	1,6	1,4
		in.lb	–	16,8	15,9	15,0	14,2	12,4
Max. torsional backlash	j_t	arcmin	≤8					
Torsional rigidity	C_{t21}	Nm/arcmin	28					
		in.lb/arcmin	248					
Max. axial force ^{b)}	F_{2AMax}	N	8250					
		lb _f	1856					
Max. radial force ^{b)}	F_{2RMax}	N	6000					
		lb _f	1350					
Max. tilting moment	M_{2KMax}	Nm	843					
		in.lb	7461					
Service life (For calculation see "Information")	L_h	h	> 20000					
Weight incl. standardadapter plate	m	kg	12					
		lb _m	26,5					
Operating noise (with $n_1=3000$ rpm no load)	L_{PA}	dB(A)	≤ 64					
Max. permitted housing temperature		°C	+90					
		F	194					
Ambient temperature		°C	-15 to +40					
		F	5 to 104					
Lubrication			Synthetic transmission oil					
Paint			None					
Direction of rotation			See drawing					
Protection class			IP 65					
Moment of inertia (relates to the drive)	J_1	kgcm ²	–	5,77	5,53	5,44	5,40	5,35
		10 ⁻³ in.lb.s ²	–	5,11	4,89	4,81	4,78	4,74

^{a)} Idling torques decrease during operation

^{b)} Refers to center of the output shaft or flange



- a) Hollow shaft, keywayed
- b) Hollow shaft, smooth
- c) End disc for screw M10 (on request)
- d) End disc as forcing washer for screw M12 (on request)
- e) Locking ring – DIN 472 (on request)

Non-tolerated dimensions ± 1 mm

- 1) Check motor shaft fit.
- 2) Min./Max. permissible motor shaft length.
Longer motor shafts are adaptable, please contact us.
- 3) The dimensions depend on the motor.
- 4) Smaller motor shaft diameter is compensated by a bushing with a minimum thickness of 1 mm.
- 5) Tolerance h6 for mounted shaft.

CAD data is available under www.wittenstein-alpha.com

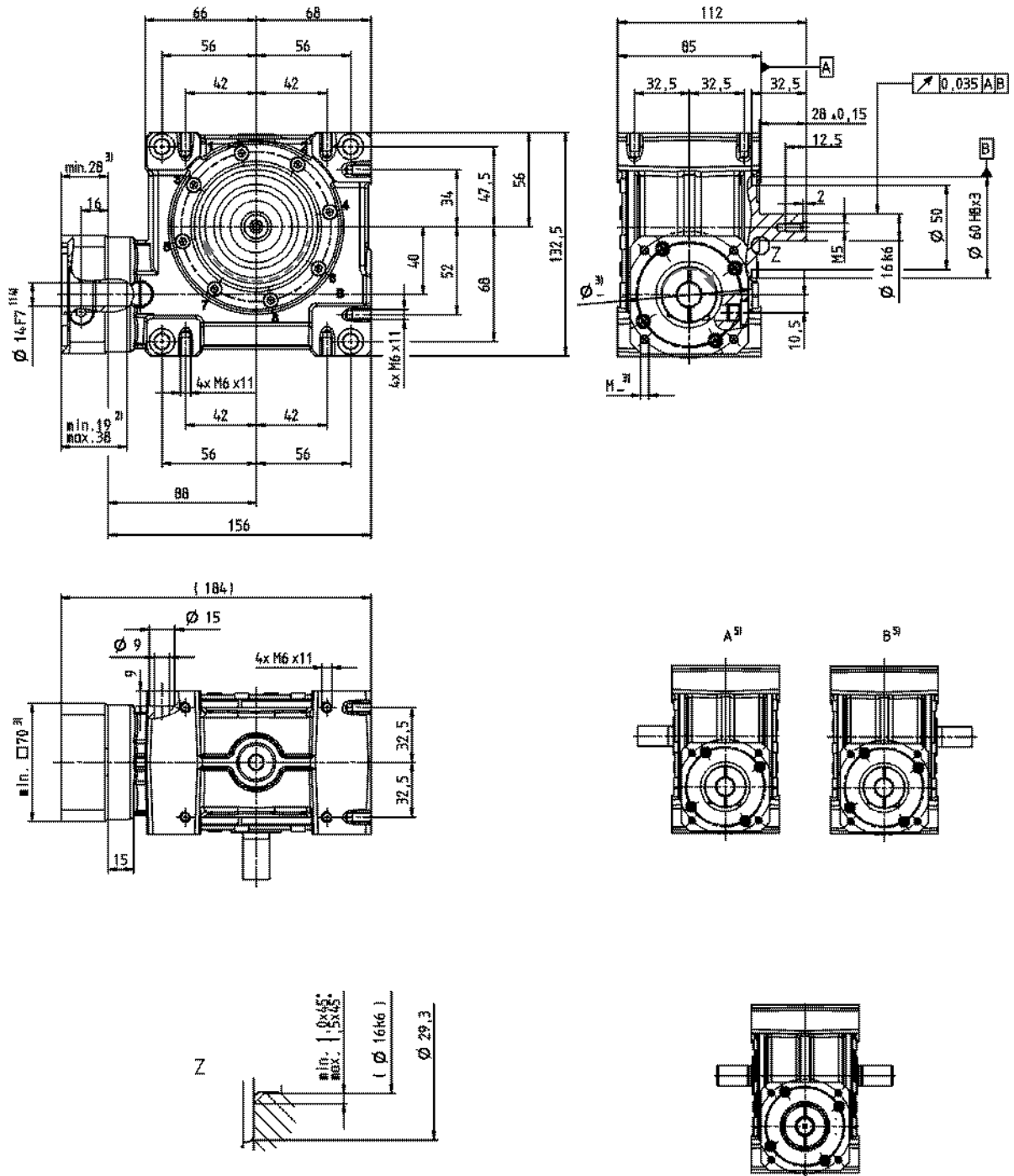
Motor mounting according to operating manual

VDS economy 040 1-stage

				1-stage					
Ratio		<i>i</i>		4	7	10	16	28	40
$n_{IN}=500$ rpm	T_{2Max}	Nm		45	60	68	72	75	70
			in.lb	398	531	602	637	664	620
	T_{2Servo}	Nm		19	26	28	29	32	28
			in.lb	168	230	248	257	283	248
$n_{IN}=1000$ rpm	T_{2Max}	Nm		45	60	68	72	75	70
			in.lb	398	531	602	637	664	620
	T_{2Servo}	Nm		19	26	28	29	32	28
			in.lb	168	230	248	257	283	248
$n_{IN}=2000$ rpm	T_{2Max}	Nm		35	50	54	59	63	60
			in.lb	310	443	478	522	558	531
	T_{2Servo}	Nm		19	26	28	29	33	29
			in.lb	168	230	248	257	292	257
$n_{IN}=3000$ rpm	T_{2Max}	Nm		30	42	46	51	53	52
			in.lb	266	372	407	451	469	460
	T_{2Servo}	Nm		19	26	28	29	32	28
			in.lb	168	230	248	257	283	248
$n_{IN}=4000$ rpm	T_{2Max}	Nm		28	36	40	44	47	46
			in.lb	248	319	354	389	416	407
	T_{2Servo}	Nm		19	25	27	28	31	27
			in.lb	168	221	239	248	274	239
Emergency stop torque	T_{2Not}	Nm		118	126	125	129	134	122
		in.lb		1044	1115	1106	1142	1186	1080
Max. input speed	n_{1Max}	rpm		6000					
Mean no load running torque ^{a)} (With $n_1=3000$ min ⁻¹ and 20° C gear temperature)	T_{012}	Nm		0,8	0,7	0,5	0,5	0,4	0,4
		in.lb		7,1	6,2	4,4	4,4	3,5	3,5
Max. torsional backlash	j_t	arcmin		≤8					
Torsional rigidity	C_{t21}	Nm/arcmin		4,5					
		in.lb/arcmin		40					
Max. axial force ^{b)}	F_{2AMax}	N		3000					
		lb _f		675					
Max. radial force ^{b)}	F_{2RMax}	N		2400					
		lb _f		540					
Max. tilting moment	M_{2KMax}	Nm		205					
		in.lb		1814					
Service life (For calculation see "Information")	L_h	h		> 20000					
Weight incl. standard adapter plate	m	kg		4,1					
		lb _m		9,1					
Operating noise (with $n_1=3000$ rpm no load)	L_{PA}	dB(A)		≤ 54					
Max. permitted housing temperature		°C		+90					
		F		194					
Ambient temperature		°C		-15 to +40					
		F		5 to 104					
Lubrication				Synthetic transmission oil					
Paint				None					
Direction of rotation				See drawing					
Protection class				IP 65					
Moment of inertia (relates to the drive) Moments of inertia for motor shaft diameter 14 and 19 mm	C	14	J_i	kgcm ²	0.52	0.38	0.34	0.32	0.32
				10 ⁻³ in.lb.s ²	0.46	0.34	0.30	0.28	0.28
	E	19	J_i	kgcm ²	0.54	0.40	0.37	0.35	0.34
				10 ⁻³ in.lb.s ²	0.48	0.35	0.33	0.31	0.30

^{a)} Idling torques decrease during operation

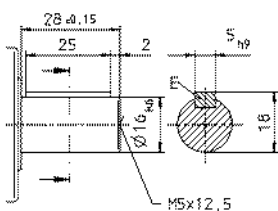
^{b)} Refers to center of the output shaft or flange



Optional dual-shaft output. Drawings available upon request.

Alternatives: Output shaft variants

Keywayed output shaft in mm
E = key as per DIN 6885, sheet 1, form A



Non-tolerated dimensions ± 1 mm

- 1) Check motor shaft fit.
- 2) Min./Max. permissible motor shaft length.
Longer motor shafts are adaptable, please contact us.
- 3) The dimensions depend on the motor.
- 4) Smaller motor shaft diameter is compensated by a bushing with a minimum thickness of 1 mm. Motor shaft diameters up to 19 mm available – please contact WITTENSTEIN alpha
- 5) Output side

CAD data is available under www.wittenstein-alpha.com

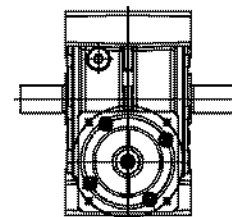
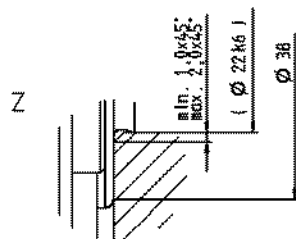
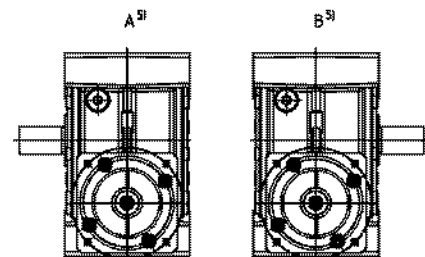
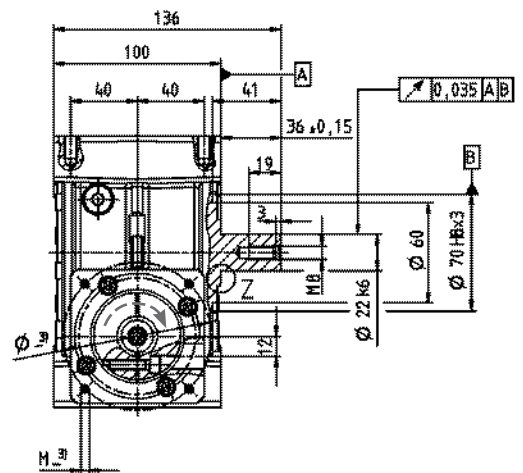
Motor mounting according to operating manual

VDS economy 050 1-stage

			1-stage					
Ratio	<i>i</i>		4	7	10	16	28	40
$n_{IN}=500$ rpm	T_{2Max}	Nm	–	102	111	118	128	116
		in.lb	–	903	982	1044	1133	1027
	T_{2Servo}	Nm	–	62	64	70	78	64
		in.lb	–	549	566	620	690	566
	η	%	–	89	86	82	72	64
$n_{IN}=1000$ rpm	T_{2Max}	Nm	–	103	108	114	124	112
		in.lb	–	912	956	1009	1097	991
	T_{2Servo}	Nm	–	66	70	76	84	70
		in.lb	–	584	620	673	743	620
	η	%	–	91	89	85	77	69
$n_{IN}=2000$ rpm	T_{2Max}	Nm	–	92	97	105	117	103
		in.lb	–	814	858	929	1035	912
	T_{2Servo}	Nm	–	68	71	77	86	72
		in.lb	–	602	628	681	761	637
	η	%	–	93	91	88	75	75
$n_{IN}=3000$ rpm	T_{2Max}	Nm	–	82	88	97	105	95
		in.lb	–	726	779	858	929	841
	T_{2Servo}	Nm	–	67	70	76	84	70
		in.lb	–	593	620	673	743	620
	η	%	–	94	93	90	83	78
$n_{IN}=4000$ rpm	T_{2Max}	Nm	–	77	81	90	99	88
		in.lb	–	681	717	797	876	779
	T_{2Servo}	Nm	–	64	69	75	83	69
		in.lb	–	566	611	664	735	611
	η	%	–	95	93	91	85	80
Emergency stop torque	T_{2Not}	Nm	–	242	242	250	262	236
		in.lb	–	2142	2142	2213	2319	2089
Max. input speed	n_{1Max}	rpm	6000					
Mean no load running torque ^{a)} (With $n_1=3000$ min ⁻¹ and 20° C gear temperature)	T_{012}	Nm	–	1,2	1,2	1,1	1	0,9
		in.lb	–	10,6	10,6	9,7	8,9	8,0
Max. torsional backlash	j_t	arcmin	≤8					
Torsional rigidity	C_{t21}	Nm/arcmin	8					
		in.lb/arcmin	71					
Max. axial force ^{b)}	F_{2AMax}	N	5000					
		lb _f	1125					
Max. radial force ^{b)}	F_{2RMax}	N	3800					
		lb _f	855					
Max. tilting moment	M_{2KMax}	Nm	409					
		in.lb	3620					
Service life (For calculation see "Information")	L_h	h	> 20000					
Weight incl. standardadapter plate	m	kg	7,7					
		lb _m	17,0					
Operating noise (with $n_1=3000$ rpm no load)	L_{PA}	dB(A)	≤ 62					
Max. permitted housing temperature		°C	+90					
		F	194					
Ambient temperature		°C	-15 to +40					
		F	5 to 104					
Lubrication			Synthetic transmission oil					
Paint			None					
Direction of rotation			See drawing					
Protection class			IP 65					
Moment of inertia (relates to the drive)	J_1	kgcm ²	–	2,01	1,93	1,84	1,81	1,86
		10 ⁻³ in.lb.s ²	–	1,78	1,71	1,63	1,60	1,64

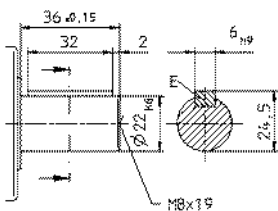
^{a)} Idling torques decrease during operation

^{b)} Refers to center of the output shaft or flange



Right-angle gearheads Economy

VDSe

V-Drive
economy

- 1) Check motor shaft fit.
- 2) Min./Max. permissible motor shaft length.
Longer motor shafts are adaptable, please contact us.
- 3) The dimensions depend on the motor.
- 4) Smaller motor shaft diameter is compensated by a bushing with a minimum thickness of 1 mm.
- 5) Output side



!

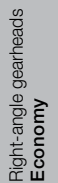
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VDS economy 063 1-stage

			1-stage					
Ratio	<i>i</i>		4	7	10	16	28	40
$n_{IN}=500$ rpm	T_{2Max}	Nm	–	264	270	279	301	282
		in.lb	–	2336	2390	2469	2664	2496
	T_{2Servo}	Nm	–	183	195	198	215	201
		in.lb	–	1620	1726	1752	1903	1779
	η	%	–	91	88	83	74	68
$n_{IN}=1000$ rpm	T_{2Max}	Nm	–	256	265	276	299	280
		in.lb	–	2266	2345	2443	2646	2478
	T_{2Servo}	Nm	–	197	208	212	230	215
		in.lb	–	1743	1841	1876	2036	1903
	η	%	–	93	91	86	78	73
$n_{IN}=2000$ rpm	T_{2Max}	Nm	–	234	252	263	277	269
		in.lb	–	2071	2230	2328	2451	2381
	T_{2Servo}	Nm	–	188	203	212	224	217
		in.lb	–	1664	1797	1876	1982	1920
	η	%	–	94	93	89	83	78
$n_{IN}=3000$ rpm	T_{2Max}	Nm	–	183	198	209	230	224
		in.lb	–	1620	1752	1850	2036	1982
	T_{2Servo}	Nm	–	145	163	181	182	177
		in.lb	–	1283	1443	1602	1611	1566
	η	%	–	95	94	91	85	81
$n_{IN}=4000$ rpm	T_{2Max}	Nm	–	146	162	175	196	193
		in.lb	–	1292	1434	1549	1735	1708
	T_{2Servo}	Nm	–	114	134	152	152	149
		in.lb	–	1009	1186	1345	1345	1319
	η	%	–	96	94	92	86	83
Emergency stop torque	T_{2Not}	Nm	–	484	491	494	518	447
		in.lb	–	4283	4345	4372	4584	3956
Max. input speed	n_{1Max}	rpm	4500					
Mean no load running torque ^{a)} (With $n_1=3000$ min ⁻¹ and 20° C gear temperature)	T_{012}	Nm	–	1,9	1,8	1,7	1,6	1,4
		in.lb	–	16,8	15,9	15,0	14,2	12,4
Max. torsional backlash	j_t	arcmin	≤8					
Torsional rigidity	C_{t21}	Nm/arcmin	28					
		in.lb/arcmin	248					
Max. axial force ^{b)}	F_{2AMax}	N	8250					
		lb _f	1856					
Max. radial force ^{b)}	F_{2RMax}	N	6000					
		lb _f	1350					
Max. tilting moment	M_{2KMax}	Nm	843					
		in.lb	7461					
Service life (For calculation see "Information")	L_h	h	> 20000					
Weight incl. standardadapter plate	m	kg	12,5					
		lb _m	27,6					
Operating noise (with $n_1=3000$ rpm no load)	L_{PA}	dB(A)	≤ 64					
Max. permitted housing temperature		°C	+90					
		F	194					
Ambient temperature		°C	-15 to +40					
		F	5 to 104					
Lubrication			Synthetic transmission oil					
Paint			None					
Direction of rotation			See drawing					
Protection class			IP 65					
Moment of inertia (relates to the drive)	J_1	kgcm ²	–	5,78	5,53	5,44	5,40	5,35
		10 ⁻³ in.lb.s ²	–	5,12	4,90	4,82	4,78	4,74

^{a)} Idling torques decrease during operation

^{b)} Refers to center of the output shaft or flange



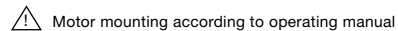
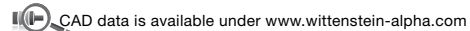
VDSe

V-Drive
economy

E = key as per DIN 6885, sheet 1, form A



- 1) Check motor shaft fit.
- 2) Min./Max. permissible motor shaft length.
Longer motor shafts are adaptable, please contact us.
- 3) The dimensions depend on the motor.
- 4) Smaller motor shaft diameter is compensated by a bushing with a minimum thickness of 1 mm.
- 5) Output side



System solutions



alpha rack & pinion system

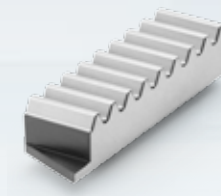
Precise rack and pinion drives tailored to your applications

We provide you with an optimum system solution comprising a gearhead, rack and pinion precisely tailored to your requirements. A selected range of accessories for lubrication and mounting complete the linear system.

www.rack-pinion.com



Lubrication



Assembly jig

Your benefits:

Dynamic

- Maximum movement speed and acceleration with low moments of inertia
- Excellent control characteristics due to constant linear rigidity along the entire movement path

Precise

- Drive solutions with unique true running accuracy
- Maximum positioning accuracy due to precision alignment of components

Efficient

- Effortless commissioning
- Minimal mounting space and high power density
- Huge savings potential



alpha IQ

Low backlash planetary gearboxes
with integrated sensors

Achieving compatibility.
Utilizing intelligence.
Increasing efficiency.

WITTENSTEIN alpha gearhead with
integrated sensors – helping you better
understand your processes.

torqXis sensors

Modular intelligent sensor solution for
measuring mechanical parameters in
the drive train.

A window to the process:
Innovative systems are the result of
in-depth process analysis – the decisive
factor for understanding, monitoring and
control of drive components.

Our services

- Customer-specific sensor solutions
- Empirical drive design
- On-site service
- Rental systems
- Measurement service

Your benefits:

- Energy-efficient drive control
- Dimensioning of drives
- Process-integrated monitoring
of relevant process parameters
- Effective design optimization
- Effortless integration in the drive train
- Robust measurement tool (IP65)



Rack and
pinion system



alpha IQ



torqXis

alpha rack & pinion system

WITTENSTEIN alpha rack and pinion systems – the perfect symbiosis of state-of-the-art technology and many years of experience.

Our specialist knowledge extends from the coupling of gearhead, motor, pinion and rack to complete system solutions.

30 years of experience in the fields of gearhead construction, toothing technology and the design of complete drive systems go into our rack and pinion systems.

For more detailed information, please visit: **www.rack-pinion.com**

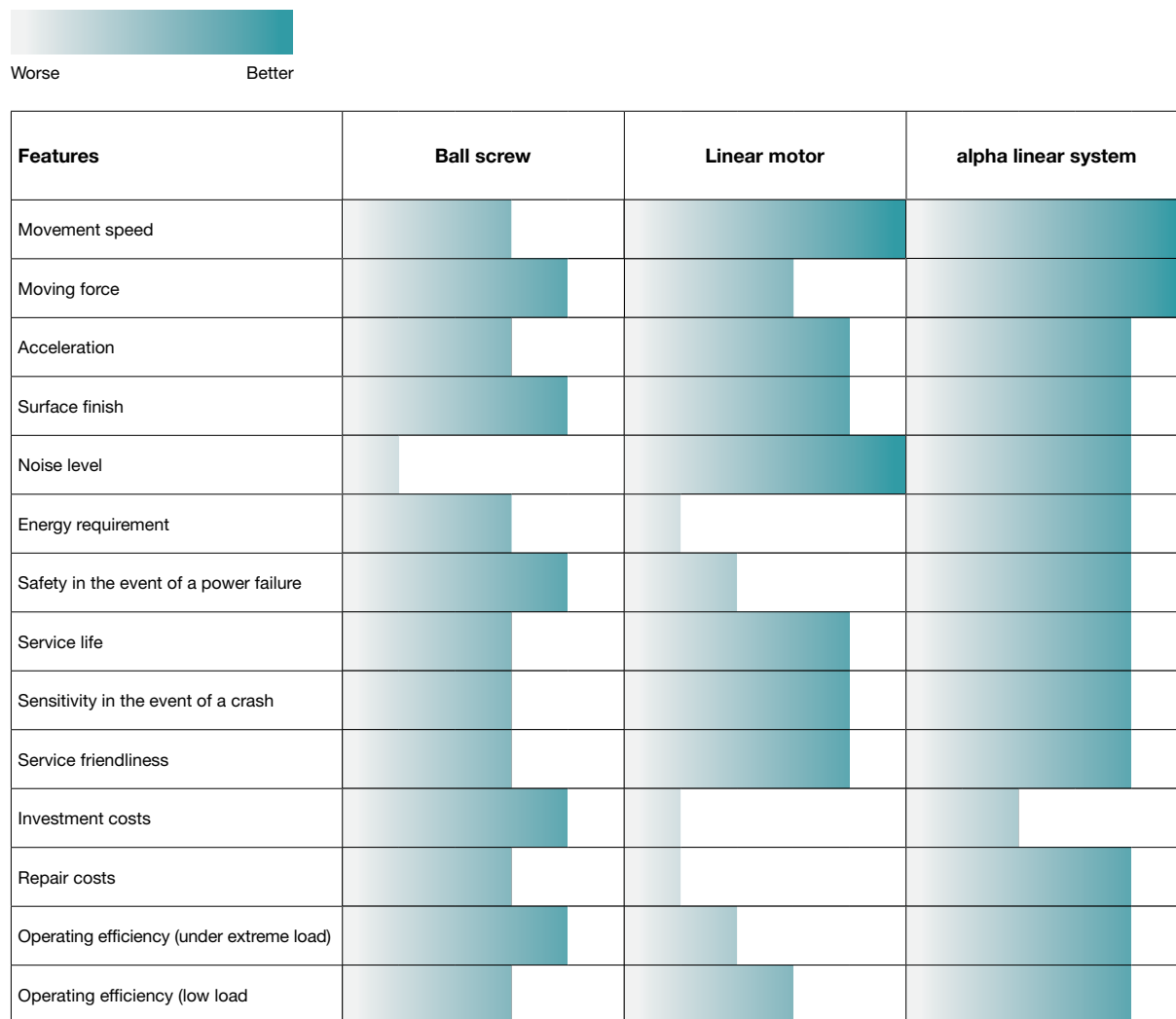


The alternative – not only for long distances

Rack and pinion combinations not only excel in applications involving long, precise movement paths. The alpha technology achieves an excellent degree of precision using an electronic tensioning system. The high-precision manufacture of individual components is an essential aspect here because manufacturers and users must be able to rely on the installed drives to achieve the level of accuracy required.

We offer the highest levels of precision, dynamics and rigidity as well as an extended service life that more than satisfy the demanding requirements of machine and system manufacturers. The result of our efforts is maximum performance across the board. WITTENSTEIN alpha has succeeded in opening up new areas of application for the old established system of gearhead, rack and pinion, while also setting new standards in terms of moving forces, power density and rigidity.

The alpha rack & pinion system in direct comparison with other linear systems



The comparison is based on typical processes involved in machining large workpieces and machines with long movement paths.



The alpha rack & pinion system compared



High Performance Linear System

Planetary gearhead RP+
High-performance pinion
High-performance rack

- Maximum degrees of freedom in design
- Cost reductions through downsizing
- Maximum power density
- Maximum precision in master/slave configuration
- Application e.g. for HSC milling machines or highly dynamic and precise handling applications

150% greater moving force*
100% higher power density*
50% higher system reliability*
50% less mounting effort*
15% more accurate positioning*

* Compared to industry standard

You can download the system catalog from
www.rack-pinion.com



Precision System

Planetary gearhead TP+
Premium Class+/
Premium Class RTP pinion
Premium Class rack

- Maximum positioning accuracy with single drive
- Cost reductions through omission of direct measuring systems possible
- Unsurpassed precision in master/slave configuration
- Applications e.g. for laser machines or milling machines



Performance Linear System

Planetary gearhead alpheno®
Premium Class+ pinion
Performance Class rack

- Maximum power output
- Added efficiency
- Compliance with the increased statutory requirements with regard to machine safety
- Maximum precision in master/slave configuration
- Application e.g. for updating existing wood, plastic/composite machining center designs or in automation

alpha rack and pinion system

In addition to the standard planetary gearheads, the relevant servo right-angle gearheads are of course also available for our rack and pinion systems. The range is completed by the integrated motor/gearhead units TPM+ and RPM+ from WITTENSTEIN motion control.

Please refer to the further information on servo right-angle gearheads in this catalog. To the actuators under
www.wittenstein-motion-control.de



The system quick selection
is available on the next two
pages:



Standard System

Planetary gearhead SP+
Standard Class RSP pinion
Value Class rack

- Adapted to linear standard applications in the mid-range area with medium/normal requirements for positioning accuracy
- Application e.g. for wood, plastic/ composite machining centers and in automation

Economy System

Planetary gearhead LP+
Planetary gearhead SP+
Value Class pinion
Value Class rack

- Adapted to linear applications in the economy segment with comparatively low requirements for positioning accuracy and moving force
- Applications e.g. for wood processing machines or in automation

Master/slave configuration – electrically clamped drives

The closed-loop control clamped drives enable a machine accuracy* of up to $< 5 \mu\text{m}$ to be achieved. This is regardless of the moving force, movement speed or axis length! Here, maximum precision can only be achieved through the optimal interaction between the individual components. Such accuracy is only possible for a system supplier such as WITTENSTEIN alpha GmbH.

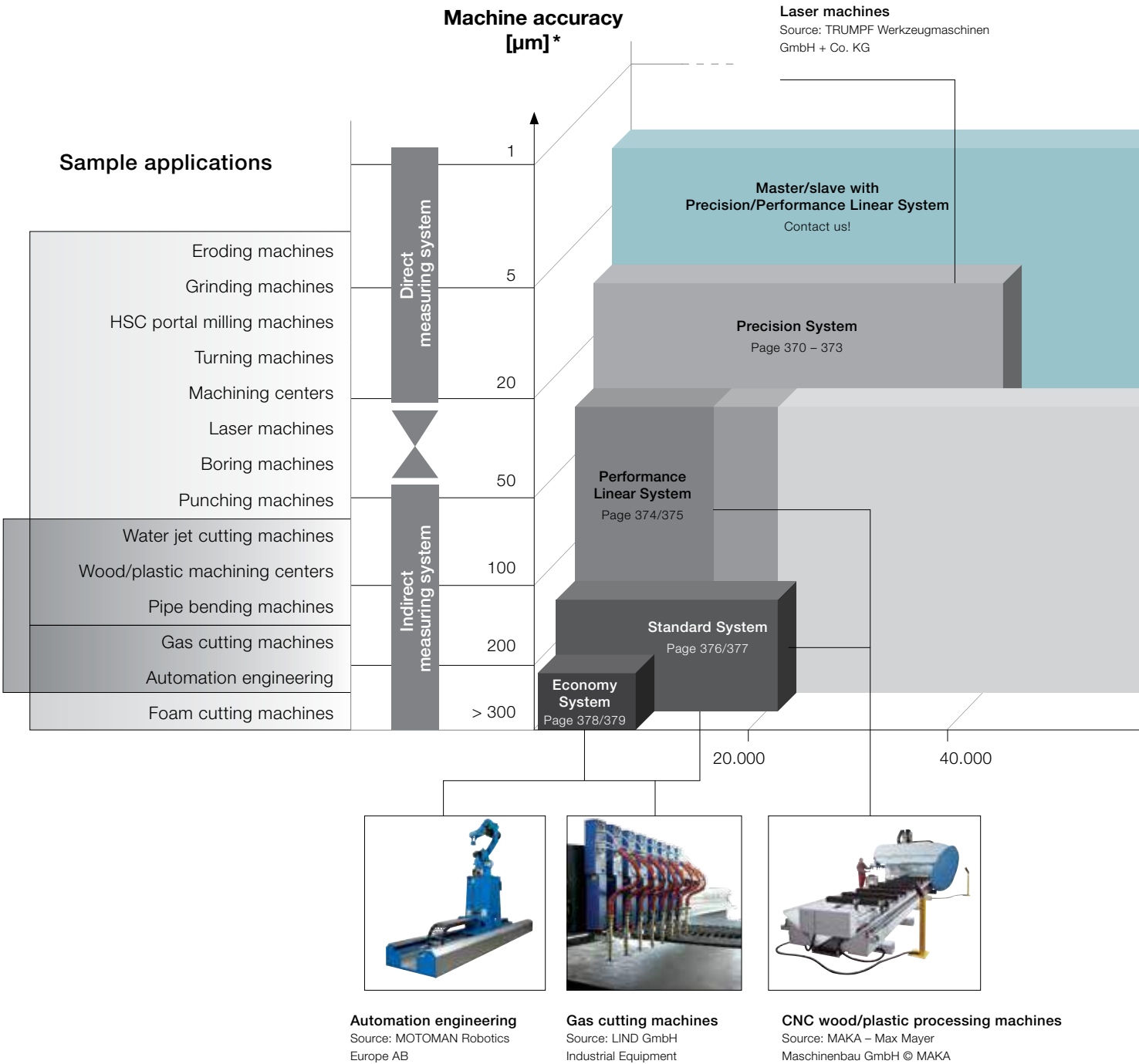
* depending on other parameters



Quick system selection – the right system for each application



Laser machines
Source: TRUMPF Werkzeugmaschinen GmbH + Co. KG





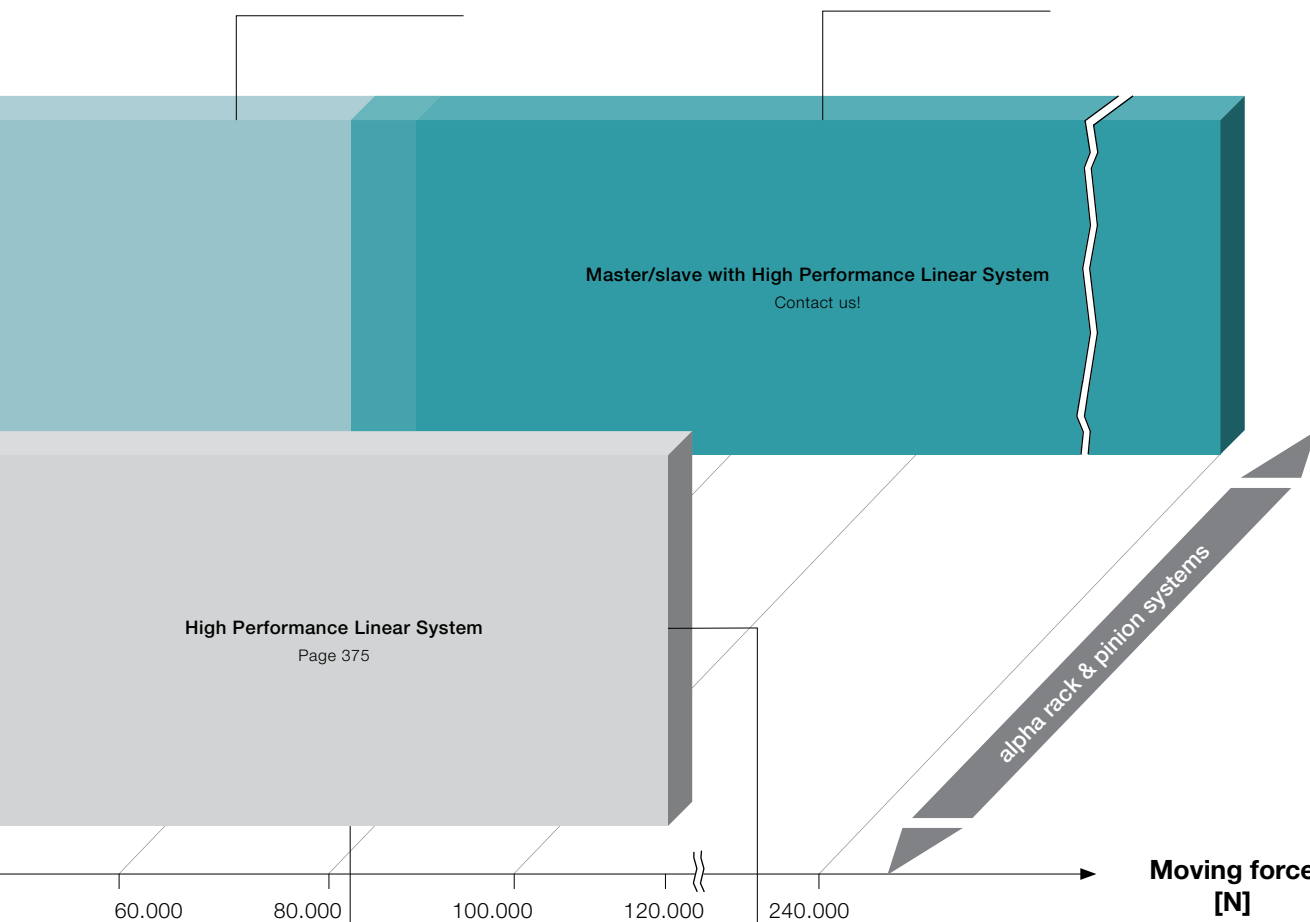
Profile machining centers

Source: Handtmann A-Punkt Automation GmbH



HSC portal milling machines

Source: F. Zimmermann GmbH



Pipe bending machines

Source: Wafios AG



Press transfer

Source: Strothmann
Machines & Handling GmbH

* depending on other parameters

Pinion versions for the system



Premium Class+ pinion

In conjunction with Precision and Performance Linear System

- High-precision and optimally designed toothing geometries for best possible power transmission, superior running and precision in application
- Innovative pinion/gearhead connection ensures:
 - Highest linear rigidity through the direct connection of pinions with small partial circle diameter
 - Maximum flexibility in pinion selection
 - Optimally dimensioned and rigid pinions
 - Compact drive design
- Factory assembled with marked high point
- In addition to our standard pinions for rack and pinion applications, we offer you further options for special applications, e.g. slew ring drives. Contact us!



Premium Class RTP pinion

In conjunction with Precision system

- High-precision and optimally designed toothing geometries for best possible power transmission, superior running and precision in application
- Adapted to the standard gearhead series with the proven TP+ output flange
- High movement speeds with low input speeds thanks to large pitch diameter
- Compact pinion/gearhead connection
- Factory assembled with marked high point



Standard Class RSP pinion

In conjunction with Standard system

- Precise toothing with optimally designed toothing geometry
- Positive involute connection between pinion and gearhead
- Compact design
- Factory assembled with marked high point

Factory assembled

All of our pinions are supplied factory assembled. For you, this results in the **following benefits:**

- Tested quality through 100% final inspection
- Highest quality and reliability, perfect setting of the tooth backlash between pinion and rack through aligned pinion and marked high point*
- Prevention of potential sources of error during assembly at your plant

*not for Value Class pinions

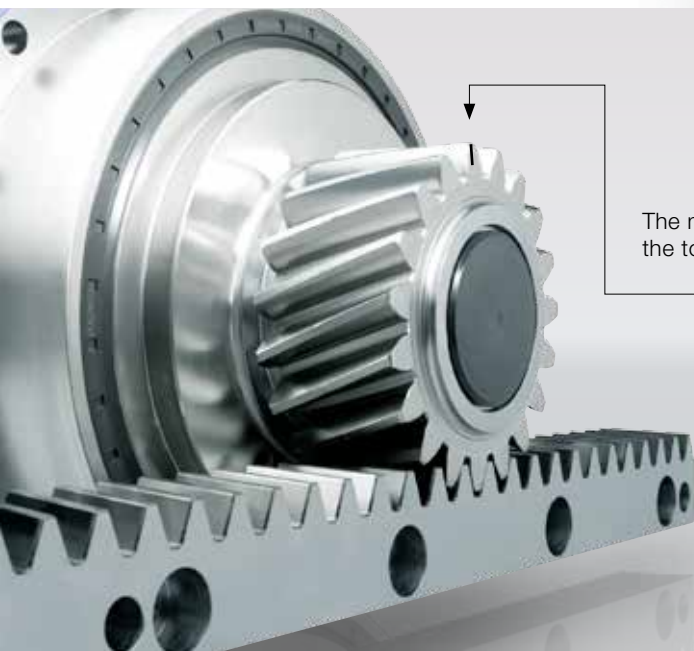




Value Class pinion

In conjunction with Economy system

- Precise toothing with optimally designed toothing geometry
- Low backlash shrink-fit/bonded connection with key as overload protection
- Factory-made shrink-fit/bonded connection ensures perfect seating of the pinion throughout the entire service life



The marked high point enables perfect setting of the tooth backlash between pinion and rack.

Rack versions for the system

Premium Class rack

In conjunction with Precision system

Solution for extremely dynamic, precision high-end-applications. For even greater precision: linear and gantry sorting possible. Contact us!

Your benefits:

- Best toothing quality ensures greatest precision, even in single-drive applications
- Up to a machine accuracy of approx. 30 µm, an indirect measuring system is sufficient in single-drive applications in conjunction with assorted racks

Performance Class rack

In conjunction with Performance Linear System

The solution for highly dynamic Mid-Range and precise high-end applications (with electrically clamped drives).

Your benefits:

- Significantly higher strength in the surface layer and in the core structure
- Higher permissible bending loads
- Maximum fatigue strength against vibration loads
- Maximum wear resistance

Where your requirements exceed these significantly, our High Performance Linear System is the right solution for you. Further information is available in the download area at www.rack-pinion.com

Value Class rack

In conjunction with Economy system

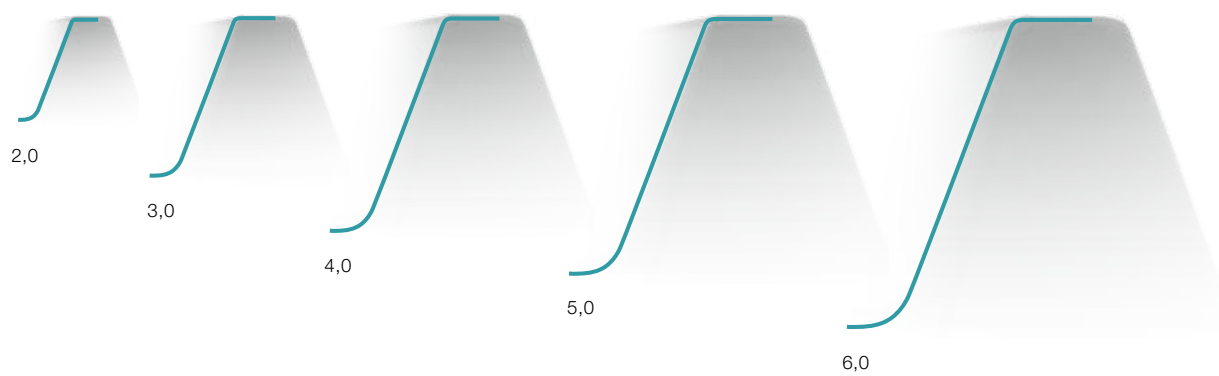
The cost-effective solution for mid-range and economy applications with comparatively low requirements for positioning accuracy and moving force. Helical teeth ensure the usual smooth running.

The right rack for all requirements

The correct rack is an essential component in realizing your machine concepts. WITTENSTEIN alpha offers three classes of rack, Premium Class, Value Class and Smart Class, to find the right solution for your application requirements in conjunction with a matched gearhead and pinion.

Meeting your requirements without limits!





Tooting size comparison (DIN 867).



Premium Class rack

Module	p_t	L	z	a	a_1	B	d	$d_1^{b)}$	D	$f^{+0.5}$	h	h_b	h_D	H	I	I_1	L_1	m
2	6.67	500	75	31.7	436.6	24	7	5.7	11	2	22	8	7	24	62.5	125.0	8.5	1.99
2	6.67	333	50	31.7	269.9	24	7	5.7	11	2	22	8	7	24	62.5	104.2	8.5	1.32
2	6.67	167	25	31.7	103.3	24	7	5.7	11	2	22	8	7	24	62.5	41.7	8.5	0.65
3	10.00	500	50	35.0	430.0	29	10	7.7	15	2	26	9	9	29	62.5	125.0	10.3	2.80
3	10.00	250	25	35.0	180.0	29	10	7.7	15	2	26	9	9	29	62.5	125.0	10.3	1.39
4	13.33	507	38	18.3	460.0	39	12	9.7	18	3	35	12	11	39	62.5	125.0	13.8	5.11
5	16.67	500	30	37.5	425.0	49	14	11.7	20	3	34	12	13	39	62.5	125.0	17.4	6.05
6	20.00	500	25	37.5	425.0	59	18	15.7	26	3	43	16	17	49	62.5	125.0	20.9	9.01

All dimensions in [mm]

Cumulative pitch error $F_p = 12 \mu\text{m}$ for m2 (500 mm) and m3 (250 mm in length); $F_p = 15 \mu\text{m}$ for $m > 2$ Single pitch error $f_p = 3 \mu\text{m}$ ^{b)} Recommended tolerance dimension: $6^{H7}/8^{H7}/10^{H7}/12^{H7}/16^{H7}$ ^{c)} Hole spacing between two racks on module 4 is 131.67 mm. p_t = Reference circle pitch

z = Number of teeth

m = Mass in kg

Performance Class rack

Module	p_t	L	z	a	a_1	B	d	$d_1^{b)}$	D	$f^{+0.5}$	h	h_b	h_D	H	I	I_1	L_1	m
2	6.67	1000	150	31.7	936.6	24	7	5.7	11	2	22	8	7	24	62.5	125.0	8.5	4.01
3	10.00	1000	100	35.0	930.0	29	10	7.7	15	2	26	9	9	29	62.5	125.0	10.3	5.64
4	13.33	1000	75	33.3	933.4	39	10	7.7	15	3	35	12	9	39	62.5	125.0	13.8	10.32
5	16.67	1000	60	37.5	925.0	49	14	11.7	20	3	34	12	13	39	62.5	125.0	17.4	12.23
6	20.00	1000	50	37.5	925.0	59	18	15.7	26	3	43	16	17	49	62.5	125.0	20.9	18.28

All dimensions in [mm]

Cumulative pitch error $F_p = 35 \mu\text{m}/1000 \text{ mm}$ Single pitch error $f_p = 8 \mu\text{m}$; $10 \mu\text{m}$ at m5 and m6^{b)} Recommended tolerance dimension: $6^{H7}/8^{H7}/10^{H7}/12^{H7}/16^{H7}/20^{H7}$ p_t = Reference circle pitch

z = Number of teeth

m = Mass in kg

Value Class rack

Module	p_t	L	z	a	a_1	B	d	$d_1^{b)}$	D	$f^{+0.5}$	h	h_b	h_D	H	I	I_1	L_1	m
2	6.67	1000	150	31.7	936.6	24	7	5.7	11	2	22	8	7	24	62.5	125.0	8.5	4.01
3	10.00	1000	100	35.0	930.0	29	10	7.7	15	2	26	9	9	29	62.5	125.0	10.3	5.64
4	13.33	1000	75	33.3	933.4	39	10	7.7	15	3	35	12	9	39	62.5	125.0	13.8	10.32
5	16.67	1000	60	37.5	925.0	49	14	11.7	20	3	34	12	13	39	62.5	125.0	17.4	12.23
6	20.00	1000	50	37.5	925.0	59	18	15.7	26	3	43	16	17	49	62.5	125.0	20.9	18.28

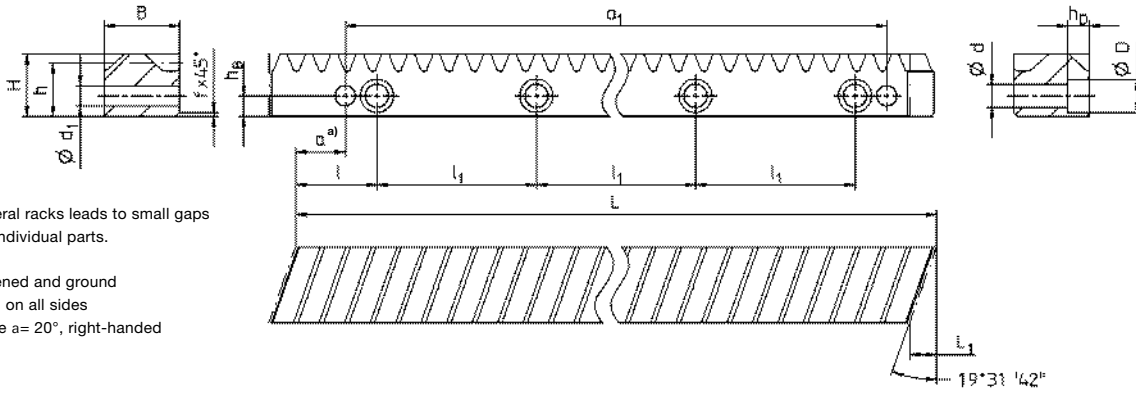
All dimensions in [mm]

Cumulative pitch error $F_p = 35 \mu\text{m}/1000 \text{ mm}$ Single pitch error $f_p = 8 \mu\text{m}$; $10 \mu\text{m}$ at m5 and m6^{b)} Recommended tolerance dimension: $6^{H7}/8^{H7}/10^{H7}/12^{H7}/16^{H7}$ p_t = Reference circle pitch

z = Number of teeth

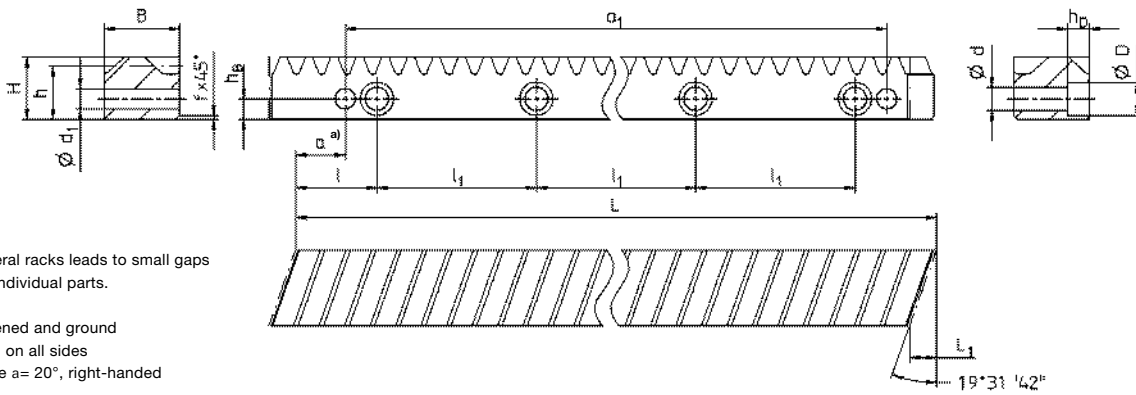
m = Mass in kg

Please refer to the operating instructions available at www.wittenstein-alpha.com for instructions on assembly and design of the machine bed



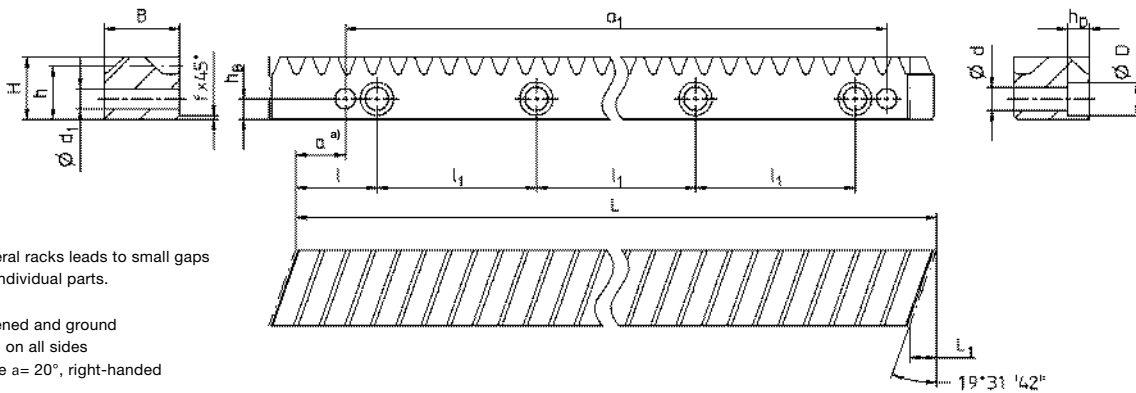
a) Installing several racks leads to small gaps between the individual parts.

Gearing hardened and ground
Profile ground on all sides
Pressure angle $a = 20^\circ$, right-handed



a) Installing several racks leads to small gaps between the individual parts.

Gearing hardened and ground
Profile ground on all sides
Pressure angle $a = 20^\circ$, right-handed



a) Installing several racks leads to small gaps between the individual parts.

Gearing hardened and ground
Profile ground on all sides
Pressure angle $a = 20^\circ$, right-handed

Planetary gearhead TP⁺ (HIGH TORQUE) / right-angle gearhead TPK⁺ (HIGH TORQUE) with Premium Class⁺ pinion and Premium Class rack (all pinions, pressure angle $\alpha=20^\circ$, inclination angle $\beta=19.5283^\circ$ left-handed)

Gearhead size ^{b)}	Module	z	A $\pm 0,3^{a)}$	b	B	d _a	d	x	L12	L13	x2	L15	L16	L17
TP ⁺ / TPK ⁺ 010	2	20	44.021	26	24	48.3	42.441	0.4	71.0	50.5	20.5	8.5	38.5	33.5
TP ⁺ / TPK ⁺ 025	2	20	44.021	26	24	48.3	42.441	0.4	73.5	53.0	24.0	12.0	41.0	33.5
	3	20	59.031	31	29	72.3	63.662	0.4	76.0	52.5	23.5	9.0	38.0	39.0
TP ⁺ / TPK ⁺ 050	3	20	59.031	31	29	72.3	63.662	0.4	89.5	66.0	28.0	13.5	51.5	39.0
	4	20	78.241	41	39	94.8	84.882	0.2	97.0	67.5	29.5	10.0	48.0	50.0
TP ⁺ / TPK ⁺ 110	4	20	78.241	41	39	94.8	84.882	0.2	112.5	83.0	33.0	13.5	63.5	50.0
	5	19	86.399	51	49	115.1	100.798	0.4	120.0	85.0	35.0	10.5	60.5	60.5
TP ⁺ / TPK ⁺ 300	5	19	86.399	51	49	115.1	100.798	0.4	139.0	104.0	38.0	13.5	79.5	60.5
	6	19	105.879	61	59	138.0	120.958	0.4	142.5	106.0	40.0	10.5	76.5	67.0
TP ⁺ / TPK ⁺ 500	6	19	105.879	61	59	138.0	120.958	0.4	155.0	118.5	43.5	14.0	89.0	67.0

All dimensions in [mm]

^{a)} Align mechanism recommended
(alignment dimension ± 0.3 mm)

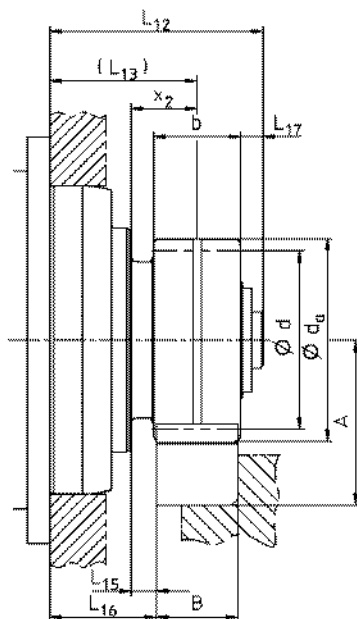
^{b)} Output type: 3 – system output

z = Number of teeth

d_a = Tip diameter

d = Partial circle diameter

x = Profile correction factor



Planetary gearhead TP⁺ / right-angle gearhead TPK⁺ with Premium Class⁺ pinion and Premium Class rack · Technical data for the smallest possible ratio

Gearhead size	Module	z	F_{2T}		T_{2B}		v_{Max}^*		m_{pinion}	
	[mm]		[N]	[lb _f]	[Nm]	[in.lb]	[m/min]	[in/sec]	[kg]	[lb _m]
TP ⁺ / TPK ⁺ 010	2	20	2285	514	48	429	200	131	0.4	0.8
TP ⁺ / TPK ⁺ 025	2	20	3270	736	69	614	150	98	0.4	0.8
	3	20	3193	718	102	900	225	148	1.0	2.1
TP ⁺ / TPK ⁺ 050	3	20	10401	2340	331	2930	200	131	1.0	2.1
	4	20	9983	2246	424	3750	267	175	1.9	4.3
TP ⁺ / TPK ⁺ 110	4	20	19889	4475	844	7471	233	153	1.9	4.3
	5	19	19308	4344	973	8613	277	182	3.1	6.8
TP ⁺ / TPK ⁺ 300	5	19	28155	6335	1419	12559	158	104	3.1	6.8
	6	19	27436	6173	1659	14686	190	125	5.8	12.8
TP ⁺ / TPK ⁺ 500	6	19	37228	8376	2252	19928	190	125	5.8	12.8

Technical data based on max. 1000 load cycles per hour.

Further gearhead/pinion combinations in cymex®.

* Depending on ratio

F_{2T} = Max. moving force

T_{2B} = Max. acceleration torque

z = Number of teeth

v_{max} = Max. movement speed

m_{pinion} = Pinion mass

Planetary gearhead TP⁺ HIGH TORQUE/ right-angle gearhead TPK⁺ HIGH TORQUE with Premium Class⁺ pinion and Premium Class rack · Technical data for the smallest possible ratio

Gearhead size	Module	z	F_{2T}		T_{2B}		v_{max}^*		m_{pinion}	
	[mm]		[N]	[lb _f]	[Nm]	[in.lb]	[m/min]	[in/sec]	[kg]	[lb _m]
TP ⁺ 010	2	20	3385	762	72	636	36	24	0.4	0.8
TP ⁺ / TPK ⁺ 025	2	20	4088	920	87	768	36	24	0.4	0.8
	3	20	3992	898	127	1125	55	36	1.0	2.1
TP ⁺ / TPK ⁺ 050	3	20	10401	2340	331	2930	45	30	1.0	2.1
	4	20	9983	2246	424	3750	61	40	1.9	4.3
TP ⁺ / TPK ⁺ 110	4	20	19889	4475	844	7471	55	36	1.9	4.3
	5	19	19308	4344	973	8613	65	43	3.1	6.8
TP ⁺ / TPK ⁺ 300	5	19	31051	6986	1565	13851	36	24	3.1	6.8
	6	19	30226	6801	1828	16180	43	28	5.8	12.8
TP ⁺ / TPK ⁺ 500	6	19	40189	9043	2431	21513	43	28	5.8	12.8

Technical data based on max. 1000 load cycles per hour.

Further gearhead/pinion combinations in cymex®.

* Depending on ratio

F_{2T} = Max. moving force

T_{2B} = Max. acceleration torque

z = Number of teeth

v_{max} = Max. movement speed

m_{pinion} = Pinion mass

Planetary gearhead TP⁺ / right-angle gearhead TK⁺/TPK⁺ with Premium Class RTP pinion and Premium Class rack (all pinions, pressure angle $\alpha=20^\circ$, inclination angle $\beta=19.5283^\circ$ left-handed)

Gearhead size ^{a)}	Module	z	A $\pm 0,3^{b)}$	b	B	d _a	d	x	L12	L13	x2	L15	L16
TP ⁺ /TK ⁺ /TPK ⁺ 004	2	26	50.4	26	24	61.0	55.174	0.4	45.5	32.5	13.0	1.0	20.5
TP ⁺ /TK ⁺ /TPK ⁺ 010	2	29	53.4	26	24	66.9	61.540	0.3	66.0	53.0	23.0	11.0	41.0
	2	33	57.6	26	24	75.4	70.028	0.3	56.0	43.0	13.0	1.0	31.0
	2	37	61.9	26	24	83.9	78.517	0.3	56.0	43.0	13.0	1.0	31.0
TP ⁺ /TK ⁺ /TPK ⁺ 025	2	35	59.7	26	24	79.7	74.272	0.3	65.0	52.0	23.0	11.0	40.0
	2	40	65.0	26	24	90.3	84.883	0.3	55.0	42.0	13.0	1.0	30.0
	2	45	70.2	26	24	100.6	95.493	0.22	55.0	42.0	13.0	1.0	30.0
TP ⁺ /TK ⁺ /TPK ⁺ 050	3	31	76.2	31	29	106.7	98.676	0.3	82.0	66.5	28.5	14.0	52.0
	3	35	82.6	31	29	119.4	111.409	0.3	69.0	53.5	15.5	1.0	39.0
	3	40	90.6	31	29	135.3	127.324	0.3	69.0	53.5	15.5	1.0	39.0
TP ⁺ /TK ⁺ /TPK ⁺ 110	4	38	116.6	41	39	171.4	161.277	0.25	91.0	70.5	20.5	1.0	51.0
TP ⁺ /TK ⁺ /TPK ⁺ 300	5	32	120.3	51	49	182.8	169.766	0.285	142.0	116.5	50.5	26.0	92.0
TP ⁺ /TK ⁺ /TPK ⁺ 500	6	31	143.4	61	59	213.0	197.352	0.295	171.0	140.5	65.5	36.0	111.0

All dimensions in [mm]

^{b)} Align mechanism recommended (alignment dimension ± 0.3 mm)

^{c)} Output type: 0 – Flange

z = Number of teeth

d_a = Tip diameter

d = Partial circle diameter

x = Profile correction factor

Planetary gearhead TP⁺ HIGH TORQUE / right-angle gearhead TPK⁺ HIGH TORQUE with Premium Class RTP pinion and Premium Class rack (all pinions, pressure angle $\alpha=20^\circ$, inclination angle $\beta=19.5283^\circ$ left-handed)

Gearhead size ^{a)}	Module	z	A $\pm 0,3^{b)}$	b	B	d _a	d	x	L12	L13	x2	L15	L16
TP ⁺ /TPK ⁺ 025	2	35	59.7	26	24	79.7	74.272	0.3	65.0	52.0	23.0	11.0	40.0
TP ⁺ /TPK ⁺ 050	3	31	76.2	31	29	106.7	98.676	0.3	82.0	66.5	28.5	14.0	52.0
	3	40	90.6	31	29	135.3	127.324	0.3	69.0	53.5	15.5	1.0	39.0
TP ⁺ /TPK ⁺ 110	4	40	119.9	41	39	177.9	169.766	0	91.0	70.5	20.5	1.0	51.0
TP ⁺ /TPK ⁺ 300	5	32	120.3	51	49	182.8	169.766	0.285	142.0	116.5	50.5	26.0	92.0

All dimensions in [mm]

^{b)} Align mechanism recommended (alignment dimension ± 0.3 mm)

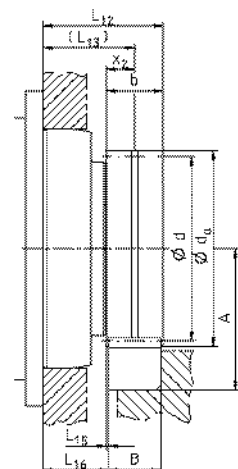
^{c)} Output type: 0 – Flange

z = Number of teeth

d_a = Tip diameter

d = Partial circle diameter

x = Profile correction factor



Planetary gearhead TP⁺ / right-angle gearhead TK⁺/TPK⁺ with Premium Class RTP pinion and Premium Class rack

Technical data for the smallest possible ratio

Gearhead size	Module	z	F_{2T}		T_{2B}		v_{max}^*		m_{pinion}	
	[mm]		[N]	[lb _p]	[Nm]	[in.lb]	[m/min]	[in/sec]	[kg]	[lb _m]
TP ⁺ / TK ⁺ / TPK ⁺ 004	2	26	1287	290	36	314	260	171	0.5	1.0
TP ⁺ / TK ⁺ / TPK ⁺ 010	2	29	2174	489	67	592	290	190	0.5	1.2
	2	33	2348	528	82	728	330	217	0.7	1.5
	2	37	2317	521	91	805	370	243	0.9	2.0
TP ⁺ / TK ⁺ / TPK ⁺ 025	2	35	3163	712	117	1040	263	172	0.7	1.6
	2	40	3377	760	143	1269	300	197	0.9	2.1
	2	45	3329	749	159	1407	338	221	1.3	2.8
TP ⁺ / TK ⁺ / TPK ⁺ 050	3	31	9882	2223	488	4315	310	203	1.6	3.6
	3	35	10817	2434	603	5333	350	230	1.9	4.3
	3	40	10575	2379	673	5959	400	262	2.7	5.9
TP ⁺ / TK ⁺ / TPK ⁺ 110	4	38	19842	4464	1600	14162	443	291	5.9	13.1
TP ⁺ / TK ⁺ / TPK ⁺ 300	5	32	25111	5650	2131	18865	267	175	7.7	16.9
TP ⁺ / TK ⁺ / TPK ⁺ 500	6	31	32174	7239	3175	28100	310	203	14.3	31.5

Technical data based on max. 1000 load cycles per hour.

Further gearhead/pinion combinations in cymex®.

* Depending on ratio

 F_{2T} = Max. moving force

 T_{2B} = Max. acceleration torque

z = Number of teeth

 v_{max} = Max. movement speed

 m_{pinion} = Pinion mass

Planetary gearhead TP⁺ HIGH TORQUE / right-angle gearhead TPK⁺ HIGH TORQUE with Premium Class RTP pinion and Premium Class rack

Technical data for the smallest possible ratio

Gearhead size	Module	z	F_{2T}		T_{2B}		v_{max}^*		m_{pinion}	
	[mm]	[]	[N]	[lb _p]	[Nm]	[in.lb]	[m/min]	[in/sec]	[kg]	[lb _m]
TP ⁺ / TPK ⁺ 025	2	40	4221	950	179	1586	73	48	0.9	2.1
TP ⁺ / TPK ⁺ 050	3	35	10817	2434	603	5333	79	52	1.9	4.3
	3	40	10575	2379	673	5959	91	60	2.7	5.9
TP ⁺ / TPK ⁺ 110	4	40	19692	4431	1672	14794	109	72	6.3	13.8
TP ⁺ / TPK ⁺ 300	5	32	27664	6224	2348	20783	85	56	7.7	16.9

Technical data based on max. 1000 load cycles per hour.

Further gearhead/pinion combinations in cymex®.

* Depending on ratio

 F_{2T} = Max. moving force

 T_{2B} = Max. acceleration torque

z = Number of teeth

 v_{max} = Max. movement speed

 m_{pinion} = Pinion mass

Performance Linear System – new performance dimensions

More performance
in less space!

The right linear drive system
for your application

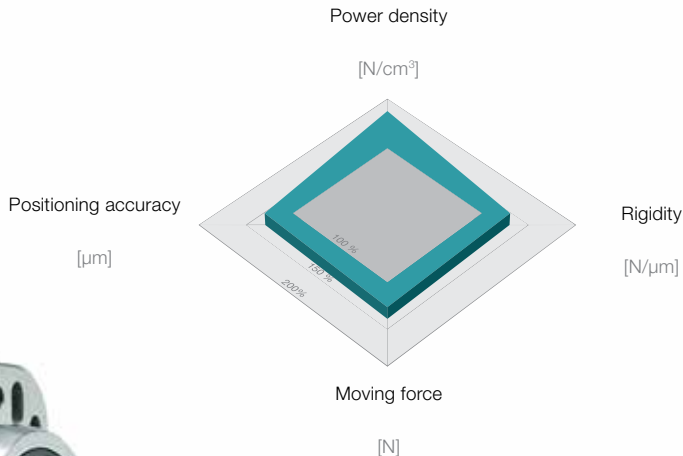
The Performance Linear System meets customer requirements for compact and efficient solutions of the highest quality. In addition to the extended design options, possibilities for the efficiency enhancement of existing applications are also available to users.

And there are plenty of customization options as well. Users can size and optimize the Performance package according to their requirements.

Performance Linear System – PLS*	Max. moving force [N]	Max. speed [m/min]
PLS 2.2	6000	200
PLS 3.2	9000	200
PLS 4.3	12000	200

*In conjunction with alpheno® Further versions available upon request

Comparison of technical data
between the industry standard
and the [Performance Linear System](#)



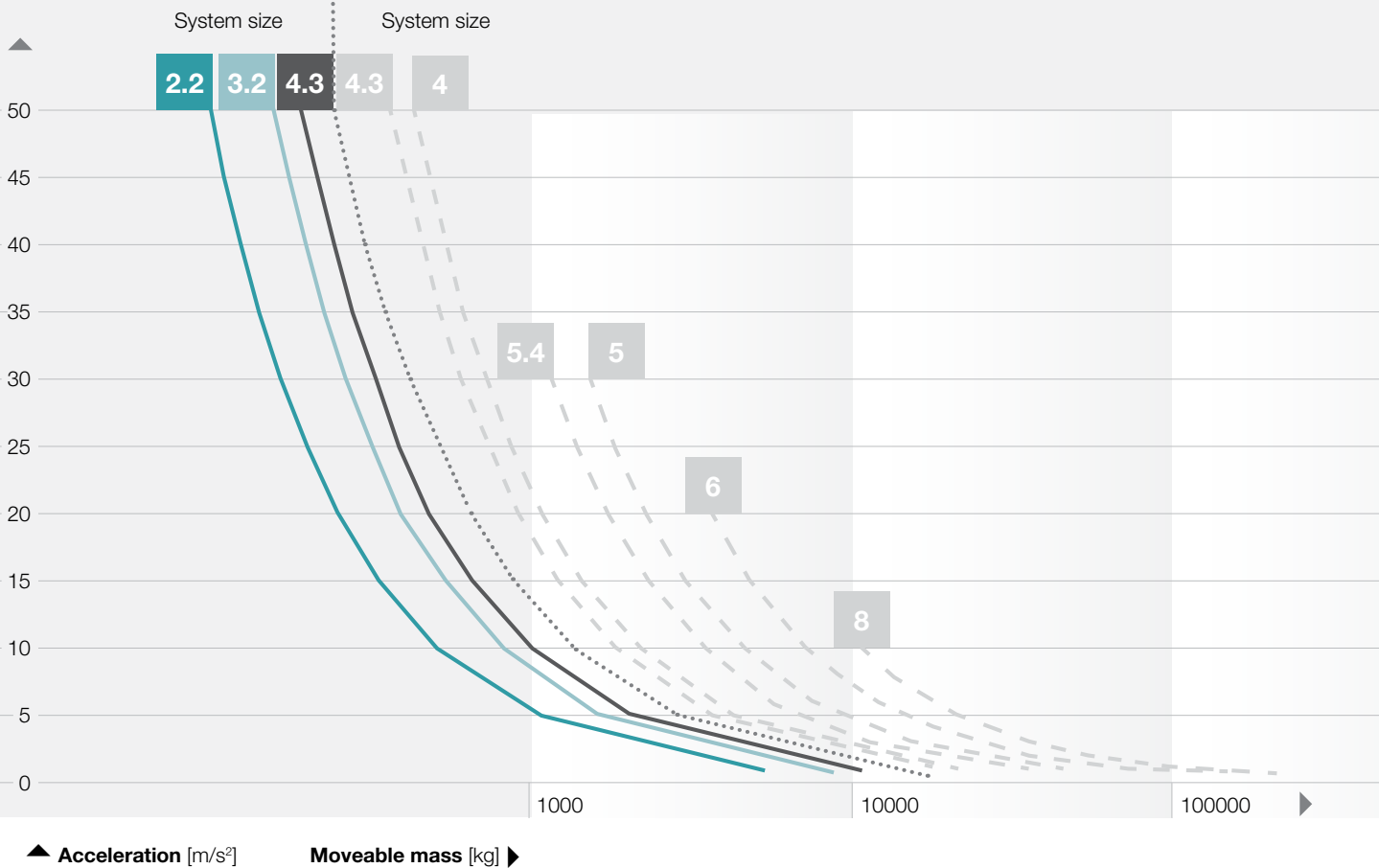
Performance Linear System
with a positioning accuracy of $< 5 \mu\text{m}$ and an efficiency of $\leq 97\%$.



Further information on the High Performance Linear System are available in the system catalog "High Performance Linear System" or on the Internet at www.rack-pinion.com

Quick system selection

Performance Linear System (PLS) ◀ ▶ High Performance Linear System (HPLS)



Planetary gearhead SP⁺/ right-angle gearhead SK⁺/ SPK⁺ with Standard Class RSP pinion and Value Class rack (all pinions, pressure angle $\alpha=20^\circ$, inclination angle $\beta=19.5283^\circ$ left-handed)

Gearhead size ^{b)}	Module	z	A $\pm 0,3^a)$	b	B	d _a	d	x	L12	L13	x2	L15	L16
SP ⁺ /SK ⁺ 060	2	15	38.9	26	24	38.0	31.831	0.5	52.0	39.0	19.0	7.0	27.0
	2	16	40.0	26	24	40.2	33.953	0.5	52.0	39.0	19.0	7.0	27.0
	2	18	41.9	26	24	44.0	38.197	0.4	52.0	39.0	19.0	7.0	27.0
SP ⁺ /SK ⁺ /SPK ⁺ 075	2	18	41.9	26	24	44.0	38.197	0.4	53.0	40.0	20.0	8.0	28.0
	2	20	44.0	26	24	48.3	42.441	0.4	53.0	40.0	20.0	8.0	28.0
	2	22	46.1	26	24	52.5	46.686	0.4	53.0	40.0	20.0	8.0	28.0
SP ⁺ /SK ⁺ /SPK ⁺ 100	2	23	47.2	26	24	54.6	48.808	0.4	64.0	51.0	21.0	9.0	39.0
	2	25	49.3	26	24	58.8	53.052	0.4	64.0	51.0	21.0	9.0	39.0
	2	27	51.2	26	24	62.7	57.296	0.3	64.0	51.0	21.0	9.0	39.0
SP ⁺ /SK ⁺ /SPK ⁺ 140	3	20	59.0	31	29	72.3	63.662	0.4	81.0	65.5	35.5	21.0	51.0
	3	22	62.2	31	29	78.6	70.028	0.4	81.0	65.5	35.5	21.0	51.0
	3	24	65.4	31	29	85.0	76.394	0.4	81.0	65.5	35.5	21.0	51.0
SP ⁺ /SK ⁺ /SPK ⁺ 180	4	20	79.0	41	39	96.3	84.883	0.4	84.0	63.5	33.5	14.0	44.0
SP ⁺ 210	4	25	89.4	41	39	117.0	106.103	0.34	103.0	82.5	44.5	25.0	63.0
SP ⁺ 240	5	24	99.4	51	49	141.0	127.324	0.35	113.0	87.5	47.5	23.0	63.0

All dimensions in [mm]

^{a)} Align mechanism recommended (alignment dimension ± 0.3 mm)

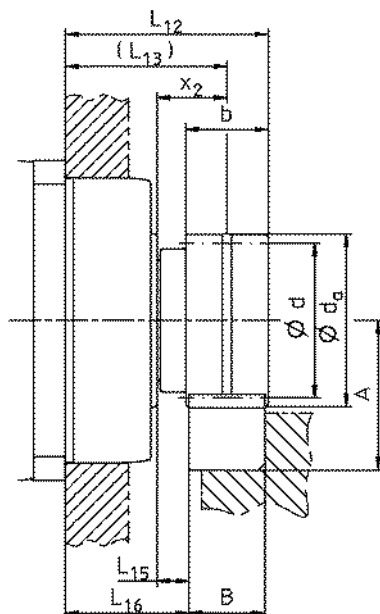
^{b)} Output type: 2 – Involute as per DIN5480;
also available with V-Drive worm gearhead

z = Number of teeth

d_a = Tip diameter

d = Partial circle diameter

x = Profile correction factor



Planetary gearhead SP⁺/ right-angle gearhead SK⁺/ SPK⁺ with Standard Class RSP pinion and Value Class rack · Technical data for the smallest possible ratio

Gearhead size	Module	z	F_{2T}		T_{2B}		v_{max}^*		m_{pinion}	
	[mm]		[N]	[lb _f]	[Nm]	[in.lb]	[m/min]	[in/sec]	[kg]	[lb _m]
SP ⁺ /SK ⁺ 060	2	15	2183	491	35	308	200	131	0.21	0.46
	2	16	2122	477	36	319	213	140	0.23	0.51
	2	18	2100	473	40	355	240	157	0.29	0.64
SP ⁺ /SK ⁺ /SPK ⁺ 075	2	18	3096	697	59	523	240	157	0.26	0.57
	2	20	3065	690	65	576	267	175	0.33	0.73
	2	22	3036	683	71	627	293	192	0.40	0.88
SP ⁺ /SK ⁺ /SPK ⁺ 100	2	23	4300	968	105	929	230	151	0.36	0.79
	2	25	4300	968	114	1010	250	164	0.46	1.01
	2	27	4300	968	123	1090	270	177	0.55	1.21
SP ⁺ /SK ⁺ /SPK ⁺ 140	3	20	8000	1800	255	2254	267	175	0.91	2.01
	3	22	8000	1800	280	2479	293	192	1.18	2.60
	3	24	7991	1798	305	2702	320	210	1.48	3.26
SP ⁺ /SK ⁺ /SPK ⁺ 180	4	20	11776	2650	500	4424	311	204	1.8	3.99
SP ⁺ 210	4	25	18531	4169	983	8701	278	182	2.8	6.17
SP ⁺ 240	5	24	27836	6263	1772	15684	333	219	4.9	10.80

Technical data based on max. 1000 load cycles per hour.
Further gearhead/pinion combinations in cymex®.

* Depending on ratio

F_{2T} = Max. moving force
 T_{2B} = Max. acceleration torque
z = Number of teeth
 v_{max} = Max. movement speed
 m_{pinion} = Pinion mass

Planetary gearhead LP⁺/ right-angle gearhead LK⁺/ LPK⁺ with Value Class pinion and rack

(all pinions, pressure angle $\alpha=20^\circ$, inclination angle $\beta=19.5283^\circ$ left-handed)

Gearhead size ^{b)}	Module	z	A $\pm 0,3^a)$	b	B	d _a	d	x	L12	L13	x2	L15	L16	L17
LP ⁺ / LK ⁺ / LPK ⁺ 070	2	18	41.899	26	24	43.7	38.197	0.4	42.0	27.0	19.0	7.0	15.0	2.0
LP ⁺ / LK ⁺ / LPK ⁺ 090	2	22	45.743	26	24	51.4	46.686	0.2	52.0	30.0	20.0	8.0	18.0	9.0
LP ⁺ / LK ⁺ / LPK ⁺ 120	2	26	49.587	26	24	59.1	55.174	0	77.5	33.0	21.0	9.0	21.0	31.5
LP ⁺ / LK ⁺ / LPK ⁺ 155	3	24	64.197	31	29	82.3	76.394	0	107.0	50.5	35.5	21.0	36.0	41.0

All dimensions in [mm]

^{a)} Align mechanism recommended (alignment dimension ± 0.3 mm)

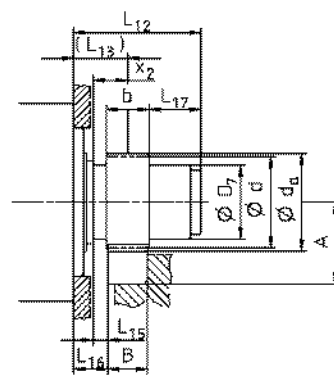
^{b)} Output type: 1 – Shaft with key

z = Number of teeth

d_a = Tip diameter

d = Partial circle diameter

x = Profile correction



Planetary gearhead SP⁺/ right-angle gearhead SK⁺/ SPK⁺ with Value Class pinion and rack

(all pinions, pressure angle $\alpha=20^\circ$, inclination angle $\beta=19.5283^\circ$ left-handed)

Gearhead size ^{b)}	Module	z	A $\pm 0,3^a)$	b	B	d _a	d	x	L12	L13	x2	L15	L16	L17
SP ⁺ / SK ⁺ 060	2	18	41.899	26	24	43.7	38.197	0.4	54.0	39.0	19.0	7.0	27.0	2.0
SP ⁺ / SK ⁺ / SPK ⁺ 075	2	22	45.743	26	24	51.4	46.686	0.2	62.0	40.0	20.0	8.0	28.0	9.0
SP ⁺ / SK ⁺ / SPK ⁺ 100	2	26	49.587	26	24	59.1	55.174	0	95.5	51.0	21.0	9.0	39.0	31.5
SP ⁺ / SK ⁺ / SPK ⁺ 140	3	24	64.197	31	29	82.3	76.394	0	122.0	65.5	35.5	21.0	51.0	41.0

All dimensions in [mm]

^{a)} Align mechanism recommended (alignment dimension ± 0.3 mm)

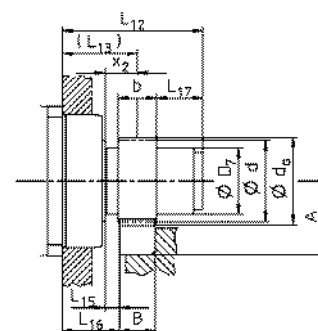
^{b)} Output type: 1 – Shaft with key, also available with V-Drive worm gearhead

z = Number of teeth

d_a = Tip diameter

d = Partial circle diameter

x = Profile correction



Planetary gearhead LP⁺/ right-angle gearhead LK⁺/ LPK⁺ with Value Class pinion and rack

Gearhead size	Module	z	F_{2T}		T_{2B}		v_{max}^*		m_{pinion}	
	[mm]		[N]	[lb _f]	[Nm]	[in.lb]	[m/min]	[in/sec]	[kg]	[lb _m]
LP ⁺ / LK ⁺ / LPK ⁺ 070	2	18	1360	306	26	230	240	157	0.28	0.62
LP ⁺ / LK ⁺ / LPK ⁺ 090	2	22	2270	511	53	469	293	192	0.41	0.90
LP ⁺ / LK ⁺ / LPK ⁺ 120	2	26	4300	968	119	1050	277	182	0.58	1.28
LP ⁺ / LK ⁺ / LPK ⁺ 155	3	24	7000	1575	267	2367	288	189	1.52	3.35

Technical data based on max. 1000 load cycles per hour.
Further gearhead/pinion combinations in cymex®.

* Depending on ratio

F_{2T} = Max. moving force
 T_{2B} = Max. acceleration torque
z = Number of teeth
 v_{max} = Max. movement speed
 m_{pinion} = Pinion mass

Planetary gearhead SP⁺/ right-angle gearhead SK⁺/ SPK⁺ with Value Class pinion and rack

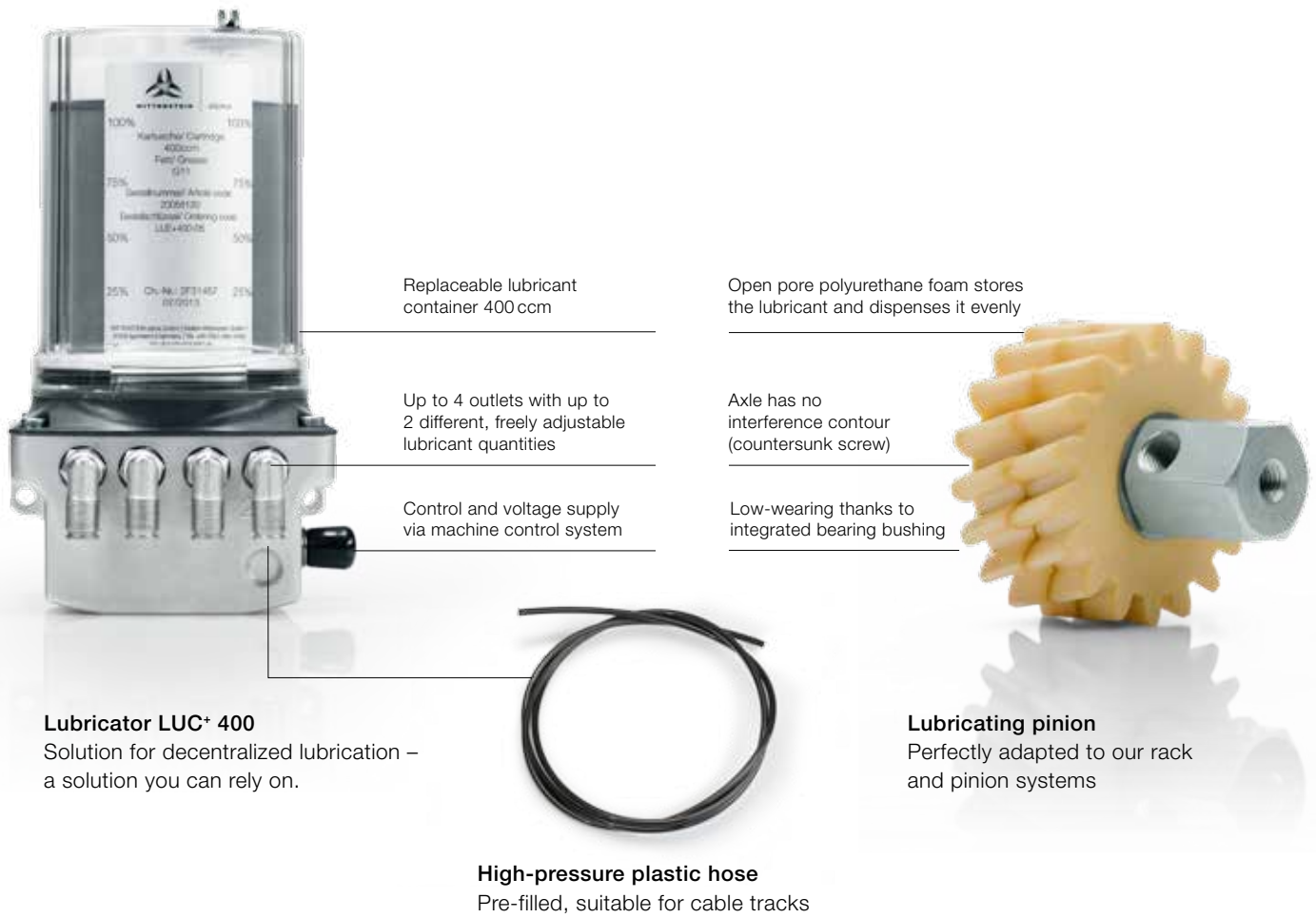
Gearhead size	Module	z	F_{2T}		T_{2B}		v_{max}^*		m_{pinion}	
	[mm]		[N]	[lb _f]	[Nm]	[in.lb]	[m/min]	[in/sec]	[kg]	[lb _m]
SP ⁺ / SK ⁺ 060	2	18	2100	473	40	355	240	157	0.28	0.62
SP ⁺ / SK ⁺ / SPK ⁺ 075	2	22	3036	683	71	627	293	192	0.41	0.90
SP ⁺ / SK ⁺ / SPK ⁺ 100	2	26	5635	1268	155	1376	260	171	0.58	1.28
SP ⁺ / SK ⁺ / SPK ⁺ 140	3	24	7991	1798	305	2702	320	210	1.52	3.35

Technical data based on max. 1000 load cycles per hour.
Further gearhead/pinion combinations in cymex®.

* Depending on ratio

F_{2T} = Max. moving force
 T_{2B} = Max. acceleration torque
z = Number of teeth
 v_{max} = Max. movement speed
 m_{pinion} = Pinion mass

alpha rack & pinion system accessory range – Lubrication



Lubricator LUC+ 400
Solution for decentralized lubrication – a solution you can rely on.

High-pressure plastic hose
Pre-filled, suitable for cable tracks

Lubricating pinion
Perfectly adapted to our rack and pinion systems

Perfect lubrication – for a perfect system

In order to achieve a long service life, our rack and pinion systems require adequate lubrication. We offer you suitable lubricating pinions, fastening axles, and lubricators, all adapted perfectly to our systems. The polyurethane foam lubricating pinion is supplied with a preset quantity of grease via a lubricator or central lubricating system. This ensures an optimal lubricating film on the rack and pinion. In addition to the supply of lubricant, the lubricating pinion also ensures cleaning of the open toothing.

Your benefits

- Greatly reduced maintenance costs:
 - Replaceable cartridge
 - Up to 16 lubrication points can be supplied with just one lubricator
 - Lubricating pinion has a long service life
- Can be fully integrated in the machine control system:
 - Direct control
 - Different error messages via PLC
- Lubricant quantities can be precisely adjusted to the application (minimal-quantity lubrication)
- Minimal current required
- Perfectly adapted for the lubrication of rack and pinion systems

Technical information on the LUC⁺ 400 lubricator

Technical data

Dimensions (W x H x D)	Max. 112x196x94 mm
Weight	1120 g
Lubricant volume	400 cm ³
Lubricant type	Grease up to NLGI 3
Method of operation	Piston pump
Operating pressure	Max. 70 bar
Metering volume/stroke	0.15 cm ³ (output/pulse signal)
No. of outlets	1, 2, 3, 4
Outlet	Rotating, right-angled hose connections 6 mm to 150 bar
Operating voltage	24 VDC
Current input	I _{max} during operation 350 mA (regular < 200 mA)
Fuse	350 mA (characteristic: medium slow-blow or slow-blow)
Protection class	IP 65
Operating temperature	-20°C to +70°C
Control	Integrated, microelectronic
Pressure monitoring	Integrated, electronic (system pressure measurement)
Fill level monitoring	Integrated; reed contact
Control connection	Connector; M12x1, 4-pole
Activation of progressive distributor	Suitable

Lubricator versions

Overview of lubricating sets	Outlets	Pump body	Lubricant	Scope of delivery of hoses	Article code
LUC+400-0511-02	1	1	WITTENSTEIN alpha G11	2 m	20058416
LUC+400-0521-02	2	1	WITTENSTEIN alpha G11	2 x 2 m	20058418
LUC+400-0531-02	3	2	WITTENSTEIN alpha G11	3 x 2 m	20058420
LUC+400-0541-02	4	2	WITTENSTEIN alpha G11	4 x 2 m	20058422
LUC+400-0551-02	2	2	WITTENSTEIN alpha G11	2 x 2 m	20058424

Lengths up to 10 m per outlet via hose connector 6-0 and LUH hose possible. Sets with 5 m hose length available on request.

Replacement cartridge and individual hoses

Designation	Thread	Model	Hose diameter/filling quantity	Article code
Hose 2m, G11 LUH-02-05 ^{a)}	-	2 m	6	20058134
Hose 5m, G11 LUH-05-05 ^{a)}	-	5 m	6	20058135
Hose connector 6-0	-	Straight	6	20058148
Replacement cartridge LUE+400-05	-	G11	400 cm ³	20058120
Grease gun cartridge LGC-400-05 ^{b)}	-	G11	400 cm ³	20058111

^{a)} Pre-filled hoses. Only use air-free, pre-filled hoses! ^{b)} For pre-greasing lubricating pinions, movement path

Hose connectors and splitters

Designation	Thread/connection	Model/no. of outlets	Hose diameter	Article code
Hose connection G1/4-6-0	G 1/4"	Straight	6	20058144
Hose connection M06-6-1	M6x1	Angled	6	20058145
Hose connection M1/8-6-1	G 1/8"	Angled	6	20058146
Hose connection G1/4-6-1	G 1/4"	Angled	6	20058147
Splitter LUS 2-0-NL	Plug-in	2	6	20058103
Splitter LUS 3-0-NL	Plug-in	3	6	20058104
Splitter LUS 4-0-NL	Plug-in	4	6	20058105

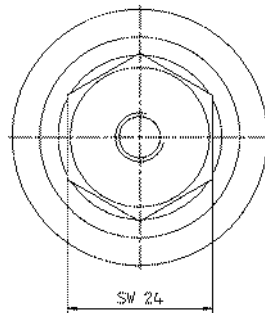
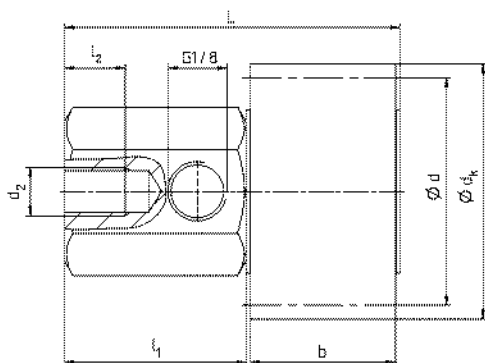
alpha rack & pinion system accessory range – Dimensions of lubricating pinion and fastening axles

Technical data of lubricating pinion set

The design options will dictate whether the rack or the output pinion should be lubricated. Lubrication via the output pinion is preferable owing to the better lubricant distribution.

Module	Number of teeth	Use	Order number	Order code	d	d _k	b	l ₁	l ₂	d ₂	L
2	18	Rack	20053903	LMT 200-PU-18L1-024-1	38,2	42,2	24	30	10	M8	55,4
		Pinion	20053904	LMT 200-PU-18R1-024-1							
3	18	Rack	20053905	LMT 300-PU-18L1-030-1	57,3	63,3	30	30	10	M8	61,4
		Pinion	20053906	LMT 300-PU-18R1-030-1							
4	18	Rack	20053907	LMT 400-PU-18L1-040-1	76,4	84,4	40	30	10	M8	71,4
		Pinion	20053908	LMT 400-PU-18R1-040-1							
5	17	Rack	20053909	LMT 500-PU-17L1-050-1	90,2	100,2	50	30	10	M8	81,4
		Pinion	20053910	LMT 500-PU-17R1-050-1							
6	17	Rack	20053911	LMT 600-PU-17L1-060-1	108,2	120,2	60	30	10	M8	91,4
		Pinion	20053912	LMT 600-PU-17R1-060-1							
8	17	Rack	20053913	LMT 800-PU-17L1-080-1	144,3	160,3	80	30	10	M8	111,4
		Pinion	20053914	LMT 800-PU-17R1-080-1							

Connector for hose Ø 6x4 mm included in scope of delivery. Lubricating pinions must be soaked in lubricant before operation.



**Lubricating
pinion for racks,
left-handed**



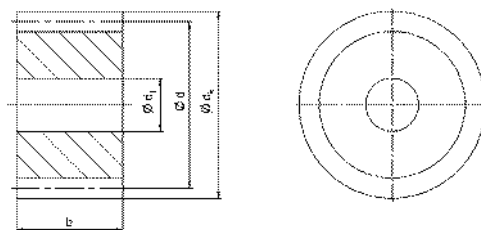
**Lubricating
pinion for gear wheels,
right-handed**

Lubricating pinion

Module	z	Use	d	d ₁	d _k	b	Order code	Article code
2	18 LH	Rack	38,2	12	42,2	24	RLU 200-PU-18L1-024	20053683
	18 RH	Pinion					RLU 200-PU-18R1-024	20053684
3	18 LH	Rack	57,3	12	63,3	30	RLU 300-PU-18L1-030	20053685
	18 RH	Pinion					RLU 300-PU-18R1-030	20053686
4	18 LH	Rack	76,4	12	84,4	40	RLU 400-PU-18L1-040	20053687
	18 RH	Pinion					RLU 400-PU-18R1-040	20053688
5	18 LH	Rack	90,2	20	100,2	50	RLU 500-PU-17L1-050	20053689
	18 RH	Pinion					RLU 500-PU-17R1-050	20053690
6	18 LH	Rack	108,2	20	120,2	60	RLU 600-PU-17L1-060	20053691
	18 RH	Pinion					RLU 600-PU-17R1-060	20053692
8	18 LH	Rack	144,3	20	160,3	80	RLU 800-PU-17L1-080	20053693
	18 RH	Pinion					RLU 800-PU-17R1-080	20053694

Lubricating pinions must be soaked in lubricant before operation.

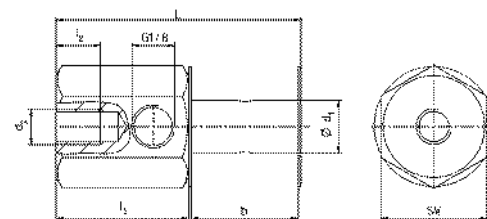
Customized pinions: We also have solutions for your special requirements, please contact us!



Fastening axle, right-angle

Module	L	I ₁	I ₂	b	d ₁	d ₂	SW	Connection thread d ₃	Order code	Article code
2	55,4	30	10	24	12	M8	24	G1/8"	LAS-024-012-1	20053696
3	61,4	30	10	30	12	M8	24	G1/8"	LAS-030-012-1	20053698
4	71,4	30	10	40	12	M8	24	G1/8"	LAS-040-012-1	20053700
5	81,4	30	10	50	20	M8	24	G1/8"	LAS-050-020-1	20053702
6	91,4	30	10	60	20	M8	24	G1/8"	LAS-060-020-1	20053704
8	111,4	30	10	80	20	M8	24	G1/8"	LAS-080-020-1	20053706

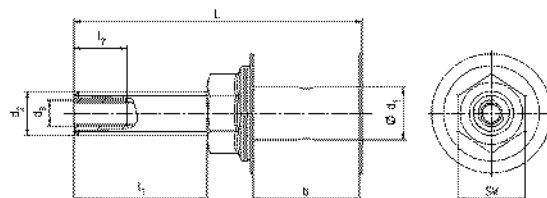
Connector for hose Ø 6x4 mm included in scope of delivery.



Fastening axle, straight

Module	L	I ₁	I ₂	b	d ₁	d ₂	SW	Connection thread d ₃	Order code	Article code
2	61	30	12	24	12	M10	15	M6	LAS-024-012-0	20053695
3	71	30	12	30	12	M10	15	M6	LAS-030-012-0	20053697
4	81	30	12	40	12	M10	15	M6	LAS-040-012-0	20053699
5	116	30	12	50	20	M16	24	G1/8"	LAS-050-020-0	20053701
6	126	30	12	60	20	M16	24	G1/8"	LAS-060-020-0	20053703
8	146	30	12	80	20	M16	24	G1/8"	LAS-080-020-0	20053705

Connector for hose Ø 6x4 mm included in scope of delivery.



alpha Rack & Pinion System accessory range – Lubrication

Lubricating pinion – general information

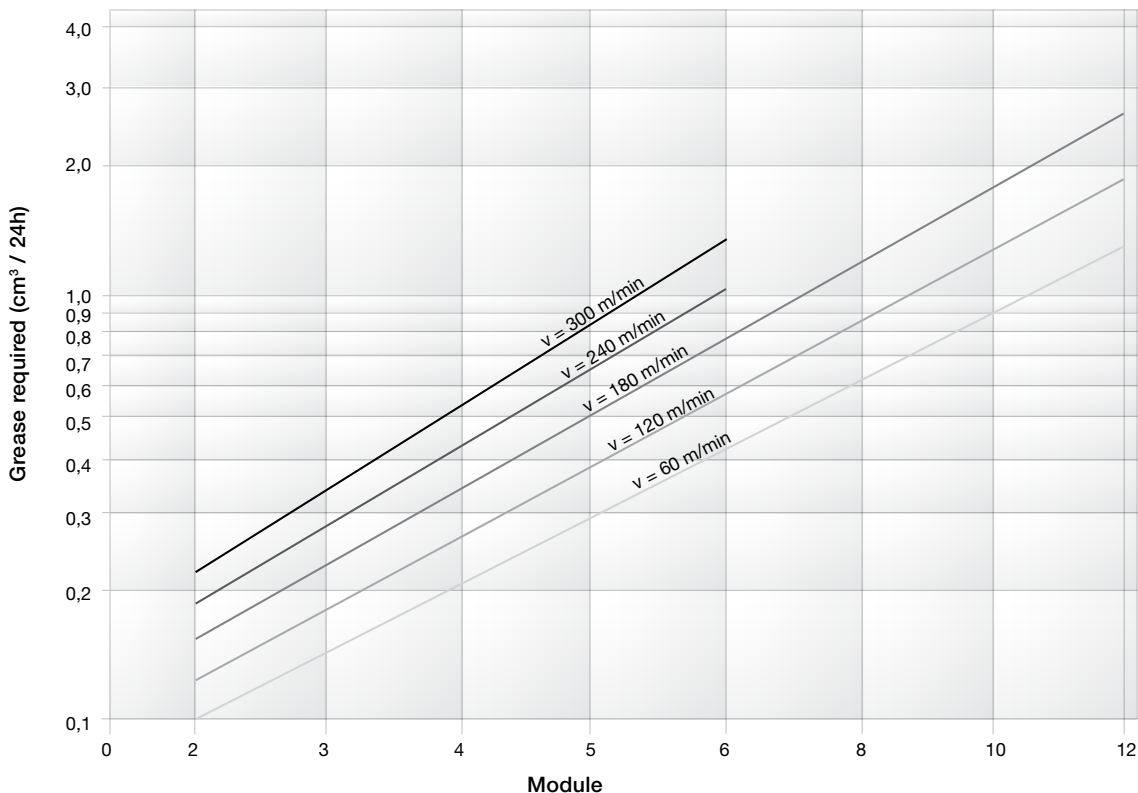
Due to the possibility of high moving forces and dynamics of the drives used, the open toothing of our rack and pinion drives must be lubricated. We recommend automatic re-lubrication using our polyurethane lubricating pinions.

Re-lubrication with the PU lubricating pinion ensures that the lubricant is applied to the toothing continuously and automatically. For this purpose, the lubricating pinion, which is adapted to the toothing of the pinion or rack, engages with the teeth, where it transfers the lubricant to the toothing torque-free.

The open-cell polyurethane foam ensures an optimal supply of the toothing with lubricant, even over extremely lengthy periods. The material partially stores the lubricant and dispenses minute amounts of it. This ensures that continuous lubrication and wear through insufficient lubrication is prevented.

In order to ensure full functionality of the lubricating pinion from the start of operation onwards and to prevent damage to the drive through dry starting, it must be pre-lubricated (ideally soak in the grease used for several hours)!

Chart for determining lubricant quantities depending on the module and movement speed



alpha rack & pinion system accessory range – Assembly jig

Assembly jig

You will need an assembly jig to align the transitions between the individual racks.



Module	L	Order codes	Order number
2	100	ZMT 200-PD5-100	20020582
3	100	ZMT 300-PD5-100	20021966
4	156	ZMT 400-PD5-156	20037466
5	156	ZMT 500-PD5-156	20037469
6	156	ZMT 600-PD5-156	20037470

Needle roller

High-precision needle rollers are required when making checks during and after assembly using the dial gauge.

Module	Order number
2	20001001
3	20000049
4	20038001
5	20038002
6	20038003

alpha IQ and torqXis – integrated sensor technology or modular sensor systems



Understanding processes

Intelligent sensor systems

Whether integrated in the gearhead or as a modular solution, sensors allow you to measure, diagnose and assess process parameters directly, i.e. all mechanical loads processed by the gearhead can be measured at the output drive.

Further information is available on the Internet at:

www.wittenstein-sensors.com

Use of sensors

Cost savings – drive design

Thanks to this innovative technology, it has now become possible to take real values into account during drive design. This not only saves costs, but also enables a compact design.

Controlling the forces in the drive train

Unforeseen failures in the drive train result in enormous costs. The acting load spectra are measured, analyzed and diagnosed using innovative sensors.

Preventive tool wear warning system

With the aid of sensor technology, conclusions can be drawn regarding the condition of the driven tools based on changes in the applied torque or the lateral force in the drive train.

Enhancing machine availability

Intelligent systems continuously monitor the drive status, allow maintenance measures to be planned more effectively and shorten the response time for maintenance deployments to a minimum.

Efficient drive control

Load-dependent process control is made possible through online calculation of the torque and lateral force. Innovative sensors used as an active control element not only improve process quality, but also help in understanding and improving the process.

Quality verification in the drive train

The top priority is of course to prevent faults. However, when a fault does arise, it is just as important to analyze it as accurately as possible! In many cases, this can be achieved with the aid of sensor technology.

Versions and Applications

alpha IQ

Achieving compatibility.
Utilizing intelligence.
Increasing efficiency.
WITTENSTEIN alpha gearhead with integrated sensors – helping you to better understand your processes.

torqXis sensors

Modular sensor solution for measuring mechanical parameters in the drive train.

alpha IQ / torqXis Measured parameters



Torque



Temperature



X direction



Y direction

Product features

	alpha IQ				torqXis				
Solution	Integrated solution – intelligent sensors and low backlash gearhead in one unit				Modular solution – the sensor can simply installed like a flange between the output and the machine bed.				
	1-3 measured parameters Simultaneous measurement of torque and/or lateral forces				Standard version (S) Simultaneous measurement of torque and lateral forces in X and Y directions				
					Light version (L) Measurement of torque or lateral force in one direction				
Size	TP+ 025 IQ	TP+ 050 IQ	TP+ 110 IQ	TP+ 300 IQ	SFR 004 for TP+ 004	SFR 010 for TP+ 010	SFR 025 for TP+ 025	SFR 050 for TP+ 050	SFR 110 for TP+ 110
Torque measurement range	250Nm	500Nm	1,500Nm	3,000Nm	50 Nm	100Nm	250Nm	500Nm	1,500Nm
	800Nm	1,500Nm	3,000Nm	8,750Nm		300Nm	800Nm	1,500Nm	3,000Nm
Lateral force measurement range (X/Y)	2,500N	5,000N	10,000N	15,000N	850 N	1,500N	2,500N	5,000N	10,000N
	10,000N	15,000N	30,000N	44,000N		4,500N	10,000N	15,000N	30,000N
Type of measurement	Reaction forces / reaction torques – sensors not corotating								
Absolute accuracy	< 2%								
Repeat accuracy	< 0.5%								
Evaluation	torqXis software for measurement, storage and evaluation of data / configuration of sensor system								
Analog interfaces	Voltage interface, current interface								
Digital interfaces	RS 232, USB, Ethernet/IP								

Accessories – smart additions for efficiency and intelligent performance



Metal bellows couplings

Perfectionists you can count on

Metal bellows couplings are designed for the highest requirements in servo drive technology. The compact design ensures that installation space is kept to a minimum. High torsional rigidity enables precise results and dynamics.

- Compensation for shaft misalignment
- Completely backlash free
- Compact and easy to mount
- Maintenance-free and fatigue durable
- Corrosion resistant version available as an option (BC2, BC3, BCT)

Elastomer couplings

Harmonious endurance runners

Elastomer couplings ensure precisely manufactured hubs and attachable intermediate elements for maximum true-running accuracy in the drive train. In addition, torque peaks and vibrations are damped to ensure superior smooth running.

- Compensation for shaft misalignment
- Completely backlash free
- Choice of torsional rigidity/damping
- Compact design
- Extremely simple installation (plug-in)
- Maintenance-free and fatigue durable
- Ideal for connection to spindle drives, toothed belt drives, and linear modules

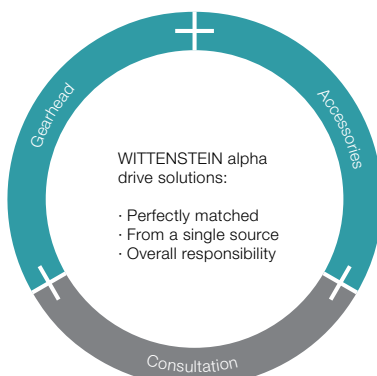
Torque limiters

Intelligent monitors

Torque limiters with integrated mechanical switching mechanism combine dynamic and precise transmission with TÜV-certified torque limitation. They therefore protect the drive and machine from overload.

- Machine downtimes are avoided
- High availability and productivity
- Precise, preset overload protection (switch-off in 1–3 ms)
- Precise repeat accuracy
- Compact and completely backlash free
- Just one protection element per axle

Gearheads, accessories and consulting from a single source



Flexibility without limits

Broad range of precision gearheads with perfectly matched accessories.

Surely an ideal solution for you!

WITTENSTEIN alpha accessories give you even greater design freedom and options.

In the fast lane with WITTENSTEIN alpha!

Gearheads and accessories

- Perfectly adapted
- One complete delivery
- One contact

Every detail is important for your success!



Shrink disks

Compact athletes

With our hollow shaft or mounted shaft gearheads for mounting directly on load shafts, machines can be designed to take up a minimal installation space.

- Reliable torque transmission
- Simple mounting and removal
- Quick selection, easy and convenient
- Optional: Corrosion resistant version



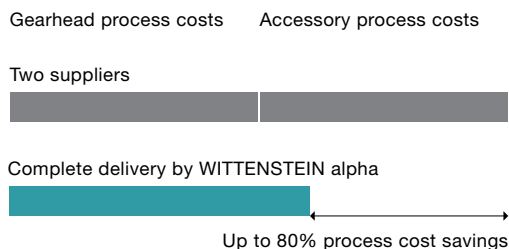
Flange shafts

Flexible design

Our flange shafts provide you with output options that are especially adapted for work with TP+, TPK+ and TK+ flange gearheads.

- Flexible shaft diameter
- Can be adapted to your output components
- Customized options available

Reduce costs



→ The savings in installation and process costs more than offsets the value of the accessories

Optimization of your added value chain

Use the combination of gearhead and accessories in a complete package to streamline your internal processes:

- One** consultation service
- One** complete delivery
- One** internal process

- Minimize your internal effort
 - Maximize your time and cost savings
- Your long-term advantage with complete delivery!



Couplings – securing – transmitting – equalizing



Your customized coupling completes the drive train:

- Flexible in design
- Fine-tuning your drive
- Maximum performance

Selection and calculation made easy:

Info- & CAD-Finder

cymex®



For further information, please visit
www.wittenstein-alpha.de/en/

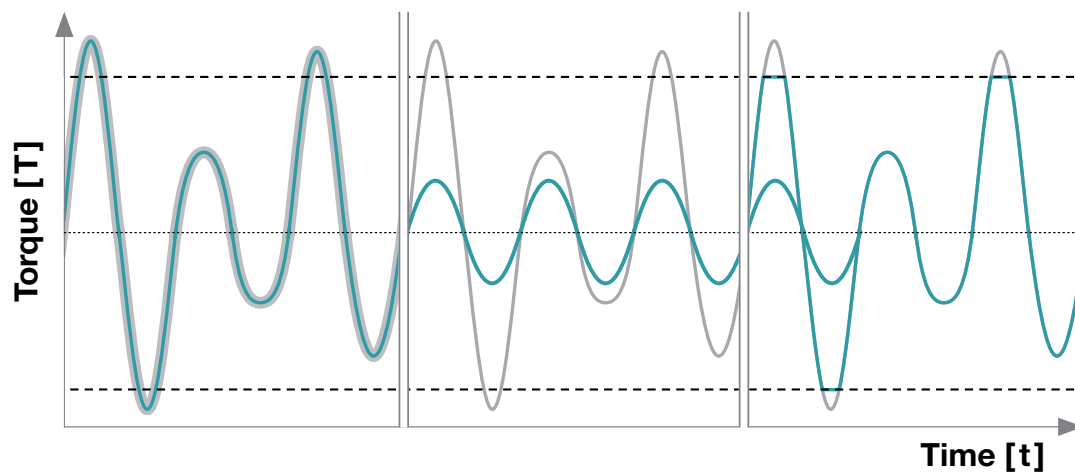
Quick coupling selection

		Metal bellows coupling					Elastomer coupling		Torque limiter		
Feature	Application	BCT	BCH	BC2	BC3	EC2	EL6	ELC	TL1	TL2	TL3
Transmission characteristics	High torsional rigidity	•	•	•	•	•			•	•	•
	Damping of torque peaks and vibration						•	•			
Compensation characteristics	Compensation of shaft misalignments (axial, angular, lateral)	•	•	•	•	•	•	•		•	•
Protection characteristics	Switching protection element for the protection of components in the event of overload								•	•	•
Mounting	Standard clamping hub (radial)	•	•	•		•		•	•	•	
	Conical clamping hub (axial)	•			•		•		•		•
	Plug-in connection						•	•			
Drive interfaces	Shaft		•	•	•	•	•	•	•	•	•
	Flange	•									
Output interfaces	Shaft	•	•	•	•	•	•	•		•	•
	Indirect (belt pulley, sprocket wheel)								•		

Versions and Applications

By combining gearheads and accessories, your application receives an individual drive concept with optimized overall performance.

- Maximum service life of all drive components
- Integrated safety functions
- Harmonious drive characteristics



Precise, torsionally rigid
transmission
→ Metal bellows coupling

Damping of peaks/vibrations
→ Elastomer coupling

Safe torque limitation
→ Torque limiter

Compare

Features	Metal bellows coupling					Elastomer coupling		Torque limiter		
	BCT	BCH	BC2	BC3	EC2	EL6	ELC	TL1	TL2	TL3
Max. acceleration torque T _B /T _{BE} /T _{Dis} [Nm]	50 – 8500	15 – 1500	15 – 6000	15 – 10000	2 – 500	6 – 2150	1 – 2150	0,1 – 2800	0,1 – 1800	5 – 2800
Torsional backlash	Completely backlash free									
Geometry										
Selectable bore diameter D ₁ /D ₂ [mm]	12 - 100	8 - 80	8 - 140	10 - 180	4 - 62	6 - 80	3 - 80	4 - 100	3 - 80	10 - 100
Bore D ₁ /D ₂ smooth	•	•	•	•	•	•	•	•	•	•
Bore D ₁ /D ₂ key	•	•	•	•	•	•	•	•	•	•
Selectable coupling length (A, B)		•	•	•					•	•
Options										
Corrosion resistant (stainless steel hubs, welded)	•		•	•						
Including self-opening clamp system					•					
Selectable disengagement mechanism								•	•	•
Torque adjusting wrench and switch								•	•	•
Selectable intermediate element (elastomer insert)						•	•			



Couplings



Shrink disc

BCT – bellows coupling with flange connection

			Standard series					HIGH TORQUE series	
Technical data			15	60	150	300	1500	1500	4000
Gearhead output	TP ⁺ , TPK ⁺ , TK ⁺ , VDT ⁺ , TPM, TPC		004 MF	010 MF	025 MF	050 MF	110 MF	110 MA	300 MA
Max. acceleration torque ^{a)} (max. 1000 cycles per hour)	T _B	Nm	50	210	380	750	2600	6000	8500
		in.lb	443	1859	3363	6638	23010	53104	75231
Max. speed	n _{Max}	rpm	10000						
Axial misalignment 	Max. values	mm	1	1.5	2	2.5	3	1.5	3
Angular misalignment 	Max. values	°	1	1	1	1	1	1	1
Lateral misalignment 	Max. values	mm	0.25	0.25	0.25	0.25	0.2	0.2	0.4
Axial spring stiffness	C _a	N/mm	28.6	76.9	86.9	112	322	1024	1154
Lateral spring stiffness	C _l	N/mm	475	1410	1620	3860	5890	21000	7750
Torsional rigidity	C _T	Nm/arcmin	6.7	21.0	41.0	156	379	437	1455
		in.lb/arcmin	59.3	185.9	362.9	1381	3354	3867	12877
Moment of inertia	J	kgcm ²	1.5	6.5	13.0	55	450	470	1850
		10 ⁻³ in.lb.s ²	1.3	5.8	11.5	49	398	416	1637
Hub material			Al	Al	Al	Steel	Steel	Steel	Steel
Bellows material			highly flexible stainless steel						
Adapter flange material			Steel						
Approx. weight	m	kg	0.3	0.7	1	2.8	10	10.5	27.4
		lb	0.67	1.5	2.21	6.18	22.5	23	60.3
Max. permitted temperature		°C	-30 to +100 (bonded)				-30 to +300 (welded)		
		F	-22 to +212 (bonded)				-22 to +XXX (welded)		
Dimensions									
Overall length including adapter flange (without L ₃)	L ₁	mm	51.5	73.5	77.5	96.5	148	139.5	207
Fit length ^{b)}	L ₂	mm	16.5	23	27.5	34	55	61	80
Distance	L ₃	mm	6.5	9.5	11	13	22.5	-	-
Distance between centers	L ₄	mm	1 x 17.5	1 x 23	1 x 27	1 x 39	2 x 55	-	-
Length installation space (without L ₃)	L ₇	mm	48.5	67	72	90	140	131.5	195
Screw head length	L ₈	mm	-	-	-	-	-	7.5	10
Bore diameter from Ø to Ø H7	D ₁	mm	12 - 28	14 - 35	19 - 42	24 - 60	50 - 80	35 - 70	50 - 100
TP flange hole circle diameter ^{c)}	D ₂	mm	31.5 8 x M5	50 8 x M6	63 12 x M6	80 12 x M8	125 12 x M10	125 12 x M12	145 12 x M20
Outer diameter (flange)	D ₃	mm	63.5	86	108	132	188	190	244
Outer diameter of hub/bellows	D ₅	mm	49	66	82	110	157	157	200
Adapter flange hole circle diameter ^{c)}	D ₆	mm	56.5 10 x M4	76 10 x M5	97 10 x M6	120 12 x M6	170 16 x M8	172 16 x M8	221 20 x M12

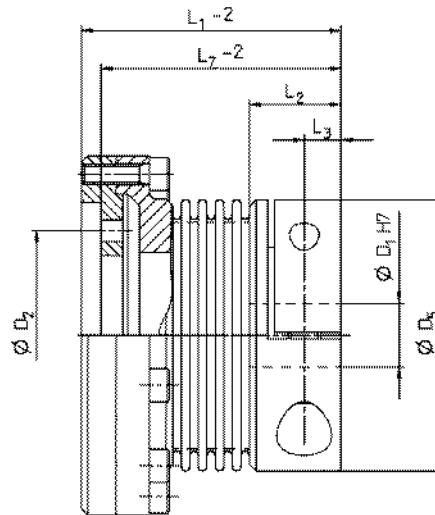
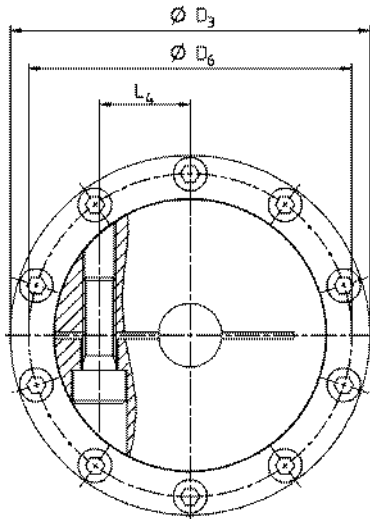
^{a)} valid for maximum bore diameter (see D₁)

^{b)} Tolerance for shaft/hub connection 0.01-0.05 mm.

^{c)} Adapter flange and screws included in scope of delivery

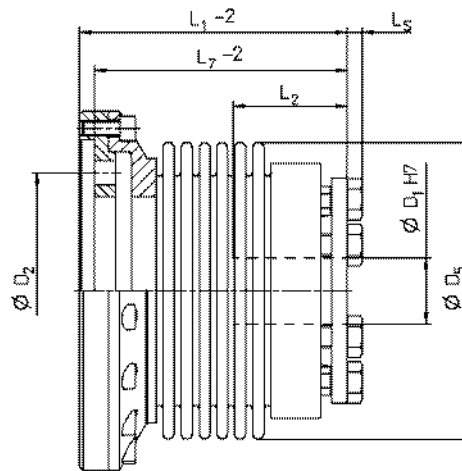
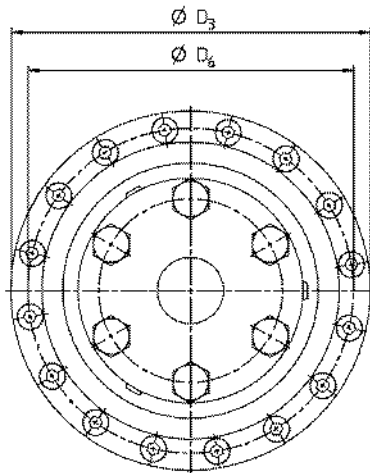
BCT Standard

with Standard clamping hub



BCT HIGH TORQUE

with conical clamping hub



Your benefits:

- Completely backlash free
- High torsional rigidity
- Small installation place and compactness
- Fatigue endurable and maintenance free
- Perfectly matched technically and geometrically to flange gearhead

Optional:

- Bores with key / involute
- Corrosion resistant version
- Other designs, geometry

BCH – bellows coupling with split clamping hub

			Series																			
Technical data			15		30		60		80		150		200		300		500		800		1500	
Length options (see ordering code)			A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A		A	
Max. acceleration torque (max. 1000 cycles per hour)	T _B	Nm	15		30		60		80		150		200		300		500		800		1500	
		in.lb	133		266		531		708		1328		1770		2655		4425		7080		13275	
EMERGENCY STOP torque (briefly permissible)	T _{Emer}	Nm	22.5		45		90		120		225		300		450		750		1200		2250	
		in.lb	199		398		797		1062		1991		2655		3983		6638		10620		19913	
Max. speed	n _{Max}	rpm	10000																			
Axial misalignment 	Max. values	mm	1.0	2.0	1.0	2.0	1.5	2.0	2.0	3.0	2.0	3.0	2.0	3.0	2.5	3.5	2.5	3.5	3.5		3.5	
Angular misalignment 	Max. values	°	1.0	1.5	1.0	1.5	1.0	1.5	1.0	1.5	1.0	1.5	1.0	1.5	1.0	1.5	1.0	1.5	1.5		1.5	
Lateral misalignment 	Max. values	mm	0.15	0.2	0.2	0.25	0.2	0.25	0.2	0.25	0.2	0.25	0.25	0.3	0.25	0.30	0.30	0.35	0.35		0.35	
Axial spring stiffness	C _a	N/mm	25	15	50	30	72	48	48	32	82	52	90	60	105	71	70	48	100		320	
Lateral spring stiffness	C _l	N/mm	475	137	900	270	1200	420	920	290	1550	435	2040	610	3750	1050	2500	840	2000		3600	
Torsional rigidity	C _t	Nm/arcmin	5.8	4.4	11	8.1	22	16	38	25	51	32	56	41	131	102	148	146	227		379	
		in.lb/arcmin	52	39	100	72	196	142	332	219	451	283	492	361	1159	901	1313	1288	2009		3359	
Moment of inertia	J	kgcm ²	0.7	0.8	1.4	1.5	2.3	2.6	6.5	6.7	25	32	45	54	85	105	173	196	243		492	
		10 ⁻³ in.lb.s ²	0.6	0.7	1.2	1.3	2.0	2.2	5.5	5.7	21	27	38	46	72	89	147	167	207		418	
Hub material			Al		Al		Al		Al		Steel		Steel		Steel		Steel		Steel		Steel	
Bellows material			highly flexible stainless steel																			
Approx. weight	m	kg	0.15		0.30		0.40		0.80		1.7		2.5		4.0		7.5		7.0		12	
		lb	0.33		0.66		0.88		1.8		3.8		5.5		8.8		17		15		27	
Max. permitted temperature		°C	-30 to +100 (bonded)														-30 to +300 (welded)					
		F	-22 to +212 (bonded)														-22 to +572 (welded)					
Dimensions																						
Overall length	L ₁	mm	59	66	69	77	83	93	94	106	95	107	105	117	111	125	133	146	140		166	
Fit length ^{a)}	L ₂	mm	22		27		31		36		36		41		43		51		45		55	
Distance	L ₃	mm	6.5		7.5		9.5		11		11		12.5		13		16.5		18		22.5	
Distance between centers	L ₄	mm	17		19		23		27		27		31		39		41		48		55	
Insertion length	L ₇ ⁻²	mm	29	36	35	43	41	51	47	59	48	60	51	63	55	69	62	75	65.5		71	
Bore diameter from Ø to Ø H7	D _{1/2}	mm	8 - 28		10 - 30		12 - 35		14 - 42		19 - 42		22 - 45		24 - 60		35 - 60		40 - 75		50 - 80	
Outer diameter	D ₃	mm	49		55		66		81		81		90		110		124		134		157	

^{a)} Tolerance for shaft/hub connection 0.01-0.05 mm.

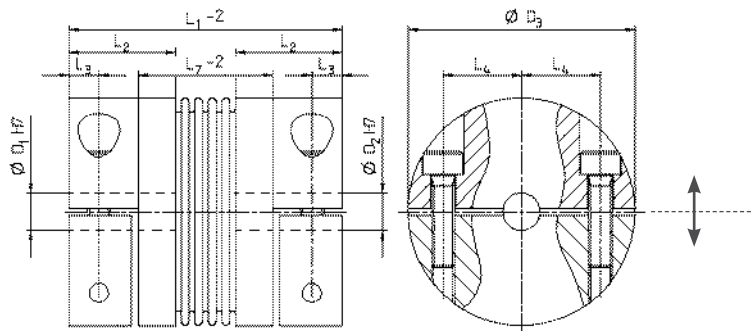
^{b)} per clamping hub, 180° apart

Your benefits:

- Mounting time is greatly reduced through clamping hubs in half-shell design
- Precise preliminary alignment of shafts possible
- Completely backlash free
- High torsional rigidity
- High dynamics through low mass moment
- Fatigue endurable and maintenance free

Optional:

- Bores with key / involute
- Other hub materials
- Other designs, geometry



BC2 – bellows coupling with clamping hub

			Series																					
Technical data			15		30		60		80		150		200		300		500		800		1500		4000	6000
Length options (see ordering code)			A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	A
Max. acceleration torque (max. 1000 cycles per hour)	T _B	Nm	15		30		60		80		150		200		300		500		800		1500		4000	6000
		in.lb	133		266		531		708		1328		1770		2655		4425		7080		13275		35400	53100
EMERGENCY STOP torque (briefly permissible)	T _{Emer}	Nm	22.5		45		90		120		225		300		450		750		1200		2250		6000	9000
		in.lb	199		398		797		1062		1991		2655		3983		6638		10620		19913		53100	79650
Max. speed	n _{Max}	rpm	10000																					
Axial misalignment 	Max. values	mm	1	2	1	2	1.5	2	2	3	2	3	2	3	2.5	3.5	2.5	3.5	3.5	4.5	3.5	4.5	3.5	3
Angular misalignment 	Max. values	°	1	1.5	1	1.5	1	1.5	1	1.5	1	1.5	1	1.5	1	1.5	1	1.5	1.5	2	1.5	2	1.5	1.5
Lateral misalignment 	Max. values	mm	0.15	0.2	0.2	0.25	0.2	0.25	0.2	0.25	0.2	0.25	0.25	0.3	0.25	0.3	0.3	0.35	0.35	1	0.35	1	0.4	0.4
Axial spring stiffness	C _a	N/mm	25	15	50	30	72	48	48	32	82	52	90	60	105	71	70	48	100	285	320	440	565	1030
Lateral spring stiffness	C _l	N/mm	475	137	900	270	1200	420	920	290	1550	435	2040	610	3750	1050	2500	840	2000	1490	3600	1700	6070	19200
Torsional rigidity	C _T	Nm/arcmin	5.8	4.4	11.3	8.1	22.1	16.0	37.5	24.7	50.9	32.0	55.6	40.7	131	102	148	145	227	207	379	343	989	1658
		in.lb/arcmin	51.5	38.6	100.4	72.1	195.7	141.6	332.1	218.8	450.5	283.2	491.7	360.4	1158	901	1313	1287	2008	1830	3357	3038	8753	14674
Moment of inertia	J	kgcm ²	0.6	0.7	1.2	1.3	3.2	3.5	8.0	8.5	19.0	20.0	32.0	34.0	76	79	143	146	162	170	435	450	1650	4950
		10 ⁻³ in.lb.s ²	0.5	0.6	1.1	1.2	2.8	3.1	7.1	7.5	16.8	17.7	28.3	30.1	67	70	127	129	143	150	385	398	1460	4381
Hub material			Al		Al		Al		Al		Steel		Steel		Steel		Steel		Steel		Steel		Steel	
Bellows material			highly flexible stainless steel																					
Approx. weight	m	kg	0.16		0.26		0.48		0.8		1.85		2.65		4.0		6.3		5.7		11.5		28.8	49.4
		lb	0.35		0.57		1.06		1.77		4.09		5.86		8.84		13.9		12.6		25.4		63.6	109
Max. permitted temperature		°C	-30 to +100 (bonded)															-30 to +300 (welded)						
		F	-22 to +212 (bonded)															-22 to +572 (welded)						
Dimensions																								
Overall length	L ₁	mm	59	66	69	77	83	93	94	106	95	107	105	117	111	125	133	146	140	179	166	230	225	252
Fit length ^{a)}	L ₂	mm	22		27		31		36		36		41		43		51		45		55		85	107
Distance	L ₃	mm	6.5		7.5		9.5		11		11		12.5		13		16.5		18		22.5		28	35
Distance between centers	L ₄	mm	17		19		23		27		27		31		39		41		2 x 48		2 x 55		65	90
Bore diameter from Ø to Ø H7	D _{1/2}	mm	8 - 28		10 - 30		12 - 35		14 - 42		19 - 42		22 - 45		24 - 60		35 - 60		40 - 75		50 - 80		50 - 90	60 - 140
Outer diameter	D ₃	mm	49		55		66		81		81		90		110		124		134		157		200	253

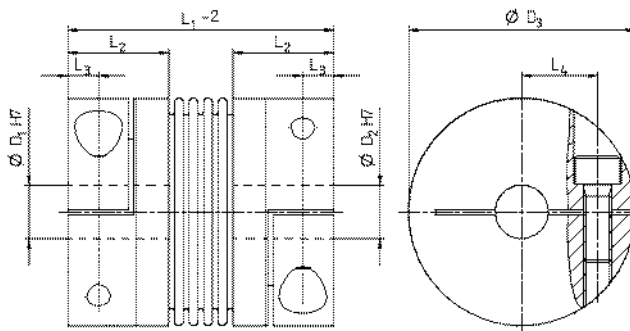
^{a)} Tolerance for shaft/hub connection 0.01-0.05 mm.

Your benefits:

- Completely backlash free
- Fatigue endurable and maintenance free
- High power density through compact design
- High dynamics through low mass moment
- Simple mounting thanks to clamping screw

Optional:

- Bores with key / involute
- Corrosion resistant version
- Other designs, geometry



BC3 – bellows coupling with conical clamping hub

			Series																			
Technical data			15		30		60		150		200		300		500		800	1500	4000	6000	10000	
Length options (see order codes)			A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	A	A	A	A	
Max. acceleration torque (max. 1000 cycles per hour)	T _B	Nm	15		30		60		150		200		300		500		800	1500	4000	6000	10000	
		in.lb	133		266		531		1328		1770		2655		4425		7080	13275	35400	53100	88500	
EMERGENCY STOP torque (briefly permissible)	T _{Emer}	Nm	22.5		45		90		225		300		450		750		1200	2250	6000	9000	15000	
		in.lb	199		398		797		1991		2655		3983		6638		10620	19913	53100	79650	132750	
Max. speed	n _{Max}	rpm	10000																			
Axial misalignment 	Max. values	mm	1	2	1	2	1.5	2	2	3	2	3	2.5	3.5	2.5	3.5	3.5	3.5	3.5	3	3	
Angular misalignment 	Max. values	°	1	1.5	1	1.5	1	1.5	1	1.5	1	1.5	1	1.5	1	1.5	1.5	1.5	1.5	1.5	1.5	
Lateral misalignment 	Max. values	mm	0.15	0.2	0.2	0.25	0.2	0.25	0.2	0.25	0.25	0.3	0.25	0.3	0.3	0.35	0.35	0.35	0.4	0.4	0.4	
Axial spring stiffness	C _a	N/mm	25	15	50	30	72	48	82	52	90	60	105	71	70	48	100	320	565	1030	985	
Lateral spring stiffness	C _l	N/mm	475	137	900	270	1200	420	1500	435	2040	610	3750	1050	2500	840	2000	3600	6070	19200	21800	
Torsional rigidity	C _T	Nm/arcmin	5.8	4.4	11.3	8.1	22.1	16.0	50.9	32.0	55.6	40.7	130.9	101.8	148	145	227	379	989	1658	3185	
		in.lb/arcmin	51.5	38.6	100.4	72.1	195.7	141.6	450.5	283.2	491.7	360.4	1158.5	901.0	1313	1287	2008	3357	8753	14674	28189	
Moment of inertia	J	kgcm ²	0.7	0.8	1.5	1.6	3.9	4.1	12.0	16.0	17.0	25.0	51.0	59.0	91	99	132	349	855	2540	6290	
		10 ⁻³ in.lb.s ²	0.6	0.7	1.3	1.4	3.5	3.6	10.6	14.2	15.0	22.1	45.1	52.2	81	88	117	309	757	2248	5567	
Hub material			Steel																			
Bellows material			highly flexible stainless steel																			
Approx. weight	m	kg	0.26	0.27	0.42	0.44	0.71	0.74	1.2		1.8		3		4.2		5.6	8.2	23	32.6	45.5	
		lb	0.57	0.60	0.93	0.97	1.57	1.63	2.65		3.97		6.61		9.33		12.3	18.1	50.7	71.9	100.3	
Max. permitted temperature		°C	-30 to +100 (bonded)														-30 to +300 (welded)					
		F	-22 to +212 (bonded)														-22 to +572 (welded)					
Dimensions																						
Overall length (without L ₃)	L ₁	mm	48	55	57	65	66	76	75	87	78	90	89	103	97	110	114	141	195	210	217	
Fit length ^{a)}	L ₂	mm	19		22		27		32		32		41		41		50	61	80	85	92	
Screw head length	L _s	mm	2.8		3.5		3.5		4		4		5.3		5.3		6.4	7.5	10	10	10	
Bore diameter from Ø to Ø H7	D _{1/2}	mm	10 - 22		12 - 23		12 - 29		15 - 38		15 - 44		24 - 56		24 - 60		30 - 60	35 - 70	50 - 100	60 - 140	70 - 180	
Outer diameter	D ₃	mm	49		55		66		81		90		110		124		133	157	200	253	303	
Outer diameter of hub	D ₅	mm	49		55		66		81		90		110		122		116	135	180	246	295	

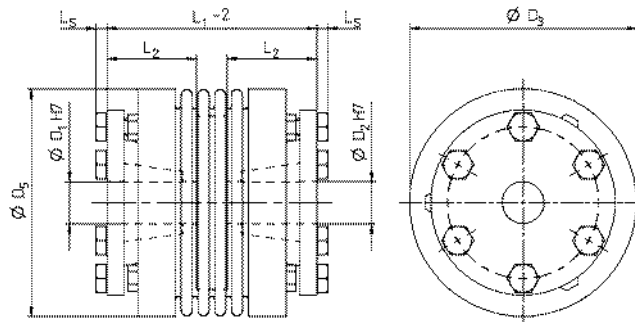
^{a)} Tolerance for shaft/hub connection 0.01-0.05 mm.

Your benefits:

- Completely backlash free
- Fatigue endurable and maintenance free
- High torques owing to conical clamping hub
- High dynamics through higher clamping forces
- Axial mounting via conical clamping hub

Optional:

- Bores with key / involute
- Corrosion resistant version
- Other designs



EC2 – bellows coupling Economy with clamping hub

			Series									
Technical data			2	4.5	10	15	30	60	80	150	300	500
Max. acceleration torque (max. 1000 cycles per hour)	T _B	Nm	2	4.5	10	15	30	60	80	150	300	500
		in.lb	18	40	89	133	266	531	708	1328	2655	4425
EMERGENCY STOP torque (briefly permissible)	T _{Emer}	Nm	3	6.75	15	22.5	45	90	120	225	450	750
		in.lb	27	60	133	199	398	797	1062	1991	3983	6638
Max. speed	n _{Max}	rpm	10000									
Axial misalignment 	Max. values	mm	0.5	1	1	1	1	1.5	2	2	2	2.5
Angular misalignment 	Max. values	°	1	1	1	1	1	1	1	1	1	1
Lateral misalignment 	Max. values	mm	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Axial spring stiffness	C _a	N/mm	8	35	30	30	50	67	44	77	112	72
Lateral spring stiffness	C _l	N/mm	50	350	320	315	366	679	590	960	2940	1450
Torsional rigidity	C _T	Nm/arcmin	0.44	2.0	2.6	6.7	9	21	23	41	46	84
		in.lb/arcmin	3.9	18	23	59	80	186	204	363	407	743
Moment of inertia	J	kgcm ²	0.02	0.07	0.16	0.65	1.2	3	7.5	18	75	117
		10 ⁻³ in.lb.s ²	0.02	0.06	0.14	0.58	1.1	2.7	6.6	16	66	104
Hub material			Al	Al	Al	Al	Al	Al	Al	Steel	Steel	Steel
Bellows material			highly flexible stainless steel									
Approx. weight	m	kg	0.02	0.05	0.06	0.16	0.25	0.4	0.7	1.7	3.8	4.9
		lb	0.044	0.110	0.132	0.353	0.551	0.882	1.54	3.75	8.38	10.8
Max. permitted temperature		°C	-30 to +100 (bonded)									
		F	-22 to +212 (bonded)									
Dimensions												
Overall length	L ₁	mm	30	40	44	58	68	79	92	92	109	114
Fit length ^{a)}	L ₂	mm	10.5	13	13	21.5	26	28	32.5	32.5	41	42.5
Distance	L ₃	mm	4	5	5	6.5	7.5	9.5	11	11	13	17
Distance between centers	L ₄	mm	8	11	14	17	20	23	27	27	39	41
Clamping hub from Ø to Ø H7	D _{1/2}	mm	4 - 12.7	6 - 16	6 - 24	8 - 28	10 - 32	14 - 35	16 - 42	19 - 42	24 - 60	35 - 62
Outer diameter	D ₃	mm	25	32	40	49	56	66	82	82	110	123

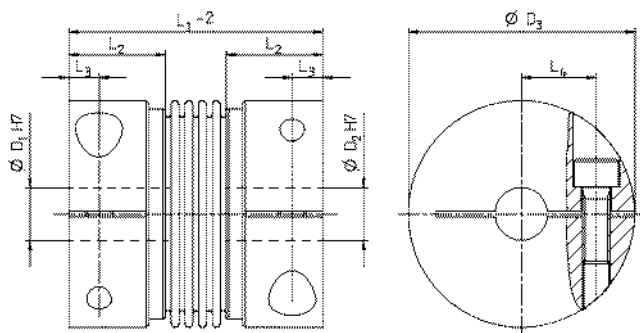
^{a)} Tolerance for shaft/hub connection 0.01-0.05 mm.

Your benefits:

- Completely backlash free
- Fatigue endurable and maintenance free
- Low-cost version
- High dynamics through very low mass moment
- Simple mounting thanks to clamping screw

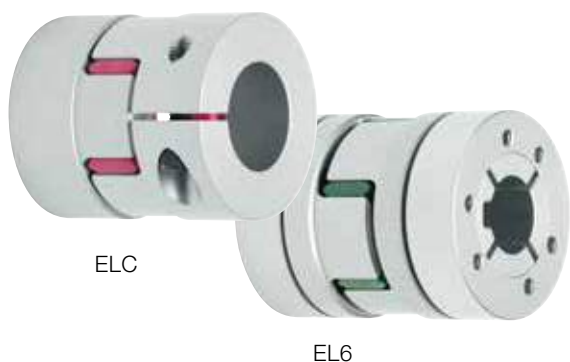
Optional:

- Bores with key / involute
- Optional mounting / self-opening clamp system
- Different hub material (aluminum, steel)



EL – Elastomer couplings

Elastomer couplings ensure precisely manufactured hubs and attachable intermediate elements for maximum true-running accuracy in the drive train. In addition, torque peaks and vibrations are damped to ensure superior smooth running.



Your benefits:

- Compensation for shaft misalignment
- Completely backlash free
- Selectable torsional rigidity/damping
- Compact design
- Extremely simple installation (plug-in)
- Maintenance-free and fatigue endurable
- Ideal for connection to spindle drives, toothed belt drives and linear modules

Fields of application:

- Machine tools
- Packaging machines
- Automation and handling technology
- Printing presses
- Particularly linear drives (spindle drives, toothed belt axes)
- Applications in continuous operation

The elastomer insert you select largely determines the characteristics of the entire drive train. Select between 3 versions and thereby determine the damping characteristics and torsional rigidity you require.



Version A
Shore hardness 98 Sh A



Version B
Shore hardness 64 Sh D



Version C
Shore hardness 80 Sh A

Description of elastomer inserts

Version	Features	Relative damping (ψ)	Shore hardness	Material	Temperature range	Color
A	Good damping	0.4-0.5	98 Sh A	TPU	-30°C to +100°C	Red
B	High torsional rigidity	0.3-0.45	64 Sh D	TPU	-30°C to +120°C	Green
C	Very good damping	0.3-0.4	80 Sh A	TPU	-30°C to +100°C	Yellow

The values for proportional damping and the full torque load of the respective elastomer inserts were determined at 10 Hz and +20°C

EL6 – elastomer coupling with conical clamping ring

			Series																							
Technical data			10			20			60			150			300			450			800					
Elastomer insert version (see order code)			A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C			
Max. rated torque	T _{NE}	Nm in.lb	12.6 112	16 142	4.0 35	17 150	21 186	6.0 53	60 531	75 664	20 177	160 1416	200 1770	42 372	325 2876	405 3584	84 743	530 4691	660 5841	95 841	950 8408	1100 9735	240 2124			
Max. acceleration torque (max. 1000 cycles per hour)	T _{BE}	Nm in.lb	25 221	32 283	6 53	34 301	42 372	12 106	120 1062	150 1328	35 310	320 2832	400 3540	85 752	650 5753	810 7169	170 1505	1060 9381	1350 11948	190 1682	1900 16815	2150 19028	400 3540			
Max. speed	n _{Max}	rpm	20000			19000			14000			13000			10000			9000			4000					
Axial misalignment 	Max. values	mm	±1			±2			±2			±2			±2			±2			±2					
Angular misalignment 	Max. values	°	1	0.8	1.2	1	0.8	1.2	1	0.8	1.2	1	0.8	1.2	1	0.8	1.2	1	0.8	1.2	1	0.8	1.2			
Lateral misalignment 	Max. values	mm	0.1	0.08	0.22	0.1	0.08	0.25	0.12	0.1	0.25	0.15	0.12	0.3	0.18	0.14	0.35	0.2	0.18	0.35	0.25	0.2	0.4			
Static torsional rigidity (at 50% T _{BE})	C _T	Nm/arcmin in.lb/arcmin	0.076 0.67	0.17 1.5	0.026 0.23	0.33 2.9	0.73 6.5	0.15 1.3	0.96 8.5	2.8 24.8	0.41 3.6	1.4 12.4	3.1 27.4	0.33 2.9	3.6 31.9	5.2 46	0.37 3.3	4.4 38.9	7.9 69.9	1.2 10.6	12 106	19 168	3.0 26.6			
Dynamic torsional rigidity (at T _{BE})	C _{Tdy}	Nm/arcmin in.lb/arcmin	0.16 1.4	0.48 4.2	0.065 0.58	0.74 6.6	1.3 11.5	0.25 2.2	2.3 20.4	3.5 31.0	0.39 3.5	3.9 34.5	8.5 75.2	1 8.9	6.9 61.1	12 106	1.8 15.9	16 142	24 212	3.4 30.1	24 212	52 460	8.3 73.5			
Moment of inertia	J	kgcm ² 10 ⁻³ in.lb.s ²	0.08			0.30			1.0			2.0			6.0			17			184					
Hub material			Al			Al			Al			Al			Al			Al			Steel					
Elastomer material			Polymer																							
Approx. weight	m	kg lb	0.08 0.18			0.12 0.27			0.3 0.66			0.5 1.1			0.9 2.0			1.5 3.3			9.6 21					
Dimensions																										
Overall length	L ₁	mm	42			56			64			76			96			110			138					
Fit length ^{a)}	L ₂	mm	15			20			23			28			36			42			53					
Bore diameter from Ø to Ø H7	D _{1/2}	mm	6 - 16			8 - 24			12 - 32			19 - 35			20 - 45			28 - 55			32 - 80					
Outer diameter	D ₃	mm	32			43			56			66			82			102			136.5					
Maximum internal diameter (elastomer insert)	D ₇	mm	14.2			19.2			26.2			29.2			36.2			46.2			60.5					
Fastening screws (ISO 4762(12.9))			3x M3			6x M4			4x M5			8x M5			8x M6			8x M8			8x M10					

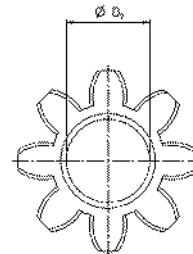
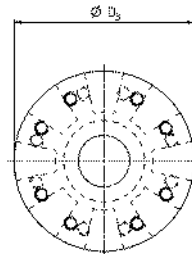
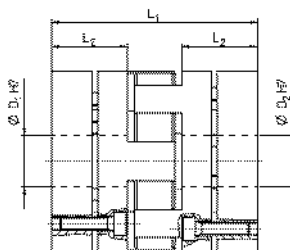
^{a)} Tolerance for shaft/hub connection 0.01-0.05 mm.

Your benefits:

- Extremely simple axial mounting (plug-in)
- Selectable damping characteristics/torsional rigidity (see elastomer options)
- Completely backlash free
- Damping of vibration and torque peaks
- Ideal for connecting linear modules
- High true-running accuracy and smooth running

Optional:

- Bores with key / involute
- Other designs



ELC – elastomer coupling

Compact version with clamping hub

			Series																										
Technical data			2			5			10			20			60			150			300			450			800		
Elastomer insert version (see order code)			A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C
Max. rated torque for elastomer insert ^{a)}	T _{NE}	Nm in.lb	2 18	2.4 21	0.5 4.4	9 80	12 106	2 18	12.5 111	16 142	4 35	17 150	21 186	6 53	60 531	75 664	20 177	160 1416	200 1770	42 372	325 2876	405 3584	84 743	530 4691	660 5841	95 841	950 8408	1100 9735	240 2124
Max. acceleration torque of elastomer insert (max. 1000 cycles per hour) ^{a)}	T _{BE}	Nm in.lb	4 35	4.8 42	1.0 8.9	18 159	24 212	4 35	25 221	32 283	6 53	34 301	42 372	12 106	120 1062	150 1328	35 310	320 2832	400 3540	85 752	650 5753	810 7169	170 1505	1060 9381	1350 11948	190 1682	1900 16815	2150 19028	400 3540
Max. speed	n _{Max}	rpm	15000			15000			13000			12500			11000			10000			9000			8000			4000		
Axial misalignment 	Max. values	mm	±1			±1			±1			±2			±2			±2			±2			±2			±2		
Angular misalignment 	Max. values	°	1	0.8	1.2	1	0.8	1.2	1	0.8	1.2	1	0.8	1.2	1	0.8	1.2	1	0.8	1.2	1	0.8	1.2	1	0.8	1.2	1	0.8	1.2
Lateral misalignment 	Max. values	mm	0.08	0.06	0.2	0.08	0.06	0.2	0.1	0.08	0.22	0.1	0.08	0.25	0.12	0.1	0.25	0.15	0.12	0.3	0.18	0.14	0.35	0.2	0.18	0.35	0.25	0.2	0.4
Static torsional rigidity at (50% T _{BE})	C _T	Nm/arcmin in.lb/arcmin	0.02 0.13	0.03 0.29	0.01 0.04	0.04 0.39	0.10 0.89	0.02 0.13	0.08 0.67	0.17 1.5	0.03 0.23	0.33 2.9	0.73 6.5	0.15 1.33	0.96 8.5	2.8 25	0.41 3.6	1.4 12	3.1 27	0.33 2.9	3.6 32	5.2 46	0.37 3.3	4.4 39	7.9 70	1.2 11	12 106	19 168	3.0 27
Dynamic torsional rigidity at (T _{BE})	C _{Tdy}	Nm/arcmin in.lb/arcmin	0.03 0.26	0.07 0.59	0.01 0.09	0.09 0.77	0.2 1.8	0.03 0.27	0.16 1.4	0.48 4.2	0.07 0.58	0.74 6.5	1.3 12	0.25 2.2	2.3 20	3.5 30.9	0.39 3.5	3.9 35	8.5 75	1.0 8.9	6.9 61	12 106	1.8 16	16 142	24 212	3.4 30	24 212	52 460	8.3 73
Moment of inertia	J	kgcm ² 10 ⁻³ in.lb.s ²	0.01			0.04			0.06			0.20			0.80			1.60			6.00			13.2			160		
Hub material			Al			Al			Al			Al			Al			Al			Al			Al			Steel		
Elastomer material			Polymer																										
Approx. weight	m	kg lb	0.008 0.018			0.02 0.044			0.05 0.11			0.12 0.27			0.30 0.66			0.50 1.1			0.90 2.0			1.5 3.3			8.5 18.8		
Dimensions																													
Overall length	L ₁	mm	20			26			32			50			58			62			86			94			123		
Fit length ^{b)}	L ₂	mm	6			8			10.3			17			20			21			31			34			46		
Distance	L ₃	mm	3			4			5			8.5			10			11			15			17.5			23		
Distance between centers	L ₄	mm	5.5			8			10.5			15.5			21			24			29			38			50.5		
Hub length	L ₅	mm	12			16.7			20.7			31			36			39			52			57			74		
Bore diameter from Ø to Ø H7	D _{1/2}	mm	3 - 8			4 - 12.7			4 - 16			8 - 25			12 - 32			19 - 36			20 - 45			28 - 60			35 - 80		
Outer diameter	D ₃	mm	16			25			32			42			56			66.5			82			102			136.5		
Outer diameter with screw head	D _{3S}	mm	17			25			32			44.5			57			68			85			105			139		
Maximum internal diameter (elastomer insert)	D ₇	mm	6.2			10.2			14.2			19.2			26.2			29.2			36.2			46.2			60.5		

^{a)} Max. torque additionally dependent on minimum selected bore diameter on drive or output side (D_{1/2}).

This only applies to ELC couplings. Please check using "Maximum transmittable torque" table.

^{b)} Tolerance for shaft/hub connection 0.01-0.05 mm.

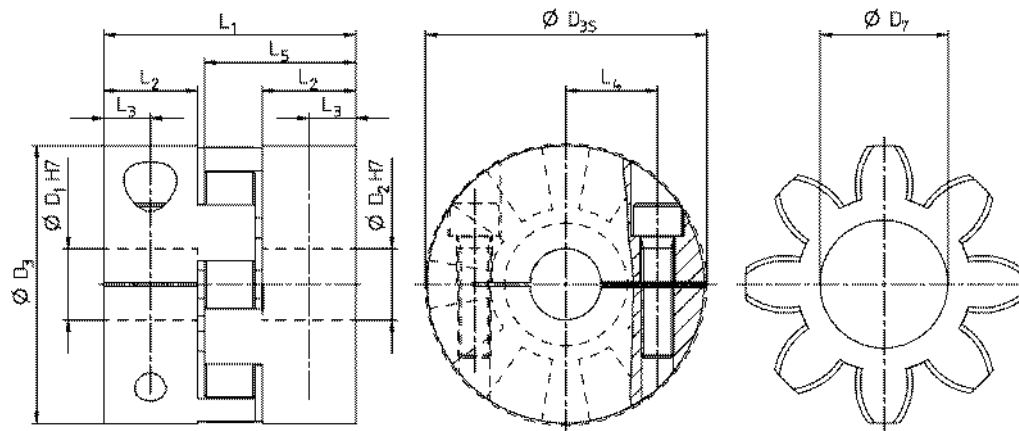
Maximum transmittable torque [Nm]

$D_{1/2}$ Series	Ø 3	Ø 4	Ø 5	Ø 8	Ø 16	Ø 19	Ø 25	Ø 30	Ø 32	Ø 35	Ø 45	Ø 50	Ø 55	Ø 60	Ø 65	Ø 70	Ø 75	Ø 80
2	0,2	0,8	1,5	2,5														
5		1,5	2	8														
10			4	12	32													
20				20	35	45	60											
60					50	80	100	110	120									
150						120	160	180	200	220								
300						200	230	300	350	380	420							
450								420	480	510	600	660	750	850				
800										700	750	800	835	865	900	925	950	1000

Maximum transmittable torque according to minimum selected bore diameter ($D_{1/2}$) and ELC series

If intermediate value, please perform linear interpolation

Higher torques possible by means of additional keys.



Your benefits:

- Extremely simple radial mounting (plug-in)
- Selectable damping characteristics/torsional rigidity (see elastomer options)
- Completely backlash free
- Damping of vibration and torque peaks
- Ideal for connecting linear modules
- High true-running accuracy and smooth running

Optional:

- Bores with key / involute
- intermediate cardan piece (higher lateral misalignment)
- Other designs

TL – torque limiters

Torque limiters with integrated mechanical switching mechanism combine dynamic and precise transmission with TÜV-certified torque limitation. They therefore protect the drive and machine from overload.



Your benefits:

- Machine downtimes are avoided
- High availability and productivity
- Precise, preset overload protection (switch-off in 1 – 3 ms)
- Precise repeat accuracy
- Compact and completely backlash free
- Just one protection element per axle

Your benefits:

- Extremely high machine availability
- Extremely high machine dynamics
- Minimal maintenance requirements
- Extremely high service life of machine and components
- TÜV certification

Selectable function systems – re-engagement after overload has been rectified

Single position re-engagement (W) (Standard)



Re-engagement after exactly 360°
Guaranteed synchronism
Switch signal in the event of overload*

Applications:
Packaging machines
Machine tools
Automation systems

Multi-position (D)



Re-engagement after exactly 60° (Standard)
Optionally after (30, 45, 60, 90, 120°)
System is immediately available again
Switch signal in the event of overload*

Applications:
Packaging machines
Machine tools
Automation systems

Full engagement (F)



Permanent separation of drive and output
Free deceleration of centrifugal masses
Manual re-engagement (every 60°)
Switch signal in the event of overload*

Applications:
Applications with extremely high speeds and kinetic energy

Load holding version (G)



None, or limited
Separation of drive and output
Only slow rotation possible during overload
Re-engagement after torque drop
Guaranteed load safety
Switch signal in the event of overload*

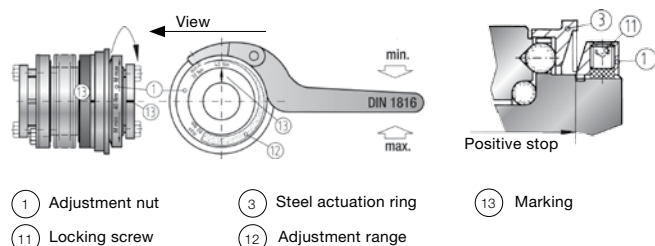
Applications:
Particularly for vertical axes such as presses, load-lifting equipment

*(For suitable switches, see Page 403)

Accessories for TL – torque limiters

Alpha torque limiters are factory adjusted to the specified disengagement torque, which is marked on the coupling.
Thanks to the installed disc springs with special degressive spring characteristics it is also possible to adjust the preset disengagement torque within the adjustment range.
Adjustment of the disengagement torque can be carried out using a torque adjusting wrench

Torque adjusting wrench for DIN 1816 nuts



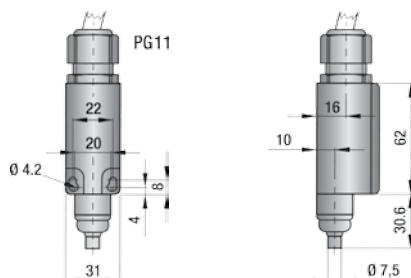
Smaller coupling sizes do not require a torque adjusting wrench.
The adjusting nut for the 1.5/2/4.5/10 series can be adjusted with a bolt or pin.

Torque adjusting wrench			
Series	Designation	AC according to the function system	
		W, D, G*	F*
15	GHS TL 15	20047730	20047730
30	GHS TL 30	20047731	20047731
60	GHS TL 60	20047732	20047749
80	GHS TL 80	20047733	20047733
150	GHS TL 150	20047733	20047733
200	GHS TL 200	20047734	20047750
300	GHS TL 300	20047735	20047735
500	GHS TL 500	20047736	20047736
800	GHS TL 800	20047737	20047751
1500	GHS TL 1500	20047738	20047738
2500	GHS TL 2500	20047739	20047752

*Function systems: single position (W), multi-position (D), load holding (G), full disengagement (F)

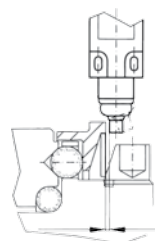
Mechanical limit switch (emergency cut-off)

Dimension drawings



Important:

The switch function must always be checked 100 % after mounting.



The actuation tappet should be positioned as close as possible to the actuation ring of the torque limiter (approx. 0.1–0.2 mm).

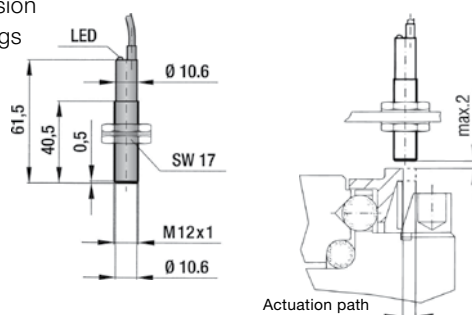
Distance approx. 0.1–0.2 mm

Technical data	ME TL AC: 20022999
Max. voltage:	500 V AC
Max. constant current:	10 A
Degree of protection:	IP 65
Contact type:	NC contact (positive opening)
Ambient temperature:	-30 °C to +80 °C
Actuation:	Tappet (metal)
Circuit symbol:	

The mechanical limit switch is suitable for size 30 and above.

Proximity switch (emergency cut-off)

Dimension drawings



Important:

The switch function must always be checked 100 % after mounting.

Technical data	NAS TL AC: 20022998
Voltage range:	10 to 30 V DC
Max. output current:	200 mA
Max. switching frequency:	800 Hz
Temperature range:	-25 °C to +70 °C
Degree of protection:	IP 67
Switch type:	PNP NC contact
Detection gap:	max. 2 mm
Circuit symbol:	

TL1 – Torque limiter for indirect drives

Technical data

			Miniature version (Standard clamping hub)				Standard version (Conical clamping hub)												
Series			1.5	2	4.5	10	15	30	60	150	200	300	500	800	1500	2500			
Adjustment range from min. to max. disengagement torque T _{Dis} (approx. values) Function systems: single position (W), multi-position (D) and load holding (G)	T _{Dis}	Nm in.lb	A	0.1-0.6	0.2-1.5	1-3	2-6	5-15	5-20	10-30	20-70	30-90	100-200	80-200	400-650	600-800	1500-2000		
				1-6	2-14	9-27	18-54	45-133	45-177	89-266	177-620	266-797	885-1770	708-1770	3540-5753	5310-7080	13275-17700		
		Nm in.lb	B	0.4-1	0.5-2.2	2-4.5	4-12	12-25	10-30	25-80	45-150	60-160	150-240	200-350	500-800	700-1200	2000-2500		
				4-9	5-20	18-40	36-107	107-222	89-266	222-708	399-1328	531-1416	1328-2124	1770-3098	4425-7080	6195-10620	17700-22125		
		Nm in.lb	C	0.8-2	1.5-3.5	3-7	7-18	20-40	20-60	50-115	80-225	140-280	220-440	320-650	650-950	1000-1800	2300-2800		
				8-18	14-31	27-62	62-160	177-354	177-531	443-1018	708-1992	1239-2478	1947-3894	2832-5753	5753-8408	8850-15930	20355-24780		
		Nm in.lb	D	-	-	-	-	35-70	50-100	-	-	250-400	-	-	-	-	-		
				-	-	-	-	310-620	443-885	-	-	222-3540	-	-	-	-	-		
	Adjustment range from min. to max. disengagement torque T _{Dis} (approx. values) Function system: Full engagement (F)	T _{Dis}	Nm in.lb	A	0.3-0.8	0.5-2	2.5-4.5	2-5	7-15	8-20	10-30	20-60	80-140	120-180	50-150	200-400	1000-1250	1400-2200	
					3-8	5-18	23-40	18-45	62-133	71-177	89-266	177-531	708-1239	1062-1593	443-1328	1770-3540	8850-11063	12390-19470	
Nm in.lb			B	0.6-1.3	-	-	4-10	-	16-30	20-40	40-80	130-200	160-300	100-300	450-850	1250-1500	1800-2700		
				6-12	-	-	36-89	-	142-266	177-354	354-708	1151-1770	1416-2655	885-2655	3983-7523	11063-13275	15930-23895		
Nm in.lb			C	-	-	-	8-15	-	-	30-60	80-150	-	300 - 450	250-500	-	-	-		
				-	-	-	71-133	-	-	266-531	708-1328	-	2655 - 3983	2213-4425	-	-	-		
Max. radial force (radial load capacity) within the permitted distance range S ^{a)}			F _R S	N		50	100	200	500	1400	1800	2300	3000	3500	4500	5600	8000	12000	20000
				mm		3 - 6	5 - 8	5 - 11	6 - 14	7 - 17	10 - 24	10 - 24	12 - 24	12 - 26	12 - 28	16 - 38	16 - 42	20 - 50	28 - 60
Moment of inertia	J	kgcm ²		0.1	0.2	0.5	0.7	1.5	2.5	5.0	16	27	52	86	200	315	2100		
		in.lb.s ² .10 ⁻³		0.1	0.2	0.4	0.6	1.3	2.2	4.4	14	24	46	76	177	279	1859		
Max. speed ^{b)}	n _{Max}	rpm		3000						2000			1000						
Material				Hardened steel															
Approx. weight	m	kg		0.03	0.065	0.12	0.22	0.4	0.7	1.0	1.3	2.0	3.0	4.0	5.5	10	28		
		lb		0.07	0.14	0.27	0.49	0.9	1.5	2.2	2.9	4.4	6.6	8.8	12	22	61		
Max. permitted temperature		°C		-30 to +120															
		F		-22 to +572															

^{a)} If different, additional bearing required (see illustration 1)

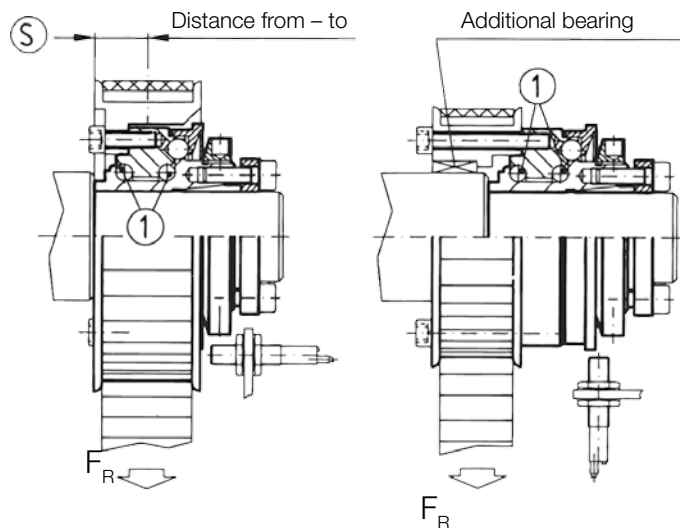
^{b)} If you have more stringent requirements, please contact WITTENSTEIN alpha

Your benefits:

- Ideal for connecting toothed belt pulleys and sprocket wheels
- Integrated bearing for indirect drives
- Certified disengagement mechanism in the event of overload
- Pre-set disengagement torque
- Completely backlash free
- Fatigue endurable and maintenance free
- High compactness
- High dynamics through low mass moment

Optional:

- Bores with key
- Other designs



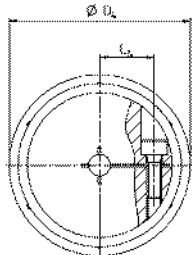
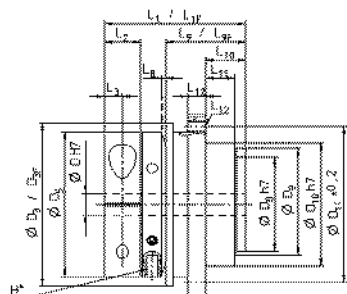
Dimensions

			Miniature version (Standard clamping hub)				Standard version (Conical clamping hub)									
Series			1.5	2	4.5	10	15	30	60	150	200	300	500	800	1500	2500
Overall length (without L ₉)	L ₁	mm	23	28	32	39	40	50	54	58	63	70	84	95	109	146
Overall length F (without L ₉)	L _{1F}	mm	23	28	32	39	40	50	54	58	66	73	88	95	117	152
Fit length ^{b)}	L ₂	mm	7	8	11	11	19	22	27.5	32	32	41	41	49	61	80
Distance	L ₃	mm	3.5	4	5	5	-	-	-	-	-	-	-	-	-	-
Distance between centers	L ₄	mm	6.5	8	10	15	-	-	-	-	-	-	-	-	-	-
Actuation path	L ₆	mm	0.7	0.8	0.8	1.2	1.5	1.5	1.7	1.9	2.2	2.2	2.2	2.2	3.0	3.0
Distance	L ₉	mm	11	15	17	22	27	35	37	39	44	47	59	67	82	112
Distance F	L _{9F}	mm	11.5	16	18	24	27	37	39	41.5	47	51.5	62	75	94	120
Distance	L ₁₀	mm	5	6	8	11	8	11	11	12	12	15	21	19	25	34
Centering length -0.2	L ₁₁	mm	2.5	3.5	5	8	3	5	5	5	5	6	9	10	13.5	20
Thread	L ₁₂		4xM2	4xM2.5	6xM2.5	6xM3	6xM4	6xM5	6xM5	6xM6	6xM6	6xM8	6xM8	6xM10	6xM12	6xM16
Thread length		mm	3	4	4	5	6	8	9	10	10	10	12	15	16	24
Distance	L ₁₃	mm	1	1.3	1.5	1.5	2.5	2.5	2.5	2.5	3	3	4	4	4.5	6
Screw head length	L ₈	mm	-	-	-	-	4	5	5	6	6	8	8	10	12	16
Bore diameter from Ø to Ø H7	D	mm	4-8	4-12	5-14	6-20	8-22	12-22	12-29	15-37	20-44	25-56	25-56	30-60	35-70	50-100
Outer diameter of actuation ring	D ₃	mm	23	29	35	45	55	65	73	92	99	120	135	152	174	242
Outer diameter of actuation ring F	D _{3F}	mm	24	32	42	51.5	62	70	83	98	117	132	155	177	187	258
Flange diameter -0.2	D ₄	mm	26	32	40	50	53	63	72	87	98	112	128	140	165	240
Outer diameter of hub	D ₅	mm	20	25	32	40	-	-	-	-	-	-	-	-	-	-
Diameter h7	D ₆	mm	11	14	17	24	27	32	39	50	55	65	72	75	92	128
Diameter	D ₉	mm	13	18	21	30	35	42	49	62	67	75	84	91	112	154
Centering diameter h7	D ₁₀	mm	14	22	25	34	40	47	55	68	75	82	90	100	125	168
Hole circle diameter ± 0.2	D ₁₁	mm	22	28	35	43	47	54	63	78	85	98	110	120	148	202

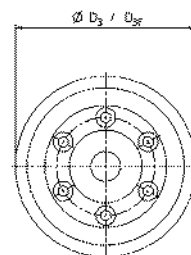
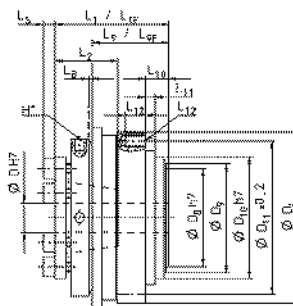
^{b)} Tolerance for shaft/hub connection 0.01-0.05 mm.

L_{1F} , L_{9F} , D_{3F} = Full disengagement version (F)

TL 1 miniature version (1.5-10 series)
with Standard clamping hub



TL 1 Standard version (15-2500 series)
with conical clamping hub



* Bore for torque adjusting wrench, see Page 403

TL2 – Torque limiter

Technical data

Series			1.5		2		4.5		10		15		30		60		80		150		200		300		500		800		1500				
Length options (see order codes)			A	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	A				
Adjustment range from min. to max. disengagement torque T _{Dis} (approx. values) Function systems: single position (W), multi-position (D) and load holding (G)	T _{Dis}	Nm in.lb	A	0.1-0.6		0.2-1.5		1-3		2-6		5-10		10-25		10-30		20-70		20-70		30-90		100-200		80-200		400-650		650-800			
				1-6		2-14		9-27		18-54		45-89		89-222		89-266		177-620		177-620		266-797		885-1770		708-1770		3540-5753		5753-7080			
		Nm in.lb	B	0.4-1		0.5-2		3-6		4-12		8-20		20-40		25-80		30-90		45-150		60-160		150-240		200-350		500-800		700-1200			
				4-9		5-18		27-54		36-107		71-177		177-354		221-708		266-797		399-1328		531-1416		1328-2124		1770-3098		4425-2080		6195-10620			
		Nm in.lb	C	0.8-1.5		-		-		-		-		-		-		-		80-180		120-240		200-320		300-500		650-850		1000-1800			
				8-14																708-1593		1062-2124		1770-2832		2655-4425		5753-7523		8850-15930			
Adjustment range from min. to max. disengagement torque T _{Dis} (approx. values) Function system: Full engagement (F)	T _{Dis}	Nm in.lb	A	0.3-0.8		0.5-2		2.5-4.5		2-5		7-15		8-20		20-40		20-60		20-60		80-140		120-180		60-150		200-400		1000-1250			
				3-8		5-18		22-40		18-45		62-133		71-177		177-354		177-531		177-531		708-1239		1062-1592		531-1328		1770-3540		8850-11063			
		Nm in.lb	B	0.6-1.3		-		-		5-10		-		16-30		30-60		40-80		40-80		130-200		160-300		100-300		450-800		1250-1500			
				6-12						45-89				142-266		268-531		354-708		354-708		1151-1770		1416-2655		885-2655		3983-7080		11063-13275			
		Nm in.lb	C	-		-		-		-		-		-		-		-		-		80-150		-		-		250-500		-		-	
																						708-1328						2213-4425					
Axial misalignment 	Max. values	mm		0.5	0.5	0.6	0.7	1	1	1.2	1	2	1	2	1.5	2	2	3	2	3	2	3	2	3	2.5	3.5	2.5	3.5	3.5	3.5			
Angular misalignment 	Max. values	°		1	1	1.5	1.5	2	1.5	2	1	1.5	1	1.5	1	1.5	1	1.5	1	1.5	1.5	2	1.5	2	2	2.5	2.5	2.5	2.5				
Lateral misalignment 	Max. values	mm		0.15	0.15	0.20	0.20	0.25	0.20	0.30	0.15	0.2	0.20	0.25	0.20	0.25	0.20	0.25	0.20	0.25	0.25	0.30	0.25	0.3	0.30	0.35	0.35	0.35	0.35				
Axial spring stiffness	C _a	N/mm		16	11	20	25	29	36	48	25	15	50	30	72	48	48	32	82	52	90	60	105	71	70	48	100	320					
Lateral spring stiffness	C _l	N/mm		70	40	30	290	45	280	145	475	137	900	270	1200	420	920	255	1550	435	2040	610	3750	1050	2500	840	2000	3600					
Torsional rigidity	C _T	Nm/arcmin		0.20	0.35	0.38	2.0	1.5	2.6	2.3	5.8	4.4	11	8	22	16	38	25	51	32	56	41	122	102	148	145	227	379					
		in.lb/arcmin		1.8	3.1	3.3	18	13	23	21	51	39	100	72	196	142	332	219	451	283	492	360	1081	901	1313	1287	2008	3357					
Moment of inertia	J	kgcm ²		0.1	0.1	0.1	0.2	0.2	0.6	0.7	1	1.5	2.7	3.2	7.5	8	18	19	25	28	51	53	115	118	228	230	420	830					
		in.lb.s ² .10 ⁻³		0.09	0.09	0.09	0.18	0.18	0.53	0.62	0.89	1.33	2.39	2.83	6.64	7.1	16	17	22	25	45	47	102	104	202	204	372	735					
Hub material				Al		Al		Al		Al		Al		Al		Al		Al		Steel		Steel		Steel		Steel		Steel		Steel			
Max. speed ^{b)}	n _{Max}	rpm		3000												2000												1000					
Bellows material				highly flexible stainless steel																													
Protection element material				Hardened steel																													
Approx. weight	m	kg		0.035	0.07	0.2		0.3		0.4		0.6		1.0		2.0		2.4		4.0		5.9		9.6		14		21					
		lb		0.08	0.15	0.44		0.66		0.88		1.32		2.21		4.41		5.30		8.82		13.1		21.2		30.9		46.3					
Max. permitted temperature		°C		-30 to +100 (bonded)																								-30 to +300 (welded)					
		F		-22 to +212 (bonded)																								-22 to +572 (welded)					

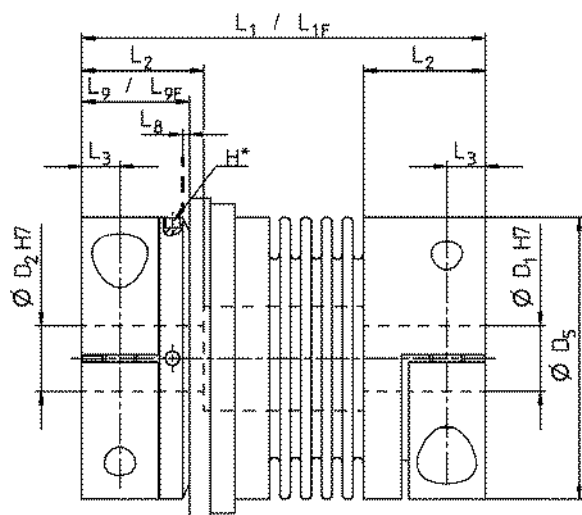
^{b)} If you have more stringent requirements, please contact WITTENSTEIN alpha

Dimensions

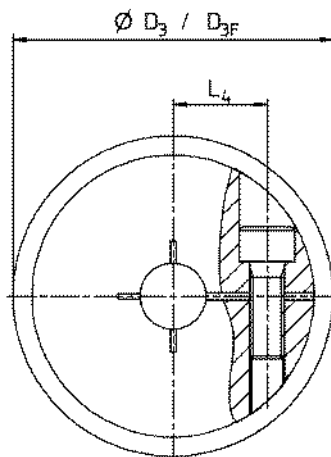
Series		1.5	2		4.5		10		15		30		60		80		150		200		300		500		800	1500	
Length options (see order codes)		A	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	A	
Overall length	L ₁	mm	42	46	51	57	65	65	74	75	82	87	95	102	112	115	127	116	128	128	140	139	153	163	177	190	223
Overall length F	L _{1F}	mm	42	46	51	57	65	65	74	75	82	87	95	102	112	117	129	118	130	131	143	142	156	167	181	201	232
Fit length ^{a)}	L ₂	mm	11	13		16		16		22		27		31		35		35		40		42		51		48	67
Distance	L ₃	mm	3.5	4		5		5		6.5		7.5		9.5		11		11		12.5		13		17		18	22.5
Distance between centers	L ₄	mm	6	8		10		15		17		19		23		27		27		31		39		41		2x48	2x55
Actuation path	L ₈	mm	0.7	0.8		0.8		1.2		1.5		1.5		1.7		1.9		1.9		2.2		2.2		2.2		2.2	3.0
Distance	L ₉	mm	12	13		15		17		19		24		28		31		31		35		35		45		50	63
Distance (F)	L _{9F}	mm	11.5	12		14		16		19		22		29		31		30		33		35		43		54	61
Bore diameter from Ø to Ø H7	D _{1/2}	mm	3 - 9	4-12		5-14		6-20		10-26		12-30		15-32		19-42		19-42		24-45		30-60		35-60		40-75	50-80
Outer diameter of actuation ring	D ₃	mm	23	29		35		45		55		65		73		92		92		99		120		135		152	174
Outer diameter of actuation ring F	D _{3F}	mm	24	32		42		51.5		62		70		83		98		98		117		132		155		177	187
Outer diameter of hub	D ₅	mm	19	25		32		40		49		55		66		81		81		90		110		123		134	157
Max. internal diameter	D ₇	mm	9.1	12.1		14.1		20.1		21.1		24.1		32.1		36.1		36.1		42.1		58.1		60.1		60.1	68.1

^{a)} Tolerance for shaft/hub connection 0.01-0.05 mm.

L_{1F} , L_{9F} , D_{3F} = Full disengagement version (F)



* Bore for torque adjusting wrench, see Page 403



Your benefits:

- Certified disengagement mechanism in the event of overload
- Pre-set disengagement torque
- Completely backlash free
- Fatigue endurable and maintenance free
- Compensation of shaft misalignments
- Small installation space despite protection element
- Radial mounting via clamping screw

Optional:

- Bores with key / involute
- Other designs



TL3 – Torque limiter

Technical data

Series			15		30		60		150		200		300		500		800	1500	2500				
Length options (see order codes)			A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	A	A				
Adjustment range from min. to max. disengagement torque T _{Dis} (approx. values) Function systems: single position (W), multi-position (D) and load holding (G)	T _{Dis}	Nm	A	5-10		10-25		10-30		20-70		30-90		100-200		80-200		400-650		650-850		1500-2000	
		in.lb		45-89		89-222		89-266		177-620		266-797		885-1770		708-1770		3540-5753		5753-7523		13275-17700	
		Nm	B	8-20		20-40		25-80		45-150		60-160		150-240		200-350		500-800		700-1200		2000-2500	
		in.lb		71-177		177-354		222-708		399-1328		531-1416		1328-2124		1770-3098		4425-7080		6195-10620		17700-22125	
		Nm	C	-		-		-		80-200		140-280		220-400		300-500		600-900		1000-1800		2300-2800	
		in.lb								708-1770		1239-2478		1947-3540		2655-4425		5310-7965		8850-15930		20355-24780	
Adjustment range from min. to max. disengagement torque T _{Dis} (approx. values) Function system: Full engagement (F)	T _{Dis}	Nm	A	7-15		8-20		20-40		20-60		80-140		120-180		60-150		200-400		1000-1250		1400-2200	
		in.lb		62-133		71-177		177-354		177-531		708-1239		1062-1593		531-1328		1770-3540		8850-11063		12390-19470	
		Nm	B	-		16-30		30-60		40-80		130-200		160-300		100-300		450-800		1250-1500		1800-2700	
		in.lb				142-266		266-531		354-706		1151-1770		1416-2655		885-2855		3982-7080		11063-13275		15930-23895	
		Nm	C	-		-		-		80-150		-		-		250-500		-		-		-	
		in.lb								708-1328						2213-4425							
Axial misalignment 	Max. values	mm	1	2	1	2	1.5	2	2	3	2	3	2.5	3.5	2.5	3.5	3.5	3.5	3.5				
Angular misalignment 	Max. values	°	1	1.5	1	1.5	1	1.5	1	1.5	1.5	2	1.5	2	2	2.5	2.5	2.5	2.5				
Lateral misalignment 	Max. values	mm	0.15	0.20	0.20	0.25	0.20	0.25	0.20	0.25	0.25	0.30	0.25	0.30	0.30	0.35	0.35	0.35	0.35				
Axial spring stiffness	C _a	N/mm	25	15	50	30	72	48	82	52	90	60	105	71	70	48	100	320	1150				
Lateral spring stiffness	C _l	N/mm	475	137	900	270	1200	380	1550	435	2040	610	3750	1050	2500	840	2000	3600	6070				
Torsional rigidity	C _T	Nm/arcmin	5.8	4.4	11	8.1	22	16	51	32	56	41	122	102	148	145	227	379	989				
		in.lb/arcmin	51	39	100	72	196	142	451	283	492	360	1081	901	1313	1287	2008	3357	8753				
Moment of inertia	J	kgcm ²	1.0	1.5	2.8	3.0	7.5	8.0	19	20	28	30	55	60	110	128	200	420	2570				
		in.lb.s ² .10 ⁻³	0.85	1.3	2.4	2.6	6.4	6.8	16	17	24	26	47	51	94	109	170	357	2185				
Max. speed ^{b)}	n _{Max}	rpm	3000						2000						1000								
Hub material			Steel																				
Bellows material			highly flexible stainless steel																				
Protection element material			Hardened steel																				
Approx. weight	m	kg	0.3		0.4		1.2		2.3		3.0		5.0		6.5		9.0		16.3		35		
		lb	0.66		0.88		2.65		5.07		6.61		11.0		14.3		19.8		35.9		77.2		
Max. permitted temperature		°C	-30 to +100 (bonded)														-30 to +300 (welded)						
		F	-22 to +212 (bonded)														-22 to +572 (welded)						

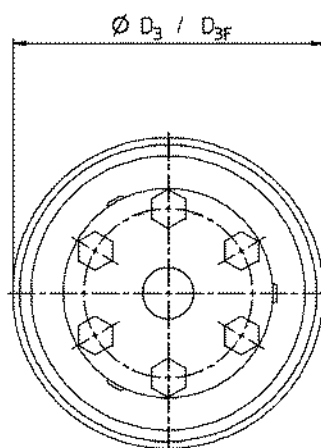
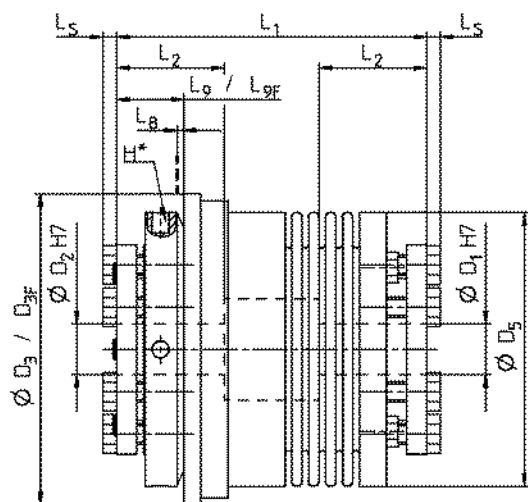
^{b)} If you have more stringent requirements, please contact WITTENSTEIN alpha

Dimensions

Series		15		30		60		150		200		300		500		800	1500	2500	
Length options (see order codes)		A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	A	A	
Overall length (without L ₃)	L ₁	mm	62	69	72	80	84	94	93	105	99	111	114	128	123	136	151	175	246
Overall length F	L _{1F}	mm	62	69	72	80	84	94	93	105	102	114	117	131	127	140	151	184	252
Fit length ^{a)}	L ₂	mm	19		22		27		32		32		41		41		49	61	80
Actuation path	L ₈	mm	1.5		1.5		1.7		1.9		2.2		2.2		2.2		2.2	3	3
Distance	L ₃	mm	13		16		18		19		19		23		25		31	30	34
Distance F	L _{3F}	mm	13		14		17		18		17		20		22		20	26	31
Screw head length	L ₅	mm	2.8		3.5		3.5		4		4		5.3		5.3		6.4	7.5	10
Bore diameter from Ø to Ø H7	D _{1/2}	mm	10-22		12-23		12-29		15-37		20-44		25-56		25-60		30-60	35-70	50-100
Outer diameter of actuation ring	D ₃	mm	55		65		73		92		99		120		135		152	174	243
Outer diameter of actuation ring F	D _{3F}	mm	62		70		83		98		117		132		155		177	187	258
Outer diameter of hub	D ₅	mm	49		55		66		81		90		110		123		133	157	200

^{a)} Tolerance for shaft/hub connection 0.01-0.05 mm.

L_{1F} , L_{3F} , D_{3F} = Full disengagement version F



* Bore for torque adjusting wrench, see Page 403

Your benefits:

- Certified disengagement mechanism in the event of overload
- Pre-set disengagement torque
- Completely backlash free
- Fatigue endurable and maintenance free
- Compensation of shaft misalignments
- Small installation space despite protection element
- Axial mounting via conical clamping hub

Optional:

- Bores with key / involute
- Other designs



Shrink discs – Always well connected



Harmony in perfection:

Our shrink discs are ideally adapted to your extremely compact hollow shaft or mounted shaft connection. This means maximum performance of your drive!

The best accessories for the best gearhead in order to achieve full performance.



Your benefits:

- Technically and geometrically matched
- Compact version
- Simple mounting and removal
- Backlash-free, positive connection
- High true-running accuracy
- Two-part design

Your benefits

- Reliable and safe transmission
- Huge installation space reduction
- Multiple reuse
- High dynamism and accuracy
- Extremely smooth-running
- Corrosion resistant design

Quick shrink disc selection

Gearhead type	Order code/Article code				d	D	A	H*	H2*	J [kgcm²]
		Standard	Nickel plated	Stainless steel						
SP*/SPK*/HG* 060	Order code	SD 018x044 S2	SD 018x044 N2	SD 018x044 E2	18	44	30	15	19	0,252
	Article code	20000744	20048496	20048491						
SP*/SPK*/HG* 075	Order code	SD 024x050 S2	SD 024x050 N2	SD 024x050 E2	24	50	36	18	22	0,729
	Article code	20001389	20047957	20043198						
SP*/SPK*/HG* 100	Order code	SD 036x072 S2	SD 036x072 N2	SD 036x072 E2	36	72	52	22	27,5	3,94
	Article code	20001391	20048497	20035055						
SP*/SPK*/HG* 140	Order code	SD 050x090 S2	SD 050x090 N2	SD 050x090 E2	50	90	68	26	31,5	11,1
	Article code	20001394	20048498	20047937						
SP*/SPK*/HG* 180	Order code	SD 068x115 S2	SD 068x115 N2	SD 068x115 E2	68	115	86	29	34,5	31,1
	Article code	20001396	20048499	20048492						

* Apply for the unclamped state.
Shrink discs suitable for alpheno® and PKF gearheads upon request.

Gearhead type	Order code/Article code				d	D	A	H*	H2*	J [kgcm²]
		Standard	Nickel plated	Stainless steel						
VDH*/VDHe 040	Order code	SD 024x050 S2	SD 024x050 N2	SD 024x050 E2	24	50	36	18	22	0,729
	Article code	20001389	20047957	20043198						
VDH*/VDHe 050	Order code	SD 030x060 S2V	SD 030x060 N2	SD 030x060 E2	30	60	44	20	24	1,82
	Article code	20020687	20047934	20047885						
VDH*/VDHe 063	Order code	SD 036x072 S2V	SD 036x072 N2V	SD 036x072 E2	36	72	52	22	27,5	3,94
	Article code	20020688	20047530	20035055						
VDH* 080	Order code	SD 050x090 S2V	SD 050x090 N2V	SD 050x090 E2	50	90	68	26	31,5	11,1
	Article code	20020689	20047935	20047937						
VDH* 100	Order code	SD 062x110 S2V	SD 062x110 N2	SD 062x110 E2	62	110	80	29	34,5	27
	Article code	20020690	20047927	20047860						

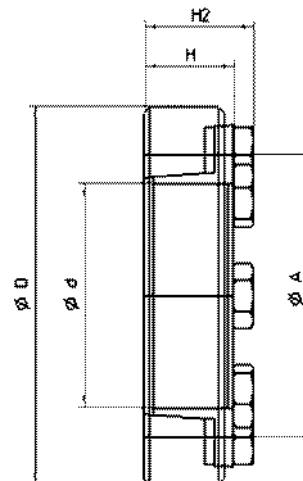
* Apply for the unclamped state.

One shrink disk per gearhead is sufficient. Please refer to the operating instructions for information on correct shrink disc installation.
The instructions are enclosed with the order.

Mounting/operating manual at www.wittenstein-alpha.de/en/download

Recommendation for the load shaft:
Tolerance h6
Surface roughness $\leq R_z 16$
Minimum yield strength $R_p 0.2 \geq 385 \text{ N/mm}^2$

The shrink disc is not included in the scope of delivery of the gearhead. Therefore, it must be ordered separately (for the V-Drive gearhead type, this is possible in the order code).



Flange shafts – Flexible in design



More design freedom for the output:
Our flange shafts provide you with
made to measure output shafts, es-
pecially adapted for TP⁺, TPK⁺, TK⁺
and TPC⁺ flange gearheads:

- Flexible shaft diameter
- Can be adapted to your output components
- Customized options possible

Your benefits

- Geometrically adapted to the gearhead
- Choice of shaft diameters
- Can also be combined with couplings
- Other options available on request (material, geometry)

Your benefits

- Simple selection
- Greater design freedom
- A flexible solution for your drive

Quick flange shaft selection

Gearhead TP+ / TPK+ / TK+ / TPC+	Diam. of shaft D1 option A [mm]	Order code	Diam. of shaft D1 option B [mm]	Order code	Effective shaft length L1 [mm]	Overall length L2 [mm]
004 MF	16	FLW TP 004-S-016-023-033	22	FLW TP 004-S-022-023-033	23	033
010 MF	22	FLW TP 010-S-022-030-041	32	FLW TP 010-S-032-030-041	30	041
010 MA	22	FLW TP 010-A-022-042-065	32	FLW TP 010-A-032-042-065	42	065
025 MF	32	FLW TP 025-S-032-038-051	40	FLW TP 025-S-040-038-051	38	051
025 MA	32	FLW TP 025-A-032-050-079	40	FLW TP 025-A-040-050-079	50	079
050 MF	40	FLW TP 050-S-040-038-054	55	FLW TP 050-S-055-038-054	38	054
050 MA	40	FLW TP 050-A-040-062-095	55	FLW TP 050-A-055-062-095	62	095
110 MF	55	FLW TP 110-S-055-052-073	75	FLW TP 110-S-075-052-073	52	073
110 MA	55	FLW TP 110-A-055-081-119	75	FLW TP 110-A-075-081-119	81	119
300 MF	90	FLW TP 300-S-090-123-150			123	150
300 MA	90	FLW TP 300-A-090-123-150			090	150

Technical characteristics:

Material

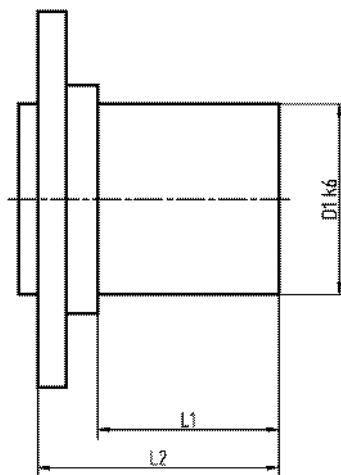
Yield strength

Tolerance k6

Surface roughness

The flange shaft and fastening screws are not included with the gearhead.

For more precise information on mounting, please see the gearhead operating instructions.



Schematic diagram:

D1 = Shaft diameter

L1 = Effective shaft length

L2 = Overall length



Information



Quick gearhead selection	416
Gearhead – Detailed sizing	418
Hypoid – Detailed sizing	422
Modular system matrix “Output type”	424
V-Drive – Detailed sizing	426
Coupling – Detailed sizing	428
Glossary	432
Order information	438



Always there for you!

Technical support:
Tel. +49 7931 493-10800





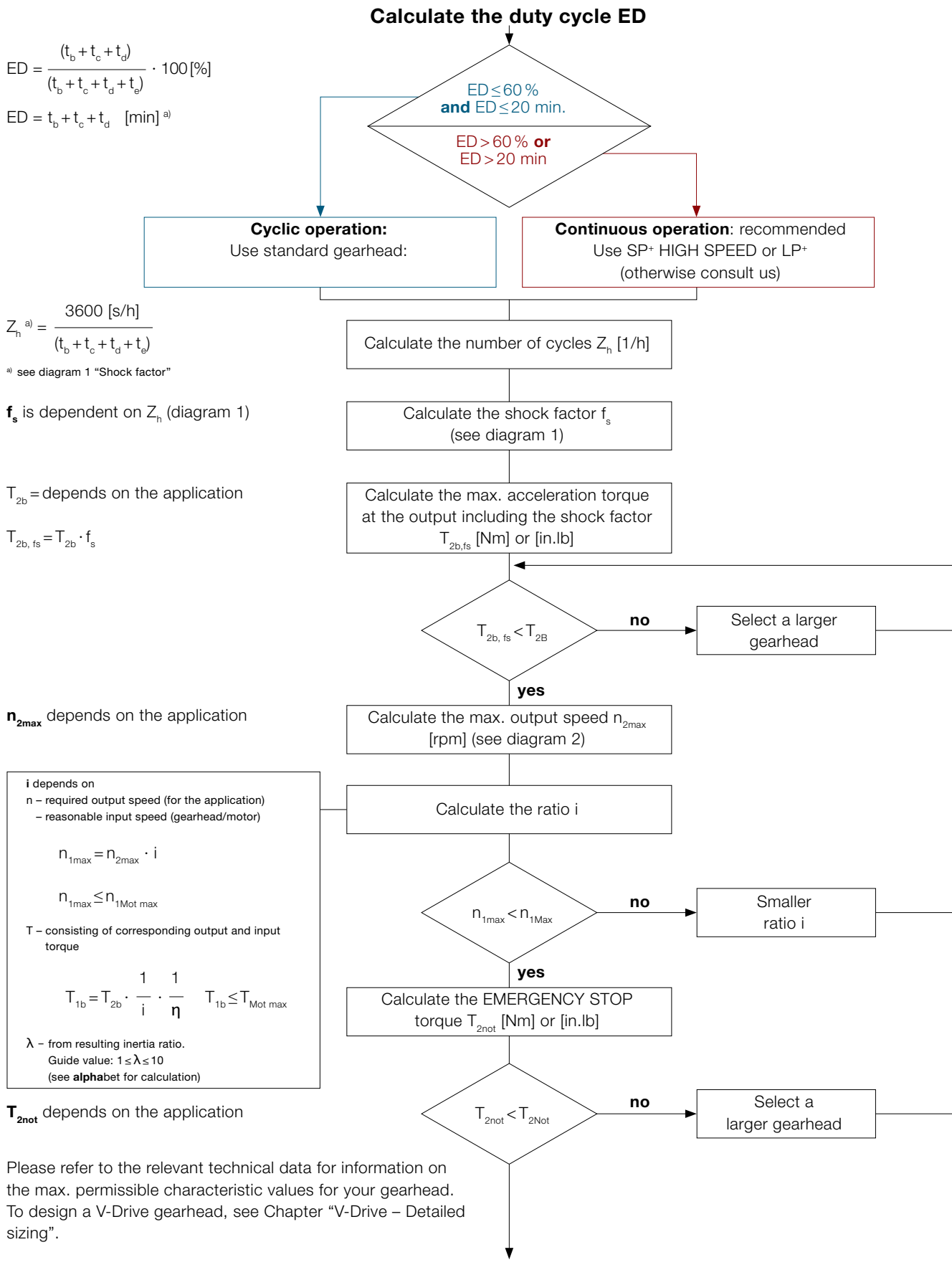
Quick gearhead selection

The quick gearhead selection feature is designed exclusively for calculating gearhead sizes approximately. Quick selection is not a substitute for the detailed sizing feature! To select a specific gearhead, proceed as described in the Chapter "Gearhead – Detailed sizing" or "V-Drive – Detailed sizing". For quick, convenient and reliable gearhead selection, we recommend using WITTENSTEIN alpha's cymex® sizing software.

Cyclic operation S5 Valid for ≤ 1000 cycles/hour Duty cycle < 60 % and < 20 min.^{a)}	1. Calculate the max. motor acceleration torque using motor data T_{MaxMot} [Nm] or [in.lb] 2. Calculate the max. available acceleration torque at the gearhead output T_{2b} [Nm] or [in.lb] $T_{2b} = T_{MaxMot} \cdot i$ 3. Compare the max. available acceleration torque T_{2b} [Nm] or [in.lb] with the max. permissible acceleration torque T_{2B} [Nm] or [in.lb] at the gearhead output $T_{2b} \leq T_{2B}$	4. Compare the bore hole diameter on the clamping hub (see technical data sheets) 5. Compare the motor shaft length L_{Mot} [mm] or [in] with the min. and max. dimensions in the corresponding dimension sheet
Continuous operation S1 Duty cycle ≥ 60 % or ≥ 20 min.^{a)}	1. Select cyclic operation S5 2. Calculate the rated motor torque T_{1NMot} [Nm] or [in.lb] 3. Calculate the previous rated torque at the gearhead output T_{2n} [Nm] or [in.lb] $T_{2n} = T_{1NMot} \cdot i$	4. Compare the previous rated torque T_{2n} [Nm] or [in.lb] with the permissible nominal torque T_{2N} [Nm] or [in.lb] at the gearhead output $T_{2n} \leq T_{2N}$ 5. Calculate the previous input speed n_{1n} [rpm] 6. Compare the previous input speed n_{1n} [rpm] with the permissible rated speed n_{1N} [rpm] $n_{1n} \leq n_{1N}$

^{a)} recommended by WITTENSTEIN alpha. Please contact us if you require further assistance.

Cyclic operation **S5** and continuous operation **S1**



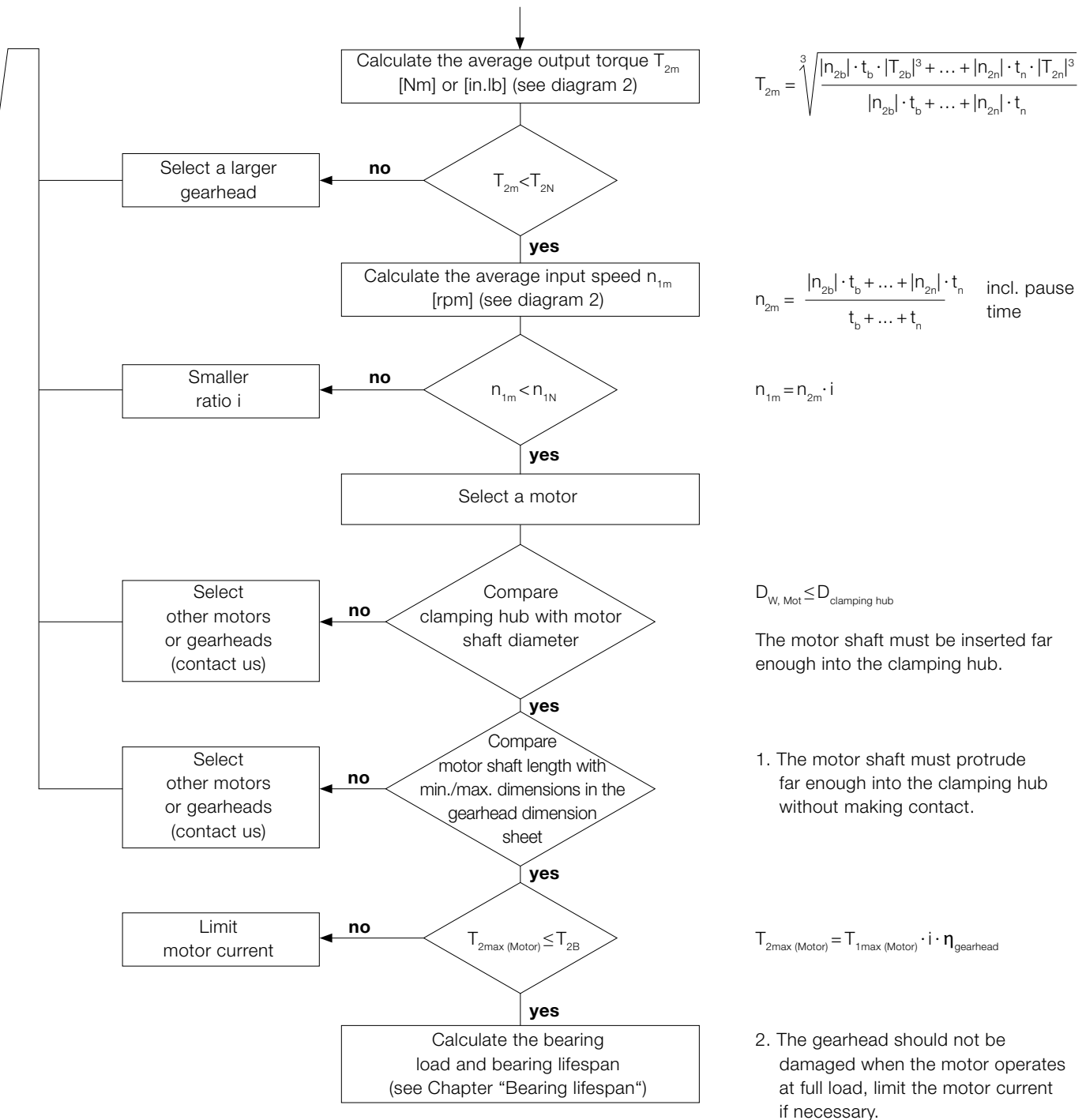


Diagram 1

Large number of cycles combined with short acceleration times may cause the drive train to vibrate. Use the shock factor f_s to include the resulting excess torque values in calculations.

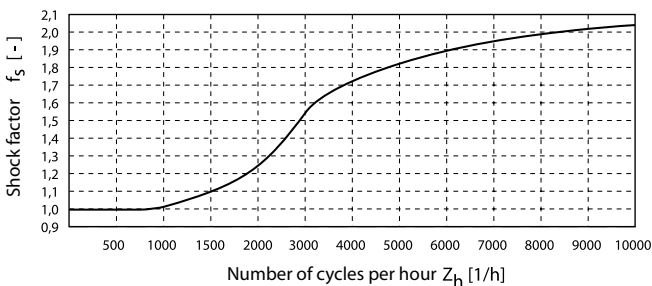
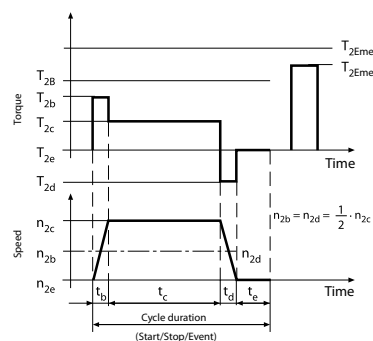


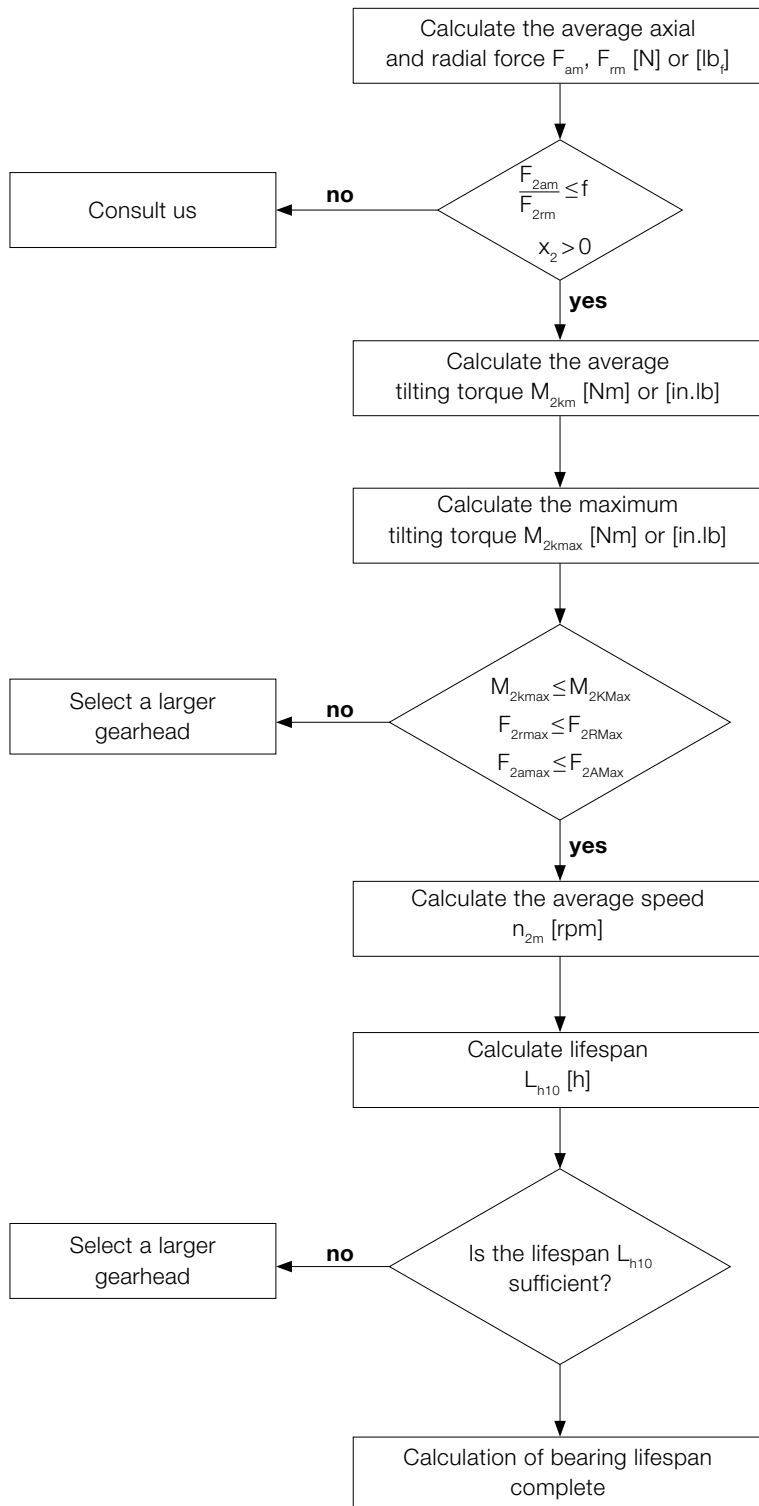
Diagram 2

Standard collective load at output

If the load on the gearhead in continuous operation S1 is less than or equal to the rated torque T_{2N} , the gearing is. At input speeds less than/equal to the rated speed n_{1N} , the temperature of the gearhead will not exceed 90 °C under average ambient conditions.



Bearing lifespan L_{h10} (output bearing)



$$F_{2am} = \sqrt[3]{\frac{|n_{2b}| \cdot t_b \cdot |F_{2ab}|^3 + \dots + |n_{2n}| \cdot t_n \cdot |F_{2an}|^3}{|n_{2b}| \cdot t_b + \dots + |n_{2n}| \cdot t_n}}$$

$$F_{2rm} = \sqrt[3]{\frac{|n_{2b}| \cdot t_b \cdot |F_{2rb}|^3 + \dots + |n_{2n}| \cdot t_n \cdot |F_{2rn}|^3}{|n_{2b}| \cdot t_b + \dots + |n_{2n}| \cdot t_n}}$$

$$M_{2km} = \frac{F_{2am} \cdot y_2 + F_{2rm} \cdot (x_2 + z_2)^a}{W}$$

$$M_{2kmax} = \frac{F_{2amax} \cdot y_2 + F_{2rmax} \cdot (x_2 + z_2)^a}{W}$$

^{a)} x_2, y_2, z_2 in mm or in

$$n_{2m} = \frac{n_{2b} \cdot t_b + \dots + n_{2n} \cdot t_n}{t_b + \dots + t_n}$$

$$L_{h10} = \frac{16666}{n_{2m}} \cdot \left[\frac{K1_2}{M_{2km}} \right]^{p_2}$$

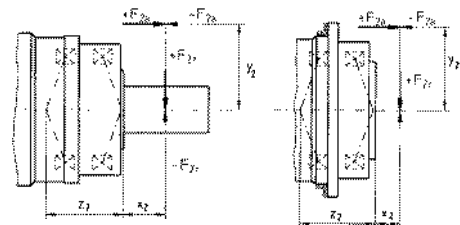
	metric	inch
W	1000	1

	TP ⁺ /TPK ⁺	SP ⁺ /SPK ⁺	LP ⁺ /LPB ⁺ LPK ⁺	alphira [®] (CP)
f	0.37	0.40	0.24	0.24

LP+/LPB+/LPK+		050	070	090	120	155
z ₂	[mm]	20	28.5	31	40	47
	[in]	0.79	1.12	1.22	1.58	1.85
K1 ₂	[Nm]	75	252	314	876	1728
	[in.lb]	664	2230	2779	7753	15293
p ₂		3	3	3	3	3

alphira® (CP)		040	060	080	115
z ₂	[mm]	12.5	19.5	23.5	28.5
	[in]	0.49	0.77	0.93	1.12
K _{1₂}	[Nm]	15.7	70.0	157.0	255.0
	[in.lb]	139	620	1389	2257
p ₂		3	3	3	3

Example with output shaft and flange:



SP+ / SPK+		060	075	100	140	180	210	240
Z ₂	[mm]	42.2	44.8	50.5	63.0	79.2	94.0	99.0
	[in]	1.66	1.76	1.99	2.48	3.12	3.70	3.90
K1 ₂	[Nm]	795	1109	1894	3854	9456	15554	19521
	[in.lb]	7036	9815	16762	34108	83686	137653	172761
P ₂		3.33	3.33	3.33	3.33	3.33	3.33	3.33

TP ⁺ /TPK ⁺		004	010	025	050	110	300	500	2000	4000
z ₂	[mm]	57.6	82.7	94.5	81.2	106.8	140.6	157	216	283
	[in]	2.27	3.26	3.72	3.20	4.21	5.48	6.12	8.50	11.1
K _{1₂}	[Nm]	536	1325	1896	4048	9839	18895	27251	96400	184000
	[in.lb]	4744	11726	16780	35825	87075	167220	241171	853140	1628400
p ₂		3.33	3.33	3.33	3.33	3.33	3.33	3.33	3.33	3.33

TK⁺/SK⁺/HG⁺/LK⁺: Calculation using cymex[®].
Please contact us for further information.

Gearhead types and sizes			TK* 004 SK* 060 HG* 060	SPK* 075 TPK* 010 TPK* 025 MA	TK* 010 SK* 075 HG* 075	SPK* 100 TPK* 025 TPK* 050 MA
Dimensions of rearward drive						
Solid shaft diameter	øD _{k6}	mm	16	16	22	22
Solid shaft length	L	mm	28 ±0.15	28 ±0.15	36 ±0.15	36 ±0.15
Hollow shaft interface outer diameter	øD _{h8}	mm	18	18	24	24
Hollow shaft interface inner diameter	ød _{h6}	mm	15	15	20	20
Hollow shaft interface length	L _{hw}	mm	14	14	16	16
Distance from input axis	A	mm	42.9	42.9	52.6	52.6
Key dimensions (E = key as per DIN 6885, sheet 1, form A)	l	mm	25	25	32	32
	b _{h9}	mm	5	5	6	6
	a	mm	2	2	2	2
	h	mm	18	18	24.5	24.5
Output shaft threaded bore	B		M5x12.5	M5x12.5	M8x19	M8x19
Permissible load of rearward drive						
Max. acceleration torque ^{c)}	T _{3B}		= T _{2B} - T _{2b}	Please contact us	= T _{2B} - T _{2b}	Please contact us
Nominal output torque ^{c)}	T _{3N}		= T _{2N} - T _{2n}		= T _{2N} - T _{2n}	
EMERGENCY STOP torque ^{c)}	T _{3Not}		= T _{2Not} - T _{2not}		= T _{2Not} - T _{2not}	
Max. axial force ^{b)}	F _{3Amax}		1,500	1,500	1,800	1,800
Max. radial force ^{b)}	F _{3Rmax}		2,300	2,300	3,000	3,000
Max. tilting torque	M _{3Kmax}		60	60	100	100
Calculation of average tilting torque at the rearward drive						
Factor for tilting torque calculation	z ₃	mm	11.9	11.9	15.6	15.6
Distance between axial force and center of gearhead	y ₃	mm	Application-dependent			
Distance between lateral force and shaft collar	x ₃	mm	Application-dependent			

^{a)} Connection via shrink discs (see from page 410)

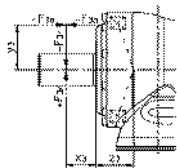
^{b)} Refers to center of shaft

^{c)} Index as small letter = existing value (application-dependent);
index as capital letter = permissible value
(see catalog values from page 150)

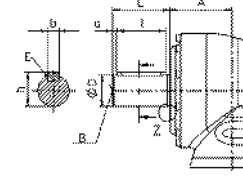
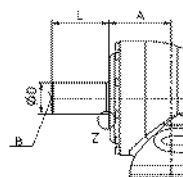
Rearward drive:

Solid shaft

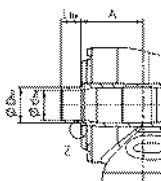
with key



$$M_{3k} = F_{3a} \cdot y_3 + F_{3r} \cdot (x_3 + z_3)$$



TK* 025 SK* 100 HG* 100	SPK* 140 TPK* 050 TPK* 110 MA	TK* 050 SK* 140 HG* 140	SPK* 180 SPK* 240 TPK* 110 TPK* 500 TPK* 300 MA	TK* 110 SK* 180 HG* 180	SPK* 210 TPK* 300 TPK* 500 MA
32	32	40	40	55	55
58 ±0.15	58 ±0.15	82 ±0.15	82 ±0.15	82 ±0.15	82 ±0.15
36	36	50	50	68	68
30	30	40	40	55	55
20	20	25	25	25	25
63.5	63.5	87	87	107.8	107.8
50	50	70	70	70	70
10	10	12	12	16	16
4	4	5	5	6	6
35	35	43	43	59	59
M12x28	M12x28	M16x36	M16x36	M20x42	M20x42
$= T_{2B} - T_{2b}$	Please contact us	$= T_{2B} - T_{2b}$	Please contact us	$= T_{2B} - T_{2b}$	Please contact us
$= T_{2N} - T_{2n}$		$= T_{2N} - T_{2n}$		$= T_{2N} - T_{2n}$	
$= T_{2Not} - T_{2not}$		$= T_{2Not} - T_{2not}$		$= T_{2Not} - T_{2not}$	
2,000	2,000	9,900	9,900	4,000	4,000
3,300	3,300	9,500	9,500	11,500	11,500
150	150	580	580	745	745
16.5	16.5	20	20	23.75	23.75
Application-dependent					
Application-dependent					

Hollow shaft interface ^{a)}


Hollow shaft



No connection possible

Closed cover



No connection possible

Modular system matrix "Output type"

HG⁺/SK⁺/SPK⁺/TK⁺/TPK⁺

S

K

+

-

1

0

0

B

-

M

F

1

-

7

-

D

E

1

/ motor

Type code:

B = Modular output combination

S = Standard

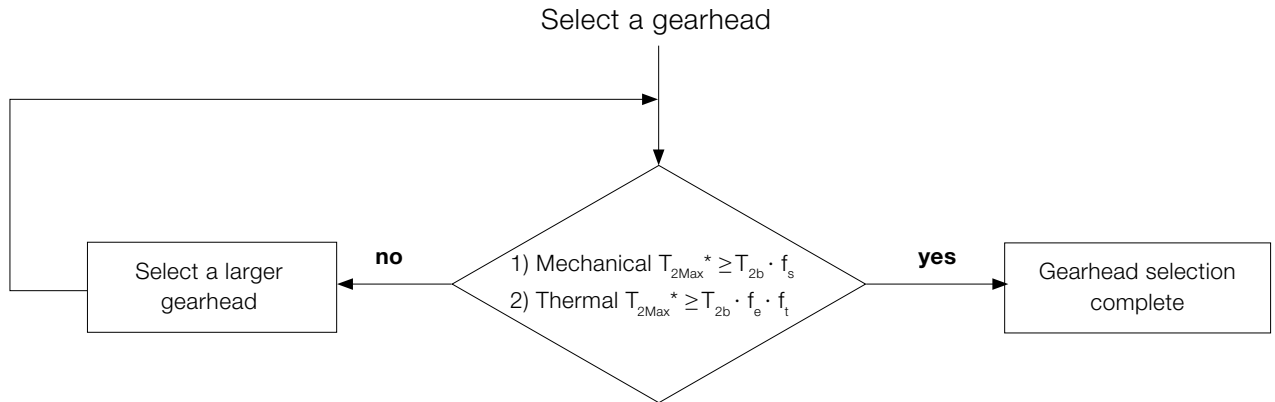
Output shaft shape

When selecting an output combination from the modular system, please select the letter "B" as the type code in the order code. The digit for the required type of output is the modular matrix system.

Example: If you opt for an SK⁺ with a smooth shaft and require an additional output in the form of a keywayed output shaft, then select the letter "G" and enter in the order key under "Output shaft shape".

	Output type	Backward					
		Front	Smooth shaft	Keywayed shaft	Hollow shaft interface	Hollow shaft	Cover
SK ⁺ / SPK ⁺	 Smooth shaft		D	G	A	-	0*
	 Keywayed shaft		E	H	B	-	1*
	 Involute		F	I	C	-	2*
SPK ⁺	 Attachable shaft		O	P	N	-	5*
TK ⁺	 Flanged hollow shaft		D	G	6	5*	0
TPK ⁺	 Flanged hollow shaft		D	G	6	-	0*
HG ⁺	 Hollow shaft		D	G	6*	5*	0

* Standard version: please specify type code "S" in the order code



Cycles per hour	Load factor f_s
0	1
1000	1,3
3000	1,9
6000	2,2
10000	2,3

Duty cycle for each hour (DC%)	f_e for duty cycle
100	1
80	0,94
60	0,86
40	0,74
20	0,56

Temperature factor f_t												
Ratio	VD 040						VD 050					
	4	7	10	16	28	40	4	7	10	16	28	40
n_{IN} = 500 rpm	0,53	0,53	0,53	0,53	0,53	0,53	0,53	0,53	0,53	0,53	0,53	0,53
n_{IN} = 1,000 rpm	0,53	0,53	0,53	0,53	0,53	0,53	0,53	0,53	0,53	0,53	0,53	0,53
n_{IN} = 2,000 rpm	0,53	0,53	0,53	0,53	0,53	0,53	0,53	0,53	0,53	0,56	0,61	0,53
n_{IN} = 3,000 rpm	0,64	0,89	0,96	0,88	0,96	0,84	0,57	0,75	0,78	0,86	0,95	0,79
n_{IN} = 4,000 rpm	1,03	1,15	1,24	1,29	1,40	1,25	0,89	1,16	1,22	1,16	1,28	1,23
Ratio	VD 063						VD 080					
	4	7	10	16	28	40	4	7	10	16	28	40
n_{IN} = 500 rpm	0,53	0,53	0,53	0,53	0,53	0,53	0,53	0,53	0,54	0,57	0,64	0,53
n_{IN} = 1,000 rpm	0,53	0,53	0,53	0,56	0,65	0,57	0,7	0,82	0,8	0,83	0,88	0,78
n_{IN} = 2,000 rpm	0,76	0,95	0,94	0,99	1,06	1,01	0,9	1,12	1,1	1,28	1,37	1,2
n_{IN} = 3,000 rpm	1	1,11	1,23	1,32	1,42	1,38	1,22	1,58	1,57	1,88	2,03	1,78
n_{IN} = 3,500 rpm	1,44	1,56	1,74	1,9	2,07	2,03	1,66	1,78	1,79	2,16	2,35	2,06
Ratio	VD 100											
	4	7	10	16	28	40						
n_{IN} = 500 rpm	0,62	0,7	0,72	0,73	0,79	0,69						
n_{IN} = 1,000 rpm	0,79	0,93	0,98	0,99	1,09	0,94						
n_{IN} = 2,000 rpm	1,18	1,3	1,4	1,44	1,62	1,53						
n_{IN} = 3,000 rpm	1,83	1,96	2,16	2,24	2,56	2,46						
n_{IN} = 4,000 rpm	-	-	-	-	-	-						

T_{2Max}^* = Max. permissible torque at gearhead
 T_{2b} Process torque

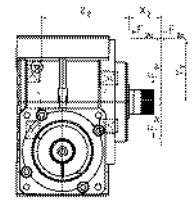
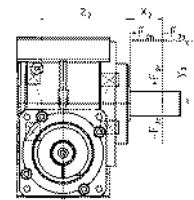
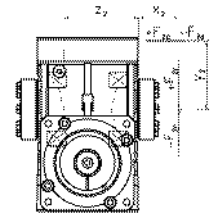
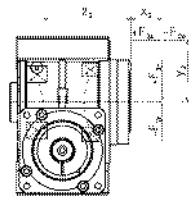
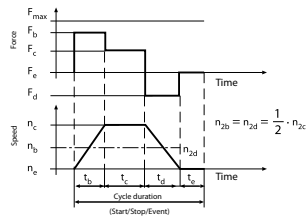
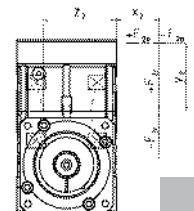
Ratios $i=28$ and $i=40$ are self-locking at zero speed.

The self-locking state may be overcome and therefore the gearhead should not replace a brake.

For applications that run at a continuous speed of 3,000 rpm or more in installation position F or G, please contact us.

* For applications with maximum precision requirements throughout lifespan, T_{2Servo} should be used

Bearing lifespan L_{h10} (output bearing)

VDS⁺ involute

VDS⁺ / VDS_e
smooth, keywayed

VDH⁺ / VDHe
smooth

VDT⁺

VDH⁺ / VDHe
keywayed

Output (VDT⁺-, VDH⁺-, VDHe-, VDS⁺- & VDS_e- version)

Calculate the average axial and radial force F_{2am} , F_{2rm} [N]

$$\frac{F_{2am}}{F_{2rm}} \leq 0.4$$

$$x_2 > 0$$

Index "2" $\triangleq$ output

$$F_{2am} = \sqrt[3]{\frac{n_{2b} \cdot t_b \cdot F_{2ab}^3 + \dots + n_{2n} \cdot t_n \cdot F_{2an}^3}{n_{2b} \cdot t_b + \dots + n_{2n} \cdot t_n}}$$

$$F_{2rm} = \sqrt[3]{\frac{n_{2b} \cdot t_b \cdot F_{2rb}^3 + \dots + n_{2n} \cdot t_n \cdot F_{2rn}^3}{n_{2b} \cdot t_b + \dots + n_{2n} \cdot t_n}}$$

$$M_{2km} = \frac{F_{2am} \cdot y_2 + F_{2rm} \cdot (x_2 + z_2)}{W}$$

Z_2 [mm]	VDT ⁺	VDH ⁺ /VDHe/ VDS _e	VDS ⁺
VD 040	-	57.25	-
VD 050	104	71.5	92.25
VD 063	113.5	82	111.5
VD 080	146.75	106.25	143.25
VD 100	196	145.5	181

$$M_{2kmax} = \frac{F_{2amax} \cdot y_2 + F_{2rmax} \cdot (x_2 + z_2)}{W}$$

Type	VD 040	VD 050	VD 063	VD 080	VD 100
M_{2kmax} [Nm]	205	409	843	1,544	3,059
F_{2rmax} [N]	2,400	3,800	6,000	9,000	14,000
F_{2amax} [N]	3,000	5,000	8,250	13,900	19,500

$$T_{2m} = \sqrt[3]{\frac{|n_{2b}| \cdot t_b \cdot |T_{2b}|^3 + \dots + |n_{2n}| \cdot t_n \cdot |T_{2n}|^3}{|n_{2b}| \cdot t_b + \dots + |n_{2n}| \cdot t_n}}$$

Calculate the maximum tilting torque M_{2kmax} [Nm]

$$\begin{aligned} M_{2kmax} &\leq M_{2kmax} \\ F_{2rmax} &\leq F_{2rmax} \\ F_{2amax} &\leq F_{2amax} \end{aligned}$$

yes

Calculate the average speed n_{2m} [rpm]

Calculate lifespan L_{h10} [h]

$$L_{h10} = \frac{16666}{n_{2m}} \cdot \left[\frac{K1_2}{p_t \cdot T_{2m} + M_{2km}} \right]^{3.33}$$

Is the lifespan L_{h10} sufficient?

Gearhead selection complete

Please contact us!

	metric
W	1,000

Select a larger gearhead

$K1_2$ [Nm]	VDT ⁺	VDH ⁺ /VDHe/ VDS _e	VDS ⁺
VD 040	-	1,230	-
VD 050	3,050	2,320	2,580
VD 063	4,600	3,620	5,600
VD 080	9,190	9,770	10,990
VD 100	20,800	15,290	20,400

P_t	T/H/S
i=4	1.5
i=7	0.72
i=10	0.6
i=16	0.5
i=28	0.4
i=40	0.36

$$n_{2m} = \frac{n_{2b} \cdot t_b + \dots + n_{2n} \cdot t_n}{t_b + \dots + t_n}$$

Metal bellows and torque limiters – Detailed sizing (EC2, BC2, BC3, BCH, BCT, TL1, TL2, TL3)

$$Z_n = \frac{3600 \text{ [s/h]}}{(t_b + t_c + t_d + t_e)}$$

f_{sB} is dependent on Z_n
(table 1)

T_{2b} = depends on the application

$$T_{2b, f_{sB}} = T_{2b} \cdot f_{sB}$$

T_B = Max. acceleration torque
of coupling (max. 1000 cycles
per hour)

Calculate the number of cycles Z_n [1/h]

Calculate the load factor for metal
bellows and torque limiters f_{sB}
(see table 1)

Calculate the max. acceleration torque
at the output including the load factor
 $T_{2b, f_{sB}}$ [Nm]

$T_{2b, f_{sB}} < T_B$

no

Select a larger coupling

yes

Coupling type

Torque limiter
(TL1, TL2, TL3)

Metal bellows coupling
(EC2, BC2, BC3, BCH, BCT)

Set precise disengage-
ment torque T_{Dis}

T_{Dis} = Depends on the application: Please
set the precise disengagement torque
(preset by WITTENSTEIN alpha) above
the maximum application load and below
the maximum transferable disengage-
ment torque of torque limiter $T_{Dis \text{ max}}$
within the selected adjustment range,
in order to protect the drive components

$T_{Dis \text{ max}} \leq T_B$

no

Select a larger coupling

yes

The max. speed range of the coupling must be adhered to:

$$n_{\text{max}} \leq n_{\text{Max}}$$

(in the event of other requirements, please request the finely balanced version)

Number of cycles Z_n [1/h]	Load factor f_{sB}
<1000	1,0
<2000	1,1
<3000	1,2
<4000	1,8
>4000	2,0

Table 1: Load factor Metal bellows and torque limiters

Comparison of load shaft diameter on drive and output side $d_{W1/2}$ with the bore hole diameter area of coupling $D_{1/2}$

$$\begin{aligned} d_{W1/2 \text{ min.}} &\geq D_{1/2 \text{ Min}} \\ d_{W1/2 \text{ max.}} &\leq D_{1/2 \text{ Max}} \end{aligned}$$

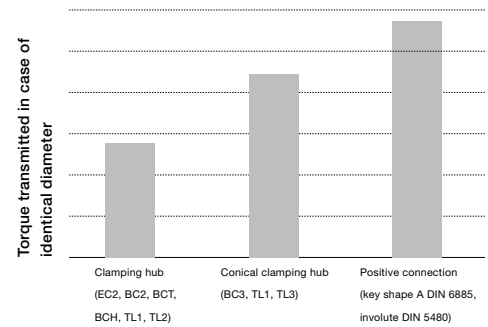
no

Select larger coupling, adapt load shaft or clamping system

yes

d_{W1} = Drive-side shaft diameter (motor/gearhead)
 d_{W2} = Output-side shaft diameter (application)
 $d_{W1/2 \text{ min.}}$ = Min. shaft diameter (drive/output)
 $d_{W1/2 \text{ max.}}$ = Max. shaft diameter (drive/output)
 $D_{1/2 \text{ Min}}$ = Min. bore diameter of coupling
 $D_{1/2 \text{ Max}}$ = Max. bore diameter of coupling

Adapt hub shape in case of identical diameter



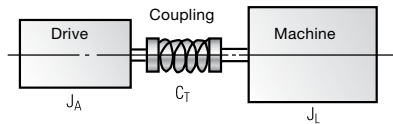
Detailed sizing of metal bellows and torque limiters complete

Note:

The resonant frequency of the coupling must be higher or lower than the machine frequency. For the purpose of calculation, the drive is reduced to a two-mass system:

Best practices in sizing: $f_e \geq 2 \times f_{er}$

Two-mass system



$$f_e = \frac{1}{2 \cdot \pi} \sqrt{C_T \cdot \frac{J_A + J_L}{J_A \cdot J_L}} \quad [\text{Hz}]$$

C_T = Torsional rigidity of coupling [Nm/rad]
 f_e = Natural frequency of 2-mass system [Hz]
 f_{er} = Excitation frequency of drive [Hz]
 J_L = Moment of inertia of machine [kgm²]
 J_A = Moment of inertia on drive side [kgm²]

Maximum misalignments:

Permissible values (axial, angular, lateral) for shaft misalignments must be adhered to

EMERGENCY STOP torque:

If there is a need for the transmission of EMERGENCY STOP situations, it is recommended to use torque limiters (TL1, TL2 and TL3) in order to protect further drive components and to increase the overall service life. Models EC2, BC2, BC3 and BCH can briefly transmit 1.5 times the T_B of the coupling, provided all the other instructions are complied with (see T_{Emer}).

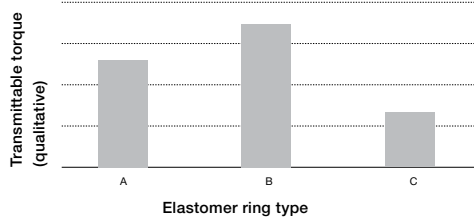
For torque limiters with the "Load holding version" functional system, double load safety is ensured for the TL1 coupling (indirect drives), while an adequate size must be ensured for the TL2 and TL3 models with bellows attachment: Blocking load $< T_B$ of the coupling!

Elastomer couplings – detailed sizing (EL6, ELC)

T_{2n} = Depends on the application

f_{tE} = The temperature factor for elastomer couplings is dependent on the elastomer ring and the ambient temperature at the coupling (see table 1)

T_{NE}^* = Max. rated torque of elastomer ring



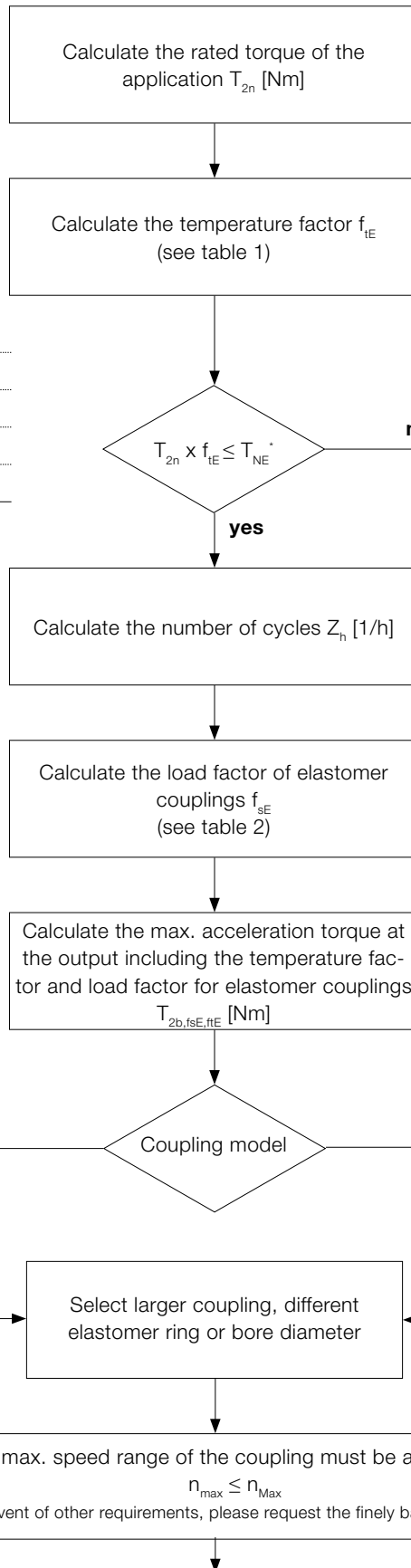
$$Z_h = \frac{3600 \text{ [s/h]}}{(t_b + t_c + t_d + t_e)}$$

f_{sE} The load factor of elastomer couplings is dependent on Z_h (table 2)

T_{2b} = depends on the application

$$T_{2b,fsE,ftE} = T_{2b} \cdot f_{sE} \cdot f_{tE}$$

T_{BE} = max. acceleration torque of elastomer (max. 1000 cycles per hour)



Temperature factor f_{tE}	Elastomer ring		
Temperature [°C]	A	B	C
> -30 to -10	1,5	1,7	1,4
> -10 to +30	1,0	1,0	1,0
> +30 to +40	1,2	1,1	1,3
> +40 to +60	1,4	1,3	1,5
> +60 to +80	1,7	1,5	1,8
> +80 to +100	2,0	1,8	2,1
> +100 to +120	-	2,4	-

Table 1: Temperature factor for elastomer couplings dependent on elastomer ring and ambient temperature

Number of cycles Z_h [1/h]	Impact factor f_{sE}
<1000	1,0
<2000	1,2
<3000	1,4
<4000	1,8
>4000	2,0

Table 2: Load factor for elastomer couplings

* = The maximum torque transmitted by the ELC coupling is also dependent on the minimum bore diameter (please also compare with table on catalog page 401 ELC couplings)

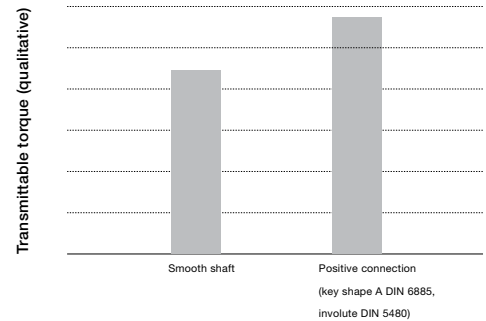
Comparison of load shaft diameter on drive and output side $d_{W1/2}$ with the bore hole diameter area of coupling $D_{1/2}$

$$\begin{matrix} d_{W1/2 \text{ min.}} \geq D_{1/2 \text{ Min}} \\ d_{W1/2 \text{ max.}} \leq D_{1/2 \text{ Max}} \end{matrix}$$

no

Select larger coupling, adapt load shaft or clamping system

Adapt clamping system in the event of identical diameter



yes

d_{W1} = Drive-side shaft diameter (motor/gearhead)
 d_{W2} = Output-side shaft diameter (application)
 $d_{W1/2 \text{ min.}}$ = Min. shaft diameter (drive/output)
 $d_{W1/2 \text{ max.}}$ = Max. shaft diameter (drive/output)
 $D_{1/2 \text{ Min}}$ = Min. bore diameter of coupling
 $D_{1/2 \text{ Max}}$ = Max. bore diameter of coupling

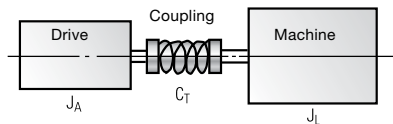
Detailed sizing of elastomer couplings complete

Note:

The resonant frequency of the coupling must be higher or lower than the machine frequency. For the purpose of calculation, the drive is reduced to a two-mass system:

Best practices in sizing: $f_e \geq 2 \times f_{er}$

Two-mass system



$$f_e = \frac{1}{2 \cdot \pi} \sqrt{C_T \cdot \frac{J_A + J_L}{J_A \cdot J_L}} \quad [\text{Hz}]$$

C_T = Torsional rigidity of coupling [Nm/rad]

f_e = Natural frequency of 2-mass system [Hz]

f_{er} = Excitation frequency of drive [Hz]

J_L = Moment of inertia of machine [kgm²]

J_A = Moment of inertia on drive side [kgm²]

The max. speed range of the coupling must be adhered to:

$n_{\text{max}} \leq n_{\text{Max}}$ (in the case of other requirements, please request the finely balanced version)

Emergency stop torque: Dimensioning does not take emergency stop torques into consideration.

Instead, please regard the required emergency stop torque as the maximum torque of the application.

Maximum misalignments:

Permissible values (axial, angular, lateral) for shaft misalignments must be adhered to

Based on angle of torsion

Transmission errors due to a torsional load on the metal bellows (EC2, BC2, BC3, BCH, BCT, TL2 und TL3):

$$\varphi = \frac{180}{\pi} \cdot \frac{T_{2b}}{C_T} \quad [\text{degrees}]$$

φ = angle of turn [degrees]

C_T = torsional rigidity of coupling [Nm/rad]

T_{2b} = max. available acceleration torque [Nm]

The **alphabet**

Acceleration torque (T_{2B})

The acceleration torque T_{2B} is the maximum permissible torque that can briefly be transmitted at the output by the gearhead after $\leq 1000/h$ cycles. For $> 1000/h$ cycles, the **→ Shock factor** must be taken into account. T_{2B} is the limiting parameter in cyclic operation.

Adapter plate

WITTENSTEIN alpha uses a system of standardized adapter plates to connect the motor and the gearhead, making it possible to mount an WITTENSTEIN alpha gearhead to any desired motor without difficulty.

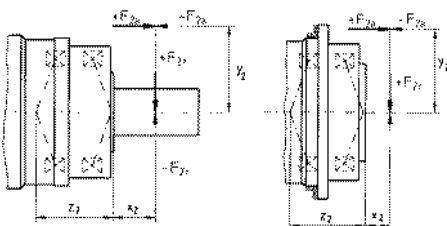
Angular minute

A degree is subdivided into 60 angular minutes ($= 60 \text{ arcmin} = 60'$). In other words, if the torsional backlash is specified as 1 arcmin, for example, the output can be turned $1/60^\circ$. The repercussions for the actual application are determined by the arc length: $b = 2 \cdot \pi \cdot r \cdot \alpha^\circ / 360^\circ$. A pinion with a radius $r = 50 \text{ mm}$ on a gearhead with standard torsional backlash $j_t = 3'$ can be turned $b = 0.04 \text{ mm}$.

Axial force (F_{2AMax})

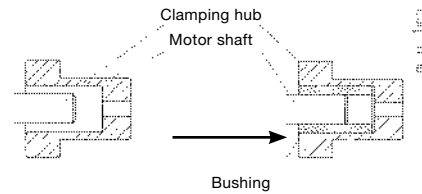
In the case of SP+/LP+/SPK+, the axial force F_{2AMax} acting on a gearhead runs parallel to its output shaft. On a TP+, the force runs perpendicular to its output shaft. It may be applied with axial offset via a lever arm y_2 under certain circumstances, in which case it also generates a bending moment. If the axial force exceeds the permissible catalogue values, additional design features (e.g. axial bearings) must be implemented to absorb these forces.

Example with output shaft and flange:



Bushing

If the motor shaft diameter is smaller than the **→ clamping hub**, a bushing is used to compensate the difference in diameter.



Clamping hub

The clamping hub ensures a frictional connection between the motor shaft and gearhead. A **→ bushing** is used as the connecting element if the motor shaft diameter is smaller than that of the clamping hub.

Continuous operation (S1)

Continuous operation is defined by the **→ duty cycle**. If the duty cycle is greater than 60 % and/or longer than 20 minutes, this qualifies as continuous operation. **→ Operating modes**

Cyclic operation (S5)

Cyclic operation is defined via the **→ duty cycle**. If the duty cycle is less than 60 % and shorter than 20 minutes, it qualified as cyclic operation (**→ operating modes**).

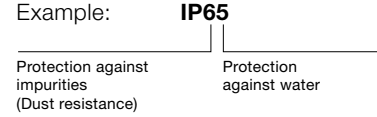
cymex®

cymex® is the calculation software developed by our company for dimensioning complete drive trains. We can also provide training to enable you to make full use of all the possibilities provided by the software.

Degree of protection (IP)

The various degrees of protection are defined in DIN EN 60529 "Degrees of protection offered by enclosure (IP code)". The IP degree of protection (IP stands for International Protection) is represented by two digits. The first digit indicates the protection against the ingress of

impurities and the second the protection against the ingress of water.



Duty cycle (ED)

The duty cycle ED is determined by one cycle. The times for acceleration (t_b), constant travel if applicable (t_c) and deceleration (t_d) combined yield the duty cycle in minutes. The duty cycle is expressed as a percentage with inclusion of the pause time t_e .

$$ED [\%] = \frac{t_b + t_c + t_d}{t_b + t_c + t_d + t_e} \cdot 100 \frac{\text{Motion duration}}{\text{Cycle duration}}$$

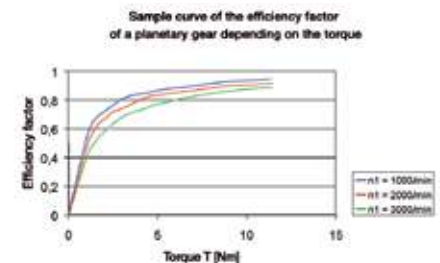
$$ED [\text{min}] = t_b + t_c + t_d$$

Efficiency (η)

Efficiency [%] η is the ratio of output power to input power. Power lost through friction reduces efficiency to less than 1 or 100 %.

$$\eta = P_{\text{out}} / P_{\text{in}} = (P_{\text{in}} - P_{\text{lost}}) / P_{\text{in}}$$

WITTENSTEIN alpha always measures the efficiency of a gearhead during operation at full load (T_{2B}). If the input power or torque are lower, the efficiency rating is also lower due to the constant no-load torque. Power losses do not increase as a result. Speed also has an effect on efficiency, as shown in the example diagram above.



Emergency stop torque (T_{2Not})

The emergency stop torque [Nm] T_{2Not} is the maximum permissible torque at the gearhead output and must not be reached more than 1000 times during the life of the gearhead. It must never be exceeded!

→ Refer to this term for further details.

Ex symbol



Devices bearing the Ex symbol comply with EU Directive 94/9/EC (ATEX) and are approved for use in defined explosion-hazardous zones

Detailed information on explosion groups and categories, as well as further information on the relevant gearhead are available upon request.

HIGH SPEED (MC)

The HIGH SPEED version of our SP⁺ gearhead has been specially developed for applications in continuous operation at high input speeds, e.g. as found in the printing and packaging industries.

HIGH TORQUE (MA)

The HIGH TORQUE version of our TP⁺ gearhead has been specially developed for applications requiring extremely high torques and maximum rigidity.

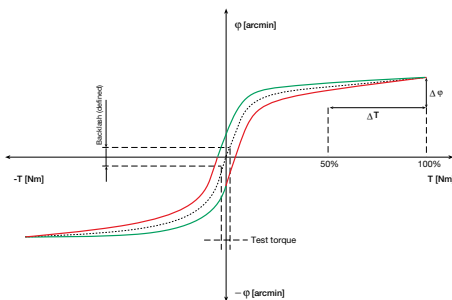
MA = HIGH TORQUE

MC = HIGH SPEED

MF = standard versions of our WITTENSTEIN alpha servo gearheads

Hysteresis curve

The hysteresis is measured to determine the torsional rigidity of a gearhead. The result of this measurement is known as the hysteresis curve.



If the input shaft is locked, the gearhead is loaded with a torque that increases continuously up to T_{2B} and is then relieved at the output in both directions. The torsional angle is plotted against the torque. This yields a closed curve from which the → **torsional backlash** and → **torsional rigidity** can be calculated.

Jerk

Jerk is derived from acceleration and is defined as the change in acceleration within a unit of time. The term impact is used if the acceleration curve changes abruptly and the jerk is infinitely large.

Lateral force (F_R)

Lateral force is the force component acting at right angles to the output shaft with the SP⁺/LP⁺/SPK⁺ or parallel to the output flange with the TP⁺. It acts perpendicular to the axial force and can assume an axial distance of x_2 in relation to the shaft nut with the SP⁺/LP⁺ or shaft flange with the TP⁺, which acts as a lever arm. The lateral force produces a bending moment (see also axial force).

Mass moment of inertia (J)

The mass moment of inertia J is a measurement of the effort applied by an object to maintain its momentary condition (at rest or moving).

Mesh frequency (f_z)

The mesh frequency may cause problems regarding vibrations in an application, especially if the excitation frequency corresponds to the intrinsic frequency of the application.

The mesh frequency can be calculated for all SP⁺, TP⁺, LP⁺ and alphira® gearheads using the formula $f_z = 1,8 \cdot n_2$ [rpm] and is therefore independent of the ratio if the output speed is the same.

If it does indeed become problematic, the intrinsic frequency of the system can be changed or another gearhead (e.g. hypoid gearhead) with a different mesh frequency can be selected.

NSF symbol



Lubricants certified as grade H1 by the NSF (NSF = National Sanitation Foundation) can be used in the food sector where occasional unavoidable contact with food cannot be excluded.

No load running torque (T_{012})

The no load running torque T_{012} is the torque which must be applied to a gearhead in order to overcome the internal friction; it is therefore considered lost torque. The values specified in the catalog are calculated by WITTENSTEIN alpha at a speed of $n_1 = 3000$ rpm and an ambient temperature of 20 °C.

T_{012} : 0 no load 1 → 2 from input end to output end

Nominal torque (T_{2N})

The nominal torque [Nm] T_{2N} is the torque continuously transmitted by a gearhead over a long period of time, i.e. in → **continuous operation** (without wear).

Operating modes

(continuous operation **S1** and cyclic operation **S5**)

When selecting a gearhead, it is important to consider whether the motion profile is characterized by frequent acceleration and deceleration phases in cyclic operation (S5) as well as pauses, or whether it is designed for continuous operation (S1), i.e. with long phases of constant motion.

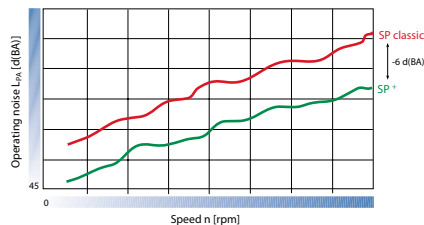
Operating noise (L_{PA})

Low noise level L_{PA} is a factor of growing importance for environmental and health reasons. WITTENSTEIN alpha has succeeded in reducing the noise of the new SP+ gearheads by another 6 dB(A) over the former SP units (i.e. sound reduced to one quarter). Noise levels are now currently 64 - 70 dB(A) depending on the size of the gearhead.

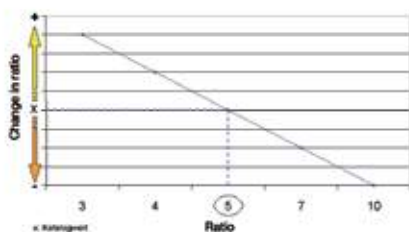
The gear ratio and speed both affect the noise level. The relationships are demonstrated in the following trend graphs. As a general rule: A higher speed means a higher noise level, while a higher ratio means a lower noise level. The values specified in our catalog relate to gearheads with the ratio $i = 10/100$ at a speed of $n = 3000$ rpm.

Positioning accuracy

The positioning accuracy is determined by the angular deviation from a setpoint and equals the sum of the torsional angles due to load → **(torsional rigidity and torsional backlash)** and kinetics → **(synchronization error)** occurring simultaneously in practise.



Change in operating noise in relation to the ratio



Rate of mass moment of inertia ($\lambda = \text{Lambda}$)

The ratio of mass moment of inertia λ is the ratio of external inertia (application side) to internal inertia (motor and gearhead side). It is an important parameter determining the controllability of an application. Accurate control of dynamic processes becomes more difficult with differing mass moments of inertia and as λ becomes greater. WITTENSTEIN alpha recommends that a guideline value of $\lambda < 5$ is maintained. A gearhead reduces the external mass moment of inertia by a factor of $1/i^2$.

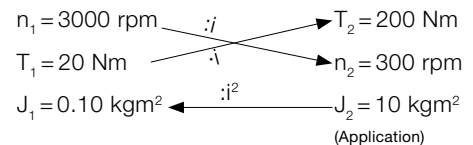
$$\lambda = \frac{J_{\text{external}}}{J_{\text{internal}}}$$

J_{external} reduced to the gear input:
 $J'_{\text{external}} = J_{\text{external}} / i^2$

Simple applications ≤ 10
 Dynamic applications ≤ 5
 Highlydynamic applications ≤ 1

Ratio (i)

The gear ratio i indicates the factor by which the gearhead transforms the three relevant parameters of motion (speed, torque and mass moment of inertia). The factor is a result of the geometry of the gearing elements (Example: $i = 10$).

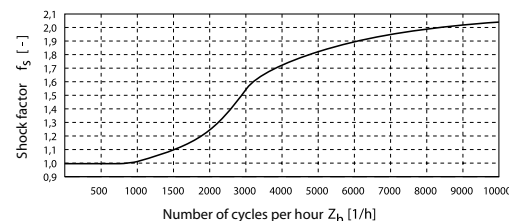


Safety notice

If your application has to meet special safety requirements (e.g. vertical axes, tensioned drives), we recommend using exclusively our alpheno®, RP+, TP+ and TP+ HIGH TORQUE products or contact WITTENSTEIN alpha for advice.

Shock factor (f_s)

The maximum permissible acceleration torque during cyclic operation specified in the catalog applies for a cycle rate less than 1000/h. Higher cycle rates combined with short acceleration times can cause vibrations in the drive train. Use the shock factor f_s to include the resulting excess torque values in calculations. The shock factor f_s can be determined with reference to the curve. This calculated value is multiplied by the actual acceleration torque T_{2b} and then compared with the maximum permissible acceleration torque T_{2B} . ($T_{2b} \cdot f_s = T_{2b,fs} < T_{2B}$)

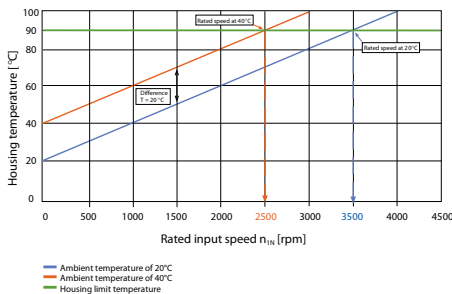


Speed (n)

Two speeds are of relevance when dimensioning a gearhead: the maximum speed and the nominal speed at the input. The maximum permissible speed n_{1Max} must not be exceeded because it serves as the basis for dimensioning

→ **cyclic operation.** The nominal speed n_{1N} must not be exceeded in
→ **continuous operation.**

The housing temperature limits the nominal speed, which must not exceed 90 °C. The nominal input speed specified in the catalogue applies to an ambient temperature of 20 °C. As can be seen in the diagram below, the temperature limit is reached more quickly in the presence of an elevated outside temperature. In other words, the nominal input speed must be reduced if the ambient temperature is high. The values applicable to your gearhead are available from WITTENSTEIN alpha on request.



Synchronization error

The synchronization error is equal to the variations in speed measured between the input and output during one revolution of the output shaft. The error is caused by manufacturing tolerances and results in minute angular deviations and fluctuations in ratio.

T_{2Max}

T_{2Max} means the maximum torque which can be transmitted by the gearbox.

This value can be chosen for applications that can accept a slight increase in backlash over time.

T_{2Servo}

T_{2Servo} is a special value for precision applications in which a minimum backlash must be guaranteed over the life of the gearbox. The increase in backlash seen in other worm gears is less due to the optimized hollow flank teeth.

Technical data

The technical data relating to our products can be downloaded from our homepage. Alternatively, you can send your requests, suggestions and comments to the address below.

Tilting moment (M_{2K})

The tilting torque M_{2K} is a result of the → **axial and lateral forces** applied and their respective points of application in relation to the inner radial bearing on the output side.

Timing belt

The AT profile of the Wittenstein standard belt pulley is a flank-centered profile for backlash-free torque transmission.

Effective diameter

$d_0 = \text{Number of teeth } z \times \text{Pitch } p / \pi$

Recommended preload per strand for linear drives $F_v \geq F_u$

Radial force at the output shaft for the determination of the bearing life:

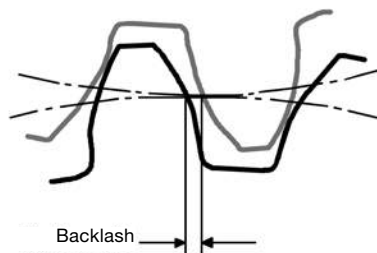
$F_r = 2 \times F_v$

Torque (M)

The torque is the actual driving force of a rotary motion. It is the product of lever arm and force. $M = F \cdot l$

Torsional backlash (j_t)

Torsional backlash j_t is the maximum angle of torsion of the output shaft in relation to the input. Torsional backlash is measured with the input shaft locked.



The output is then loaded with a defined test torque in order to overcome the internal gearhead friction. The main factor affecting torsional backlash is the face clearance between the gear teeth. The

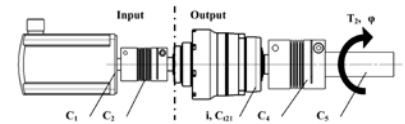
→ Refer to this term for further details.

low torsional backlash of WITTENSTEIN alpha gearheads is due to their high manufacturing accuracy and the specific combination of gear wheels.

Torsional rigidity (C_{t21})

Torsional rigidity [Nm/arcmin] C_{t21} is defined as the quotient of applied torque and generated torsion angle ($C_{t21} = \Delta T / \Delta \phi$). It consequently shows the torque required to turn the output shaft by one angular minute. The torsional rigidity can be determined from the → **hysteresis curve**. Only the area between 50 % and 100 % of T_{2B} is considered for because this area of the curve profile can be considered linear.

Torsional rigidity C , Torsion angle ϕ



Reduce all torsional rigidities to the output:

$$C_{(n),output} = C_{(n),input} \cdot i^2$$

with i = Gear ratio [-]

$C_{(n)}$ = single stiffness [Nm/arcmin]

Note: the torsional rigidity C_{t21} of the gearbox always relates to the output.

Series connection of torsional rigidities

$$1/C_{ges} = 1/C_{1,output} + 1/C_{2,output} + \dots + 1/C_{(n)}$$

Torsion angle ϕ [arcmin]

$$\phi = T_2 \cdot 1/C_{ges}$$

with T_2 = Output torque [Nm]

WITTENSTEIN alpha speedline®

If required, we can deliver a new SP+, TP+ or LP+ within 24 or 48 hours ex works.

Formulae

Torque [Nm]	$T = J \cdot \alpha$	J = Mass moment of inertia [kgm ²] α = Angular acceleration [1/s ²]
Torque [Nm]	$T = F \cdot l$	F = Force [N] l = Lever, length [m]
Acceleration force [N]	$F_b = m \cdot a$	m = Mass [kg] a = Linear acceleration [m/s ²]
Frictional force [N]	$F_{\text{frict}} = m \cdot g \cdot \mu$	g = Acceleration due to gravity 9.81 m/s ² μ = Coefficient of friction
Angular velocity [1/s]	$\omega = 2 \cdot \pi \cdot n / 60$	n = Speed [rpm] π = PI = 3.14...
Linear velocity [m/s]	$v = \omega \cdot r$	v = Linear velocity [m/s] r = Radius [m]
Linear velocity [m/s] (spindle)	$v_{\text{sp}} = \omega \cdot h / (2 \cdot \pi)$	h = Screw pitch [m]
Linear acceleration [m/s ²]	$a = v / t_b$	t_b = Acceleration time [s]
Angular acceleration [1/s ²]	$\alpha = \omega / t_b$	
Pinion path [mm]	$s = m_n \cdot z \cdot \pi / \cos \beta$	m_n = Standard module [mm] z = Number of teeth [-] β = Inclination angle [°]

Conversion table

1 mm	= 0.039 in
1 Nm	= 8.85 in lb
1 kgcm ²	= 8.85 x 10 ⁻⁴ in.lb.s ²
1 N	= 0.225 lb _f
1 kg	= 2.21 lb _m

Symbols

Symbol	Unit	Designation
C	Nm/arcmin	Rigidity
ED	%, min	Duty cycle
F	N	Force
f_s	–	Shock factor
f_t	–	Temperature factor
f_e	–	Factor for duty cycle
i	–	Ratio
j	arcmin	Backlash
J	kgm ²	Moment of inertia
K1	Nm	Factor for bearing calculation
L	h	Service life
L_{PA}	dB(A)	Operating noise
m	kg	Mass
M	Nm	Torque
n	rpm	Speed
p	–	Exponent for bearing calculation
η	%	Efficiency
t	s	Time
T	Nm	Torque
v	m/min	Linear velocity
x	mm	Distance between lateral force and shaft collar
y	mm	Distance between axial force and center of gearhead
z	mm	Factor for bearing calculation
Z	1/h	Number of cycles

Index

Capital letter	Permissible values
Small letter	Actual values
1	Drive
2	Output
3	Rearward drive (for hypoid gearheads)
A/a	Axial
B/b	Acceleration
c	Constant
cym	cymex® values (load-related characteristic values)
d	Deceleration
e	Pause
h	Hours
K/k	Tilting
m	Mean
Max/max	Maximum
Mot	Motor
N	Nominal
Not/not	Emergency stop
0	No load
R/r	Radial
t	Torsional
T	Tangential

Order information

Gearhead type

TP+ 004 – TP+ 4000
SP+ 060 – SP+ 240

Type code

S = Standard
A = Optimized mass moment of inertia ^{b)}
E = Version in ATEX ^{b)}
F = Food-grade lubrication ^{b)}
G = Grease ^{b)}
L = Low friction (SP+ 100 - 240 HIGH SPEED)
W = Corrosion resistant ^{b)}

Gearhead variations

M = Motor attachment gearhead
S = Separate version

Gearhead model

F = Standard
A = HIGH TORQUE (only TP+)
C = HIGH SPEED (only SP+)

Number of stages

1 = 1-stage
2 = 2-stage
3 = 3-stage

^{a)} Order shrink discs separately, see section accessories, shrink discs on page 410

^{b)} Reduced specification available on request

Gearhead type

TK+ 004 – TK+ 110
TPK+ 010 – TPK+ 500
SK+ 060 – SK+ 180
SPK+ 075 – SPK+ 240
HG+ 060 – HG+ 180
SC+ 060 – SC+ 180
SPC+ 060 – SPC+ 180
TPC+ 004 – TPC+ 110

Type code

S = Standard
B = Modular output combination (SK+, SPK+, TK+, TPK+, HG+ ^{c)})
E = Version in ATEX ^{b)} ^{d)}
F = Food-grade lubrication ^{b)}
W = Corrosion resistant ^{b)}

Gearhead variations

M = Motor attachment gearhead

Gearhead model

F = Standard
A = HIGH TORQUE (only TPK+)

Number of stages

1 = 1-stage
2 = 2-stage
3 = 3-stage
4 = 4-stage

^{a)} Order shrink discs separately, see section accessories, shrink discs on page 410

^{b)} Reduced specification available on request

^{c)} See modular system matrix, page 424

^{d)} SK+/TK+/HG+ only

Gearhead type

LP+ 050 – LP+ 155
LPB+ 070 – LPB+ 120

Type code

S = Standard
F = Food lubrication

Gearhead variations

M = Motor attachment gearhead

Gearhead model

F = Standard

Number of stages

1 = 1-stage
2 = 2-stage

Gearhead type

LK 050 – LK 155
LPK 050 – LPK 155
LPBK 070 – LPBK 120
CP 040 – CP 115 (alpha®)

Gearhead variations

M = Motor attachment gearhead

Gearhead model

O = Standard
L = Food-grade grease

Number of stages

1 = 1-stage
2 = 2-stage
3 = 3-stage (LPK+)

Ratios

See technical data sheets.

Gearhead type

VDT = TP flange
VDH = hollow shaft
VDS = shaft

Gearhead version

e = economy (only for VDH and VDS, size 040, 050 and 063)

Distance between axes

040, 050, 063, 080, 100

Gearhead variations

M = Motor attachment gearhead

Gearhead model

F = Standard
L = Food-grade lubrication
W = Corrosion resistant

Number of stages

1 = 1-stage

** See section accessories, shrink discs on page 410

Ratios

See technical data sheets.

Output shape

- 0 = smooth shaft/flange
- 1 = shaft with key
- 2 = involute to DIN 5480
- 3 = system output
- 4 = other
- 5 = Shaft mounted (SP⁺)^{a)}

Clamping hub bore hole diameter

(see technical data sheets and clamping hub diameter table)

Backlash

- 1 = Standard
- 0 = Reduced (see technical data sheets)

Installation on motor side

- S = Push-on sleeve
- K = Coupling

X = Special model

Ratios

See technical data sheets.

Output shape

- 0 = smooth shaft/flange (no hollow shaft)
- 1 = shaft with key
- 2 = involute to DIN 5480
- 3 = system output
- 4 = other
- 5 = Hollow shaft interface / Flanged hollow shaft (TK⁺)^{a)}
Shaft mounted (SPK⁺/SPC⁺)^{a)}
- 6 = 2 hollow shaft interfaces (HG⁺)^{a)} (see technical data sheets)

Clamping hub bore hole diameter

(see technical data sheets and clamping hub diameter table)

Backlash

- 1 = Standard
- 0 = Reduced (see technical data sheets)

Installation on motor side

- S = Push-on sleeve
- K = Coupling

X = Special model

Ratios

See technical data sheets.

Output shape

- 0 = Smooth shaft/flange
- 1 = Shaft with key

Clamping hub bore hole diameter

(see technical data sheets and clamping hub diameter table)

Backlash

- 1 = Standard (see technical data sheets)

Installation on motor side

- S = Push-on sleeve
- K = Coupling

Output shape

- 0 = Smooth shaft (for LP⁺ only)
- 1 = Shaft with key
- LPBK⁺**
- 1 = Centering on output side

Clamping hub bore hole diameter

- 1 = Standard (see technical data sheets)

Backlash

- 1 = Standard

X = Special model

Ratios

- 4 (not for economy sizes 050 and 063)
- 7
- 10
- 16
- 28
- 40

Output shape

- 0 = smooth shaft/flange
- 1 = shaft with key
- 2 = involute to DIN 5480 (VDS⁺)
- 4 = other (see technical data sheets)
- 8 = Dual-shaft output, smooth (VDS⁺, VDS^e)
- 9 = Dual-shaft output with key (VDS⁺, VDS^e)

Clamping hub bore hole diameter

- 2 = 14 mm (040)
- 3 = 19 mm (040, 050)
- 4 = 28 mm (063)
- 5 = 35 mm (080)
- 7 = 48 mm (100)

Backlash

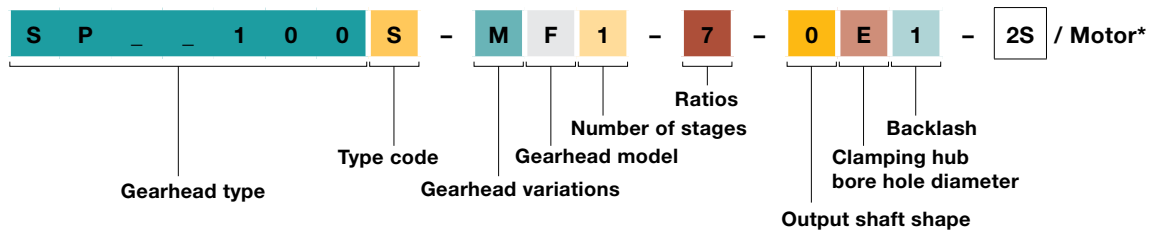
- 1 = Standard
- 0 = Reduced

VDH – number of shrink discs**

- 0 = no shrink disc
- 1 = one shrink disc
- 2 = two shrink discs

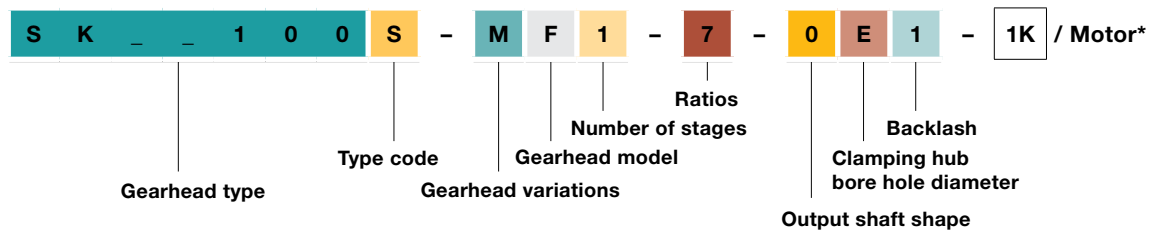
X = Special model

TP⁺/SP⁺



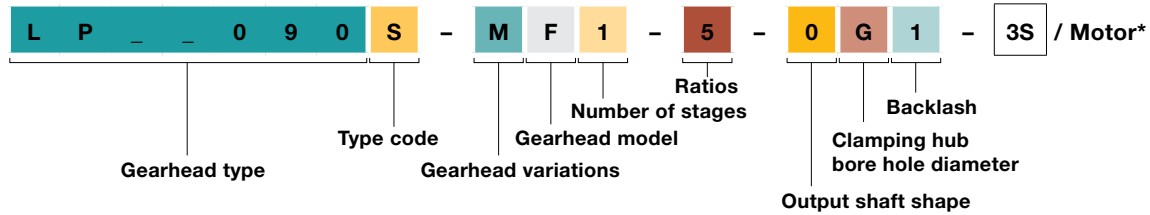
* Full motor designation only required for determining gearhead attached components!

TK⁺/TPK⁺/SK⁺/SPK⁺/HG⁺/SC⁺/SPC⁺/TPC⁺

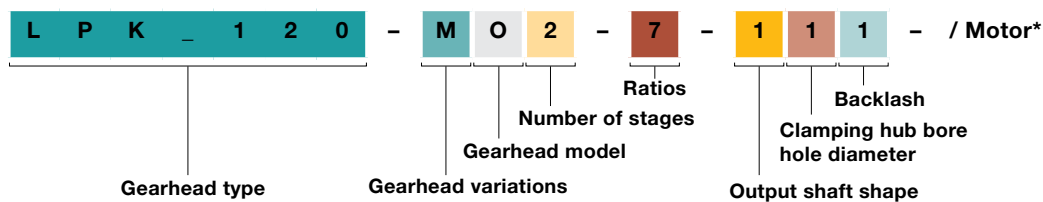


* Full motor designation only required for determining gearhead attached components!

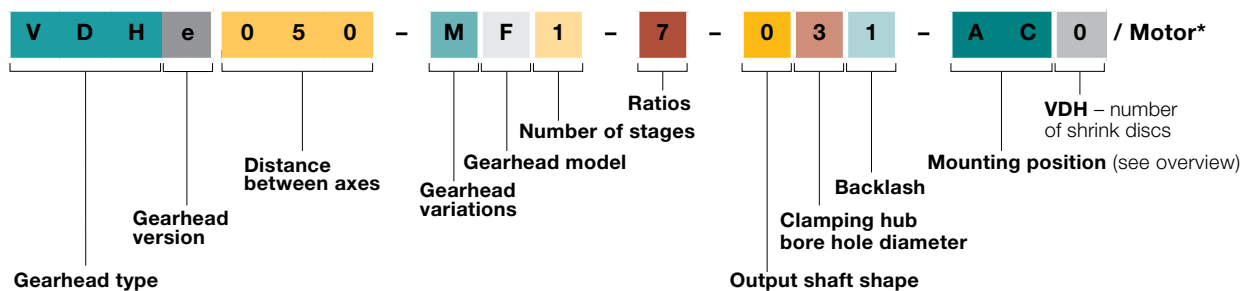
LP⁺/LPB⁺ Generation 3



LK⁺/LPK⁺/LPBK⁺/CP (alphira®)



V-Drive



Mounting positions and clamping hub diameters

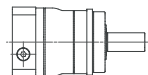
Coaxial gearheads

Clamping hub diameter

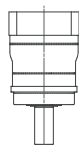
(the technical data sheet contains all diameters available for TP⁺, SP⁺, TK⁺, TPK⁺, SK⁺, SPK⁺, SC⁺, SPC⁺, TPC⁺, HG⁺ and LP⁺ models)

TP⁺ 2000/4000: Please contact WITTENSTEIN alpha

B5 – horizontal



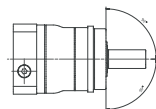
V1 – vertical
Output shaft
downwards



V3 – vertical
Output shaft
upwards



S – can be tilted
 $\pm 90^\circ$ from a horizontal
position



Code letter	mm
B	11
C	14
D	16
E	19
G	24
H	28

Code letter	mm
I	32
K	38
L	42
M	48
N	55
O	60

Intermediate diameters possible in combination with a bushing with a minimum thickness of 1 mm.

Right-angle gearheads

For information purposes only – not required when placing orders!

Permitted standard mounting positions for right-angle gearheads (see illustrations)

If the mounting position is different, contact WITTENSTEIN alpha

B5/V3
Output shaft, horizontal
Motor shaft upwards



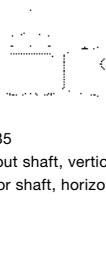
B5/V1
Output shaft, horizontal
Motor shaft downwards



V1/B5
Output shaft, vertical
Motor shaft, horizontal



V3/B5
Output shaft, vertical, upwards
Motor shaft, horizontal



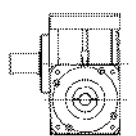
B5/B5
Output shaft, horizontal
Motor shaft, horizontal



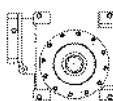
Worm gearheads

Mounting position (only relevant for oil volume)

Output side A:
View of motor interface
Only valid for VDS⁺, VDSe⁺
and VDT⁺



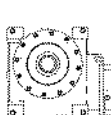
AC



AF



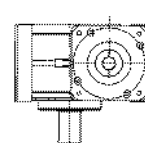
AD



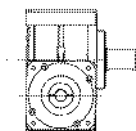
AG



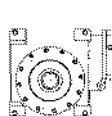
AE



Output side B:
View of motor interface
Only valid for VDS⁺, VDSe⁺
und VDT⁺



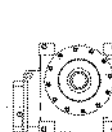
BC



BF



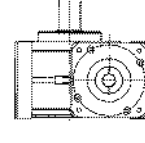
BD



BG



BE



For VDH⁺, VDHe⁺ and VDS⁺/VDSe⁺ with Dual-shaft output, A and B must be replaced with 0 (zero).

Order information

Rack and assembly jig

Rack type ZST = Rack ZMT = Assembly jig	Module 200 = 2.00 300 = 3.00 400 = 4.00 500 = 5.00 600 = 6.00	Version PA5 = Premium Class HE6 = Performance Class VB6 = Value Class PD5 = Assembly jig	Length 100 = Assembly jig (module 2–3) 156 = Assembly jig (module 4–6) 480 = Smart Class (module 2–4) 167/333 = Premium Class (module 2) 250 = Premium Class (module 3) 500 = Premium Class (module 2–6) 1000 = Value Class (module 2–6)
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Premium Class⁺ and Value Class pinion

Designation RMT = Pinion mounted ex works RMX = Pinion mounted offset 180° (for VC pinions only)	Module 200 = 2.00 300 = 3.00 400 = 4.00 500 = 5.00 600 = 6.00	Version PC5 = Premium Class VC6 = Value Class	Number of teeth (see technical data sheet)
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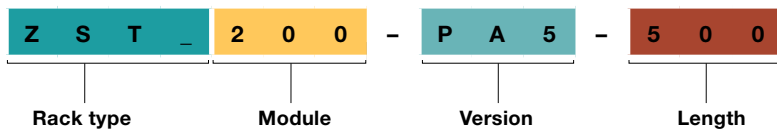
Premium Class RTP and Standard Class RSP pinions

Designation RSP = Standard Class RSP pinion for SP Involute output as per DIN 5480 RTP = Premium Class RTP pinion for TP output RTPA = Premium Class RTP pinion for TP High Torque output	Gearhead size For SP output: 060, 075, 100, 140, 180, 210, 240 For TP output: 004, 010, 025, 050, 110, 300, 500 (see technical data sheets)	Module A02 = 2.00 A03 = 3.00 A04 = 4.00 A05 = 5.00 A06 = 6.00	Tolerance class 5e24 = Premium Class RTP/ RTPA 6e25 = Standard Class RSP	Number of teeth (see technical data sheet)
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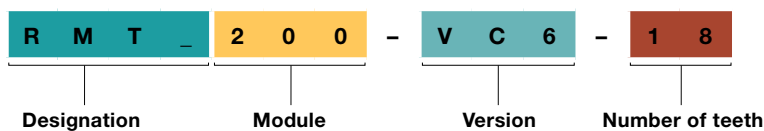
Torque limiter, bellows coupling and elastomer coupling

Model Torque limiter TL1 / TL 2 / TL3 Metal bellows coupling BCT / BCH / BC2 / BC3 / EC2 Elastomer coupling ELC / EL6	Series (see technical data sheets)	Length option A = First length B = Second length Elastomer ring option A = 98 Sh A B = 64 Sh D C = 80 Sh A	Torque limiter (TL) function W = Single position (360°) D = Multi-position (60°) G = Load holding F = Full engagement Metal bellows coupling function (BC, EC) A = Standard B = incl. self-opening clamp system (EC2) Elastomer coupling function (EL) A = Standard	Internal diameter D₁ (drive side) TL1: D ₁ = D ₂ BCT: D ₁ = Output side
Bore version D₁ 0 = Smooth 1 = Key shape A DIN 6885 2 = Involute DIN 5480 (on request) 3 = Key shape A ANSI B17.1	Internal diameter D₂ (output side) TL1: D ₁ = D ₂ BCT: D ₂ = TP* flange hole circle	Bore version D₂ 0 = Smooth 1 = Key shape A DIN 6885 2 = Involute DIN 5480 (on request) 3 = Key shape A ANSI B17.1 A = Hole circle BCT HIGH TORQUE	Torque limiter (TL) adjustment range A = First series B = Second series C = Third series D = Fourth series (for TL1 only)	Disengagement torque Torque limiter T_{Dis} [Nm] (see technical data sheets for torque limiter)

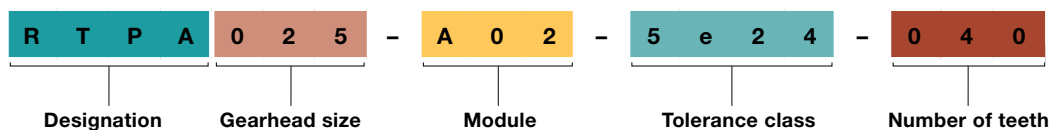
Order codes



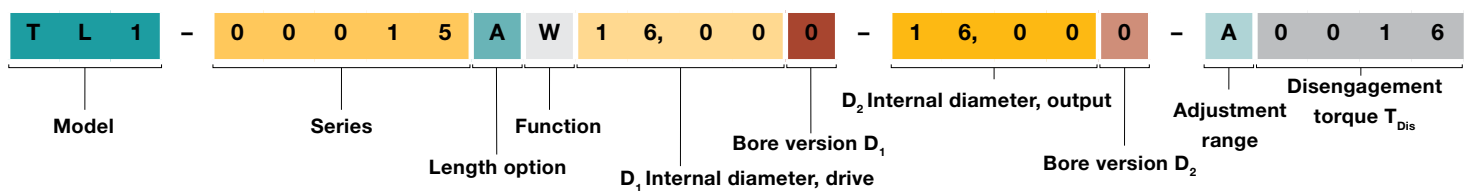
Premium Class⁺ and Value Class pinion



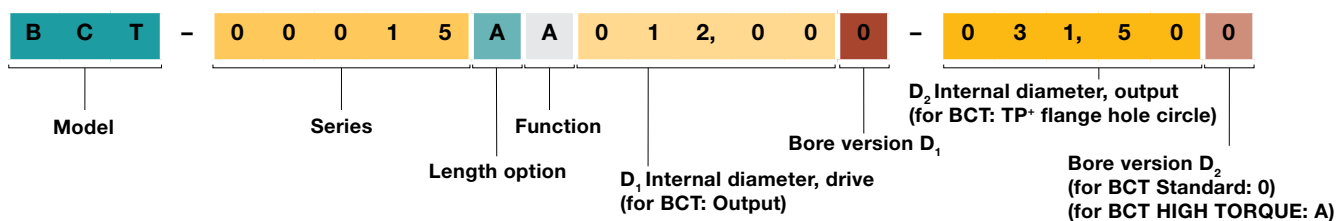
Premium Class RTP and Standard Class RSP pinions



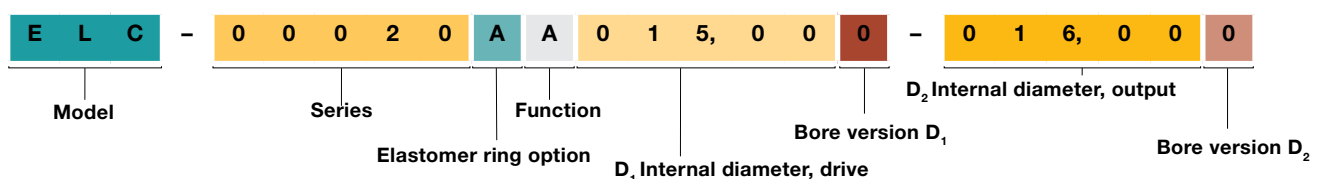
Torque limiter

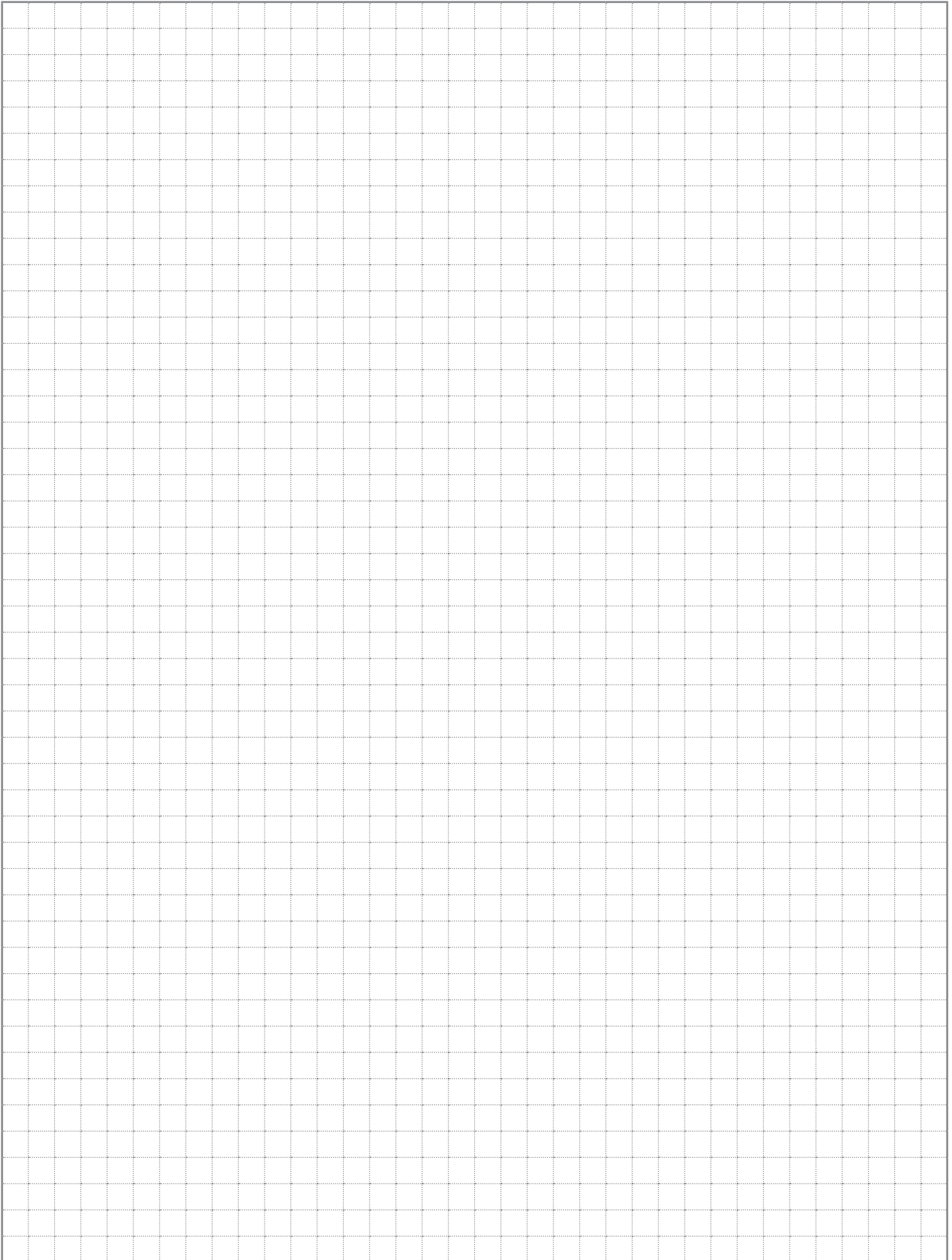


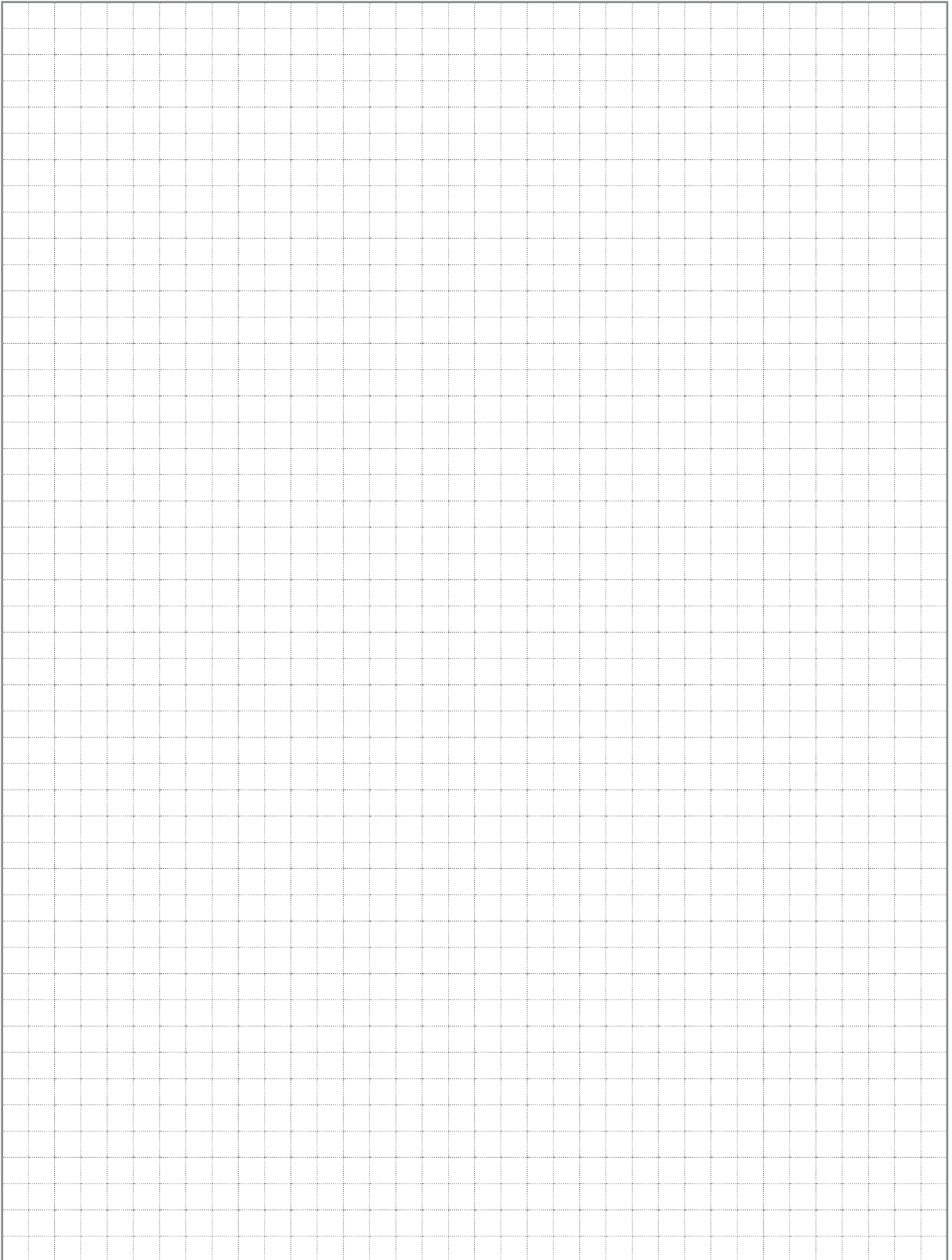
Bellows coupling



Elastomer coupling









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