WITTENSTEIN | alpha

Product catalog 2016/2017

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

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Servo right-angle gearheads
System solutions
Accessories

Contents

Managing Directors of WITTENSTEIN alpha GmbH:
Michael Müller, Philipp Guth

Dear Customers,

In more than three decades, WITTENSTEIN alpha GmbH has developed into a brand for innovation and excellence in drive technology. The products in this catalog reflect this. Above all our new, versatile alpha Value Line gearhead series. Their strengths: maximum efficiency on all axes, high degree of reliability, unimagined freedom in drive connection and design. The Value Line sets a standard that also points to the future:
For WITTENSTEIN alpha, customer satisfaction always has the highest priority – worldwide.

We think globally, act dynamically and remain true to the values that have made WITTENSTEIN alpha great: openness for innovation, striving towards excellence and real partnership with our customers.

All of these values are reflected in our new cymex® 5 design software, the software for dimensioning and design of the entire drive train. cymex® 5 sets new standards in all respects.
This enables us to achieve increased productivity as well as efficient, reliable and sustainable processes. New standards that enable us, together with you, to exploit future opportunities.

We are looking forward to it!

WITTENSTEIN alpha GmbH Management Team

WITTENSTEIN Group

Specialized fields united in one company

– one with the future

WITTENSTEIN

WITTENSTEIN | alpha

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

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.

WITTENSTEIN | motion control

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.

WITTENSTEIN | cyber motor

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.

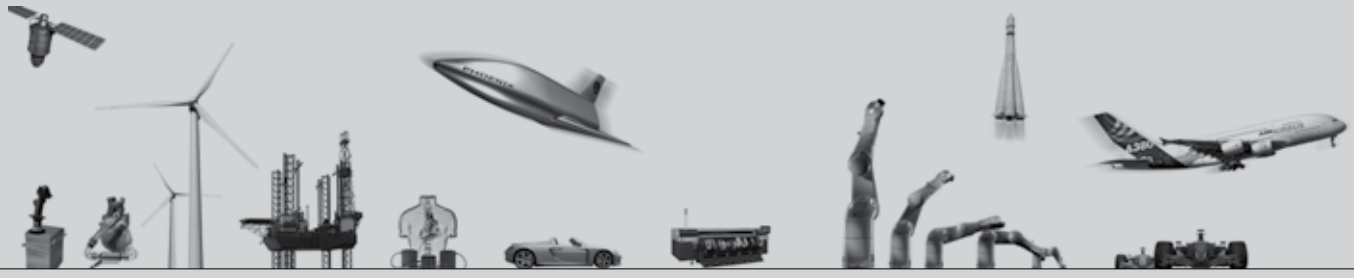


Photo Phoenix: EADS Astrium

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 2,000 people worldwide and is represented by 60 subsidiaries and dealerships in more than 40 countries.

WITTENSTEIN | intens

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.

WITTENSTEIN | bastian

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.

WITTENSTEIN | aerospace & simulation

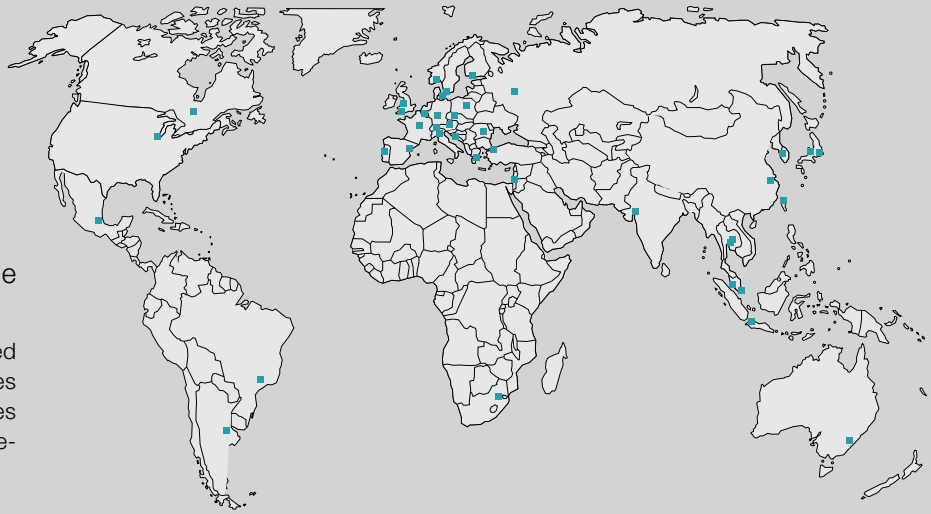
Maximum effect, minimum weight and efficiency plays a vital role in the aerospace industry. The powerful actuator systems manufactured by WITTENSTEIN aerospace & simulation GmbH represent both high quality and unique compactness. These highly efficient systems are used **in the Airbus A380 as well as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

attocube
pioneers of precision

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 sets benchmarks worldwide

in the fields of machine construction and drive technology

Efficiency engineering – efficient processes and efficient products

Our mission statement for the best possible customer solutions in the highest quality

With "efficiency engineering", WITTENSTEIN alpha combines many of the long-established unmistakable properties on the market into a powerful mission statement, into a recognizable characteristic. The umbrella of "efficiency engineering" encompasses all aspects of the effectiveness and efficiency of WITTENSTEIN alpha products, systems and solutions.They are based on efficient engineering achievement and efficient processes in production as well as partnership with the customers.

Research & Development, Production and Sales …

… from a single source!

Change and innovation for more than 30 years

First low backlash planetary gearheads | Software development | System solutions | Low backlash planetary gearheads | Servo right-angle gearheads

1983 SP

1984 Founding of alpha getriebebau

1994 TP

1995 SP classic

1996 LP

1999 cymex®

2002 alpha is the most innovative of the German medium-sized companies

2004 SP+/TP+/LP+-product range alpheno®

2007 TPK+/SPK+/HG+/SK+/TK+

2008 Change of name to WITTENSTEIN alpha

Competence in many sectors

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 axles such as drive axles and tool manipulators.

The revolution in linear technology | New generation LP+/LPB+ | Hygienic Design/New generation of bevel gears | New generation of racks | alpha Value Line | Software development

2011
High Performance Linear System

2012
LP+/LPB+ Generation 3

2013
Hygienic Design/ SC+/SPC+/TPC+

2014
Innovative rack installation

2015
NP/NPL/NPS/ NPT/NPR

2016
cymex® 5

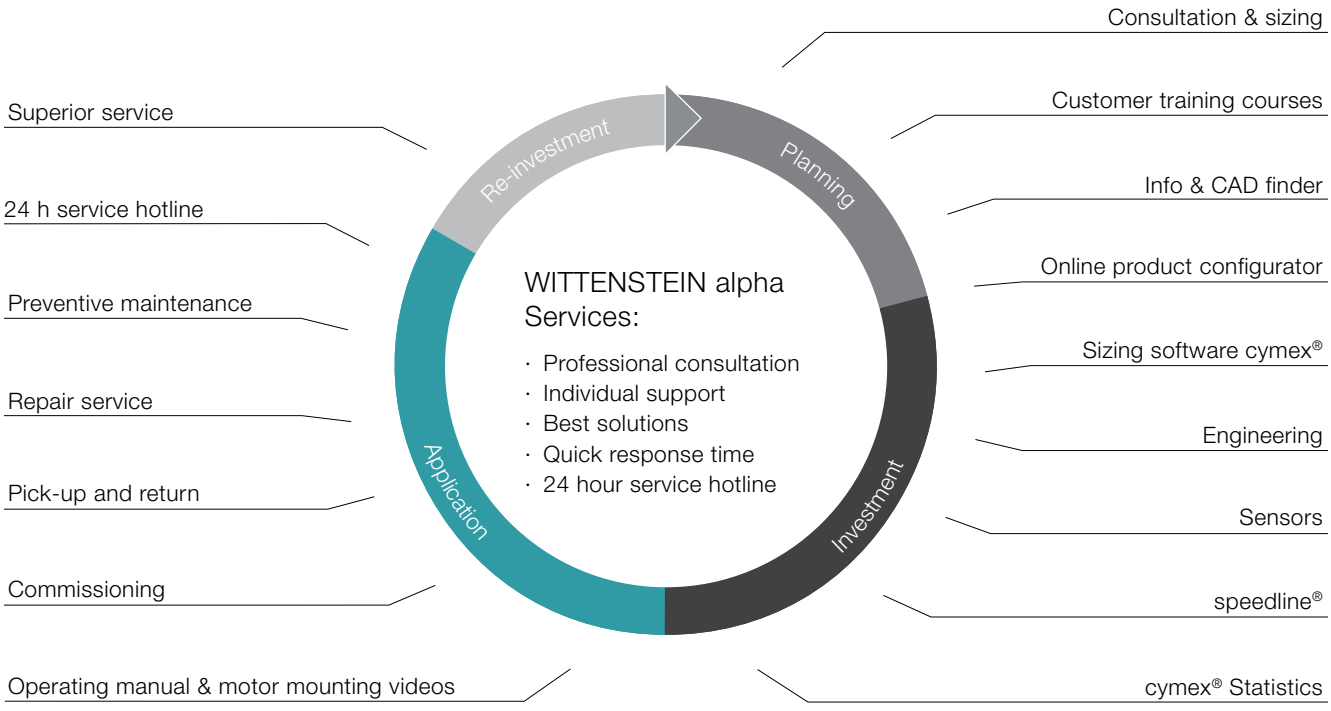
efficiency engineering
efficiency engineering mission statement

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 aftersales, 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 the our Service catalog and at: **alpha.wittenstein.de/en-en/services/**

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

Consultation and sizing

Personally on-site for you

Engineering

Your challenge is our drive

Consulting expertise and innovative strength

Our competency

Personal consultation on drive technology, customized services, as well as process and drive peripherals.Profit from our many years of experience and expertise through our regionally-based sales network.

Your benefits

- Professional consulting
- Personal contact
- Best solutions through professional
- application calculation and drive design
- Customized services
- System solutions for the most demanding applications

Analysis – Optimization – Implementation

Our competency

Advanced software tools for calculation and simulation as well as comprehensive mechatronics expertise.Profit from our many years of engineering achievement in machine construction.

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 consulting/support and design support
- Complex multi-axis analysis
- Multi-body simulation in 2D and 3D
- Optimization of motion design
- Design of gearing, shafts and bearings
- FEM calculations

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® 5
Calculate on the Best

The new design software with top performance

cymex® 5 is the new standard
The engineers from WITTENSTEIN alpha have completely redeveloped the cymex® design software. The result is a design tool that sets standards in all respects.

With cymex® 5, the dimensioning and design of complete drive trains (application + transformation + gearhead + motor) is now faster, simpler and more reliable than ever before. Calculation is made much easier through predefined standard applications. Consideration of all major influencing factors guarantees an optimal design and increases the efficiency of the machine.

cymex® 5 is extremely fast

Compared with previous software solutions, the workload with cymex® is between 5 and 90 % lower. This saves a lot of time.

cymex® 5 is uncompromisingly reliable

Depending on the desired load, users can select components that are tailored to the application. Here, the reliability of the load and motion-related design is guaranteed at all times. The software issues the relevant notices, warnings and error messages, e.g. when individual components are overloaded.

cymex® 5 impresses the first users

"I like the user interface of cymex® 5 very much. You get used to it very quickly. It is extremely intuitive."

Max Windholz, Senior Manager Standardization
SOMIC Verpackungsmaschinen GmbH & Co.KG

„cymex® 5 is efficiency engineering."

Felix Zeeb, Mechanical Engineering
OPTIMA consumer GmbH

And this is what other users say about the new cymex® 5:

cymex®5 is international

The software is available in eleven languages:German, English, Spanish, Italian, Chinese, Japanese, French, Turkish, Russian, Portuguese and Dutch.This significantly facilitates international cooperation.

cymex®5 means close cooperation with the customer

The reason for the excellence of the new design tool is WITTENSTEIN alpha's very close cooperation with its customers.Their experiences have been incorporated in the development of the new software.

cymex®5 is 30 years of experience

WITTENSTEIN alpha has over 3 decades of experience in drive technology. This bundled knowledge provides for maximum reliability in design.

Free download

The cymex®5 design software in the basic version continues to be available as a free download.

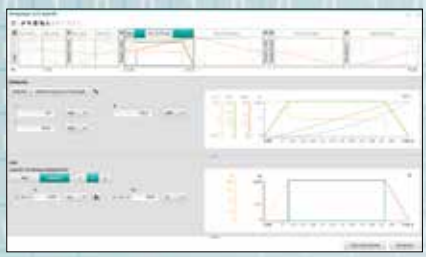
Interested?

www.wittenstein-cymex.de

cymex® 5
Calculate on the Best

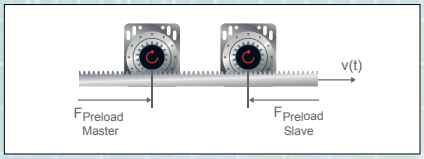
cymex® 5 has an extremely extensive database

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



cymex® 5 has an intuitive profiler

The new profiler is extremely user-friendly. The motion and load profile is clearly displayed and can be edited as required. All input parameters are described in detail.

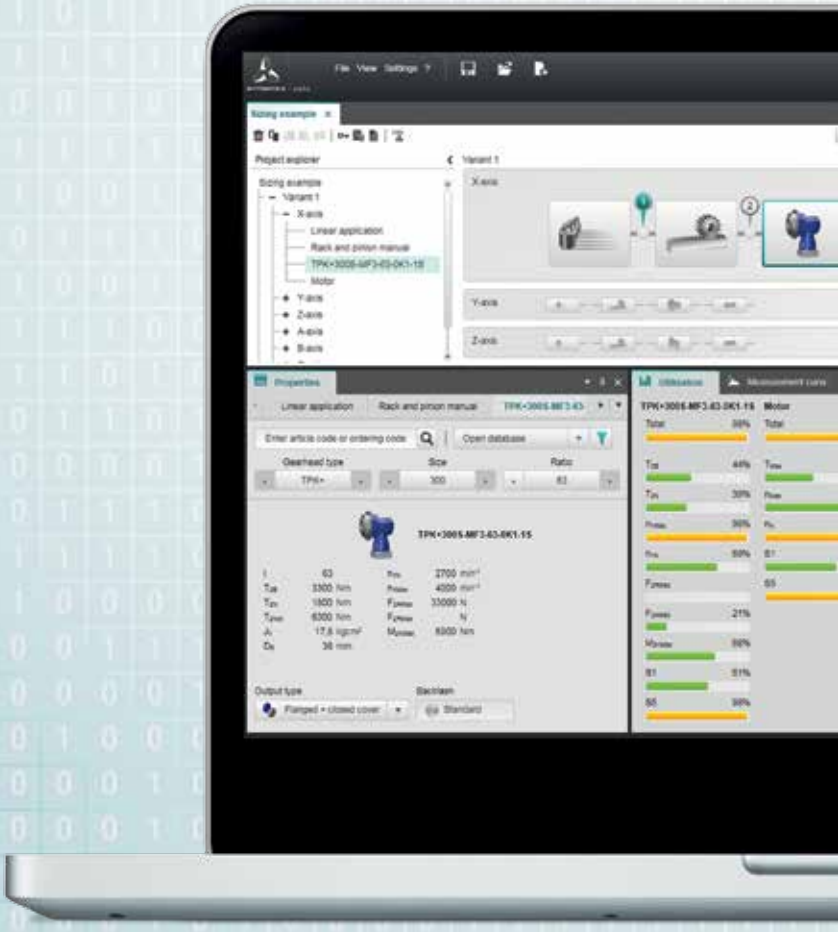


cymex® 5 has the completely new Master-Slave function*

The Master-Slave function enables the electrically clamped configuration of two drives. The mutual clamping of Master and Slave eliminates the backlash in the drive train and provides for a high degree of rigidity in the machine. This enables a significant increase in its dynamics.

cymex® 5 can define any number of axes simultaneously

In contrast to other design tools, cymex® 5 can define any number of axes at the same time. This saves up to 60 % of time during the version calculation.



*Premium function, on request.

cymex® 5 has an intuitive user interface

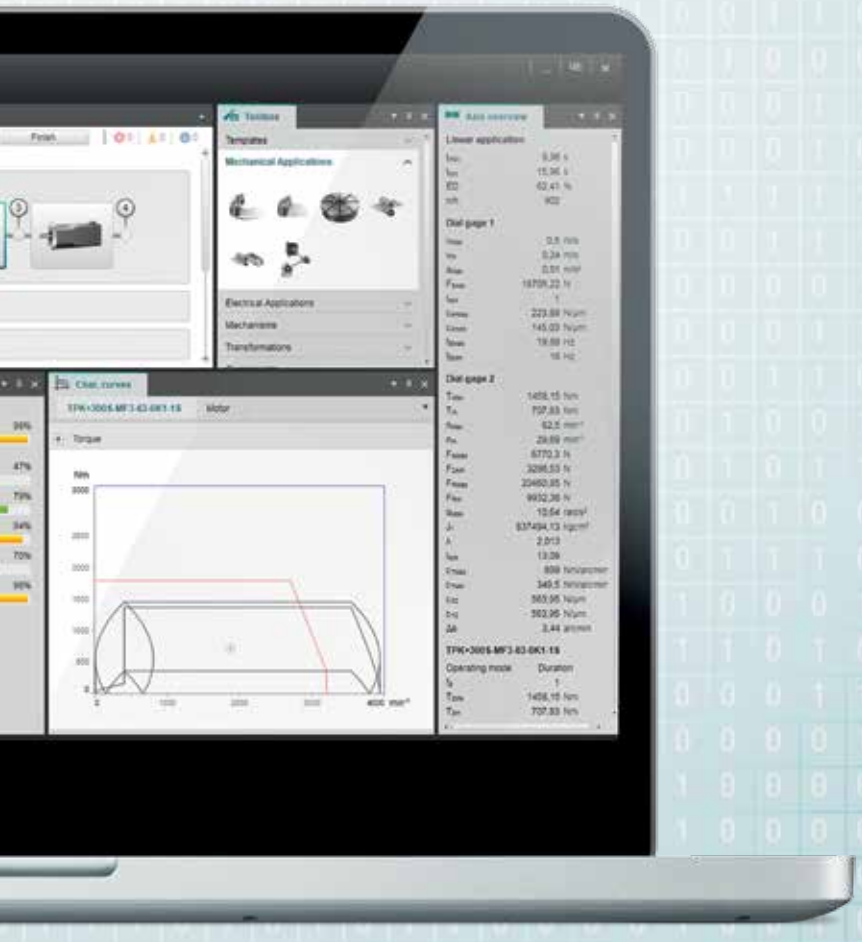
The new user interface is modern and offers maximum flexibility: The user can extend it with optional windows such as measurement curves, load diagrams or flexibly positionable function bars. The personal look & feel can be saved for follow-up projects.

cymex® 5 offers comprehensive documentation

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

cymex® 5 has a unique optimization calculator*

The entire drive train can be optimized on the basis of the motor data. The function provides optimization suggestions for the selected gearhead during the design process. This increases the efficiency and reliability. Costs can be saved through downsizing and the gearhead is neither over nor under-dimensioned.



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

The new software offers many options for the individual design of the drive train. Further to applications that were already implemented in cymex® 3, the following are now additionally integrated: the crank, conveyor, center winder and feed roll.

speedline®

Speedy deliveries

Pick-up & return

Customized logistics solution

Speed for greater flexibility

Our competency

We offer you delivery of the standard SP+, TP+ and LP+ Generation 3 series within 24 or 48 hours ex works at attractive conditions.* Our V-Drive servo worm gearheads are now also available at short notice. Benefit from the immediate processing of your request, coordination of the complete order and our individual pick-up & return service

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

We handle the complete shipment for you

Our competency

In urgent cases, we ensure immediate and professional pick-up as well as the fastest possible delivery of your repaired drive. Pick-up and delivery can be requested independently of one another. Benefit from our pick-up service, even in the case of a speedline® order.

Your benefits

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

speedline®
by WITTENSTEIN alpha

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

Our service team can be contacted at:

Tel.+49 7931 493-12900 (International)

Commissioning

Professional support for the best possible start

Customer training

With our training courses, we will make you into an expert – our knowledge is your advantage

Reliable right from the start

Our competency
Products that are one hundred percent operational right from the outset and perfectly matched to your application environment as well as support in the installation and commissioning of complex, mechanical systems. Benefit from professional installation, optimal integration of the system in your application and explanation of the drive function by our service experts.

Your benefits
- Professional communication of knowledge
- Maximum process reliability
- Extremely short installation times
- Individual training course on mechanical system installation
- Specific support for commissioning our actuators

Product & service training courses

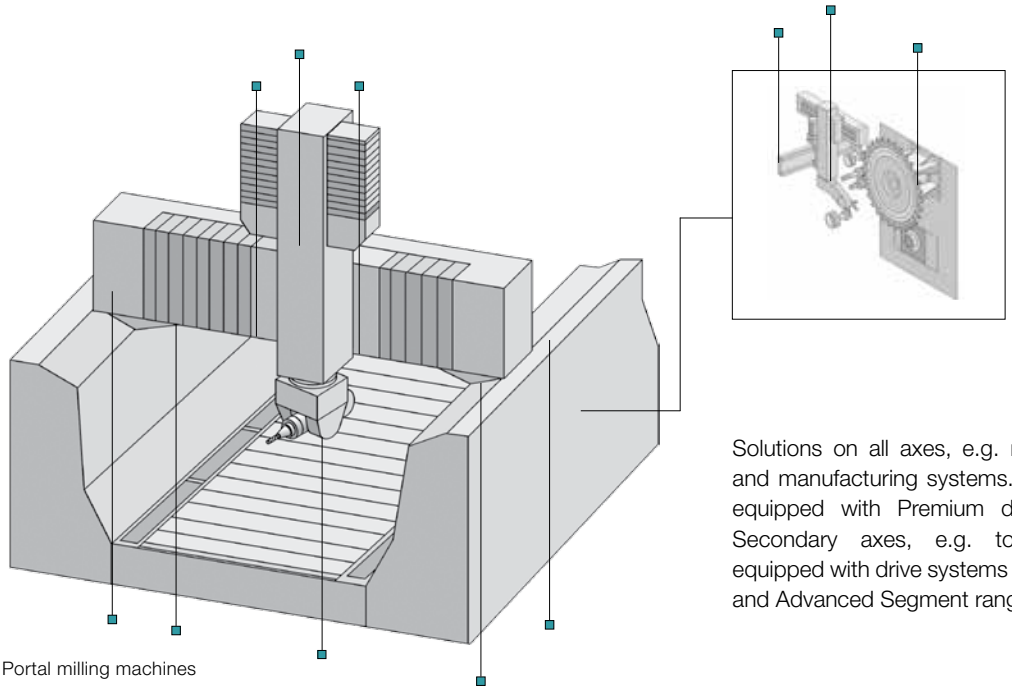
Our competency
Learn more about the product portfolio of WITTENSTEIN alpha GmbH, become an expert on our cymex design software, find out more about the installation of your systems or order spare parts following participation in our service training course. Moreover, benefit from our maintenance workshops at which participants in small groups are instructed in a mixture of theory and practice regarding safe handling during mounting of the motor to the gearhead as well as the independent replacement of wearing parts and gearhead assemblies.

Your benefits
- Individually designed content and specific training programs
- Practice-oriented learning methods
- Certified trainers

WITTENSTEIN alpha on all axes

WITTENSTEIN alpha offers complete drive solutions for each axis from a single source. The areas of application are almost limitless. They range from high-precision axes in machine tools and manufacturing systems through to packaging machines, in which maximum productivity is required.

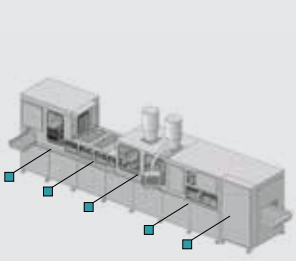
WITTENSTEIN alpha always stands as a synonym for the highest quality and reliability, high precision and synchronization quality, maximum power density, long service life and simplest motor installation.



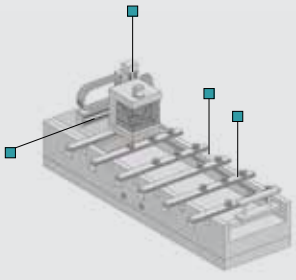
Portal milling machines

Solutions on all axes, e.g. machine tools and manufacturing systems. Primary axes equipped with Premium drive systems. Secondary axes, e.g. tool changers, equipped with drive systems from the Value and Advanced Segment ranges.

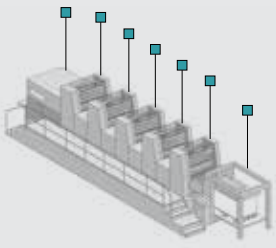
Further sector examples:



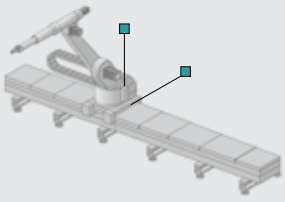
Food and packaging machines



Wood working machinery



Printing and paper machines



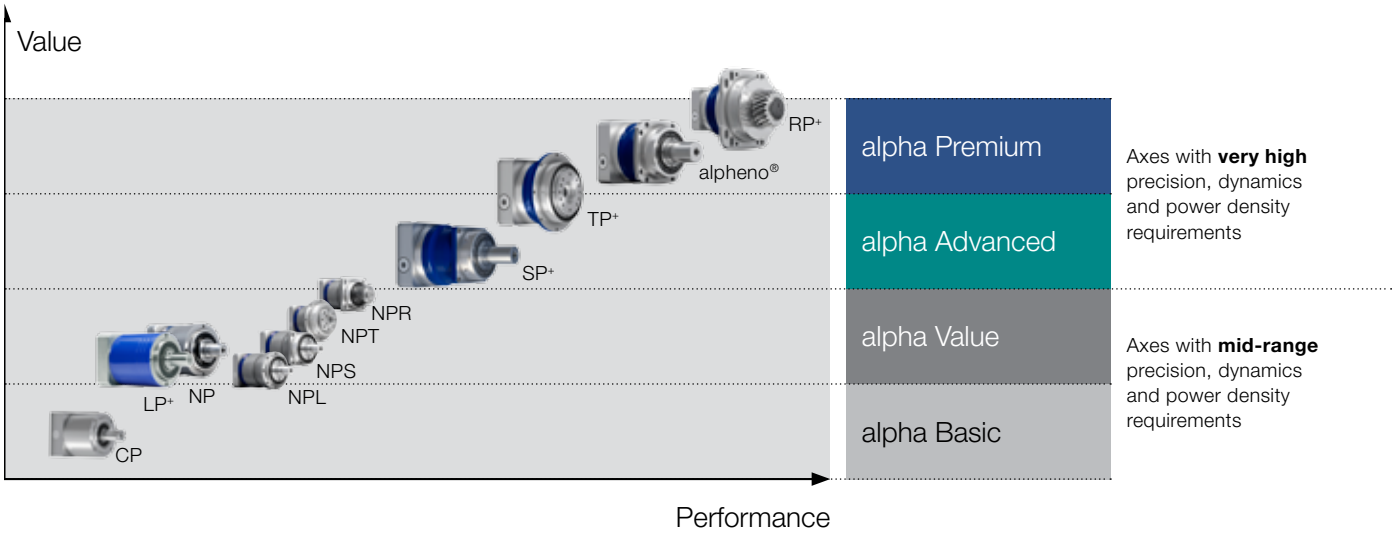
Robotics, automation and handling technology

Gearhead portfolio

WITTENSTEIN | alpha

With the help of the segment graphics, you get a quick overview of the product portfolio of WITTENSTEIN alpha.

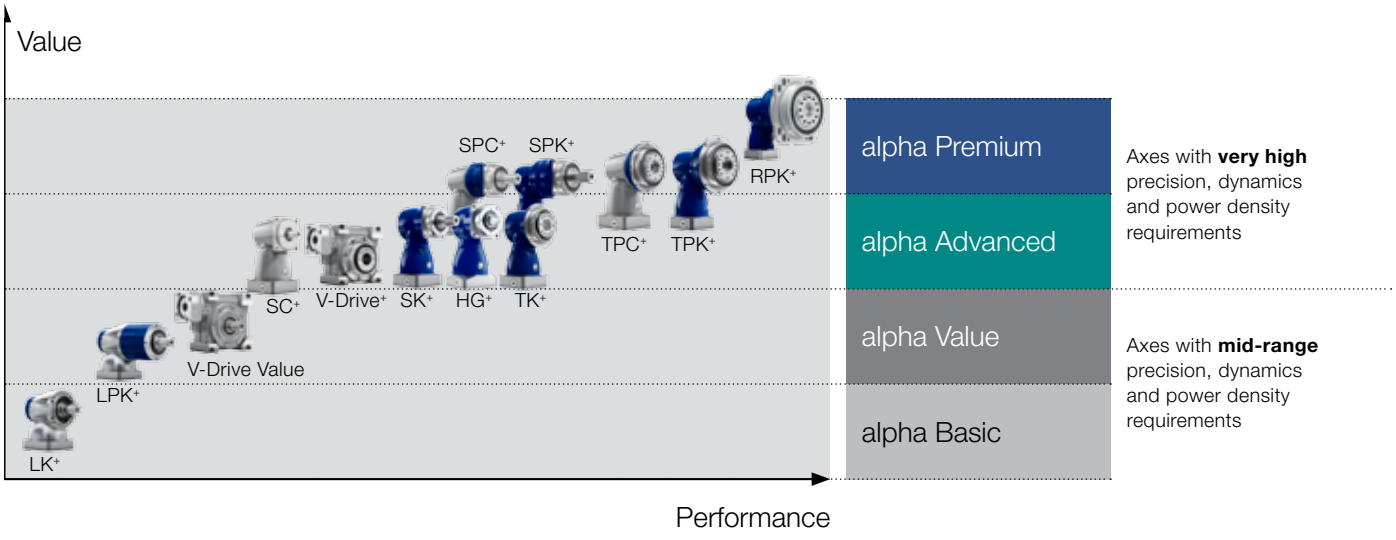
Planetary gearheads



Axes with **very high** precision, dynamics and power density requirements

Axes with **mid-range** precision, dynamics and power density requirements

Right-angle gearheads



Axes with **very high** precision, dynamics and power density requirements

Axes with **mid-range** precision, dynamics and power density requirements

Low backlash planetary gearheads High End / General

		alpha Premium		alpha Advanced					
									
Products		**alpheno®**	**RP+**	**TP+**	**TP+ HIGH TORQUE**	**SP+**	**SP+ HIGH SPEED**	**SP+ HIGH SPEED**	**HDP**
Version		MF / MC	MF / MA	MF	MA	MF	MC	MC-L	MA
Catalog page		28	30	32	58	74	100	104	124
Ratio [c]	min. i =	3	22	4	22	3	3	3	22
	max. i =	100	220	100	302,5	100	100	10	55
Torsional backlash [arcmin] [c]	Standard	≤ 3	≤ 1	≤ 3	≤ 1	≤ 3	≤ 4	≤ 4	≤ 1
	Reduced	≤ 1	-	≤ 1	-	≤ 1	≤ 2	≤ 2	-
Max. acceleration torque [Nm] (max. 1000 cycles per hour)		2800 / 3360 [b]	10000	6000	40000	4500	3600	3600	760
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		•				•	•	•	
B5 mounting flange									

[a] Power reduction: technical data available upon request [b] Please contact WITTENSTEIN alpha [c] In relation to reference sizes

alpha Value								alpha Basic
								
HDV	**NP**	**NPL**	**NPS**	**NPT**	**NPR**	**LP⁺ Generation 3**	**LPB⁺ Generation 3**	**CP**
MF	MF / MA	MF / MA	MF / MA	MF / MA	MF / MA	MF	MF	MO
124	128	128	128	128	128	130	142	148
4	3	3	3	3	3	3	3	4
100	100	100	100	100	100	100	100	100
≤ 10	≤ 8	≤ 8	≤ 8	≤ 8	≤ 8	≤ 8	≤ 8	≤ 20
-	-	-	-	-	-	-	-	-
200	800	800	800	800	760	500	305	200
•	•	•	•		•	•		
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	•					•		•

Servo right-angle gearheads High End / General

		alpha Premium	alpha Advanced					
			  			 		
Products		**RPK+**	**TPK+ HIGH TORQUE**	**TPK+**	**TPC+**	**SPK+**	**SPC+**	**SK+**
Version		MA	MA	MF	MF	MF	MF	MF
Catalog page		160	200	174	282	222	272	210
Ratio [c]	min. i =	48	66	12	4	12	4	3
	max. i =	5500	5500	10000	20	10000	20	100
Torsional backlash [arcmin]] [c]	Standard	≤ 1,3	≤ 1,3	≤ 4	≤ 4	≤ 4	≤ 4	≤ 4
	Reduced	-	-	≤ 2	≤ 2	≤ 2	≤ 2	-
Max. acceleration torque [Nm] (max. 1000 cycles per hour)		10000	10000	6000	1600	4500	1210	640
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		•	•	•	•	•	•	•
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			•	•		•	•	•
B5 mounting flange								

[a] Power reduction: technical data available upon request [b] Please contact WITTENSTEIN alpha [c] In relation to reference sizes

alpha Advanced						alpha Value				alpha Basic
										
TK⁺	**HG⁺**	**SC⁺**	**VDT⁺**	**VDH⁺**	**VDS⁺**	**VDHe**	**VDSe**	**LPK⁺**	**LPBK⁺**	**LK⁺**
MF	MF	MF	MF	MF	MF	MF	MF	MO	MO	MO
162	248	260	292	302	312	350	358	334	344	322
3	3	1	4	4	4	4	4	3	3	1
100	100	2	40	40	40	40	40	100	100	1
≤ 4	≤ 4	≤ 4	≤ 3	≤ 3	≤ 3	≤ 6	≤ 6	≤ 12	≤ 12	≤ 15
-	-	-	≤ 2	≤ 2	≤ 2	-	-	-	-	-
640	640	315	1505	1505	1505	301	301	450	220	93
		•			•		•	•		
		•			•		•	•		•
					•		•			
•	•									
•	•									
			•						•	
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•		•	•		•		•	•		•
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									•	
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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

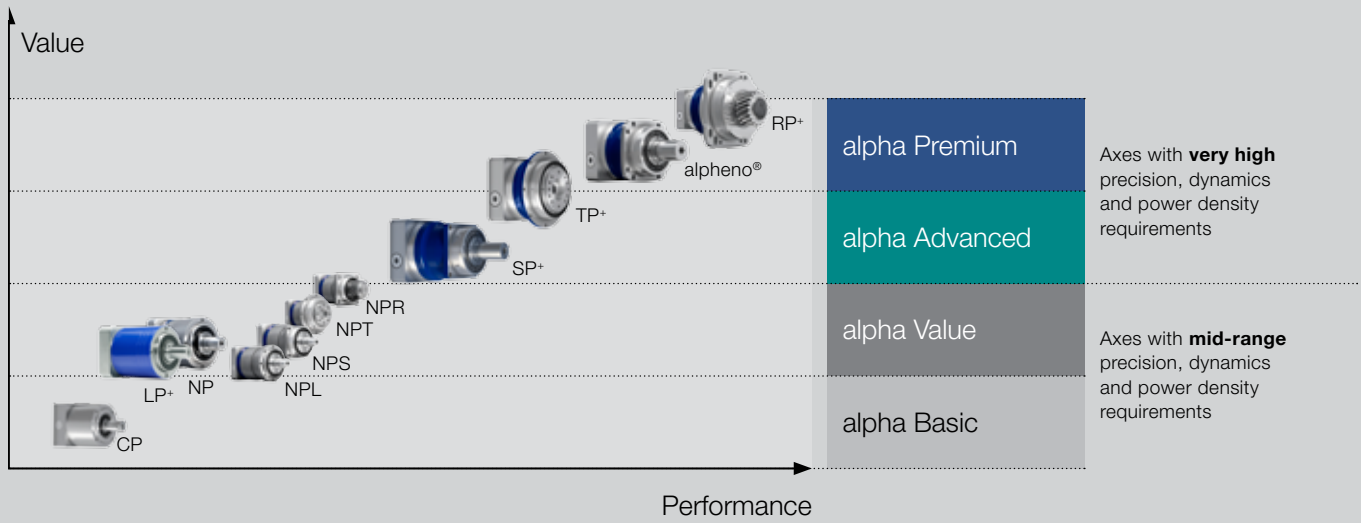
- Low backlash planetary gearhead with output flange
- Application in cyclic operation
- Torsional backlash: ≤ 1 arcmin
- Ratio: 4-220

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



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)

HDP
Hygienically safe drive

- Low-backlash planetary gearhead in hygienic design with output flange
- Application in cyclic operation
- Torsional backlash: ≤ 1 arcmin
- Ratio: 22-55

Product highlights:
- Direct process integration
- Maximum power density and dynamics
- Fast, efficient and safe cleaning

HDV
Hygienically safe drive

- Low-backlash planetary gearhead in hygienic design with output shaft
- Application in cyclic or continuous operation
- Torsional backlash: ≤ 10 arcmin
- Ratio: 4-100

Product highlights:
- Direct process integration
- Fast, efficient and safe cleaning

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!

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.

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

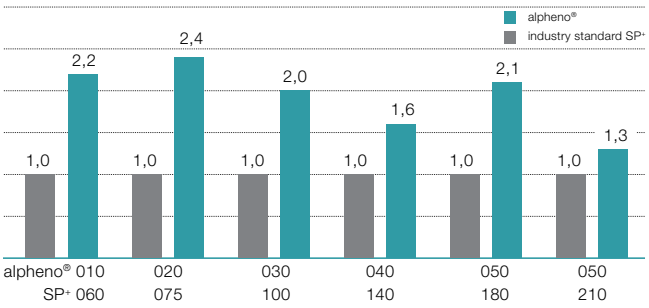
The alpheno® gear output interface facilitates a higher power transmission when compared to the industry standard which limits the transmitting torques of the gearhead. alpheno® transcends these limitations.

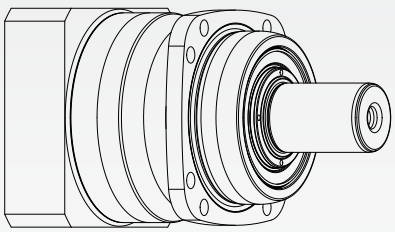
The technical advancement of alpheno® and its increased power can be directly utilized for your applications with the new design of the gear output.

alpheno® convinces with highest power density

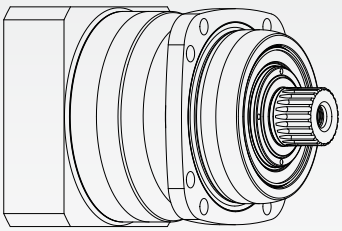
We offer you more performance in less space for the most compact drive requirements. This will allow your machine to perform better if specific system solutions are required.

Power density of the industry standard and alpheno®

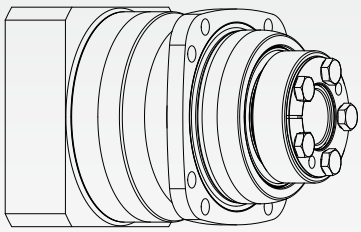




Smooth shaft



Involute



Slip-on shaft incl. shrink disk

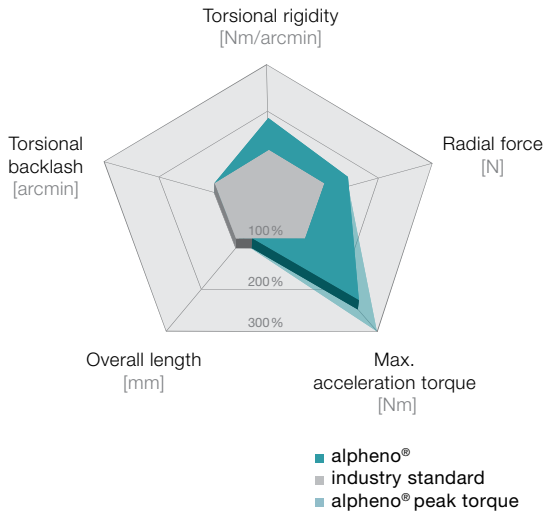
Performance linear system
with alpheno® planetary gearhead
in an optimized version for rack
and pinion applications.

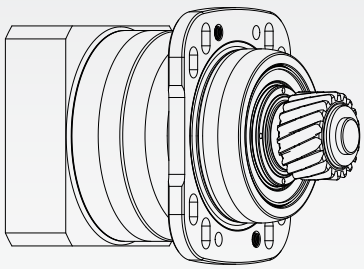
The integrated slots reduce the design
and installation requirements to
a minimum.

Performance data

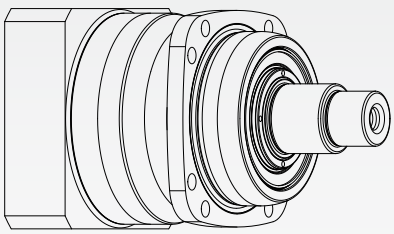
Torsional backlash [arcmin]	< 1
Ratio [-]	3 - 100
Max. acceleration torque [Nm]	2800
alpha peak torque [Nm]	3360
Max. input speed [min^{-1}]	6000
Efficiency [%]	97

alpheno® in comparison to the industry standard





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.

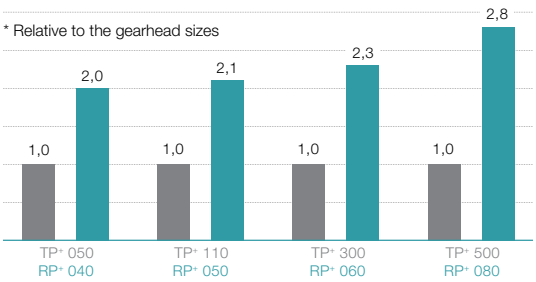
The new standard for flange gearheads

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.wittenstein-alpha.com

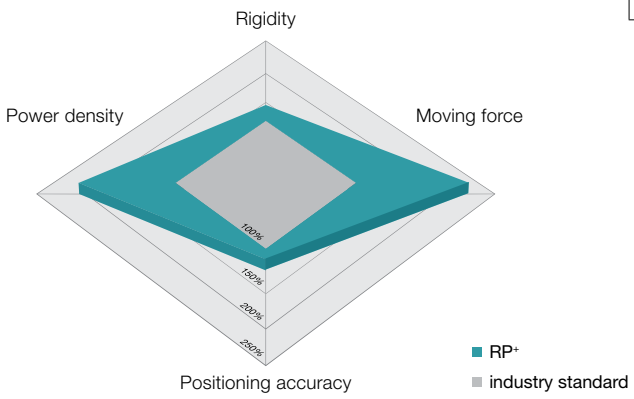
The pinions, which are specially adapted to the gearhead enable the transmission of maximum moving forces.

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



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

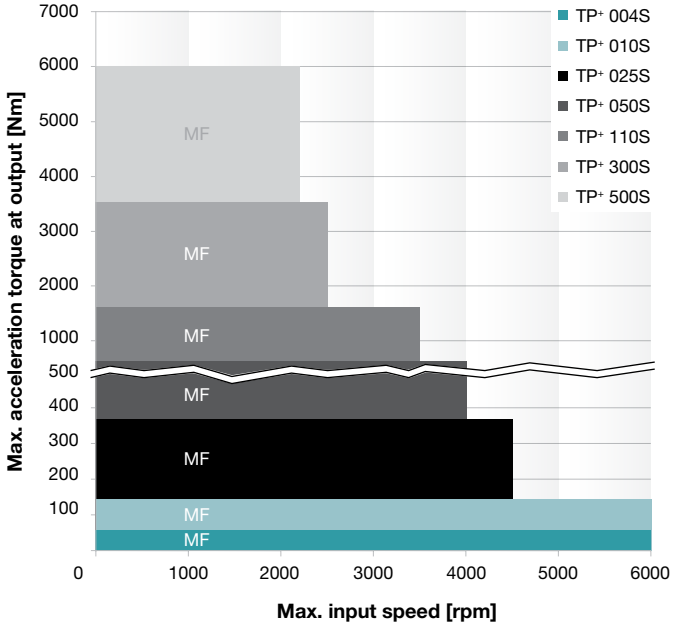
TP+ HIGH TORQUE

TP+

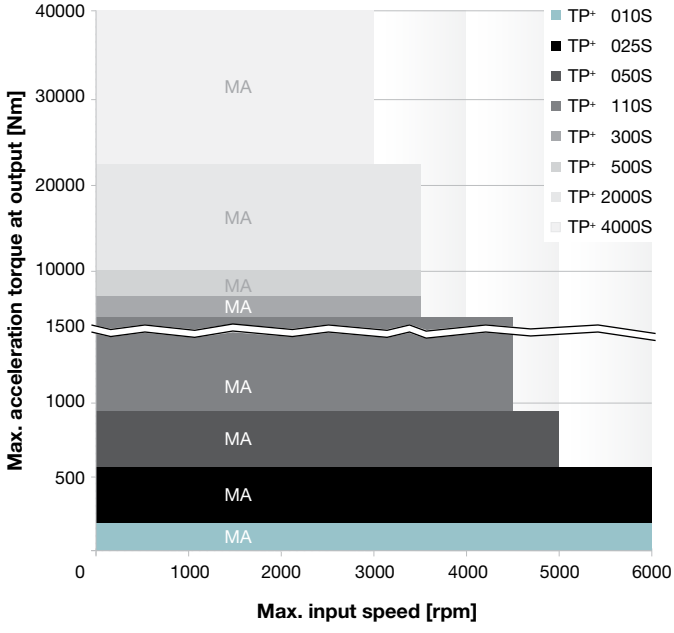
Compact top performers with output flange. The standard version is ideally suited for high positioning accuracy and highly dynamic cyclic operation.
The TP+ HIGH TORQUE is particularly well suited for high-precision applications in which high torsional rigidity is required.

Quick size selection

TP+ MF (example for i = 5)
For applications in cyclic operation (ED ≤ 60%)



TP+ HIGH TORQUE MA (example for i = 22)
For applications in cyclic operation (ED ≤ 60%)



Versions and Applications

Features	**TP⁺** MF version page 34	**TP⁺ HIGH TORQUE** MA version page 58
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

					1-stage			
Ratio [a]			i		**4**	**5**	**7**	**10**
cymex®-optimized acceleration torque (please contact us regarding the sizing)			T_{2Bcym}	Nm	60	62	60	–
				in.lb	531	549	531	–
Max. acceleration torque (max. 1000 cycles per hour)			T_{2B}	Nm	55	55	55	35
				in.lb	487	487	487	310
Nominal output torque (with n_{1N})			T_{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)			T_{2Not}	Nm	100	100	100	100
				in.lb	885	885	885	885
Nominal input speed (with T_{2N} and 20 °C ambient temperature) [b]			n_{1N}	rpm	3300	3300	4000	4000
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	0.95	0.80	0.60	0.45
				in.lb	8.41	7.08	5.31	3.98
Max. torsional backlash			j_t	arcmin	Standard ≤ 4 / Reduced ≤ 2			
Torsional rigidity [c]			C_{t21}	Nm/ arcmin	12	12	11	8
				in.lb/ arcmin	106	106	97	71
Tilting rigidity			C_{2K}	Nm/ arcmin	–			
				in.lb/ arcmin				
Max. axial force [d]			F_{2AMax}	N	1630			
				lb_f	367			
Max. tilting moment			M_{2KMax}	Nm	110			
				in.lb	974			
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	1.4			
				lb_m	3.1			
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	kgcm²	0.17	0.14	0.11	0.09
				10^{-3} in.lb.s²	0.15	0.12	0.10	0.08
Clamping hub diameter [mm]	C	14	J_1	kgcm²	0.25	0.21	0.18	0.17
				10^{-3} in.lb.s²	0.22	0.19	0.16	0.15
	E	19	J_1	kgcm²	0.57	0.54	0.51	0.49
				10^{-3} in.lb.s²	0.50	0.47	0.45	0.43

Reduced mass moments of inertia available on request.

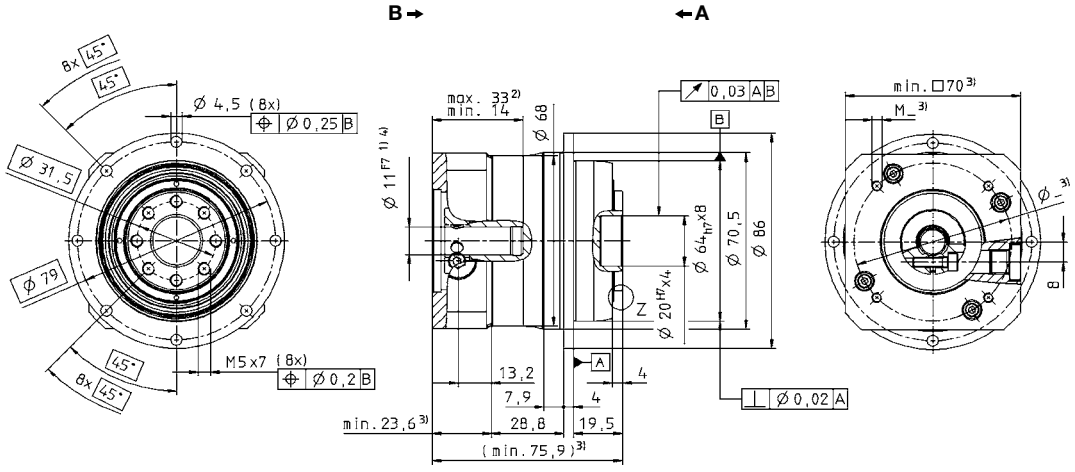
[a] Other ratios available on request
[b] For higher ambient temperatures, please reduce input speed
[c] Valid for clamping hub diameter of 14 mm
[d] Refers to center of the output shaft or flange

Motor shaft diameter [mm]

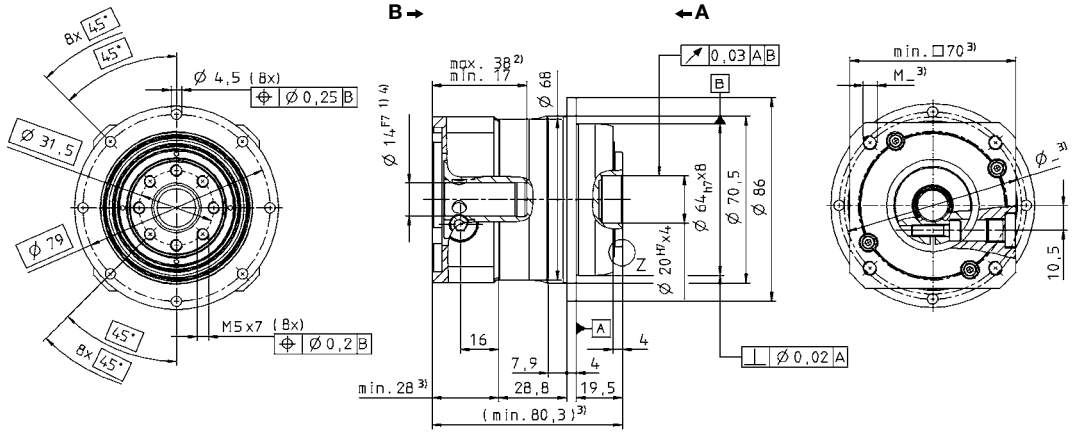
View A

View B

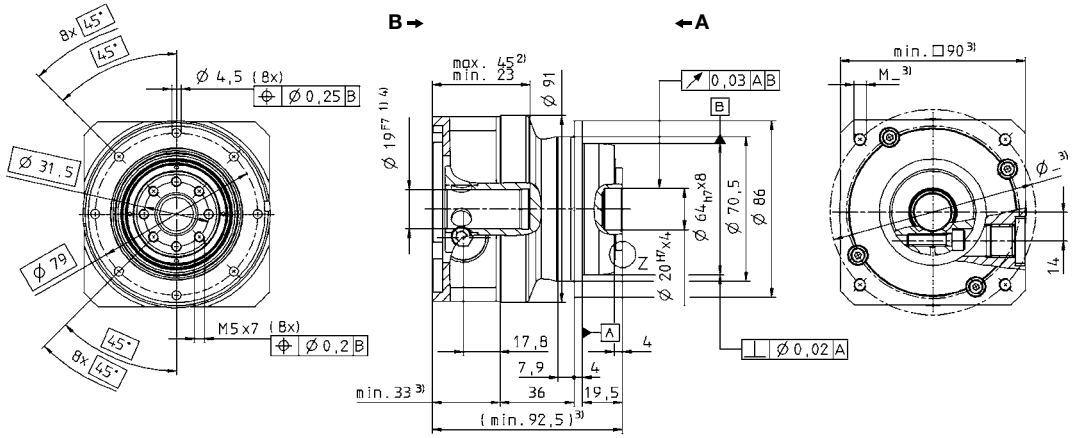
up to 11 [4] (B) clamping hub diameter

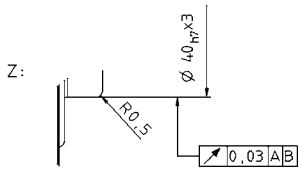


up to 14 [4] (C) clamping hub diameter



up to 19 [4] (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

				2-stage												
Ratio [a]	i			**16**	**20**	**21**	**25**	**28**	**31**	**35**	**40**	**50**	**61**	**70**	**91**	**100**
cymex®-optimized acceleration torque (please contact us regarding the sizing)	T_{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)	T_{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 n_{1N})	T_{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)	T_{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
Nominal input speed (with T_{2N} and 20 °C ambient temperature) [b]	n_{1N}		rpm	4000	4000	4000	4000	4000	4000	4000	4000	4800	5500	5500	5500	5500
Max. input speed	n_{1Max}		rpm	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) [c]	T_{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	j_t		arcmin	Standard ≤ 4 / Reduced ≤ 2												
Torsional rigidity [c]	C_{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	C_{2K}		Nm/ arcmin	–												
			in.lb/ arcmin													
Max. axial force [d]	F_{2AMax}		N	1630												
			lb_f	367												
Max. tilting moment	M_{2KMax}		Nm	110												
			in.lb	974												
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	1.5												
			lb_m	3.3												
Operating noise (with i=100 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) Clamping hub diameter [mm]	B	11	J_1	kgcm²	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.s²	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	J_1	kgcm²	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
				10^{-3} in.lb.s²	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

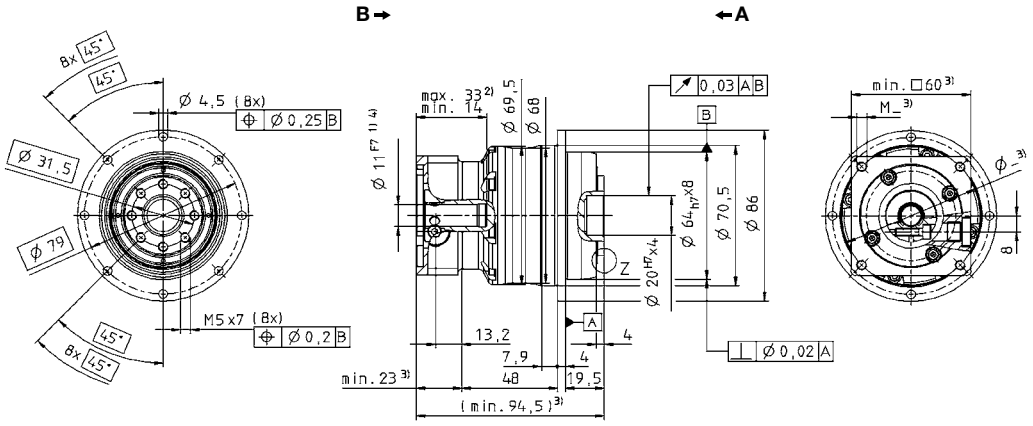
Reduced mass moments of inertia available on request.

[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

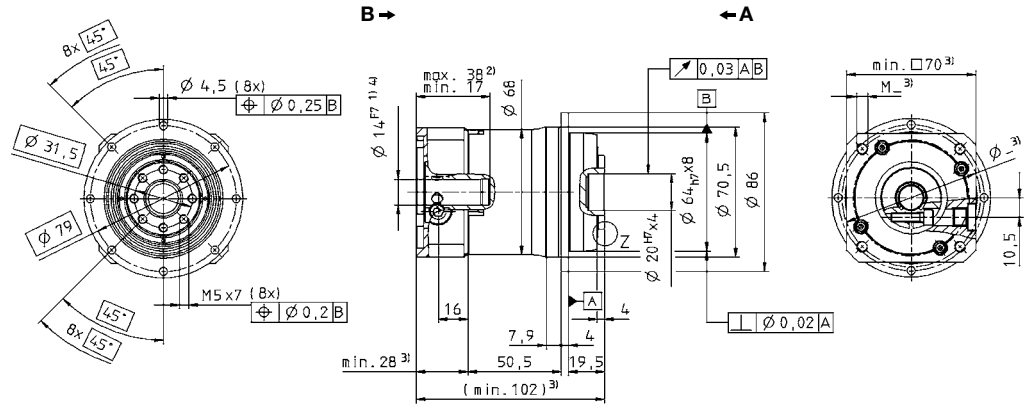
View A | View B

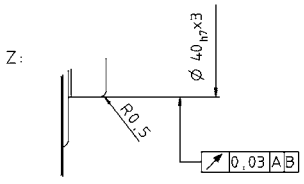
Motor shaft diameter [mm]

up to 11 [4] (B) clamping hub diameter



up to 14 [4] (C) clamping hub diameter





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

					1-stage			
Ratio [a]			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	kgcm²	0.78	0.62	0.48	0.40
				10^{-3} in.lb.s²	0.69	0.55	0.42	0.35
Clamping hub diameter [mm]	E	19	J_1	kgcm²	0.95	0.79	0.64	0.57
				10^{-3} in.lb.s²	0.84	0.70	0.57	0.50
	G	24	J_1	kgcm²	2.32	2.16	2.02	1.94
				10^{-3} in.lb.s²	2.05	1.91	1.78	1.72

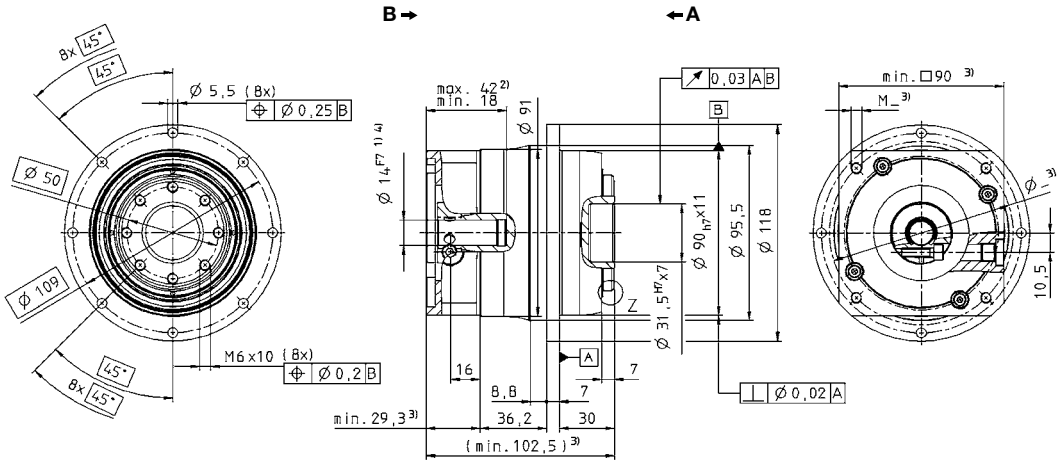
Reduced mass moments of inertia available on request.

[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

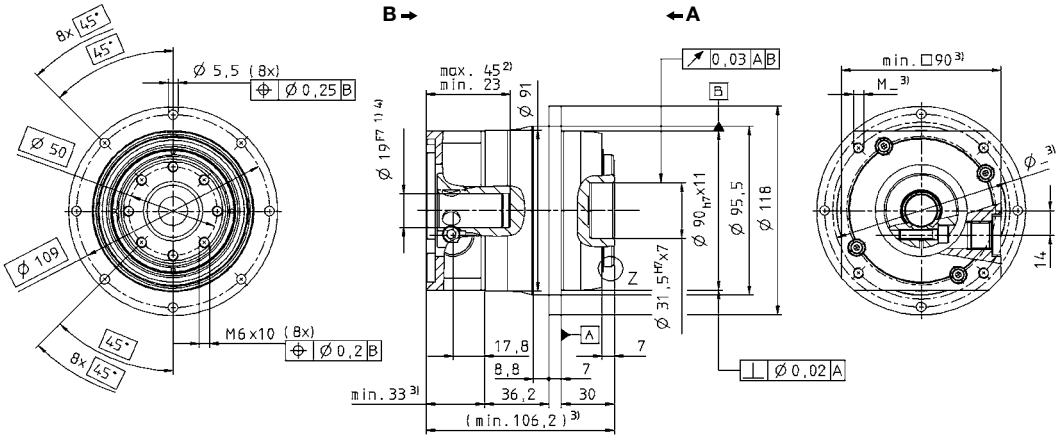
View A | View B

Motor shaft diameter [mm]

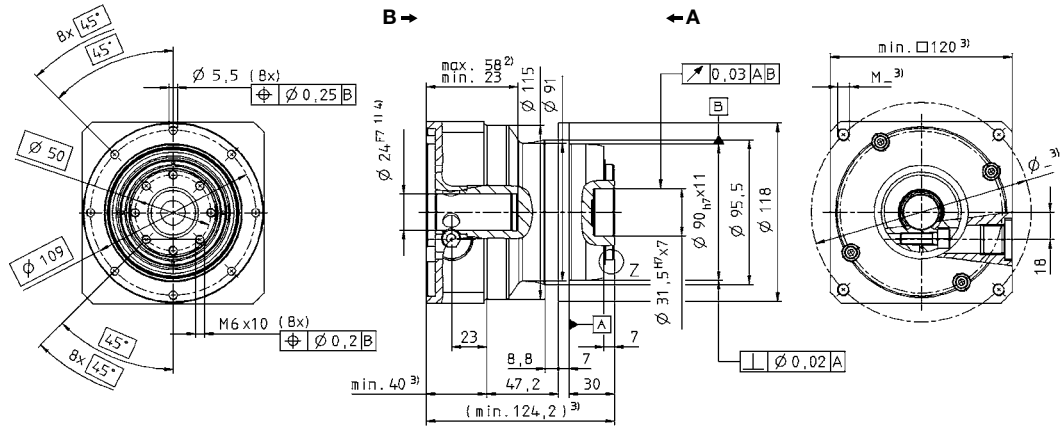
up to 14 [4] (C) clamping hub diameter

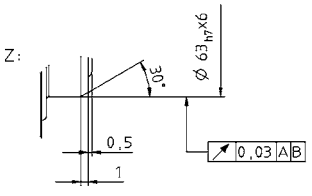


up to 19 [4] (E) clamping hub diameter



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

				2-stage												
Ratio [a]	i			**16**	**20**	**21**	**25**	**28**	**31**	**35**	**40**	**50**	**61**	**70**	**91**	**100**
cymex®-optimized acceleration torque (please contact us regarding the sizing)	T_{2Bcym}		Nm	162	162	–	162	162	–	162	–	162	–	162	–	–
			in.lb	1434	1434	–	1434	1434	–	1434	–	1434	–	1434	–	–
Max. acceleration torque (max. 1000 cycles per hour)	T_{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 n_{1N})	T_{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)	T_{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 T_{2N} and 20 °C ambient temperature) [b]	n_{1N}		rpm	3500	3500	3500	3500	3500	3500	3500	3500	3800	4500	4500	4500	4500
Max. input speed	n_{1Max}		rpm	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) [c]	T_{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	j_t		arcmin	Standard ≤ 3 / Reduced ≤ 1												
Torsional rigidity [c]	C_{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	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		%	94												
Service life (For calculation, see the Chapter "Information")	L_h		h	> 20000												
Weight incl. standard adapter plate	m		kg	3.6												
			lb_m	8.0												
Operating noise (with i=100 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)	B	11	J_1	kgcm²	0.17	0.14	0.15	0.13	0.11	0.13	0.10	0.09	0.09	0.09	0.09	0.09	0.09
				10^{-3} in.lb.s²	0.15	0.12	0.13	0.12	0.10	0.12	0.09	0.08	0.08	0.08	0.08	0.08	0.08
Clamping hub diameter [mm]	C	14	J_1	kgcm²	0.24	0.21	0.22	0.20	0.18	0.21	0.18	0.17	0.17	0.17	0.16	0.16	0.16
				10^{-3} in.lb.s²	0.21	0.19	0.19	0.19	0.16	0.18	0.16	0.15	0.15	0.15	0.14	0.15	0.14
	E	19	J_1	kgcm²	0.56	0.53	0.55	0.53	0.51	0.53	0.50	0.49	0.49	0.49	0.49	0.49	0.49
				10^{-3} in.lb.s²	0.50	0.47	0.49	0.47	0.45	0.47	0.44	0.43	0.43	0.43	0.43	0.43	0.43

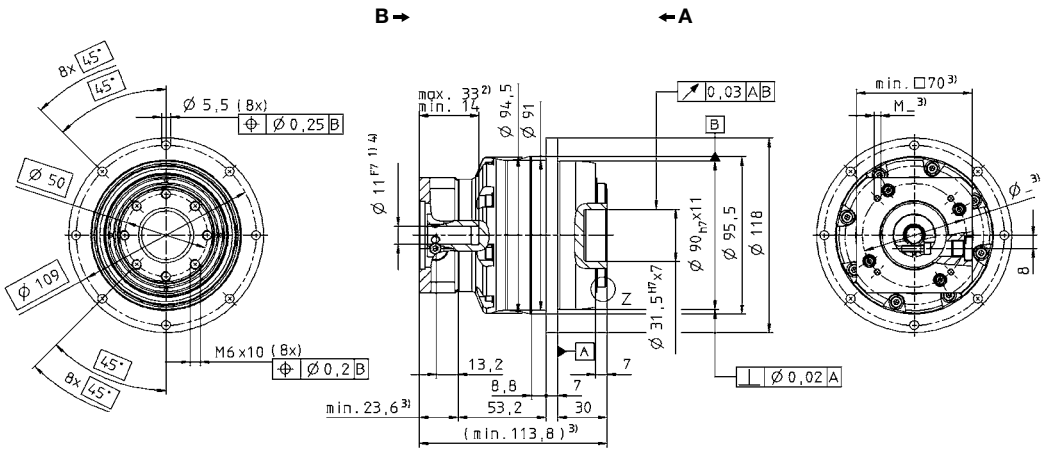
Reduced mass moments of inertia available on request.

[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

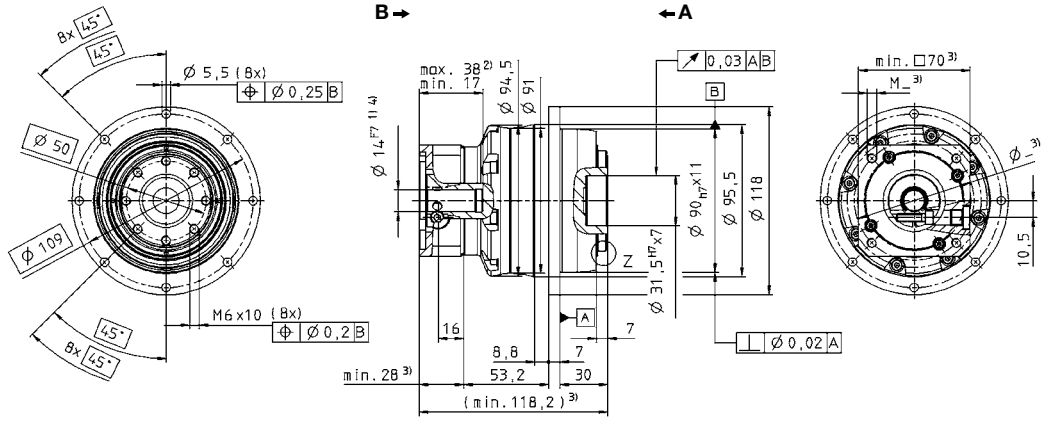
View A View B

Motor shaft diameter [mm]

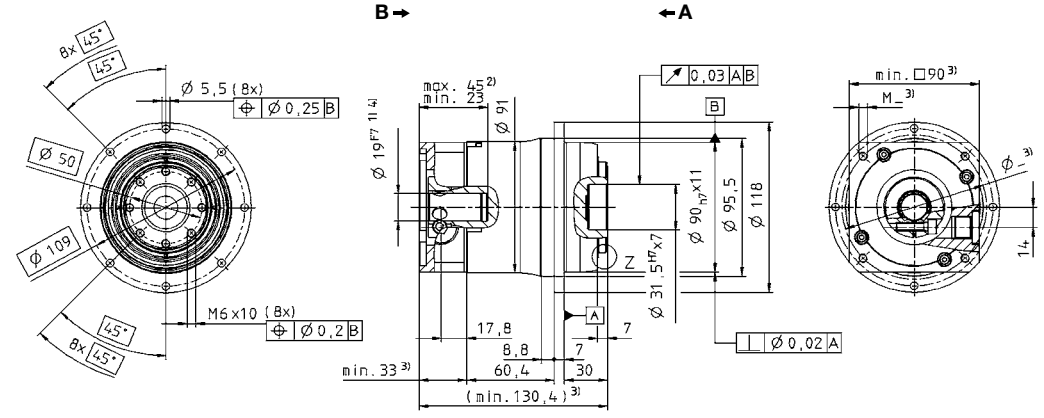
up to 11 4) (B) clamping hub diameter

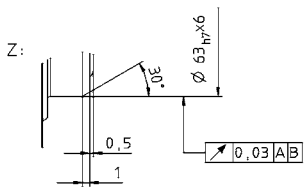


up to 14 4) (C) clamping hub diameter



up to 19 4) (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

					1-stage			
Ratio [a]			*i*		**4**	**5**	**7**	**10**
cymex®-optimized acceleration torque (please contact us regarding the sizing)			T_{2Bcym}	Nm	390	420	350	275
				in.lb	3452	3717	3098	2434
Max. acceleration torque (max. 1000 cycles per hour)			T_{2B}	Nm	350	380	330	265
				in.lb	3098	3363	2921	2345
Nominal output torque (with n_{1N})			T_{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)			T_{2Not}	Nm	625	625	625	625
				in.lb	5531	5531	5531	5531
Nominal input speed (with T_{2N} and 20 °C ambient temperature) [b]			n_{1N}	rpm	2300	2500	2500	2500
Max. input speed			n_{1Max}	rpm	4500	4500	4500	4500
Mean no load running torque (with n_1=3000 rpm and 20 °C gearhead temperature) [c]			T_{012}	Nm	3.3	2.7	2.0	1.4
				in.lb	29.2	23.9	17.7	12.4
Max. torsional backlash			j_t	arcmin	Standard ≤ 3 / Reduced ≤ 1			
Torsional rigidity [c]			C_{t21}	Nm/ arcmin	80	86	76	62
				in.lb/ arcmin	708	761	673	549
Tilting rigidity			C_{2K}	Nm/ arcmin	550			
				in.lb/ arcmin	4868			
Max. axial force [d]			F_{2AMax}	N	4150			
				lb_f	934			
Max. tilting moment			M_{2KMax}	Nm	440			
				in.lb	3894			
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	6.5			
				lb_m	14.4			
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	$kgcm^2$	2.59	2.11	1.69	1.45
				10^{-3} in.lb.s²	2.29	1.87	1.50	1.28
Clamping hub diameter [mm]	G	24	J_1	$kgcm^2$	3.28	2.80	2.38	2.14
				10^{-3} in.lb.s²	2.90	2.48	2.11	1.89
	H	28	J_1	$kgcm^2$	2.89	2.41	1.99	1.75
				10^{-3} in.lb.s²	2.56	2.13	1.76	1.55
	K	38	J_1	$kgcm^2$	10.3	9.87	9.45	9.21
				10^{-3} in.lb.s²	9.11	8.73	8.36	8.15

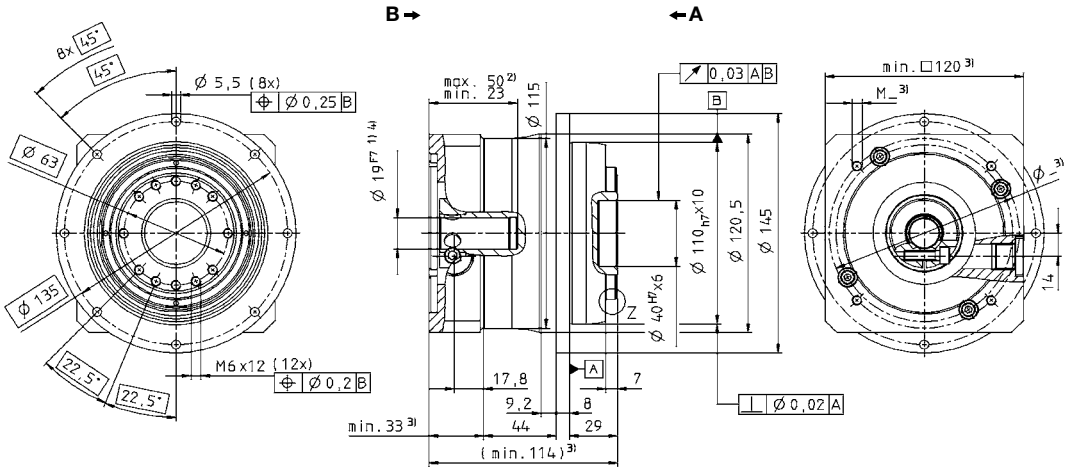
Reduced mass moments of inertia available on request.

[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

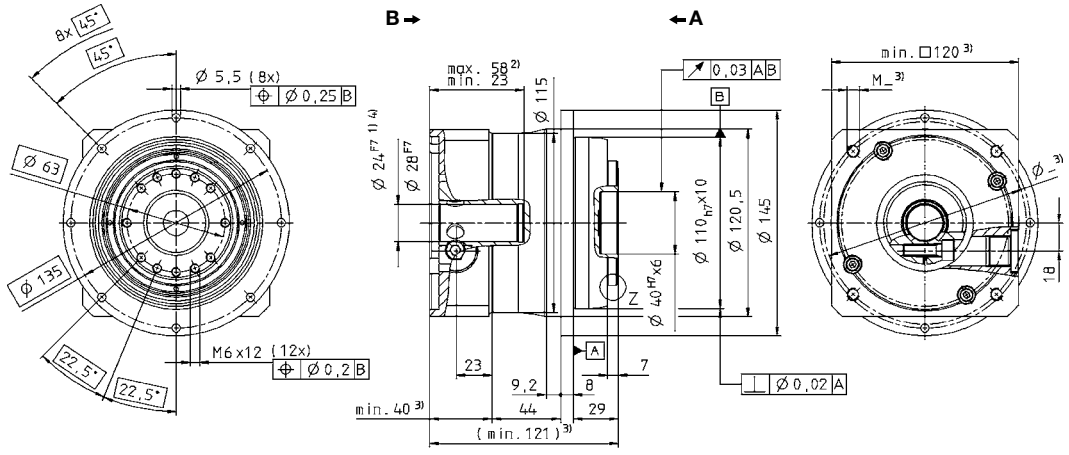
View A View B

Motor shaft diameter [mm]

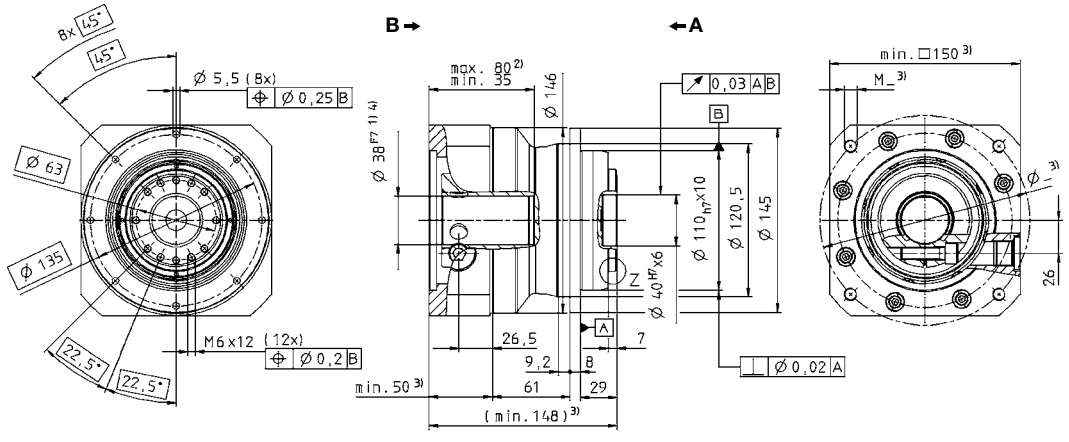
up to 19 [4] (E) clamping hub diameter

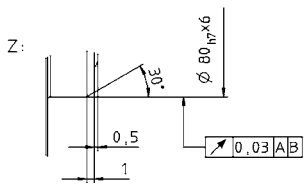


up to 24/28 [4] (G/H) clamping hub diameter



up to 38 [4] (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

				2-stage												
Ratio [a]	i			**16**	**20**	**21**	**25**	**28**	**31**	**35**	**40**	**50**	**61**	**70**	**91**	**100**
cymex®-optimized acceleration torque (please contact us regarding the sizing)	T_{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)	T_{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 n_{1N})	T_{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)	T_{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 T_{2N} and 20 °C ambient temperature) [b]	n_{1N}	rpm		2800	2800	2800	2800	2800	2800	2800	2800	3100	3500	3500	4200	4200
Max. input speed	n_{1Max}	rpm		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) [c]	T_{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	j_t	arcmin		Standard ≤ 3 / Reduced ≤ 1												
Torsional rigidity [c]	C_{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	C_{2K}	Nm/ arcmin		550												
		in.lb/ arcmin		4867												
Max. axial force [d]	F_{2AMax}	N		4150												
		lb_f		934												
Max. tilting moment	M_{2KMax}	Nm		440												
		in.lb		3894												
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		6.7												
		lb_m		14.8												
Operating noise (with i=100 and n_1 = 3000 rpm no load)	L_{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	J_1	kgcm²	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.s²	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	J_1	kgcm²	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.s²	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	J_1	kgcm²	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.s²	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

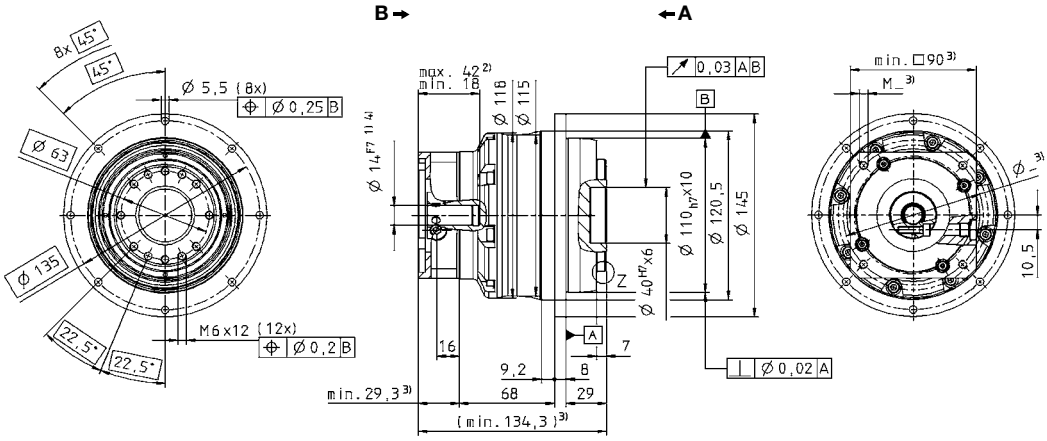
Reduced mass moments of inertia available on request.

[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

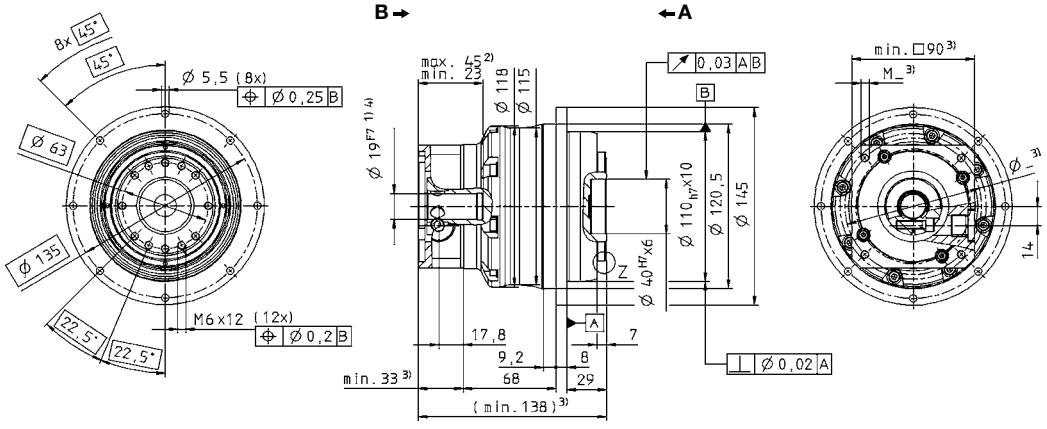
View A | View B

Motor shaft diameter [mm]

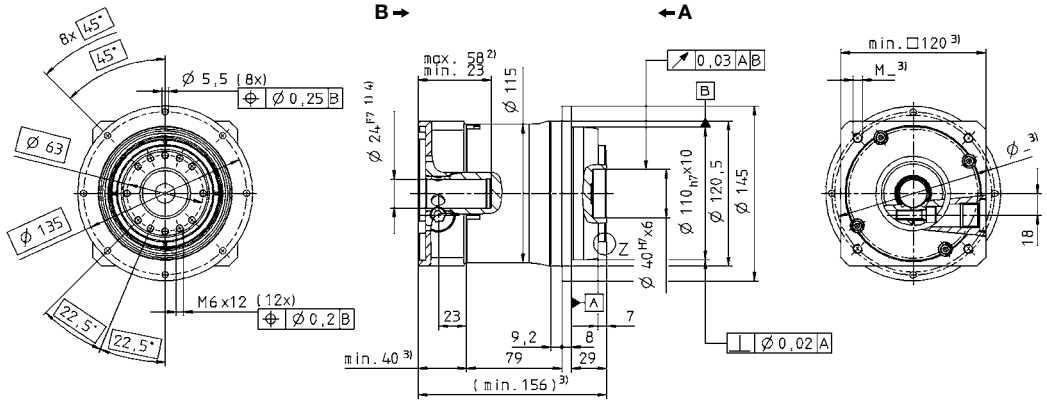
up to 14 [4] (C) clamping hub diameter



up to 19 [4] (E) clamping hub diameter



up to 24 [4] (G) clamping hub diameter



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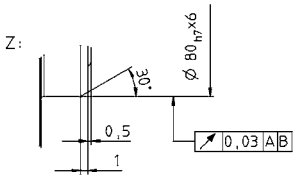


Non-tolerated dimensions ±1 mm

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

					1-stage			
Ratio [a]			i		**4**	**5**	**7**	**10**
cymex®-optimized acceleration torque (please contact us regarding the sizing)			T_{2Bcym}	Nm	750	800	–	600
				in.lb	6638	7080	–	5310
Max. acceleration torque (max. 1000 cycles per hour)			T_{2B}	Nm	700	700	700	540
				in.lb	6195	6195	6195	4779
Nominal output torque (with n_{1N})			T_{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)			T_{2Not}	Nm	1250	1250	1250	1250
				in.lb	11063	11063	11063	11063
Nominal input speed (with T_{2N} and 20 °C ambient temperature) [b]			n_{1N}	rpm	1900	2000	2500	2500
Max. input speed			n_{1Max}	rpm	4000	4000	4000	4000
Mean no load running torque (with n_1=3000 rpm and 20 °C gearhead temperature) [c]			T_{012}	Nm	8.1	6.6	4.8	3.5
				in.lb	71.7	58.4	42.5	31.0
Max. torsional backlash			j_t	arcmin	Standard ≤ 3 / Reduced ≤ 1			
Torsional rigidity [c]			C_{t21}	Nm/ arcmin	190	187	159	123
				in.lb/ arcmin	1682	1655	1407	1089
Tilting rigidity			C_{2K}	Nm/ arcmin	560			
				in.lb/ arcmin	4956			
Max. axial force [d]			F_{2AMax}	N	6130			
				lb_f	1379			
Max. tilting moment			M_{2KMax}	Nm	1335			
				in.lb	11815			
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	14.0			
				lb_m	30.9			
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	$kgcm^2$	9.47	7.85	6.39	5.54
				10^{-3} in.lb.s²	8.38	6.95	5.66	4.90
Clamping hub diameter [mm]	I	32	J_1	$kgcm^2$	12.6	11.0	9.55	8.71
				10^{-3} in.lb.s²	11.1	9.74	8.45	7.70
	K	38	J_1	$kgcm^2$	13.7	12.1	10.6	9.78
				10^{-3} in.lb.s²	12.1	10.7	9.38	8.65
	M	48	J_1	$kgcm^2$	28.3	26.7	25.3	24.4
				10^{-3} in.lb.s²	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

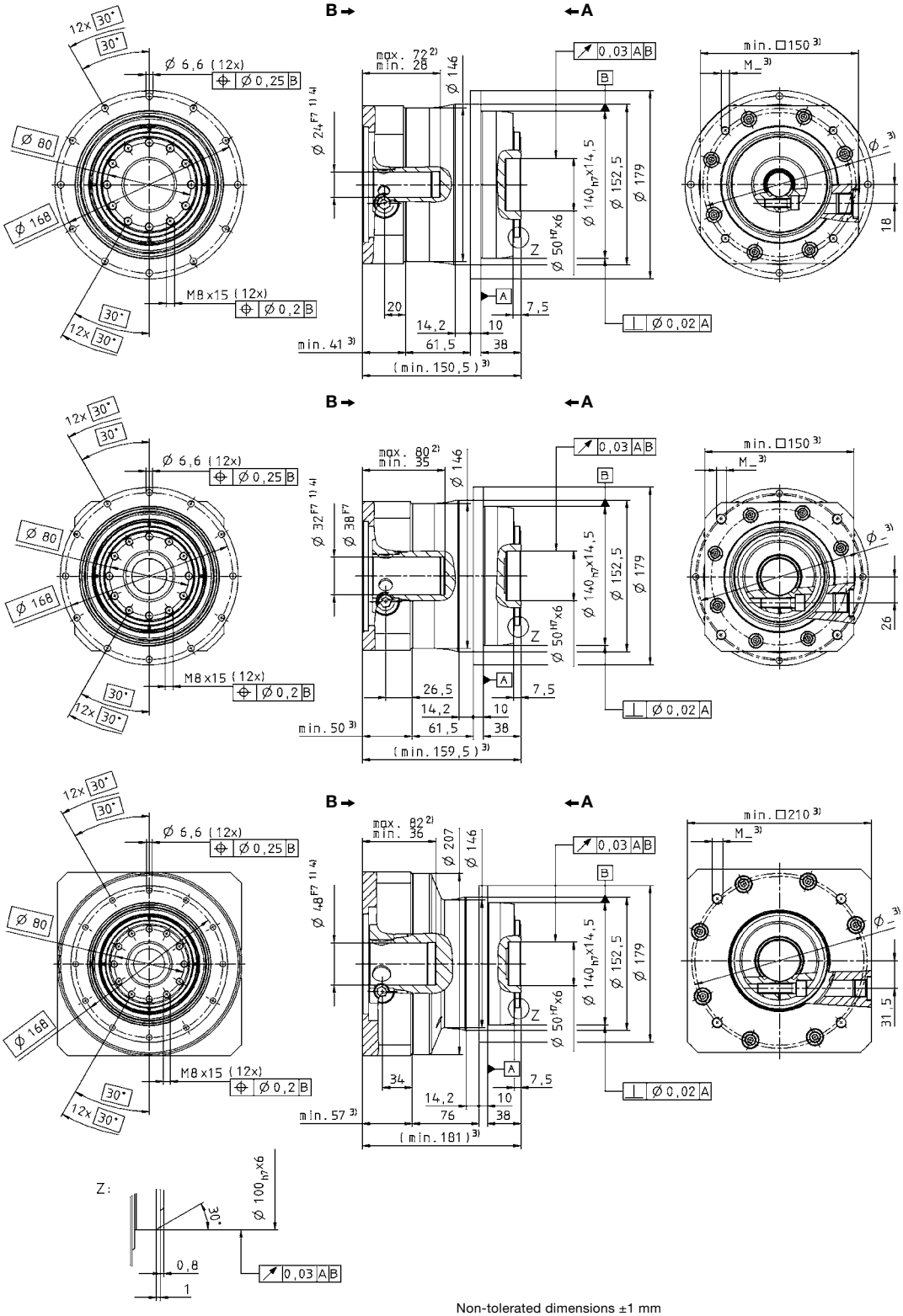
View A View B

Motor shaft diameter [mm]

up to 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

				2-stage												
Ratio [a]	i			**16**	**20**	**21**	**25**	**28**	**31**	**35**	**40**	**50**	**61**	**70**	**91**	**100**
cymex®-optimized acceleration torque (please contact us regarding the sizing)	T_{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)	T_{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 n_{1N})	T_{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)	T_{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 T_{2N} and 20 °C ambient temperature) [b]	n_{1N}	rpm		2900	2900	2900	2900	2900	2900	2900	2900	3200	3200	3200	3900	3900
Max. input speed	n_{1Max}	rpm		5000	5000	5000	5000	5000	5000	5000	5000	5000	5000	5000	5000	5000
Mean no load running torque (with n_1=3000 rpm and 20 °C gearhead temperature) [c]	T_{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	j_t	arcmin		Standard ≤ 3 / Reduced ≤ 1												
Torsional rigidity [c]	C_{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	C_{2K}	Nm/ arcmin		560												
		in.lb/ arcmin		4956												
Max. axial force [d]	F_{2AMax}	N		6130												
		lb_f		1379												
Max. tilting moment	M_{2KMax}	Nm		1335												
		in.lb		11815												
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		14.1												
		lb_m		31.2												
Operating noise (with i=100 and n_1=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	kgcm²	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.s²	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	J_1	kgcm²	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.s²	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	J_1	kgcm²	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.s²	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

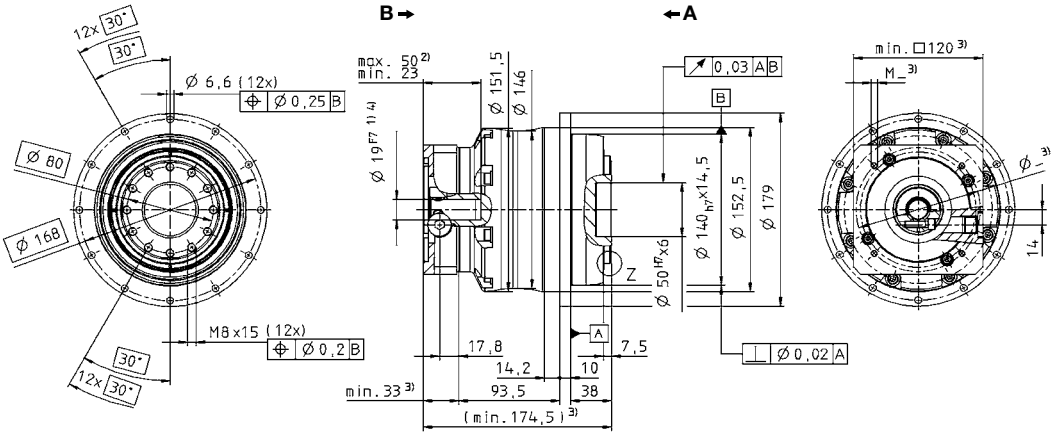
Reduced mass moments of inertia available on request.

[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

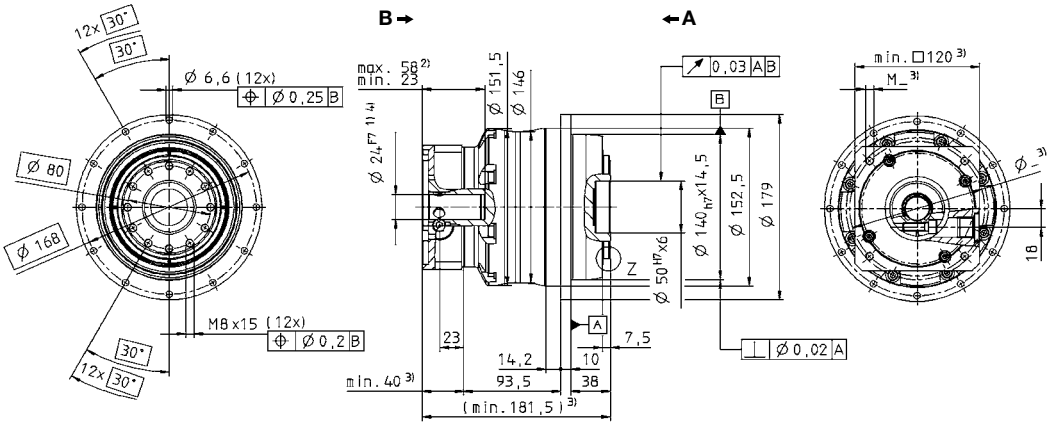
View A | View B

Motor shaft diameter [mm]

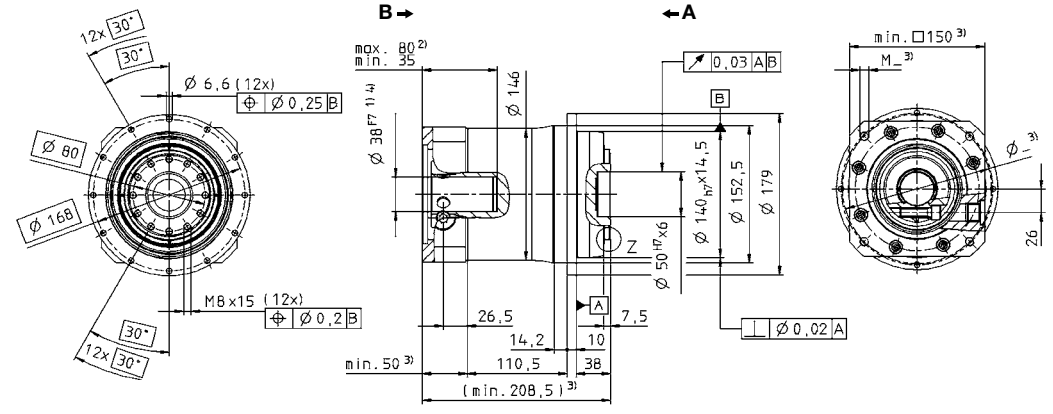
up to 19 [4] (E) clamping hub diameter

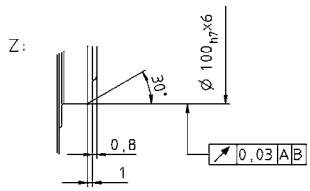


up to 24 [4] (G) clamping hub diameter



up to 38 [4] (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

					1-stage			
Ratio [a]			i		**4**	**5**	**7**	**10**
cymex®-optimized acceleration torque (please contact us regarding the sizing)			T_{2Bcym}	Nm	1900	2000	1900	1500
				in.lb	16815	17700	16815	13275
Max. acceleration torque (max. 1000 cycles per hour)			T_{2B}	Nm	1600	1600	1600	1400
				in.lb	14160	14160	14160	12390
Nominal output torque (with n_{1N})			T_{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)			T_{2Not}	Nm	2750	2750	2750	2750
				in.lb	24338	24338	24338	24338
Nominal input speed (with T_{2N} and 20 °C ambient temperature) [b]			n_{1N}	rpm	1400	1500	2000	2000
Max. input speed			n_{1Max}	rpm	3500	3500	3500	3500
Mean no load running torque (with n_1 = 3000 rpm and 20 °C gearhead temperature) [c]			T_{012}	Nm	15.6	12.7	9.4	7.0
				in.lb	138.1	112.4	83.2	62.0
Max. torsional backlash			j_t	arcmin	Standard ≤ 3 / Reduced ≤ 1			
Torsional rigidity [c]			C_{t21}	Nm/ arcmin	610	610	550	445
				in.lb/ arcmin	5399	5399	4868	3938
Tilting rigidity			C_{2K}	Nm/ arcmin	1452			
				in.lb/ arcmin	12850			
Max. axial force [d]			F_{2AMax}	N	10050			
				lb_f	2261			
Max. tilting moment			M_{2KMax}	Nm	3280			
				in.lb	29028			
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	30.0			
				lb_m	66			
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	$kgcm^2$	44.5	34.6	25.5	20.6
				10^{-3} in.lb.s²	39.4	30.6	22.6	18.2
Clamping hub diameter [mm]	M	48	J_1	$kgcm^2$	51.8	41.9	32.9	28.0
				10^{-3} in.lb.s²	45.8	37.1	29.1	24.8
	N	55	J_1	$kgcm^2$	61,5	51,5	42,3	37,3
				10^{-3} in.lb.s²	54,4	45,6	37,5	33,0

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 48 mm
[d] Refers to center of the output shaft or flange

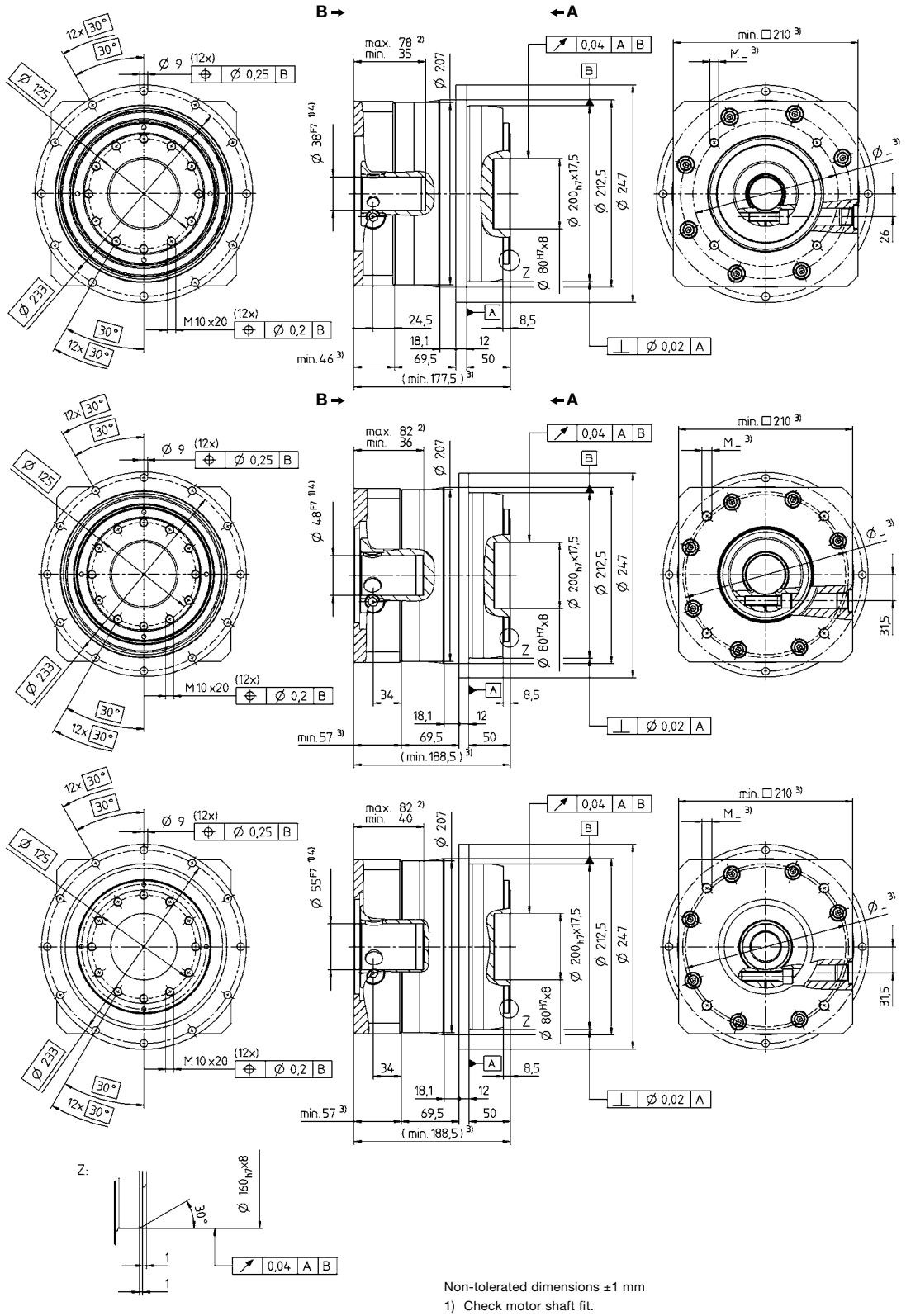
View A View B

Motor shaft diameter [mm]

up to 38 [4] (K) clamping hub diameter

up to 48 [4] (M) clamping hub diameter

up to 55 [4] (N) 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

				2-stage												
Ratio [a]			*i*	**16**	**20**	**21**	**25**	**28**	**31**	**35**	**40**	**50**	**61**	**70**	**91**	**100**
cymex®-optimized acceleration torque (please contact us regarding the sizing)			T_{2Bcym} Nm	2000	2000	–	2000	2000	–	2000	1800	1800	–	1800	–	1500
			T_{2Bcym} in.lb	17700	17700	–	17700	17700	–	17700	15930	15930	–	15930	–	13275
Max. acceleration torque (max. 1000 cycles per hour)			T_{2B} Nm	1600	1600	1400	1600	1600	1600	1600	1600	1600	1400	1600	1300	1400
			T_{2B} in.lb	14160	14160	12390	14160	14160	14160	14160	14160	14160	12390	14160	11505	12390
Nominal output torque (with n_{1N})			T_{2N} Nm	980	980	850	1050	1050	1250	1250	850	1050	1100	900	700	800
			T_{2N} 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)			T_{2Not} Nm	2750	2750	2750	2750	2750	2750	2750	2750	2750	2750	2750	2750	2750
			T_{2Not} in.lb	24338	24338	24338	24338	24338	24338	24338	24338	24338	24338	24338	24338	24338
Nominal input speed (with T_{2N} and 20 °C ambient temperature) [b]			n_{1N} rpm	2500	2500	2500	2500	2500	2500	2500	2500	2900	3200	3200	3400	3400
Max. input speed [c]			n_{1Max} rpm	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) [c]			T_{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
			T_{012} 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			j_t arcmin	Standard ≤ 3 / Reduced ≤ 1												
Torsional rigidity [c]			C_{t21} Nm/ arcmin	585	580	465	570	560	440	560	520	525	415	480	360	395
			C_{t21} in.lb/ arcmin	5177	5133	4115	5045	4956	3894	4956	4602	4646	3673	4248	3186	3496
Tilting rigidity			C_{2K} Nm/ arcmin	1452												
			C_{2K} in.lb/ arcmin	12850												
Max. axial force [d]			F_{2AMax} N	10050												
			F_{2AMax} lb_f	2261												
Max. tilting moment			M_{2KMax} Nm	3280												
			M_{2KMax} in.lb	29028												
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	34.0												
			m lb_m	75.1												
Operating noise (with *i*=100 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)	G	24	J_1 kgcm²	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
			J_1 10^{-3} in.lb.s²	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
Clamping hub diameter [mm]	I	32	J_1 kgcm²	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
			J_1 10^{-3} in.lb.s²	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	J_1 kgcm²	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
			J_1 10^{-3} in.lb.s²	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	J_1 kgcm²	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
			J_1 10^{-3} in.lb.s²	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

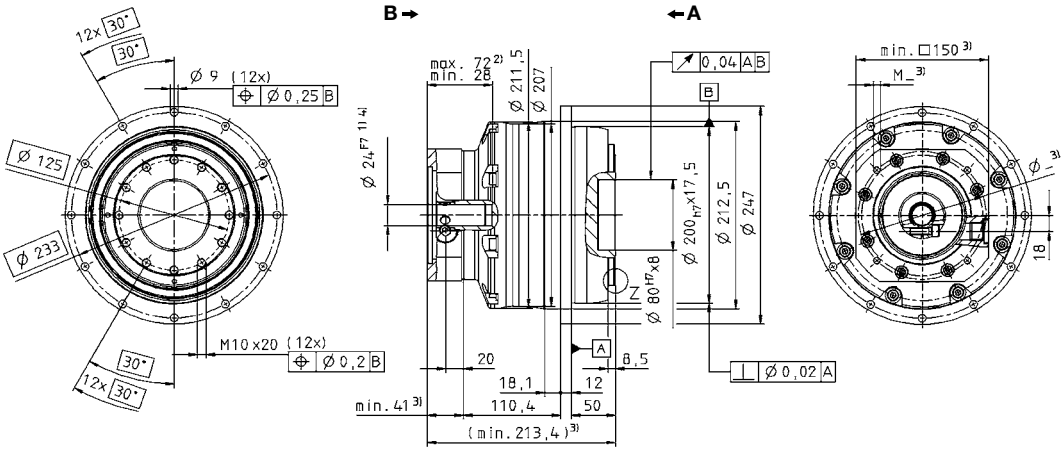
Reduced mass moments of inertia available on request.

[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

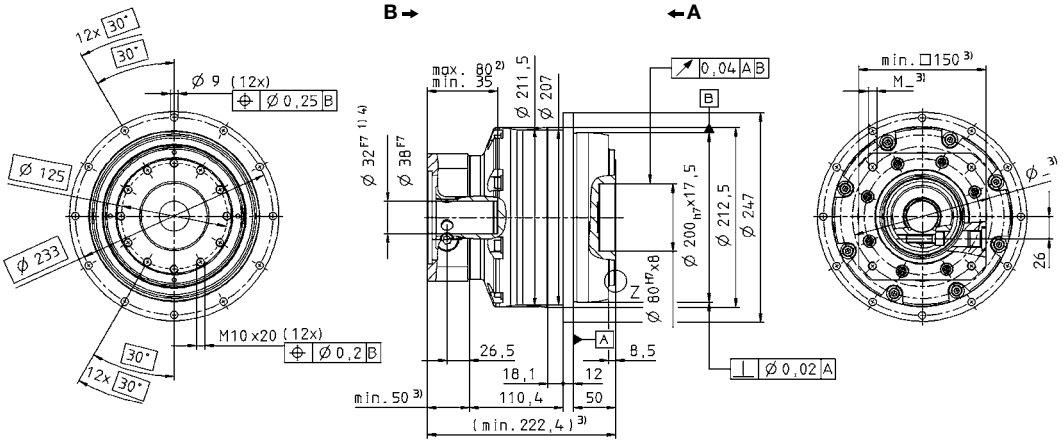
View A View B

Motor shaft diameter [mm]

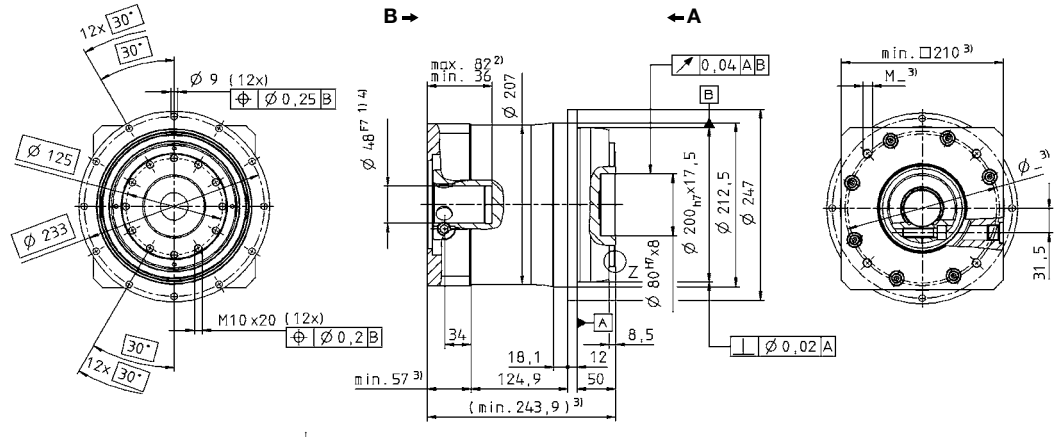
up to 24 [4] (G) clamping hub diameter

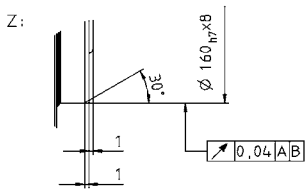


up to 32/38 [4] (I/K) clamping hub diameter



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

				1-stage			2-stage									
Ratio [a]			*i*	**5**	**7**	**10**	**20**	**21**	**25**	**31**	**35**	**50**	**61**	**70**	**91**	**100**
Max. acceleration torque (max. 1000 cycles per hour)			T_{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	26550	24780	29205	24780	24780
Nominal output torque (with n_{1N})			T_{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)			T_{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 T_{2N} and 20 °C ambient temperature) [b]			n_{1N} rpm	1000	1400	1700	2000	2000	2000	2000	2000	2300	2400	2400	2500	2500
Max. input speed			n_{1Max} rpm	2500	2500	2500	3500	3500	3500	3500	3500	3500	3500	3500	3500	3500
Mean no load running torque (with n_1=2000 rpm and 20 °C gearhead temperature)			T_{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			j_t arcmin	Standard ≤ 3 / Reduced ≤ 1			Standard ≤ 3 / Reduced ≤ 2									
Torsional rigidity			C_{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			C_{2K} Nm/ arcmin	5560												
			in.lb/ arcmin	49206												
Max. axial force [c]			F_{2AMax} N	33000												
			lb_f	7425												
Max. tilting moment			M_{2KMax} Nm	3900			5900									
			in.lb	34515			52215									
Efficiency at full load			η %	95			93									
Service life (For calculation, see the Chapter "Information")			L_h h	> 20000												
Weight incl. standard adapter plate			*m* kg	60			58.5									
			lb_m	132.6			129.3									
Operating noise (with *i*=10 and n_1=2000 rpm without 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)	M	48	J_1 kgcm²	–	–	–	31.6	27.7	26.6	26.1	25.0	24.1	24.0	23.9	23.9	23.8
			10^{-3} in.lb.s²				27.9	24.5	23.5	23.1	22.1	21.4	21.3	21.2	21.1	21.0
Clamping hub diameter [mm]	N	55	J_1 kgcm²	86.6	63.8	51.4	–	–	–	–	–	–	–	–	–	–
			10^{-3} in.lb.s²	76.6	56.5	45.5										

Reduced mass moments of inertia available on request.

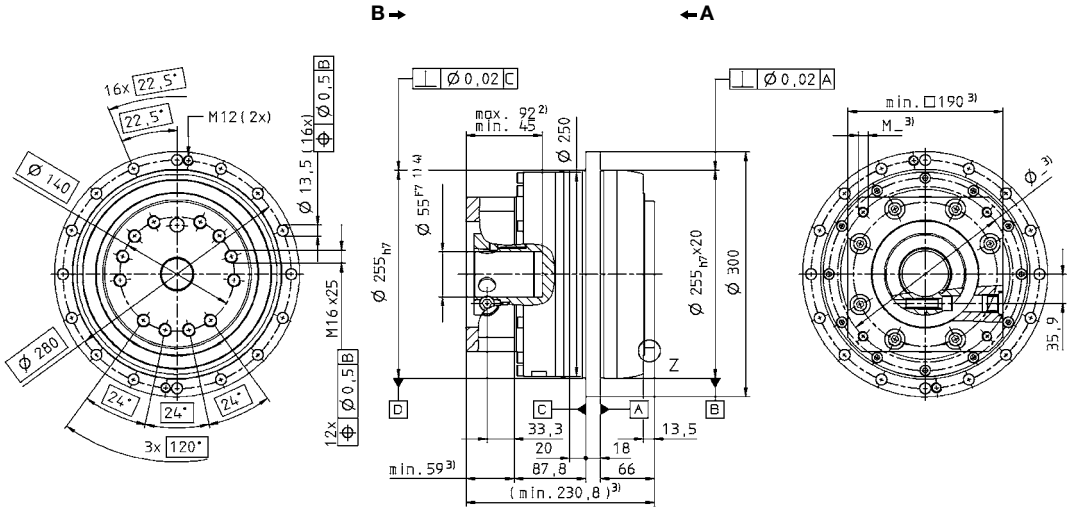
[a] Other ratios available on request
[b] For higher ambient temperatures, please reduce input speed
[c] Refers to center of the output shaft or flange

View A | View B

Motor shaft diameter [mm]

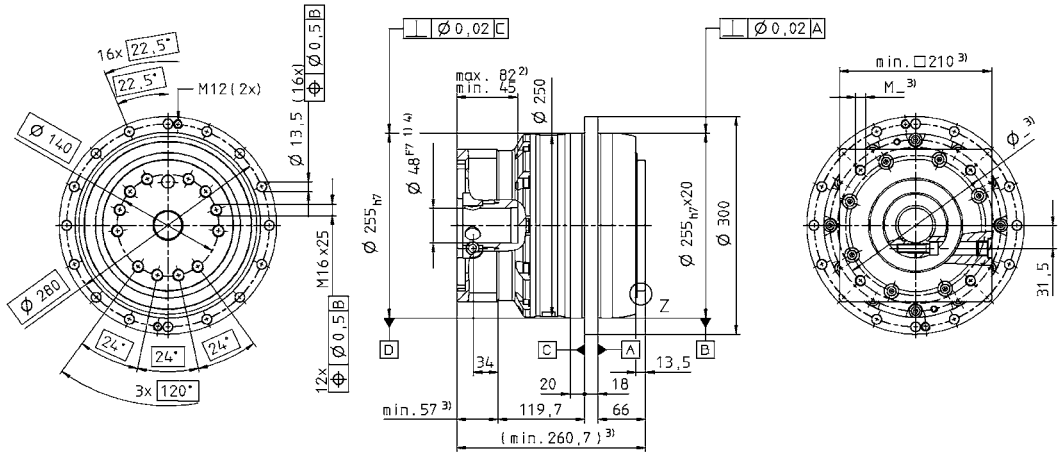
up to 55 [4] (N) clamping hub diameter

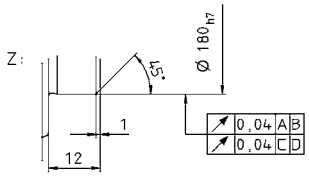
1-stage:



up to 48 [4] (M) clamping hub diameter

2-stage:





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

					1-stage			2-stage									
Ratio [a]				i			**5**	**7**	**10**	**20**	**21**	**25**	**31**	**35**	**50**	**61**	**70**	**91**	**100**
Max. acceleration torque (max. 1000 cycles per hour)			T_{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 n_{1N})			T_{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)			T_{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 T_{2N} and 20 °C ambient temperature) [b]			n_{1N}	rpm	900	1300	1500	1500	1500	1500	1500	1500	2000	2100	2100	2200	2200
Max. input speed			n_{1Max}	rpm	2500	2500	2500	3500	3500	3500	3500	3500	3500	3500	3500	3500	3500
Mean no load running torque (with n_1=2000 rpm and 20 °C gearhead temperature)			T_{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			j_t	arcmin	Standard ≤ 3 / Reduced ≤ 1			Standard ≤ 3 / Reduced ≤ 2									
Torsional rigidity			C_{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			C_{2K}	Nm/ arcmin	9480												
				in.lb/ arcmin	83898												
Max. axial force [c]			F_{2AMax}	N	50000												
				lb_f	11250												
Max. tilting moment			M_{2KMax}	Nm	5500			8800									
				in.lb	48675			77880									
Efficiency at full load			η	%	95			93									
Service life (For calculation, see the Chapter "Information")			L_h	h	> 20000												
Weight incl. standard adapter plate			m	kg	82			77.5									
				lb_m	181.2			171.3									
Operating noise (with i=10 and n_1=2000 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)	M	48	J_1	kgcm²	–	–	–	35.9	40.2	33.7	35.4	27.4	25.4	25.8	25.0	25.2	24.8
				10^{-3} in.lb.s²				31.7	35.6	29.8	31.3	24.3	22.5	22.8	22.1	22.3	22.0
Clamping hub diameter [mm]	O	60	J_1	kgcm²	181.9	142.0	119.8	–	–	–	–	–	–	–	–	–	–
				10^{-3} in.lb.s²	161.0	125.7	106.0										

Reduced mass moments of inertia available on request.

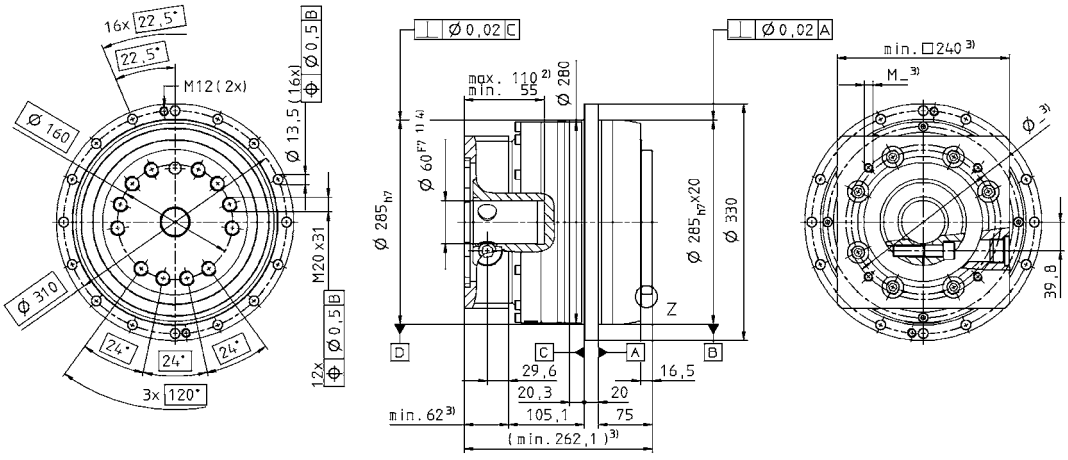
[a] Other ratios available on request
[b] For higher ambient temperatures, please reduce input speed
[c] Refers to center of the output shaft or flange

View A View B

Motor shaft diameter [mm]

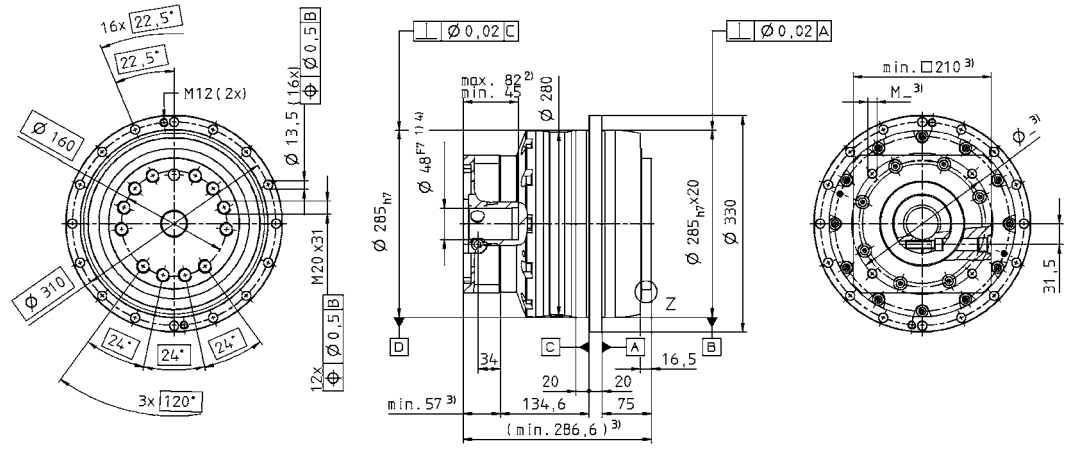
1-stage:

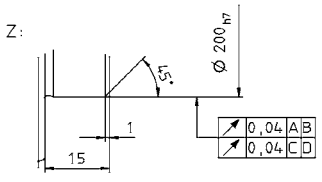
up to 60 [4] (O) clamping hub diameter



2-stage:

up to 48 [4] (M) clamping hub diameter





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

					2-stage				3-stage			
Ratio [a]			i		**22**	**27.5**	**38.5**	**55**	**88**	**110**	**154**	**220**
Max. acceleration torque (max. 1000 cycles per hour)			T_{2B}	Nm	230	230	230	230	230	230	230	230
				in.lb	2036	2036	2036	2036	2036	2036	2036	2036
Nominal output torque (with n_{1N})			T_{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)			T_{2Not}	Nm	525	525	525	525	525	525	525	525
				in.lb	4646	4646	4646	4646	4646	4646	4646	4646
Nominal input speed (with T_{2N} and 20 °C ambient temperature) [b]			n_{1N}	rpm	4000	4000	4000	4000	4500	4500	4500	4500
Max. input speed			n_{1Max}	rpm	6000	6000	6000	6000	6000	6000	6000	6000
Mean no load running torque (with n_1=3000 rpm and 20 °C gearhead temperature) [c]			T_{012}	Nm	0.60	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			j_t	arcmin	≤ 1				≤ 1			
Torsional rigidity [c]			C_{t21}	Nm/ arcmin	43	43	43	42	42	42	42	42
				in.lb/ arcmin	381	381	381	372	372	372	372	372
Tilting rigidity			C_{2K}	Nm/ arcmin	225				225			
				in.lb/ arcmin	1991				1991			
Max. axial force [d]			F_{2AMax}	N	2150				2150			
				lb_f	484				484			
Max. tilting moment			M_{2KMax}	Nm	400				400			
				in.lb	3540				3540			
Efficiency at full load			η	%	94				92			
Service life (For calculation, see the Chapter "Information")			L_h	h	> 20000				> 20000			
Weight incl. standard adapter plate			m	kg	3.2				3.6			
				lb_m	7.1				8.0			
Operating noise (with n_1=3000 rpm no load)			L_{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	J_1	$kgcm^2$	0.21	0.18	0.16	0.14	0.16	0.15	0.14	0.13
				10^{-3} in.lb.s²	0.19	0.16	0.14	0.12	0.14	0.13	0.12	0.12
Clamping hub diameter [mm]	E	19	J_1	$kgcm^2$	0.52	0.50	0.47	0.46	–	–	–	–
				10^{-3} in.lb.s²	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

View A View B

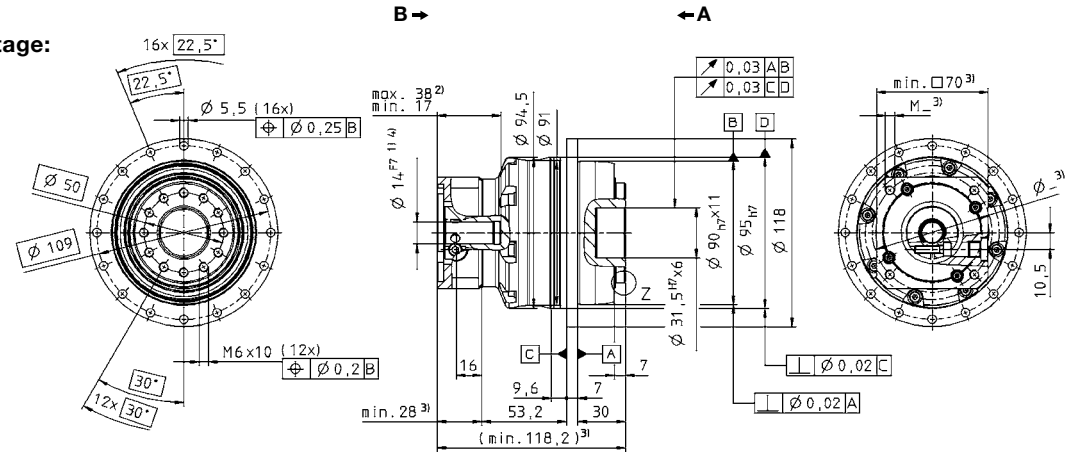
Motor shaft diameter [mm]

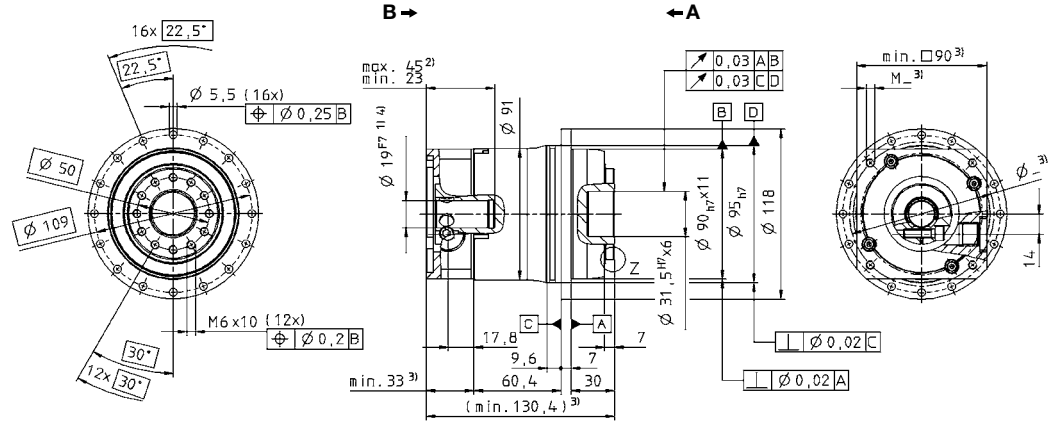
up to 14 [4] (C) clamping hub diameter

up to 19 [4] (E) clamping hub diameter

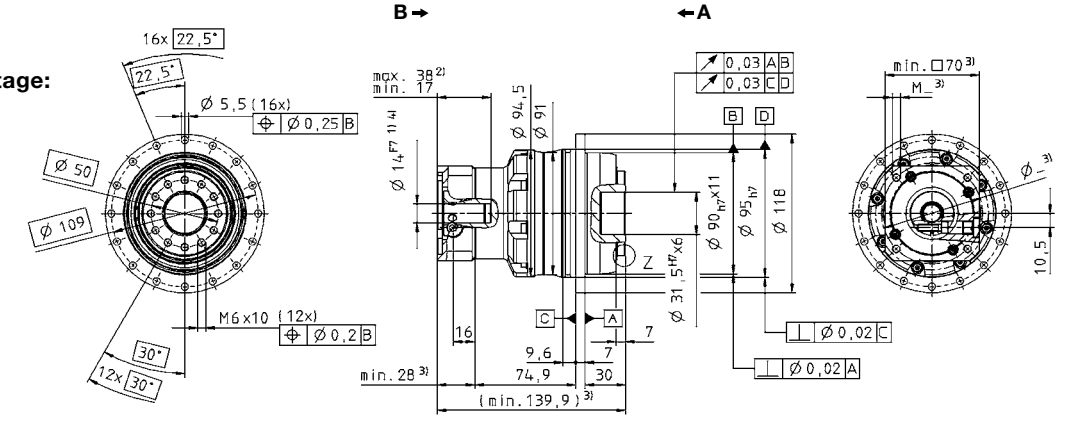
up to 14 [4] (C) clamping hub diameter

2-stage:





3-stage:



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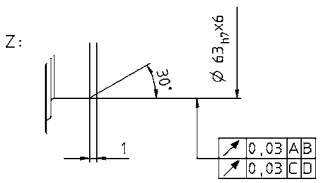


Non-tolerated dimensions ±1 mm

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

					2-stage				3-stage				
Ratio [a]			i		**22**	**27.5**	**38.5**	**55**	**66**	**88**	**110**	**154**	**220**
Max. acceleration torque (max. 1000 cycles per hour)			T_{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 n_{1N})			T_{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)			T_{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 T_{2N} and 20 °C ambient temperature) [b]			n_{1N}	rpm	3500	3500	3500	3500	4000	4000	4000	4000	4000
Max. input speed			n_{1Max}	rpm	6000	6000	6000	6000	6000	6000	6000	6000	6000
Mean no load running torque (with n_1=3000 rpm and 20 °C gearhead temperature) [c]			T_{012}	Nm	1.1	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			j_t	arcmin	≤ 1				≤ 1				
Torsional rigidity [c]			C_{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			C_{2K}	Nm/ arcmin	550				550				
				in.lb/ arcmin	4868				4868				
Max. axial force [d]			F_{2AMax}	N	4150				4150				
				lb_f	934				934				
Max. tilting moment			M_{2KMax}	Nm	550				550				
				in.lb	4868				4868				
Efficiency at full load			η	%	94				92				
Service life (For calculation, see the Chapter "Information")			L_h	h	> 20000				> 20000				
Weight incl. standard adapter plate			m	kg	5.6				6.1				
				lb_m	12.4				13.5				
Operating noise (with n_1=3000 rpm no load)			L_{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	J_1	kgcm²	0.87	0.70	0.60	0.55	0.63	0.56	0.53	0.51	0.50
				10^{-3} in.lb.s²	0.77	0.62	0.53	0.49	0.56	0.50	0.47	0.45	0.44
Clamping hub diameter [mm]	G	24	J_1	kgcm²	2.39	2.22	2.12	2.07	–	–	–	–	–
				10^{-3} in.lb.s²	2.12	1.96	1.88	1.83					

Reduced mass moments of inertia available on request.

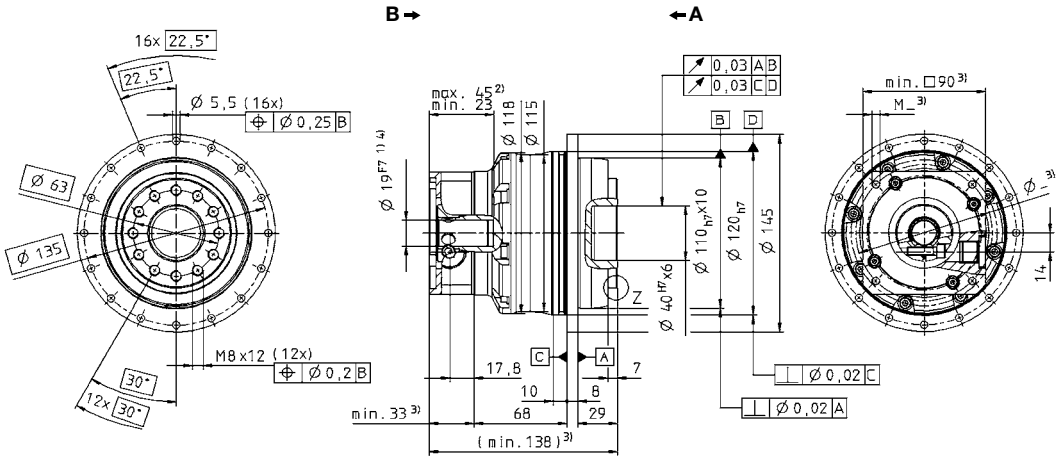
[a] Other ratios available on request
[b] For higher ambient temperatures, please reduce input speed
[c] Valid for clamping hub diameter of 19 mm
[d] Refers to center of the output shaft or flange

View A View B

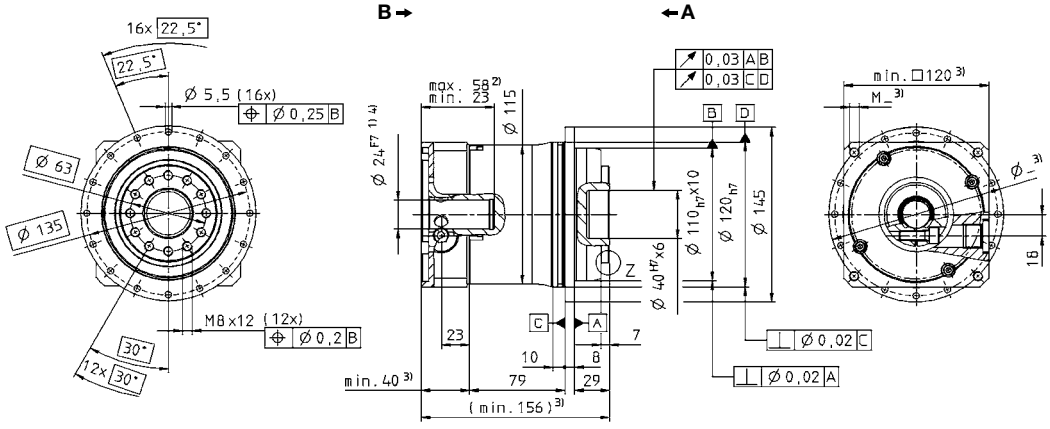
Motor shaft diameter [mm]

2-stage:

up to 19 [4] (E) clamping hub diameter

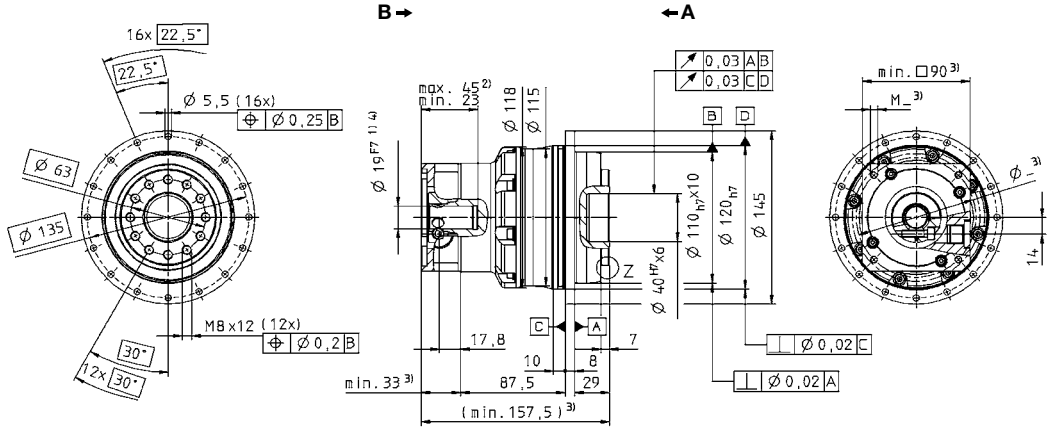


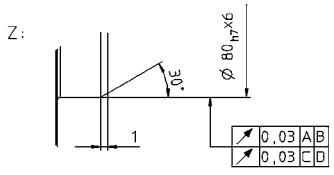
up to 24 [4] (G) clamping hub diameter



3-stage:

up to 19 [4] (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

					2-stage				3-stage				
Ratio [a]			i		**22**	**27.5**	**38.5**	**55**	**66**	**88**	**110**	**154**	**220**
Max. acceleration torque (max. 1000 cycles per hour)			T_{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 n_{1N})			T_{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)			T_{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 T_{2N} and 20 °C ambient temperature) [b]			n_{1N}	rpm	3000	3000	3000	3000	3500	3500	3500	3500	3500
Max. input speed			n_{1Max}	rpm	5000	5000	5000	5000	5000	5000	5000	5000	5000
Mean no load running torque (with n_1=3000 rpm and 20 °C gearhead temperature) [c]			T_{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			j_t	arcmin	≤ 1				≤ 1				
Torsional rigidity [c]			C_{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			C_{2K}	Nm/ arcmin	560				560				
				in.lb/ arcmin	4956				4956				
Max. axial force [d]			F_{2AMax}	N	6130				6130				
				lb_f	1379				1379				
Max. tilting moment			M_{2KMax}	Nm	1335				1335				
				in.lb	11815				11815				
Efficiency at full load			η	%	94				92				
Service life (For calculation, see the Chapter "Information")			L_h	h	> 20000				> 20000				
Weight incl. standard adapter plate			m	kg	12.5				13.4				
				lb_m	27.6				29.6				
Operating noise (with n_1=3000 rpm no load)			L_{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	J_1	kgcm²	3.76	3.32	3.01	2.82	2.61	2.42	2.22	2.12	2.07
				10^{-3} in.lb.s²	3.33	2.94	2.66	2.50	2.31	2.14	1.96	1.88	1.83
Clamping hub diameter [mm]	K	38	J_1	kgcm²	10.7	10.3	9.92	9.73	–	–	–	–	–
				10^{-3} in.lb.s²	9.47	9.11	8.78	8.61					

Reduced mass moments of inertia available on request.

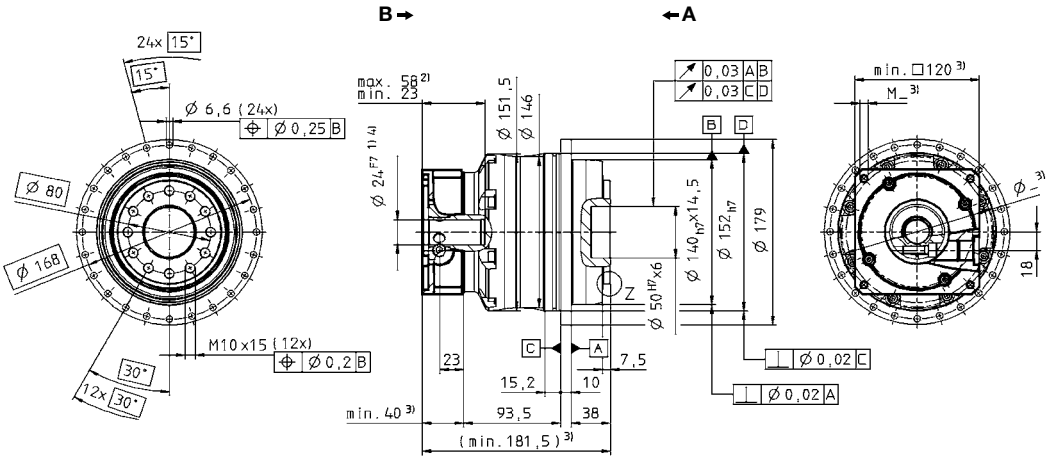
[a] Other ratios available on request
[b] For higher ambient temperatures, please reduce input speed
[c] Valid for clamping hub diameter of 24 mm
[d] Refers to center of the output shaft or flange

View A View B

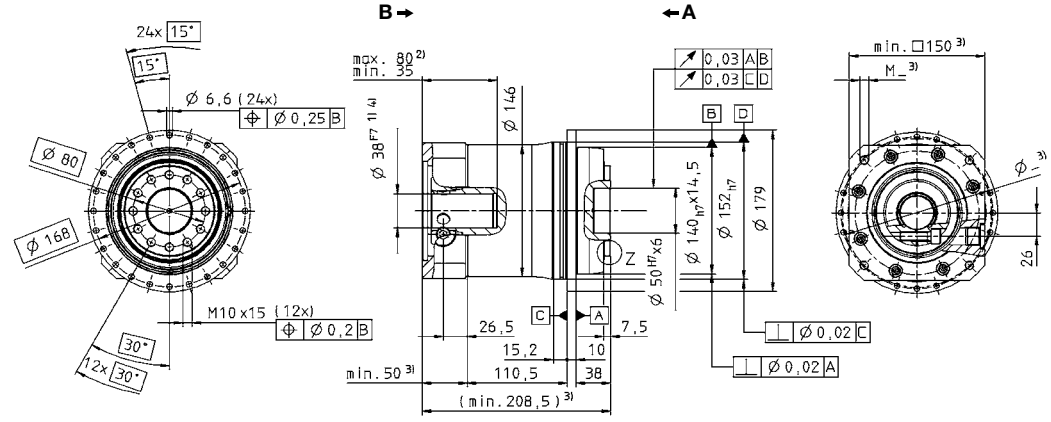
Motor shaft diameter [mm]

2-stage:

up to 24 [4] (G) clamping hub diameter

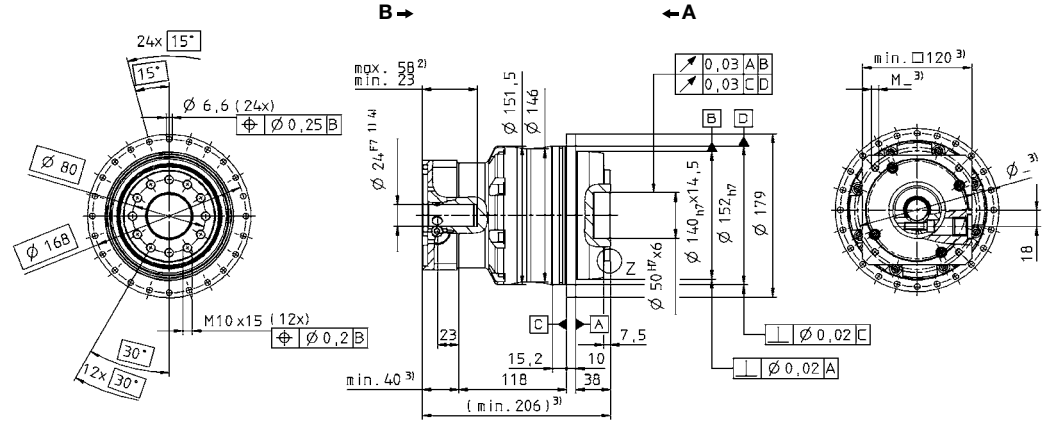


up to 38 [4] (K) clamping hub diameter



3-stage:

up to 24 [4] (G) clamping hub diameter



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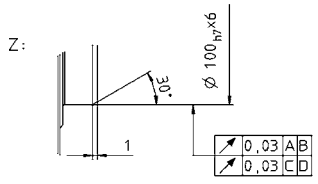


Non-tolerated dimensions ±1 mm

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

					2-stage				3-stage				
Ratio [a]			***i***		**22**	**27.5**	**38.5**	**55**	**66**	**88**	**110**	**154**	**220**
Max. acceleration torque (max. 1000 cycles per hour)			T_{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 n_{1N})			T_{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)			T_{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 T_{2N} and 20 °C ambient temperature) [b]			n_{1N}	rpm	2500	2500	2500	2500	3000	3000	3000	3000	3000
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) [c]			T_{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			j_t	arcmin	≤ 1				≤ 1				
Torsional rigidity [c]			C_{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			C_{2K}	Nm/ arcmin	1452				1452				
				in.lb/ arcmin	12850				12850				
Max. axial force [d]			F_{2AMax}	N	10050				10050				
				lb_f	2261				2261				
Max. tilting moment			M_{2KMax}	Nm	3280				3280				
				in.lb	29028				29028				
Efficiency at full load			η	%	94				92				
Service life (For calculation, see the Chapter "Information")			L_h	h	> 20000				> 20000				
Weight incl. standard adapter plate			m	kg	33.1				35.4				
				lb_m	73.2				78.2				
Operating noise (with n_1=3000 rpm no load)			L_{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	J_1	$kgcm^2$	16.6	15.2	13.9	13.1	13.8	10.2	9.77	9.47	9.16
				10^{-3} in.lb.s²	14.7	13.5	12.3	11.6	12.2	9.03	8.65	8.38	8.11
Clamping hub diameter [mm]	M	48	J_1	$kgcm^2$	31.4	29.9	28.7	28.0	–	–	–	–	–
				10^{-3} in.lb.s²	27.8	26.5	25.4	24.8					

Reduced mass moments of inertia available on request.

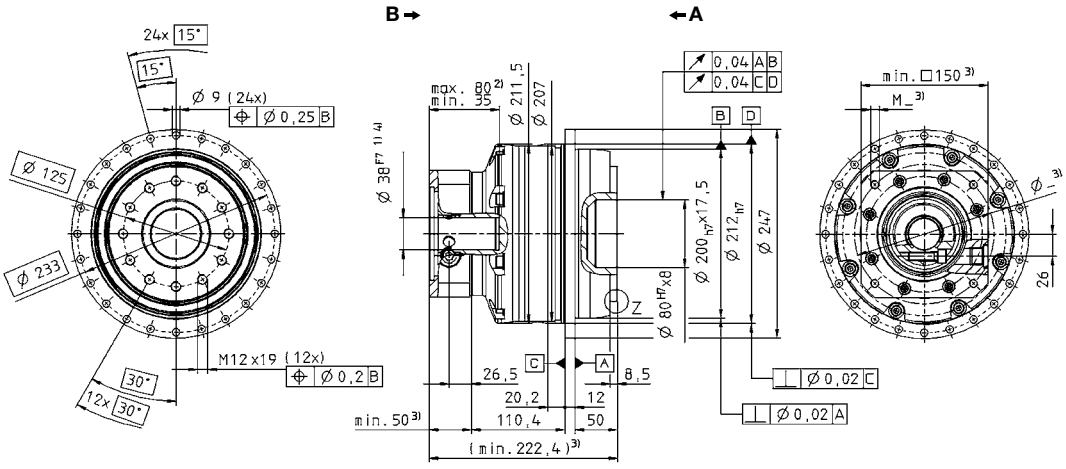
[a] Other ratios available on request
[b] For higher ambient temperatures, please reduce input speed
[c] Valid for clamping hub diameter of 38 mm
[d] Refers to center of the output shaft or flange

View A View B

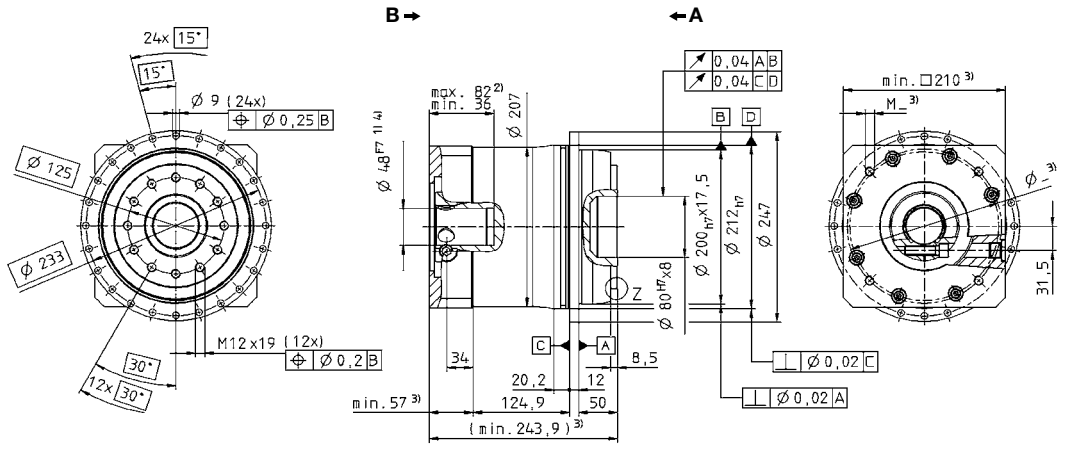
Motor shaft diameter [mm]

2-stage:

up to 38 [4] (K) clamping hub diameter

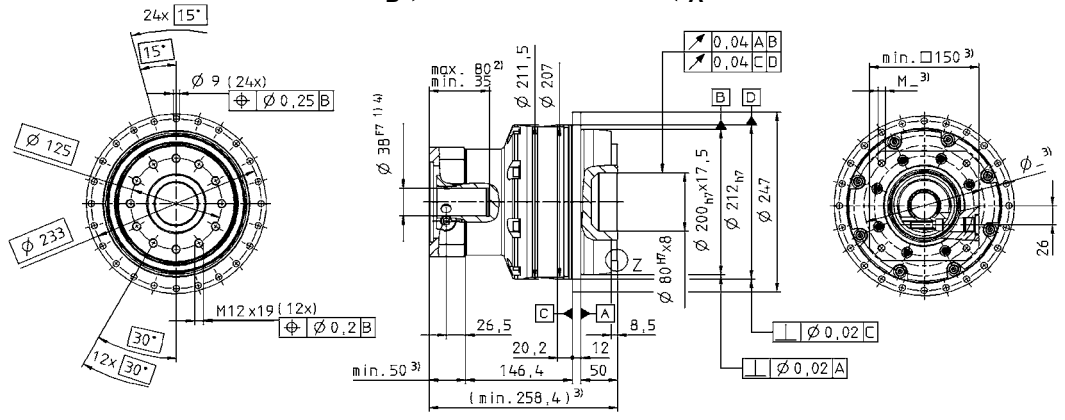


up to 48 [4] (M) clamping hub diameter

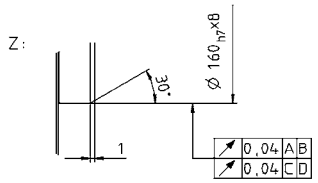


3-stage:

up to 38 [4] (K) clamping hub diameter



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 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

				1-stage	2-stage				3-stage				
Ratio [a]			*i*	**5.5**	**22**	**27.5**	**38.5**	**55**	**66**	**88**	**110**	**154**	**220**
Max. acceleration torque (max. 1000 cycles per hour)			T_{2B} Nm	4600	5500	5500	5500	3900	5500	5500	5500	5500	5500
			T_{2B} in.lb	40714	48679	48679	48679	34518	48679	48679	48679	48679	48679
Nominal output torque (with n_{1N})			T_{2N} Nm	2200	3500	3500	3500	2500	3500	3500	3500	3500	3500
			T_{2N} in.lb	19472	30978	30978	30978	22127	30978	30978	30978	30978	30978
Emergency stop torque (permitted 1000 times during the service life of the gearhead)			T_{2Not} Nm	8750	13250	13250	13250	13250	13250	13250	13250	13250	13250
			T_{2Not} in.lb	77445	117273	117273	117273	117273	117273	117273	117273	117273	117273
Nominal input speed (with T_{2N} and 20 °C ambient temperature) [b]			n_{1N} rpm	1000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Max. input speed			n_{1Max} rpm	2500	3500	3500	3500	3500	3500	3500	3500	3500	3500
Mean no load running torque (with n_1 = 2000 rpm and 20 °C gearhead temperature)			T_{012} Nm	22	12	10	9,0	7,0	6,5	4,5	4,0	3,0	2,0
			T_{012} in.lb	195	106	89	80	62	58	40	35	27	18
Max. torsional backlash			j_t arcmin	Standard ≤ 2 / Reduced ≤ 1	Standard ≤ 3 / Reduced ≤ 1.5								
Torsional rigidity			C_{t21} Nm/ arcmin	1400	1200	1200	1200	1200	1200	1200	1200	1200	1200
			C_{t21} in.lb/ arcmin	12391	10621	10621	10621	10621	10621	10621	10621	10621	10621
Tilting rigidity			C_{2K} Nm/ arcmin	5560									
			C_{2K} in.lb/ arcmin	49210									
Max. axial force [c]			F_{2AMax} N	33000									
			F_{2AMax} lb_f	7425									
Max. tilting moment			M_{2KMax} Nm	3900	6500								
			M_{2KMax} in.lb	34518	57530								
Efficiency at full load			η %	95	93								
Service life (For calculation. see "Technical Basics")			L_h h	> 20000									
Weight incl. standard adapter plate			*m* kg	55	64				67				
			m lb_m	121.25	141.1				147.7				
Operating noise (with n_1 = 2000 rpm no load)			L_{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	J_1 kgcm²	–	–	–	–	–	16.6	12.9	11.6	10.3	9.50
			J_1 in.lb.s²						0.0147	0.0114	0.0103	0.0091	0.0084
Clamping hub diameter [mm]	M	48	J_1 kgcm²	–	30.8	27.6	24.9	23.0	–	–	–	–	–
			J_1 in.lb.s²		0.0273	0.0244	0.0220	0.0204					
	N	55	J_1 kgcm²	129	–	–	–	–	–	–	–	–	–
			J_1 in.lb.s²	0.1142									

Reduced mass moments of inertia available on request.

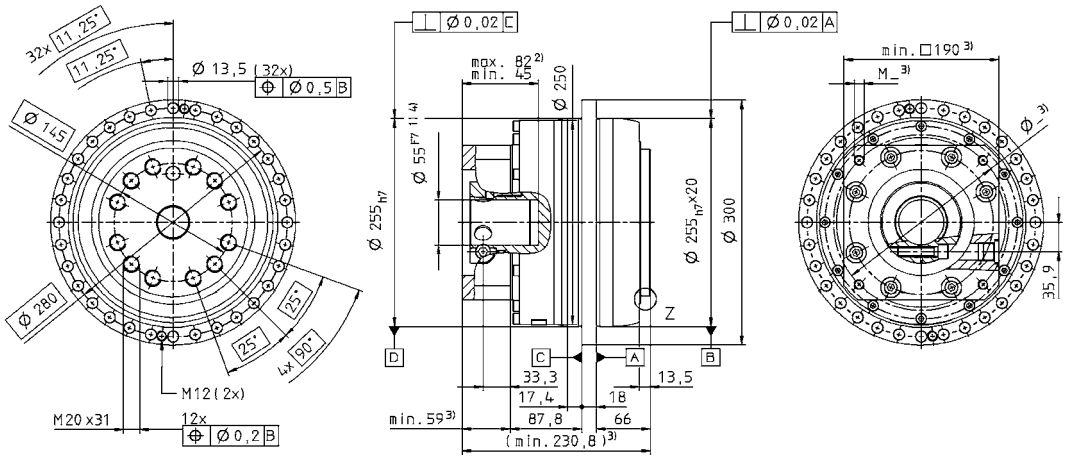
[a] Other ratios available on request
[b] For higher ambient temperatures, please reduce input speed
[c] Refers to center of the output shaft or flange

View A | View B

Motor shaft diameter [mm]

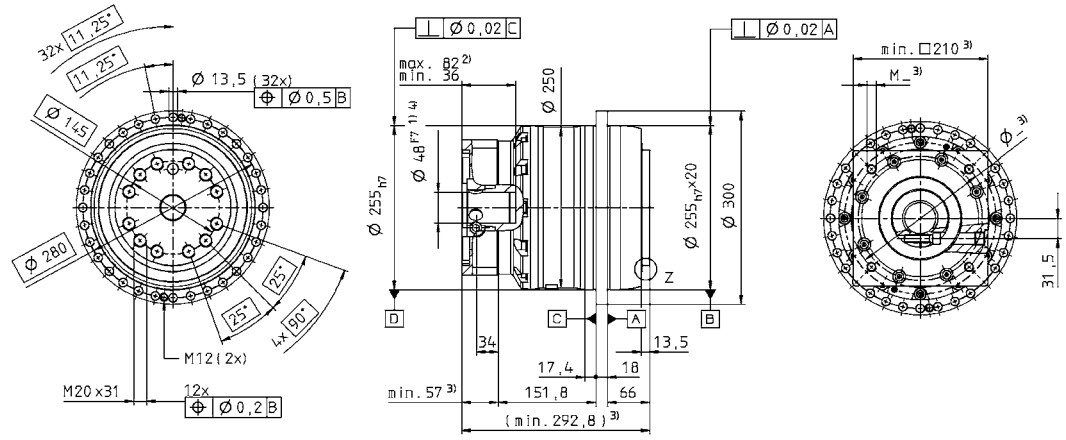
1-stage:

up to 55 [4] (N) clamping hub diameter



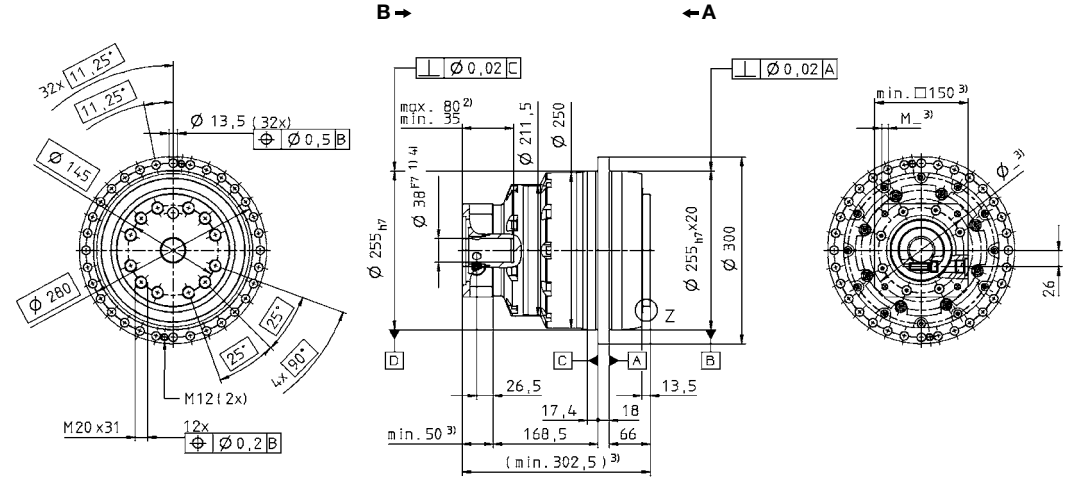
2-stage:

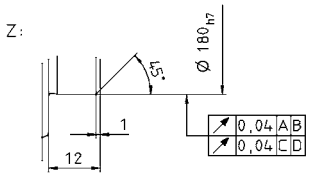
up to 48 [4] (M) clamping hub diameter



3-stage:

up to 38 [4] (K) clamping hub diameter





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*		**5.5**	**22**	**27.5**	**38.5**	**55**	**66**	**88**	**110**	**154**	**220**
Max. acceleration torque (max. 1000 cycles per hour)			T_{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 n_{1N})			T_{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)			T_{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 T_{2N} and 20 °C ambient temperature) [b]			n_{1N}	rpm	900	1500	1500	1500	1500	1500	1500	1500	1500	1500
Max. input speed			n_{1Max}	rpm	2500	3500	3500	3500	3500	3500	3500	3500	3500	3500
Mean no load running torque (with n_1=2000 rpm and 20 °C gearhead temperature)			T_{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			j_t	arcmin	Standard ≤ 2 / Reduced ≤ 1	Standard ≤ 3 / Reduced ≤ 1.5								
Torsional rigidity			C_{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			C_{2K}	Nm/ arcmin	9480									
				in.lb/ arcmin	83906									
Max. axial force [c]			F_{2AMax}	N	50000									
				lb_f	11250									
Max. tilting moment			M_{2KMax}	Nm	6600	9500								
				in.lb	58415	84083								
Efficiency at full load			η	%	95	93								
Service life (For calculation, see "Technical Basics")			L_h	h	> 20000									
Weight incl. standard adapter plate			*m*	kg	80					89				
				lb_m	176.4					196.2				
Operating noise (with n_1=2000 rpm no load)			L_{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)	K	38	J_1	$kgcm^2$	–	–	–	–	–	17.9	13.5	11.9	10.5	9.7
				$in.lb.s^2$						15.8	11.9	10.5	9.3	8.6
Clamping hub diameter [mm]	M	48	J_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
	O	60	J_1	$kgcm^2$	175	–	–	–	–	–	–	–	–	–
				$in.lb.s^2$	0.1549									

Reduced mass moments of inertia available on request.

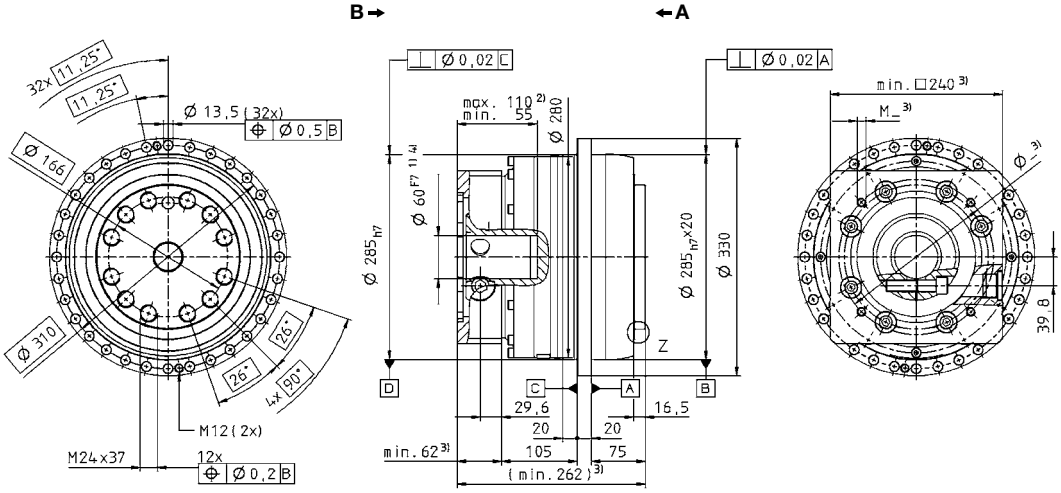
[a] Other ratios available on request
[b] For higher ambient temperatures, please reduce input speed
[c] Refers to center of the output shaft or flange

View A | View B

Motor shaft diameter [mm]

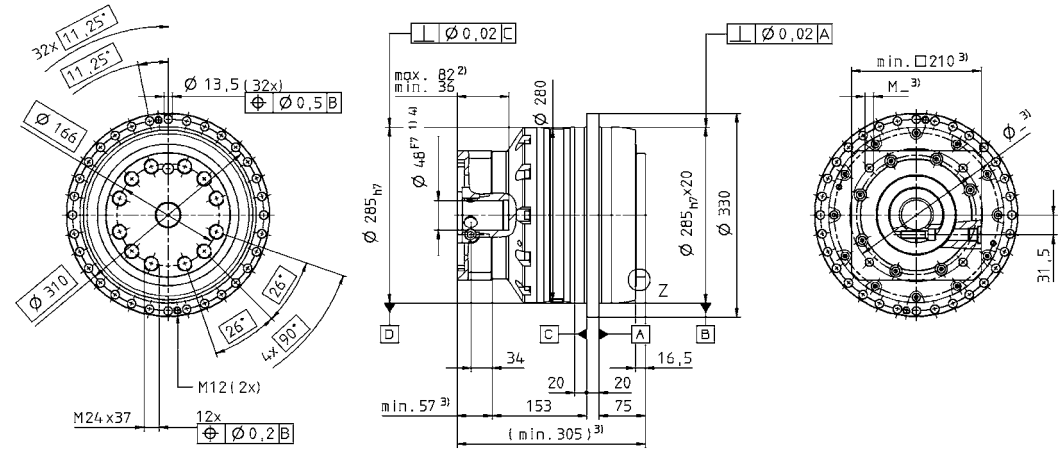
1-stage:

up to 60 [4] (O) clamping hub diameter



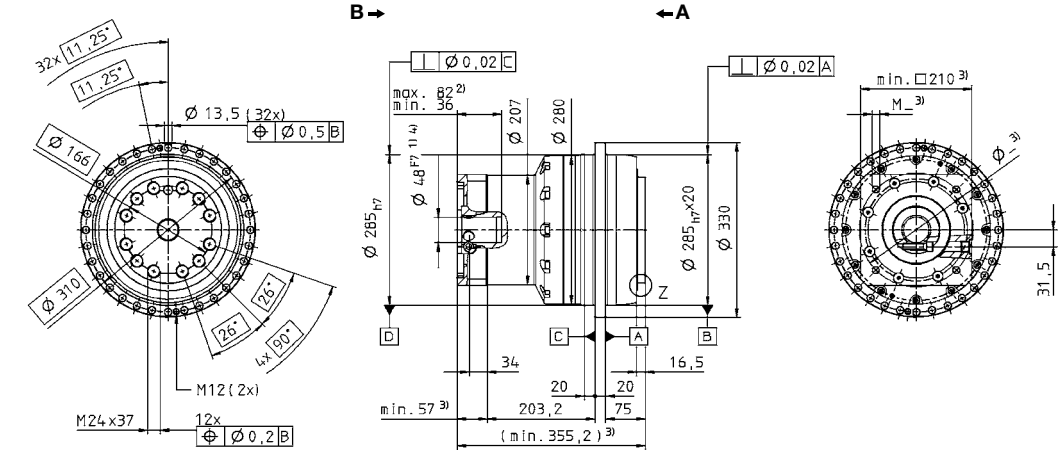
2-stage:

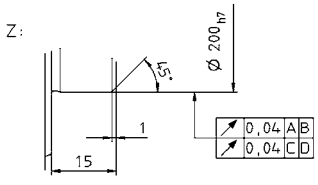
up to 48 [4] (M) clamping hub diameter



3-stage:

up to 48 [4] (M) clamping hub diameter





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

					2-stage		3-stage							
Ratio			*i*		**22**	**30.25**	**66**	**88**	**110**	**121**	**154**	**220**	**302.5**
Max. acceleration torque (max. 1000 cycles per hour)			T_{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 n_{1N})			T_{2N}	Nm	13500	13500	13500	13500	13500	13500	13500	10000	13500
				in.lb	119475	119475	119475	119475	119475	119475	119475	88500	119475
Emergency stop torque (permitted 1000 times during the service life of the gearhead)			T_{2Not}	Nm	44000	44000	44000	44000	44000	44000	44000	44000	44000
				in.lb	389400	389400	389400	389400	389400	389400	389400	389400	389400
Nominal input speed (with T_{2N} and 20 °C ambient temperature) [a]			n_{1N}	rpm	2000	2000	2500	2500	2500	2500	2500	2500	2500
Max. input speed			n_{1Max}	rpm	3000	3000	3500	3500	3500	3500	3500	3500	3500
Mean no load running torque (with n_1=2000 rpm and 20 °C gearhead temperature)			T_{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			j_t	arcmin	≤ 3								
Torsional rigidity			C_{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			C_{2K}	Nm/ arcmin	13000								
				in.lb/ arcmin	115060								
Max. axial force [b]			F_{2AMax}	N	100000								
				lb_f	22500								
Max. tilting moment			M_{2KMax}	Nm	31600		31600						
				in.lb	279660		279660						
Efficiency at full load			η	%	95		93						
Service life (For calculation, see the Chapter "Information")			L_h	h	> 20000								
Weight incl. standard adapter plate			*m*	kg	190		185						
				lb_m	420		409						
Operating noise (with n_1=3000 rpm no load)			L_{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	J_1	kgcm²	-	-	52	37	35	35	28	26	25
				10^{-3} in.lb.s²	-	-	46	33	31	31	25	23	22
Clamping hub diameter [mm]	N	55	J_1	kgcm²	101	74	-	-	-	-	-	-	-
				10^{-3} in.lb.s²	89	65	-	-	-	-	-	-	-

Please indicate the mounting position with your order, see page 447.
WITTENSTEIN alpha recommends fitting a motor support to the mounted motor in order to additionally prevent unforeseen external influences such as vibration.

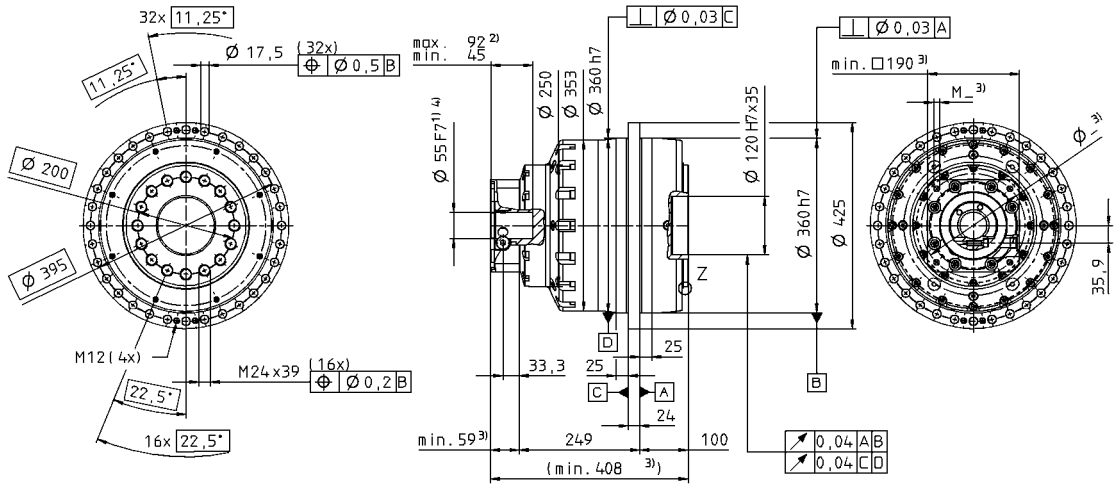
[a] For higher ambient temperatures, please reduce input speed
[b] Refers to center of the output shaft or flange

View A View B

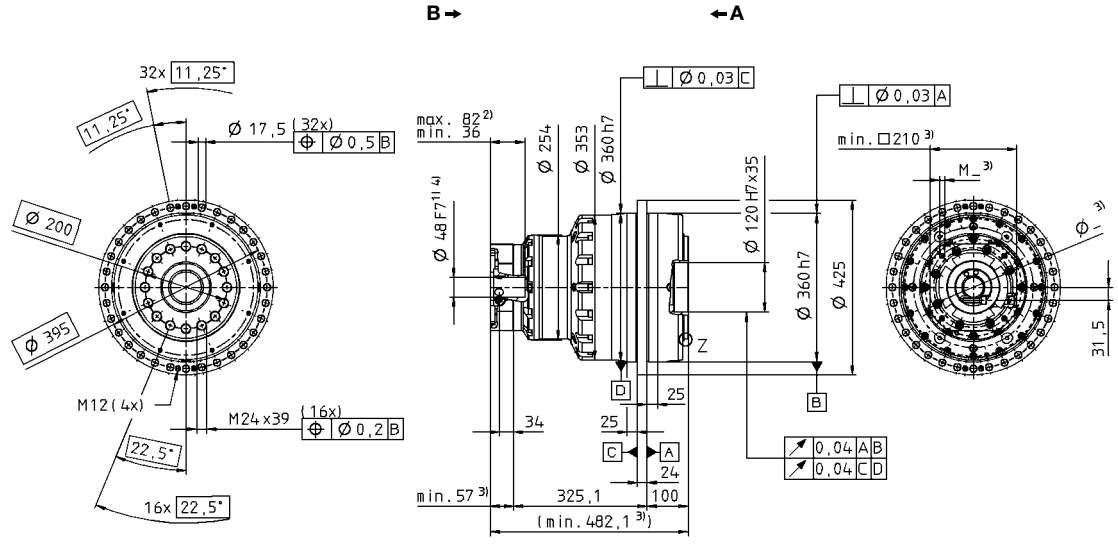
Motor shaft diameter [mm]

up to 55 [4] (N) clamping hub diameter

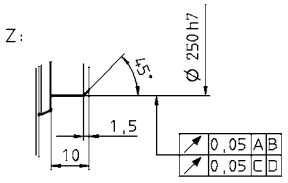
2-stage:



3-stage:



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

					2-stage		3-stage						
Ratio			*i*		**22**	**30.25**	**66**	**88**	**110**	**121**	**154**	**220**	**302.5**
Max. acceleration torque (max. 1000 cycles per hour)			T_{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 n_{1N})			T_{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)			T_{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 T_{2N} and 20 °C ambient temperature) [a]			n_{1N}	rpm	1500	1500	1500	1500	1500	1500	1500	1500	1500
Max. input speed			n_{1Max}	rpm	3000	3000	3000	3000	3000	3000	3000	3000	3000
Mean no load running torque (with n_1=2000 rpm and 20 °C gearhead temperature)			T_{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			j_t	arcmin	≤ 4								
Torsional rigidity			C_{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			C_{2K}	Nm/ arcmin	65000								
				in.lb/ arcmin	575250								
Max. axial force [b]			F_{2AMax}	N	140000								
				lb_f	31500								
Max. tilting moment			M_{2KMax}	Nm	58000		71400						
				in.lb	513300		631890						
Efficiency at full load			η	%	95		93						
Service life (For calculation, see the Chapter "Information")			L_h	h	> 20000								
Weight incl. standard adapter plate			*m*	kg	350		380						
				lb_m	774		840						
Operating noise (with n_1=3000 rpm no load)			L_{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	J_1	kgcm²	-	-	85	55	43	48	34	29	28
				10^{-3} in.lb.s²	-	-	75	49	38	42	30	26	25
Clamping hub diameter [mm]	O	60	J_1	kgcm²	230	174	-	-	-	-	-	-	-
				10^{-3} in.lb.s²	204	154	-	-	-	-	-	-	-

Please indicate the mounting position with your order, see page 447.
WITTENSTEIN alpha recommends fitting a motor support to the mounted motor in order to additionally prevent unforeseen external influences such as vibration.

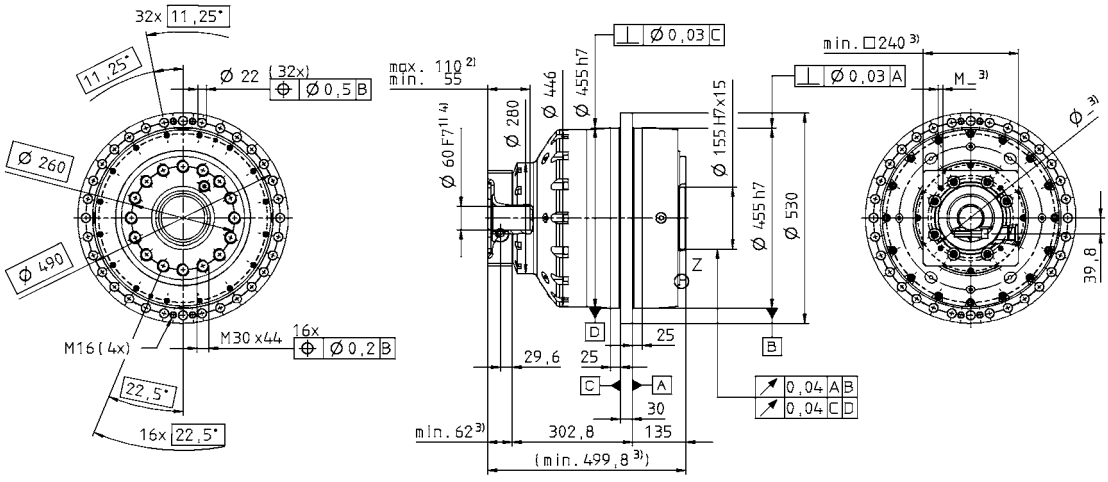
[a] For higher ambient temperatures, please reduce input speed
[b] Refers to center of the output shaft or flange

View A | View B

Motor shaft diameter [mm]

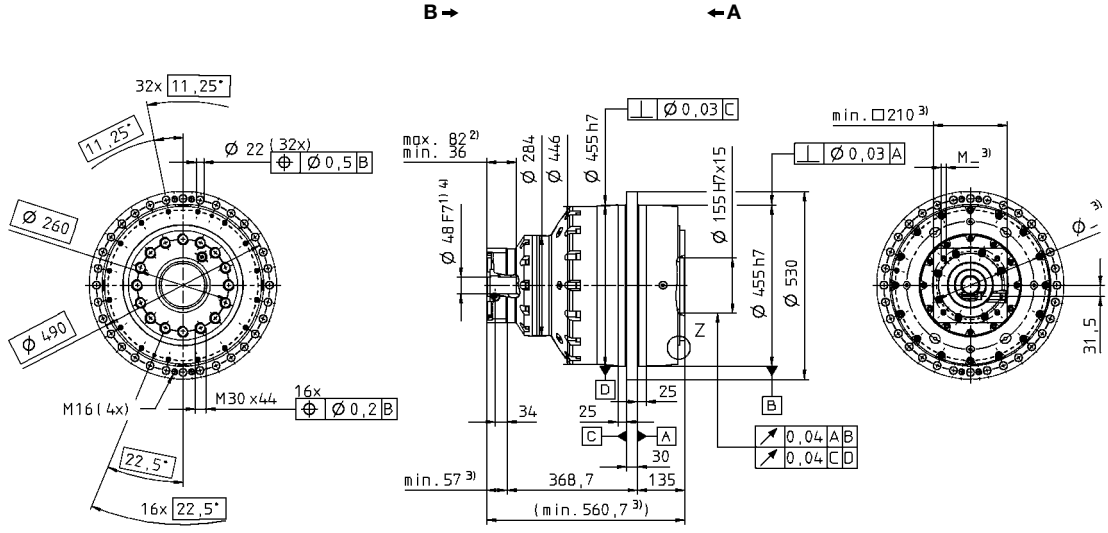
2-stage:

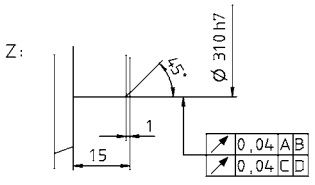
up to 60 [4] (O) clamping hub diameter



3-stage:

up to 48 [4] (M) clamping hub diameter





Non-tolerated dimensions ±1 mm

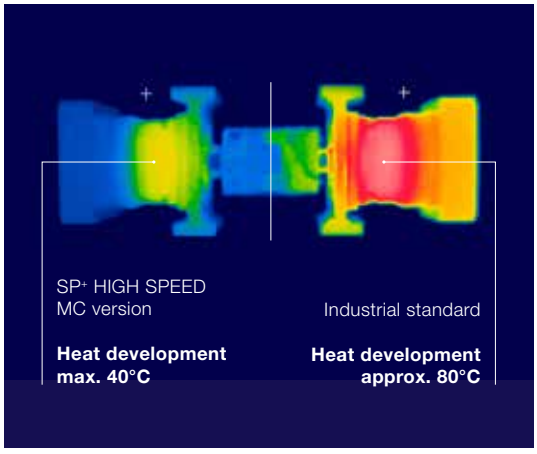
1) Check motor shaft fit.
2) Min./Max. permissible motor shaft length. Longer motor shafts are adaptable, please contact us.
3) The dimensions depend on the motor.
4) Smaller motor shaft diameter is compensated by a bushing with a minimum thickness of 1 mm.

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

Motor mounting according to operating manual

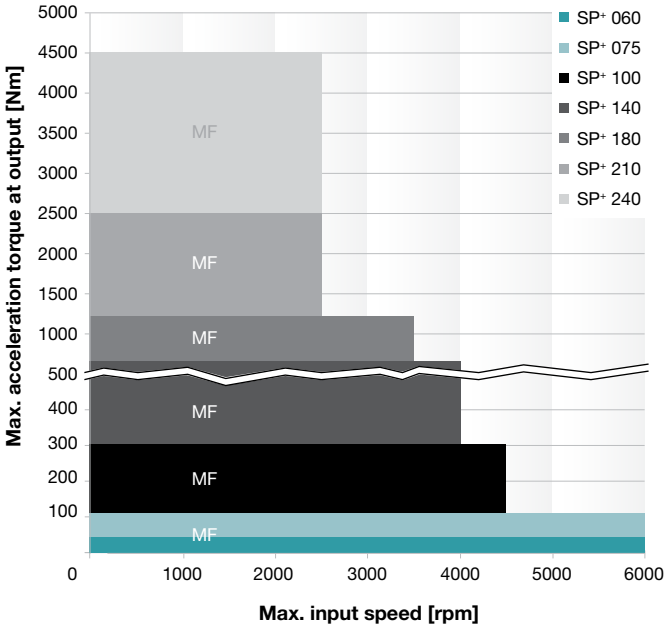
SP+/SP+ HIGH SPEED – The classic all-rounder

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.

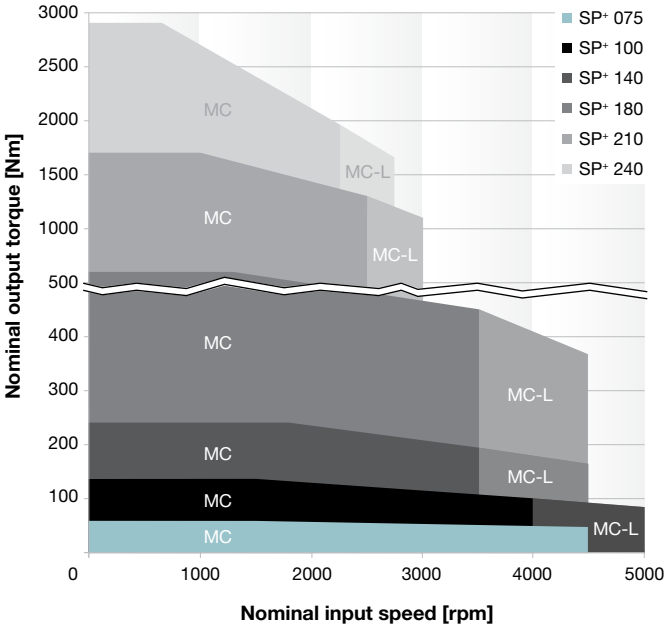


Quick size selection

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



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



Versions and Applications

Features	**SP+** MF version page 76	**SP+ HIGH SPEED** MC version page 100	**SP+ HIGH SPEED** MC-L version page 104
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		•	•	
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

SP+ 060 MF 1-stage

				1-stage					
Ratio [a]			i	**3**	**4**	**5**	**7**	**8**	**10**
cymex®-optimized acceleration torque (please contact us regarding the design)			T_{2Bcym} Nm	–	58	60	54	–	–
			T_{2Bcym} in.lb		513	531	478		
Max. acceleration torque (max. 1000 cycles per hour)			T_{2B} Nm	30	42	42	42	32	32
			T_{2B} in.lb	266	372	372	372	283	283
Nominal output torque (with n_{1N})			T_{2N} Nm	17	26	26	26	17	17
			T_{2N} in.lb	150	230	230	230	150	150
Emergency stop torque (permitted 1000 times during the service life of the gearhead)			T_{2Not} Nm	80	100	100	100	80	80
			T_{2Not} in.lb	708	885	885	885	708	708
Nominal input speed (with T_{2N} and 20°C ambient temperature) [b]			n_{1N} rpm	3300	3300	3300	4000	4000	4000
Max. input speed			n_{1max} rpm	6000	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	0.3
			T_{012} in.lb	8.0	6.2	5.3	3.5	2.7	2.7
Max. torsional backlash			j_t arcmin	Standard ≤ 4 / Reduced ≤ 2					
Torsional rigidity			C_{t21} Nm/ arcmin	4.5					
			C_{t21} in.lb/ arcmin	40					
Max. axial force [d]			F_{2AMax} N	2400					
			F_{2AMax} lb_f	540					
Max. radial force [d]			F_{2RMax} N	2800					
			F_{2RMax} lb_f	630					
Max. tilting torque			M_{2KMax} Nm	152					
			M_{2KMax} 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					
			m 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 kgcm²	0.21	0.15	0.12	0.10	0.10	0.09
			J_1 10^{-3} in.lb.s²	0.18	0.13	0.11	0.09	0.09	0.08
Clamping hub diameter [mm]	C	14	J_1 kgcm²	0.28	0.22	0.20	0.18	0.16	0.16
			J_1 10^{-3} in.lb.s²	0.25	0.20	0.17	0.16	0.14	0.15
	E	19	J_1 kgcm²	0.61	0.55	0.52	0.50	0.49	0.49
			J_1 10^{-3} in.lb.s²	0.54	0.48	0.46	0.44	0.43	0.43

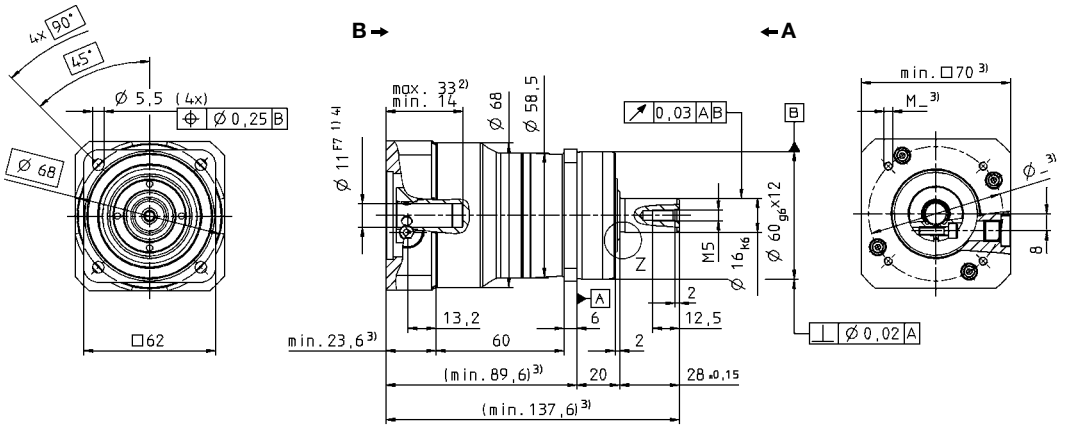
Reduced mass moments of inertia available on request.

[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

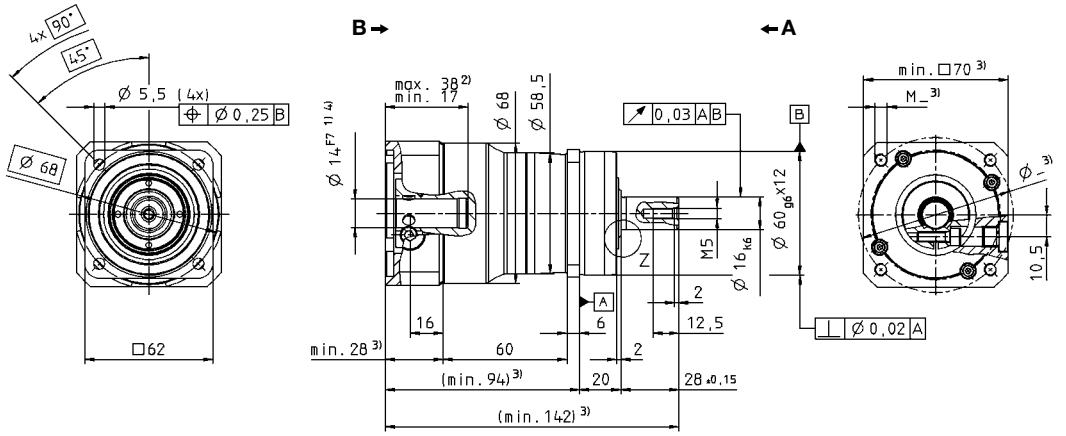
View A View B

Motor shaft diameter [mm]

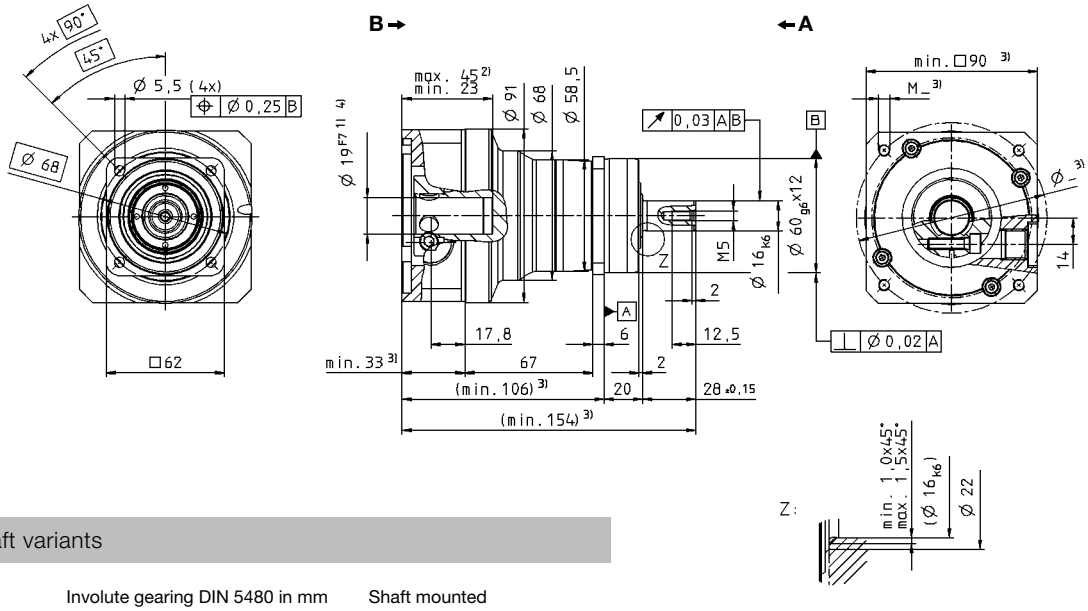
up to 11 [4] (B) clamping hub diameter



up to 14 [4] (C) clamping hub diameter[5]

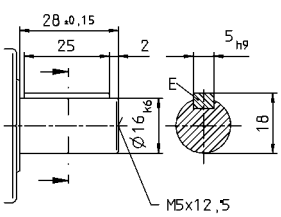


up to 19 [4] (E) clamping hub diameter

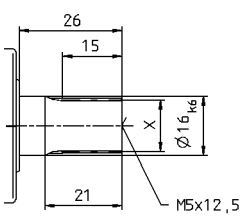


Alternatives: Output shaft variants

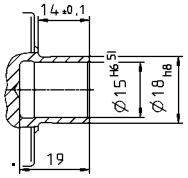
Output shaft with key in mm
E = key as per DIN 6885, sheet 1, form A



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

				2-stage									
Ratio [a]			***i***	**16**	**20**	**25**	**28**	**32**	**35**	**40**	**50**	**70**	**100**
cymex®-optimized acceleration torque (please contact us regarding the design)			T_{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)			T_{2B}	Nm	42	42	42	42	32	42	42	42	42	32
				in.lb	372	372	372	372	283	372	372	372	372	283
Nominal output torque (with n_{1N})			T_{2N}	Nm	26	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)			T_{2Not}	Nm	100	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 T_{2N} and 20°C ambient temperature) [b]			n_{1N}	rpm	4400	4400	4400	4400	4400	4400	4400	4800	5500	5500
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) [c]			T_{012}	Nm	0.5	0.4	0.4	0.3	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			j_t	arcmin	Standard ≤ 6 / Reduced ≤ 4									
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 moment			M_{2KMax}	Nm	152									
				in.lb	1345									
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	2.0									
				lb_m	4.4									
Operating noise (with i=100 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	kgcm²	0.077	0.069	0.068	0.061	0.077	0.061	0.057	0.057	0.056	0.056
				10^{-3} in.lb.s²	0.068	0.061	0.060	0.054	0.068	0.054	0.050	0.050	0.050	0.050
Clamping hub diameter [mm]	C	14	J_1	kgcm²	0.17	0.16	0.16	0.16	0.18	0.16	0.15	0.15	0.15	0.15
				10^{-3} in.lb.s²	0.15	0.15	0.14	0.14	0.16	0.14	0.14	0.13	0.13	0.13

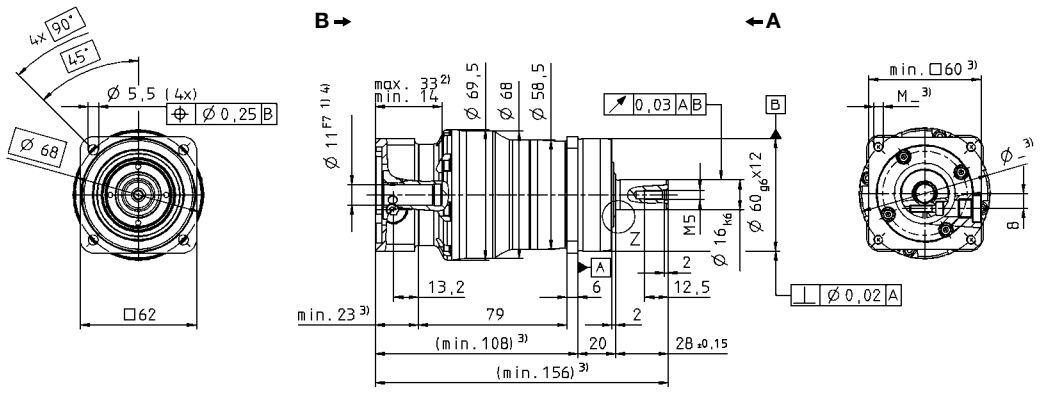
Reduced mass moments of inertia available on request.

[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

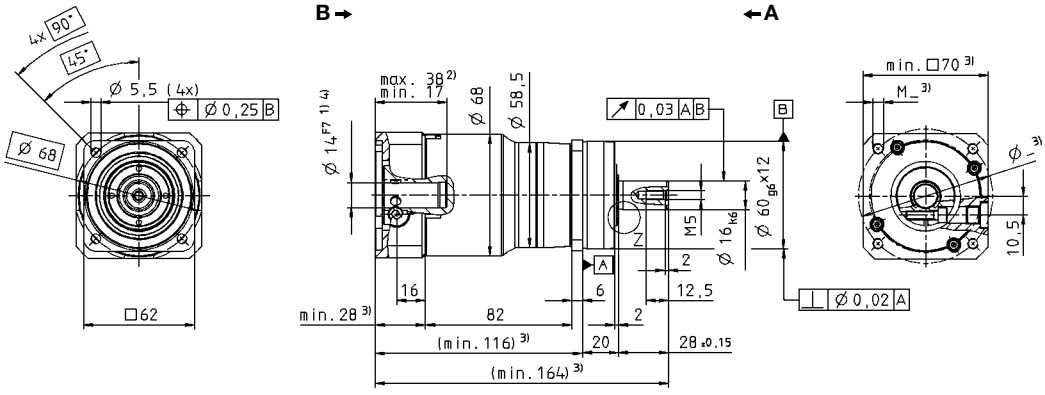
View A View B

Motor shaft diameter [mm]

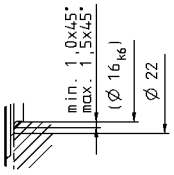
up to 11 [4] (B) clamping hub diameter



up to 14 [4] (C) clamping hub diameter

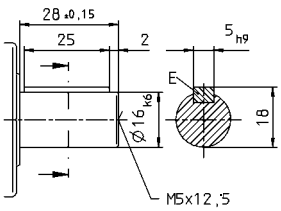


Z:

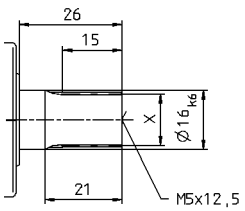


Alternatives: Output shaft variants

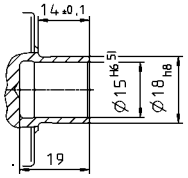
Output shaft with key in mm
E = key as per DIN 6885, sheet 1, form A



Involute gearing DIN 5480 in mm
X = W 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

					1-stage					
Ratio [a]			*i*		**3**	**4**	**5**	**7**	**8**	**10**
cymex®-optimized acceleration torque (please contact us regarding the design)			T_{2Bcym}	Nm	–	142	160	142	100	100
				in.lb	–	1254	1416	1254	885	883
Max. acceleration torque (max. 1000 cycles per hour)			T_{2B}	Nm	85	110	110	110	95	95
				in.lb	752	974	974	974	841	841
Nominal output torque (with n_{1N})			T_{2N}	Nm	47	75	75	75	52	52
				in.lb	416	664	664	664	460	460
Emergency stop torque (permitted 1000 times during the service life of the gearhead)			T_{2Not}	Nm	200	250	250	250	200	200
				in.lb	1770	2213	2213	2213	1770	1770
Nominal input speed (with T_{2N} and 20°C ambient temperature) [b]			n_{1N}	rpm	2900	2900	2900	3100	3100	3100
Max. input speed			n_{1Max}	rpm	6000	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	0.6
				in.lb	15.9	12.4	9.7	7.1	5.3	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. standardadapter 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	kgcm²	0.86	0.61	0.51	0.42	0.38	0.37
				10^{-3} in.lb.s²	0.76	0.54	0.46	0.37	0.34	0.33
Clamping hub diameter [mm]	E	19	J_1	kgcm²	1.03	0.78	0.68	0.59	0.54	0.54
				10^{-3} in.lb.s²	0.91	0.69	0.60	0.52	0.48	0.48
	G	24	J_1	kgcm²	2.40	2.15	2.05	1.96	1.91	1.91
				10^{-3} in.lb.s²	2.12	1.90	1.81	1.73	1.69	1.69

Reduced mass moments of inertia available on request.

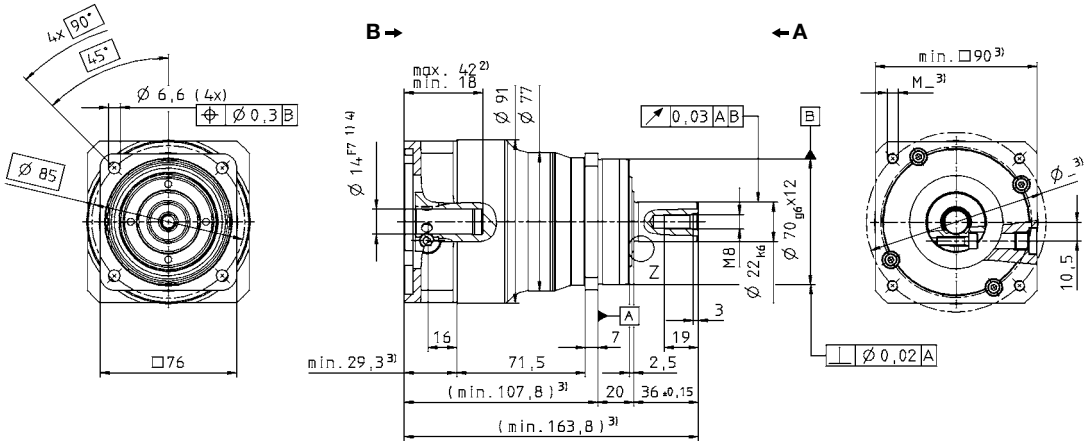
[a] Other ratios available on request
[b] For higher ambient temperatures, please reduce input speed
[c] Valid for clamping hub diameter of 19 mm
[d] Refers to centre of the output shaft or flange

View A

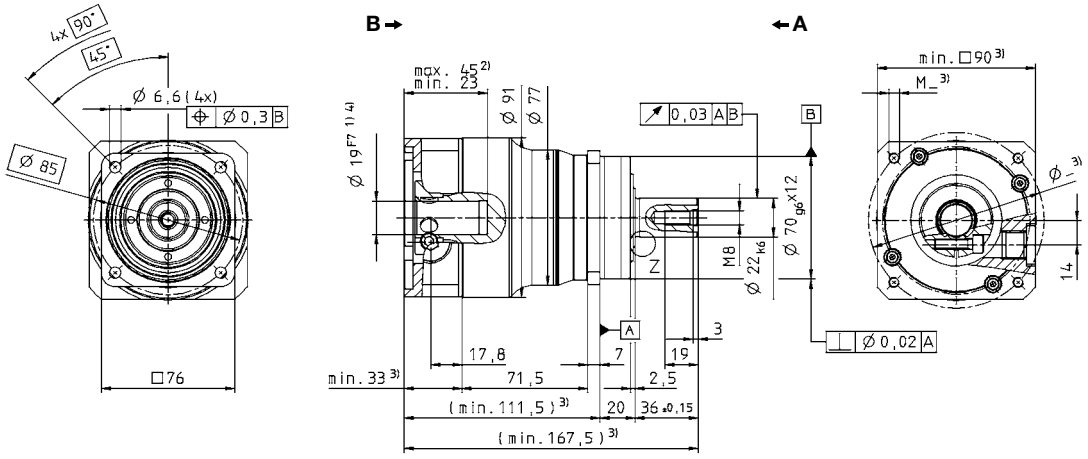
View B

Motor shaft diameter [mm]

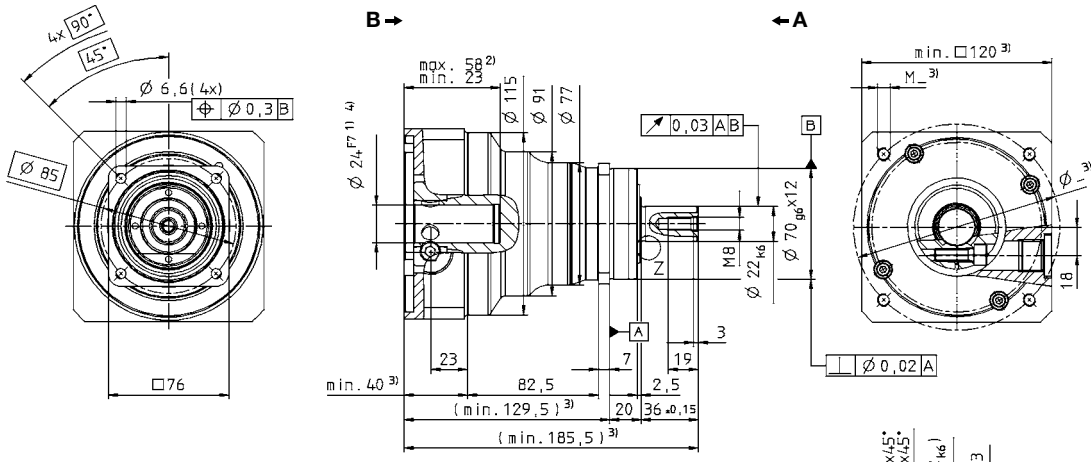
up to 14 [4] (C) clamping hub diameter



up to 19 [4] (E) clamping hub diameter



up to 24 [4] (G) clamping hub diameter



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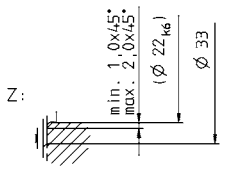
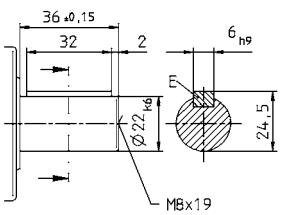


Alternatives: Output shaft variants

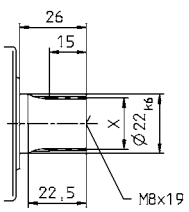
Output shaft with key in mm

E = key as per DIN 6885, sheet 1, form A



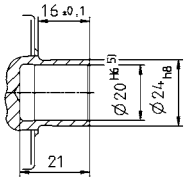
Involute gearing DIN 5480 in mm

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

				2-stage									
Ratio [a]			***i***	**16**	**20**	**25**	**28**	**32**	**35**	**40**	**50**	**70**	**100**
cymex®-optimized acceleration torque (please contact us regarding the design)			T_{2Bcym}	Nm	142	142	160	142	100	160	135	160	142	100
				in.lb	1254	1254	1416	1254	885	1416	1195	1416	1254	883
Max. acceleration torque (max. 1000 cycles per hour)			T_{2B}	Nm	110	110	110	110	95	110	110	110	110	90
				in.lb	974	974	974	974	841	974	974	974	974	797
Nominal output torque (with n_{1N})			T_{2N}	Nm	75	75	75	75	75	75	75	75	75	52
				in.lb	664	664	664	664	664	664	664	664	664	460
Emergency stop torque (permitted 1000 times during the service life of the gearhead)			T_{2Not}	Nm	250	250	250	250	250	250	250	250	250	200
				in.lb	2213	2213	2213	2213	2213	2213	2213	2213	2213	1770
Nominal input speed (with T_{2N} and 20°C ambient temperature) [b]			n_{1N}	rpm	3500	3500	3500	3500	3500	3500	3500	3800	4500	4500
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) [c]			T_{012}	Nm	0.8	0.6	0.6	0.5	0.5	0.4	0.4	0.3	0.3	0.3
				in.lb	4.4	3.5	3.5	2.7	4.4	2.7	1.8	1.8	1.8	1.8
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	%	94									
Service life (For calculation, see the Chapter "Information")			L_h	h	> 20000									
Weight incl. standard adapter plate			m	kg	3.6									
				lb_m	8.0									
Operating noise (with i=100 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)	B	11	J_1	kgcm²	0.16	0.13	0.13	0.10	0.16	0.10	0.091	0.090	0.089	0.089
				10^{-3} in.lb.s²	0.14	0.11	0.11	0.092	0.142	0.090	0.081	0.080	0.079	0.079
Clamping hub diameter [mm]	C	14	J_1	kgcm²	0.23	0.20	0.20	0.18	0.23	0.18	0.17	0.16	0.16	0.16
				10^{-3} in.lb.s²	0.20	0.18	0.18	0.16	0.20	0.16	0.15	0.15	0.14	0.14
	E	19	J_1	kgcm²	0.55	0.53	0.52	0.50	0.57	0.50	0.49	0.49	0.49	0.49
				10^{-3} in.lb.s²	0.49	0.47	0.46	0.44	0.50	0.44	0.43	0.43	0.43	0.43

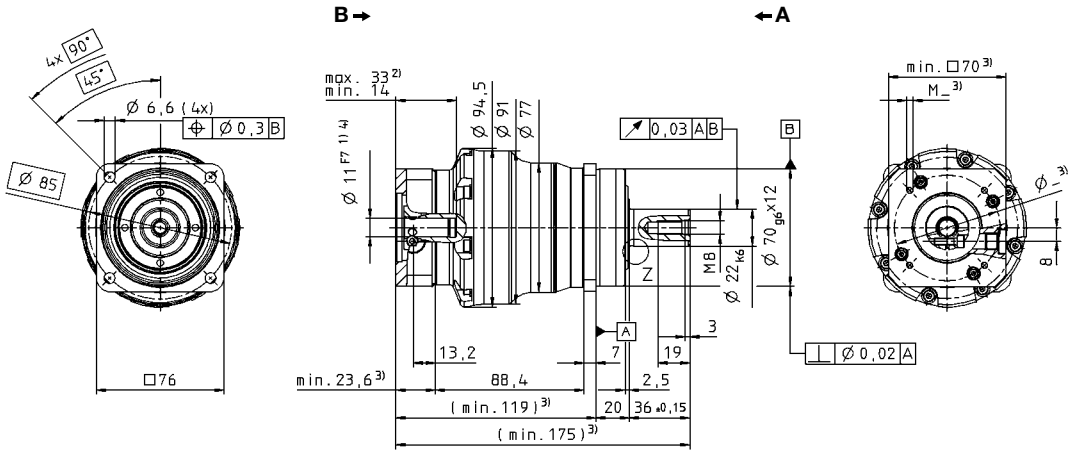
Reduced mass moments of inertia available on request.

[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

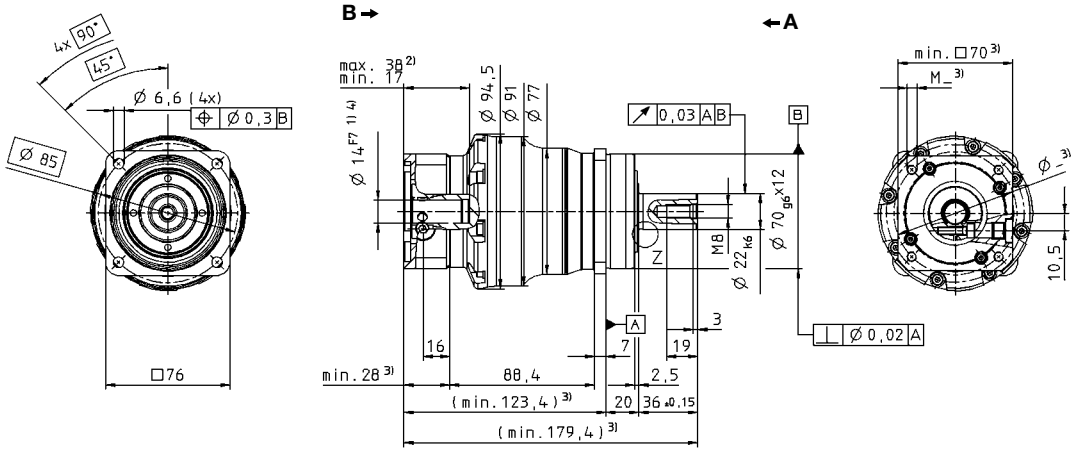
View A View B

Motor shaft diameter [mm]

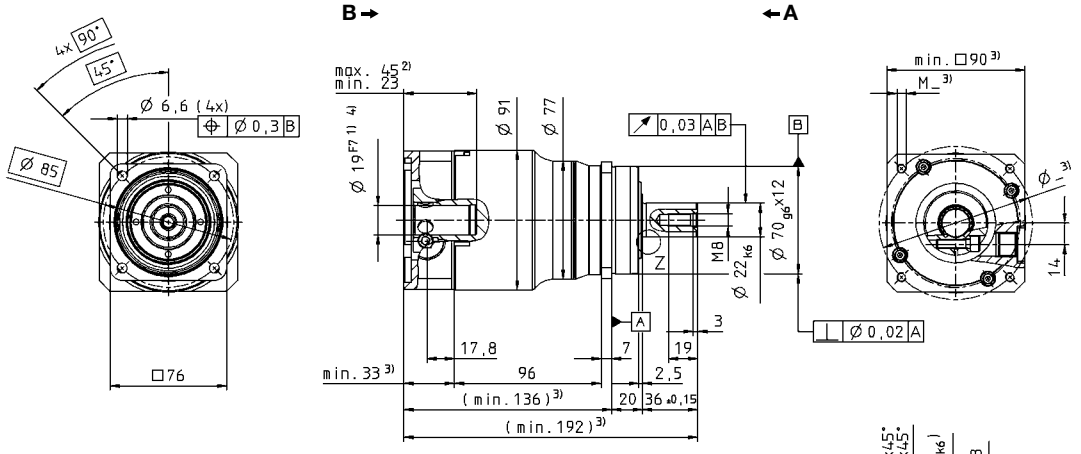
up to 11 [4] (B) clamping hub diameter



up to 14 [4] (C) clamping hub diameter



up to 19 [4] (E) clamping hub diameter



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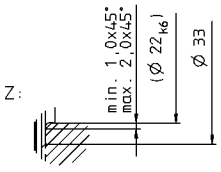
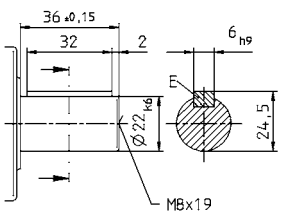
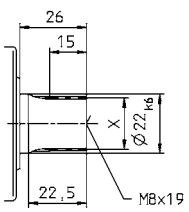


Alternatives: Output shaft variants

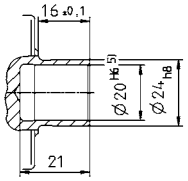
Output shaft with key in mm
E = key as per DIN 6885, sheet 1, form A



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

					1-stage					
Ratio [a]			i		**3**	**4**	**5**	**7**	**8**	**10**
cymex®-optimized acceleration torque (please contact us regarding the design)			T_{2Bcym}	Nm	–	370	400	330	260	260
				in.lb	–	3275	3540	2921	2301	2301
Max. acceleration torque (max. 1000 cycles per hour)			T_{2B}	Nm	235	315	315	315	235	235
				in.lb	2080	2788	2788	2788	2080	2080
Nominal output torque (with n_{1N})			T_{2N}	Nm	120	180	175	170	120	120
				in.lb	1062	1593	1549	1505	1062	1062
Emergency stop torque (permitted 1000 times during the service life of the gearhead)			T_{2Not}	Nm	500	625	625	625	500	500
				in.lb	4425	5531	5531	5531	4425	4425
Nominal input speed (with T_{2N} and 20°C ambient temperature) [b]			n_{1N}	rpm	2500	2500	2500	2800	2800	2800
Max. input speed			n_{1Max}	rpm	4500	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	1.4
				in.lb	31.0	23.9	21.2	14.2	12.4	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	kgcm²	3.29	2.35	1.92	1.60	1.38	1.38
				10^{-3} in.lb.s²	2.91	2.08	1.70	1.42	1.22	1.22
Clamping hub diameter [mm]	G	24	J_1	kgcm²	3.99	3.04	2.61	2.29	2.07	2.07
				10^{-3} in.lb.s²	3.53	2.69	2.31	2.03	1.83	1.83
	H	28	J_1	kgcm²	3.59	2.65	2.22	1.90	1.68	1.68
				10^{-3} in.lb.s²	3.18	2.35	1.97	1.68	1.49	1.49
	K	38	J_1	kgcm²	11.1	10.1	9.68	9.36	9.14	9.14
				10^{-3} in.lb.s²	9.78	8.95	8.57	8.28	8.09	8.09

Reduced mass moments of inertia available on request.

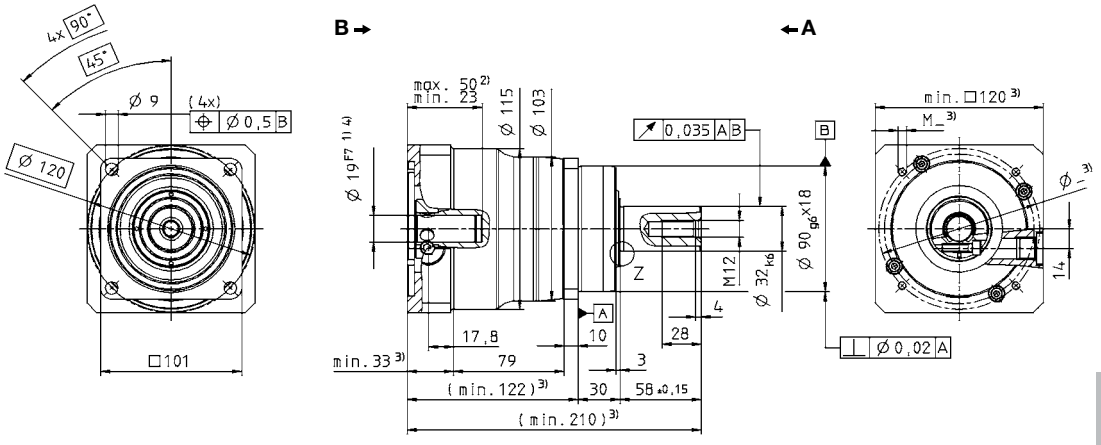
[a] Other ratios available on request
[b] For higher ambient temperatures, please reduce input speed
[c] Valid for clamping hub diameter of 24 mm
[d] Refers to centre of the output shaft or flange

View A

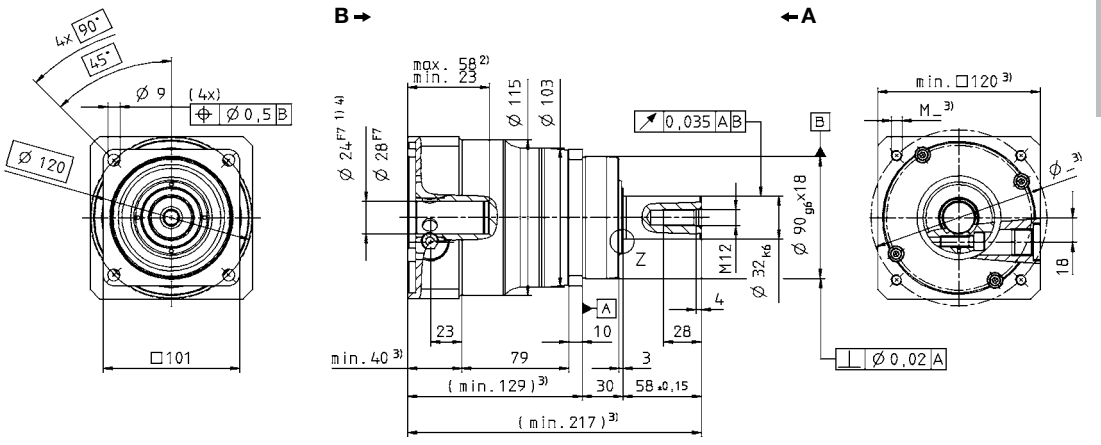
View B

Motor shaft diameter [mm]

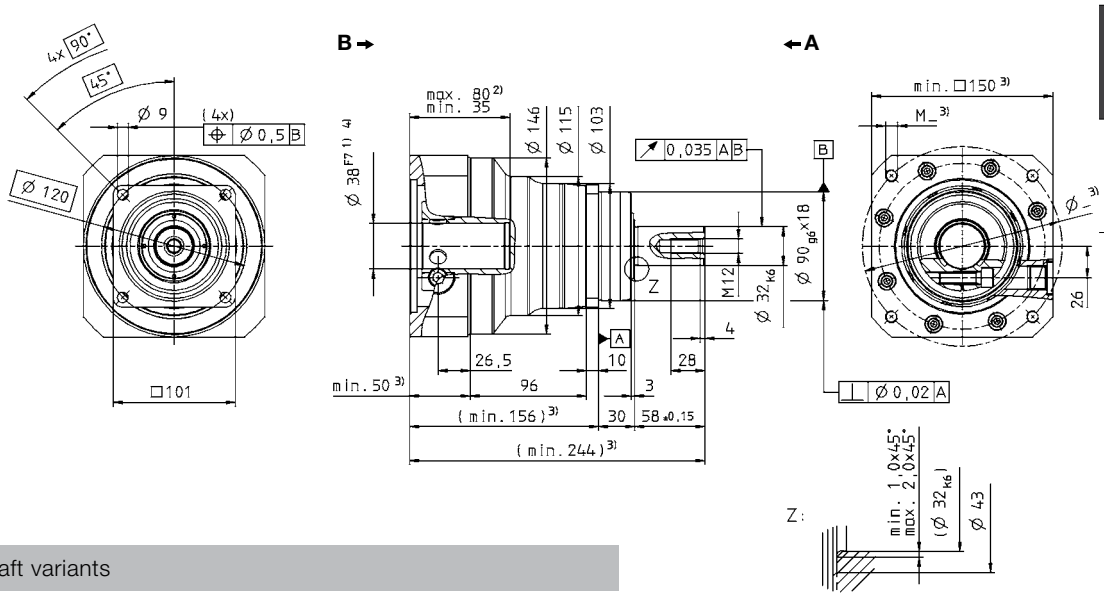
up to 19 [4] (E) clamping hub diameter



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



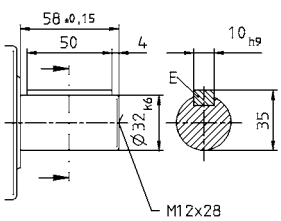
up to 38 [4] (K) clamping hub diameter



Alternatives: Output shaft variants

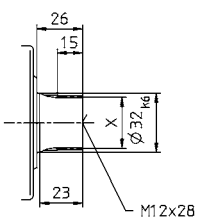
Output shaft with key in mm

E = key as per DIN 6885, sheet 1, form A



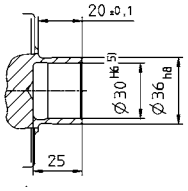
Involute gearing DIN 5480 in mm

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

					2-stage									
Ratio [a]			i		**16**	**20**	**25**	**28**	**32**	**35**	**40**	**50**	**70**	**100**
cymex®-optimized acceleration torque (please contact us regarding the design)			T_{2Bcym}	Nm	370	370	400	370	260	400	370	400	330	260
				in.lb	3275	3275	3540	3275	2301	3540	3275	3540	2921	2301
Max. acceleration torque (max. 1000 cycles per hour)			T_{2B}	Nm	315	315	315	315	235	315	315	315	315	235
				in.lb	2788	2788	2788	2788	2080	2788	2788	2788	2788	2080
Nominal output torque (with n_{1N})			T_{2N}	Nm	180	180	175	180	180	175	180	175	170	120
				in.lb	1593	1593	1549	1593	1593	1549	1593	1549	1505	1062
Emergency stop torque (permitted 1000 times during the service life of the gearhead)			T_{2Not}	Nm	625	625	625	625	625	625	625	625	625	500
				in.lb	5531	5531	5531	5531	5531	5531	5531	5531	5531	4425
Nominal input speed (with T_{2N} and 20°C ambient temperature) [b]			n_{1N}	rpm	3100	3100	3100	3100	3100	3100	3100	3500	4200	4200
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) [c]			T_{012}	Nm	1.5	1.2	1.1	0.9	0.9	0.8	0.7	0.6	0.5	0.5
				in.lb	13.3	10.6	9.7	8.8	8.8	7.1	6.2	5.3	4.4	4.4
Max. torsional backlash			j_t	arcmin	Standard ≤ 5 / Reduced ≤ 3									
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	%	94									
Service life (For calculation, see the Chapter "Information")			L_h	h	> 20000									
Weight incl. standardadapter plate			m	kg	7.9									
				lb_m	17.5									
Operating noise (with i=100 and n_1 = 3000 rpm no load)			L_{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	J_1	kgcm²	0.64	0.54	0.52	0.43	0.63	0.43	0.38	0.38	0.37	0.37
				10^{-3} in.lb.s²	0.57	0.47	0.46	0.38	0.56	0.38	0.34	0.33	0.33	0.33
Clamping hub diameter [mm]	E	19	J_1	kgcm²	0.81	0.70	0.69	0.60	0.80	0.59	0.55	0.54	0.54	0.54
				10^{-3} in.lb.s²	0.72	0.62	0.61	0.53	0.71	0.52	0.48	0.48	0.48	0.47
	G	24	J_1	kgcm²	2.18	2.07	2.05	1.97	2.23	1.96	1.92	1.91	1.91	1.91
				10^{-3} in.lb.s²	1.93	1.83	1.82	1.74	1.97	1.74	1.70	1.69	1.69	1.69
	H	28	J_1	kgcm²	1,98	1,90	1,88	1,81	2.06	1,80	1,76	1,75	1,75	1,75
				10^{-3} in.lb.s²	1,75	1,68	1,66	1,60	1.82	1,59	1,56	1,55	1,55	1,55

Reduced mass moments of inertia available on request.

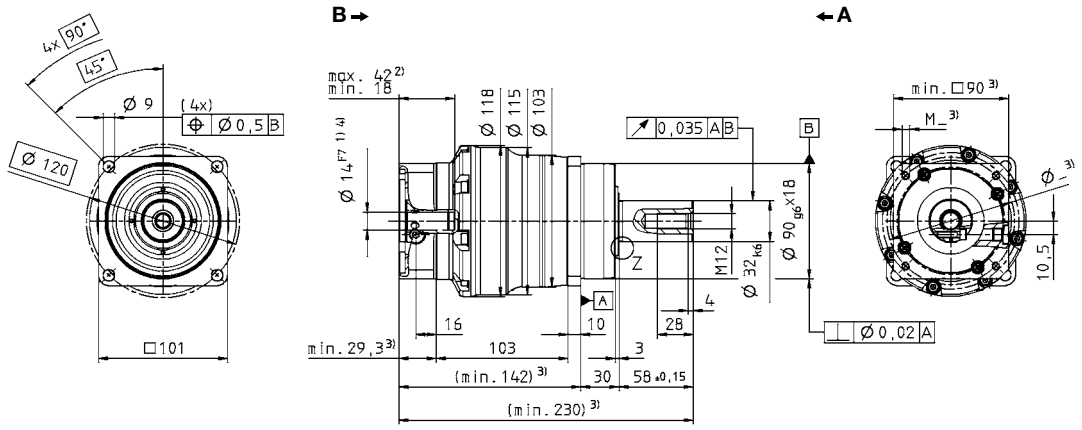
[a] Other ratios available on request
[b] For higher ambient temperatures, please reduce input speed
[c] Valid for clamping hub diameter of 19 mm
[d] Refers to centre of the output shaft or flange

View A

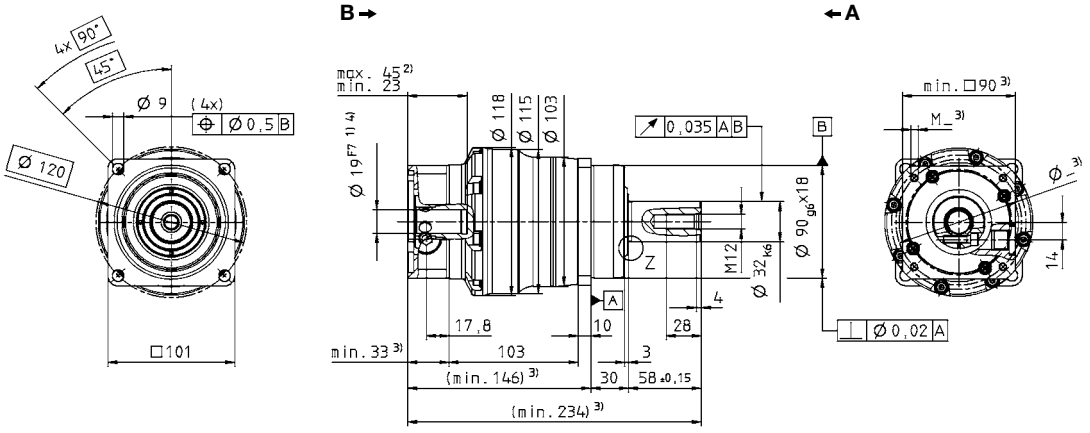
View B

Motor shaft diameter [mm]

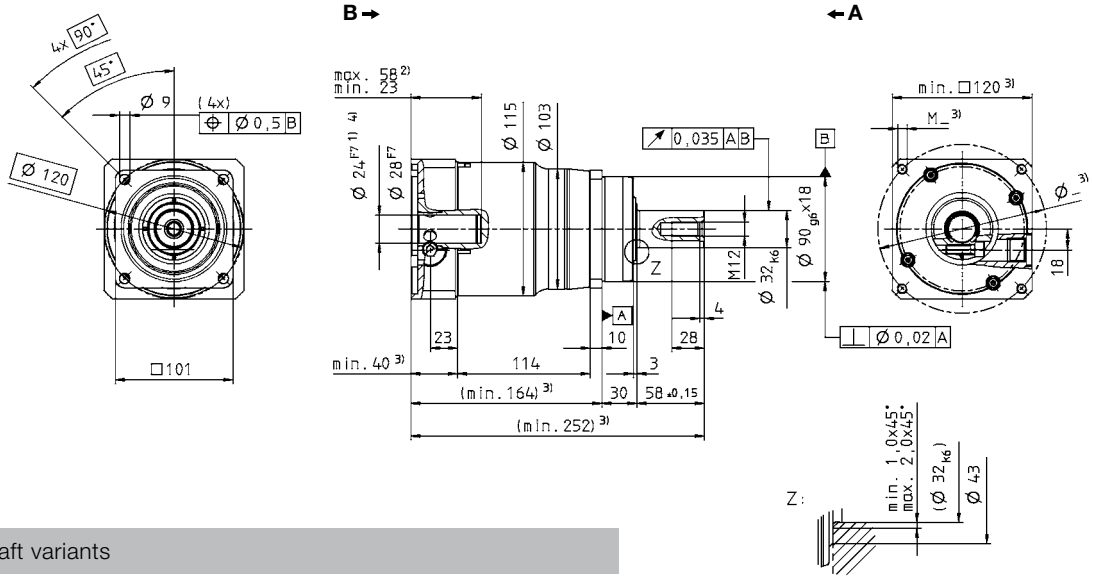
up to 14 [4] (C) clamping hub diameter



up to 19 [4] (E) clamping hub diameter



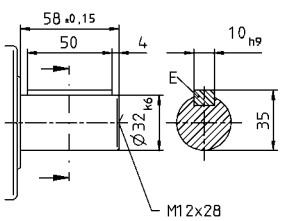
up to 24/28 [4] (G/H) clamping hub diameter



Alternatives: Output shaft variants

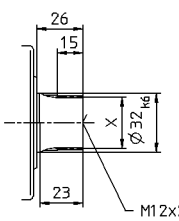
Output shaft with key in mm

E = key as per DIN 6885, sheet 1, form A



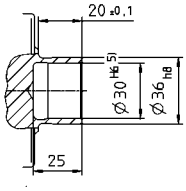
Involute gearing DIN 5480 in mm

X = W 32 x 1.25 x 30 x 24 x 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

					1-stage					
Ratio [a]			i		**3**	**4**	**5**	**7**	**8**	**10**
cymex®-optimized acceleration torque (please contact us regarding the design)			T_{2Bcym}	Nm	–	710	755	680	560	560
				in.lb	–	6284	6682	6018	4956	4956
Max. acceleration torque (max. 1000 cycles per hour)			T_{2B}	Nm	390	660	660	660	530	530
				in.lb	3451.5	5841	5841	5841	4691	4691
Nominal output torque (with n_{1N})			T_{2N}	Nm	200	360	360	360	220	220
				in.lb	1770	3186	3186	3186	1947	1947
Emergency stop torque (permitted 1000 times during the service life of the gearhead)			T_{2Not}	Nm	1000	1250	1250	1250	1000	1000
				in.lb	8850	11063	11063	11063	8850	8850
Nominal input speed (with T_{2N} and 20°C ambient temperature) [b]			n_{1N}	rpm	2100	2100	2100	2600	2600	2600
Max. input speed			n_{1Max}	rpm	4000	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	2.5
				in.lb	67	51	42	30	22	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	5.83	5.28
				10^{-3} in.lb.s²	9.45	6.92	6.01	5.17	5.16	4.67
Clamping hub diameter [mm]	I	32	J_1	$kgcm^2$	13.8	11.0	9.95	9.01	9.00	8.44
				10^{-3} in.lb.s²	12.3	9.72	8.81	7.97	7.97	7.47
	K	38	J_1	$kgcm^2$	14.9	12.1	11.0	10.1	10.1	9.51
				10^{-3} in.lb.s²	13.2	10.7	9.76	8.92	8.94	8.42
	M	48	J_1	$kgcm^2$	29.5	26.7	25.6	24.7	25.0	24.2
				10^{-3} in.lb.s²	26.1	23.6	22.7	21.9	22.1	21.4

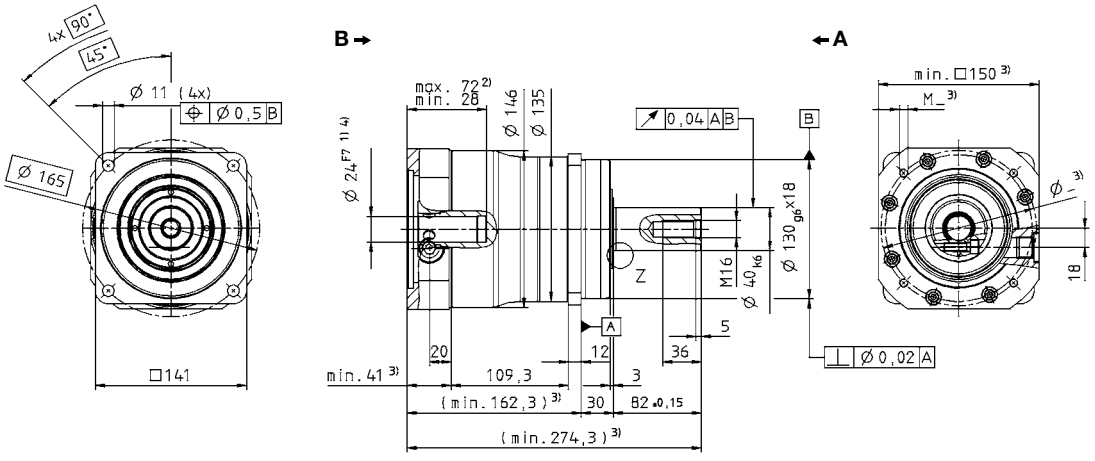
Reduced mass moments of inertia available on request.

[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

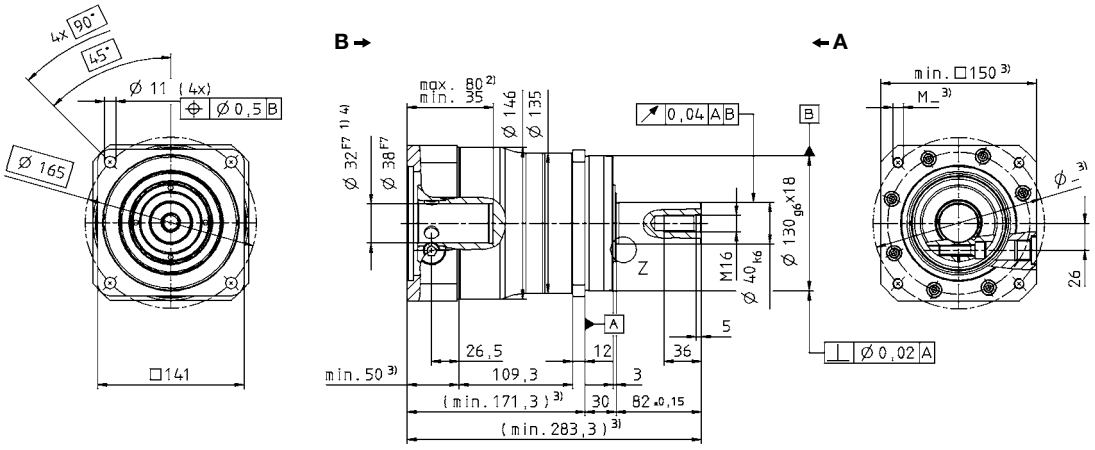
View A View B

Motor shaft diameter [mm]

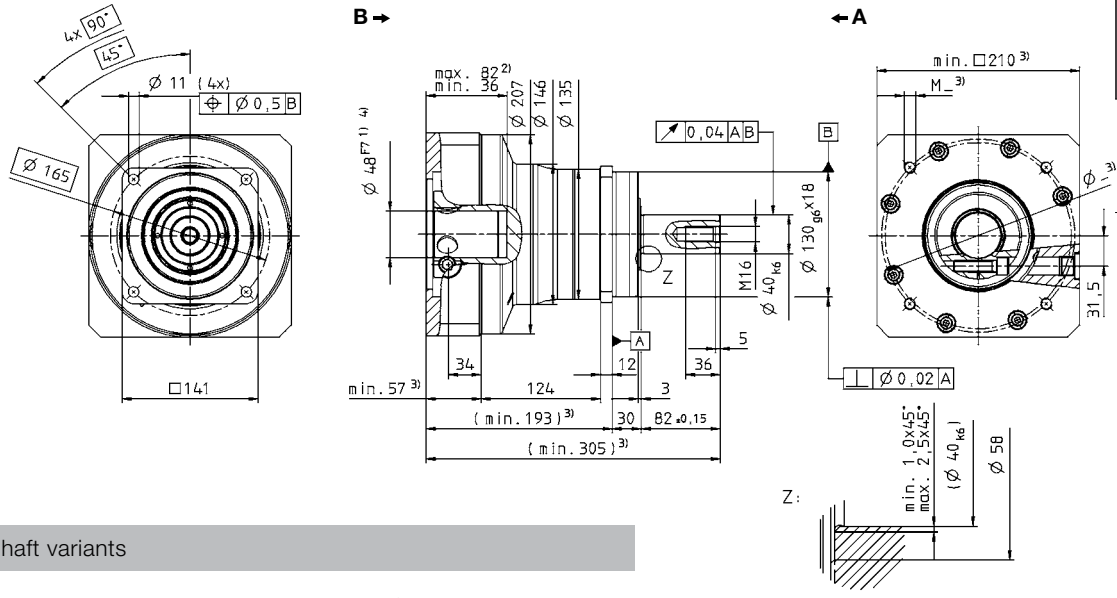
up to 24 [4] (G) clamping hub diameter



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



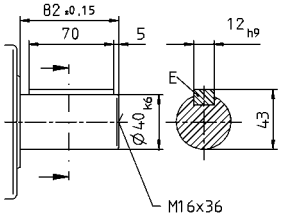
up to 48 [4] (M) clamping hub diameter



Alternatives: Output shaft variants

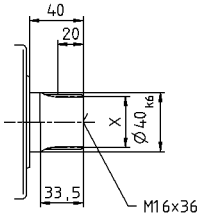
Output shaft with key in mm

E = key as per DIN 6885, sheet 1, form A



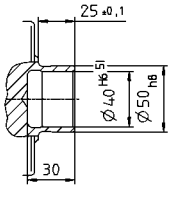
Involute gearing DIN 5480 in mm

X = W 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

				2-stage									
Ratio [a]			***i***	**16**	**20**	**25**	**28**	**32**	**35**	**40**	**50**	**70**	**100**
cymex®-optimized acceleration torque (please contact us regarding the design)			T_{2Bcym} Nm	710	710	755	710	560	755	710	755	680	560
			T_{2Bcym} in.lb	6284	6284	6682	6284	4956	6682	6284	6682	6018	4956
Max. acceleration torque (max. 1000 cycles per hour)			T_{2B} Nm	660	660	660	660	530	660	660	660	660	530
			T_{2B} in.lb	5841	5841	5841	5841	4691	5841	5841	5841	5841	4691
Nominal output torque (with n_{1N})			T_{2N} Nm	360	360	360	360	360	360	360	360	360	220
			T_{2N} in.lb	3186	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	1250	1000
			T_{2Not} in.lb	11063	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	2900	3200	3200	3900
Max. input speed [c]			n_{1Max} rpm	5000	5000	5000	5000	5000	5000	5000	5000	5000	5000
Mean no load running torque (with n_1 = 3000 rpm and 20°C gearhead temperature) [c]			T_{012} Nm	3.3	2.7	2.4	1.9	1.9	1.8	1.4	1.3	1.2	1.1
			T_{012} in.lb	29.2	23.9	21.2	16.8	16.8	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									
			C_{t21} in.lb/ arcmin	469									
Max. axial force [d]			F_{2AMax} N	9870									
			F_{2AMax} lb_f	2221									
Max. radial force [d]			F_{2RMax} N	9900									
			F_{2RMax} lb_f	2228									
Max. tilting moment			M_{2KMax} Nm	952									
			M_{2KMax} 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									
			m lb_m	37.6									
Operating noise (with *i*=100 and n_1=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 kgcm²	2.50	2.01	1.97	1.65	2.48	1.63	1.40	1.39	1.38	1.38
			J_1 10^{-3} in.lb.s²	2.21	1.78	1.75	1.46	2.19	1.44	1.24	1.23	1.22	1.22
Clamping hub diameter [mm]	G	24	J_1 kgcm²	3.19	2.71	2.67	2.34	3.18	2.32	2.10	2.08	2.08	2.07
			J_1 10^{-3} in.lb.s²	2.82	2.40	2.36	2.07	2.81	2.05	1.85	1.85	1.84	1.83
	K	38	J_1 kgcm²	10.3	9.77	9.73	9.41	9.32	9.39	9.16	9.15	9.14	9.14
			J_1 10^{-3} in.lb.s²	9.07	8.65	8.61	8.33	8.25	8.31	8.11	8.10	8.09	8.09

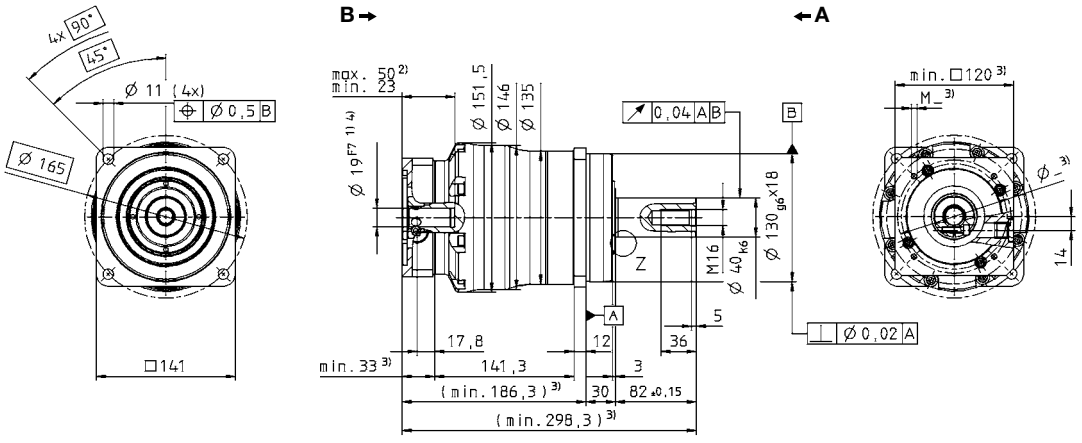
Reduced mass moments of inertia available on request.

[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

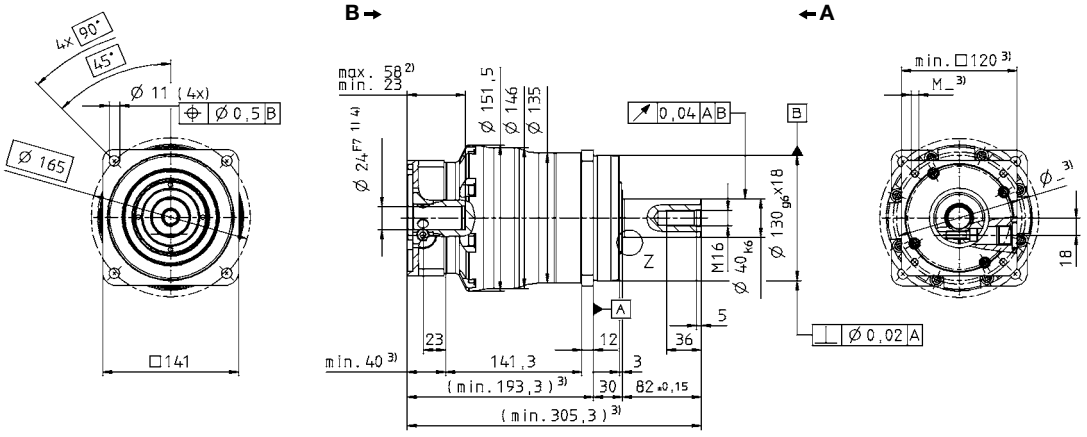
View A | View B

Motor shaft diameter [mm]

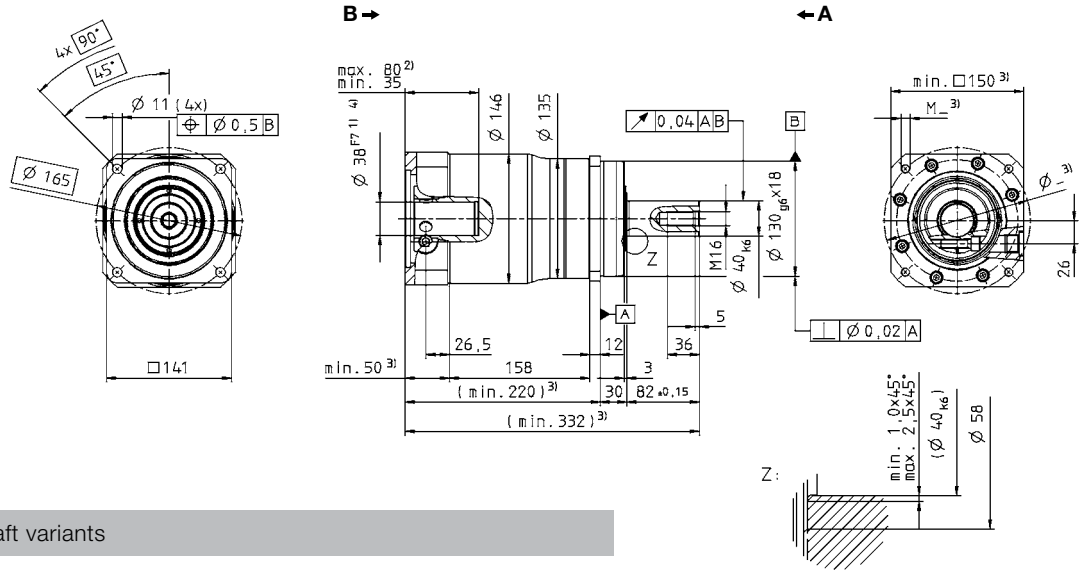
up to 19 [4] (E) clamping hub diameter



up to 24 [4] (G) clamping hub diameter

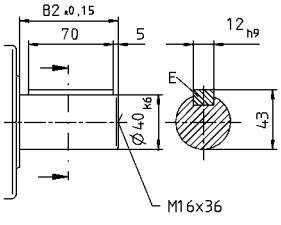


up to 38 [4] (K) clamping hub diameter

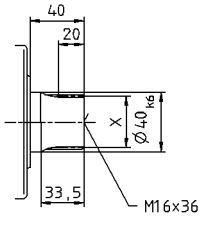


Alternatives: Output shaft variants

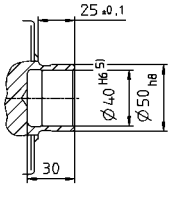
Output shaft with key in mm
E = key as per DIN 6885, sheet 1, form A



Involute gearing DIN 5480 in mm
X = W 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

					1-stage				
Ratio [a]			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_{1N})			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	kgcm²	50.8	33.9	27.9	22.2	19.2
				10^{-3} in.lb.s²	45.0	30.0	24.7	19.7	17.0
Clamping hub diameter [mm]	M	48	J_1	kgcm²	58.2	41.2	35.3	29.6	26.5
				10^{-3} in.lb.s²	51.5	36.5	31.2	26.2	23.5
	N	55	J_1	kgcm²	65.7	49.7	44.0	38.5	35.4
				10^{-3} in.lb.s²	58.2	44.0	38.9	34.0	31.4

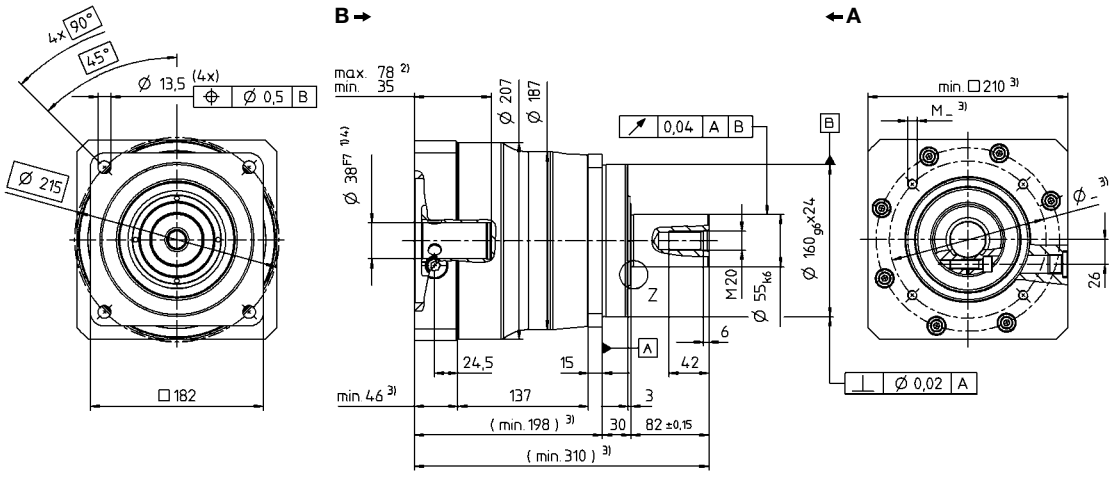
Reduced mass moments of inertia available on request.

[a] Other ratios available on request
[b] For higher ambient temperatures, please reduce input speed
[c] Valid for clamping hub diameter of 48 mm
[d] Refers to center of the output shaft or flange

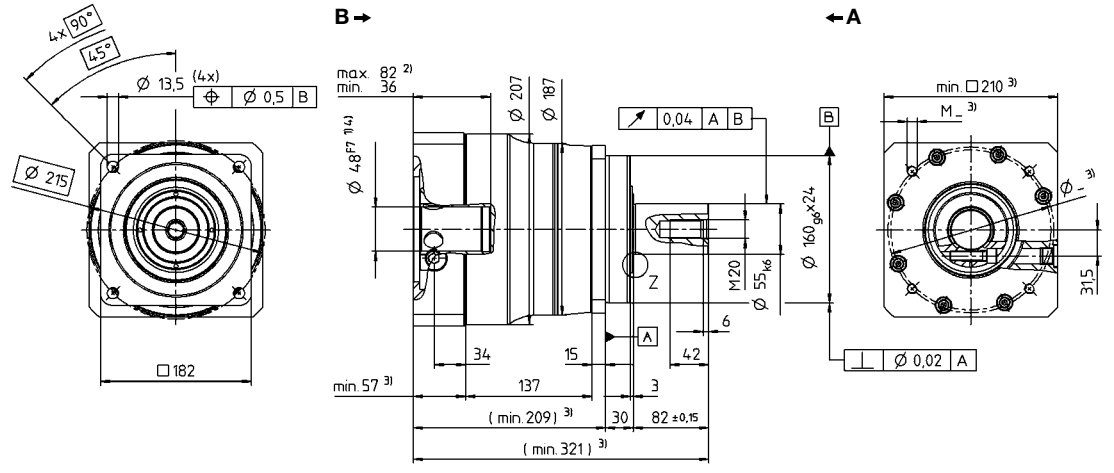
View A | View B

Motor shaft diameter [mm]

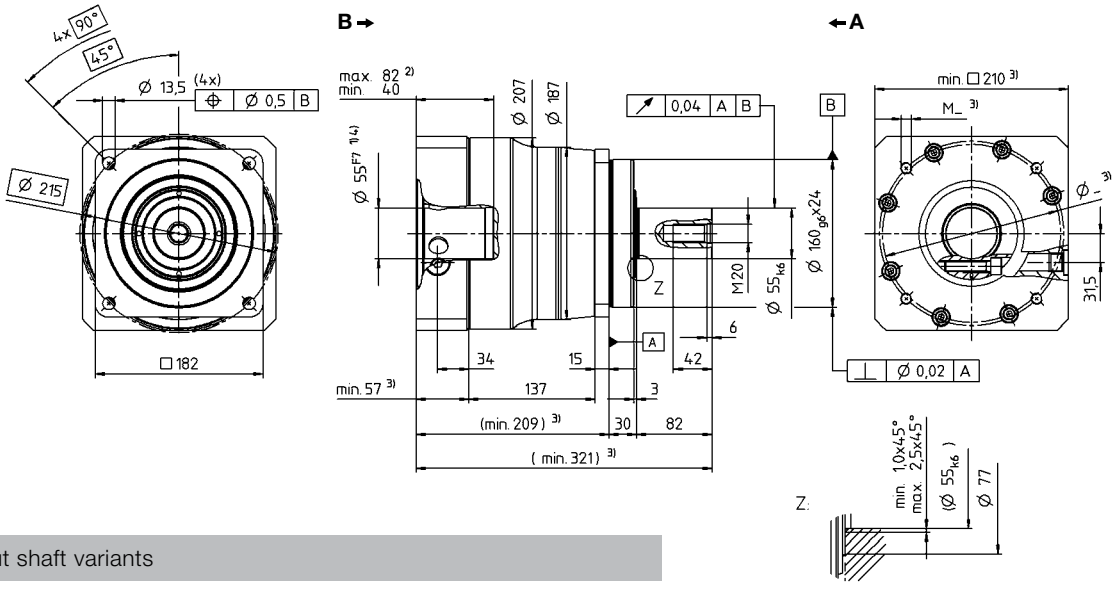
up to 38 [4] (K) clamping hub diameter



up to 48 [4] (M) clamping hub diameter

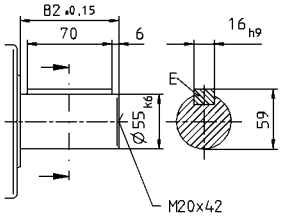


up to 55 [4] (N) clamping hub diameter

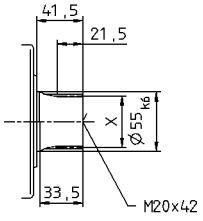


Alternatives: Output shaft variants

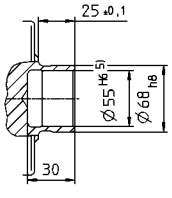
Output shaft with key in mm
E = key as per DIN 6885, sheet 1, form A



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



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

					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	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)			T_{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 n_{1N})			T_{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)			T_{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 T_{2N} and 20°C ambient temperature) [b]			n_{1N}	rpm	2700	2700	2700	2700	2700	2700	2900	3200	3400
Max. input speed [c]			n_{1Max}	rpm	4500	4500	4500	4500	4500	4000	4500	4500	4500
Mean no load running torque (with n_1 = 3000 rpm and 20°C gearhead temperature) [c]			T_{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			j_t	arcmin	Standard ≤ 5 / Reduced ≤ 3								
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	%	94								
Service life (For calculation, see the Chapter "Information")			L_h	h	> 20000								
Weight incl. standard adapter plate			m	kg	36.4								
				lb_m	80.4								
Operating noise (with i=100 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)	G	24	J_1	kgcm²	9.27	7.72	7.48	6.32	6.20	5.51	5.45	5.39	5.36
				10^{-3} in.lb.s²	8.20	6.83	6.62	5.59	5.49	4.88	4.82	4.77	4.74
Clamping hub diameter [mm]	I	32	J_1	kgcm²	12.4	10.9	10.6	9.48	9.36	8.67	8.61	8.55	8.52
				10^{-3} in.lb.s²	11.0	9.63	9.42	8.39	8.28	7.67	7.62	7.57	7.54
	K	38	J_1	kgcm²	13.5	12.0	11.7	10.6	10.4	9.74	9.68	9.63	9.60
				10^{-3} in.lb.s²	12.0	10.6	10.4	9.34	9.23	8.62	8.57	8.52	8.49
	M	48	J_1	kgcm²	28.1	26.6	26.3	25.2	25.1	24.4	24.3	24.3	24.3
				10^{-3} in.lb.s²	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.

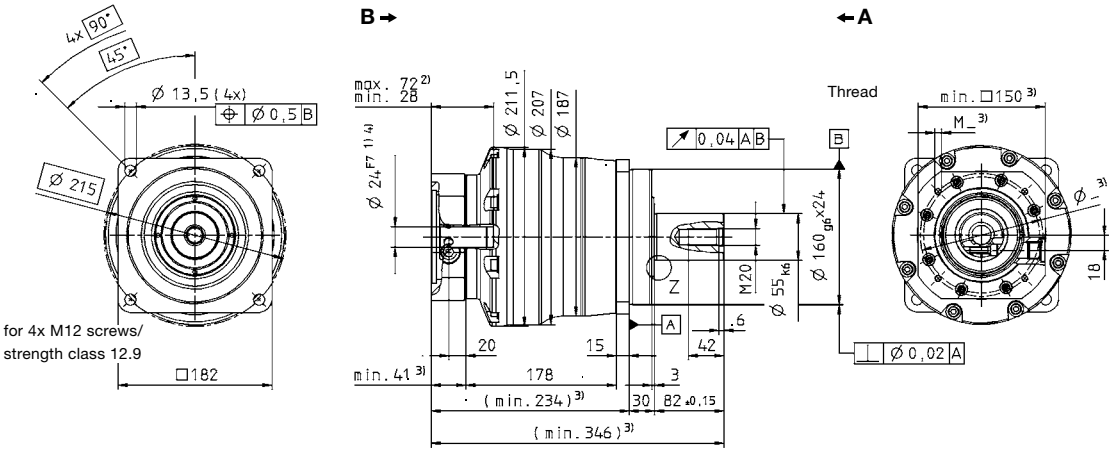
[a] Other ratios available on request
[b] For higher ambient temperatures, please reduce input speed
[c] Valid for clamping hub diameter of 38 mm
[d] Refers to center of the output shaft or flange

View A

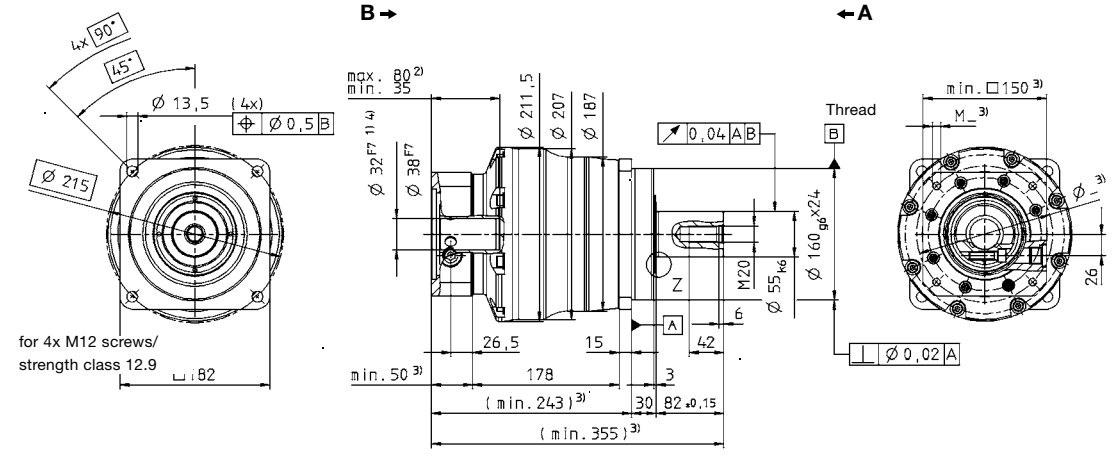
View B

Motor shaft diameter [mm]

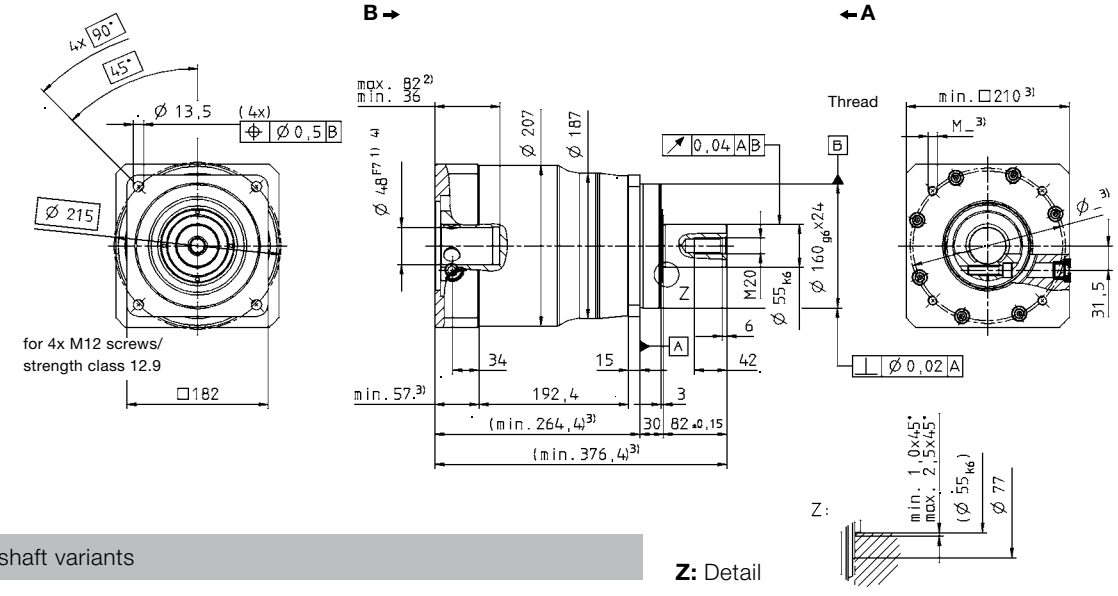
up to 24 [4] (G) clamping hub diameter



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



up to 48 [4] (M) clamping hub diameter

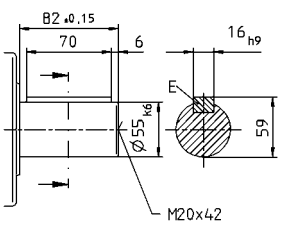


Alternatives: Output shaft variants

Z: Detail

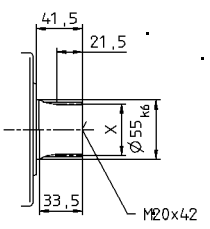
Output shaft with key in mm

E = key as per DIN 6885, sheet 1, form A



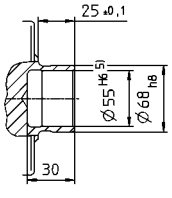
Involute gearing DIN 5480 in mm

X = W 55 x 2 x 30 x 26 x 6m, DIN 5480



Shaft mounted

Mounted via shrink disc



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

				1-stage					2-stage								
Ratio [a]			***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)			T_{2Bcym}	Nm	- Please contact us -												
				in.lb													
Max. acceleration torque (max. 1000 cycles per hour)			T_{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 n_{1N})			T_{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)			T_{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 T_{2N} and 20°C ambient temperature) [b]			n_{1N}	rpm	1200	1200	1500	1700	2000	2500	2500	2500	2500	2500	2500	2500	3000	3000
Max. input speed			n_{1Max}	rpm	2500	2500	2500	2500	2500	3500	3500	3500	3500	3500	3500	3500	3500	3500
Mean no load running torque (with n_1 = 2000 rpm and 20°C gearhead temperature)			T_{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			j_t	arcmin	Standard ≤ 3 / Reduced ≤ 1					Standard ≤ 5 / Reduced ≤ 3								
Torsional rigidity			C_{t21}	Nm/ arcmin	400					400								
				in.lb/ arcmin	3540					3540								
Max. axial force [c]			F_{2AMax}	N	30000					30000								
				lb_f	6750					6750								
Max. radial force [c]			F_{2RMax}	N	21000					21000								
				lb_f	4725					4725								
Max. tilting moment			M_{2KMax}	Nm	3100					3100								
				in.lb	27435					2744								
Efficiency at full load			η	%	97					94								
Service life (For calculation, see the Chapter "Information")			L_h	h	> 20000					> 20000								
Weight incl. standard adapter plate			m	kg	56					53								
				lb_m	124					117								
Operating noise (with i=10 and n_1 = 2000 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)	M	48	J_1	kgcm²	-	-	-	-	-	34.5	31.5	30.8	30.0	29.7	28.5	28.3	28.1	28.0
				10^{-3} in.lb.s²						30.5	27.9	27.3	26.6	26.3	25.2	25.0	24.9	24.8
Clamping hub diameter (mm)	N	55	J_1	kgcm²	139.0	94.3	76.9	61.5	53.1	-	-	-	-	-	-	-	-	-
				10^{-3} in.lb.s²	118.2	80.2	65.4	52.3	45.1									

Reduced mass moments of inertia available on request.

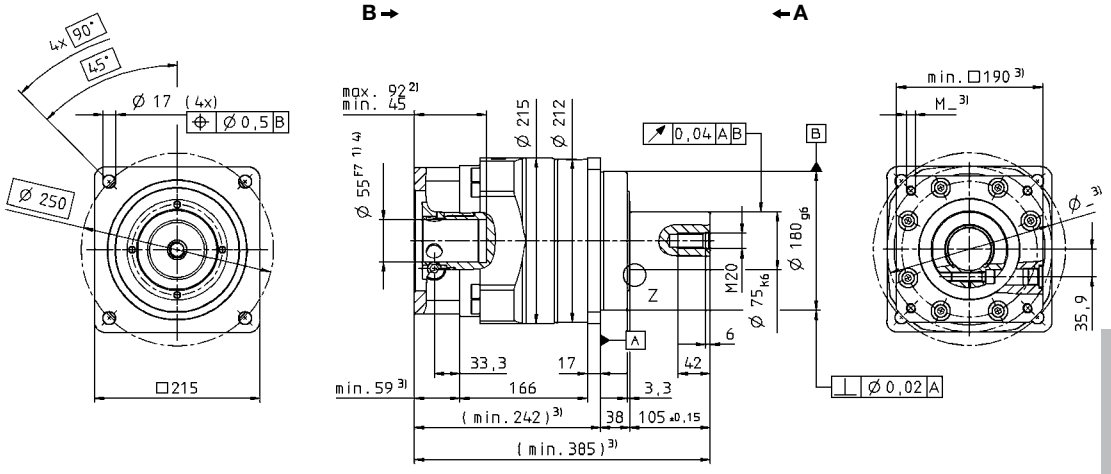
[a] Other ratios available on request
[b] For higher ambient temperatures, please reduce input speed
[c] Refers to center of the output shaft or flange

View A View B

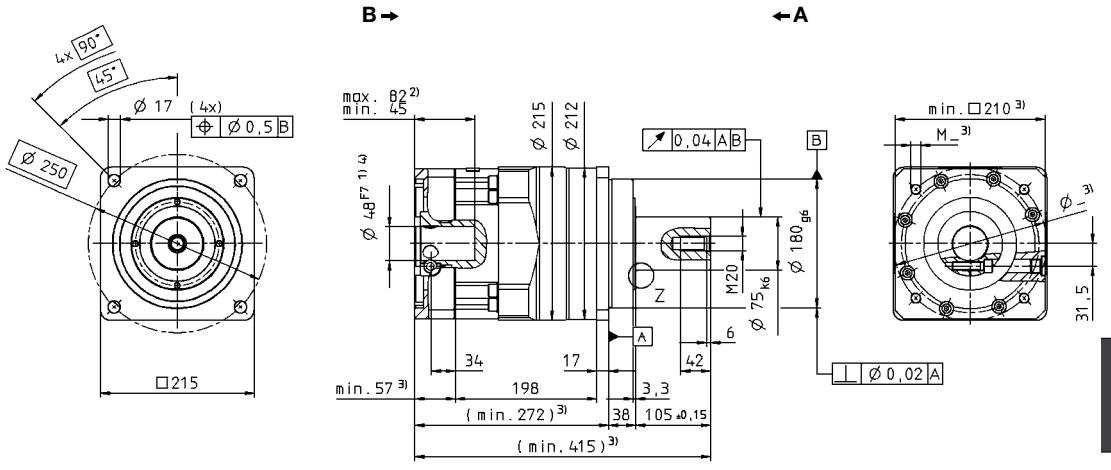
Motor shaft diameter [mm]

up to 55 [4] (N) clamping hub diameter

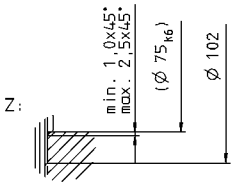
1-stage:



2-stage:

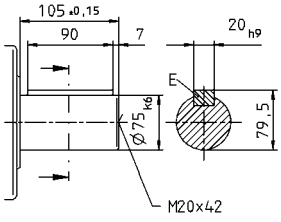


up to 48 [4] (M) clamping hub diameter

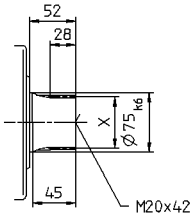


Alternatives: Output shaft variants

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



Involute gearing DIN 5480 in mm
X = W 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

				1-stage					2-stage								
Ratio [a]			***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)			T_{2Bcym}	Nm	- Please contact us -												
				in.lb													
Max. acceleration torque (max. 1000 cycles per hour)			T_{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 n_{1N})			T_{2N}	Nm	1500	2500	2500	2300	1700	2500	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)			T_{2Not}	Nm	6800	8500	8500	8500	6800	8500	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 T_{2N} and 20°C ambient temperature) [b]			n_{1N}	rpm	1000	1000	1200	1500	1700	2300	2500	2500	2500	2500	2500	2500	2800	2800
Max. input speed			n_{1Max}	rpm	2500	2500	2500	2500	2500	3500	3500	3500	3500	3500	3500	3500	3500	3500
Mean no load running torque (with n_1 = 2000 rpm and 20°C gearhead temperature)			T_{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			j_t	arcmin	Standard ≤ 3 / Reduced ≤ 1					Standard ≤ 5 / Reduced ≤ 3								
Torsional rigidity			C_{t21}	Nm/ arcmin	550					550								
				in.lb/ arcmin	4868					4868								
Max. axial force [c]			F_{2AMax}	N	33000					33000								
				lb_f	7425					7425								
Max. radial force [c]			F_{2RMax}	N	30000					30000								
				lb_f	6750					6750								
Max. tilting moment			M_{2KMax}	Nm	5000					5000								
				in.lb	44250					44250								
Efficiency at full load			η	%	97					94								
Service life (For calculation, see the Chapter "Information")			L_h	h	> 20000					> 20000								
Weight incl. standard adapter plate			m	kg	77					76								
				lb_m	170					168								
Operating noise (with i=10 and n_1 = 2000 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)	M	48	J_1	kgcm²	-	-	-	-	-	39.2	34.6	33.2	30.5	29.7	28.2	27.9	27.6	27.5
				10^{-3} in.lb.s²						34.7	30.6	29.4	27.0	26.3	25.0	24.7	24.4	24.3
Clamping hub diameter [mm]	O	60	J_1	kgcm²	260.2	198.2	163.0	138,3	124,7	-	-	-	-	-	-	-	-	-
				10^{-3} in.lb.s²	230.3	175.4	144.3	122,4	110,4									

Reduced mass moments of inertia available on request.

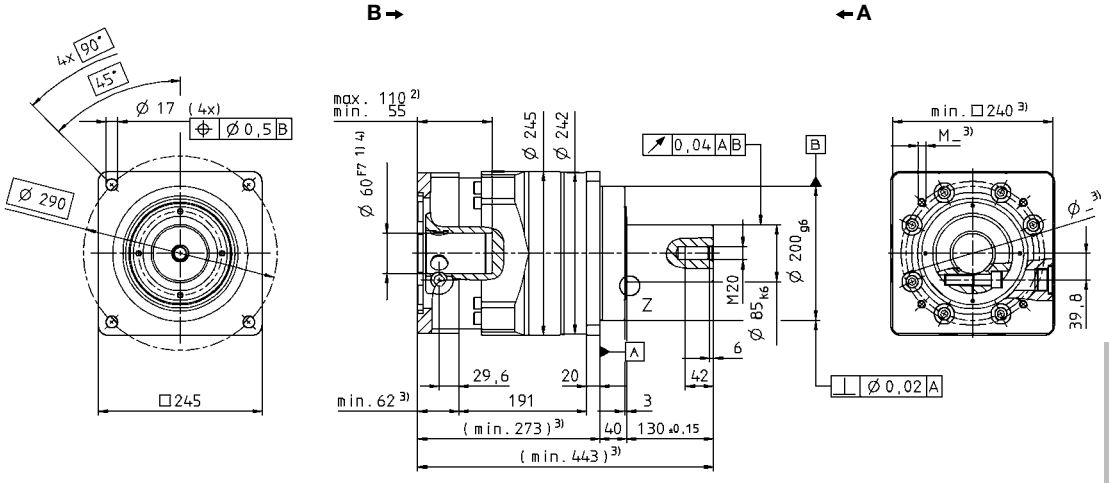
[a] Other ratios available on request
[b] For higher ambient temperatures, please reduce input speed
[c] Refers to center of the output shaft or flange

View A | View B

Motor shaft diameter [mm]

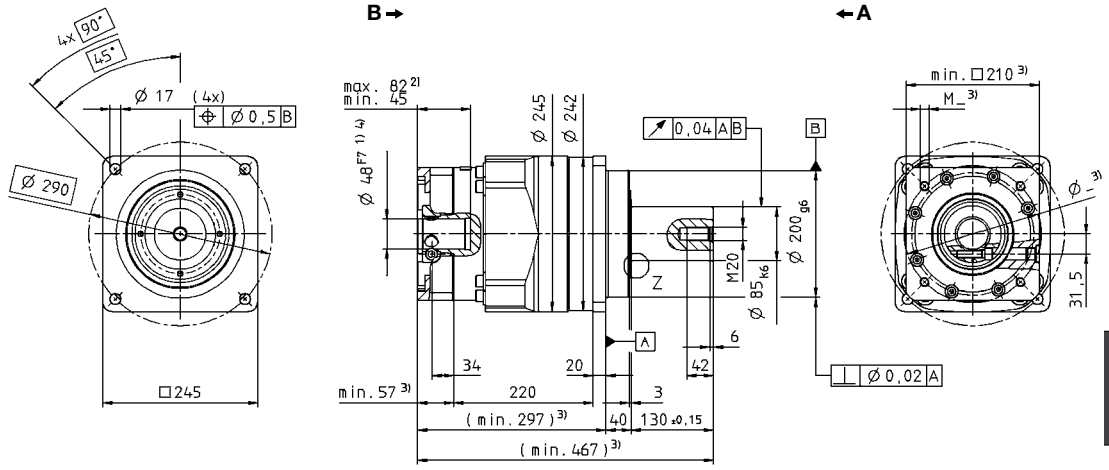
up to 60 [4] (O) clamping hub diameter

1-stage:

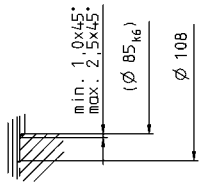


up to 48 [4] (M) clamping hub diameter

2-stage:

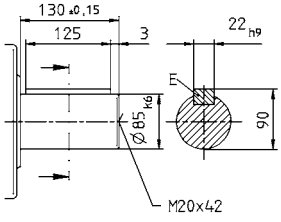


Z:

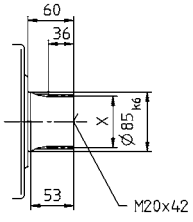


Alternatives: Output shaft variants

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



Involute gearing DIN 5480 in mm
X = W 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

					1-stage					
Ratio [a]			***i***		**3**	**4**	**5**	**7**	**8**	**10**
Max. acceleration torque (max. 1000 cycles per hour)			T_{2B}	Nm	68	90	90	90	70	70
				in.lb	602	797	797	797	620	620
cymex®-optimized nominal torque (please contact us regarding the design)			T_{2Ncym}	Nm	–	60	60	60	35	35
				in.lb	–	531	531	531	310	310
Nominal output torque (with n_{1N})			T_{2N}	Nm	28	48	48	48	30	30
				in.lb	248	425	425	425	266	266
Emergency stop torque (permitted 1000 times during the service life of the gearhead)			T_{2Not}	Nm	200	250	250	250	200	200
				in.lb	1770	2213	2213	2213	1770	1770
Nominal input speed (with T_{2N} and 20°C ambient temperature) [b]			n_{1N}	rpm	4500	4500	4500	4500	4500	4500
Max. input speed			n_{1Max}	rpm	6000	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	0.5
				in.lb	12.4	9.7	8.0	5.3	4.4	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. standardadapter 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	0.42	0.54
				10^{-3} in.lb.s²	0.91	0.69	0.60	0.52	0.37	0.48
Clamping hub diameter [mm]	G	24	J_1	$kgcm^2$	2.40	2.15	2.05	1.96	2.02	1.91
				10^{-3} in.lb.s²	2.12	1.90	1.81	1.73	1.79	1.69

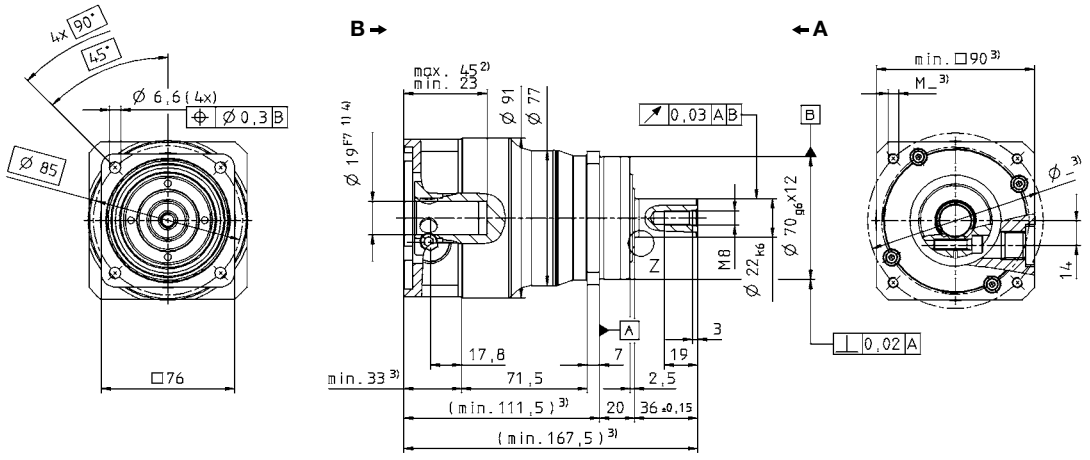
Reduced mass moments of inertia available on request.

[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

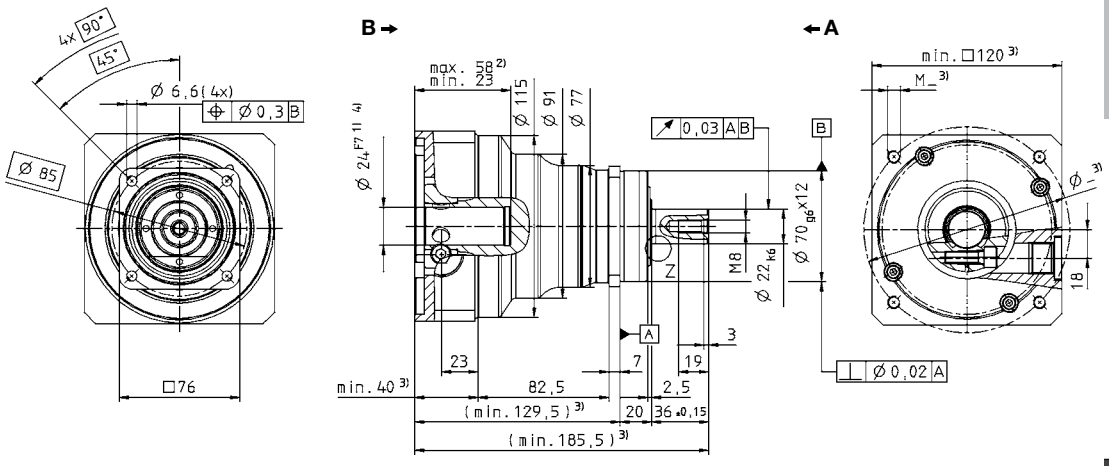
View A View B

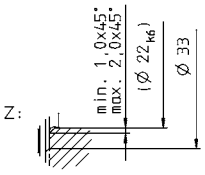
Motor shaft diameter [mm]

up to 19 [4] (E) clamping hub diameter



up to 24 [4] (G) clamping hub diameter





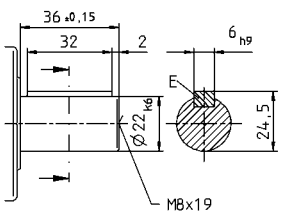
Planetary gearheads **High End**

SP+

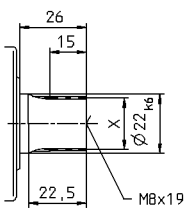
MC

Alternatives: Output shaft variants

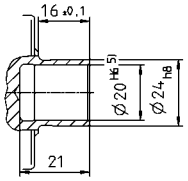
Output shaft with key in mm
E = key as per DIN 6885, sheet 1, form A



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

				2-stage									
Ratio [a]			i	**16**	**20**	**25**	**28**	**32**	**35**	**40**	**50**	**70**	**100**
Max. acceleration torque (max. 1000 cycles per hour)			T_{2B} Nm	90	90	90	90	70	90	90	90	90	70
			T_{2B} in.lb	797	797	797	797	620	797	797	797	797	620
cymex®-optimized nominal torque (please contact us regarding the design)			T_{2Ncym} Nm	–	–	–	–	–	–	60	–	–	35
			T_{2Ncym} in.lb							531			310
Nominal output torque (with n_{1N})			T_{2N} Nm	60	60	60	60	60	60	55	60	60	30
			T_{2N} in.lb	531	531	531	531	531	531	487	531	531	266
Emergency stop torque (permitted 1000 times during the service life of the gearhead)			T_{2Not} Nm	250	250	250	250	200	250	250	250	250	200
			T_{2Not} in.lb	2213	2213	2213	2213	1770	2213	2213	2213	2213	1770
Nominal input speed (with T_{2N} and 20°C ambient temperature) [b]			n_{1N} rpm	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500
Max. input speed			n_{1Max} rpm	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000
Mean no load running torque (with n_1 = 2000 rpm and 20°C gearhead temperature) [c]			T_{012} Nm	0.5	0.4	0.4	0.3	0.3	0.3	0.2	0.2	0.2	0.2
			T_{012} in.lb	4.4	3.5	3.5	2.7	2.7	2.7	1.8	1.8	1.8	1.8
Max. torsional backlash			j_t arcmin	Standard ≤ 8 / Reduced ≤ 6									
Torsional rigidity			C_{t21} Nm/ arcmin	10									
			C_{t21} in.lb/ arcmin	89									
Max. axial force [d]			F_{2AMax} N	3350									
			F_{2AMax} lb_f	754									
Max. radial force [d]			F_{2RMax} N	4200									
			F_{2RMax} lb_f	945									
Max. tilting moment			M_{2KMax} Nm	236									
			M_{2KMax} in.lb	2089									
Efficiency at full load			η %	96,5									
Service life (For calculation, see the Chapter "Information")			L_h h	> 30000									
Weight incl. standard adapter plate			m kg	3,6									
			m lb_m	8.0									
Operating noise (with i=100 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 kgcm²	0.23	0.20	0.20	0.18	0.23	0.18	0.16	0.16	0.16	0.16
			J_1 10^{-3} in.lb.s²	0.20	0.18	0.18	0.16	0.203	0.16	0.15	0.15	0.14	0.14
Clamping hub diameter [mm]	E	19	J_1 kgcm²	0.55	0.53	0.52	0.50	0.57	0.50	0.49	0.49	0.49	0.49
			J_1 10^{-3} in.lb.s²	0.49	0.47	0.46	0.45	0.505	0.44	0.43	0.43	0.43	0.43

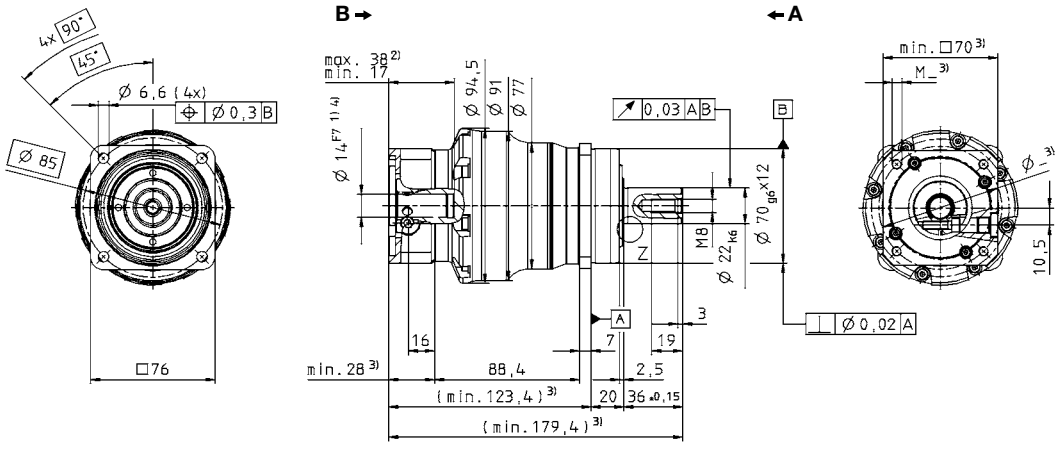
Reduced mass moments of inertia available on request.

[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

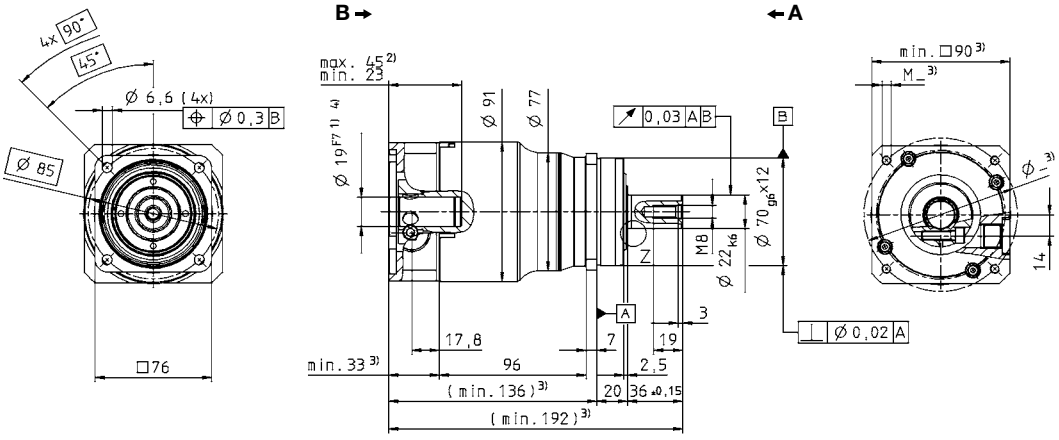
View A View B

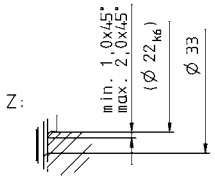
Motor shaft diameter [mm]

up to 14 [4] (C) clamping hub diameter



up to 19 [4] (E) clamping hub diameter





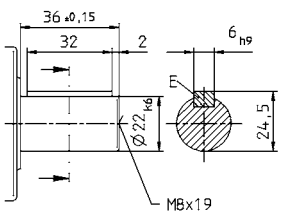
Planetary gearheads **High End**

SP+

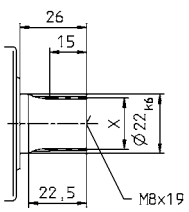
MC

Alternatives: Output shaft variants

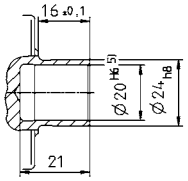
Output shaft with key in mm
E = key as per DIN 6885, sheet 1, form A



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

				Standard version MC						Friction optimized version L					
Ratio [a]	i			**3**	**4**	**5**	**7**	**8**	**10**	**3**	**4**	**5**	**7**	**8**	**10**
Max. acceleration torque (max. 1000 cycles per hour)	T_{2B}		Nm	180	240	240	240	180	180	180	240	240	240	180	180
			in.lb	1593	2124	2124	2124	1593	1593	1593	2124	2124	2124	1593	1593
cymex®-optimized nominal torque (please contact us regarding the design)	T_{2Ncym}		Nm	95	135	135	135	90	90	95	135	135	135	90	90
			in.lb	841	1195	1195	1195	797	797	841	1195	1195	1195	797	797
Nominal output torque (with n_{1N})	T_{2N}		Nm	70	100	105	105	80	80	70	100	105	105	80	80
			in.lb	620	885	929	929	708	708	620	885	929	929	708	708
Emergency stop torque (permitted 1000 times during the service life of the gearhead)	T_{2Not}		Nm	500	625	625	625	500	500	500	625	625	625	500	500
			in.lb	4425	5531	5531	5531	4425	4425	4425	5531	5531	5531	4425	4425
Nominal input speed (with T_{2N} and 20°C ambient temperature) [b]	n_{1N}		rpm	3500	4000	4500	4500	4500	4500	3500	4000	4500	4500	4500	4500
cymex® optimized speed (please contact us regarding the design)	n_{1Ncym}		rpm	–	–	–	–	–	–	4500	5000	5000	5000	5000	5000
Max. input speed	n_{1Max}		rpm	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000
Mean no load running torque (with n_1 = 2000 rpm and 20°C gearhead temperature) [c]	T_{012}		Nm	2.4	2.1	1.8	1.1	0.8	0.8	0.9	0.8	0.6	0.5	0.4	0.4
			in.lb	21.2	18.6	15.9	9.74	7.08	7.08	7.965	7.08	5.31	4.425	3.54	3.54
Max. torsional backlash	j_t		arcmin	Standard ≤ 4 / Reduced ≤ 2											
Torsional rigidity	C_{t21}		Nm/ arcmin	31						1					
			in.lb/ arcmin	274						5					
Max. axial force [d]	F_{2AMax}		N	5650						2000					
			lb_f	1271						450					
Max. radial force [d]	F_{2RMax}		N	6600						1000					
			lb_f	1485						225					
Max. tilting moment	M_{2KMax}		Nm	487						72					
			in.lb	4310						637					
Efficiency at full load	η		%	98.5						99					
Service life (For calculation, see the Chapter "Information")	L_h		h	> 30000											
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						IP 52					
Moment of inertia (relates to the drive)	G	24	J_1	kgcm²	3.99	3.04	2.61	2.29	2.26	2.07	3.99	3.04	2.61	2.29	2.26	2.07
				10^{-3} in.lb.s²	3.53	2.69	2.31	2.03	2.00	1.83	3.53	2.69	2.31	2.03	2.00	1.83
Clamping hub diameter [mm]	K	38	J_1	kgcm²	11.1	10.1	9.68	9.36	9.55	9.14	11.1	10.1	9.68	9.36	9.55	9.14
				10^{-3} in.lb.s²	9.78	8.95	8.57	8.28	8.45	8.09	9.78	8.95	8.57	8.28	8.45	8.09

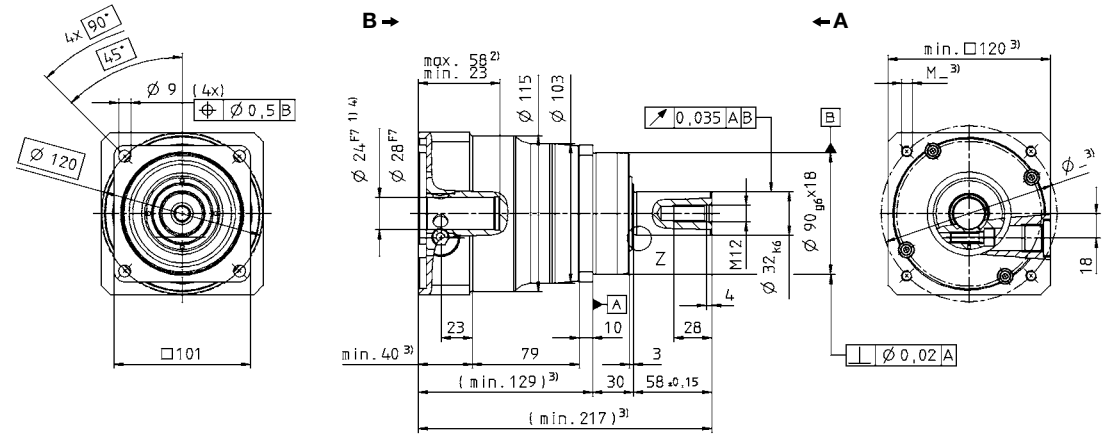
Reduced mass moments of inertia available on request.

[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

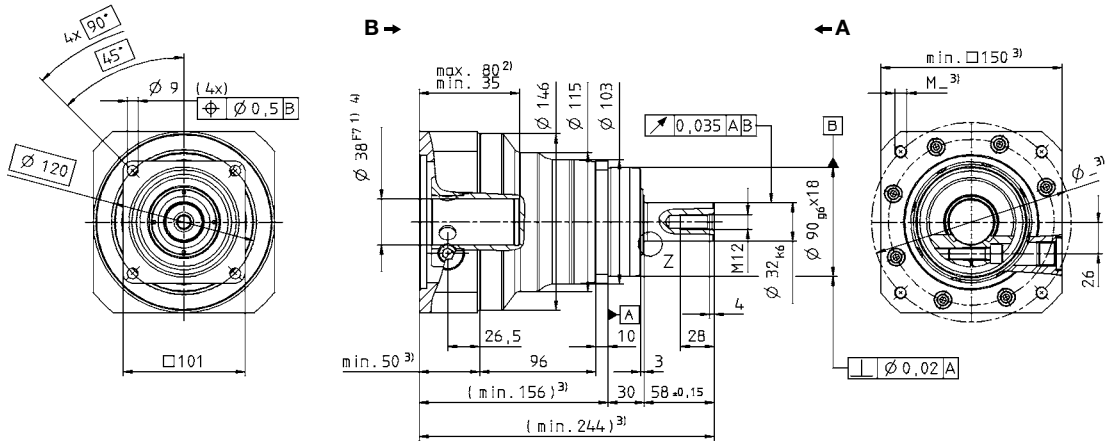
View A View B

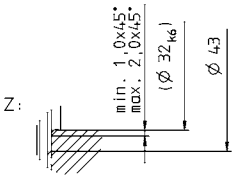
Motor shaft diameter [mm]

up to 24 [4] (G) clamping hub diameter



up to 38 [4] (K) clamping hub diameter



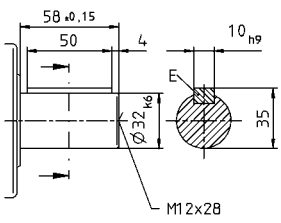


Planetary gearheads **High End**

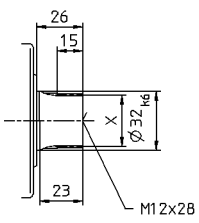
SP+ MC MC-L

Alternatives: Output shaft variants

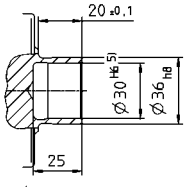
Output shaft with key in mm
E = key as per DIN 6885, sheet 1, form A



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

				2-stage									
Ratio [a]			*i*	**16**	**20**	**25**	**28**	**32**	**35**	**40**	**50**	**70**	**100**
Max. acceleration torque (max. 1000 cycles per hour)			T_{2B} Nm	240	240	240	240	180	240	240	240	240	180
			T_{2B} in.lb	2124	2124	2124	2124	1593	2124	2124	2124	2124	1593
cymex®-optimized nominal torque (please contact us regarding the design)			T_{2Ncym} Nm	–	–	–	–	–	–	–	–	–	90
			T_{2Ncym} in.lb										0
Nominal output torque (with n_{1N})			T_{2N} Nm	140	140	140	140	140	140	140	140	135	80
			T_{2N} in.lb	1239	1239	1239	1239	1239	1239	1239	1239	1195	708
Emergency stop torque (permitted 1000 times during the service life of the gearhead)			T_{2Not} Nm	625	625	625	625	500	625	625	625	625	500
			T_{2Not} in.lb	5531	5531	5531	5531	4425	5531	5531	5531	5531	4425
Nominal input speed (with T_{2N} and 20°C ambient temperature) [b]			n_{1N} rpm	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500
Max. input speed			n_{1Max} rpm	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000
Mean no load running torque (with n_1 = 2000 rpm and 20°C gearhead temperature) [c]			T_{012} Nm	0.8	0.7	0.6	0.5	0.4	0.4	0.4	0.3	0.3	0.3
			T_{012} in.lb	7.1	6.2	5.3	4.4	3.5	3.5	3.5	2.7	2.7	2.7
Max. torsional backlash			j_t arcmin	Standard ≤ 6 / Reduced ≤ 4									
Torsional rigidity			C_{t21} Nm/ arcmin	31									
			C_{t21} in.lb/ arcmin	274									
Max. axial force [d]			F_{2AMax} N	5650									
			F_{2AMax} lb_f	1271									
Max. radial force [d]			F_{2RMax} N	6600									
			F_{2RMax} lb_f	1485									
Max. tilting moment			M_{2KMax} Nm	487									
			M_{2KMax} in.lb	4310									
Efficiency at full load			η %	96.5									
Service life (For calculation, see the Chapter "Information")			L_h h	> 30000									
Weight incl. standardadapter plate			*m* kg	7.9									
			m lb_m	17.5									
Operating noise (with *i*=100 and n_1=3000 rpm no load)			L_{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	J_1 kgcm²	0.81	0.70	0.69	0.60	0.80	0.59	0.55	0.54	0.54	0.54
			J_1 10^{-3} in.lb.s²	0.72	0.62	0.61	0.53	0.71	0.52	0.48	0.48	0.48	0.47
Clamping hub diameter [mm]	G	24	J_1 kgcm²	2.18	2.07	2.05	1.97	2.23	1.96	1.92	1.91	1.91	1.91
			J_1 10^{-3} in.lb.s²	1.93	1.83	1.82	1.74	1.97	1.74	1.70	1.69	1.69	1.69

Reduced mass moments of inertia available on request.

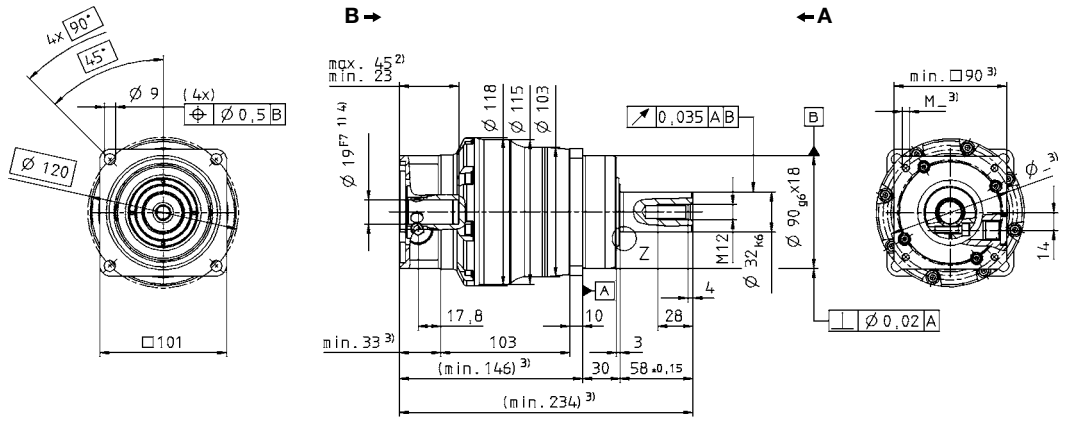
[a] Other ratios available on request
[b] For higher ambient temperatures, please reduce input speed
[c] Valid for clamping hub diameter of 19 mm
[d] Refers to centre of the output shaft or flange

View A

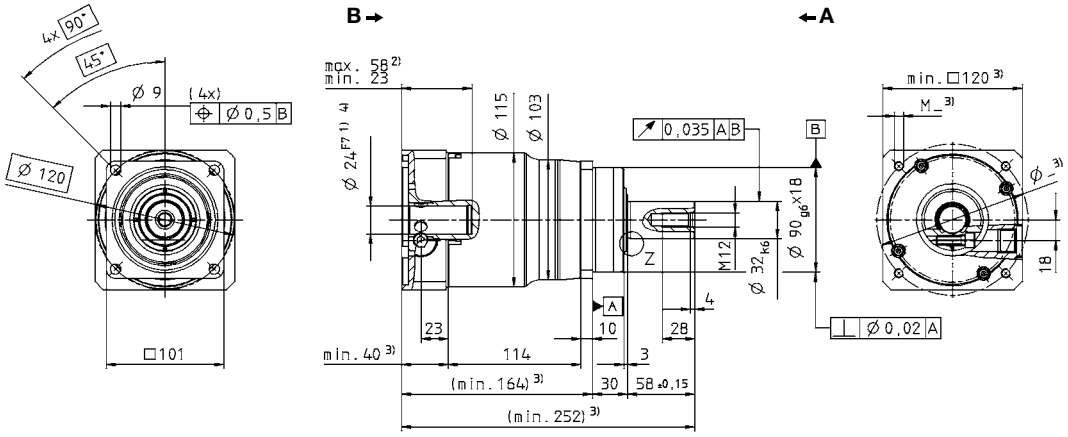
View B

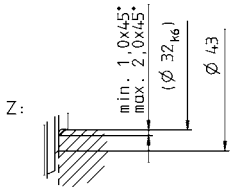
Motor shaft diameter [mm]

up to 19 [4] (E) clamping hub diameter



up to 24 [4] (G) clamping hub diameter

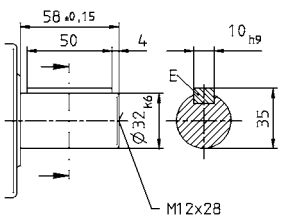




Alternatives: Output shaft variants

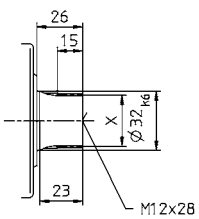
Output shaft with key in mm

E = key as per DIN 6885, sheet 1, form A



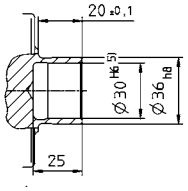
Involute gearing DIN 5480 in mm

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

				Standard version MC						Friction optimized version L					
Ratio [a]			*i*	**3**	**4**	**5**	**7**	**8**	**10**	**3**	**4**	**5**	**7**	**8**	**10**
Max. acceleration torque (max. 1000 cycles per hour)			T_{2B} Nm	310	480	480	480	380	380	310	480	480	480	380	380
			T_{2B} in.lb	2744	4248	4248	4248	3363	3363	2744	4248	4248	4248	3363	3363
cymex®-optimized nominal torque (please contact us regarding the design)			T_{2Ncym} Nm	150	240	240	270	180	180	150	240	240	270	180	180
			T_{2Ncym} in.lb	1328	2124	2124	2390	1593	1593	2744	4248	4248	4248	3363	3363
Nominal output torque (with n_{1N})			T_{2N} Nm	130	195	205	210	160	160	130	195	205	210	160	160
			T_{2N} in.lb	1151	1726	1814	1859	1416	1416	1151	1726	1814	1859	1416	1416
Emergency stop torque (permitted 1000 times during the service life of the gearhead)			T_{2Not} Nm	1000	1250	1250	1250	1000	1000	1000	1250	1250	1250	1000	1000
			T_{2Not} in.lb	8850	11063	11063	11063	8850	8850	8850	11063	11063	11063	8850	8850
Nominal input speed (with T_{2N} and 20°C ambient temperature) [b]			n_{1N} rpm	3000	3500	4500	4500	4500	4500	3000	3500	4500	4500	4500	4500
cymex® optimized speed (please contact us regarding the design)			n_{1Ncym} rpm	–	–	–	–	–	–	4000	4500	5000	5000	5000	5000
Max. input speed			n_{1Max} rpm	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000
Mean no load running torque (with n_1 = 2000 rpm and 20°C gearhead temperature) [c]			T_{012} Nm	5.1	3.9	3.1	2.3	1.6	1.6	2.0	1.5	1.2	1.0	0.9	0.9
			T_{012} in.lb	45.1	34.5	27.4	20.4	14.2	14.2	17.7	13.3	10.6	8.9	8.0	8.0
Max. torsional backlash			j_t arcmin	Standard ≤ 4 / Reduced ≤ 2											
Torsional rigidity			C_{t21} Nm/ arcmin	53											
			C_{t21} in.lb/ arcmin	469											
Max. axial force [d]			F_{2AMax} N	9870						3000					
			F_{2AMax} lb_f	2221						675					
Max. radial force [d]			F_{2RMax} N	9900						1200					
			F_{2RMax} lb_f	2228						270					
Max. tilting moment			M_{2KMax} Nm	952						110					
			M_{2KMax} in.lb	8425						974					
Efficiency at full load			η %	98.5						99					
Service life (For calculation, see the Chapter "Information")			L_h h	> 30000											
Weight incl. standard adapter plate			*m* kg	17.2											
			m lb_m	38											
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						IP 52					
Moment of inertia (relates to the drive)	K	38	J_1 kgcm²	14.9	12.1	11.0	10.1	10.1	9.51	14.9	12.1	11.0	10.1	10.1	9.51
			J_1 10^{-3} in.lb.s²	13.2	10.7	9.8	8.9	8.9	8.4	13.2	10.7	9.8	8.9	8.9	8.4
Clamping hub diameter [mm]	M	48	J_1 kgcm²	29.5	26.7	25.6	24.7	–	24.2	29.5	26.7	25.6	24.7	25.0	24.2
			J_1 10^{-3} in.lb.s²	26.1	23.6	22.7	21.9	–	21.4	26.1	23.6	22.7	21.9	22.1	21.4

Reduced mass moments of inertia available on request.

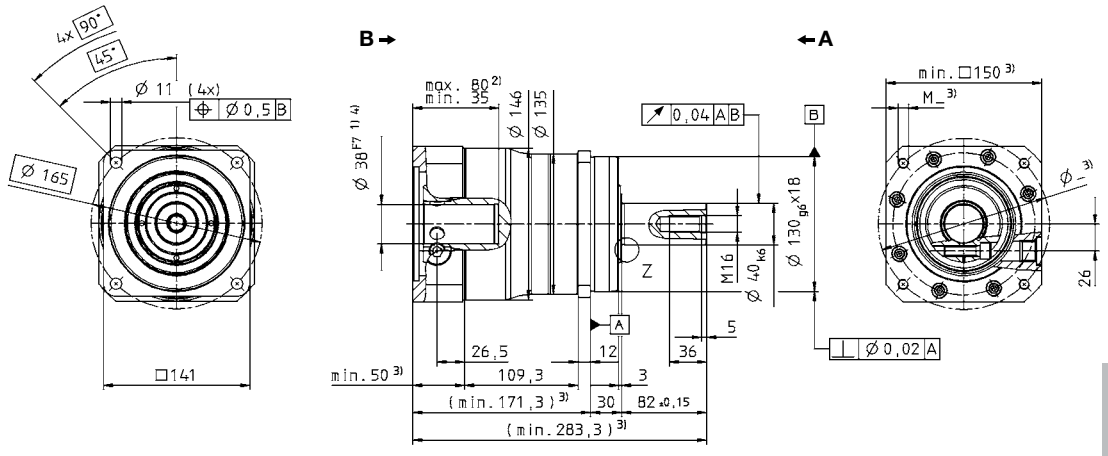
When fully utilizing the permissible average input speed (n_{1N}), the heating due to the motor must be taken into consideration. Please contact us for an optimal design.

[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

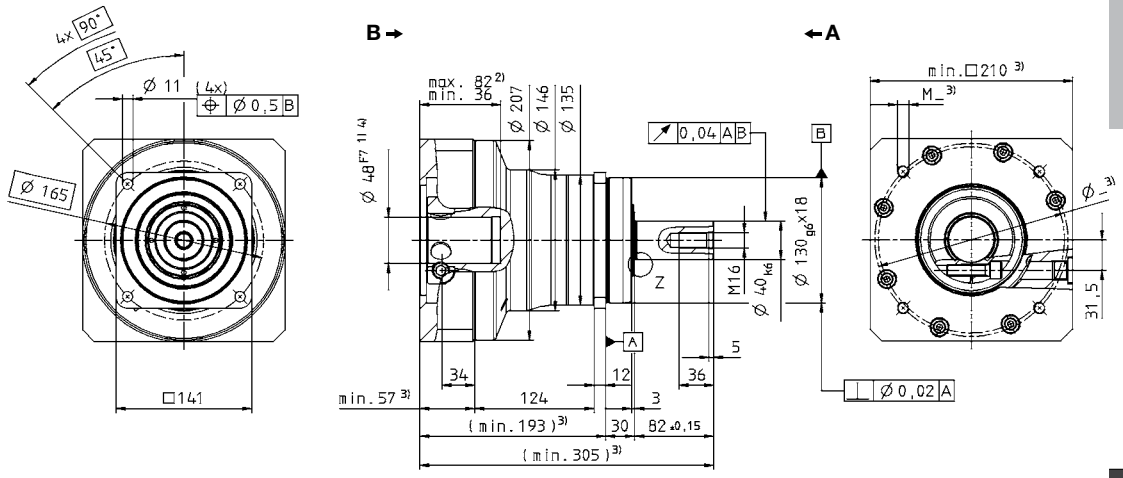
View A View B

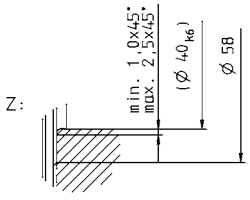
Motor shaft diameter [mm]

up to 38 [4] (K) clamping hub diameter



up to 48 [4] (M) clamping hub diameter



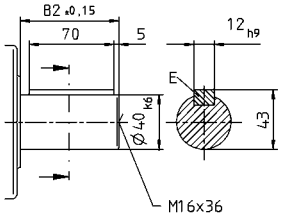


Planetary gearheads **High End**

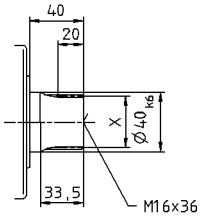
SP+ MC MC-L

Alternatives: Output shaft variants

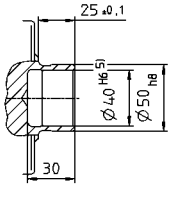
Output shaft with key in mm
E = key as per DIN 6885, sheet 1, form A



Involute gearing DIN 5480 in mm
X = W 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

				2-stage									
Ratio [a]			*i*	**16**	**20**	**25**	**28**	**32**	**35**	**40**	**50**	**70**	**100**
Max. acceleration torque (max. 1000 cycles per hour)			T_{2B} Nm	480	480	480	480	380	480	480	480	480	380
			T_{2B} in.lb	4248	4248	4248	4248	3363	4248	4248	4248	4248	3363
cymex®-optimized nominal torque (please contact us regarding the design)			T_{2Ncym} Nm	290	290	290	–	–	–	–	–	–	–
			T_{2Ncym} in.lb	2567	2567	2567							
Nominal output torque (with n_{1N})			T_{2N} Nm	260	280	280	290	290	290	290	290	260	180
			T_{2N} in.lb	2301	2478	2478	2567	2567	2567	2567	2567	2301	1593
Emergency stop torque (permitted 1000 times during the service life of the gearhead)			T_{2Not} Nm	1250	1250	1250	1250	1000	1250	1250	1250	1250	1000
			T_{2Not} in.lb	11063	11063	11063	11063	8850	11063	11063	11063	11063	8850
Nominal input speed (with T_{2N} and 20°C ambient temperature) [b]			n_{1N} rpm	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500
Max. input speed			n_{1Max} rpm	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000
Mean no load running torque (with n_1 = 2000 rpm and 20°C gearhead temperature) [c]			T_{012} Nm	1.6	1.3	1.2	1.0	1.0	0.9	0.7	0.6	0.5	0.5
			T_{012} in.lb	14.2	11.5	10.6	8.9	8.9	8.0	6.2	5.3	4.4	4.4
Max. torsional backlash			j_t arcmin	Standard ≤ 6 / Reduced ≤ 4									
Torsional rigidity			C_{t21} Nm/ arcmin	53									
			C_{t21} in.lb/ arcmin	469									
Max. axial force [d]			F_{2AMax} N	9870									
			F_{2AMax} lb_f	2221									
Max. radial force [d]			F_{2RMax} N	9900									
			F_{2RMax} lb_f	2228									
Max. tilting moment			M_{2KMax} Nm	952									
			M_{2KMax} in.lb	8425									
Efficiency at full load			η %	96.5									
Service life (For calculation, see the Chapter "Information")			L_h h	> 30000									
Weight incl. standard adapter plate			*m* kg	17									
			m lb_m	38									
Operating noise (with *i*=100 and n_1=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)	G	24	J_1 kgcm²	3.19	2.71	2.67	2.34	3.18	2.32	2.10	2.08	2.08	2.07
			J_1 10^{-3} in.lb.s²	2.82	2.40	2.36	2.07	2.81	2.05	1.85	1.85	1.84	1.83
Clamping hub diameter [mm]	K	38	J_1 kgcm²	10.3	9.77	9.73	9.41	9.32	9.39	9.16	9.15	9.14	9.14
			J_1 10^{-3} in.lb.s²	9.07	8.65	8.61	8.33	8.24	8.31	8.11	8.10	8.09	8.09

Reduced mass moments of inertia available on request.

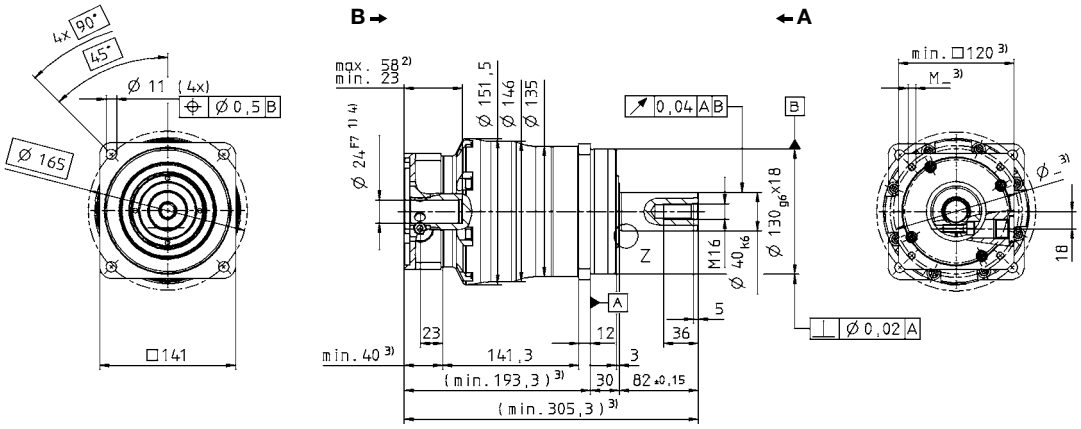
When fully utilizing the permissible average input speed (n_{1N}), the heating due to the motor must be taken into consideration. Please contact us for an optimal design.

[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

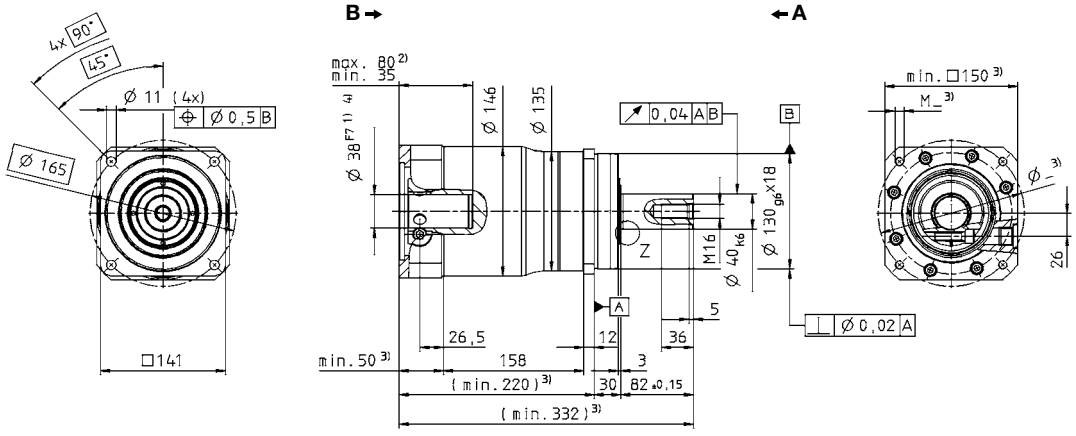
View A View B

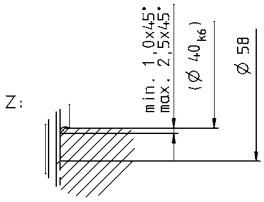
Motor shaft diameter [mm]

up to 24 [4] (G) clamping hub diameter



up to 38 [4] (K) clamping hub diameter





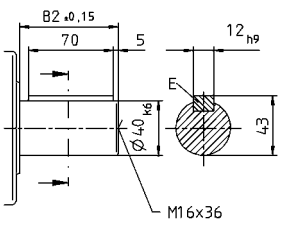
Planetary gearheads **High End**

SP+

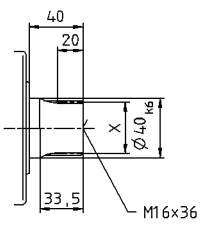
MC

Alternatives: Output shaft variants

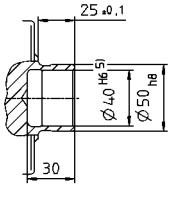
Output shaft with key in mm
E = key as per DIN 6885, sheet 1, form A



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

			Standard version MC					Friction optimized version L				
Ratio [a]	*i*		**3**	**4**	**5**	**7**	**10**	**3**	**4**	**5**	**7**	**10**
Max. acceleration torque (max. 1000 cycles per hour)	T_{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)	T_{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 n_{1N})	T_{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)	T_{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 T_{2N} and 20°C ambient temperature) [b]	n_{1N}	rpm	3000	3500	4500	4500	4500	3000	3500	4500	4500	4500
cymex® optimized speed (please contact us regarding the design)	n_{1Ncym}	rpm	–	–	–	–	–	4000	4500	5000	5000	5000
Max. input speed	n_{1Max}	rpm	4500	6000	6000	6000	6000	4500	6000	6000	6000	6000
Mean no load running torque (with n_1 = 2000 rpm and 20°C gearhead temperature) [c]	T_{012}	Nm	10.2	7.7	6.2	4.5	3.2	3.8	3.0	2.3	1.8	1.6
		in.lb	90.3	68.1	54.9	39.8	28.3	34	27	20	16	14
Max. torsional backlash	j_t	arcmin	Standard ≤ 4 / Reduced ≤ 2									
Torsional rigidity	C_{t21}	Nm/ arcmin	175									
		in.lb/ arcmin	1549									
Max. axial force [d]	F_{2AMax}	N	14150					5000				
		lb_f	3184					1125				
Max. radial force [d]	F_{2RMax}	N	15400					2000				
		lb_f	3465					450				
Max. tilting moment	M_{2KMax}	Nm	1600					208				
		in.lb	14160					1841				
Efficiency at full load	η	%	98.5					99				
Service life (For calculation, see the Chapter "Information")	L_h	h	> 30000									
Weight incl. standard adapter plate	*m*	kg	34									
		lb_m	75									
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					IP 52				
Moment of inertia (relates to the drive)	J_1	kgcm²	58.5	41.6	35.6	30.0	26.9	58.5	41.6	35.6	30.0	26.9
Clamping hub diameter [mm] M 48		10^{-3} in.lb.s²	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.

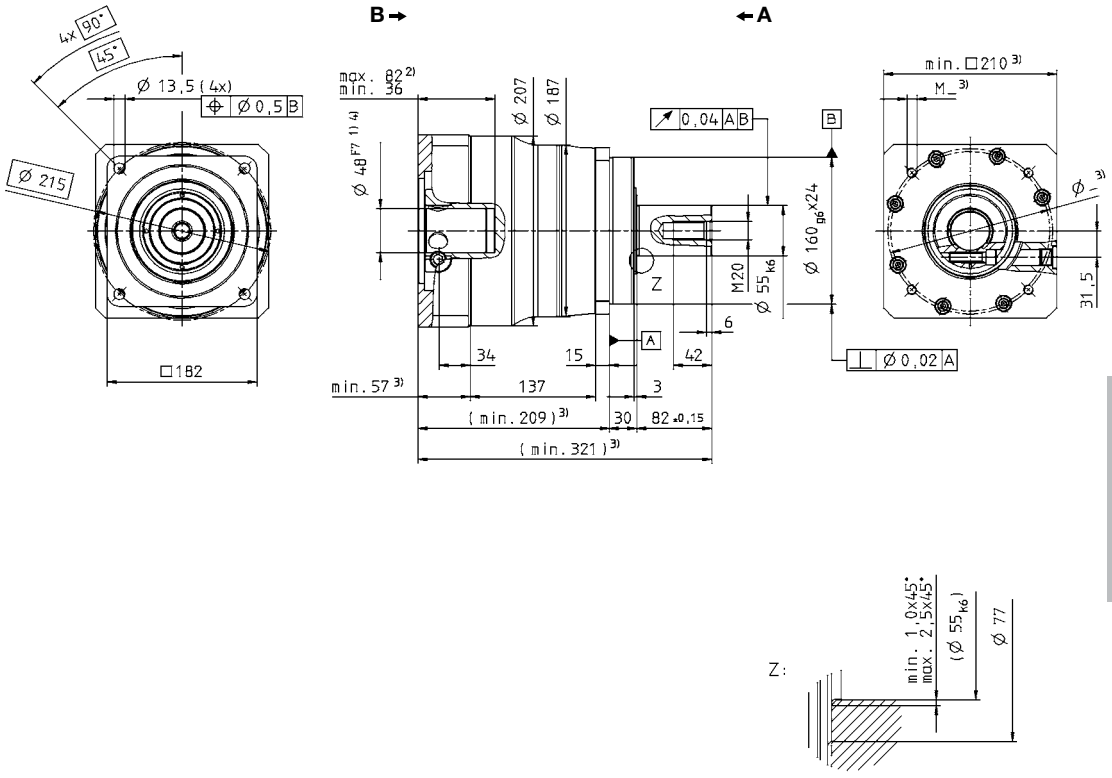
When fully utilizing the permissible average input speed (n_{1N}), the heating due to the motor must be taken into consideration. Please contact us for an optimal design.

[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+

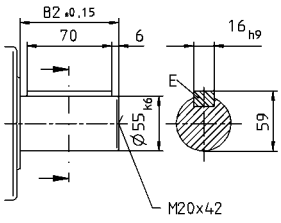
MC

MC-L

Alternatives: Output shaft variants

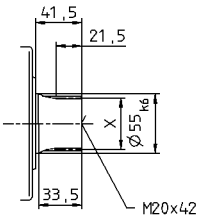
Output shaft with key in mm

E = key as per DIN 6885, sheet 1, form A



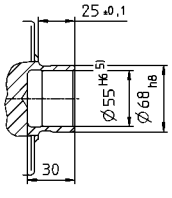
Involute gearing DIN 5480 in mm

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

			2-stage								
Ratio [a]	i		**16**	**20**	**25**	**28**	**35**	**40**	**50**	**70**	**100**
Max. acceleration torque (max. 1000 cycles per hour)	T_{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)	T_{2Ncym}	Nm	–	–	–	–	–	–	–	–	–
		in.lb									
Nominal output torque (with n_{1N})	T_{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)	T_{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 T_{2N} and 20°C ambient temperature) [b]	n_{1N}	rpm	4500	4500	4500	4500	4500	4500	4500	4500	4500
Max. input speed	n_{1Max}	rpm	6000	6000	6000	6000	6000	6000	6000	6000	6000
Mean no load running torque (with n_1 = 2000 rpm and 20°C gearhead temperature) [c]	T_{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	j_t	arcmin	Standard ≤ 6 / Reduced ≤ 4								
Torsional rigidity	C_{t21}	Nm/ arcmin	175								
		in.lb/ arcmin	149								
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	%	96.5								
Service life (For calculation, see the Chapter "Information")	L_h	h	> 30000								
Weight incl. standard adapter plate	m	kg	36								
		lb_m	80								
Operating noise (with i=100 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)	J_1	kgcm²	13.5	12.0	11.7	10.6	10.4	9.74	9.68	9.63	9.60
Clamping hub diameter [mm]		10^{-3} in.lb.s²	12.0	10.6	10.4	9.34	9.23	8.62	8.57	8.52	8.49
	K	38									

Reduced mass moments of inertia available on request.

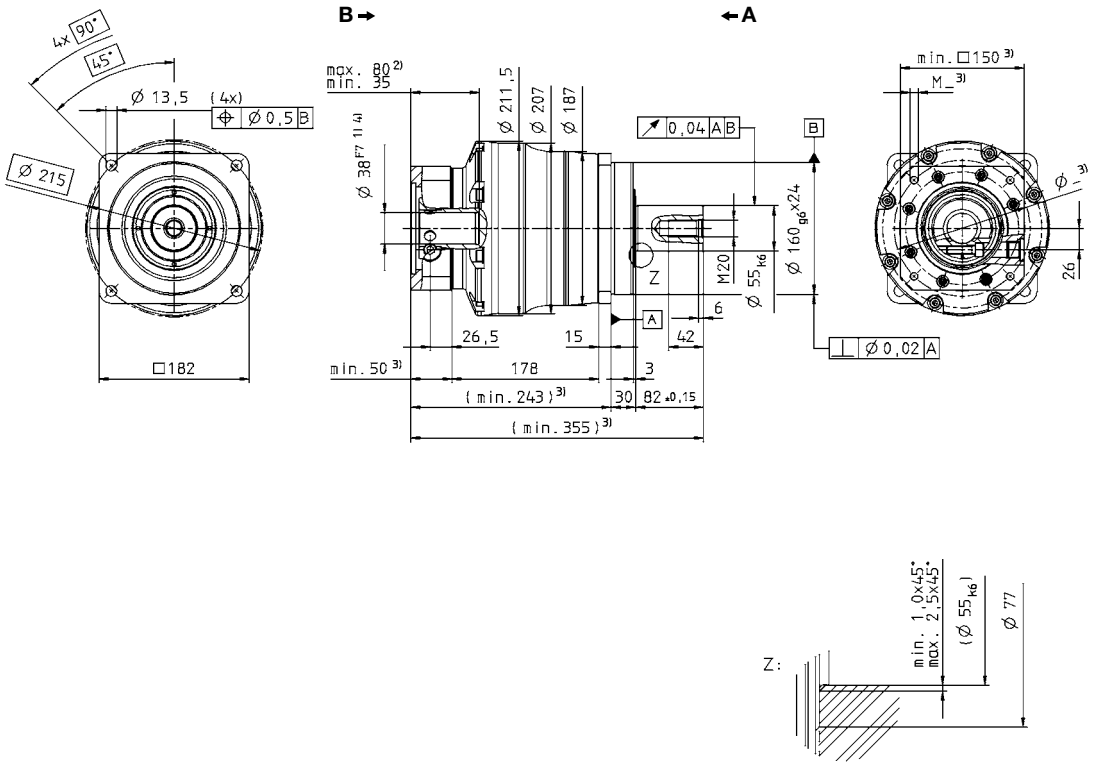
When fully utilizing the permissible average input speed (n_{1N}), the heating due to the motor must be taken into consideration. Please contact us for an optimal design.

[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

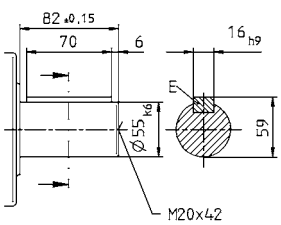
Motor shaft diameter [mm]

up to 38 [4] (K) clamping hub diameter

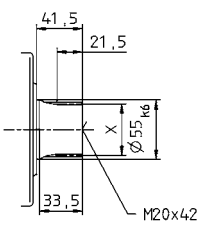


Alternatives: Output shaft variants

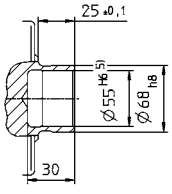
Output shaft with key in mm
E = key as per DIN 6885, sheet 1, form A



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



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

			Standard version MC					Friction optimized version L				
Ratio [a]	*i*		**3**	**4**	**5**	**7**	**10**	**3**	**4**	**5**	**7**	**10**
Max. acceleration torque (max. 1000 cycles per hour)	T_{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)	T_{2Ncym}	Nm	- Please contact us -									
		in.lb										
Nominal output torque (with n_{1N})	T_{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)	T_{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 T_{2N} and 20°C ambient temperature) [b]	n_{1N}	rpm	2250	2500	3500	3500	3500	2250	2500	3500	3500	3500
cymex® optimized speed (please contact us regarding the design)	n_{1Ncym}	rpm	–	–	–	–	–	2750	3000	4000	4000	4000
Max. input speed	n_{1Max}	rpm	3400	6000	6000	6000	6000	6000	6000	6000	6000	6000
Mean no load running torque (with n_1 = 2000 rpm and 20°C gearhead temperature) [c]	T_{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	j_t	arcmin	Standard ≤ 4 / Reduced ≤ 2									
Torsional rigidity	C_{t21}	Nm/ arcmin	400									
		in.lb/ arcmin	3540									
Max. axial force [d]	F_{2AMax}	N	30000					8000				
		lb_f	6750					1800				
Max. radial force [d]	F_{2RMax}	N	21000					2500				
		lb_f	4725					563				
Max. tilting moment	M_{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")	L_h	h	> 30000									
Weight incl. standard adapter plate	*m*	kg	56									
		lb_m	124									
Operating noise (with *i*=10 and n_1 = 2000 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					IP 52				
Moment of inertia (relates to the drive) N 55	J_1	kgcm²	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.s²	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.

When fully utilizing the permissible average input speed (n_{1N}), the heating due to the motor must be taken into consideration. Please contact us for an optimal design.

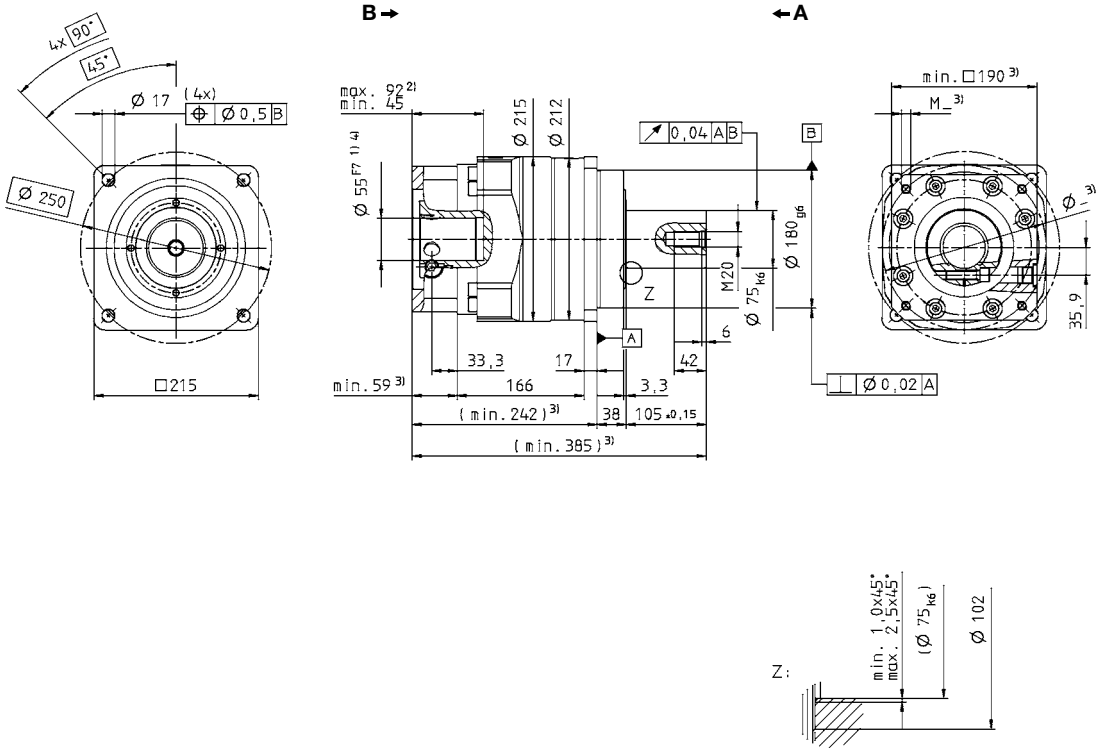
[a] Other ratios available on request
[b] For higher ambient temperatures, please reduce input speed
[c] Valid for clamping hub diameter of 55 mm
[d] Refers to center of the output shaft or flange

View A

View B

Motor shaft diameter [mm]

up to 55 [4] (N) clamping hub diameter



Planetary gearheads **High End**

SP+

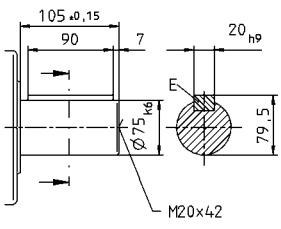
MC

MC-L

Alternatives: Output shaft variants

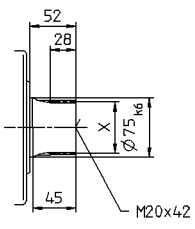
Output shaft with key in mm

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 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

			2-stage								
Ratio [a]	i		**16**	**20**	**25**	**28**	**35**	**40**	**50**	**70**	**100**
Max. acceleration torque (max. 1000 cycles per hour)	T_{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)	T_{2Ncym}	Nm	- Please contact us -								
		in.lb									
Nominal output torque (with n_{1N})	T_{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)	T_{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 T_{2N} and 20°C ambient temperature) [b]	n_{1N}	rpm	3500	4500	4500	4500	4500	4500	4500	4500	4500
Max. input speed	n_{1Max}	rpm	6000	6000	6000	6000	6000	6000	6000	6000	6000
Mean no load running torque (with n_1 = 2000 rpm and 20°C gearhead temperature)	T_{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	j_t	arcmin	Standard ≤ 4 / Reduced ≤ 2								
Torsional rigidity	C_{t21}	Nm/ arcmin	400								
		in.lb/ arcmin	3540								
Max. axial force [c]	F_{2AMax}	N	30000								
		lb_f	6750								
Max. radial force [c]	F_{2RMax}	N	21000								
		lb_f	4725								
Max. tilting moment	M_{2KMax}	Nm	3100								
		in.lb	27435								
Efficiency at full load	η	%	96.5								
Service life (For calculation, see the Chapter "Information")	L_h	h	> 30000								
Weight incl. standard adapter plate	m	kg	53								
		lb_m	117								
Operating noise (with i=10 and n_1 = 2000 rpm no load)	L_{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)	J_1	kgcm²	34.5	31.5	30.8	30.0	29.7	28.5	28.3	28.1	28.0
Clamping hub diameter (mm) M 48		10^{-3} in.lb.s²	30.5	27.9	27.3	26.6	26.3	25.2	25.0	24.9	24.8

Reduced mass moments of inertia available on request.

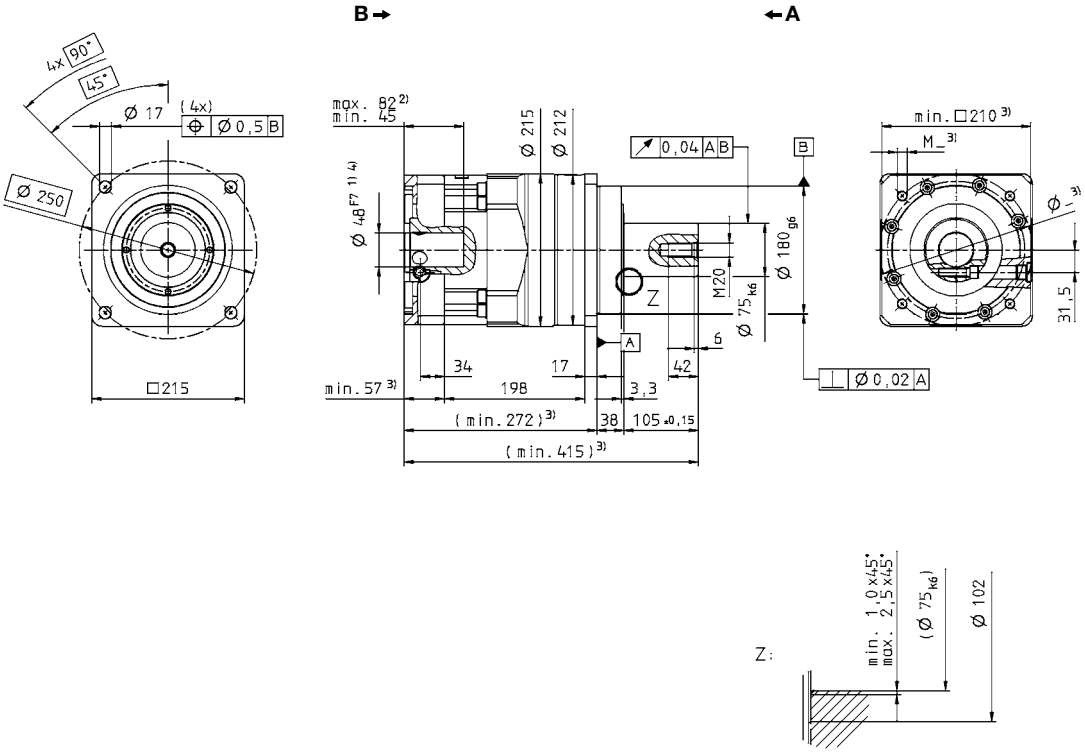
When fully utilizing the permissible average input speed (n_{1N}), the heating due to the motor must be taken into consideration. Please contact us for an optimal design.

[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**

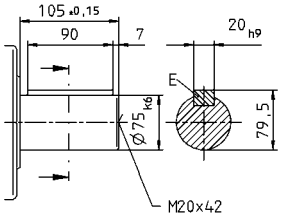
SP+

MC

Alternatives: Output shaft variants

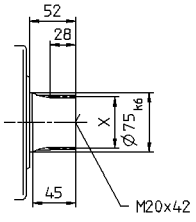
Output shaft with key in mm

E = key as per DIN 6885, sheet 1, form A



Involute gearing DIN 5480 in mm

X = W 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

				Standard version MC					Friction optimized version L				
Ratio [a]	i			**3**	**4**	**5**	**7**	**10**	**3**	**4**	**5**	**7**	**10**
Max. acceleration torque (max. 1000 cycles per hour)	T_{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)	T_{2Ncym}	Nm		- Please contact us -									
		in.lb											
Nominal output torque (with n_{1N})	T_{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)	T_{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 T_{2N} and 20°C ambient temperature) [b]	n_{1N}	rpm		1750	2250	3000	3000	3000	1750	2250	3000	3000	3000
cymex® optimized speed (please contact us regarding the design)	n_{1Ncym}	rpm		–	–	–	–	–	2250	2750	3500	3500	3500
Max. input speed	n_{1Max}	rpm		3400	4000	5000	5000	5000	3400	5000	5000	5000	5000
Mean no load running torque (with n_1 = 2000 rpm and 20°C gearhead temperature) [c]	T_{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	j_t	arcmin		Standard ≤ 4 / Reduced ≤ 2									
Torsional rigidity	C_{t21}	Nm/ arcmin		550									
		in.lb/ arcmin		4868									
Max. axial force [d]	F_{2AMax}	N		33000					10000				
		lb_f		7425					2250				
Max. radial force [d]	F_{2RMax}	N		30000					2000				
		lb_f		6750					450				
Max. tilting moment	M_{2KMax}	Nm		5000					280				
		in.lb		44250					2478				
Efficiency at full load	η	%		98.5					99				
Service life (For calculation, see the Chapter "Information")	L_h	h		> 30000									
Weight incl. standard adapter plate	m	kg		77									
		lb_m		170									
Operating noise (with i=10 and n_1 = 2000 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					IP 52				
Moment of inertia (relates to the drive)	O	60	J_1	kgcm²	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.s²	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.

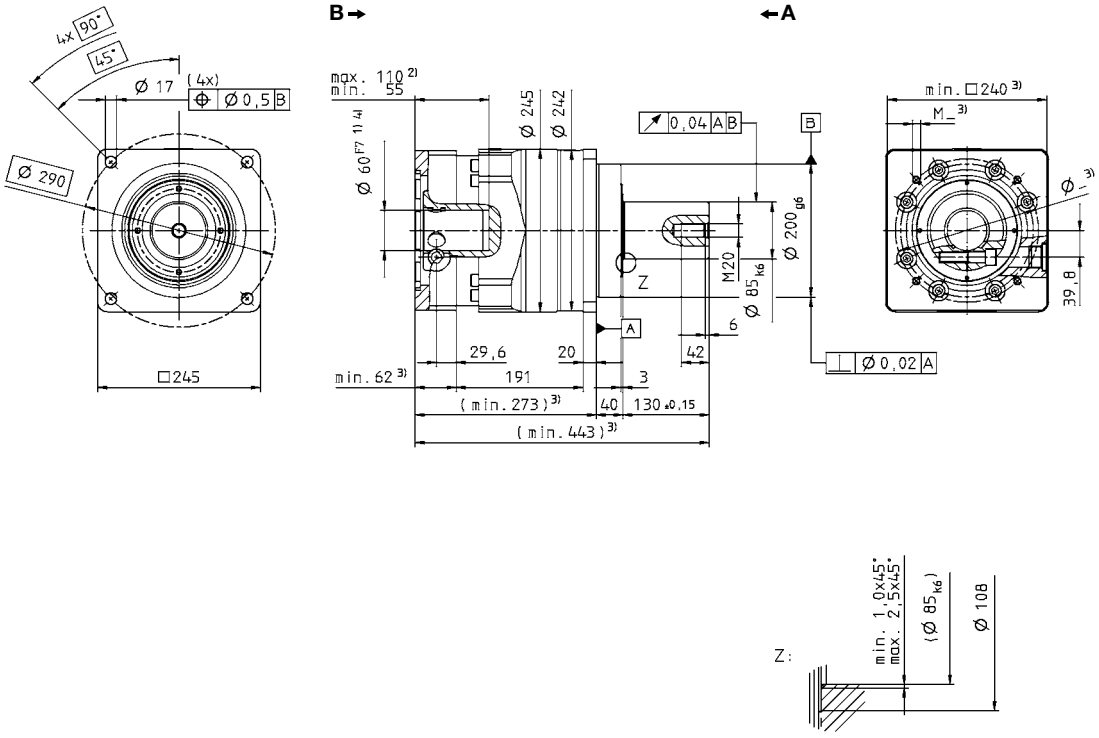
When fully utilizing the permissible average input speed (n_{1N}), the heating due to the motor must be taken into consideration. Please contact us for an optimal design.

[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

View A | View B

Motor shaft diameter [mm]

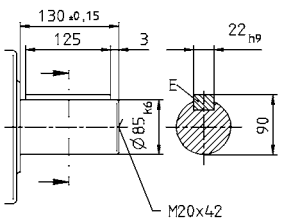
up to 60 [4] (O) clamping hub diameter



Alternatives: Output shaft variants

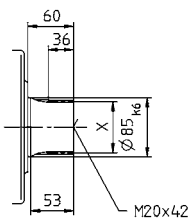
Output shaft with key in mm

E = key as per DIN 6885, sheet 1, form A



Involute gearing DIN 5480 in mm

X = W 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

			2-stage								
Ratio [a]	***i***		**16**	**20**	**25**	**28**	**35**	**40**	**50**	**70**	**100**
Max. acceleration torque (max. 1000 cycles per hour)	T_{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)	T_{2Ncym}	Nm	- Please contact us -								
		in.lb									
Nominal output torque (with n_{1N})	T_{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)	T_{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 T_{2N} and 20°C ambient temperature) [b]	n_{1N}	rpm	3500	4500	4500	4500	4500	4500	4500	4500	4500
Max. input speed	n_{1Max}	rpm	6000	6000	6000	6000	6000	6000	6000	6000	6000
Mean no load running torque (with n_1 = 2000 rpm and 20°C gearhead temperature)	T_{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	j_t	arcmin	Standard ≤ 5 / Reduced ≤ 4								
Torsional rigidity	C_{t21}	Nm/ arcmin	550								
		in.lb/ arcmin	4868								
Max. axial force [c]	F_{2AMax}	N	33000								
		lb_f	7425								
Max. radial force [c]	F_{2RMax}	N	30000								
		lb_f	6750								
Max. tilting moment	M_{2KMax}	Nm	5000								
		in.lb	44250								
Efficiency at full load	η	%	96.5								
Service life (For calculation, see the Chapter "Information")	L_h	h	> 30000								
Weight incl. standard adapter plate	*m*	kg	76								
		lb_m	168								
Operating noise (with *i*=10 and n_1 = 2000 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) **Clamping hub diameter [mm]** **M** **48**	J_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.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.

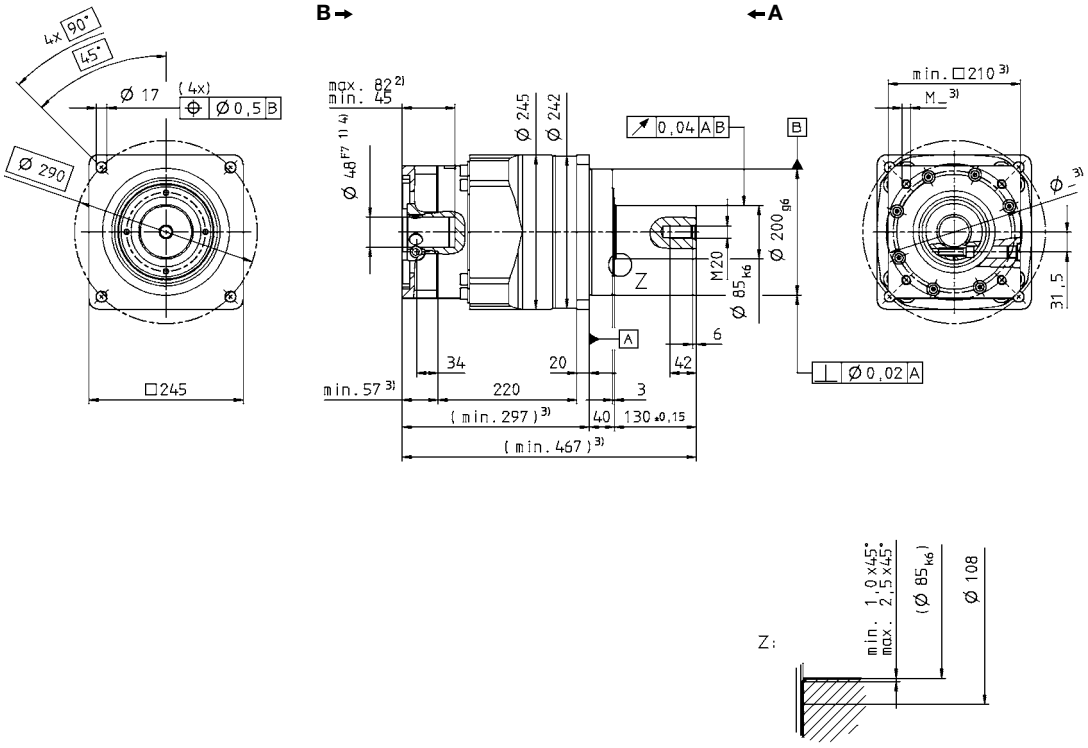
When fully utilizing the permissible average input speed (n_{1N}), the heating due to the motor must be taken into consideration. Please contact us for an optimal design.

[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**

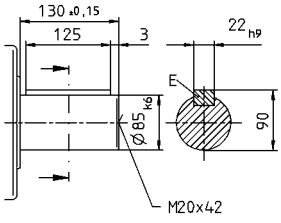
SP+

MC

Alternatives: Output shaft variants

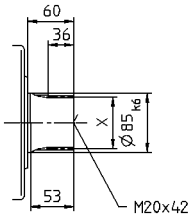
Output shaft with key in mm

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

Hygienic design – hygienically safe drive

HDP

HDV

WITTENSTEIN alpha Hygiene Design – the first planetary gearhead worldwide with **EHEDG certification**. For process-integrated, hygienic and sterile automation.

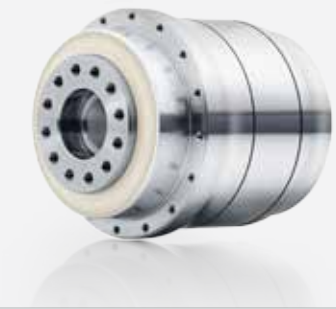
- EHEDG and FDA certified
- Casing material in hygienic steel 1.4404
- Smooth rolled or electropolished surface
- Triple sealing concept:IP69X (max. 30 bar)
- Cavity-free casing design
- Food-grade lubrication (NSF certified)

Fields of application:

- CIP (Clean in Place) / SIP (Sterilize in Place)
- Delta robot applications
- Foodstuffs industry (production, processing, packaging, filling)
- Pharmaceutical industry
- Cosmetics industry
- Process technology
- Textile industry
- Medical technology

Your benefits:

- Hygienic and sterile production drive
- Direct contact with foodstuffs possible
- Fast, efficient and safe cleaning
- Resistant to chemical cleaning and disinfecting agents (e.g. bases, acids such as chloride, sulfuric acid, hydrochloric acid)
- Maximum corrosion resistance
- New freedom in design through direct process integration
- High-pressure cleaning possible depending on general conditions
- Suitable for all current motor installation concepts



HDP

For highly dynamic and compact applications (e.g. Delta robot) with direct foodstuff contact, our Hygiene Design with output flange is the optimal solution.

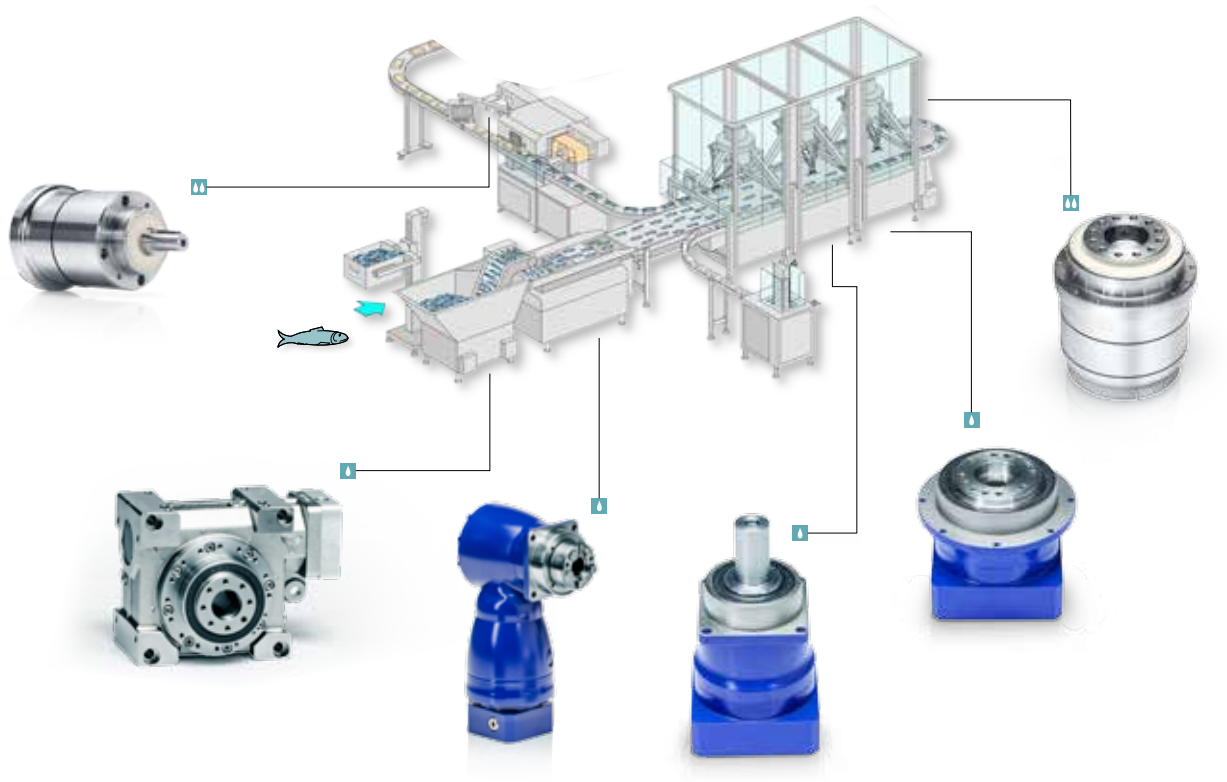
EHEDG certified

The main task of the EHEDG is to contribute towards hygienic design and construction in all areas of food production and therefore to ensure the safe processing of foodstuffs.

FDA certified

The Food and Drug Administration is the statutory foodstuffs and pharmaceutical monitoring authority for the safety and efficacy of pharmaceuticals, biological products, medicinal products and foodstuffs in the USA.

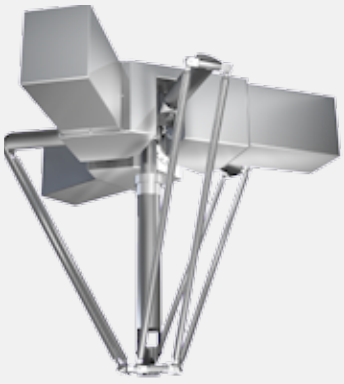
Example application: food processing



Classification according to DIN EN 1672-2

Application in wet and damp environments (spray area)
→ process-integrated

Application in wet areas, including high-pressure cleaning as well as contact with cleaning agents and chemicals (food sector)
→ process-integrated



Previous solution:
Costly encasing of the drive required for protection.

- Dirt and moisture accumulation under the casing possible
- Large surface to be cleaned
- Additional costs (construction, cleaning effort)
- Trapped heat under the casing impairs the service life of the drive

Hygienic solution:
New freedom in design through use of Hygiene Design drive.

- Direct cleaning of drive components ensures hygienic production
- Smaller surfaces to be cleaned saves time and cleaning costs
- Open drive concept has positive effect on drive service life

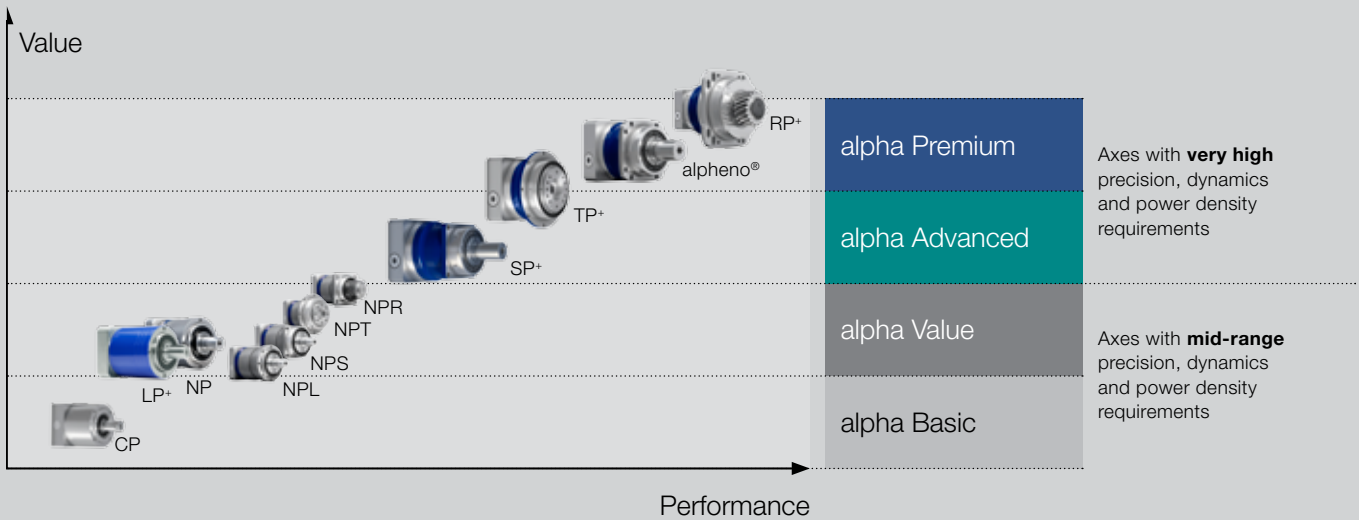
Further information and technical data on Hygiene Design can be found online at:
www.wittenstein-alpha.de/hygiene-design

Low backlash planetary gearheads General

alpha Value Line
Individual talents

- Low-backlash planetary gearheads with output shaft (NP, NPL, NPS, NPR) or output flange (NPT)
- Applications in cyclic or continuous operation
- Torsional backlash ≤ 8 arcmin
- Ratio: 3-100

Product highlights
- Maximum efficiency
- High flexibility
- New freedom in design



alpha Value Line
LP+ Generation 3
LPB+ Generation 3
CP

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

CP
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

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 General 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!

Just in time

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

alpha Value Line – benefit down to the last detail

Efficiency on all axes

The alpha Value Line is suitable for universal application and offers the best economical solution for almost every requirement, on each axis and for every sector.
With the alpha Value Line, WITTENSTEIN alpha offers each drive and drive interface as a compatible extension to the existing High End portfolio - for maximum flexibility in design, assembly and application.

Performance data*

Torsional backlash [arcmin]	≤ 8
Ratios	3 - 100
Max. torque $T_{2\alpha}$ [Nm]	800
Max. input speed [rpm^{-1}]	10000
Efficiency [%]	97
Max. radial force F_{2RMax} [N]	10000

* All product variants also available in High TORQUE version.

Maximum efficiency

The alpha Value Line gearheads are extremely economical to purchase, unbeatably efficient in operation and maintenance free over the entire service life.

High flexibility

Modular configuration of interfaces to motor and to application. The gearheads are available with different clamping hub diameters, drive stages, design and installation versions.

Fast availability

With our alpha Value Line, we set new standards regarding delivery times and delivery reliability. Even with large unit volumes.

New design options

for example, in linear applications with rack and pinion or belt pulley. The NPR version is equipped with an integral slot flange. This enables easy positioning of the pinion or simple tensioning of the belt.

Further information on the alpha Value Line is available online at: www.wittenstein-alpha.de/alpha-value-line

Here, you can obtain the appropriate brochure with technical data and dimensioned drawings for each version.

NP

NPS

Suitable accessories available:

Depending on the requirement, the alpha Value Line can be supplemented with accessories such as metal bellows couplings, elastomer couplings and torque limiters.

alpha Value Linear System

Perfect for linear applications with average demands on positioning accuracy and feed force. Different versions for automation, machine tools and wood working machinery as well as many other applications.

Maximum reliability

The gearheads are suitable for both cyclic as well as continuous operation.

Versatile installation

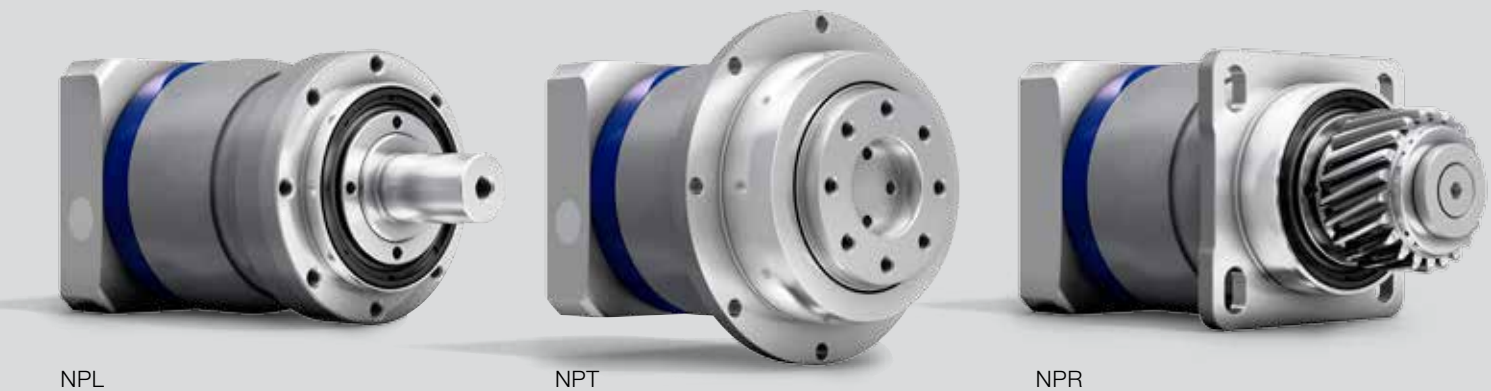
The grease lubrication enables versatile mounting positions. This makes the gearheads so flexible, that they can be installed vertically, horizontally, with the output facing upwards and/or downwards.

Simple motor installation

Safe, faultless motor installation is possible in a single working step.

Extremely smooth-running

The gearheads are characterized by maximum smooth running and synchronization quality.



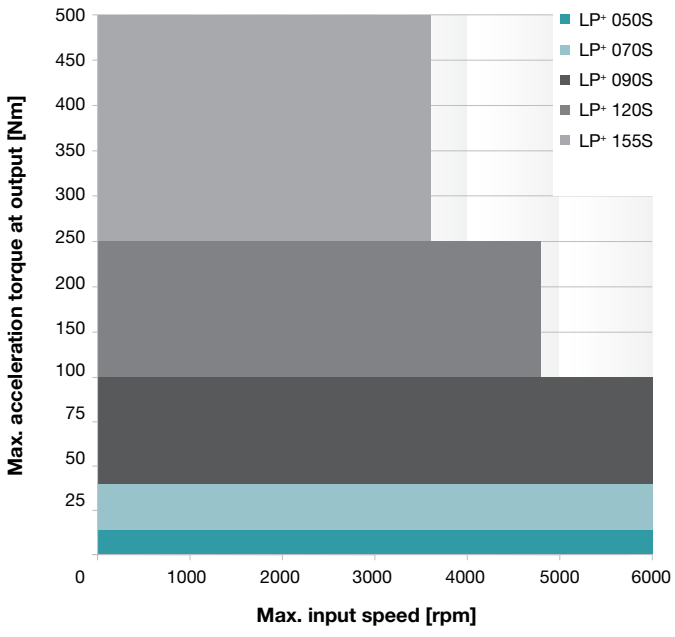
NPL NPT NPR

LP+/LPB+ Generation 3 – Economical multitalent

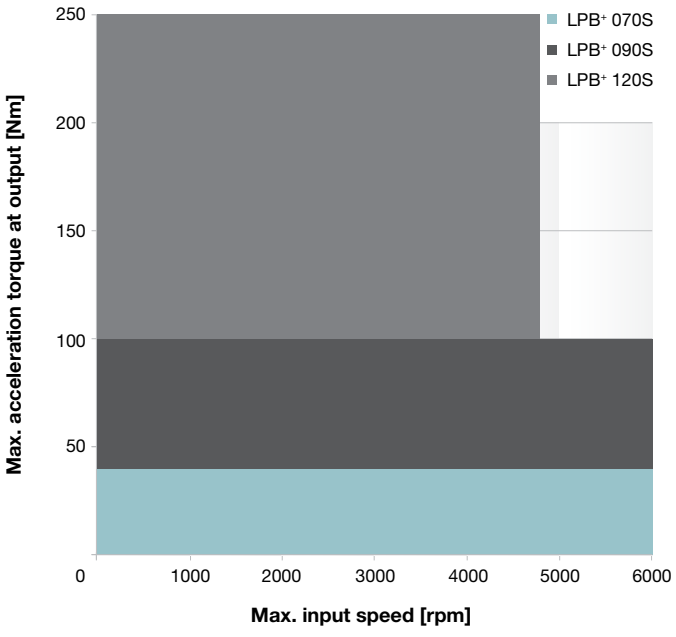
Low backlash planetary gearheads with output shaft or output flange. The LP+/LPB+ Generation 3 gearhead series combines maximum quality with economical precision. The LPB+ Generation 3 is especially suitable for compact belt drives.

Quick size selection

LP+ Generation 3 MF (example for i = 5)
For applications in cyclic operation (DC ≤ 60%)
or in continuous operation (DC ≥ 60%)



LPB+ Generation 3 MF (example for i = 5)
For applications in cyclic operation (DC ≤ 60%)
or in continuous operation (DC ≥ 60%)



Versions and Applications

Features	LP+ Generation 3 MF version page 132	LPB+ Generation 3 MF version page 142
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		•	

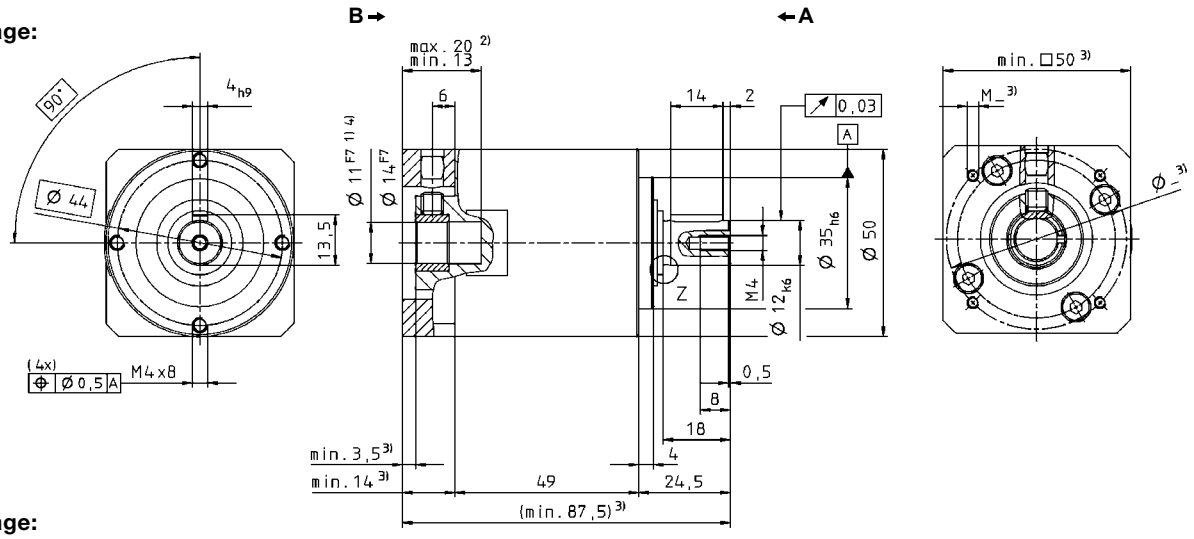
[a] Power reduction: technical data available upon request [b] Please contact WITTENSTEIN alpha [c] In relation to reference sizes

LP+ 050 MF 1/2-stage

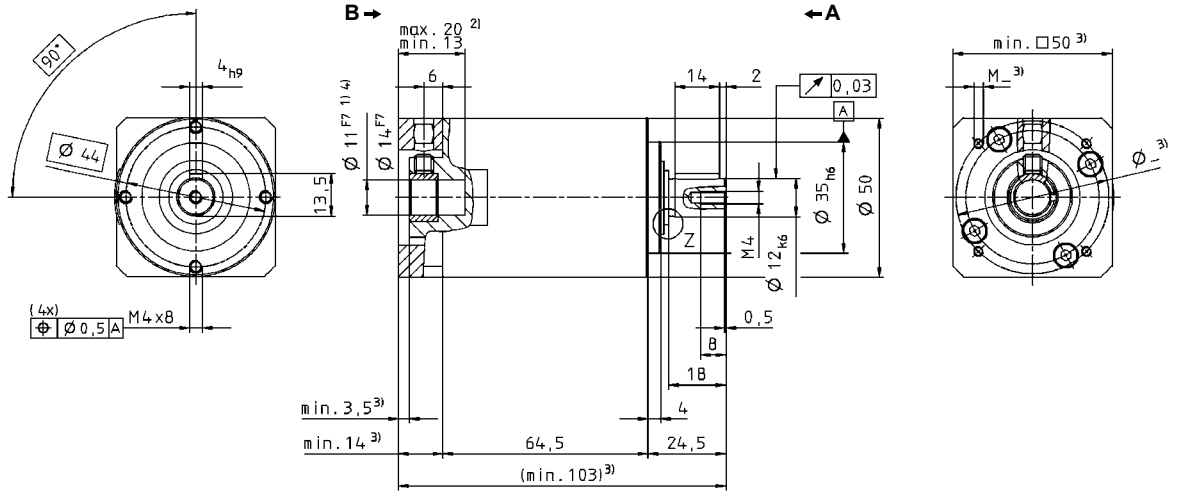
					1-stage				2-stage						
Ratio [a]			i		**4**	**5**	**7**	**10**	**16**	**20**	**25**	**35**	**50**	**70**	**100**
Max. acceleration torque (max. 1000 cycles per hour)			T_{2B}	Nm	13	14	14	13	13	13	14	14	14	14	13
				in.lb	120	120	120	120	120	120	120	120	120	120	120
Nominal output torque (with n_{1N})			T_{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)			T_{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 T_{2N} and 20°C ambient temperature) [b]			n_{1N}	rpm	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000
Max. input speed			n_{1Max}	rpm	8000	8000	8000	8000	8000	8000	8000	8000	8000	8000	8000
Mean no load running torque (with n_1 = 3000 rpm and 20°C gearhead temperature)			T_{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			j_t	arcmin	≤ 10				≤ 13						
Torsional rigidity			C_{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 [c]			F_{2AMax}	N	700				700						
				lb_f	160				160						
Max. radial force [c]			F_{2RMax}	N	650				650						
				lb_f	150				150						
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	0.75				0.95						
				lb_m	1.7				2.1						
Operating noise for i=10 and n_1 = 3000 rpm without 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					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	J_1	$kgcm^2$	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
				10^{-3} in.lb.s²	0.05	0.04	0.04	0.04	0.05	0.04	0.04	0.04	0.04	0.04	0.04
Clamping hub diameter (mm)	C	14	J_1	$kgcm^2$	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.s²	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2

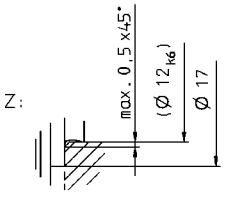
[a] Other ratios are available on request: i = 40
[b] For higher ambient temperatures, please reduce input speed
[c] Refers to center of the output shaft, if n_2 = 100 rpm

LP+ 1-stage:



LP+ 2-stage:





Non-tolerated dimensions ±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

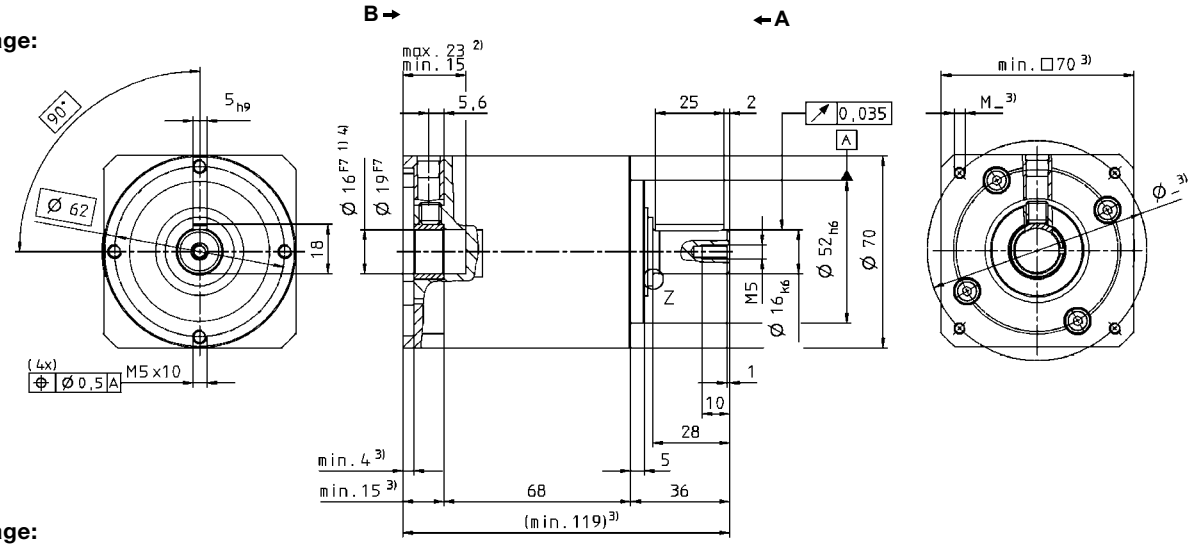
Motor mounting according to operating manual

				1-stage					2-stage									
Ratio [a]			*i*	**3**	**4**	**5**	**7**	**10**	**9**	**12**	**16**	**20**	**25**	**30**	**40**	**50**	**70**	**100**
Max. acceleration torque (max. 1000 cycles per hour)			T_{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 n_{1N})			T_{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)			T_{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 T_{2N} and 20°C ambient temperature) [b]			n_{1N} rpm	3700	3700	3700	3700	3700	3700	3700	3700	3700	3700	3700	3700	3700	3700	3700
Max. input speed			n_{1Max} rpm	6000	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)			T_{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			j_t arcmin	≤ 8					≤ 10									
Torsional rigidity			C_{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]			F_{2AMax} N	1550					1550									
			lb_f	349					349									
Max. radial force [c]			F_{2RMax} N	1450					1450									
			lb_f	326					326									
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	2.0					2.4									
			lb_m	4.4					5.3									
Operating noise for i=10 and n_1 = 3000 rpm without 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 64														
Moment of inertia (relates to the drive)	D	16	J_1 kgcm²	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	0.2
			10^{-3} in.lb.s²	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	0.2
Clamping hub diameter (mm)	E	19	J_1 kgcm²	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	0.5
			10^{-3} in.lb.s²	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	0.4	0.4

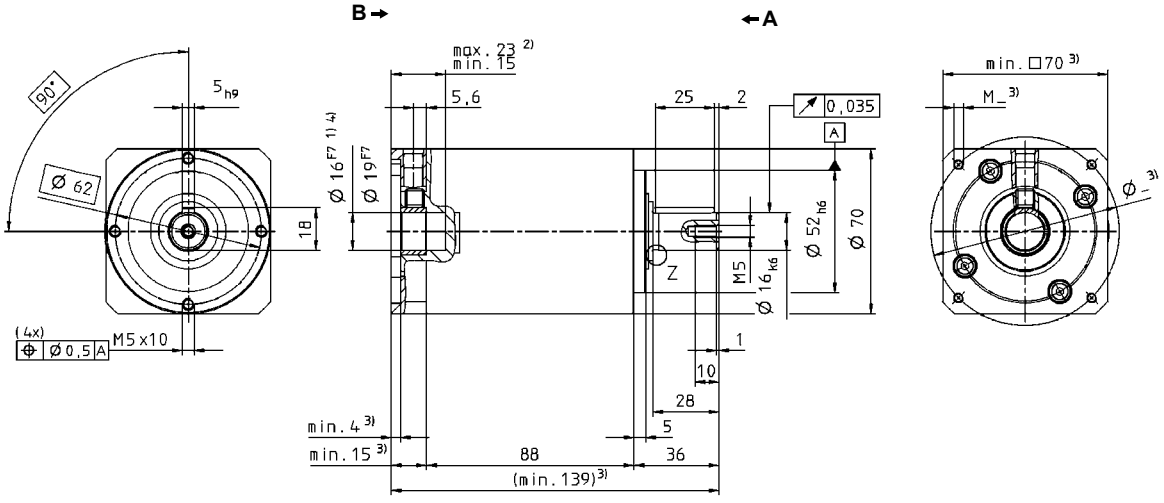
[a] Other ratios are available on request: i = 15, 21, 28 and 35.
[b] For higher ambient temperatures, please reduce input speed
[c] Refers to center of the output shaft, if n_2 = 100 rpm

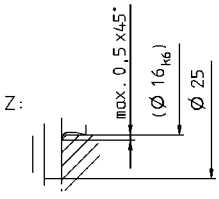
View A View B

LP+ 1-stage:



LP+ 2-stage:





Non-tolerated dimensions ±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 19mm available – please contact WITTENSTEIN alpha

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

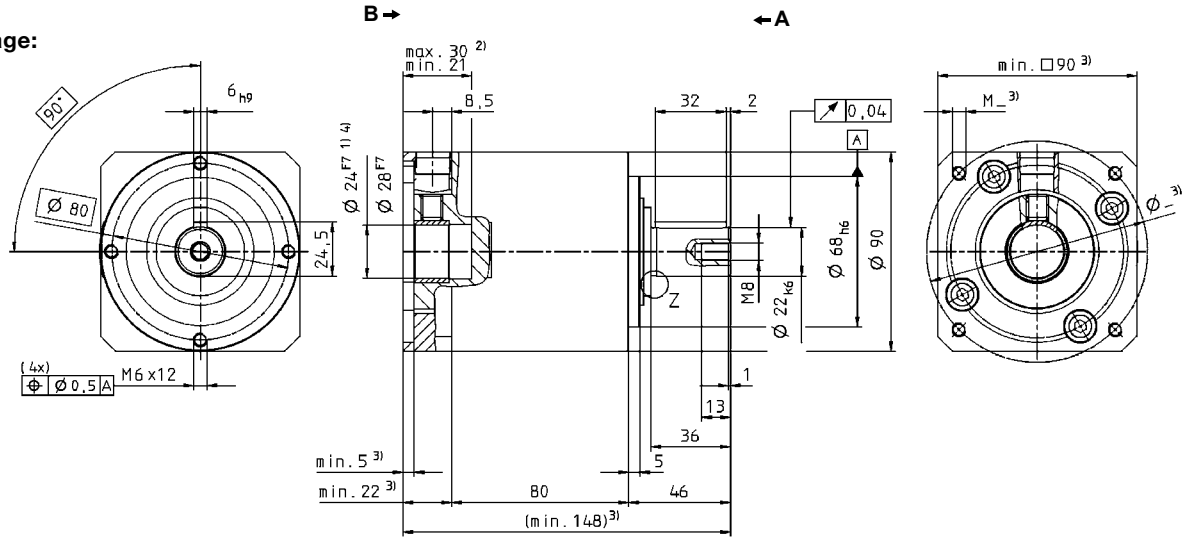
Motor mounting according to operating manual

				1-stage					2-stage									
Ratio [a]			*i*	**3**	**4**	**5**	**7**	**10**	**9**	**12**	**16**	**20**	**25**	**30**	**40**	**50**	**70**	**100**
Max. acceleration torque (max. 1000 cycles per hour)			T_{2B} Nm	125	115	100	100	90	125	125	115	115	100	125	115	100	100	90
			T_{2B} in.lb	1110	1020	890	890	800	1110	1110	1020	1020	890	1110	1020	890	890	800
Nominal output torque (with n_{1N})			T_{2N} Nm	63	58	50	50	45	63	63	58	58	50	63	58	50	50	45
			T_{2N} 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)			T_{2Not} Nm	185	190	190	190	190	190	190	190	190	190	190	190	190	190	190
			T_{2Not} in.lb	1640	1680	1680	1680	1680	1680	1680	1680	1680	1680	1680	1680	1680	1680	1680
Nominal input speed (with T_{2N} and 20°C ambient temperature) [b]			n_{1N} rpm	3400	3400	3400	3400	3400	3400	3400	3400	3400	3400	3400	3400	3400	3400	3400
Max. input speed			n_{1Max} rpm	6000	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)			T_{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
			T_{012} 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			j_t arcmin	≤ 8					≤ 10									
Torsional rigidity			C_{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
			C_{t21} in.lb/ arcmin	106	106	84	84	75	106	106	106	106	84	84	106	84	84	75
Max. axial force [c]			F_{2AMax} N	1900					1900									
			F_{2AMax} lb_f	430					430									
Max. radial force [c]			F_{2RMax} N	2400					2400									
			F_{2RMax} lb_f	540					540									
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	4.0					5.0									
			m lb_m	8.8					11									
Operating noise for i=10 and n_1 = 3000 rpm without 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 64														
Moment of inertia (relates to the drive)	G	24	J_1 kgcm²	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	1.4
			J_1 10^{-3} in.lb.s²	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	1.3
Clamping hub diameter (mm)	H	28	J_1 kgcm²	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	1.7
			J_1 10^{-3} in.lb.s²	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	1.5

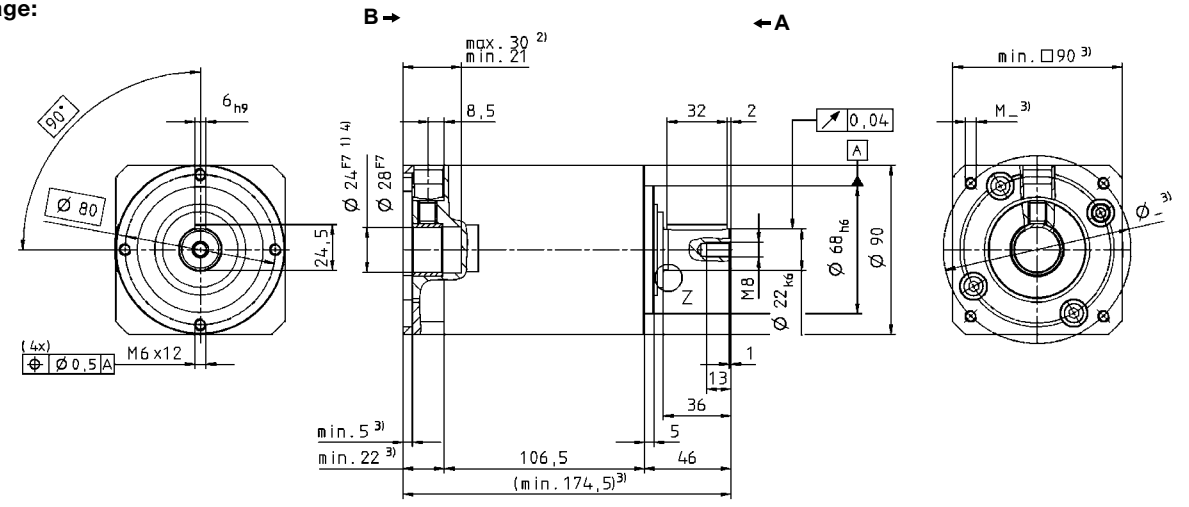
[a] Other ratios are available on request: i = 15, 21, 28 and 35.
[b] For higher ambient temperatures, please reduce input speed
[c] Refers to center of the output shaft, if n_2 = 100 rpm

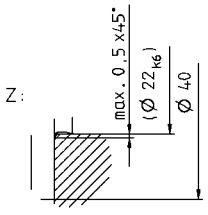
View A View B

LP⁺ 1-stage:



LP⁺ 2-stage:





Non-tolerated dimensions ±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 28mm available – please contact WITTENSTEIN alpha

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

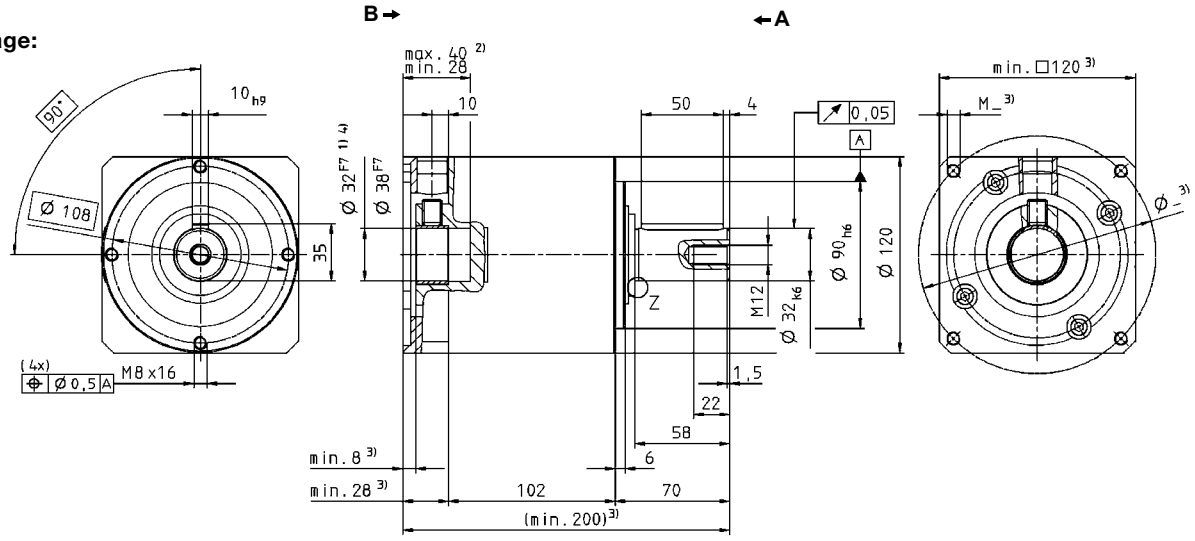
Motor mounting according to operating manual

LP+ 120 MF 1/2-stage

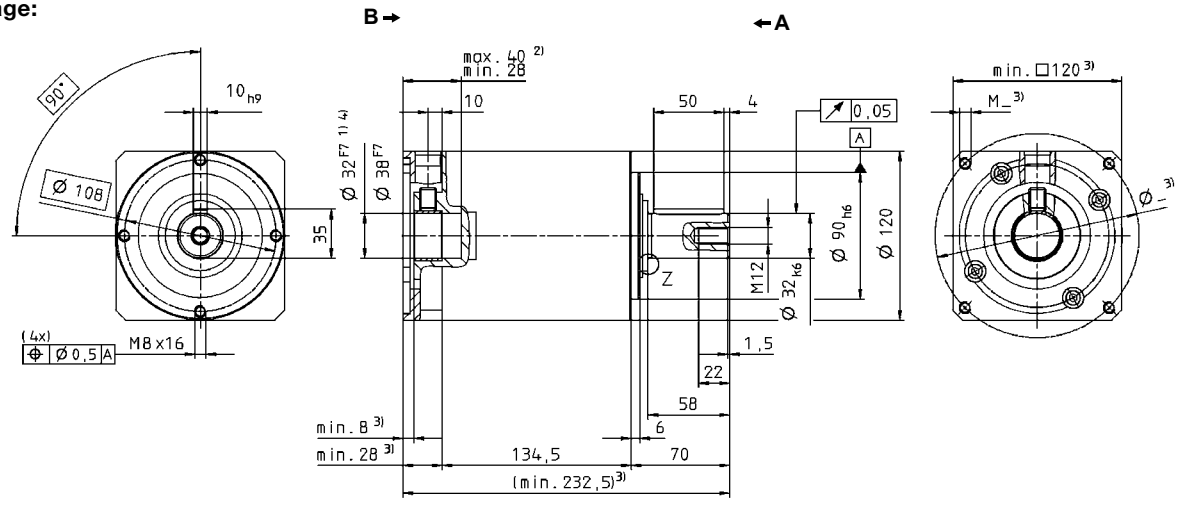
				1-stage					2-stage									
Ratio [a]			***i***	**3**	**4**	**5**	**7**	**10**	**9**	**12**	**16**	**20**	**25**	**30**	**40**	**50**	**70**	**100**
Max. acceleration torque (max. 1000 cycles per hour)			T_{2B} Nm	305	305	250	250	220	305	305	305	305	250	305	305	250	250	220
			T_{2B} in.lb	2700	2700	2210	2210	1950	2700	2700	2700	2700	2210	2700	2700	2210	2210	1950
Nominal output torque (with n_{1N})			T_{2N} Nm	155	155	125	125	110	155	155	155	155	125	155	155	125	125	110
			T_{2N} 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)			T_{2Not} Nm	400	480	480	480	480	480	480	480	480	480	480	480	480	480	480
			T_{2Not} in.lb	3540	4250	4250	4250	4250	4250	4250	4250	4250	4250	4250	4250	4250	4250	4250
Nominal input speed (with T_{2N} and 20°C ambient temperature) [b]			n_{1N} rpm	2600	2600	2600	2600	2600	2600	2600	2600	2600	2600	2600	2600	2600	2600	2600
Max. input speed			n_{1Max} rpm	4800	4800	4800	4800	4800	4800	4800	4800	4800	4800	4800	4800	4800	4800	4800
Mean no load running torque (with n_1 = 3000 rpm and 20°C gearhead temperature)			T_{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
			T_{012} 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			j_t arcmin	≤ 8					≤ 10									
Torsional rigidity			C_{t21} Nm/ arcmin	30	30	25	25	22	30	30	30	30	25	25	30	25	25	22
			C_{t21} in.lb/ arcmin	270	270	220	220	190	270	270	270	270	220	220	270	220	220	190
Max. axial force [c]			F_{2AMax} N	4000					4000									
			F_{2AMax} lb_f	900					900									
Max. radial force [c]			F_{2RMax} N	4600					4600									
			F_{2RMax} lb_f	1035					1035									
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	8.6					11.0									
			m lb_m	19.0					24.3									
Operating noise for i=10 and n_1 = 3000 rpm without load			L_{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	J_1 kgcm²	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	5.0
			J_1 10^{-3} in.lb.s²	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	4.4
Clamping hub diameter (mm)	K	38	J_1 kgcm²	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	5.9
			J_1 10^{-3} in.lb.s²	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	5.2

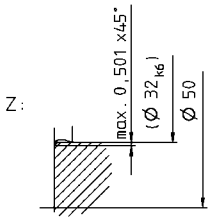
[a] Other ratios are available on request: i = 15, 21, 28 and 35.
[b] For higher ambient temperatures, please reduce input speed
[c] Refers to center of the output shaft, if n_2 = 100 rpm

LP⁺ 1-stage:



LP⁺ 2-stage:





Non-tolerated dimensions ±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 38mm available – please contact WITTENSTEIN alpha

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

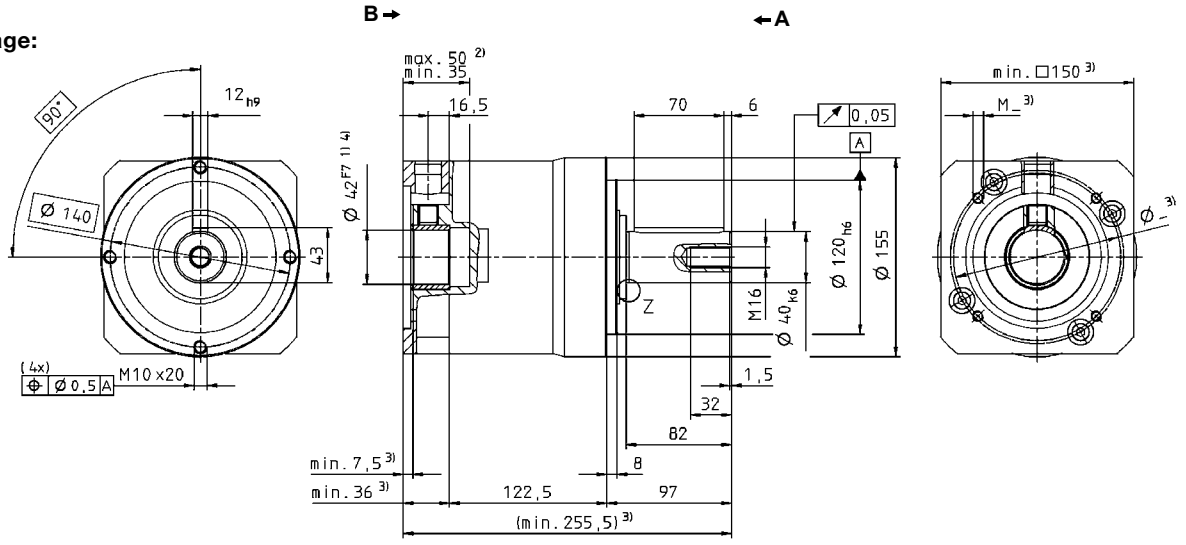
Motor mounting according to operating manual

					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) Clamping hub diameter (mm)	L	42	J_1	$kgcm^2$	17	16	–	–	–
				10^{-3} in.lb.s²	15	14	–	–	–
	I	32	J_1	$kgcm^2$	–	–	5.4	5.0	5.0
				10^{-3} in.lb.s²	–	–	4.8	4.4	4.4
	K	38	J_1	$kgcm^2$	–	–	6.3	5.9	5.9
				10^{-3} in.lb.s²	–	–	5.5	5.2	5.2

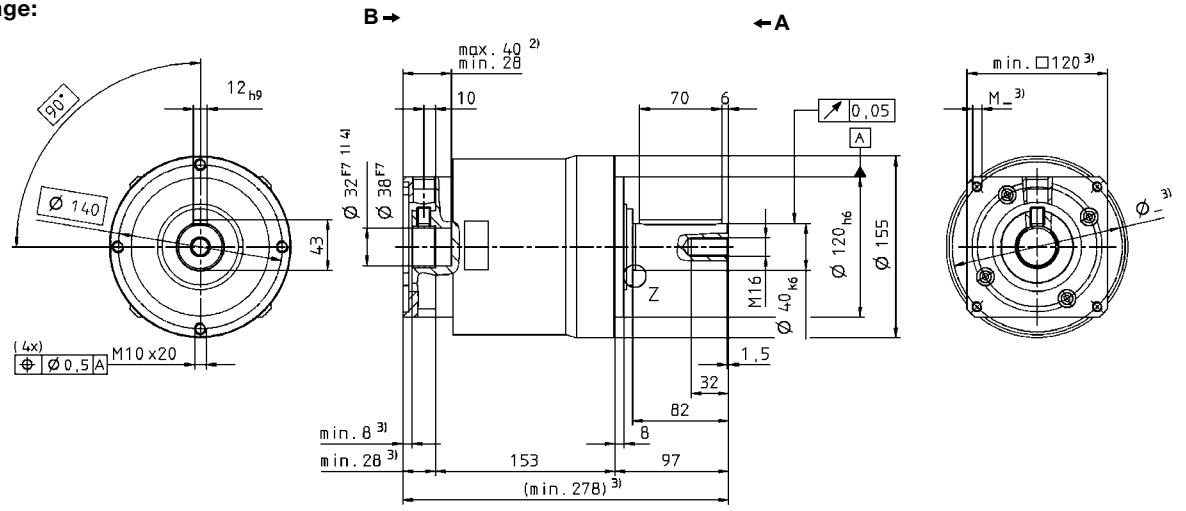
[a] For higher ambient temperatures, please reduce input speed
[b] Refers to center of the output shaft, if n_2 = 100 rpm

View A View B

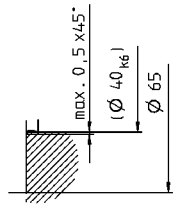
LP⁺ 1-stage:



LP⁺ 2-stage:



Z:



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. LP⁺ 2-stage: Motor shaft diameters up to 38mm available – please contact WITTENSTEIN alpha

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

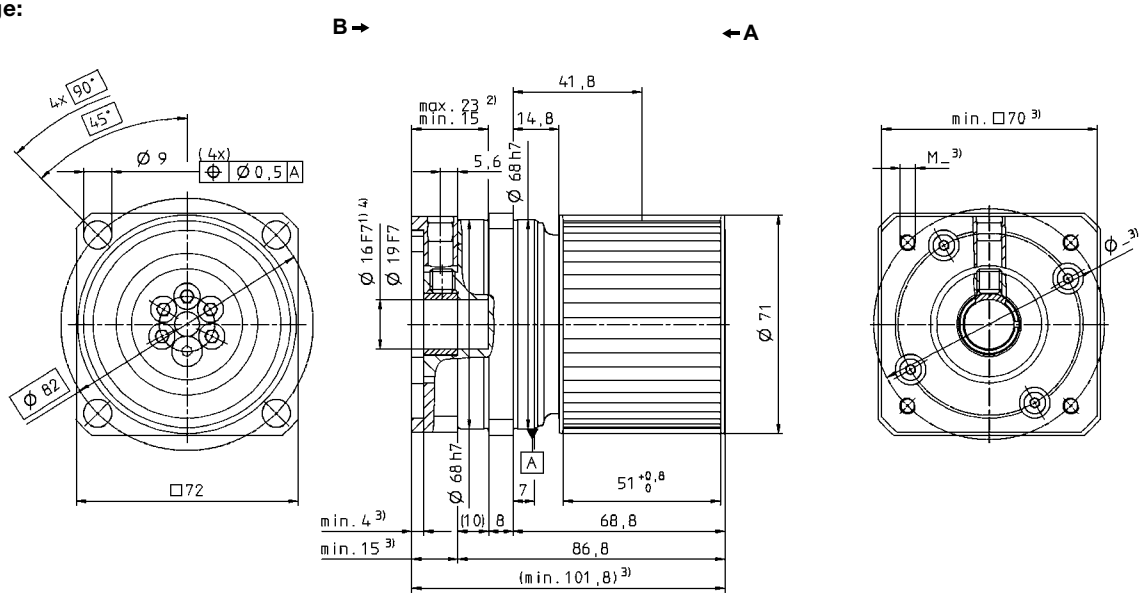
Motor mounting according to operating manual

LPB+ 070 MF 1/2-stage

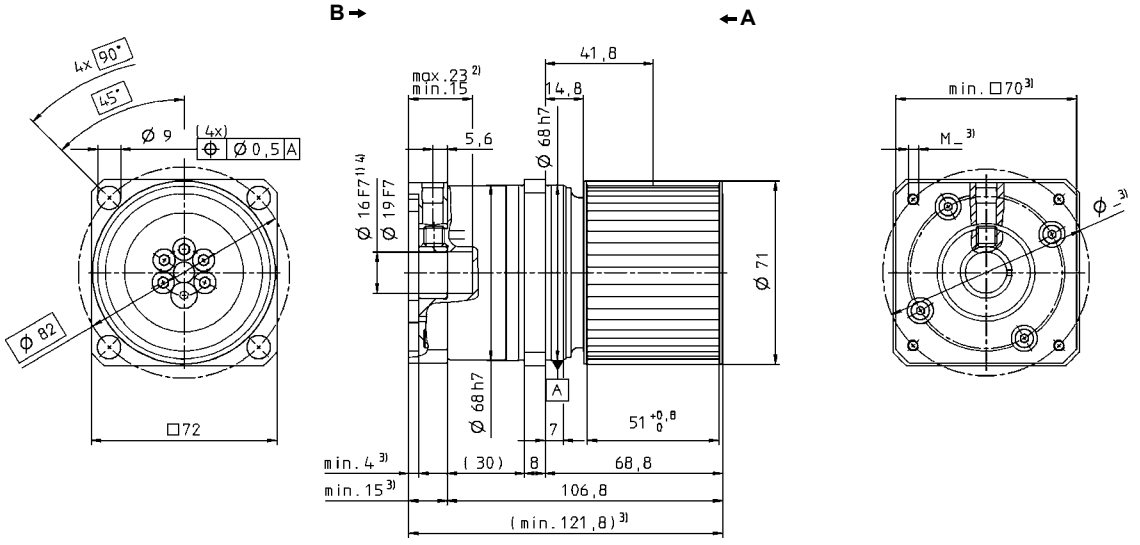
				1-stage					2-stage									
Ratio [d]			*i*	**3**	**4**	**5**	**7**	**10**	**9**	**12**	**16**	**20**	**25**	**30**	**40**	**50**	**70**	**100**
Max. acceleration torque (max. 1000 cycles per hour)			T_{2B} Nm	55	42	40	40	37	55	55	42	42	40	55	42	40	40	37
			T_{2B} in.lb	490	370	350	350	330	490	490	370	370	350	490	370	350	350	330
Nominal output torque (with n_{1N})			T_{2N} Nm	29	22	21	21	19	29	29	22	22	21	29	22	21	21	19
			T_{2N} 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)			T_{2Not} Nm	65	75	75	75	75	75	75	75	75	75	75	75	75	75	75
			T_{2Not} in.lb	580	660	660	660	660	660	660	660	660	660	660	660	660	660	660
Nominal input speed (with T_{2N} and 20°C ambient temperature) [a]			n_{1N} rpm	3700	3700	3700	3700	3700	3700	3700	3700	3700	3700	3700	3700	3700	3700	3700
Max. input speed			n_{1Max} rpm	6000	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)			T_{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
			T_{012} 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			j_t arcmin	≤ 8					≤ 10									
Torsional rigidity			C_{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
			C_{t21} in.lb/ arcmin	55	55	40	40	35	55	55	55	55	40	55	55	40	40	35
Max. axial force [b]			F_{2AMax} N	1550					1550									
			F_{2AMax} lb_f	350					350									
Max. radial force [c]			F_{2RMax} N	3000					3000									
			F_{2RMax} lb_f	680					680									
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	1.6					2									
			m lb_m	3.5					4.4									
Operating noise for i=10 and n_1 = 3000 rpm without 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 64														
Moment of inertia (relates to the drive)	D	16	J_1 kgcm²	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	0.2
			J_1 10^{-3} in.lb.s²	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	0.2
Clamping hub diameter (mm)	E	19	J_1 kgcm²	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	0.5
			J_1 10^{-3} in.lb.s²	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	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:



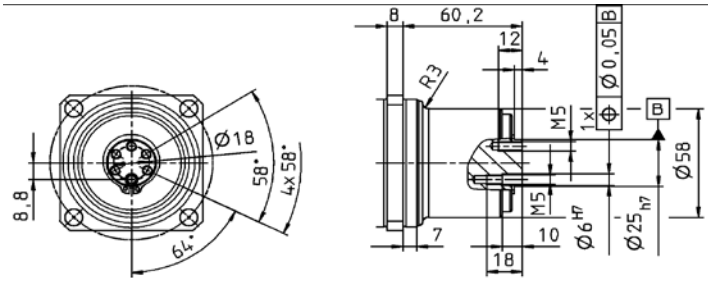
LPB⁺ 2-stage:



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

Belt Pulley PLPB+ 070 Profile AT5-0			
Pitch	*p*	mm	5
Number of teeth	*z*		43
Circumference	*z* * *p*	mm/rotation	215
Inertia	*J*	kgcm²	3.86
Mass	*m*	kg	0.48

Illustration: Output flange without belt pulley



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 19mm available – please contact WITTENSTEIN alpha

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

Motor mounting according to operating manual

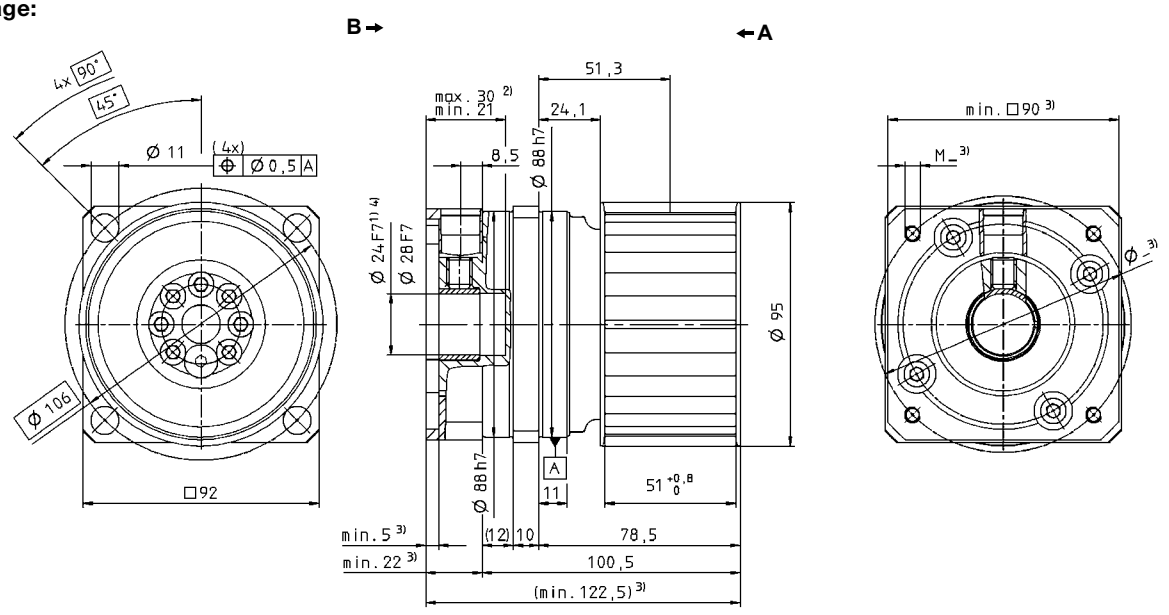
LPB+ 090 MF 1/2-stage

					1-stage					2-stage									
Ratio [d]			***i***		**3**	**4**	**5**	**7**	**10**	**9**	**12**	**16**	**20**	**25**	**30**	**40**	**50**	**70**	**100**
Max. acceleration torque (max. 1000 cycles per hour)			T_{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 n_{1N})			T_{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)			T_{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 T_{2N} and 20°C ambient temperature) [a]			n_{1N}	rpm	3400	3400	3400	3400	3400	3400	3400	3400	3400	3400	3400	3400	3400	3400	3400
Max. input speed			n_{1Max}	rpm	6000	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)			T_{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			j_t	arcmin	≤ 8					≤ 10									
Torsional rigidity			C_{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]			F_{2AMax}	N	1900					1900									
				lb_f	430					430									
Max. radial force [c]			F_{2RMax}	N	4300					4300									
				lb_f	970					970									
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	3.3					4.3									
				lb_m	7.3					10									
Operating noise for i=10 and n_1 = 3000 rpm without 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 64														
Moment of inertia (relates to the drive)	G	24	J_1	kgcm²	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	1.4
				10^{-3} in.lb.s²	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	1.3
Clamping hub diameter (mm)	H	28	J_1	kgcm²	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	1.7
				10^{-3} in.lb.s²	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	1.5

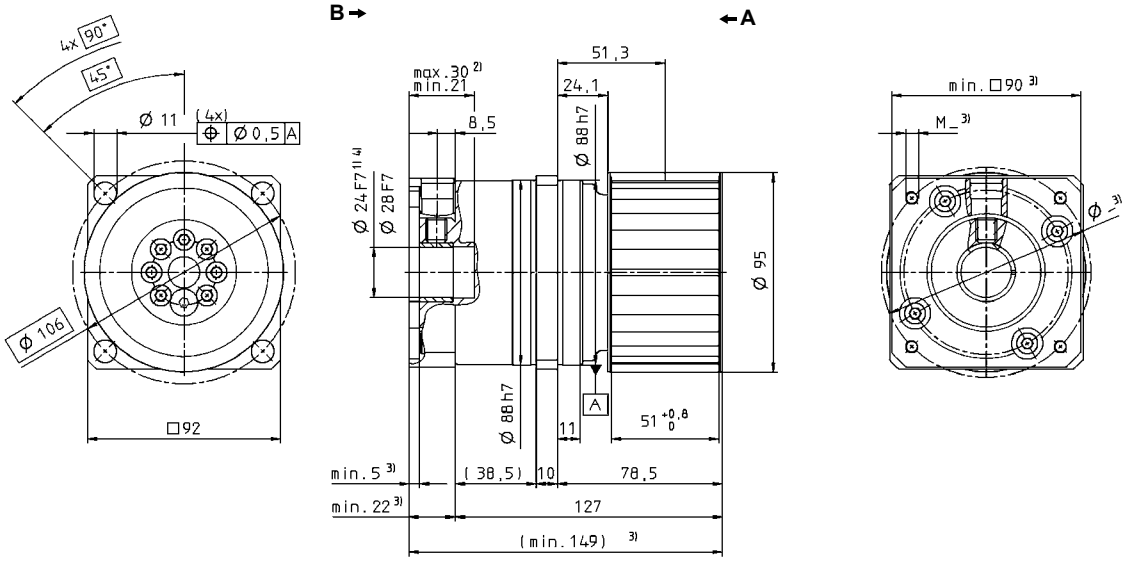
[a] For higher ambient temperatures, please reduce input speed
[b] Based on the center of the output flange at n_2 = 100 rpm
[c] With mounted PLPB+ belt pulley and 100 rpm
[d] Other ratios are available on request: i = 15, 21, 28 and 35.

View A View B

LPB⁺ 1-stage:

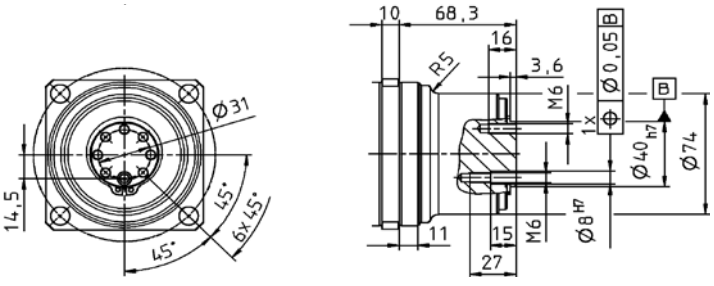


LPB⁺ 2-stage:



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* * *p*	mm/rotation	280
Inertia	*J*	kgcm²	10.95
Mass	*m*	kg	0.82

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 28mm available – please contact WITTENSTEIN alpha

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

Motor mounting according to operating manual

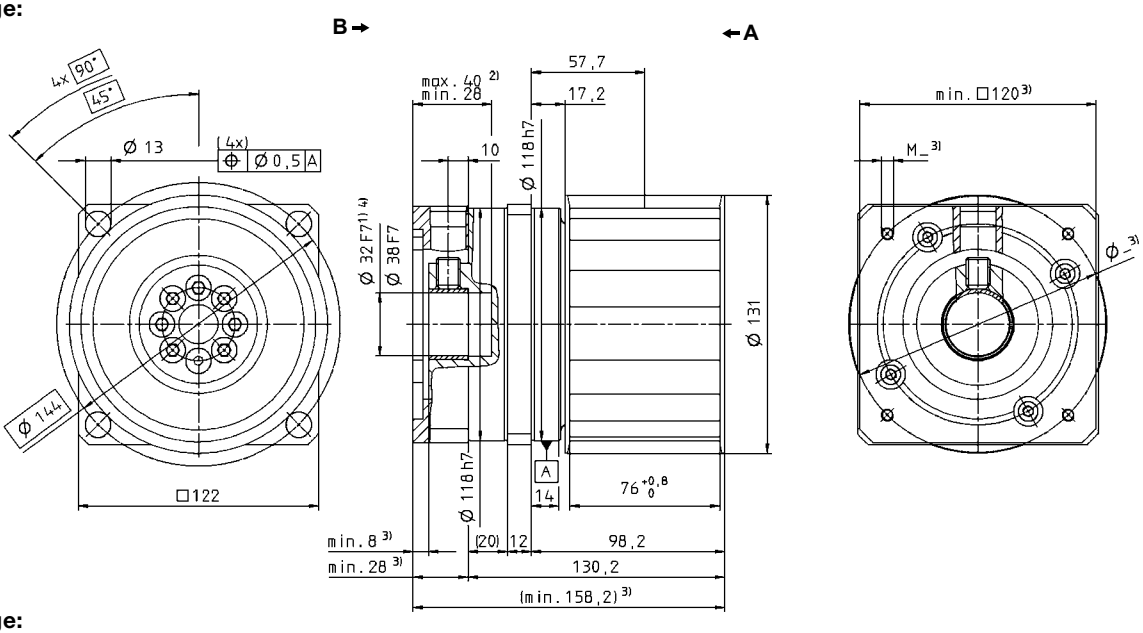
LPB+ 120 MF 1/2-stage

					1-stage					2-stage										
Ratio [d]			i		**3**	**4**	**5**	**7**	**10**	**9**	**12**	**16**	**20**	**25**	**30**	**40**	**50**	**70**	**100**
Max. acceleration torque (max. 1000 cycles per hour)			T_{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 n_{1N})			T_{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)			T_{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 T_{2N} and 20°C ambient temperature) [a]			n_{1N}	rpm	2600	2600	2600	2600	2600	2600	2600	2600	2600	2600	2600	2600	2600	2600	2600
Max. input speed			n_{1Max}	rpm	4800	4800	4800	4800	4800	4800	4800	4800	4800	4800	4800	4800	4800	4800	4800
Mean no load running torque (with n_1 = 3000 rpm and 20°C gearhead temperature)			T_{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			j_t	arcmin	≤ 8					≤ 10									
Torsional rigidity			C_{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]			F_{2AMax}	N	4000					4000									
				lb_f	900					900									
Max. radial force [c]			F_{2RMax}	N	9500					9500									
				lb_f	2140					2140									
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	7.3					9.7									
				lb_m	16					21									
Operating noise for i=10 and n_1 = 3000 rpm without load			L_{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	J_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.s²	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	J_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.s²	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

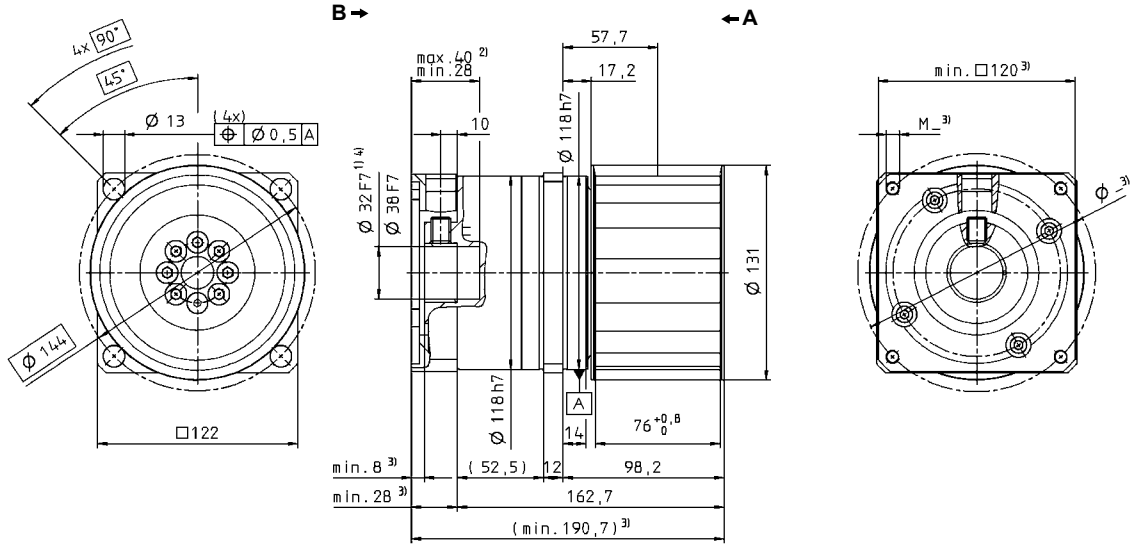
[a] For higher ambient temperatures, please reduce input speed
[b] Based on the center of the output flange at n_2 = 100 rpm
[c] With mounted PLPB+ belt pulley and 100 rpm
[d] Other ratios are available on request: i = 28.

View A View B

LPB⁺ 1-stage:

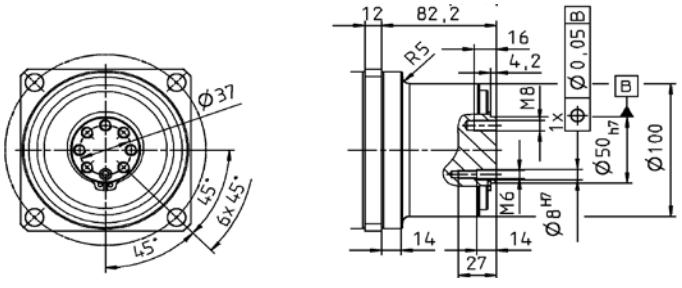


LPB⁺ 2-stage:



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

Illustration: Output flange without belt pulley



Belt Pulley PLPB⁺ 120 Profile AT20-0			
Pitch	*p*	mm	20
Number of teeth	*z*		19
Circumference	*z* * *p*	mm/rotation	380
Inertia	*J*	kgcm²	50.62
Mass	*m*	kg	2.61

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 38mm available – please contact WITTENSTEIN alpha

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

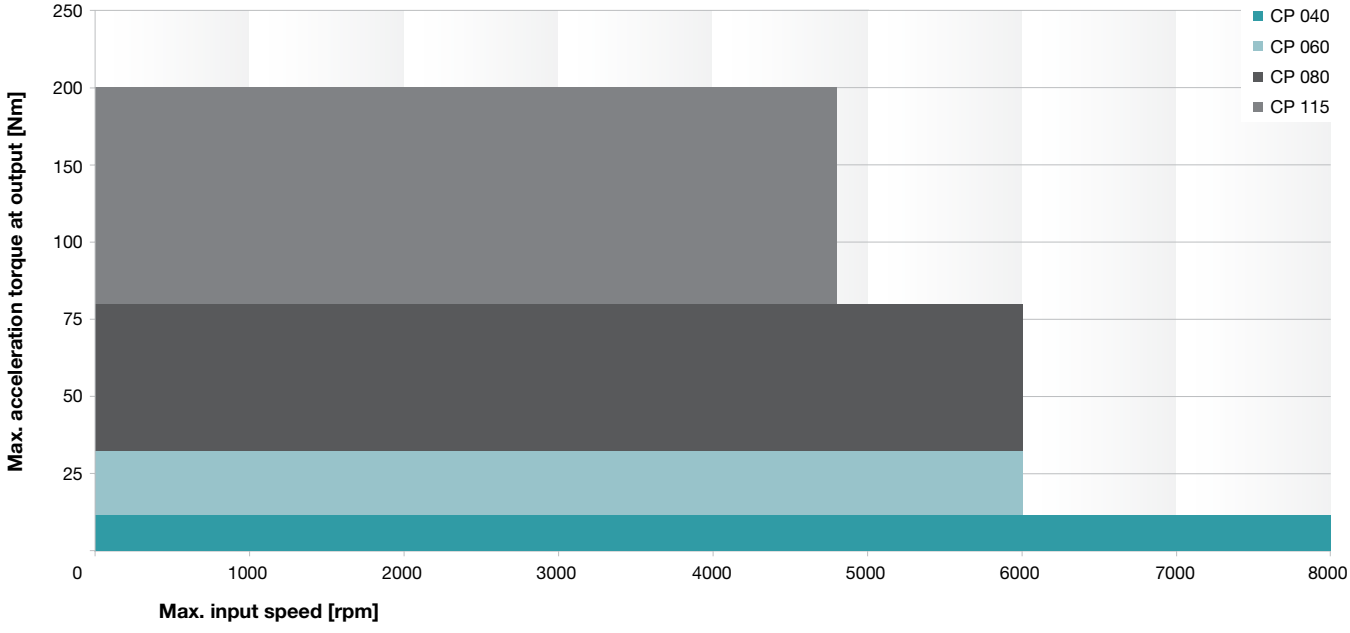
Motor mounting according to operating manual

CP – Economical entry-level model

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

Quick size selection

CP (example for i = 5)
For applications in cyclic operation (DC ≤ 60%) or continuous operation (DC ≥ 60%)



Versions and Applications

Features	**CP** MO version Catalog page 150
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

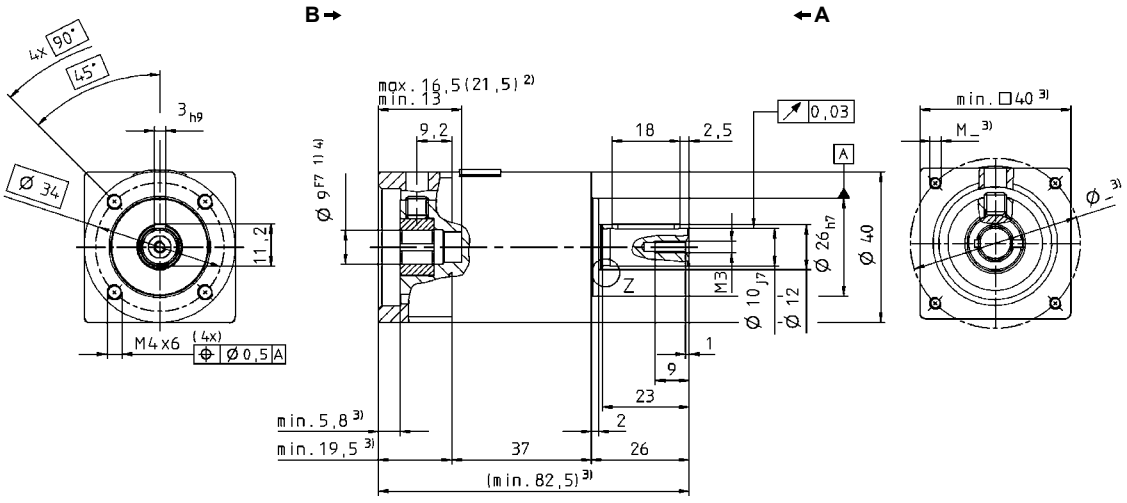
			1-stage					2-stage							
Ratio	***i***		**4**	**5**	**7**	**8**	**10**	**16**	**20**	**25**	**35**	**50**	**64**	**70**	**100**
Max. acceleration torque (max. 1000 cycles per hour)	T_{2B}	Nm	10.5	11.5	11.5	10.5	10.5	10.5	10.5	11.5	11.5	11.5	10.5	11.5	10.5
		in.lb	93	102	102	93	93	93	93	102	102	102	93	102	93
Nominal output torque (with n_{1N})	T_{2N}	Nm	5.2	5.7	5.7	5.2	5.2	5.2	5.2	5.7	5.7	5.7	5.2	5.7	5.2
		in.lb	46	50	50	46	46	46	46	50	50	50	46	50	46
Emergency stop torque (permitted 1000 times during the service life of the gearhead)	T_{2Not}	Nm	26	26	26	26	26	26	26	26	26	26	26	26	26
		in.lb	230	230	230	230	230	230	230	230	230	230	230	230	230
Nominal input speed (with T_{2N} and 20°C ambient temperature) [a]	n_{1N}	rpm	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000
Max. input speed	n_{1Max}	rpm	8000	8000	8000	8000	8000	8000	8000	8000	8000	8000	8000	8000	8000
Mean no load running torque (with n_1 = 3000 rpm and 20°C gearhead temperature)	T_{012}	Nm	0.05	0.05	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	0.44	0.44
Max. torsional backlash	j_t	arcmin	≤ 20					≤ 25							
Torsional rigidity	C_{t21}	Nm/ arcmin	0.58	0.58	0.58	0.52	0.52	0.58	0.58	0.58	0.58	0.58	0.52	0.58	0.52
		in.lb/ arcmin	5.1	5.1	5.1	4.6	4.6	5.1	5.1	5.1	5.1	5.1	4.6	5.1	4.6
Max. axial force [b]	F_{2AMax}	N	230					230							
		lb_f	51					51							
Max. radial force [b]	F_{2RMax}	N	200					200							
		lb_f	45					45							
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	0.31					0.52							
		lb_m	0.69					1.15							
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			Lubricated for life												
Paint			Aluminum												
Direction of rotation			Motor and gearhead same direction												
Protection class			IP 64												
Moment of inertia (relates to the drive)	J_1	$kgcm^2$	0.04	0.04	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	0.035	0.035	0.035	0.035	0.035	0.035	0.035	0.035	0.035	0.035	0.035	0.035	0.035

[a] For higher ambient temperatures, please reduce input speed

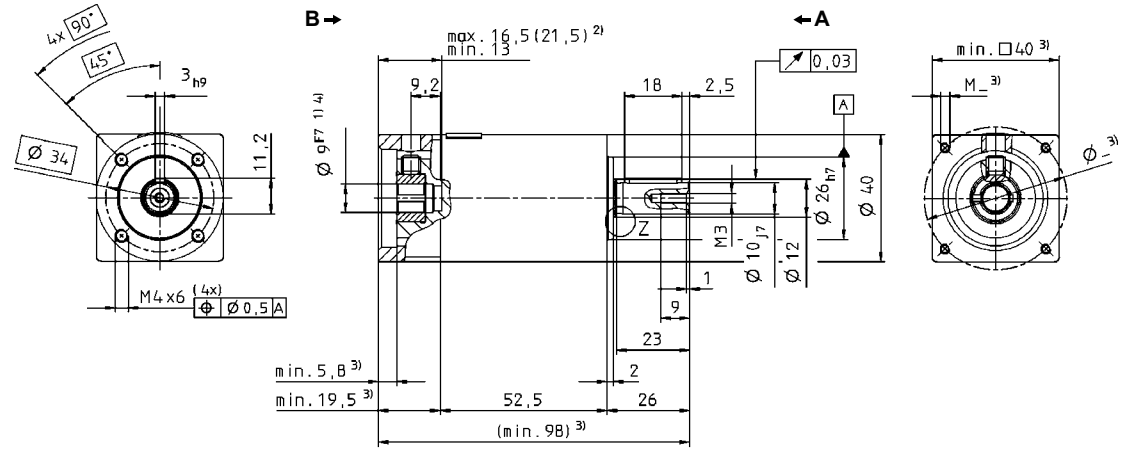
[b] Relates to center of the output shaft or flange, at 100 rpm

View A View B

1-stage:



2-stage:



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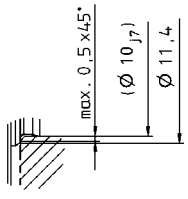


Non-tolerated dimensions ±1mm

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

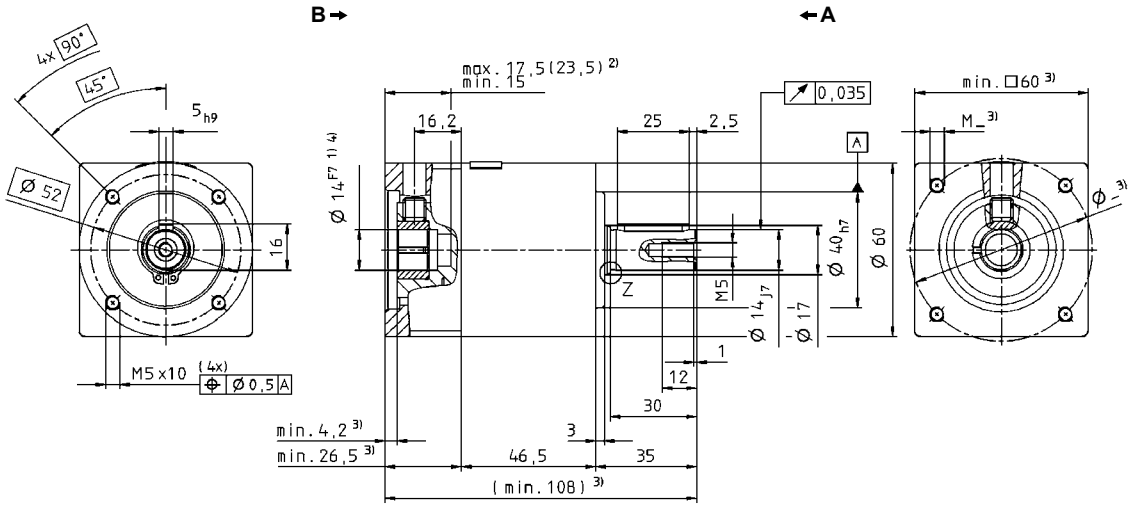
Motor mounting according to operating manual

			1-stage					2-stage							
Ratio	***i***		**4**	**5**	**7**	**8**	**10**	**16**	**20**	**25**	**35**	**50**	**64**	**70**	**100**
Max. acceleration torque (max. 1000 cycles per hour)	T_{2B}	Nm	32	32	32	29	29	32	32	32	32	32	29	32	29
		in.lb	283	283	283	257	257	283	283	283	283	283	257	283	257
Nominal output torque (with n_{1N})	T_{2N}	Nm	16	16	16	15	15	16	16	16	16	16	15	16	15
		in.lb	142	142	142	133	133	142	142	142	142	142	133	142	133
Emergency stop torque (permitted 1000 times during the service life of the gearhead)	T_{2Not}	Nm	75	75	75	75	75	75	75	75	75	75	75	75	75
		in.lb	664	664	664	664	664	664	664	664	664	664	664	664	664
Nominal input speed (with T_{2N} and 20°C ambient temperature) [a]	n_{1N}	rpm	3700	3700	3700	3700	3700	3700	3700	3700	3700	3700	3700	3700	3700
Max. input speed	n_{1Max}	rpm	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)	T_{012}	Nm	0.11	0.11	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	0.97	0.97
Max. torsional backlash	j_t	arcmin	≤ 20					≤ 25							
Torsional rigidity	C_{t21}	Nm/ arcmin	2.1	2.1	2.1	1.9	1.9	2.1	2.1	2.1	2.1	2.1	1.9	2.1	1.9
		in.lb/ arcmin	19	19	19	17	17	19	19	19	19	19	17	19	17
Max. axial force [b]	F_{2AMax}	N	750					750							
		lb_f	169					169							
Max. radial force [b]	F_{2RMax}	N	650					650							
		lb_f	146					146							
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	0.88					1.1							
		lb_m	1.9					2.4							
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	-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)	J_1	$kgcm^2$	0.17	0.17	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.s²	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15

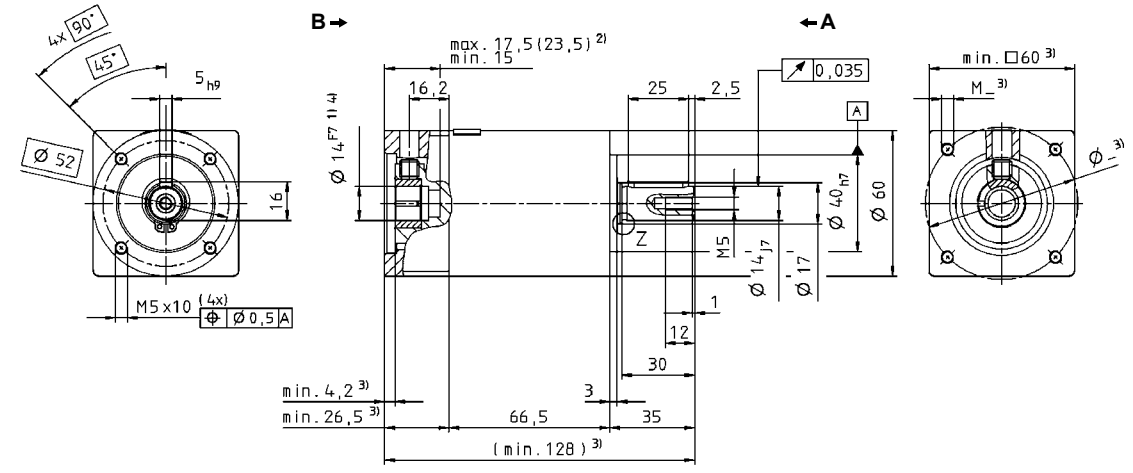
[a] For higher ambient temperatures, please reduce input speed

[b] Relates to center of the output shaft or flange, at 100 rpm

1-stage:



2-stage:



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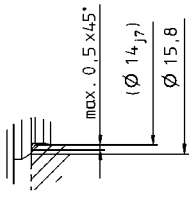


Non-tolerated dimensions ±1mm

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

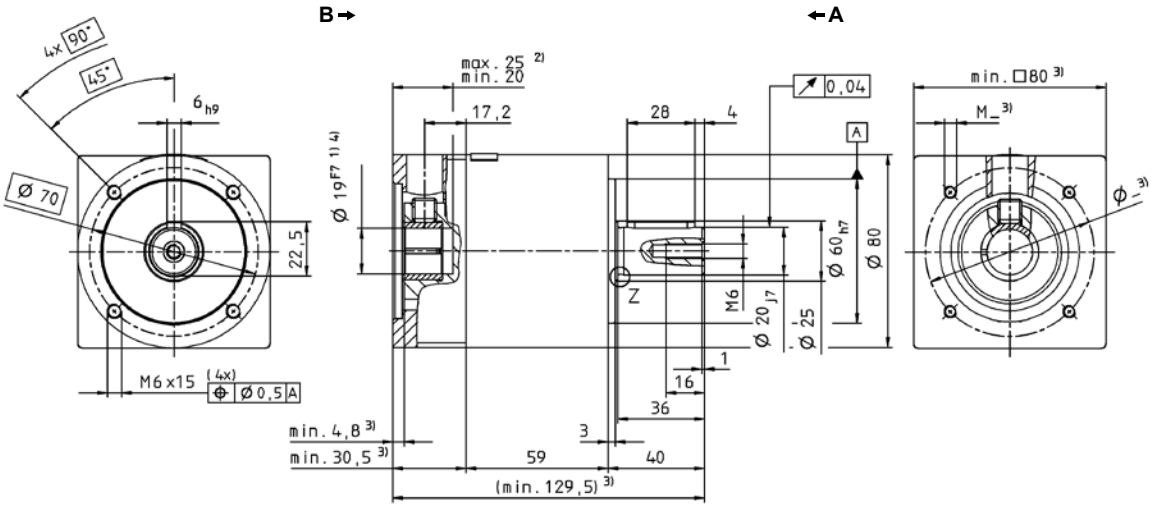
			1-stage					2-stage							
Ratio	***i***		**4**	**5**	**7**	**8**	**10**	**16**	**20**	**25**	**35**	**50**	**64**	**70**	**100**
Max. acceleration torque (max. 1000 cycles per hour)	T_{2B}	Nm	80	80	80	72	72	80	80	80	80	80	72	80	72
		in.lb	708	708	708	637	637	708	708	708	708	708	637	708	637
Nominal output torque (with n_{1N})	T_{2N}	Nm	40	40	40	35	35	40	40	40	40	40	35	40	35
		in.lb	354	354	354	310	310	354	354	354	354	354	310	354	310
Emergency stop torque (permitted 1000 times during the service life of the gearhead)	T_{2Not}	Nm	190	190	190	190	190	190	190	190	190	190	190	190	190
		in.lb	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682
Nominal input speed (with T_{2N} and 20°C ambient temperature) [a]	n_{1N}	rpm	3400	3400	3400	3400	3400	3400	3400	3400	3400	3400	3400	3400	3400
Max. input speed	n_{1Max}	rpm	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)	T_{012}	Nm	0.28	0.28	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	2.5	2.5
Max. torsional backlash	j_t	arcmin	≤ 20					≤ 25							
Torsional rigidity	C_{t21}	Nm/ arcmin	6.1	6.1	6.1	5.5	5.5	6.1	6.1	6.1	6.1	6.1	5.5	6.1	5.5
		in.lb/ arcmin	54	54	54	49	49	54	54	54	54	54	49	54	49
Max. axial force [b]	F_{2AMax}	N	1600					1600							
		lb_f	360					360							
Max. radial force [b]	F_{2RMax}	N	1200					1200							
		lb_f	270					270							
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	2.1					2.8							
		lb_m	4.6					6.2							
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			Lubricated for life												
Paint			Aluminum												
Direction of rotation			Motor and gearhead same direction												
Protection class			IP 64												
Moment of inertia (relates to the drive)	J_1	$kgcm^2$	0.54	0.54	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	0.48	0.48

[a] For higher ambient temperatures, please reduce input speed

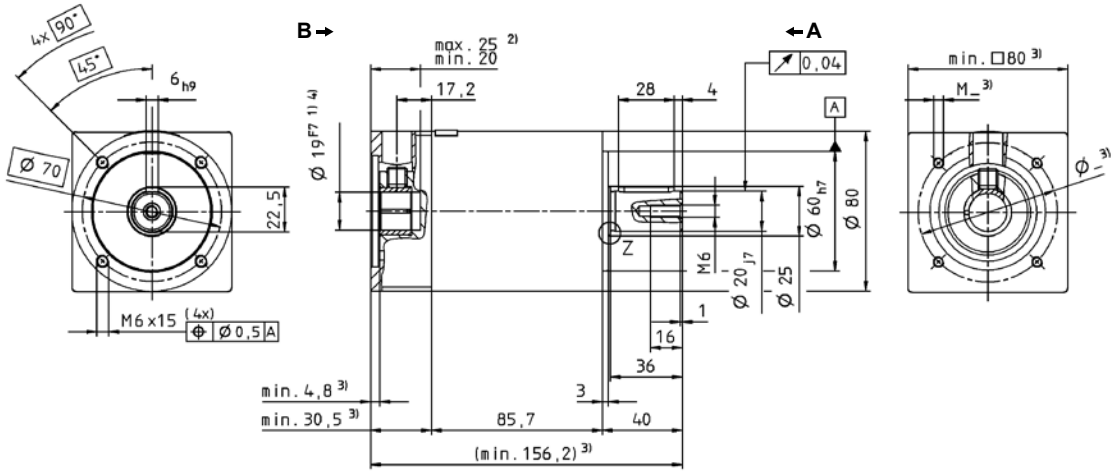
[b] Relates to center of the output shaft or flange, at 100 rpm

View A View B

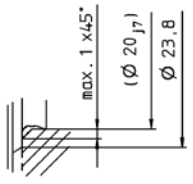
1-stage:



2-stage:



Z:



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

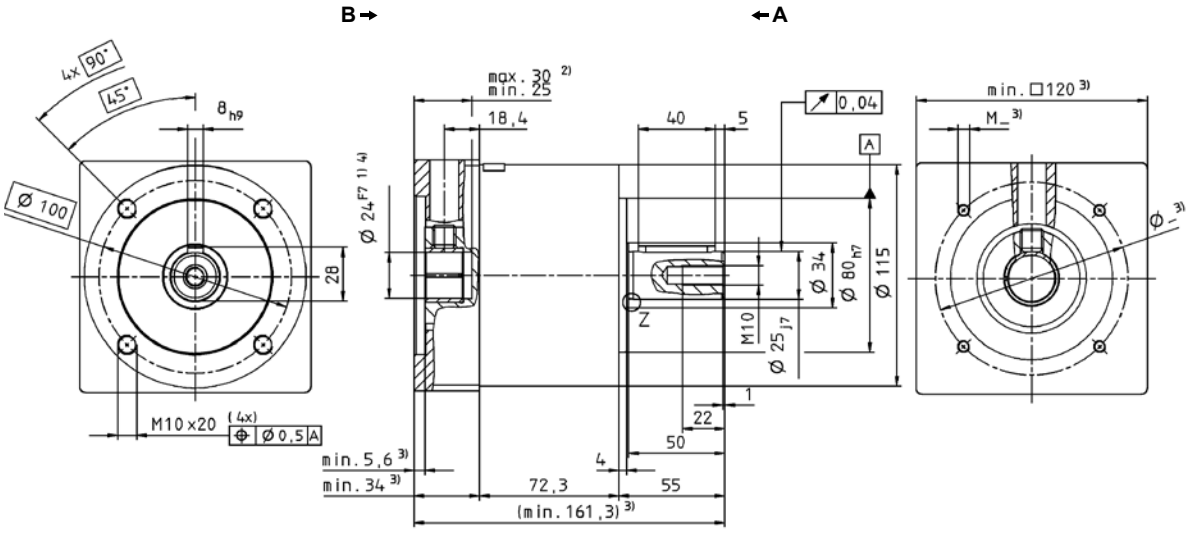
			1-stage					2-stage							
Ratio	***i***		**4**	**5**	**7**	**8**	**10**	**16**	**20**	**25**	**35**	**50**	**64**	**70**	**100**
Max. acceleration torque (max. 1000 cycles per hour)	T_{2B}	Nm	200	200	200	180	180	200	200	200	200	200	180	200	180
		in.lb	1770	1770	1770	1593	1593	1770	1770	1770	1770	1770	1593	1770	1593
Nominal output torque (with n_{1N})	T_{2N}	Nm	100	100	100	90	90	100	100	100	100	100	90	100	90
		in.lb	885	885	885	797	797	885	885	885	885	885	797	885	797
Emergency stop torque (permitted 1000 times during the service life of the gearhead)	T_{2Not}	Nm	480	480	480	480	480	480	480	480	480	480	480	480	480
		in.lb	4248	4248	4248	4248	4248	4248	4248	4248	4248	4248	4248	4248	4248
Nominal input speed (with T_{2N} and 20°C ambient temperature) [a]	n_{1N}	rpm	2600	2600	2600	2600	2600	2600	2600	2600	2600	2600	2600	2600	2600
Max. input speed	n_{1Max}	rpm	4800	4800	4800	4800	4800	4800	4800	4800	4800	4800	4800	4800	4800
Mean no load running torque (with n_1 = 3000 rpm and 20°C gearhead temperature)	T_{012}	Nm	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
		in.lb	4.4	4.4	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	j_t	arcmin	≤ 20					≤ 25							
Torsional rigidity	C_{t21}	Nm/ arcmin	16.5	16.5	16.5	14.5	14.5	16.5	16.5	16.5	16.5	16.5	14.5	16.5	14.5
		in.lb/ arcmin	146	146	146	128	128	146	146	146	146	146	128	146	128
Max. axial force [b]	F_{2AMax}	N	2100					2100							
		lb_f	472					472							
Max. radial force [b]	F_{2RMax}	N	1550					1550							
		lb_f	349					349							
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	5.2					6.9							
		lb_m	11.5					15.2							
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			Aluminum												
Direction of rotation			Motor and gearhead same direction												
Protection class			IP 64												
Moment of inertia (relates to the drive)	J_1	$kgcm^2$	1.8	1.8	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.s²	1.6	1.6	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

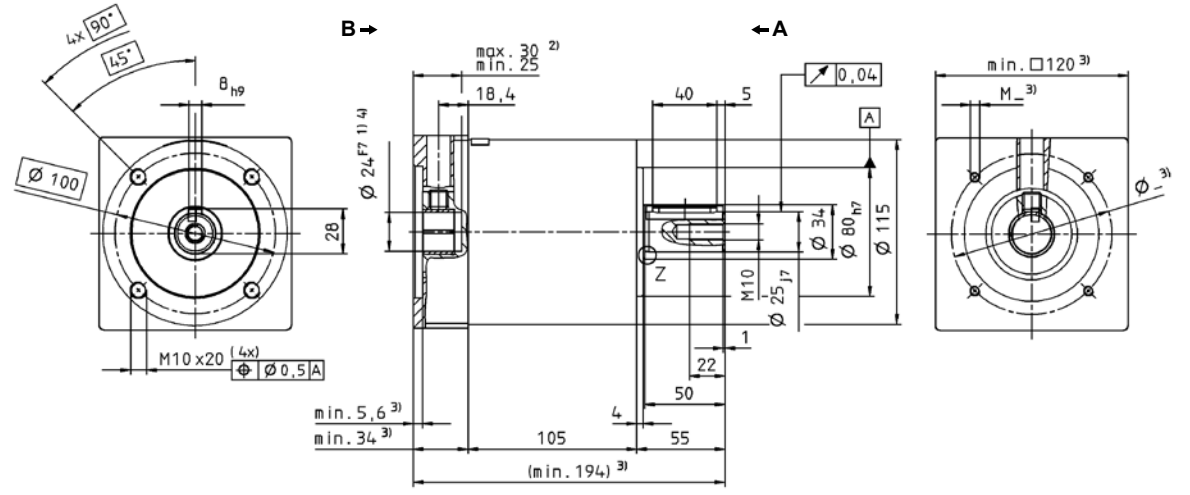
[b] Relates to center of the output shaft or flange, at 100 rpm

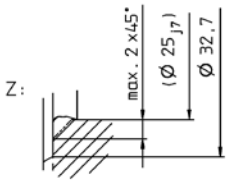
View A View B

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

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

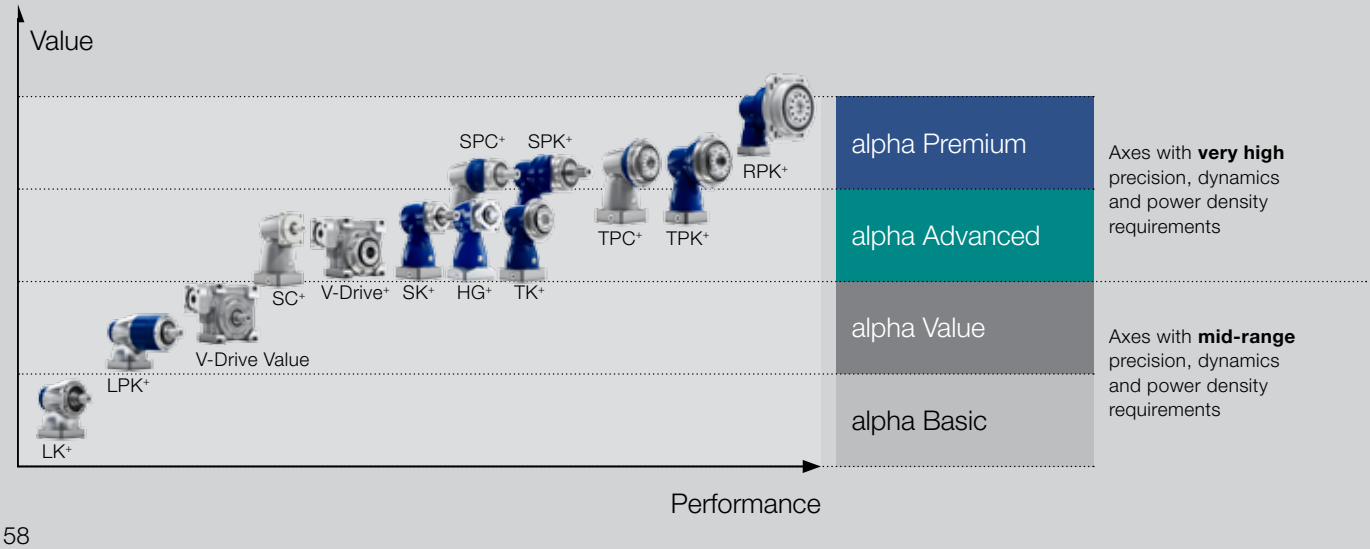
- Low backlash right-angle gearhead with output flange
- Applications in cyclic or continuous operation
- Torsional backlash: ≤ 1.3 arcmin
- Ratio: 3-10,000

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

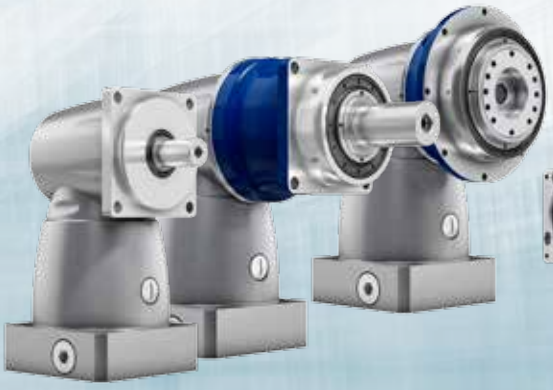
SK+ and SPK+
Space-saving right-angle precision with output shaft

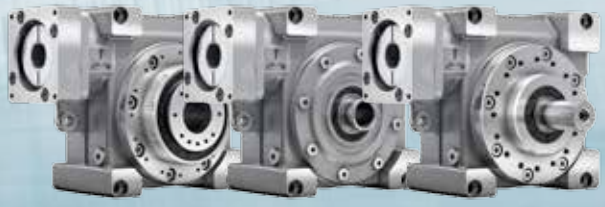
- Low backlash hypoid gearhead with output shaft
- Applications in cyclic or continuous operation
- Torsional backlash < 2 arcmin
- Ratio: 3-10,000

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



Now with even higher torques!





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 Advanced (VDT⁺/VDH⁺/VDS⁺)
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.

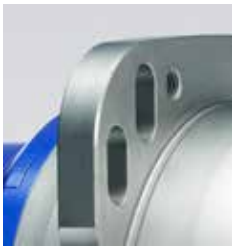
Maximum durability

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.

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

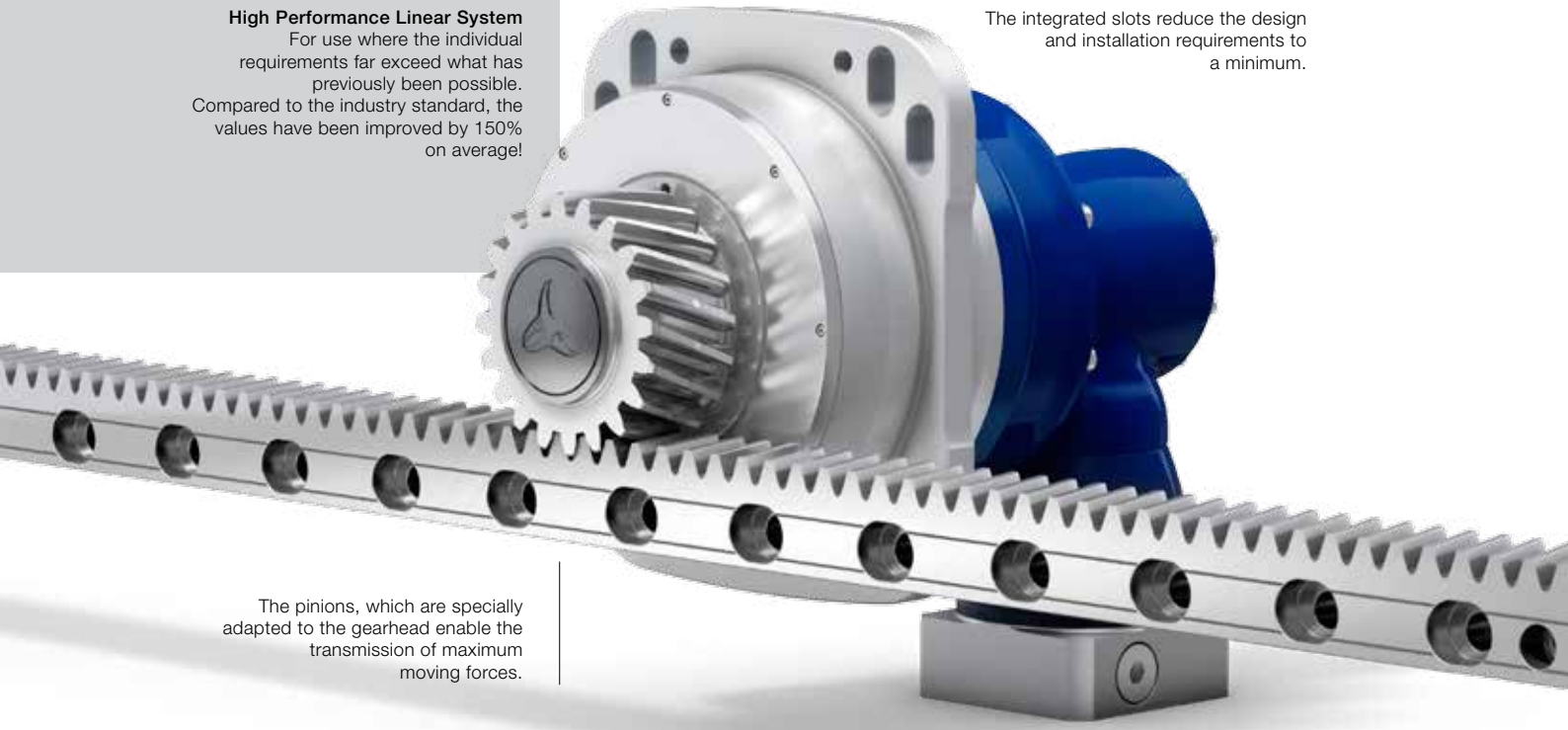
Torsional backlash [arcmin]	< 3
Ratios [-]	66-5,500
Max. torque [N]	10,000
Max. input speed [rpm]	6,000
Efficiency [%]	≤ 92

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.

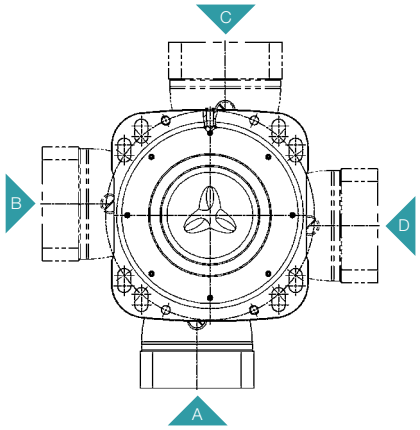
Further information is available in the High Performance Linear System catalog or on the Internet at www.rack-pinion.com

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



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.

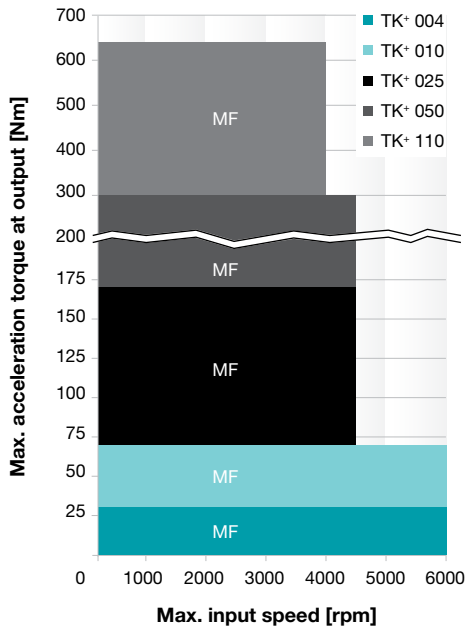
Sets standards in terms of power density, modularity and easy installation.

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

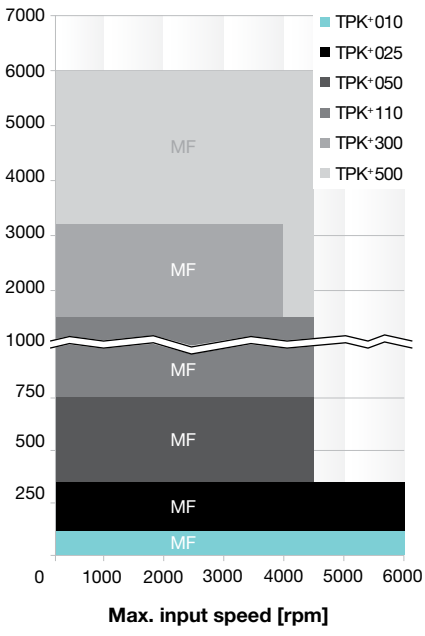
The representatives of our versatile hypoid gearhead with TP+ compatible output flange and hollow shaft.
TPK+/TPK+ HIGH TORQUE gearheads with planetary stage are especially suitable for high-precision applications requiring higher power and torsional rigidity.

Quick size selection

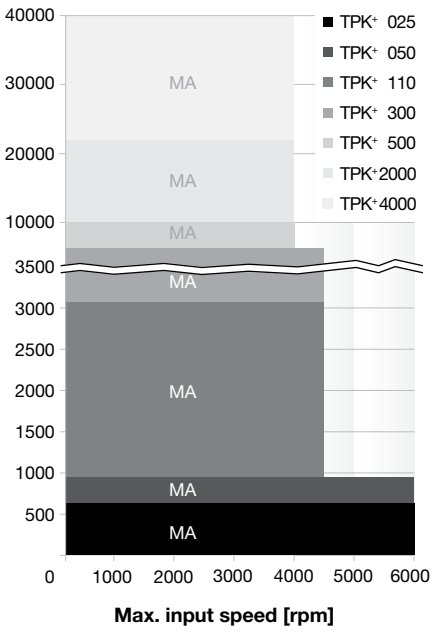
TK+ MF (ex. i = 5)
For applications in cyclic operation (ED ≤ 60%)



TPK+ MF (ex. i = 25)
For applications in cyclic operation (ED ≤ 60%)



TPK+ HIGH TORQUE MA (ex. i = 88)
For applications in cyclic operation (ED ≤ 60%)



* Technical data and dimension sheets are available upon request.

Versions and Applications

Features	TK+ MF version page 164	TPK+ MF version page 174	TPK+ HIGH TORQUE MA version page 200
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

* You can find order information for the relevant type of output on page 424.

TK+ 004 MF 1/2-stage

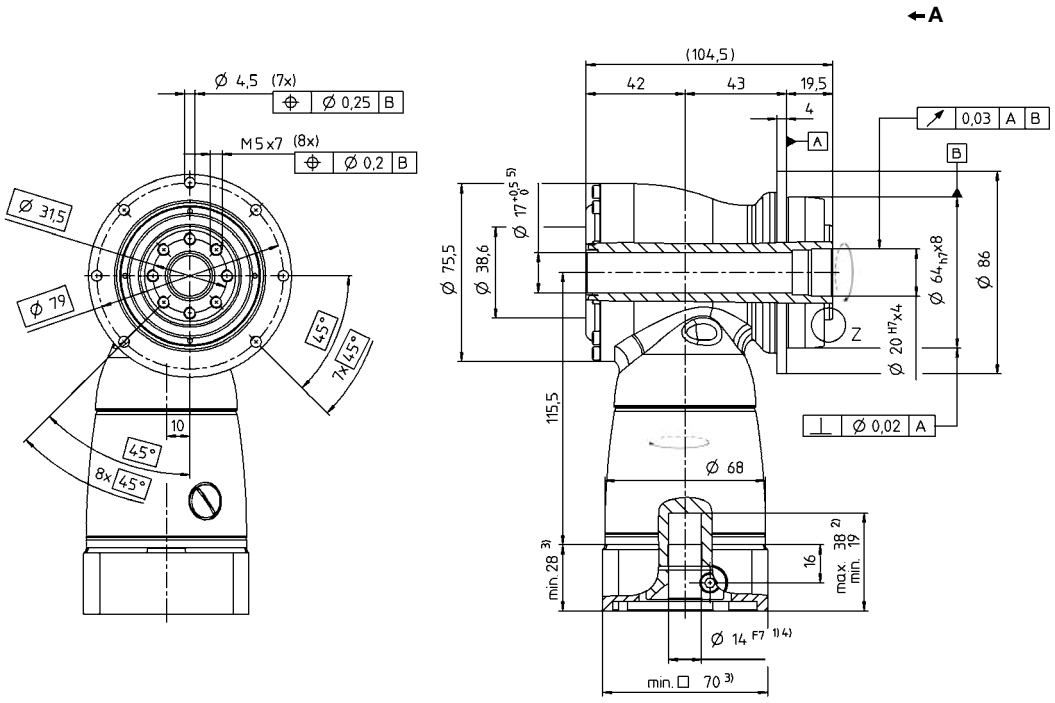
					1-stage					2-stage									
Ratio [a]			*i*		**3**	**4**	**5**	**7**	**10**	**12**	**16**	**20**	**25**	**28**	**35**	**40**	**50**	**70**	**100**
Max. acceleration torque (max. 1000 cycles per hour)			T_{2B}	Nm	30	30	30	25	20	30	30	30	30	30	30	30	30	25	20
				in.lb	266	266	266	221	177	266	266	266	266	266	266	266	266	221	177
Nominal output torque (with n_{1N})			T_{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	177	133
Emergency stop torque (permitted 1000 times during the service life of the gearhead)			T_{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	398	354
Nominal input speed (with T_{2N} and 20 °C ambient temperature) [b), c)]			n_{1N}	rpm	2200	2400	2700	2700	2700	4400	4400	4400	4400	4400	4400	4400	4800	5500	5500
Max. continuous speed (with 20 % T_{2N} and 20 °C ambient temperature)			n_{1Ncym}	rpm	2700	3100	3600	3100	3100	5000	5000	5000	5000	5000	5000	5000	5000	5500	5500
Max. input speed			n_{1Max}	rpm	6000	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	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	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	0.9
Max. torsional backlash			j_t	arcmin	≤ 5														
Torsional rigidity			C_{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)]			F_{2AMax}	N	2400														
				lb_f	540														
Max. radial force [e)]			F_{2RMax}	N	2700														
				lb_f	608														
Max. tilting moment			M_{2KMax}	Nm	251														
				in.lb	2220														
Efficiency at full load			η	%	96					94									
Service life (For calculation, see the Chapter "Information")			L_h	h	> 20000														
Weight incl. standard adapter plate			*m*	kg	2.9					3.2									
				lb_m	6.4					7.1									
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	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	kgcm²	–	–	–	–	–	0.09	0.09	0.08	0.07	0.06	0.06	0.06	0.06	0.06	0.06
				10^{-3} in.lb.s²						0.08	0.08	0.07	0.07	0.06	0.06	0.05	0.05	0.05	0.05
	C	14	J_1	kgcm²	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	0.17
				10^{-3} in.lb.s²	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	0.15
	E	19	J_1	kgcm²	0.92	0.82	0.76	0.72	0.70	–	–	–	–	–	–	–	–	–	–
				10^{-3} in.lb.s²	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).

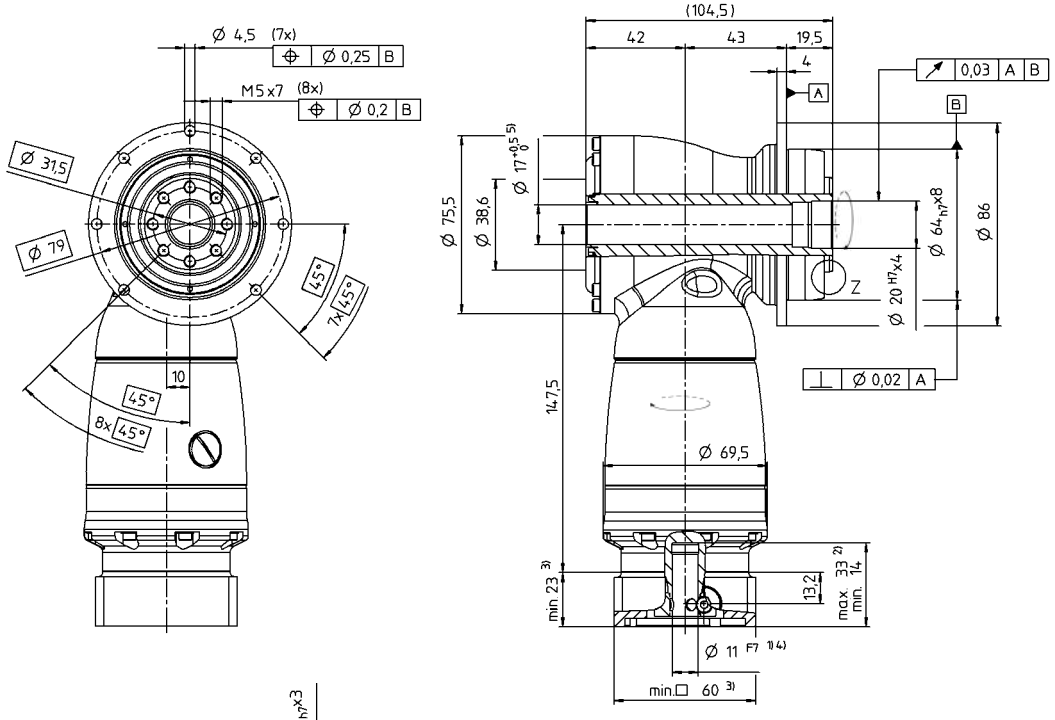
[a)] Other ratios available on request
[b)] Higher speeds are possible if the nominal torque is reduced
[c)] For higher ambient temperatures, please reduce input speed
[d)] Idling torques decrease during operation
[e)] Refers to center of the output shaft or flange

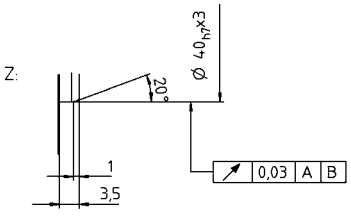
All technical data for front output side applies.
Technical data for rearward output versions, see page 428.

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.
5) Led through element max. Ø 16.8 mm

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

Motor mounting according to operating manual

TK+ 010 MF 1/2-stage

					1-stage					2-stage									
Ratio [a]			*i*		**3**	**4**	**5**	**7**	**10**	**12**	**16**	**20**	**25**	**28**	**35**	**40**	**50**	**70**	**100**
Max. acceleration torque (max. 1000 cycles per hour)			T_{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	531	443
Nominal output torque (with n_{1N})			T_{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	398	354
Emergency stop torque (permitted 1000 times during the service life of the gearhead)			T_{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	974	885
Nominal input speed (with T_{2N} and 20 °C ambient temperature) [b), c)]			n_{1N}	rpm	2100	2200	2500	2500	2500	3500	3500	3500	3500	3500	3500	3500	3800	4500	4500
Max. continuous speed (with 20 % T_{2N} and 20 °C ambient temperature)			n_{1Ncym}	rpm	2700	3100	3600	3100	3100	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500
Max. input speed			n_{1Max}	rpm	6000	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	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	0.9	0.9	0.9	0.9
Max. torsional backlash			j_t	arcmin	≤ 4														
Torsional rigidity			C_{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)]			F_{2AMax}	N	3400														
				lb_f	765														
Max. radial force [e)]			F_{2RMax}	N	4000														
				lb_f	900														
Max. tilting moment			M_{2KMax}	Nm	437														
				in.lb	3867														
Efficiency at full load			η	%	96					94									
Service life (For calculation, see the Chapter "Information")			L_h	h	> 20000														
Weight incl. standard adapter plate			*m*	kg	5.3					6.1									
				lb_m	11.7					13.5									
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	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	J_1	kgcm²	–	–	–	–	–	0.31	0.28	0.24	0.23	0.21	0.20	0.19	0.18	0.18	0.18
				10^{-3} in.lb.s²						0.27	0.25	0.21	0.21	0.18	0.18	0.17	0.16	0.16	0.16
	E	19	J_1	kgcm²	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.s²	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	J_1	kgcm²	3.22	2.80	2.60	2.43	2.34	–	–	–	–	–	–	–	–	–	–
				10^{-3} in.lb.s²	2.85	2.48	2.30	2.15	2.07										

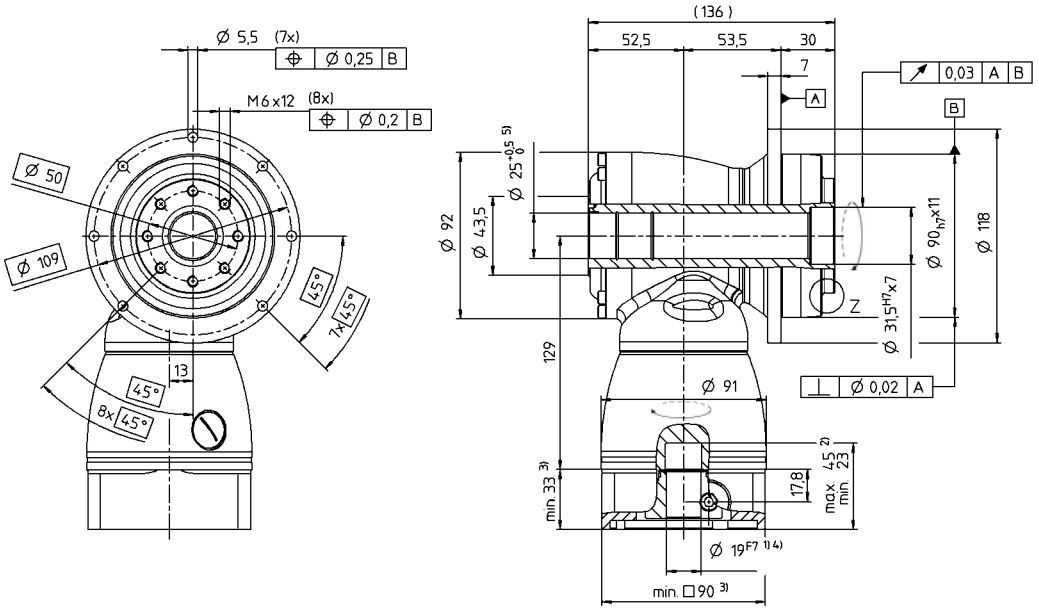
Please contact us for information on the best configuration for S1 conditions of use (continuous operation).

[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

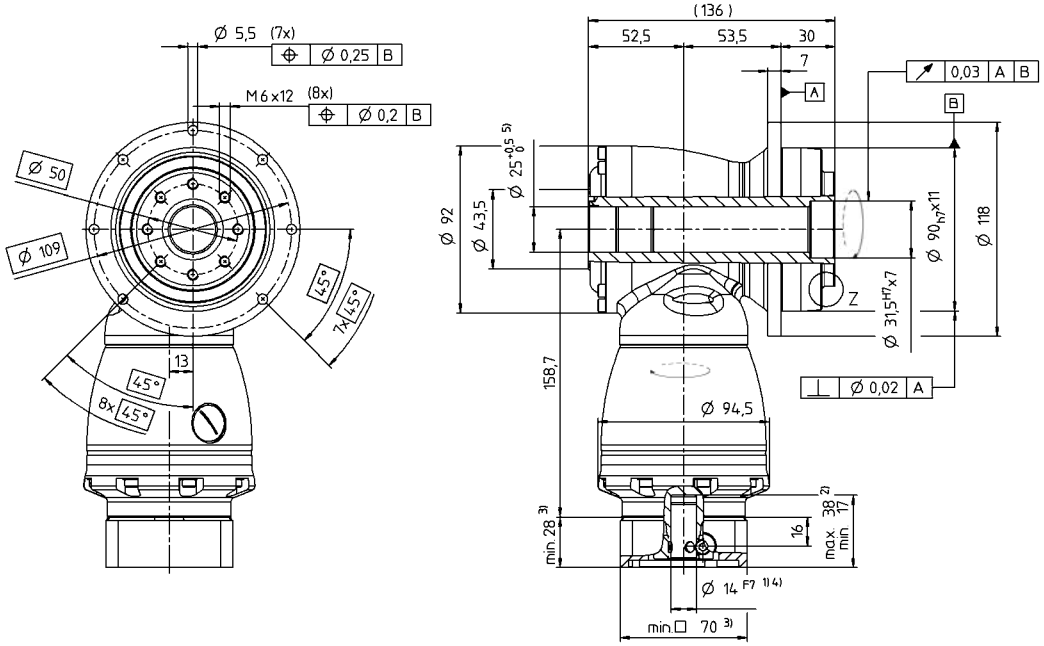
All technical data for front output side applies.
Technical data for rearward output versions, see page 428.

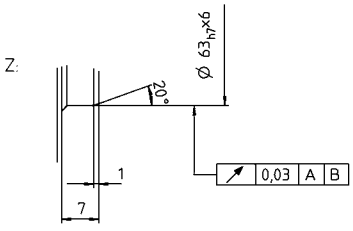
View A

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.
5) Led through element max. Ø 24.8 mm

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

Motor mounting according to operating manual

TK+ 025 MF 1/2-stage

					1-stage					2-stage									
Ratio [a]			*i*		**3**	**4**	**5**	**7**	**10**	**12**	**16**	**20**	**25**	**28**	**35**	**40**	**50**	**70**	**100**
Max. acceleration torque (max. 1000 cycles per hour)			T_{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 n_{1N})			T_{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)			T_{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 T_{2N} and 20 °C ambient temperature) [b), c)]			n_{1N}	rpm	2000	2100	2400	2200	2200	3100	3100	3100	3100	3100	3100	3100	3500	4200	4200
Max. continuous speed (with 20 % T_{2N} and 20 °C ambient temperature)			n_{1Ncym}	rpm	2700	3000	3400	3000	3000	4000	4000	4000	4000	4000	4000	4000	4000	4200	4200
Max. input speed			n_{1Max}	rpm	4500	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	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
Max. torsional backlash			j_t	arcmin	≤ 4														
Torsional rigidity			C_{t21}	Nm/ arcmin	12	13	16	16	16	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	142	142	142
Max. axial force [e)]			F_{2AMax}	N	5700														
				lb_f	1283														
Max. radial force [e)]			F_{2RMax}	N	6300														
				lb_f	1418														
Max. tilting moment			M_{2KMax}	Nm	833														
				in.lb	7370														
Efficiency at full load			η	%	96					94									
Service life (For calculation, see the Chapter "Information")			L_h	h	> 20000														
Weight incl. standardadapter plate			*m*	kg	8.9					10.6									
				lb_m	20					23									
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]	E	19	J_1	kgcm²	–	–	–	–	–	1.08	1.01	0.88	0.85	0.76	0.75	0.70	0.69	0.69	0.68
				10^{-3} in.lb.s²						0.96	0.89	0.78	0.75	0.67	0.66	0.62	0.66	0.61	0.60
	G	24	J_1	kgcm²	–	–	–	–	–	2.65	2.57	2.44	2.42	2.32	2.31	2.26	2.25	2.25	2.25
				10^{-3} in.lb.s²						2.34	2.28	2.16	2.14	2.06	2.05	2.00	2.00	1.99	1.99
	H	28	J_1	kgcm²	5.50	4.30	3.60	3.10	2.90	–	–	–	–	–	–	–	–	–	–
				10^{-3} in.lb.s²	4.83	3.77	3.22	2.77	2.54										
	K	38	J_1	kgcm²	12.7	11.5	10.9	10.4	10.1	–	–	–	–	–	–	–	–	–	–
				10^{-3} in.lb.s²	11.2	10.2	9.63	9.19	8.95										

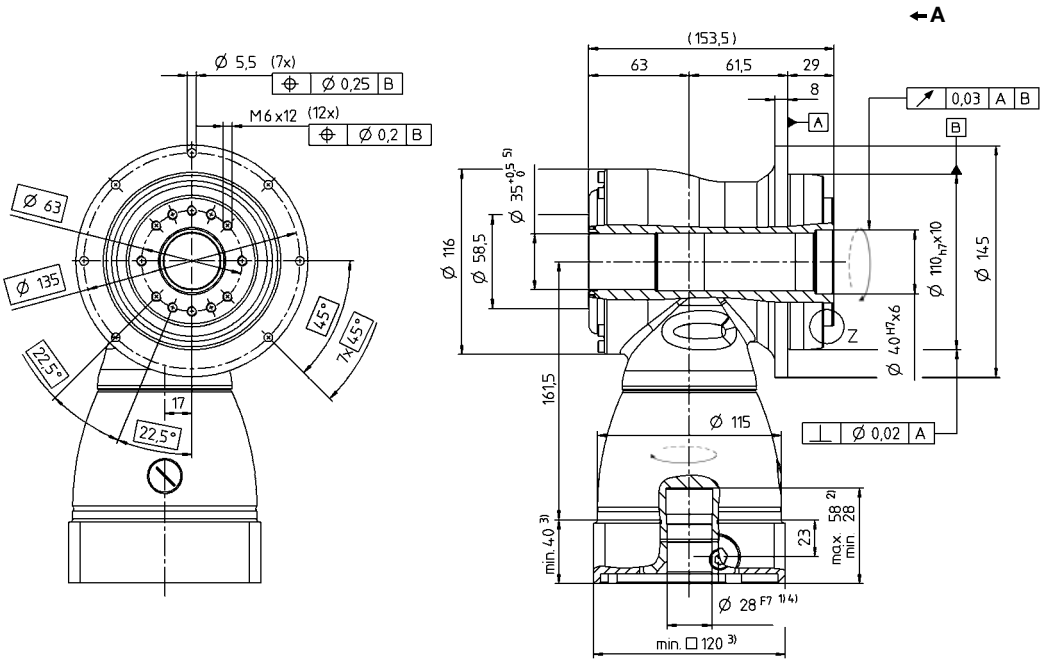
Please contact us for information on the best configuration for S1 conditions of use (continuous operation).

[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

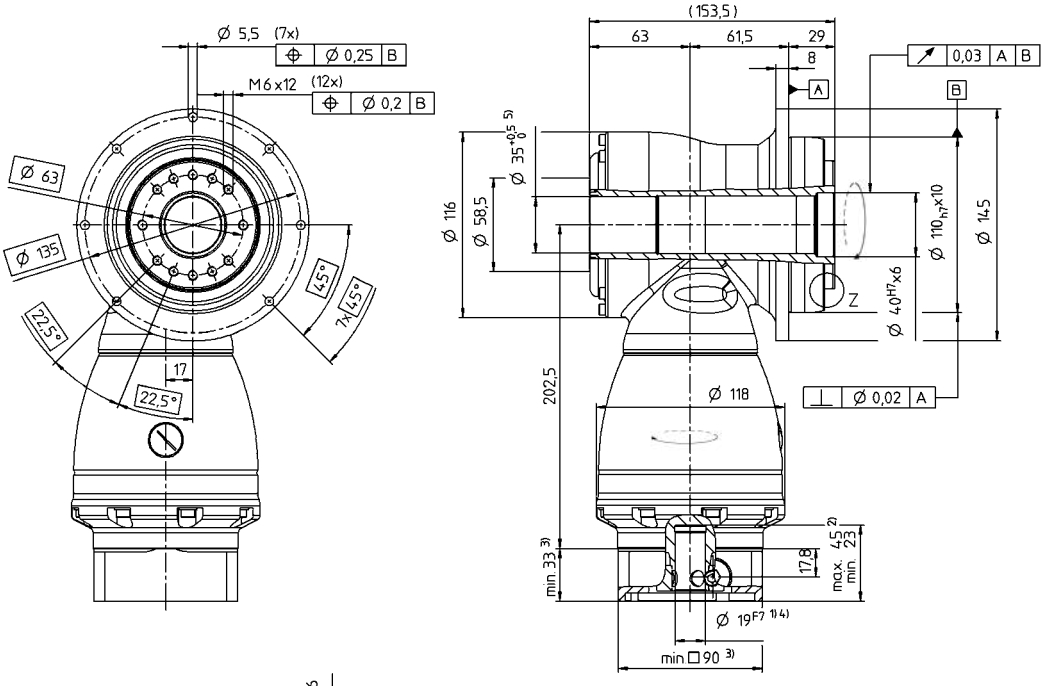
All technical data for front output side applies.
Technical data for rearward output versions, see page 428.

View A

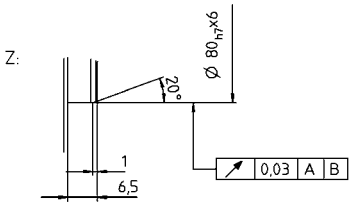
1-stage:



2-stage:



Z:



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) Led through element max. Ø 34.8 mm

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

Motor mounting according to operating manual

TK+ 050 MF 1/2-stage

				1-stage					2-stage									
Ratio [a]			*i*	**3**	**4**	**5**	**7**	**10**	**12**	**16**	**20**	**25**	**28**	**35**	**40**	**50**	**70**	**100**
Max. acceleration torque (max. 1000 cycles per hour)			T_{2B} Nm	300	300	300	250	210	300	300	300	300	300	300	300	300	250	210
			T_{2B} in.lb	2655	2655	2655	2213	1859	2655	2655	2655	2655	2655	2655	2655	2655	2213	1859
Nominal output torque (with n_{1N})			T_{2N} Nm	190	190	190	175	160	190	190	190	190	190	190	190	190	175	160
			T_{2N} in.lb	1682	1682	1682	1549	1416	1682	1682	1682	1682	1682	1682	1682	1682	1549	1416
Emergency stop torque (permitted 1000 times during the service life of the gearhead)			T_{2Not} Nm	400	500	500	450	400	500	500	500	500	500	500	500	500	450	400
			T_{2Not} in.lb	3540	4425	4425	3983	3540	4425	4425	4425	4425	4425	4425	4425	4425	3983	3540
Nominal input speed (with T_{2N} and 20 °C ambient temperature) [b), c)]			n_{1N} rpm	1700	1800	2000	1800	1800	2900	2900	2900	2900	2900	2900	2900	3200	3200	3900
Max. continuous speed (with 20 % T_{2N} and 20 °C ambient temperature)			n_{1Ncym} rpm	2200	2500	2800	2500	2500	4000	4000	4000	4000	4000	4000	4000	4200	4200	4200
Max. input speed			n_{1Max} rpm	4500	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	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
			T_{012} 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			j_t arcmin	≤ 4														
Torsional rigidity			C_{t21} Nm/ arcmin	36	40	46	44	42	40	40	40	40	40	40	40	46	44	42
			C_{t21} in.lb/ arcmin	315	356	405	387	376	356	356	356	356	356	356	356	405	387	376
Max. axial force [e)]			F_{2AMax} N	9900														
			F_{2AMax} lb_f	2228														
Max. radial force [e)]			F_{2RMax} N	9500														
			F_{2RMax} lb_f	2138														
Max. tilting moment			M_{2KMax} Nm	1692														
			M_{2KMax} in.lb	14974														
Efficiency at full load			η %	96					94									
Service life (For calculation, see the Chapter "Information")			L_h h	> 20000														
Weight incl. standardadapter plate			*m* kg	22					26									
			m lb_m	49					57									
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)	G	24	J_1 kgcm²	–	–	–	–	–	4.43	3.97	3.36	3.22	2.82	2.75	2.50	2.47	2.44	2.42
			J_1 10^{-3} in.lb.s²						3.92	3.51	2.97	2.85	2.50	2.44	2.22	2.18	2.16	2.14
Clamping hub diameter [mm]	K	38	J_1 kgcm²	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
			J_1 10^{-3} in.lb.s²	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

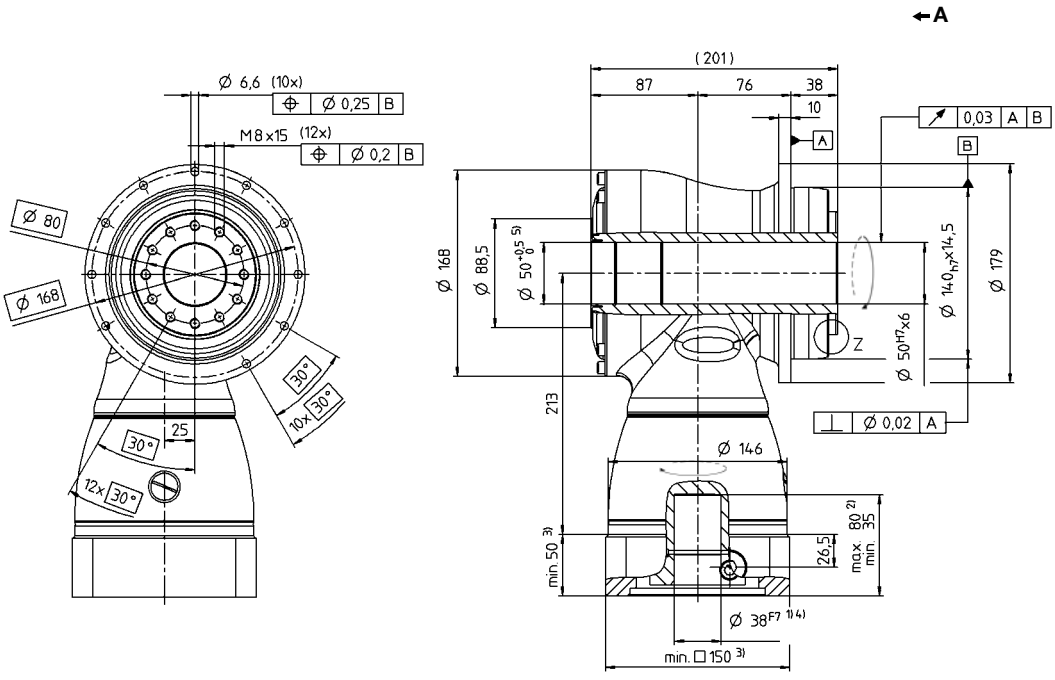
Please contact us for information on the best configuration for S1 conditions of use (continuous operation).

[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

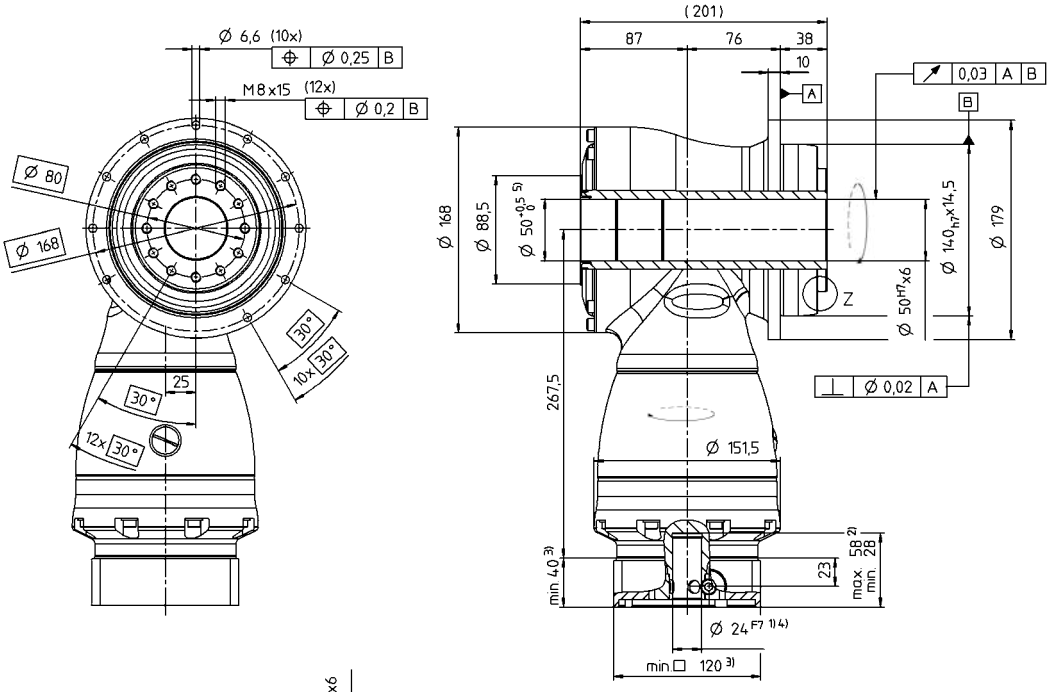
All technical data for front output side applies.
Technical data for rearward output versions, see page 428.

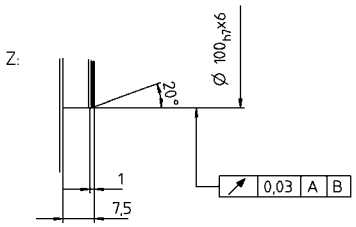
View A

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.
5) Led through element max. Ø 49.8 mm

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

Motor mounting according to operating manual

TK+ 110 MF 1/2-stage

				1-stage					2-stage									
Ratio [a]			*i*	**3**	**4**	**5**	**7**	**10**	**12**	**16**	**20**	**25**	**28**	**35**	**40**	**50**	**70**	**100**
Max. acceleration torque (max. 1000 cycles per hour)			T_{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	4868	4160
Nominal output torque (with n_{1N})			T_{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	3363	3186
Emergency stop torque (permitted 1000 times during the service life of the gearhead)			T_{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	8585	7965
Nominal input speed (with T_{2N} and 20 °C ambient temperature) [b), c)]			n_{1N} rpm	1400	1600	1800	1600	1600	2700	2700	2700	2700	2700	2700	2700	2900	3200	3400
Max. continuous speed (with 20 % T_{2N} and 20 °C ambient temperature)			n_{1Ncym} rpm	1800	2100	2500	2200	2200	3500	3500	3500	3500	3500	3500	3500	3500	3800	3800
Max. input speed			n_{1Max} rpm	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000
Mean no load running torque (with n_1 = 3000 rpm and 20 °C gearhead temperature) [d)]			T_{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			j_t arcmin	≤ 4														
Torsional rigidity			C_{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)]			F_{2AMax} N	14200														
			lb_f	3195														
Max. radial force [e)]			F_{2RMax} N	14700														
			lb_f	3308														
Max. tilting moment			M_{2KMax} Nm	3213														
			in.lb	28435														
Efficiency at full load			η %	96					94									
Service life (For calculation, see the Chapter "Information")			L_h h	> 20000														
Weight incl. standardadapter plate			*m* kg	48					54									
			lb_m	106					119									
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]	K	38	J_1 kgcm²	–	–	–	–	–	16.8	14.8	12.9	12.3	11.2	10.9	10.3	10.1	10.0	9.93
			10^{-3} in.lb.s²						14.8	13.1	11.4	10.9	9.88	9.63	9.08	8.95	8.84	8.79
	M	48	J_1 kgcm²	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.s²	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

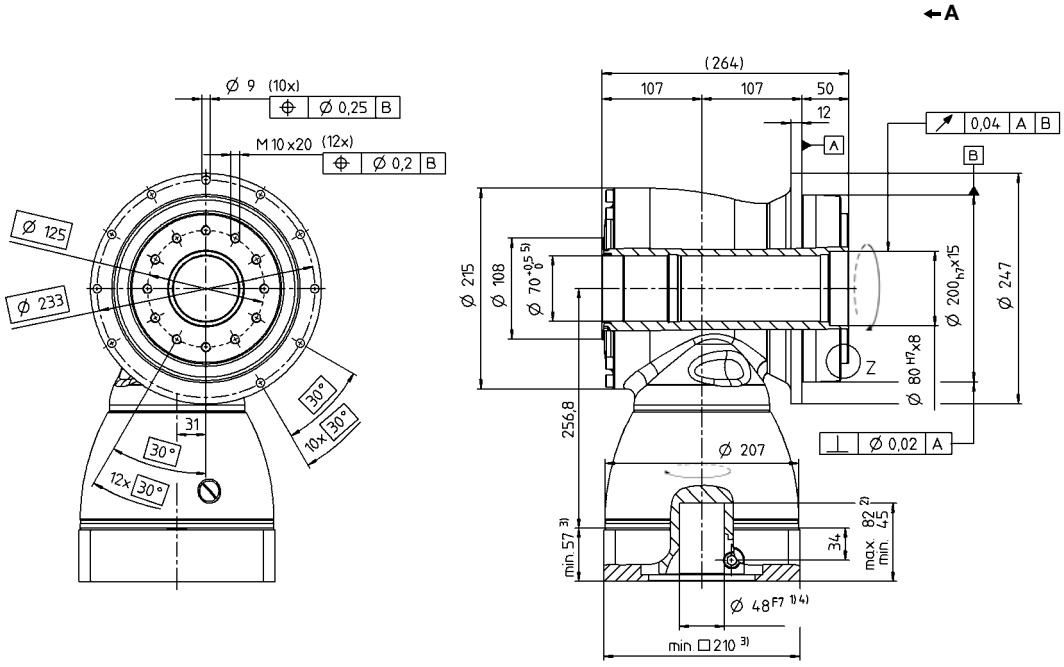
Please contact us for information on the best configuration for S1 conditions of use (continuous operation).

[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

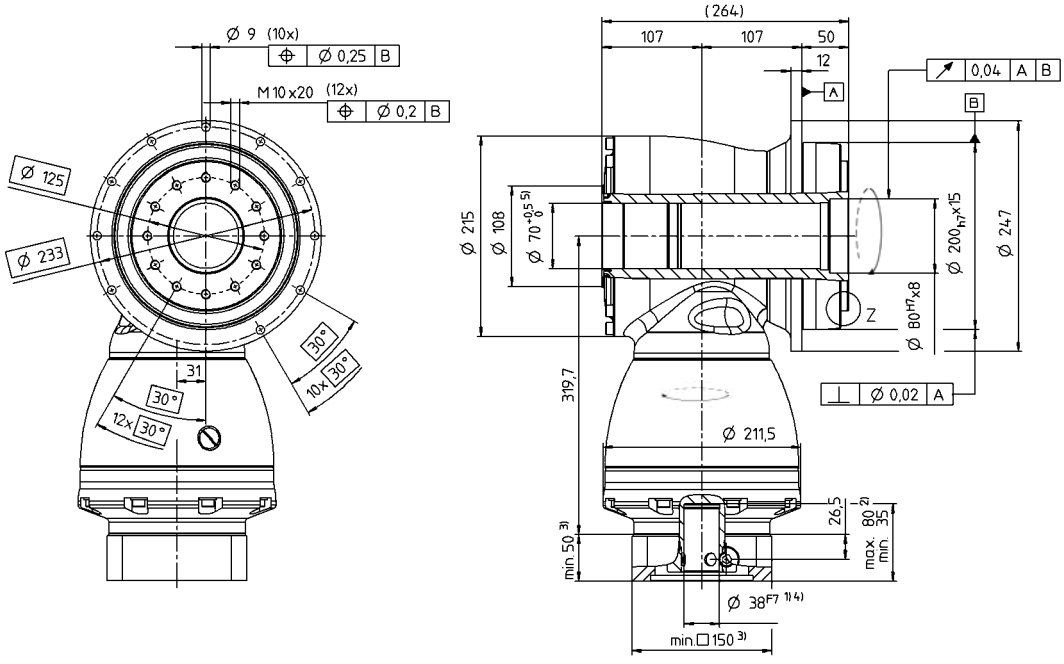
All technical data for front output side applies.
Technical data for rearward output versions, see page 428.

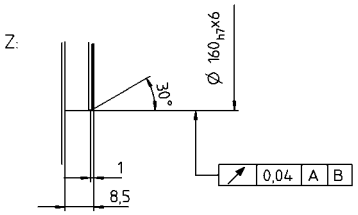
View A

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.
5) Led through element max. Ø 69.8 mm

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

Motor mounting according to operating manual

				2-stage										
Ratio [a]			*i*	**12**	**16**	**20**	**25**	**28**	**35**	**40**	**49**	**50**	**70**	**100**
Max. acceleration torque (max. 1000 cycles per hour)			T_{2B} Nm	120	120	130	130	130	130	80	130	100	130	100
			T_{2B} 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 n_{1N})			T_{2N} Nm	75	75	75	75	75	75	60	75	75	75	60
			T_{2N} 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)			T_{2Not} Nm	160	200	250	250	250	250	160	250	200	250	250
			T_{2Not} in.lb	1416	1770	2213	2213	2213	2213	1416	2213	1770	2213	2213
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_{1Ncym} 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	1.5	1.3	1.2	1.2	1.2	1.3	1.3	1.3	1.3	1.3	1.3
			T_{012} 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			j_t arcmin	Standard ≤ 5 / Reduced ≤ 3										
Torsional rigidity			C_{t21} Nm/ arcmin	16	16	20	21	23	24	15	23	19	22	27
			C_{t21} in.lb/ arcmin	142	142	177	186	204	212	133	204	168	195	239
Tilting rigidity			C_{2K} Nm/ arcmin	225										
			C_{2K} in.lb/ arcmin	1991										
Max. axial force [e)]			F_{2AMax} N	2150										
			F_{2AMax} lb_f	484										
Max. tilting moment			M_{2KMax} Nm	235										
			M_{2KMax} in.lb	2080										
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	5.2										
			m lb_m	11.5										
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	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	J_1 kgcm²	0.55	0.46	0.44	0.39	0.43	0.36	0.34	0.37	0.34	0.34	0.34
			J_1 10^{-3} in.lb.s²	0.49	0.40	0.39	0.35	0.38	0.32	0.30	0.33	0.30	0.30	0.30
	E	19	J_1 kgcm²	0.90	0.81	0.79	0.75	0.78	0.71	0.70	0.72	0.70	0.69	0.69
			J_1 10^{-3} in.lb.s²	0.80	0.72	0.70	0.66	0.69	0.63	0.62	0.64	0.62	0.61	0.61

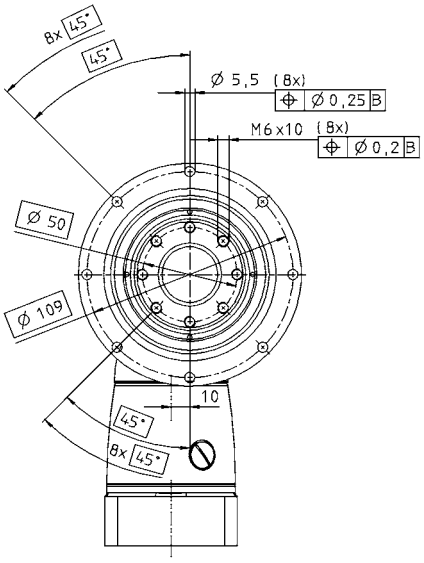
Please contact us for information on the best configuration for S1 conditions of use (continuous operation).

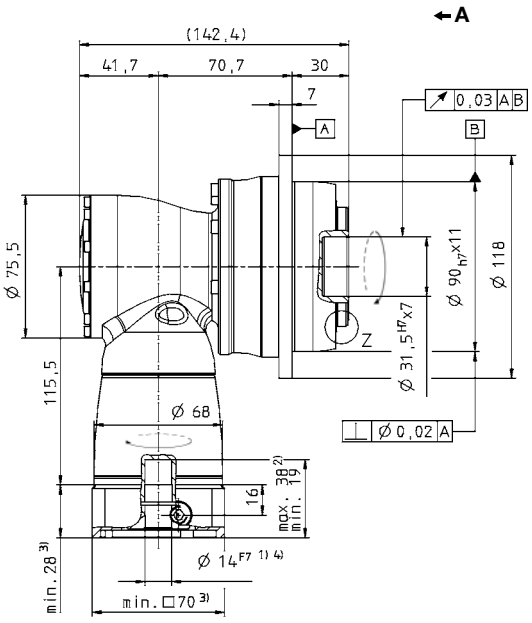
[a)] Other ratios up to i=1000 available on request
[b)] Higher speeds are possible if the nominal torque is reduced
[c)] For higher ambient temperatures, please reduce input speed
[d)] Idling torques decrease during operation
[e)] Refers to center of the output shaft or flange

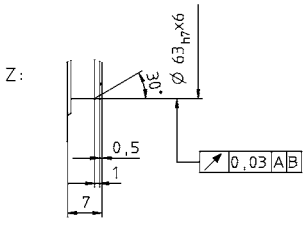
All technical data for front output side applies.
Technical data for rearward output versions, see page 428.

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*	**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	120	120	130	130	130	130	130	130	130	130	80	100	130	100
			T_{2B} in.lb	1062	1062	1151	1151	1151	1151	1151	1151	1151	1151	708	885	1151	885
Nominal output torque (with n_{1N})			T_{2N} Nm	85	85	90	90	90	90	90	90	75	90	60	75	90	60
			T_{2N} 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)			T_{2Not} Nm	200	160	250	250	250	250	250	250	250	250	160	200	250	250
			T_{2Not} in.lb	1770	1416	2213	2213	2213	2213	2213	2213	2213	2213	1416	1770	2213	2213
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	5500	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
			T_{012} 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	16	16	20	21	20	21	20	21	23	24	15	19	22	27
			C_{t21} in.lb/ arcmin	142	142	177	186	177	186	177	186	204	212	133	168	195	239
Tilting rigidity			C_{2K} Nm/ arcmin	225													
			C_{2K} in.lb/ arcmin	1991													
Max. axial force [e)]			F_{2AMax} N	2150													
			F_{2AMax} lb_f	484													
Max. tilting moment			M_{2KMax} Nm	235													
			M_{2KMax} in.lb	2080													
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													
			m 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 kgcm²	0.09	0.07	0.08	0.07	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
			J_1 10^{-3} in.lb.s²	0.08	0.06	0.07	0.06	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
	C	14	J_1 kgcm²	0.20	0.18	0.19	0.19	0.18	0.18	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17
			J_1 10^{-3} in.lb.s²	0.18	0.16	0.17	0.17	0.16	0.16	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15

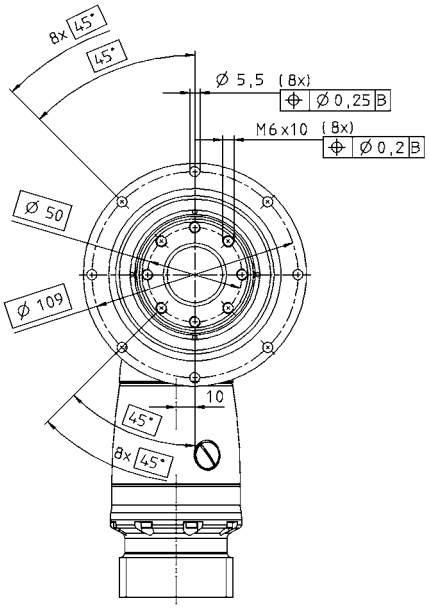
Please contact us for information on the best configuration for S1 conditions of use (continuous operation).

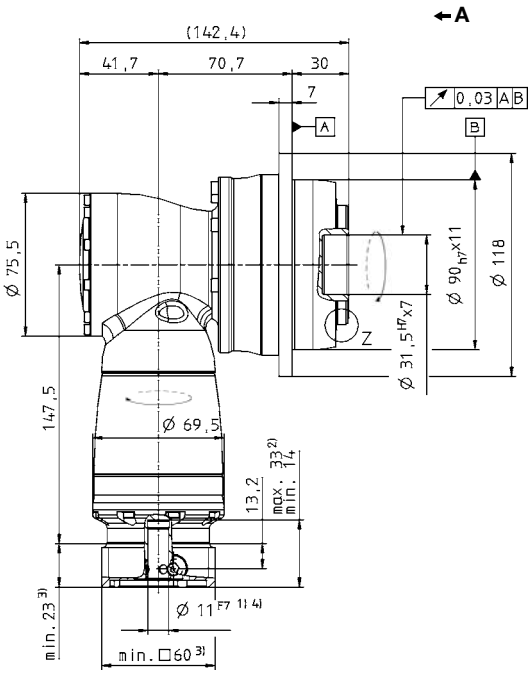
[a)] Other ratios available on request
[b)] Higher speeds are possible if the nominal torque is reduced
[c)] For higher ambient temperatures, please reduce input speed
[d)] Idling torques decrease during operation
[e)] Refers to center of the output shaft or flange

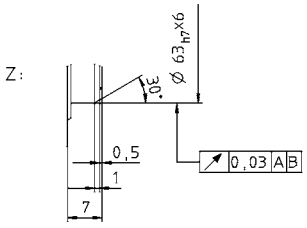
All technical data for front output side applies.
Technical data for rearward output versions, see page 428.

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

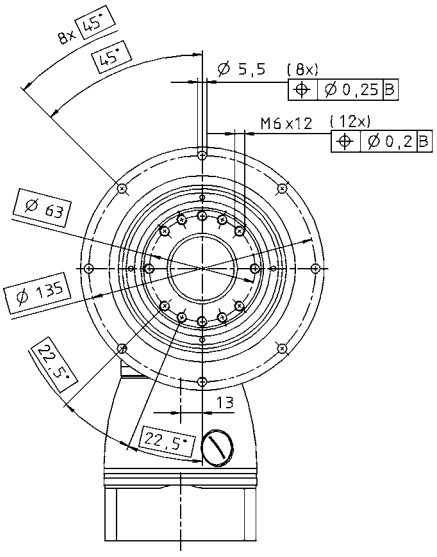
				2-stage										
Ratio [a]			*i*	**12**	**16**	**20**	**25**	**28**	**35**	**40**	**49**	**50**	**70**	**100**
Max. acceleration torque (max. 1000 cycles per hour)			T_{2B} Nm	280	280	350	350	350	330	200	330	250	330	265
			T_{2B} in.lb	2478	2478	3098	3098	3098	2921	1770	2921	2213	2921	2345
Nominal output torque (with n_{1N})			T_{2N} Nm	170	170	170	170	170	170	160	170	170	170	120
			T_{2N} 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
			T_{2Not} 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_{1Ncym} 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
			T_{012} 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
			C_{t21} in.lb/ arcmin	354	372	469	487	522	531	389	531	487	531	496
Tilting rigidity			C_{2K} Nm/ arcmin	550										
			C_{2K} in.lb/ arcmin	4868										
Max. axial force [e)]			F_{2AMax} N	4150										
			F_{2AMax} lb_f	934										
Max. tilting moment			M_{2KMax} Nm	413										
			M_{2KMax} 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										
			m 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 kgcm²	1.43	1.18	1.16	1.04	1.14	0.94	0.89	0.95	0.89	0.89	0.89
			J_1 10^{-3} in.lb.s²	1.27	1.04	1.02	0.92	1.01	0.83	0.79	0.84	0.79	0.79	0.78
	H	28	J_1 kgcm²	2.85	2.59	2.57	2.45	2.56	2.40	2.31	2.37	2.30	2.30	2.30
			J_1 10^{-3} in.lb.s²	2.52	2.29	2.27	2.17	2.26	2.08	2.04	2.10	2.04	2.04	2.04

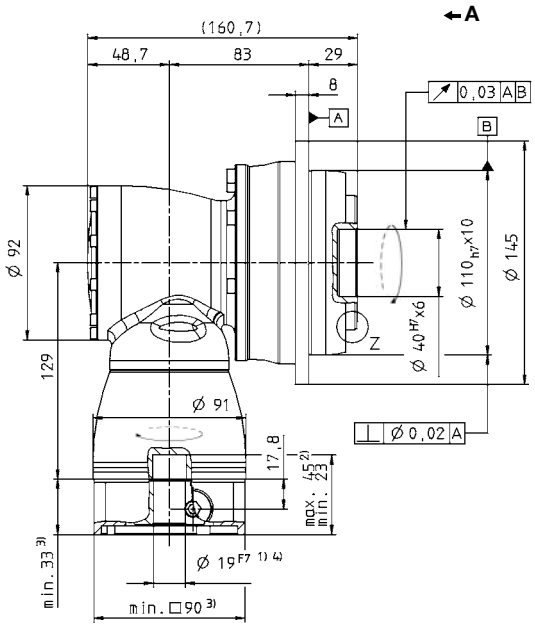
Please contact us for information on the best configuration for S1 conditions of use (continuous operation).

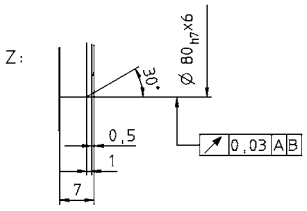
[a)] Other ratios up to i=1000 available on request
[b)] Higher speeds are possible if the nominal torque is reduced
[c)] For higher ambient temperatures, please reduce input speed
[d)] Idling torques decrease during operation
[e)] Refers to center of the output shaft or flange

All technical data for front output side applies.
Technical data for rearward output versions, see page 428.

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+ 025 MF 3-stage

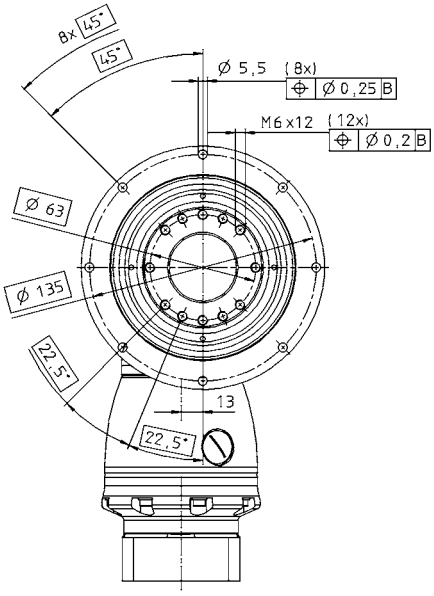
				3-stage													
Ratio [a]	*i*			**64**	**84**	**100**	**125**	**140**	**175**	**200**	**250**	**280**	**350**	**400**	**500**	**700**	**1000**
Max. acceleration torque (max. 1000 cycles per hour)	T_{2B}		Nm	280	280	350	350	350	350	350	350	350	330	200	250	330	265
			in.lb	2478	2478	3098	3098	3098	3098	3098	3098	3098	2921	1770	2213	2921	2345
Nominal output torque (with n_{1N})	T_{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	1859	1770	1416	1770	1770	1062
Emergency stop torque (permitted 1000 times during the service life of the gearhead)	T_{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	5531	5531	3540	4425	5531	5531
Nominal input speed (with T_{2N} and 20 °C ambient temperature) [b), c)]	n_{1N}		rpm	3500	3500	3500	3500	3500	3500	3500	3800	3500	3800	4500	4500	4500	4500
Max. continuous speed (with 20 % T_{2N} and 20 °C ambient temperature)	n_{1Ncym}		rpm	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500
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	0.4	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	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
Max. torsional backlash	j_t		arcmin	Standard ≤ 4 / Reduced ≤ 2													
Torsional rigidity	C_{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	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		%	92													
Service life (For calculation, see the Chapter "Information")	L_h		h	> 20000													
Weight incl. standard adapter plate	*m*		kg	9,8													
			lb_m	21,7													
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													
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	J_1	kgcm²	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	0.18
				10^{-3} in.lb.s²	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	0.16
	E	19	J_1	kgcm²	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	0.63
				10^{-3} in.lb.s²	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	0.56

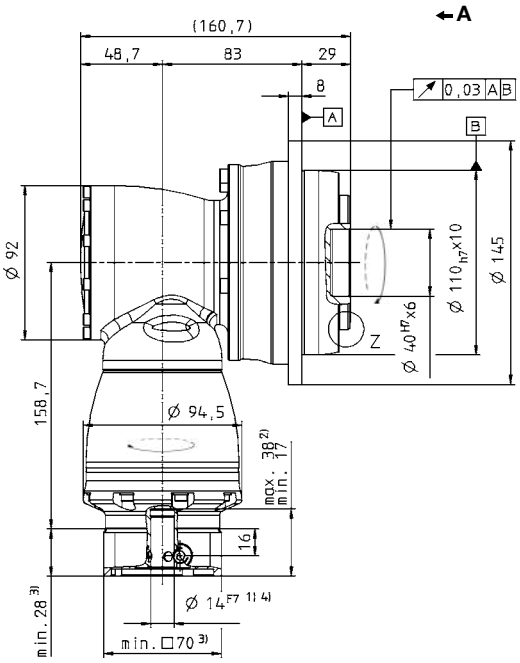
Please contact us for information on the best configuration for S1 conditions of use (continuous operation).

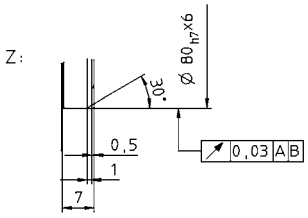
[a)] Other ratios available on request
[b)] Higher speeds are possible if the nominal torque is reduced
[c)] For higher ambient temperatures, please reduce input speed
[d)] Idling torques decrease during operation
[e)] Refers to center of the output shaft or flange

All technical data for front output side applies.
Technical data for rearward output versions, see page 428.

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

				2-stage										
Ratio [a]			*i*	**12**	**16**	**20**	**25**	**28**	**35**	**40**	**49**	**50**	**70**	**100**
Max. acceleration torque (max. 1000 cycles per hour)			T_{2B} Nm	680	680	750	750	700	700	500	700	625	700	540
			T_{2B} in.lb	6018	6018	6638	6638	6195	6416	4425	6195	5531	6195	4779
Nominal output torque (with n_{1N})			T_{2N} Nm	370	370	370	370	370	370	320	370	370	370	240
			T_{2N} 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)			T_{2Not} Nm	1000	1000	1250	1250	1250	1250	1000	1250	1250	1250	1250
			T_{2Not} in.lb	8850	8850	11063	11063	11063	11063	8850	11063	11063	11063	11063
Nominal input speed (with T_{2N} and 20 °C ambient temperature) [b), c)]			n_{1N} rpm	1900	2300	2300	2600	2300	2300	2300	2300	2300	2300	2300
Max. continuous speed (with 20 % T_{2N} and 20 °C ambient temperature)			n_{1Ncym} rpm	2700	3100	3100	3500	3100	3000	3000	3000	3000	3000	3000
Max. input speed			n_{1Max} rpm	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	4.0	3.7	3.6	2.8	3.5	2.8	3.1	3.9	3.1	3.1	3.1
			T_{012} 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			j_t arcmin	Standard ≤ 4 / Reduced ≤ 2										
Torsional rigidity			C_{t21} Nm/ arcmin	87	91	111	119	123	127	96	127	115	125	112
			C_{t21} in.lb/ arcmin	770	805	982	1053	1089	1124	850	1124	1018	1106	991
Tilting rigidity			C_{2K} Nm/ arcmin	560										
			C_{2K} in.lb/ arcmin	4956										
Max. axial force [e]			F_{2AMax} N	6130										
			F_{2AMax} lb_f	1379										
Max. tilting moment			M_{2KMax} Nm	1295										
			M_{2KMax} in.lb	11461										
Efficiency at full load			η %	94										
Service life (For calculation, see the Chapter "Information")			L_h h	> 20000										
Weight incl. standard adapter platee			*m* kg	17.0										
			m lb_m	38										
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]	H	28	J_1 kgcm²	4.56	3.76	3.71	3.28	3.66	3.00	2.79	3.10	2.78	2.77	2.77
			J_1 10^{-3} in.lb.s²	4.04	3.32	3.28	2.90	3.24	2.61	2.47	2.74	2.46	2.45	2.45
	K	38	J_1 kgcm²	11.7	10.9	10.9	10.4	10.8	10.3	9.95	10.4	9.94	9.94	9.93
			J_1 10^{-3} in.lb.s²	10.38	9.67	9.62	9.24	9.58	8.96	8.81	9.20	8.80	8.80	8.79

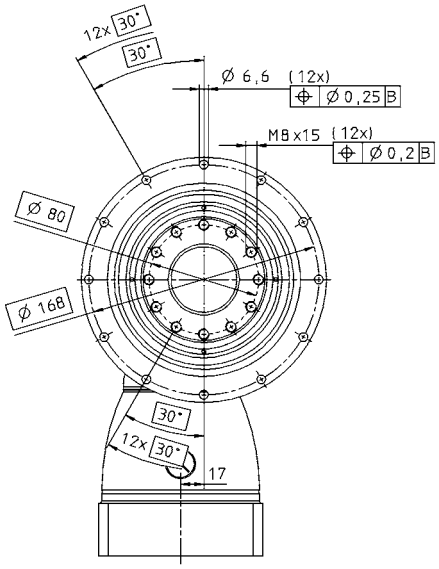
Please contact us for information on the best configuration for S1 conditions of use (continuous operation).

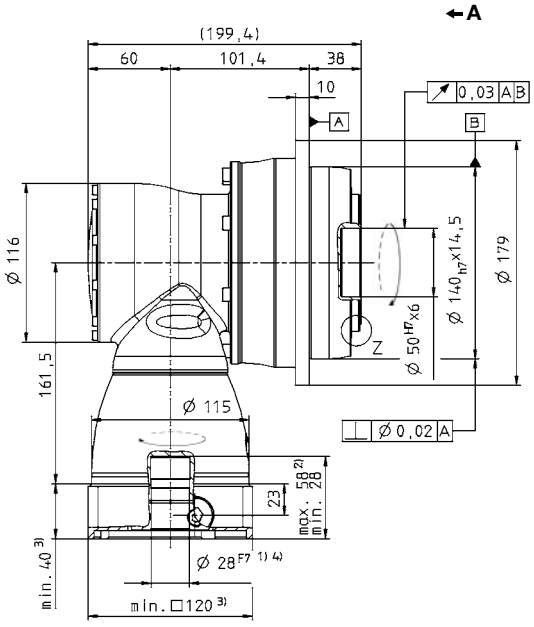
[a] Other ratios up to i=1000 available on request
[b] Higher speeds are possible if the nominal torque is reduced
[c] For higher ambient temperatures, please reduce input speed
[d] Idling torques decrease during operation
[e] Refers to center of the output shaft or flange

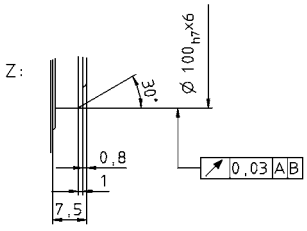
All technical data for front output side applies.
Technical data for rearward output versions, see page 428.

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

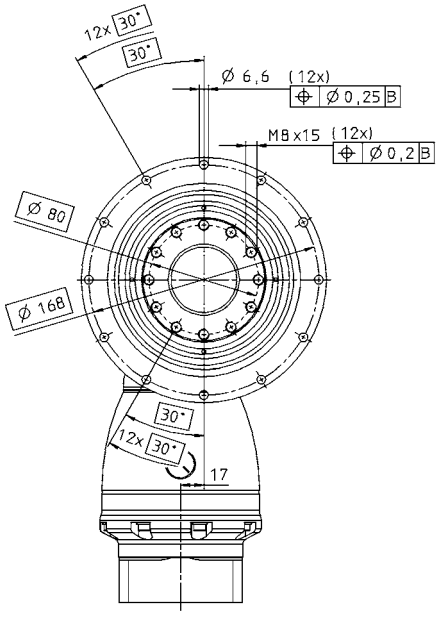
				3-stage													
Ratio [a]	*i*			**64**	**84**	**100**	**125**	**140**	**175**	**200**	**250**	**280**	**350**	**400**	**500**	**700**	**1000**
Max. acceleration torque (max. 1000 cycles per hour)	T_{2B}		Nm	680	680	750	750	750	750	750	750	700	700	500	625	700	540
			in.lb	6018	6018	6638	6638	6638	6638	6638	6638	6195	6195	4425	5531	6195	4779
Nominal output torque (with n_{1N})	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	kgcm²	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	0.69
				10^{-3} in.lb.s²	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	0.61
	G	24	J_1	kgcm²	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	2.25
				10^{-3} in.lb.s²	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	1.99

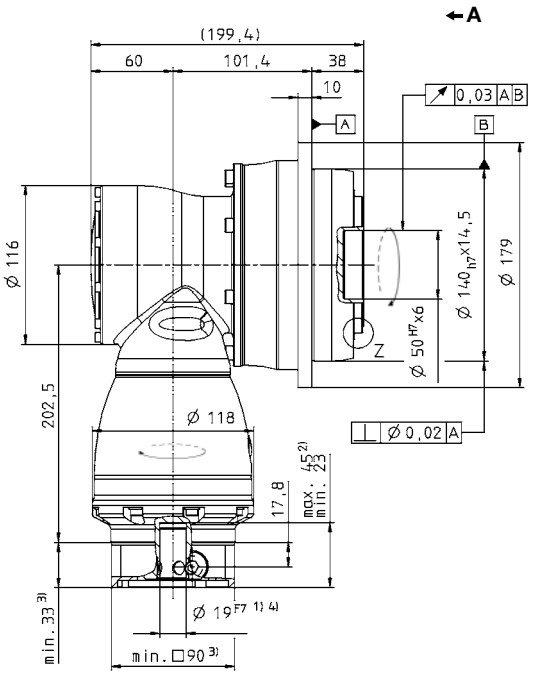
Please contact us for information on the best configuration for S1 conditions of use (continuous operation).

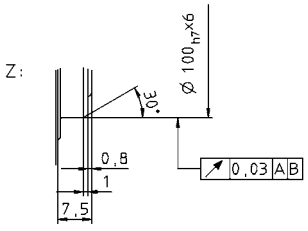
[a)] Other ratios available on request
[b)] Higher speeds are possible if the nominal torque is reduced
[c)] For higher ambient temperatures, please reduce input speed
[d)] Idling torques decrease during operation
[e)] Refers to center of the output shaft or flange

All technical data for front output side applies.
Technical data for rearward output versions, see page 428.

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

				2-stage										
Ratio [a]	*i*			**12**	**16**	**20**	**25**	**28**	**35**	**40**	**49**	**50**	**70**	**100**
Max. acceleration torque (max. 1000 cycles per hour)	T_{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 n_{1N})	T_{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)	T_{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 T_{2N} and 20 °C ambient temperature) [b), c)]	n_{1N}	rpm		1600	1900	1900	2100	1900	2100	2100	2100	2100	2100	2100
Max. continuous speed (with 20 % T_{2N} and 20 °C ambient temperature)	n_{1Ncym}	rpm		2300	2600	2600	2800	2600	3000	3000	3000	3000	3000	3000
Max. input speed	n_{1Max}	rpm		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		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	j_t	arcmin		Standard ≤ 4 / Reduced ≤ 2										
Torsional rigidity	C_{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	C_{2K}	Nm/ arcmin		1452										
		in.lb/ arcmin		12850										
Max. axial force [e]	F_{2AMax}	N		10050										
		lb_f		2261										
Max. tilting moment	M_{2KMax}	Nm		3064										
		in.lb		27116										
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		41.0										
		lb_m		91										
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				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]	J_1	kgcm²	K 38	24.3	19.0	18.7	16.1	18.5	15.7	12.8	17.5	12.7	12.7	12.7
		10^{-3} in.lb.s²		21.5	16.8	16.6	14.2	16.4	12.3	11.3	15.5	11.3	11.2	11.2

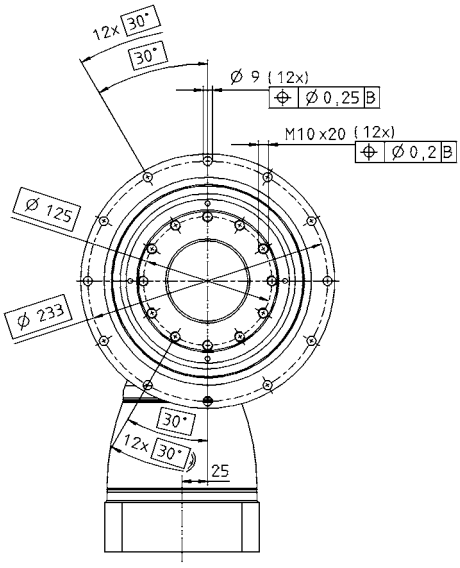
Please contact us for information on the best configuration for S1 conditions of use (continuous operation).

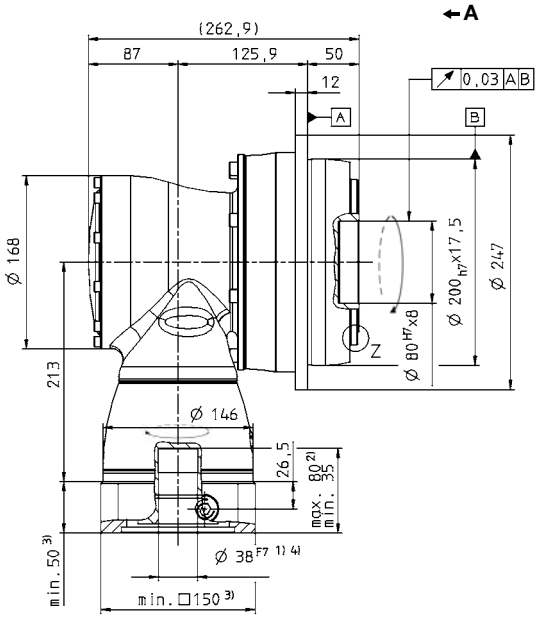
[a] Other ratios up to i=1000 available on request
[b] Higher speeds are possible if the nominal torque is reduced
[c] For higher ambient temperatures, please reduce input speed
[d] Idling torques decrease during operation
[e] Refers to center of the output shaft or flange

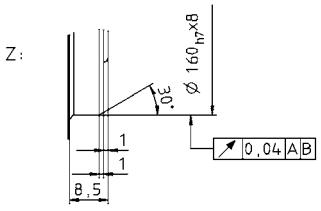
All technical data for front output side applies.
Technical data for rearward output versions, see page 428.

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

				3-stage													
Ratio [a]			*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	1200	1200	1500	1500	1500	1500	1500	1500	1600	1600	840	1050	1470	1400
			T_{2B} in.lb	10620	10620	13275	13275	13275	13275	13275	13275	14160	14160	7434	9293	13010	12390
Nominal output torque (with n_{1N})			T_{2N} Nm	700	700	950	950	950	950	950	950	1120	1250	640	750	1120	800
			T_{2N} 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)			T_{2Not} Nm	1600	1600	2500	2500	2500	2500	2500	2500	2750	2750	1600	2000	2750	2750
			T_{2Not} in.lb	14160	14160	22125	22125	22125	22125	22125	22125	24338	24338	14160	17700	24338	24338
Nominal input speed (with T_{2N} and 20 °C ambient temperature) [b), c)]			n_{1N} rpm	2900	2900	2900	2900	2900	2900	2900	3200	2900	3200	3900	3900	3900	3900
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	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
			T_{012} 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			j_t arcmin	Standard ≤ 4 / Reduced ≤ 2													
Torsional rigidity			C_{t21} Nm/ arcmin	269	252	336	346	336	346	336	346	400	407	274	341	404	389
			C_{t21} in.lb/ arcmin	2381	2230	2974	3062	2974	3062	2974	3062	3540	3602	2425	3018	3575	3443
Tilting rigidity			C_{2K} Nm/ arcmin	1452													
			C_{2K} in.lb/ arcmin	12850													
Max. axial force [e)]			F_{2AMax} N	10050													
			F_{2AMax} lb_f	2261													
Max. tilting moment			M_{2KMax} Nm	3064													
			M_{2KMax} in.lb	27116													
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	45,4													
			m lb_m	100,3													
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				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 kgcm²	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
			J_1 10^{-3} in.lb.s²	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	J_1 kgcm²	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
			J_1 10^{-3} in.lb.s²	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

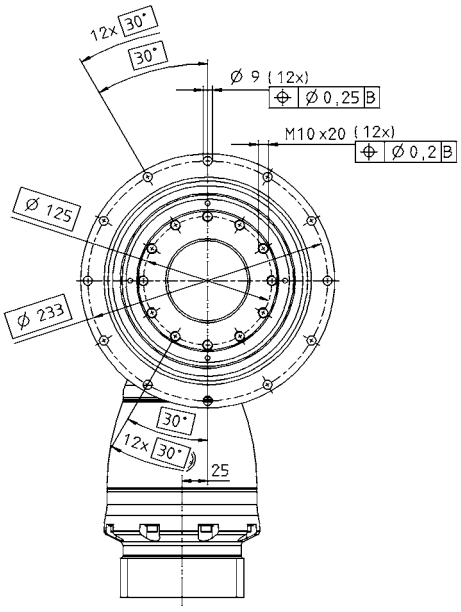
Please contact us for information on the best configuration for S1 conditions of use (continuous operation).

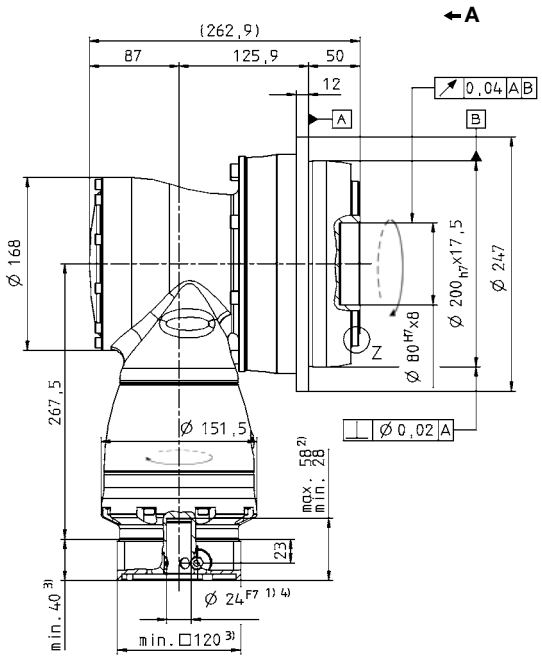
[a)] Other ratios available on request
[b)] Higher speeds are possible if the nominal torque is reduced
[c)] For higher ambient temperatures, please reduce input speed
[d)] Idling torques decrease during operation
[e)] Refers to center of the output shaft or flange

All technical data for front output side applies.
Technical data for rearward output versions, see page 428.

View A

3-stage:





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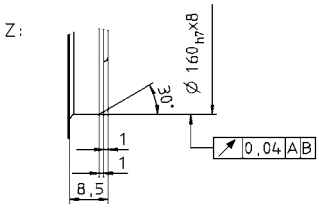


See technical data sheet for available clamping hub diameters (mass moment of inertia). Dimensions available on request.

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

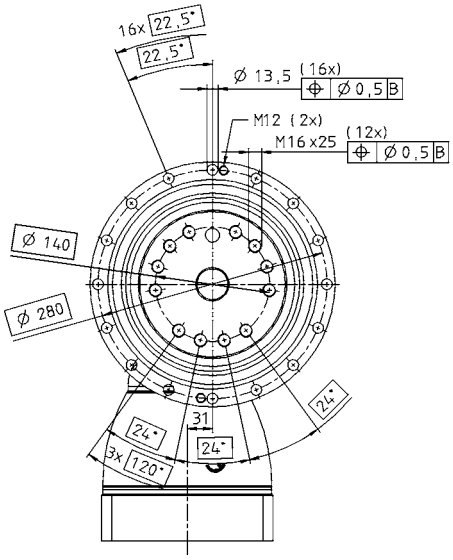
				2-stage							
Ratio [a]	*i*			**15**	**20**	**25**	**35**	**49**	**50**	**70**	**100**
Max. acceleration torque (max. 1000 cycles per hour)	T_{2B}	Nm		3200	3200	3200	3300	3300	2350	3300	2800
		in.lb		28320	28320	28320	29205	29205	20798	29205	24780
Nominal output torque (with n_{1N})	T_{2N}	Nm		2000	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)	T_{2Not}	Nm		4500	5250	5250	7350	6800	4500	6300	8750
		in.lb		39825	46463	46463	65048	60180	39825	55755	77438
Nominal input speed (with T_{2N} and 20 °C ambient temperature) [b), c)]	n_{1N}	rpm		1500	1700	1900	1900	1700	1700	1700	1700
Max. continuous speed (with 20 % T_{2N} and 20 °C ambient temperature)	n_{1Ncym}	rpm		1900	2300	2700	2700	2400	2400	2400	2400
Max. input speed	n_{1Max}	rpm		4000	4000	4000	4000	4000	4000	4000	4000
Mean no load running torque (with n_1 = 3000 rpm and 20 °C gearhead temperature) [d)]	T_{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	j_t	arcmin		Standard ≤ 4 / Reduced ≤ 2							
Torsional rigidity	C_{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	C_{2K}	Nm/ arcmin		5560							
		in.lb/ arcmin		49206							
Max. axial force [e)]	F_{2AMax}	N		33000							
		lb_f		7425							
Max. tilting moment	M_{2KMax}	Nm		5900							
		in.lb		52215							
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		83							
		lb_m		183							
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]** M 48	J_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

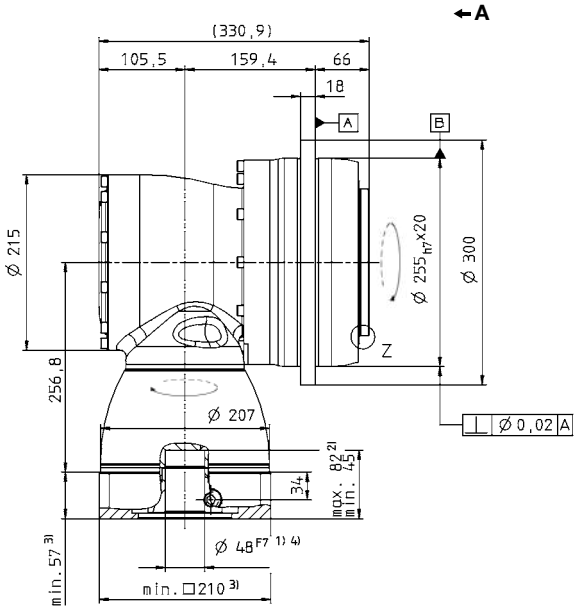
Please contact us for information on the best configuration for S1 conditions of use (continuous operation).

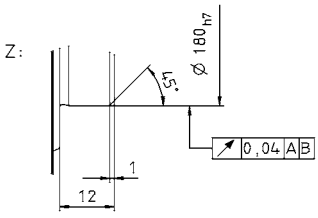
[a)] Other ratios available on request
[b)] Higher speeds are possible if the nominal torque is reduced
[c)] For higher ambient temperatures, please reduce input speed
[d)] Idling torques decrease during operation
[e)] Refers to center of the output shaft or flange

All technical data for front output side applies.
Technical data for rearward output versions, see page 428.

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

				3-stage											
Ratio [a]			*i*	**63**	**100**	**125**	**140**	**175**	**200**	**250**	**280**	**350**	**500**	**700**	**1000**
Max. acceleration torque (max. 1000 cycles per hour)			T_{2B} Nm	3300	3200	3200	3200	3200	3200	3200	3300	3300	2350	3300	2800
			T_{2B} in.lb	29205	28320	28320	28320	28320	28320	28320	29205	29205	20798	29205	24780
Nominal output torque (with n_{1N})			T_{2N} Nm	1800	2000	2000	2000	2000	2000	2000	1800	1800	1800	1800	1600
			T_{2N} in.lb	15.930	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)			T_{2Not} Nm	6300	5250	5250	5250	5250	5250	5250	7350	7350	4500	6300	8750
			T_{2Not} in.lb	55755	46463	46463	46463	46463	46463	46463	65048	65048	39825	55755	77438
Nominal input speed (with T_{2N} and 20 °C ambient temperature) [b), c)]			n_{1N} rpm	2700	2700	2700	2700	2700	2700	2900	2700	2900	3400	3400	3400
Max. continuous speed (with 20 % T_{2N} and 20 °C ambient temperature)			n_{1Ncym} rpm	3200	3500	3500	3500	3500	3500	3500	3500	3500	3800	3800	3800
Max. input speed			n_{1Max} rpm	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000
Mean no load running torque (with n_1 = 3000 rpm and 20 °C gearhead temperature) [d)]			T_{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
			T_{012} 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			j_t arcmin	Standard ≤ 4 / Reduced ≤ 2											
Torsional rigidity			C_{t21} Nm/ arcmin	699	640	664	640	664	640	664	715	730	658	727	642
			C_{t21} 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			C_{2K} Nm/ arcmin	5560											
			C_{2K} in.lb/ arcmin	49210											
Max. axial force [e)]			F_{2AMax} N	33000											
			F_{2AMax} lb_f	7425											
Max. tilting moment			M_{2KMax} Nm	5900											
			M_{2KMax} in.lb	52215											
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	87											
			m lb_m	192											
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 kgcm²	17.80	14.10	12.10	11.00	10.80	10.20	10.10	10.10	10.00	9.90	9.90	9.90
			J_1 10^{-3} in.lb.s²	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	J_1 kgcm²	32.50	28.80	26.80	25.70	25.50	24.90	24.80	24.90	24.80	24.60	24.60	24.60
			J_1 10^{-3} in.lb.s²	28.76	25.49	23.72	22.74	22.57	22.04	21.95	22.04	21.95	21.77	21.77	21.77

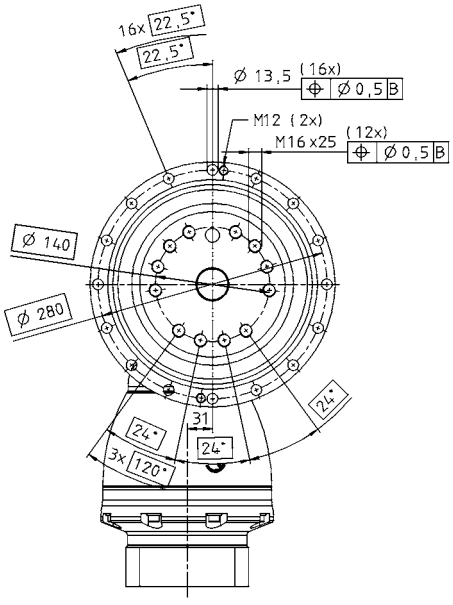
Please contact us for information on the best configuration for S1 conditions of use (continuous operation).

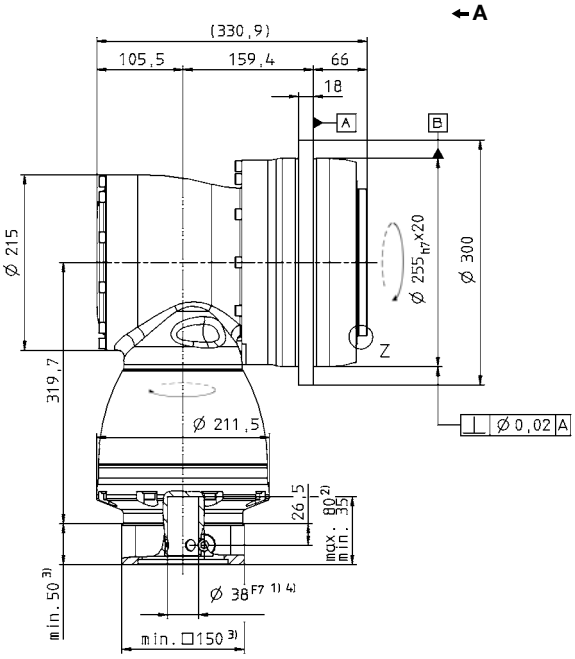
[a)] Other ratios available on request
[b)] Higher speeds are possible if the nominal torque is reduced
[c)] For higher ambient temperatures, please reduce input speed
[d)] Idling torques decrease during operation
[e)] Refers to center of the output shaft or flange

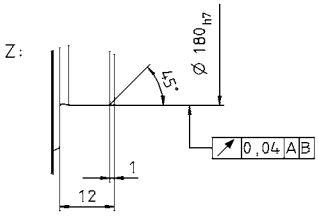
All technical data for front output side applies.
Technical data for rearward output versions, see page 428.

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

			3-stage									
Ratio [a]	*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_{1Ncym}	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 ≤ 3,3 / Reduced ≤ 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	*m*	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	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	14.51	14.51

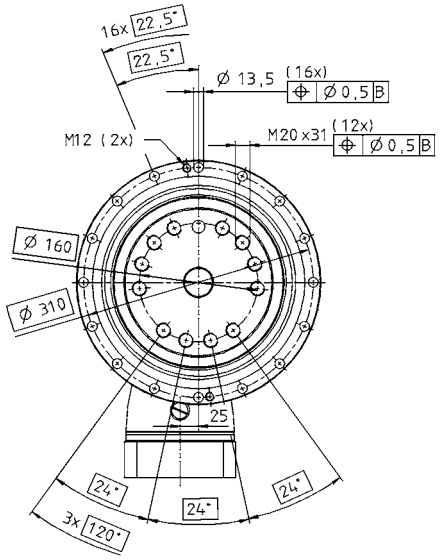
Please contact us for information on the best configuration for S1 conditions of use (continuous operation).

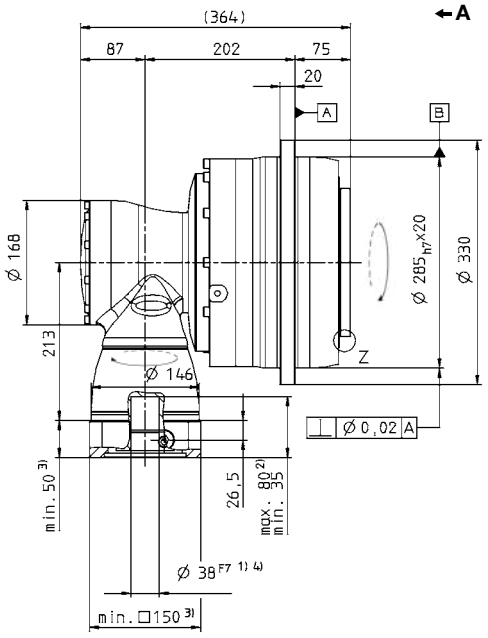
[a)] Other ratios available on request
[b)] Higher speeds are possible if the nominal torque is reduced
[c)] For higher ambient temperatures, please reduce input speed
[d)] Idling torques decrease during operation
[e)] Refers to center of the output shaft or flange

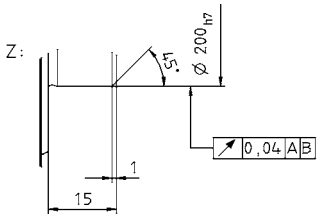
All technical data for front output side applies.
Technical data for rearward output versions, see page 428.

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

				4-stage											
Ratio [a]			***i***	**180**	**240**	**300**	**375**	**420**	**500**	**560**	**600**	**700**	**800**	**875**	**1000**
Max. acceleration torque (max. 1000 cycles per hour)			T_{2B} Nm	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000
			T_{2B} in.lb	53100	53100	53100	53100	53100	53100	53100	53100	53100	53100	53100	53100
Nominal output torque (with n_{1N})			T_{2N} Nm	3350	3350	3350	3800	3350	3350	3350	3350	3350	3350	3800	3350
			T_{2N} 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)			T_{2Not} Nm	10000	10000	10000	12500	10000	10000	10000	10000	10000	10000	12500	10000
			T_{2Not} in.lb	88500	88500	88500	110625	88500	88500	88500	88500	88500	88500	110625	88500
Nominal input speed (with T_{2N} and 20 °C ambient temperature) [b), c)]			n_{1N} rpm	2700	2900	2900	2900	2900	2900	2900	2900	2900	2900	2900	3200
Max. continuous speed (with 20 % T_{2N} and 20 °C ambient temperature)			n_{1Ncym} rpm	3800	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4200
Max. input speed			n_{1Max} rpm	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	3.4	2.5	1.6	1.4	1.1	1	1	0.8	0.8	0.7	0.7	0.6
			T_{012} 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			j_t arcmin	Standard ≤ 3,3 / Reduced ≤ 2,3											
Torsional rigidity			C_{t21} Nm/ arcmin	1250	1250	1250	1300	1250	1350	1250	1250	1262	1250	1350	1250
			C_{t21} in.lb/ arcmin	11063	11063	11063	11505	11063	11948	11063	11063	11169	11063	11948	11063
Tilting rigidity			C_{2K} Nm/ arcmin	9480											
			C_{2K} in.lb/ arcmin	83906											
Max. axial force [e)]			F_{2AMax} N	50000											
			F_{2AMax} lb_f	11250											
Max. tilting moment			M_{2KMax} Nm	8800											
			M_{2KMax} 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											
			m 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 kgcm²	5.93	4.29	3.33	3.32	2.81	3.19	2.80	2.50	2.74	2.49	2.74	2.46
			J_1 10^{-3} in.lb.s²	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	J_1 kgcm²	12.84	11.18	10.24	10.23	9.72	10.10	9.71	9.41	9.65	9.40	9.65	9.37
			J_1 10^{-3} in.lb.s²	11.37	9.89	9.06	9.06	8.60	8.94	8.59	8.33	8.54	8.32	8.54	8.29

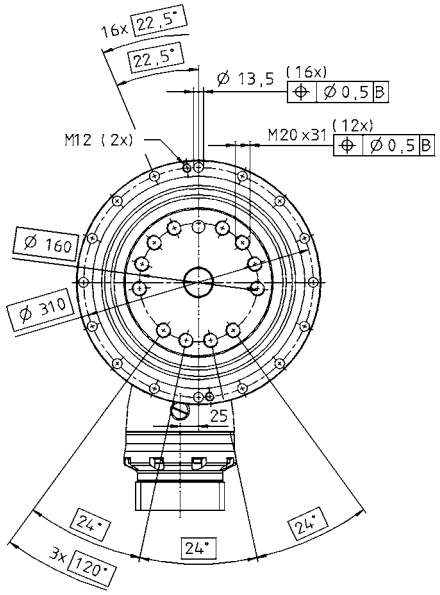
Please contact us for information on the best configuration for S1 conditions of use (continuous operation).

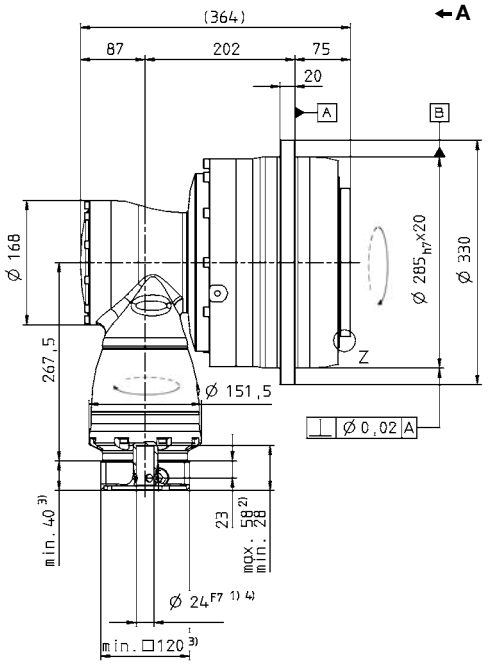
[a)] Other ratios available on request
[b)] Higher speeds are possible if the nominal torque is reduced
[c)] For higher ambient temperatures, please reduce input speed
[d)] Idling torques decrease during operation
[e)] Refers to center of the output shaft or flange

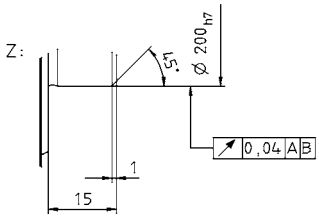
All technical data for front output side applies.
Technical data for rearward output versions, see page 428.

View A

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

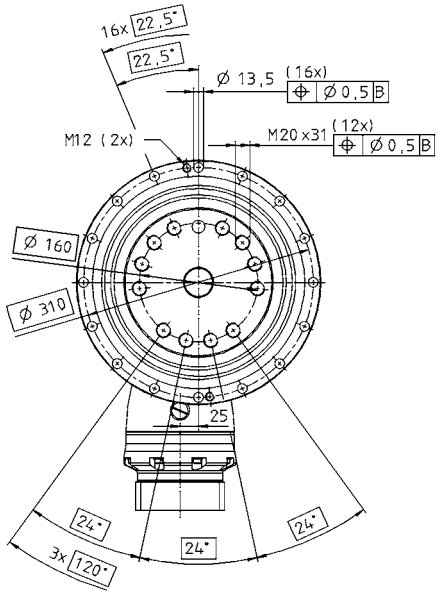
				4-stage								
Ratio [a]	*i*			**1225**	**1400**	**1750**	**2000**	**2800**	**3500**	**5000**	**7000**	**10000**
Max. acceleration torque (max. 1000 cycles per hour)	T_{2B}		Nm	6000	6000	6000	4200	5000	6000	4500	5000	4800
			in.lb	53100	53100	53100	37170	44250	53100	39825	44250	42480
Nominal output torque (with n_{1N})	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 ≤ 3,3 / Reduced ≤ 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	kgcm²	2.73	2.49	2.46	2.42	2.42	2.42	2.42	2.42	2.42
				10^{-3} in.lb.s²	2.42	2.20	2.17	2.14	2.14	2.14	2.14	2.14	2.14
	K	38	J_1	kgcm²	9.64	9.40	9.37	9.33	9.33	9.33	9.33	9.33	9.33
				10^{-3} in.lb.s²	8.53	8.32	8.29	8.26	8.26	8.26	8.26	8.26	8.26

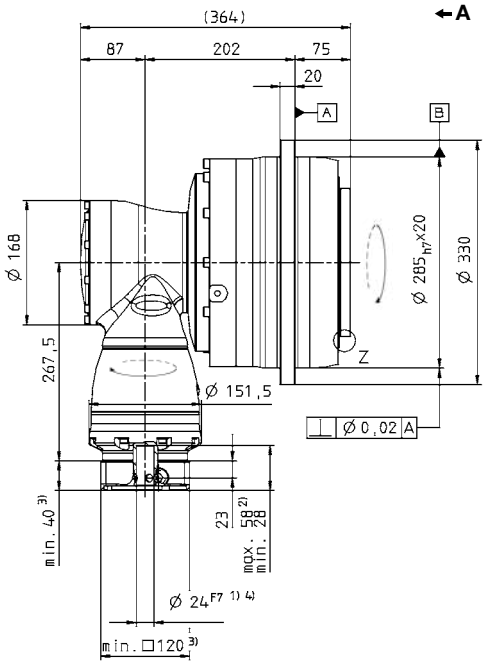
Please contact us for information on the best configuration for S1 conditions of use (continuous operation).

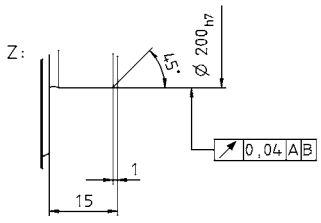
[a)] Other ratios available on request
[b)] Higher speeds are possible if the nominal torque is reduced
[c)] For higher ambient temperatures, please reduce input speed
[d)] Idling torques decrease during operation
[e)] Refers to center of the output shaft or flange

All technical data for front output side applies.
Technical data for rearward output versions, see page 428.

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

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

				3-stage							4-stage								
Ratio [a]			*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)			T_{2B} Nm	530	530	530	530	530	440	530	530	530	530	530	530	530	530	530	530
			T_{2B} in.lb	4691	4691	4691	4691	4691	3894	4691	4691	4691	4691	4691	4691	4691	4691	4691	4691
Nominal output torque (with n_{1N})			T_{2N} Nm	375	375	375	375	375	330	375	375	375	375	375	375	375	375	375	375
			T_{2N} 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)			T_{2Not} Nm	880	1100	1100	1100	990	880	1200	880	1200	1100	1200	1200	1200	1200	1200	1200
			T_{2Not} in.lb	7788	9735	9735	9735	8762	7788	10620	7788	10620	9735	10620	10620	10620	10620	10620	10620
Nominal input speed (with T_{2N} and 20 °C ambient temperature) [b), c)]			n_{1N} rpm	2400	2600	2900	2900	2900	2900	2900	4300	4300	4300	4300	4300	4300	5400	5400	5400
Max. continuous speed (with 20 % T_{2N} and 20 °C ambient temperature)			n_{1Ncym} rpm	2800	3300	3800	3800	3300	3300	3300	4800	4800	4800	4800	4800	4800	5400	5400	5400
Max. input speed			n_{1Max} rpm	6000	6000	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	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
			T_{012} 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			j_t arcmin	≤1.3															
Torsional rigidity			C_{t21} Nm/ arcmin	95	95	96	99	95	94	101	95	101	98	98	102	102	101	101	98
			C_{t21} in.lb/ arcmin	838	842	846	874	838	829	894	838	897	869	872	899	899	897	894	869
Tilting rigidity			C_{2K} Nm/ arcmin	550															
			C_{2K} in.lb/ arcmin	4868															
Max. axial force [e)]			F_{2AMax} N	4150															
			F_{2AMax} lb_f	934															
Max. tilting moment			M_{2KMax} Nm	550															
			M_{2KMax} in.lb	4868															
Efficiency at full load			η %	92							90								
Service life (For calculation, see the Chapter "Information")			L_h h	> 20.000															
Weight incl. standard adapter plate			*m* kg	8,4							8,7								
			m lb_m	19							19								
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)	B	11	J_1 kgcm²	–	–	–	–	–	–	–	0.08	0.09	0.06	0.06	0.06	0.06	0.06	0.06	0.06
			J_1 10^{-3} in.lb.s²	–	–	–	–	–	–	–	0.07	0.08	0.06	0.06	0.06	0.05	0.05	0.05	0.05
Clamping hub diameter [mm]	C	14	J_1 kgcm²	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	0.17	0.17
			J_1 10^{-3} in.lb.s²	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	0.15
	E	19	J_1 kgcm²	0.91	0.81	0.76	0.76	0.72	0.70	0.70	–	–	–	–	–	–	–	–	–
			J_1 10^{-3} in.lb.s²	0.81	0.72	0.67	0.67	0.64	0.62	0.62	–	–	–	–	–	–	–	–	–

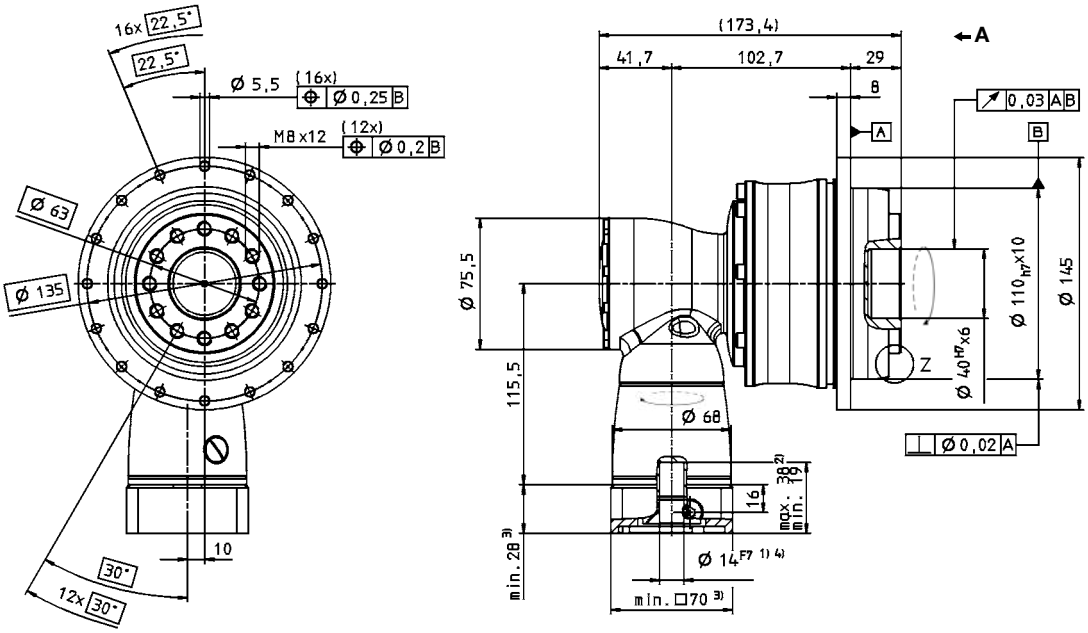
Please contact us for information on the best configuration for S1 conditions of use (continuous operation).

[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

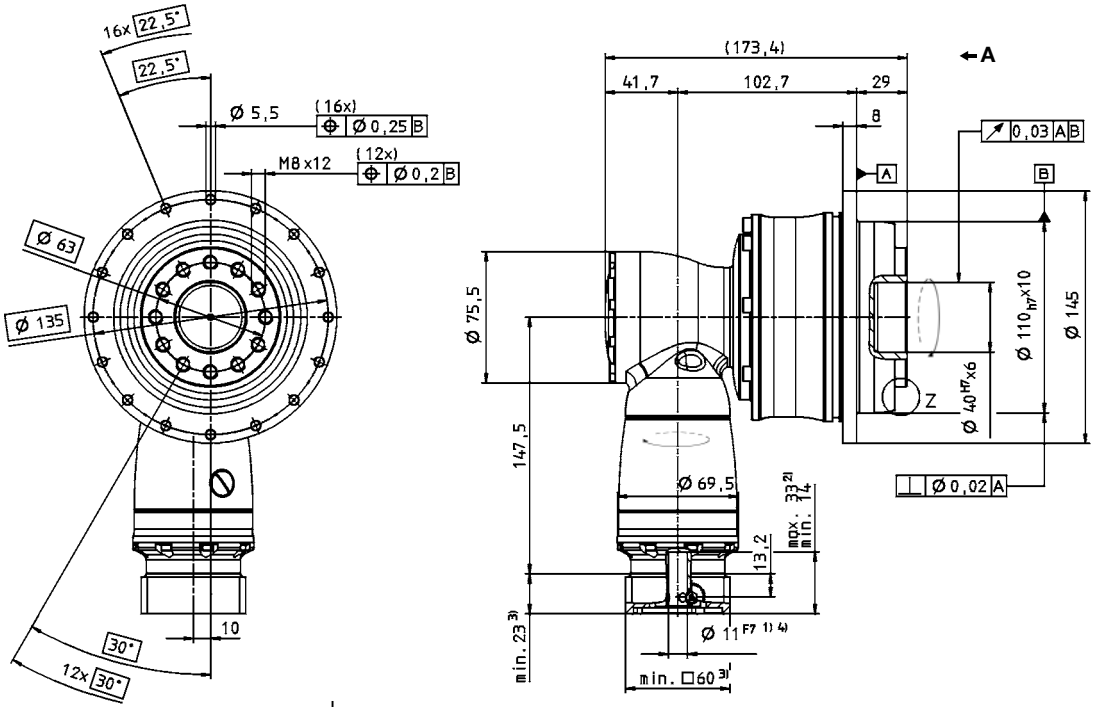
All technical data for front output side applies.
Technical data for rearward output versions, see page 428.

View A

3-stage:



4-stage:



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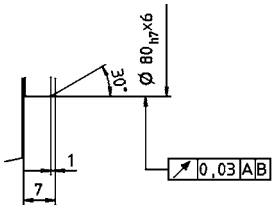


See technical data sheet for available clamping hub diameters (mass moment of inertia). Dimensions available on request.

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 MA HIGH TORQUE 3/4-stage

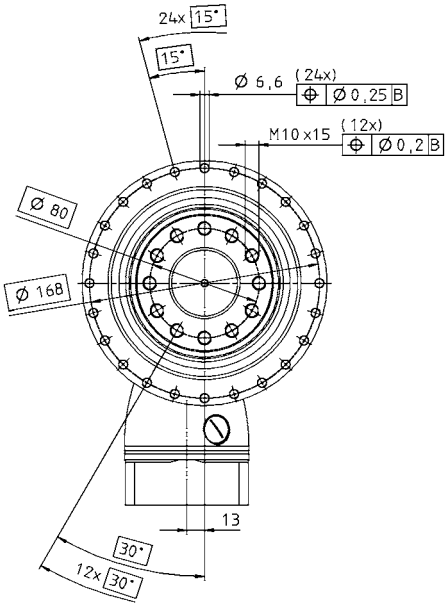
					3-stage							4-stage								
Ratio [a]			***i***		**66**	**88**	**110**	**137,5**	**154**	**220**	**385**	**330**	**462**	**577,5**	**770**	**1078**	**1540**	**2695**	**3850**	**5500**
Max. acceleration torque (max. 1000 cycles per hour)			T_{2B}	Nm	950	950	950	950	950	950	950	950	950	950	950	950	950	950	950	950
				in.lb	8408	8408	8408	8408	8408	8408	8408	8408	8408	8408	8408	8408	8408	8408	8408	8408
Nominal output torque (with n_{1N})			T_{2N}	Nm	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
Emergency stop torque (permitted 1000 times during the service life of the gearhead)			T_{2Not}	Nm	2100	2375	2375	2375	2375	2200	2375	2100	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
Nominal input speed (with T_{2N} and 20 °C ambient temperature) [b), c)]			n_{1N}	rpm	2200	2400	2700	2700	2700	2700	2700	3400	3400	3400	3400	3400	3400	4400	4400	4400
Max. continuous speed (with 20 % T_{2N} and 20 °C ambient temperature)			n_{1Ncym}	rpm	2800	3300	3800	3800	3300	3300	3300	4300	4300	4300	4300	4300	4300	4400	4400	4400
Max. input speed			n_{1Max}	rpm	6000	6000	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	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			j_t	arcmin	≤ 1,3															
Torsional rigidity			C_{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			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	1335															
				in.lb	11815															
Efficiency at full load			η	%	92							90								
Service life (For calculation, see the Chapter "Information")			L_h	h	> 20000															
Weight incl. standardadapter plate			*m*	kg	16,9							17,5								
				lb_m	37							39								
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)	E	19	J_1	kgcm²	-	-	-	-	-	-	-	0,24	0,29	0,20	0,20	0,20	0,19	0,18	0,18	0,18
				10^{-3} in.lb.s²	-	-	-	-	-	-	-	0,21	0,26	0,18	0,18	0,18	0,16	0,16	0,16	0,16
Clamping hub diameter [mm]	G	24	J_1	kgcm²	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
				10^{-3} in.lb.s²	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	0,55	0,55	0,55
	H	28	J_1	kgcm²	3,07	2,71	2,54	2,53	2,40	2,33	2,32	-	-	-	-	-	-	-	-	-
				10^{-3} in.lb.s²	2,72	2,40	2,25	2,24	2,13	2,06	2,05	-	-	-	-	-	-	-	-	-

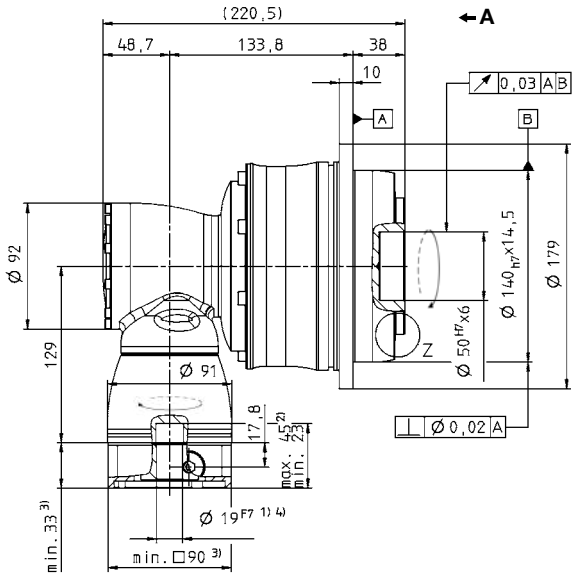
Please contact us for information on the best configuration for S1 conditions of use (continuous operation).

[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

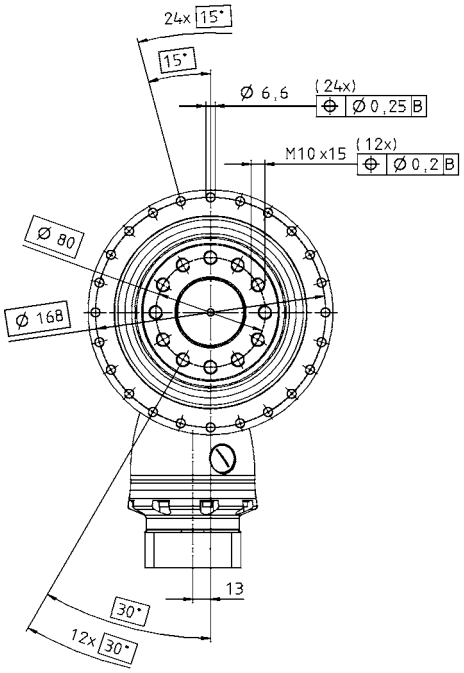
All technical data for front output side applies.
Technical data for rearward output versions, see page 428.

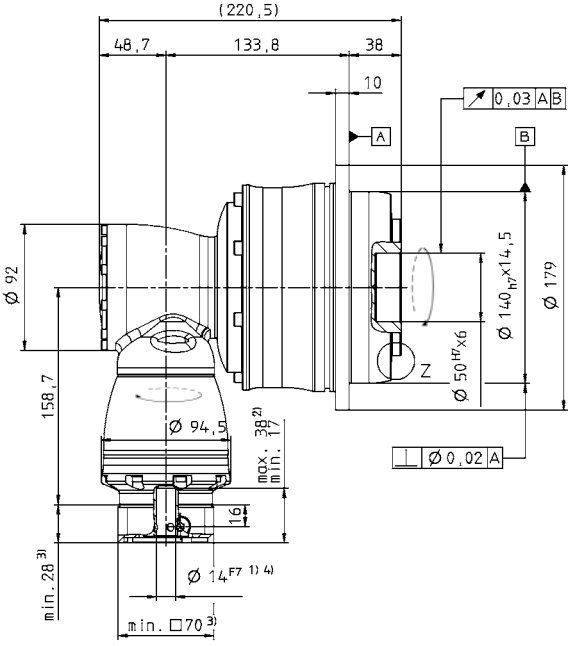
3-stage:





4-stage:





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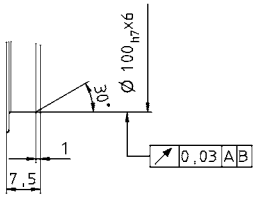


See technical data sheet for available clamping hub diameters (mass moment of inertia). Dimensions available on request.

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 MA HIGH TORQUE 3/4-stage

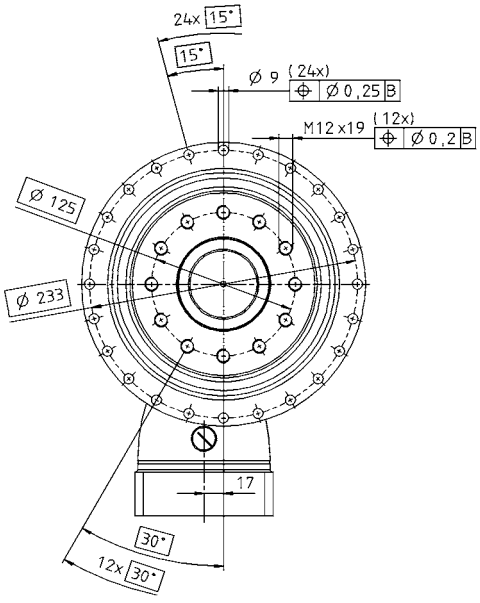
					3-stage							4-stage								
Ratio [a]			i		**66**	**88**	**110**	**137,5**	**154**	**220**	**385**	**330**	**462**	**577,5**	**770**	**1078**	**1540**	**2695**	**3850**	**5500**
Max. acceleration torque (max. 1000 cycles per hour)			T_{2B}	Nm	3100	3100	3100	3100	3100	2750	3100	3100	3100	3100	3100	3100	3100	3100	3100	2000
				in.lb	27435	27435	27435	27435	27435	24338	27435	27435	27435	27435	27435	27435	27435	27435	27435	17700
Nominal output torque (with n_{1N})			T_{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	12390
Emergency stop torque (permitted 1000 times during the service life of the gearhead)			T_{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
Nominal input speed (with T_{2N} and 20 °C ambient temperature) [b), c)]			n_{1N}	rpm	2100	2300	2600	2600	2400	2400	2400	3000	3000	3000	3000	3000	3000	4100	4100	4100
Max. continuous speed (with 20 % T_{2N} and 20 °C ambient temperature)			n_{1Ncym}	rpm	2800	3200	3600	3600	3200	3200	3200	3800	3800	3800	3800	3800	3800	4100	4100	4100
Max. input speed			n_{1Max}	rpm	4500	4500	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	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			j_t	arcmin	≤ 1,3															
Torsional rigidity			C_{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			C_{2K}	Nm/ arcmin	1452															
				in.lb/ arcmin	12850															
Max. axial force [e)]			F_{2AMax}	N	10050															
				lb_f	2261															
Max. tilting moment			M_{2KMax}	Nm	3280															
				in.lb	29028															
Efficiency at full load			η	%	92							90								
Service life (For calculation, see the Chapter "Information")			L_h	h	> 20000															
Weight incl. standardadapter plate			m	kg	39.9							40.6								
				lb_m	88							90								
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					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	kgcm²	-	-	-	-	-	-	-	0.89	1.06	0.76	0.76	0.76	0.69	0.68	0.68	0.68
				10^{-3} in.lb.s²	-	-	-	-	-	-	-	0.79	0.94	0.68	0.67	0.67	0.61	0.61	0.60	0.60
	G	24	J_1	kgcm²	-	-	-	-	-	-	-	2.46	2.63	2.33	2.32	2.32	2.26	2.25	2.25	2.25
				10^{-3} in.lb.s²	-	-	-	-	-	-	-	2.17	2.33	2.06	2.06	2.05	2.00	1.99	1.99	1.99
	H	28	J_1	kgcm²	5.48	4.27	3.64	3.58	3.14	2.87	2.84	-	-	-	-	-	-	-	-	-
				10^{-3} in.lb.s²	4.85	3.78	3.22	3.17	2.78	2.54	2.51	-	-	-	-	-	-	-	-	-
	K	38	J_1	kgcm²	12.72	11.52	10.89	10.83	10.39	10.12	10.09	-	-	-	-	-	-	-	-	-
				10^{-3} in.lb.s²	11.26	10.19	9.64	9.58	9.19	8.95	8.93	-	-	-	-	-	-	-	-	-

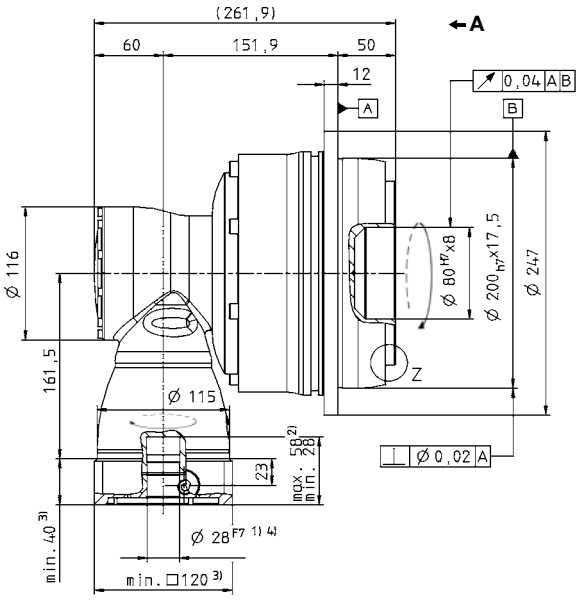
Please contact us for information on the best configuration for S1 conditions of use (continuous operation).

[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

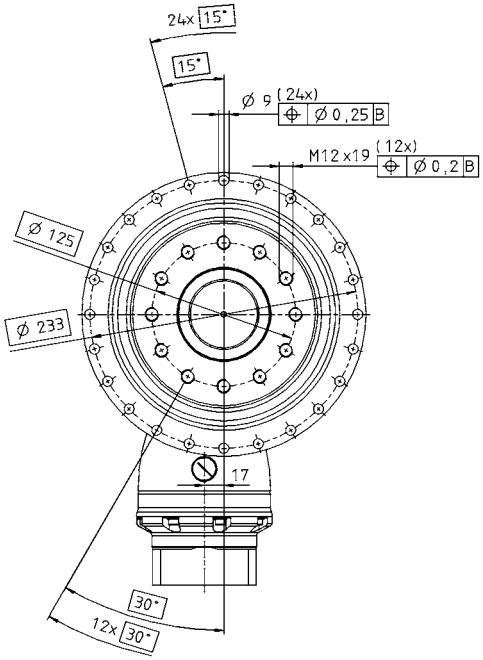
All technical data for front output side applies.
Technical data for rearward output versions, see page 428.

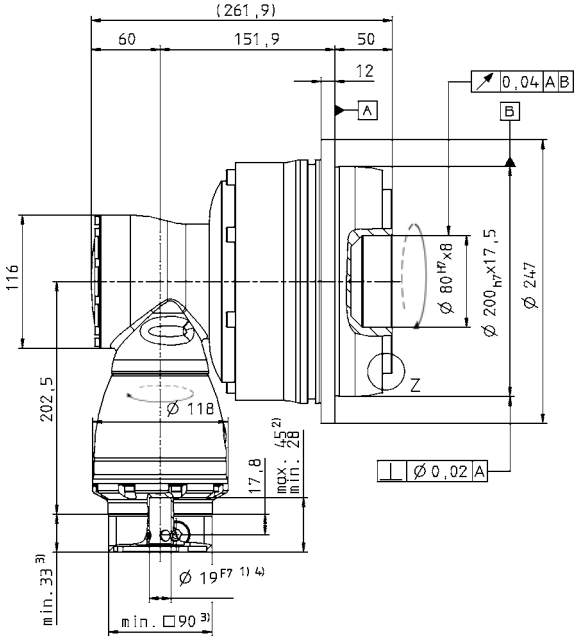
3-stage:



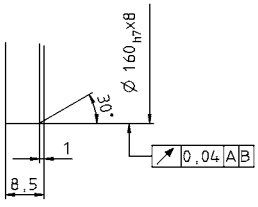


4-stage:





Z:



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 MA HIGH TORQUE 3/4-stage

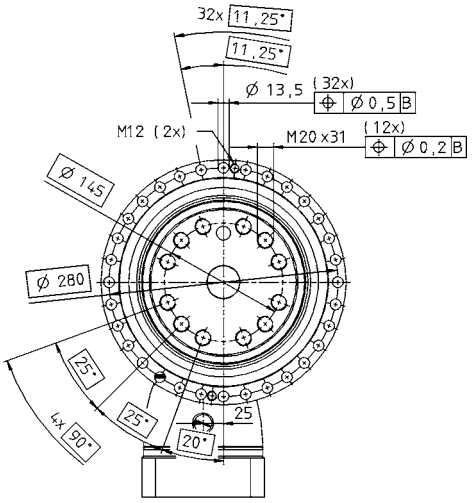
					3-stage							4-stage								
Ratio [a]			*i*		**66**	**88**	**110**	**137.5**	**154**	**220**	**385**	**330**	**462**	**577.5**	**770**	**1078**	**1540**	**2695**	**3850**	**5500**
Max. acceleration torque (max. 1000 cycles per hour)			T_{2B}	Nm	5500	5500	5500	5500	5500	4600	5500	5500	5500	5500	5500	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 n_{1N})			T_{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)			T_{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 T_{2N} and 20 °C ambient temperature) [b), c)]			n_{1N}	rpm	1800	1900	2100	2100	1900	1900	1900	2800	2800	2800	2800	2800	2800	3100	3800	3800
Max. continuous speed (with 20 % T_{2N} and 20 °C ambient temperature)			n_{1Ncym}	rpm	2300	2600	2900	2900	2600	2600	2600	3800	3800	3800	3800	3800	3800	4000	4000	4000
Max. input speed			n_{1Max}	rpm	4500	4500	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	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			j_t	arcmin	Standard ≤ 3,3 / Reduced ≤ 1,8															
Torsional rigidity			C_{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			C_{2K}	Nm/ arcmin	5560															
				in.lb/ arcmin	49210															
Max. axial force [e)]			F_{2AMax}	N	33000															
				lb_f	7425															
Max. tilting moment			M_{2KMax}	Nm	6500															
				in.lb	57525															
Efficiency at full load			η	%	92							90								
Service life (For calculation, see the Chapter "Information")			L_h	h	> 20000															
Weight incl. standardadapter plate			*m*	kg	83							87								
				lb_m	183							192								
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)	G	24	J_1	kgcm²	-	-	-	-	-	-	-	3.32	4.24	2.80	2.79	2.79	2.49	2.43	2.42	2.42
				10^{-3} in.lb.s²	-	-	-	-	-	-	-	2.94	3.75	2.48	2.47	2.47	2.20	2.15	2.14	2.14
Clamping hub diameter [mm]	K	38	J_1	kgcm²	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.s²	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

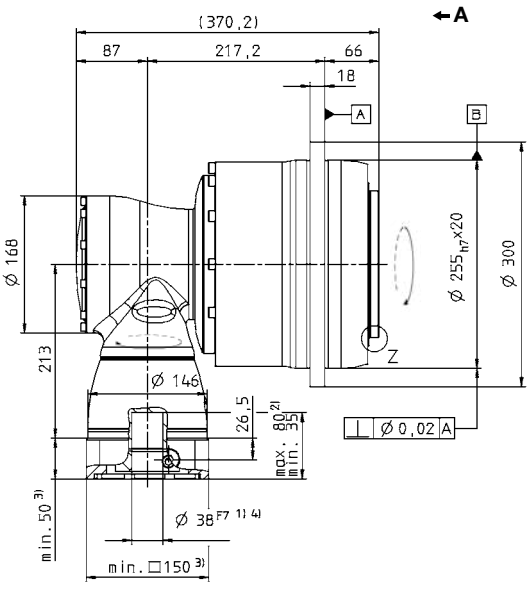
Please contact us for information on the best configuration for S1 conditions of use (continuous operation).

[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

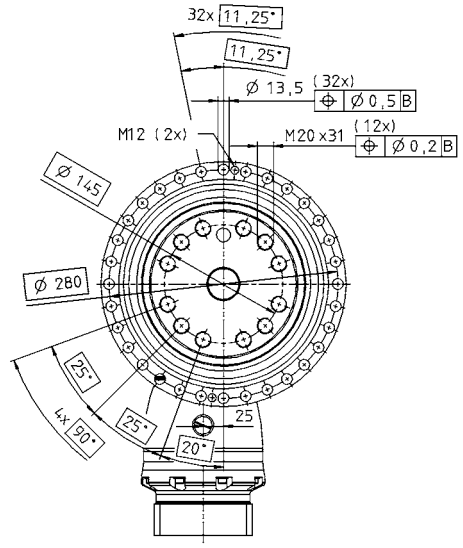
All technical data for front output side applies.
Technical data for rearward output versions, see page 428.

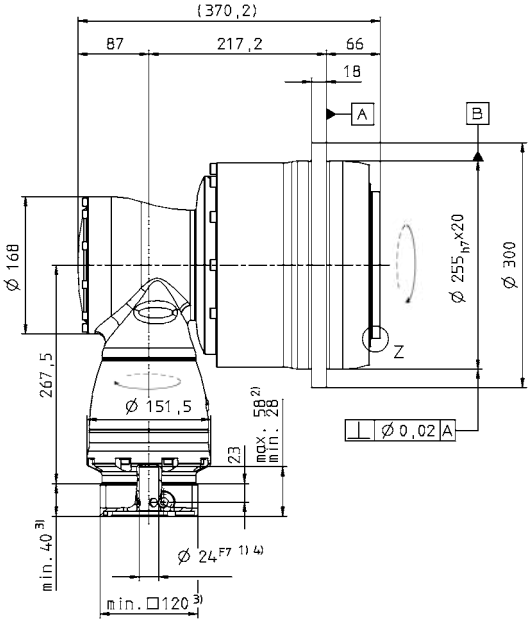
3-stage:

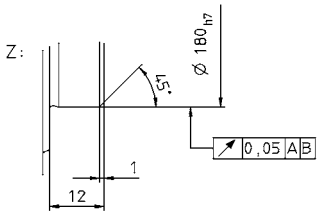




4-stage:







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

TPK+ 500 MA HIGH TORQUE 3/4-stage

				3-stage							4-stage								
Ratio [a]			***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)			T_{2B} Nm	10000	10000	10000	10000	10000	10000	10000	10000	10000	10000	10000	10000	10000	10000	10000	7200
			T_{2B} in.lb	88500	88500	88500	88500	88500	88500	88500	88500	88500	88500	88500	88500	88500	88500	88500	63720
Nominal output torque (with n_{1N})			T_{2N} Nm	5400	5400	5400	5400	5400	5400	5400	5400	5400	5400	5400	5400	5400	5400	5400	5400
			T_{2N} in.lb	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)			T_{2Not} Nm	19800	23000	23000	25000	21300	19800	25000	19800	25000	25000	25000	25000	25000	25000	25000	25000
			T_{2Not} in.lb	175230	203550	203550	221250	188505	175230	221250	175230	221250	221250	221250	221250	221250	221250	221250	221250
Nominal input speed (with T_{2N} and 20 °C ambient temperature) [b), c)]			n_{1N} rpm	1500	1700	1900	1900	1700	1700	1700	2600	2600	2600	2600	2600	2600	3100	3300	3300
Max. continuous speed (with 20 % T_{2N} and 20 °C ambient temperature)			n_{1Ncym} rpm	1800	2200	2600	2600	2300	2300	3100	3300	3300	3300	3300	3300	3300	3600	3600	3600
Max. input speed			n_{1Max} rpm	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000
Mean no load running torque (with n_1 = 3000 rpm and 20 °C gearhead temperature) [d)]			T_{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
			T_{012} 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
Max. torsional backlash			j_t arcmin	Standard ≤ 3,3 / Reduced ≤ 1,8															
Torsional rigidity			C_{t21} Nm/ arcmin	1879	1890	1901	1747	1899	1898	1772	1879	1766	1735	1742	1770	1770	1772	1772	1786
			C_{t21} in.lb/ arcmin	16626	16727	16820	15464	16809	16799	15683	16626	15633	15359	15413	15662	15662	15686	15683	15808
Tilting rigidity			C_{2K} Nm/ arcmin	9480															
			C_{2K} in.lb/ arcmin	83906															
Max. axial force [e)]			F_{2AMax} N	50000															
			F_{2AMax} lb_f	11250															
Max. tilting moment			M_{2KMax} Nm	9500															
			M_{2KMax} in.lb	84075															
Efficiency at full load			η %	92							90								
Service life (For calculation, see the Chapter "Information")			L_h h	> 20000															
Weight incl. standardadapter plate			m kg	120							124								
			m lb_m	265							274								
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)	K	38	J_1 kgcm²	-	-	-	-	-	-	-	12.43	15.36	10.93	10.92	10.91	10.13	9.95	9.91	9.91
			J_1 10^{-3} in.lb.s²	-	-	-	-	-	-	-	11.00	13.59	9.67	9.66	9.66	8.96	8.81	8.77	8.77
Clamping hub diameter [mm]	M	48	J_1 kgcm²	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
			J_1 10^{-3} in.lb.s²	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

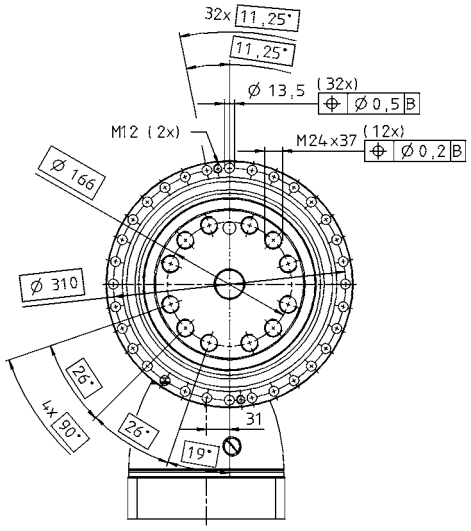
Please contact us for information on the best configuration for S1 conditions of use (continuous operation).

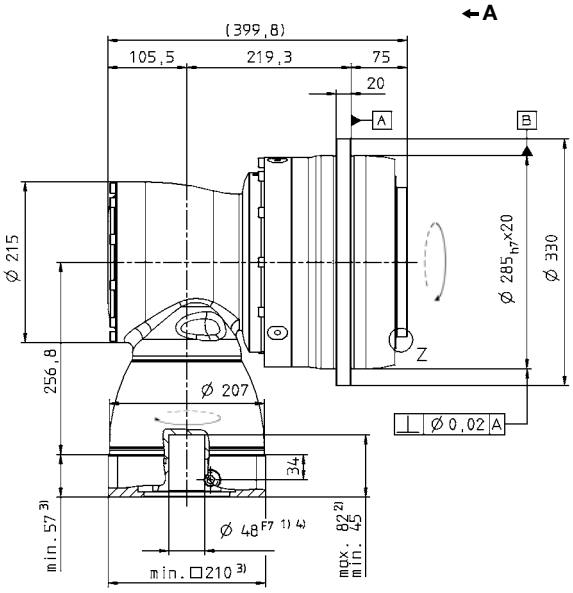
[a)] Other ratios available on request
[b)] Higher speeds are possible if the nominal torque is reduced
[c)] For higher ambient temperatures, please reduce input speed
[d)] Idling torques decrease during operation
[e)] Refers to center of the output shaft or flange

All technical data for front output side applies.
Technical data for rearward output versions, see page 428.

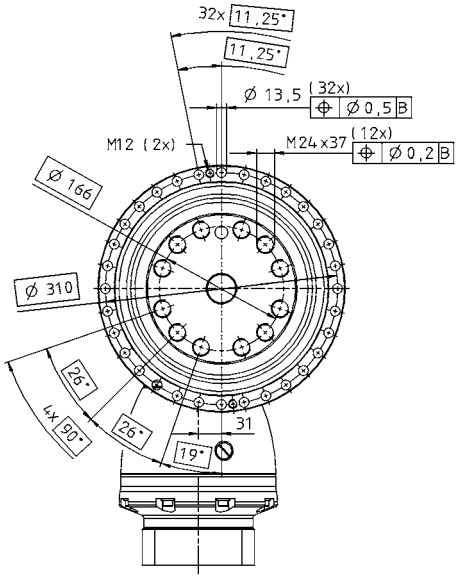
View A

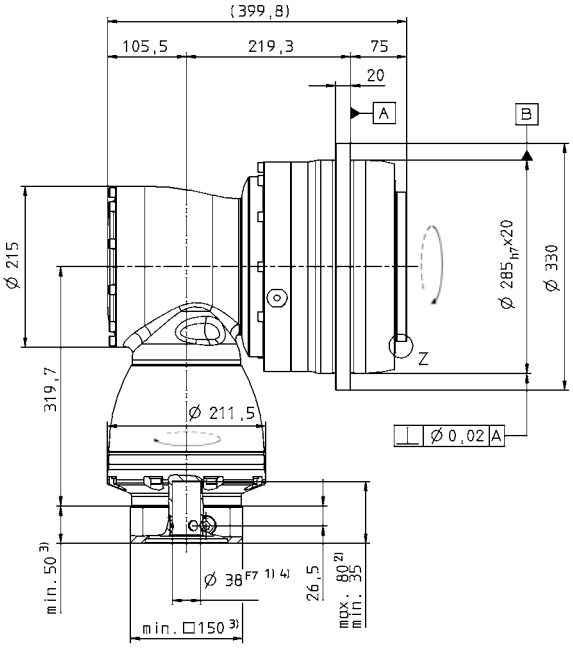
3-stage:

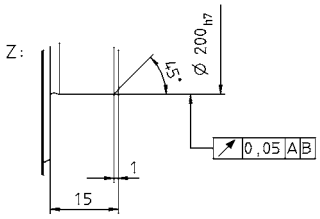




4-stage:







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

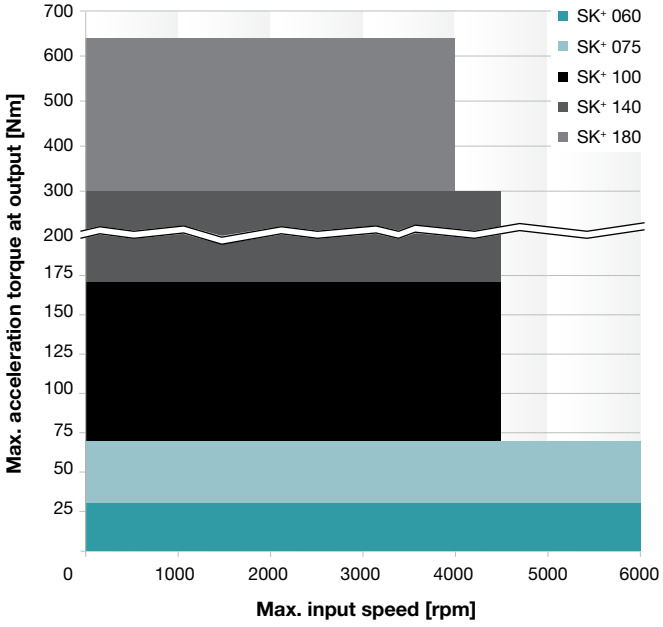
Motor mounting according to operating manual

SK+/SPK+ –
Space-saving right-angle precision with output shaft

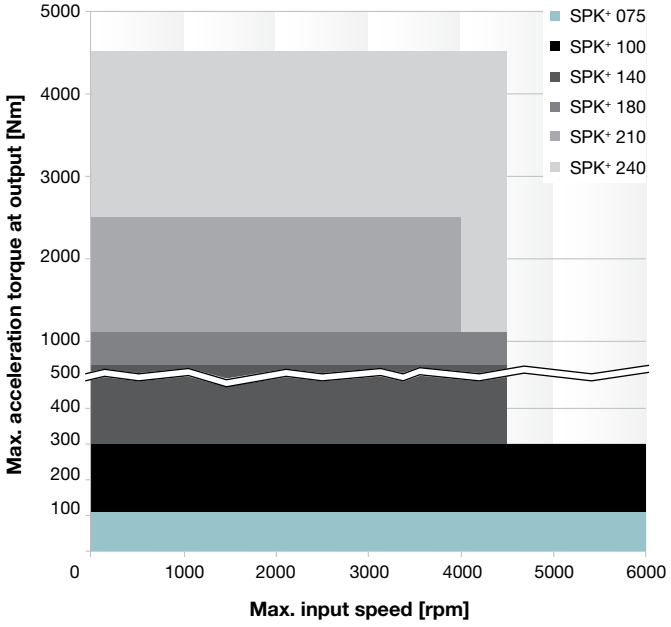
The representatives of our versatile hypoid gearhead with SP+ compatible output shaft. SPK+ gearheads with planetary stage are especially suitable for high-precision applications requiring higher power and torsional rigidity.

Quick size selection

SK+ MF (example for i = 5)
For applications in cyclic operation (DC ≤ 60%)
or continuous operation (DC ≥ 60%)



SPK+ MF (example for i = 25)
For applications in cyclic operation (DC ≤ 60%)
or continuous operation (DC ≥ 60%)



Versions and Applications

Features	**SK+** MF version page 212	**SPK+** MF version page 222
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

* You can find order information for the relevant type of output on page 444.

SK+ 060 MF 1/2-stage

					1-stage					2-stage									
Ratio [a]			*i*		**3**	**4**	**5**	**7**	**10**	**12**	**16**	**20**	**25**	**28**	**35**	**40**	**50**	**70**	**100**
Max. acceleration torque (max. 1000 cycles per hour)			T_{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 n_{1N})			T_{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	177	133
Emergency stop torque (permitted 1000 times during the service life of the gearhead)			T_{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	398	354
Nominal input speed (with T_{2N} and 20°C ambient temperature) [b), c)]			n_{1N}	rpm	2500	2700	3000	3000	3000	4400	4400	4400	4400	4400	4400	4400	4800	5500	5500
Max. continuous speed (with 20% T_{2N} and 20°C ambient temperature)			n_{1Ncym}	rpm	3000	3500	4000	3500	3500	5000	5000	5000	5000	5000	5000	5000	5000	5500	5500
Max. input speed			n_{1Max}	rpm	6000	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	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			j_t	arcmin	≤ 5														
Torsional rigidity			C_{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)]			F_{2AMax}	N	2400														
				lb_f	540														
Max. radial force [e)]			F_{2RMax}	N	2700														
				lb_f	608														
Max. tilting moment			M_{2KMax}	Nm	251														
				in.lb	2220														
Efficiency at full load			η	%	96					94									
Service life (For calculation, see the Chapter "Information")			L_h	h	> 20000														
Weight incl. standard adapter plate			*m*	kg	2.9					3.2									
				lb_m	6.4					7.1									
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	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	kgcm²	–	–	–	–	–	0.09	0.09	0.07	0.07	0.06	0.06	0.06	0.06	0.06	0.06
				10^{-3} in.lb.s²						0.08	0.08	0.07	0.06	0.06	0.06	0.05	0.05	0.05	0.05
	C	14	J_1	kgcm²	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	0.17
				10^{-3} in.lb.s²	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	0.15
	E	19	J_1	kgcm²	0.87	0.79	0.75	0.71	0.70	–	–	–	–	–	–	–	–	–	–
				10^{-3} in.lb.s²	0.77	0.70	0.66	0.63	0.62										

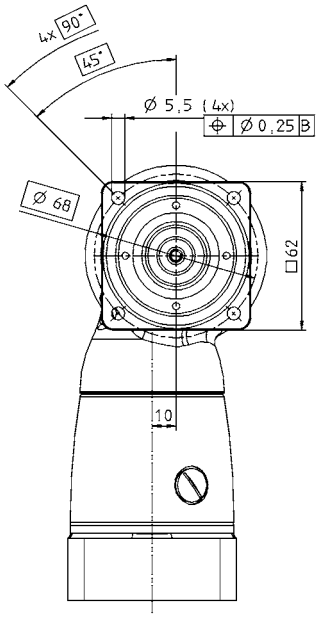
Please contact us for information on the best configuration for S1 conditions of use (continuous operation).

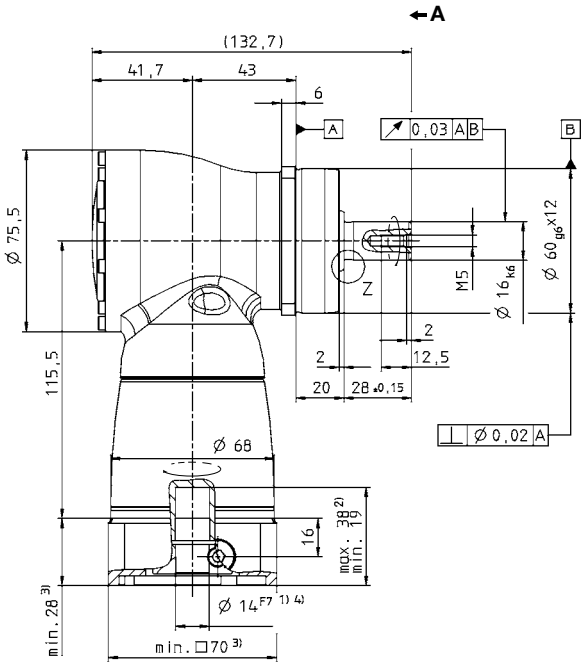
[a)] Other ratios available on request
[b)] Higher speeds are possible if the nominal torque is reduced
[c)] For higher ambient temperatures, please reduce input speed
[d)] Idling torques decrease during operation
[e)] Refers to center of the output shaft or flange

All technical data for front output side applies.
Technical data for rearward output versions, see page 428.

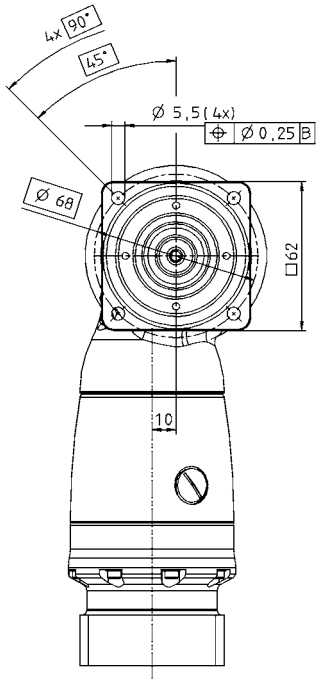
View A

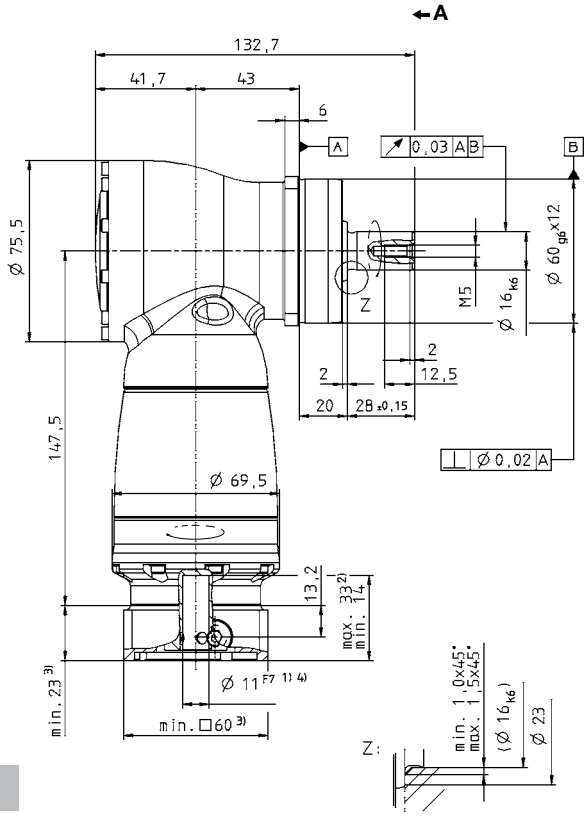
1-stage:





2-stage:

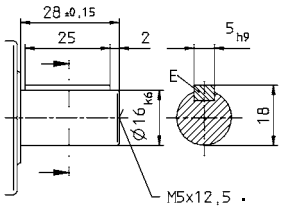




Alternatives: Output shaft variants

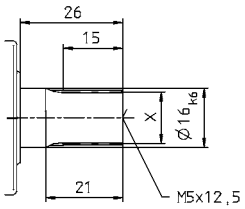
Keywayed output shaft in mm

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

SK+ 075 MF 1/2-stage

					1-stage					2-stage									
Ratio [a]			*i*		**3**	**4**	**5**	**7**	**10**	**12**	**16**	**20**	**25**	**28**	**35**	**40**	**50**	**70**	**100**
Max. acceleration torque (max. 1000 cycles per hour)			T_{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	531	443
Nominal output torque (with n_{1N})			T_{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	398	354
Emergency stop torque (permitted 1000 times during the service life of the gearhead)			T_{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	974	885
Nominal input speed (with T_{2N} and 20°C ambient temperature) [b), c)]			n_{1N}	rpm	2300	2500	2800	2800	2800	3500	3500	3500	3500	3500	3500	3500	3800	4500	4500
Max. continuous speed (with 20% T_{2N} and 20°C ambient temperature)			n_{1Ncym}	rpm	3000	3500	4000	3500	3500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500
Max. input speed			n_{1Max}	rpm	6000	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	2.0	1.7	1.5	2.0	1.8	0.3	0.3	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	0.9	0.9	0.9	0.9
Max. torsional backlash			j_t	arcmin	≤ 4														
Torsional rigidity			C_{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	6.0	6.0	6.0
				in.lb/ arcmin	44	49	53	53	53	49	49	49	49	49	49	49	53	53	53
Max. axial force [e)]			F_{2AMax}	N	3400														
				lb_f	765														
Max. radial force [e)]			F_{2RMax}	N	4000														
				lb_f	900														
Max. tilting moment			M_{2KMax}	Nm	437														
				in.lb	3867														
Efficiency at full load			η	%	96					94									
Service life (For calculation, see the Chapter "Information")			L_h	h	> 20000														
Weight incl. standard adapter plate			*m*	kg	4.8					5.4									
				lb_m	10.6					11.9									
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]	C	14	J_1	kgcm²	–	–	–	–	–	0.28	0.27	0.23	0.23	0.20	0.20	0.18	0.18	0.18	0.18
				10^{-3} in.lb.s²						0.25	0.24	0.21	0.20	0.18	0.18	0.16	0.16	0.16	0.16
	E	19	J_1	kgcm²	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.s²	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	J_1	kgcm²	2.88	2.61	2.47	2.37	2.31	–	–	–	–	–	–	–	–	–	–
				10^{-3} in.lb.s²	2.55	2.31	2.19	2.10	2.04										

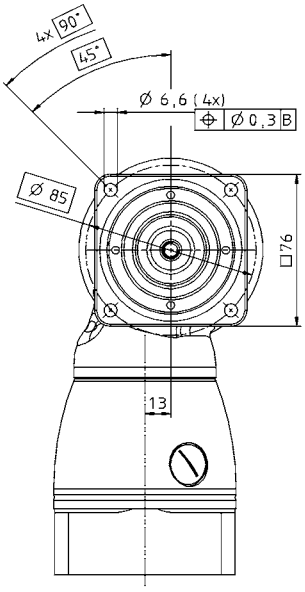
Please contact us for information on the best configuration for S1 conditions of use (continuous operation).

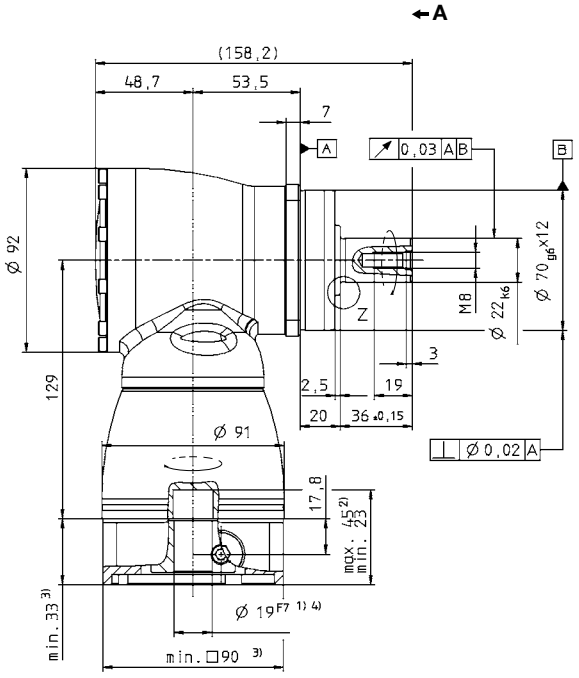
[a)] Other ratios available on request
[b)] Higher speeds are possible if the nominal torque is reduced
[c)] For higher ambient temperatures, please reduce input speed
[d)] Idling torques decrease during operation
[e)] Refers to center of the output shaft or flange

All technical data for front output side applies.
Technical data for rearward output versions, see page 428.

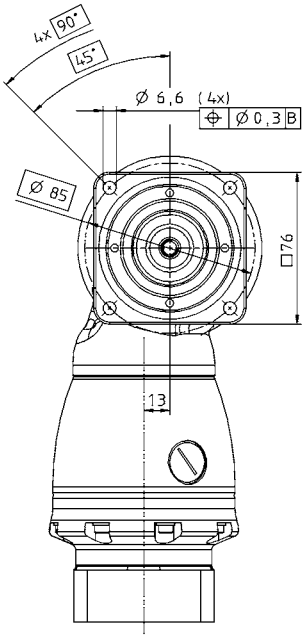
View A

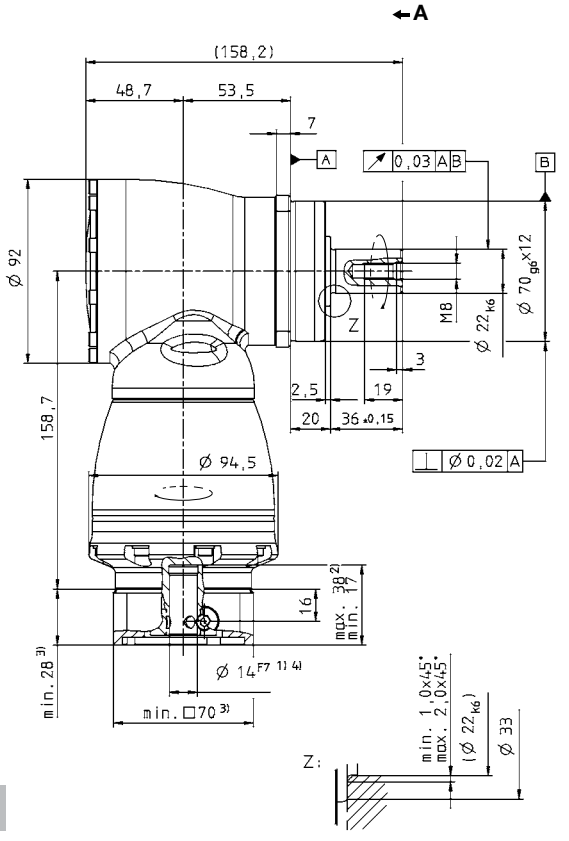
1-stage:





2-stage:

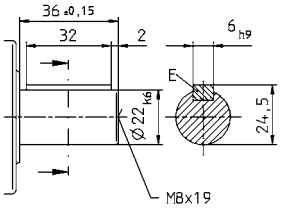




Alternatives: Output shaft variants

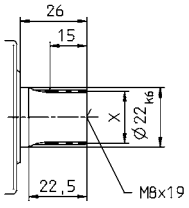
Keywayed output shaft in mm

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



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

SK+ 100 MF 1/2-stage

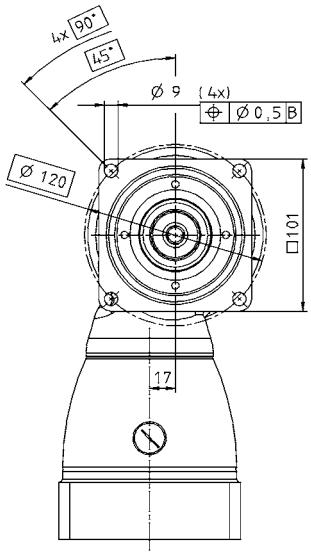
					1-stage					2-stage									
Ratio [a]			*i*		**3**	**4**	**5**	**7**	**10**	**12**	**16**	**20**	**25**	**28**	**35**	**40**	**50**	**70**	**100**
Max. acceleration torque (max. 1000 cycles per hour)			T_{2B}	Nm	170	170	170	145	125	170	170	170	170	170	170	170	170	145	125
				in.lb	1505	1505	1505	1283	1106	1505	1505	1505	1505	1505	1505	1505	1505	1283	1106
Nominal output torque (with n_{1N})			T_{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)			T_{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 T_{2N} and 20°C ambient temperature) [b), c)]			n_{1N}	rpm	2200	2400	2700	2500	2500	3100	3100	3100	3100	3100	3100	3100	3500	4200	4200
Max. continuous speed (with 20% T_{2N} and 20°C ambient temperature)			n_{1Ncym}	rpm	3000	3400	3800	3400	3400	4000	4000	4000	4000	4000	4000	4000	4000	4200	4200
Max. input speed			n_{1Max}	rpm	4500	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	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
Max. torsional backlash			j_t	arcmin	≤ 4														
Torsional rigidity			C_{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	115	115	115
Max. axial force [e)]			F_{2AMax}	N	5700														
				lb_f	1283														
Max. radial force [e)]			F_{2RMax}	N	6300														
				lb_f	1418														
Max. tilting moment			M_{2KMax}	Nm	833														
				in.lb	7370														
Efficiency at full load			η	%	96					94									
Service life (For calculation, see the Chapter "Information")			L_h	h	> 20000														
Weight incl. standardadapter plate			*m*	kg	9.3					10.0									
				lb_m	21					22									
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]	E	19	J_1	kgcm²	–	–	–	–	–	1.02	0.97	0.86	0.84	0.75	0.74	0.69	0.69	0.68	0.68
				10^{-3} in.lb.s²						0.91	0.86	0.76	0.74	0.66	0.66	0.61	0.61	0.60	0.60
	G	24	J_1	kgcm²	–	–	–	–	–	2.59	2.54	2.42	2.40	2.31	2.30	2.26	2.25	2.25	2.25
				10^{-3} in.lb.s²						2.29	2.25	2.14	2.13	2.05	2.04	2.00	1.99	1.99	1.99
	H	28	J_1	kgcm²	4.64	3.80	3.34	2.98	2.79	–	–	–	–	–	–	–	–	–	–
				10^{-3} in.lb.s²	4.10	3.36	2.95	2.64	2.47										
	K	38	J_1	kgcm²	11.9	11.0	10.6	10.2	10.0	–	–	–	–	–	–	–	–	–	–
				10^{-3} in.lb.s²	10.5	9.77	9.37	9.05	8.89										

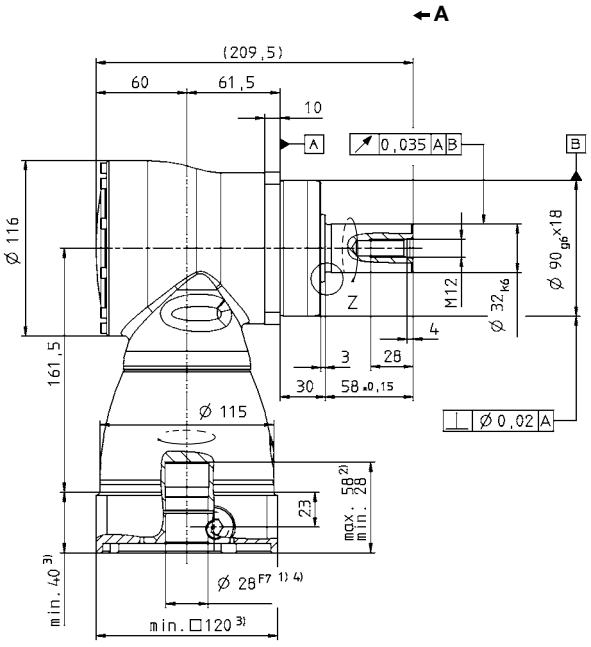
Please contact us for information on the best configuration for S1 conditions of use (continuous operation).

[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

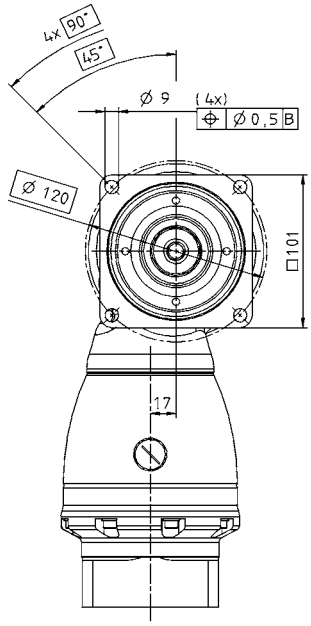
All technical data for front output side applies.
Technical data for rearward output versions, see page 428.

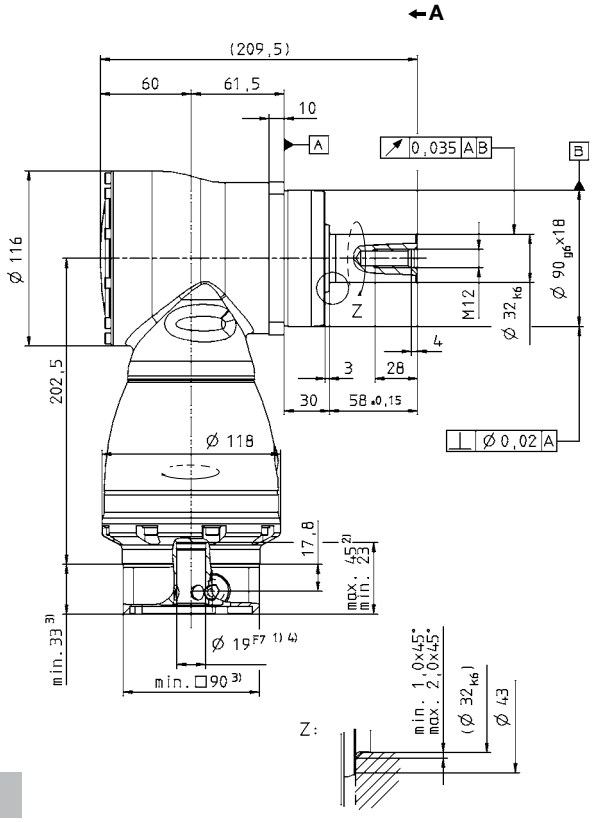
1-stage:





2-stage:

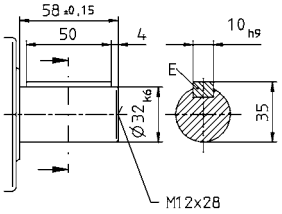




Alternatives: Output shaft variants

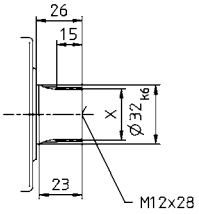
Keywayed output shaft in mm

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 6m



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

SK+ 140 MF 1/2-stage

				1-stage					2-stage									
Ratio [a]			*i*	**3**	**4**	**5**	**7**	**10**	**12**	**16**	**20**	**25**	**28**	**35**	**40**	**50**	**70**	**100**
Max. acceleration torque (max. 1000 cycles per hour)			T_{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	2213	1859
Nominal output torque (with n_{1N})			T_{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	1549	1419
Emergency stop torque (permitted 1000 times during the service life of the gearhead)			T_{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	3983	3540
Nominal input speed (with T_{2N} and 20°C ambient temperature) [b), c)]			n_{1N} rpm	1900	2000	2200	2000	2000	2900	2900	2900	2900	2900	2900	2900	3200	3200	3900
Max. continuous speed (with 20% T_{2N} and 20°C ambient temperature)			n_{1Ncym} rpm	2500	2800	3100	2800	2800	4000	4000	4000	4000	4000	4000	4000	4200	4200	4200
Max. input speed			n_{1Max} rpm	4500	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	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
Max. torsional backlash			j_t arcmin	≤ 4														
Torsional rigidity			C_{t21} Nm/ arcmin	27	30	32	32	32	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	274	274	274
Max. axial force [e)]			F_{2AMax} N	9900														
			lb_f	2228														
Max. radial force [e)]			F_{2RMax} N	9500														
			lb_f	2138														
Max. tilting moment			M_{2KMax} Nm	1692														
			in.lb	14974														
Efficiency at full load			η %	96					94									
Service life (For calculation, see the Chapter "Information")			L_h h	> 20000														
Weight incl. standardadapter plate			*m* kg	22.6					25.0									
			lb_m	50					55									
Operating noise (with n_1 = 3000 rpm without 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]	G	24	J_1 kgcm²	–	–	–	–	–	4.21	3.85	3.28	3.17	2.78	2.73	2.48	2.46	2.43	2.42
			10^{-3} in.lb.s²						3.73	3.41	2.90	2.80	2.46	2.41	2.20	2.17	2.15	2.14
	K	38	J_1 kgcm²	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.s²	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

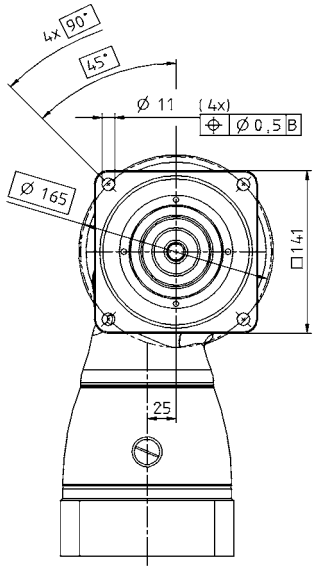
[a)] Other ratios available on request
[b)] Higher speeds are possible if the nominal torque is reduced
[c)] For higher ambient temperatures, please reduce input speed
[d)] Idling torques decrease during operation
[e)] Refers to center of the output shaft or flange

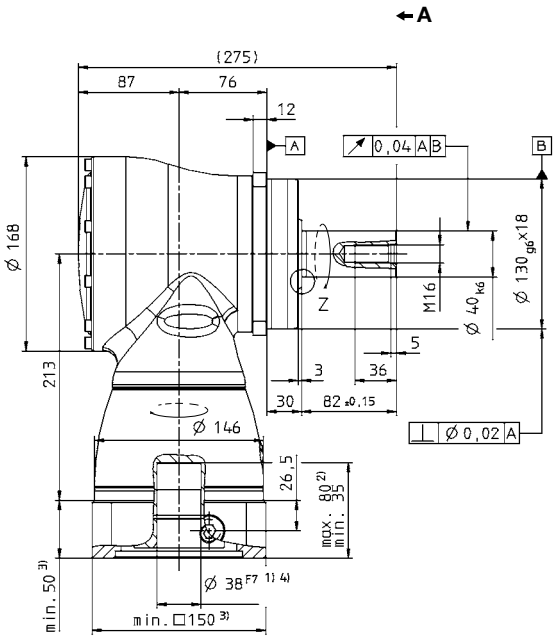
All technical data for front output side applies.
Technical data for rearward output versions, see page 428.

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

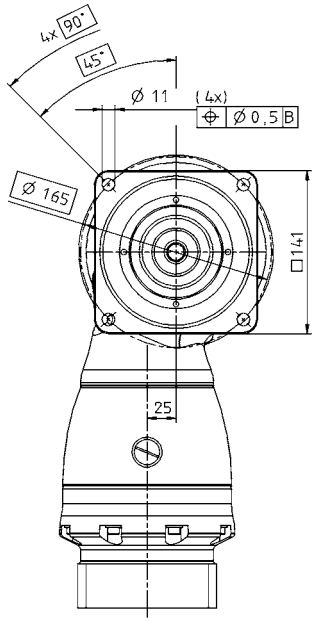
View A

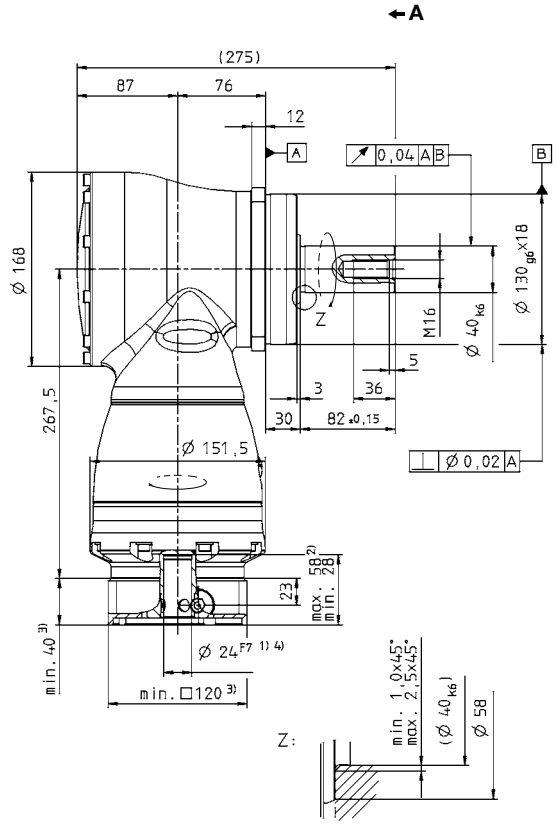
1-stage:





2-stage:

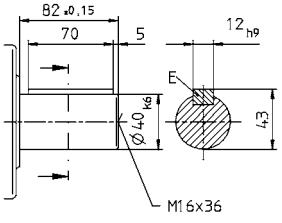




Alternatives: Output shaft variants

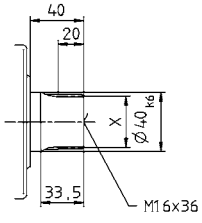
Keywayed output shaft in mm

E = key as per DIN 6885, sheet 1, form A



Involute gearing DIN 5480

X = W 40 x 2 x 30 x 18 x 6m



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

SK+ 180 MF 1/2-stage

				1-stage					2-stage									
Ratio [a]			*i*	**3**	**4**	**5**	**7**	**10**	**12**	**16**	**20**	**25**	**28**	**35**	**40**	**50**	**70**	**100**
Max. acceleration torque (max. 1000 cycles per hour)			T_{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	4868	4160
Nominal output torque (with n_{1N})			T_{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	3363	3186
Emergency stop torque (permitted 1000 times during the service life of the gearhead)			T_{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	8585	7965
Nominal input speed (with T_{2N} and 20°C ambient temperature) [b), c)]			n_{1N} rpm	1600	1800	2000	1800	1800	2700	2700	2700	2700	2700	2700	2700	2900	3200	3400
Max. continuous speed (with 20% T_{2N} and 20°C ambient temperature)			n_{1Ncym} rpm	2000	2400	2800	2500	2500	3500	3500	3500	3500	3500	3500	3500	3500	3800	3800
Max. input speed			n_{1Max} rpm	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000
Mean no load running torque (with n_1 = 3000 rpm and 20°C gearhead temperature) [d)]			T_{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			j_t arcmin	≤ 4														
Torsional rigidity			C_{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)]			F_{2AMax} N	14200														
			lb_f	3195														
Max. radial force [e)]			F_{2RMax} N	14700														
			lb_f	3308														
Max. tilting moment			M_{2KMax} Nm	3213														
			in.lb	28435														
Efficiency at full load			η %	96					94									
Service life (For calculation, see the Chapter "Information")			L_h h	> 20000														
Weight incl. standardadapter plate			*m* kg	45.4					48									
			lb_m	100					106									
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]	K	38	J_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.s²						13.6	12.3	10.9	10.6	9.65	9.48	8.96	8.88	8.81	8.77
	M	48	J_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.s²	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

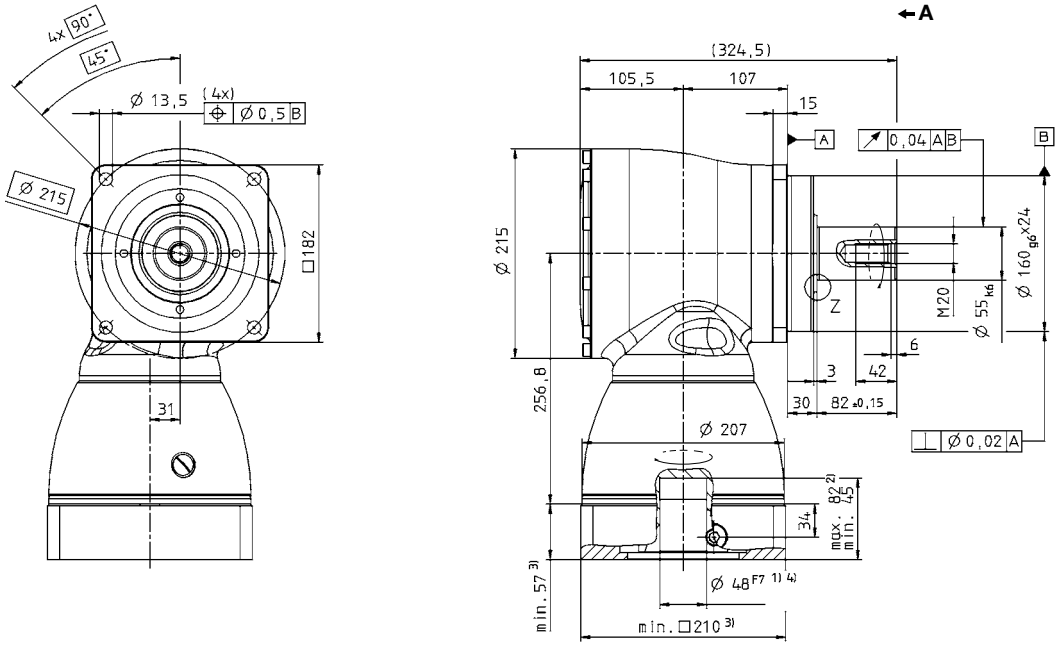
[a)] Other ratios available on request
[b)] Higher speeds are possible if the nominal torque is reduced
[c)] For higher ambient temperatures, please reduce input speed
[d)] Idling torques decrease during operation
[e)] Refers to center of the output shaft or flange

All technical data for front output side applies.
Technical data for rearward output versions, see page 428.

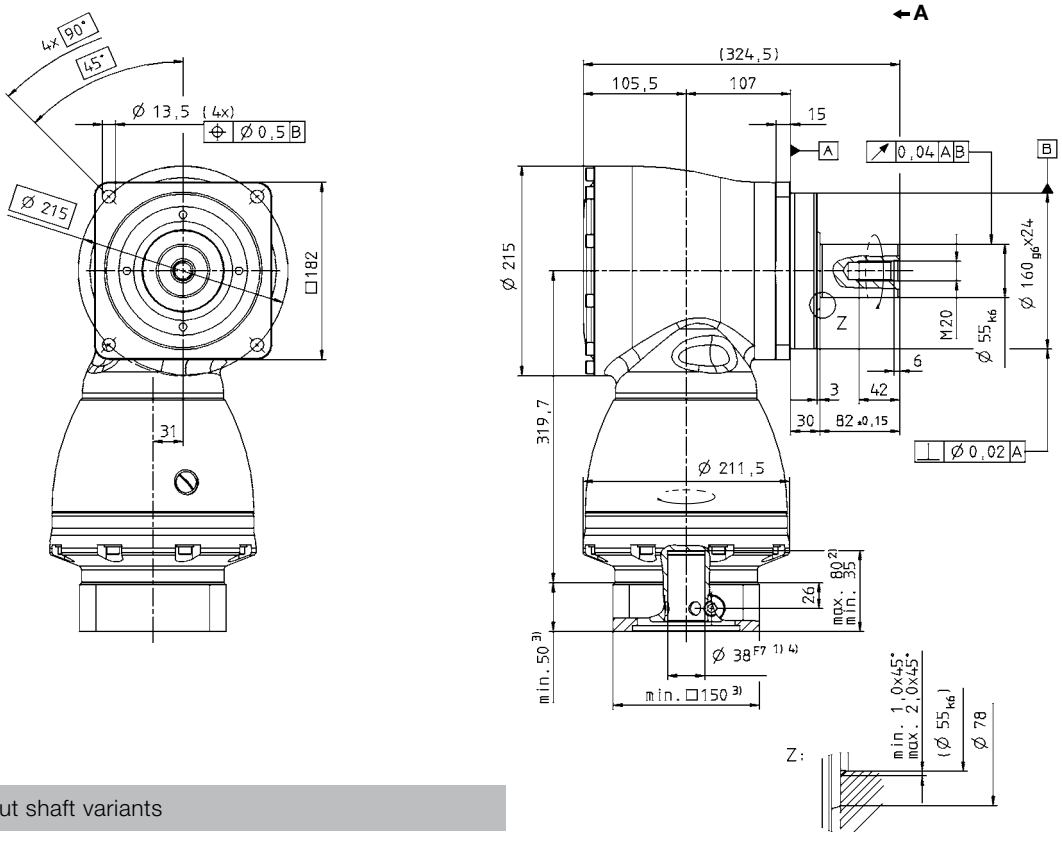
Please contact us for information on the best configuration for S1 conditions of use (continuous operation).

View A

1-stage:



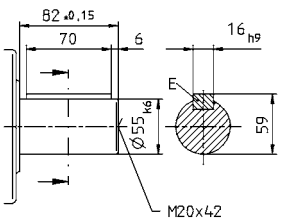
2-stage:



Alternatives: Output shaft variants

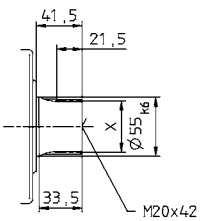
Keywayed output shaft in mm

E = key as per DIN 6885, sheet 1, form A



Involute gearing DIN 5480

X = W 55 x 2 x 30 x 26 x 6m



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

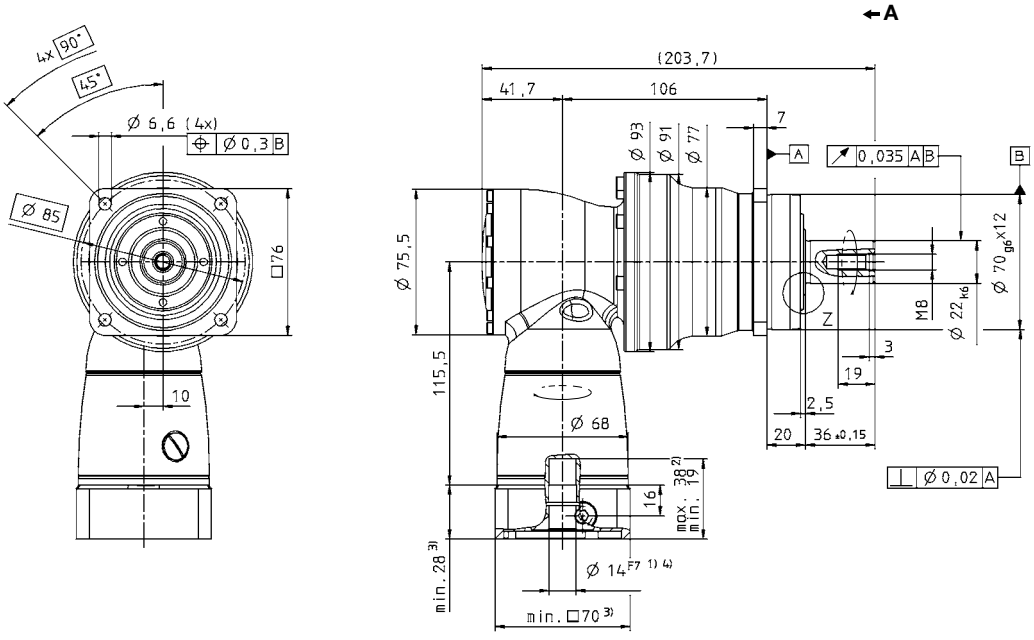
				2-stage									
Ratio [a]			*i*	**12**	**16**	**20**	**25**	**28**	**35**	**40**	**50**	**70**	**100**
Max. acceleration torque (max. 1000 cycles per hour)			T_{2B} Nm	110	110	110	110	110	110	80	100	110	90
			T_{2B} in.lb	974	974	974	974	974	974	974	885	974	797
Nominal output torque (with n_{1N})			T_{2N} Nm	75	75	75	75	75	75	60	75	75	52
			T_{2N} in.lb	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	250	175	120	150	210	200
			T_{2Not} in.lb	1416	1416	1770	1770	2213	1549	1062	1328	1859	1770
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_{1Ncym} 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	1.5	1.3	1.2	1.2	1.2	1.3	1.3	1.3	1.3	1.3
			T_{012} 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			j_t arcmin	Standard ≤ 5 / Reduced ≤ 3									
Torsional rigidity			C_{t21} Nm/ arcmin	10									
			C_{t21} in.lb/ arcmin	89									
Max. axial force [e)]			F_{2AMax} N	3350									
			F_{2AMax} lb_f	753									
Max. radial force [e)]			F_{2RMax} N	4000									
			F_{2RMax} lb_f	900									
Max. tilting moment			M_{2KMax} Nm	236									
			M_{2KMax} in.lb	2089									
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	5.2									
			m lb_m	11.5									
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	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	J_1 kgcm²	0.54	0.45	0.44	0.40	0.44	0.36	0.35	0.34	0.34	0.34
			J_1 10^{-3} in.lb.s²	0.48	0.40	0.39	0.35	0.39	0.32	0.31	0.30	0.30	0.30
	E	19	J_1 kgcm²	0.89	0.80	0.79	0.75	0.79	0.71	0.70	0.70	0.70	0.69
			J_1 10^{-3} in.lb.s²	0.79	0.71	0.70	0.66	0.70	0.63	0.62	0.62	0.62	0.61

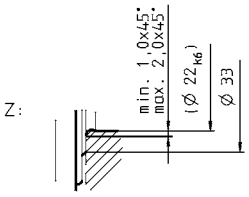
[a)] Other ratios up to i=1000 available on request
[b)] Higher speeds are possible if the nominal torque is reduced
[c)] For higher ambient temperatures, please reduce input speed
[d)] Idling torques decrease during operation
[e)] Refers to center of the output shaft or flange

All technical data for front output side applies.
Technical data for rearward output versions, see page 428.

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

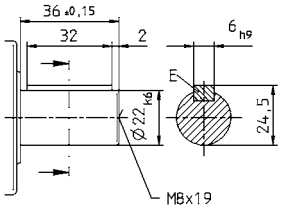
2-stage:



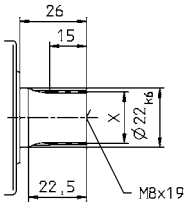


Alternatives: Output shaft variants

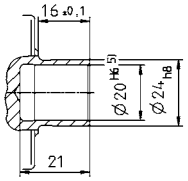
Keywayed output shaft in mm
E = key as per DIN 6885, sheet 1, form A



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*	**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
			T_{2B} 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
			T_{2N} 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
			T_{2Not} 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
			T_{012} 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													
			C_{t21} in.lb/ arcmin	89													
Max. axial force [e)]			F_{2AMax} N	3350													
			F_{2AMax} lb_f	754													
Max. radial force [e)]			F_{2RMax} N	4000													
			F_{2RMax} lb_f	900													
Max. tilting moment			M_{2KMax} Nm	236													
			M_{2KMax} 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													
			m 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 kgcm²	0.09	0.07	0.08	0.07	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
			J_1 10^{-3} in.lb.s²	0.08	0.06	0.07	0.06	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
	C	14	J_1 kgcm²	0.20	0.18	0.19	0.19	0.18	0.18	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17
			J_1 10^{-3} in.lb.s²	0.18	0.16	0.17	0.17	0.16	0.16	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15

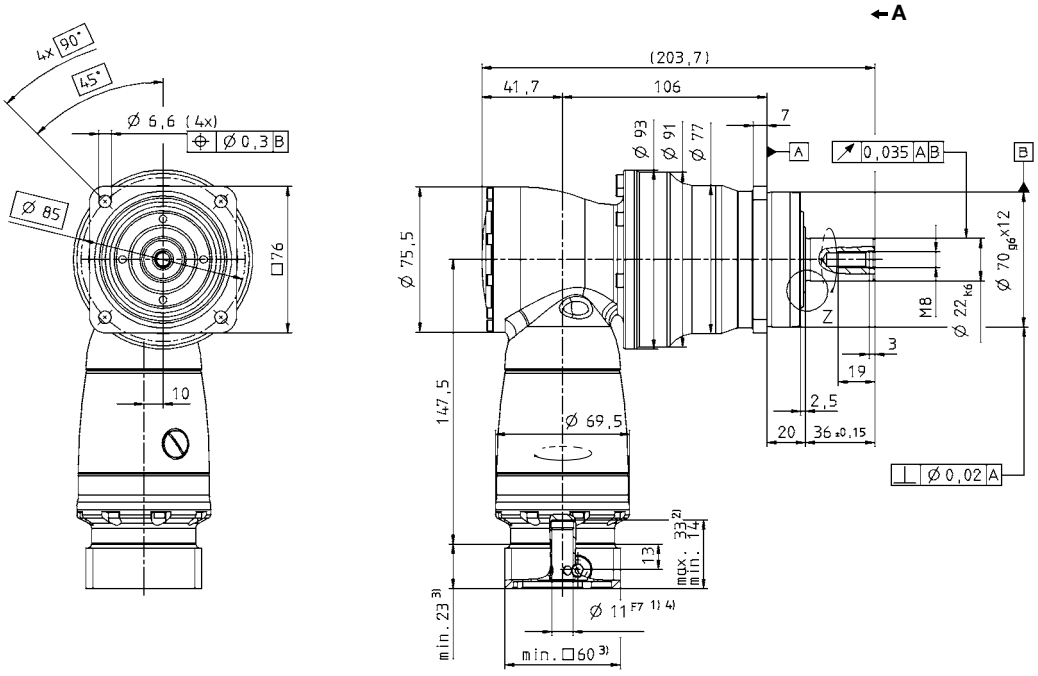
[a)] Other ratios up to i=1000 available on request
[b)] Higher speeds are possible if the nominal torque is reduced
[c)] For higher ambient temperatures, please reduce input speed
[d)] Idling torques decrease during operation
[e)] Refers to center of the output shaft or flange

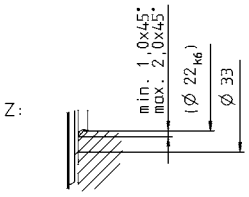
All technical data for front output side applies.
Technical data for rearward output versions, see page 428.

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

View A

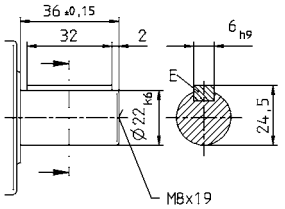
3-stage:



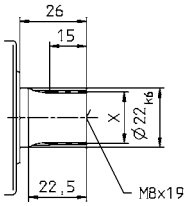


Alternatives: Output shaft variants

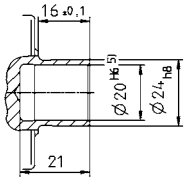
Keywayed output shaft in mm
E = key as per DIN 6885, sheet 1, form A



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

					2-stage									
Ratio [a]			*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_{1Ncym}	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	kgcm²	1.48	1.20	1.17	1.05	1.15	0.95	0.90	0.89	0.89	0.89
				10^{-3} in.lb.s²	1.31	1.06	1.04	0.93	1.02	0.84	0.79	0.79	0.79	0.78
	H	28	J_1	kgcm²	2.89	2.62	2.59	2.46	2.56	2.36	2.31	2.31	2.30	2.30
				10^{-3} in.lb.s²	2.56	2.31	2.29	2.18	2.27	2.09	2.05	2.04	2.04	2.04

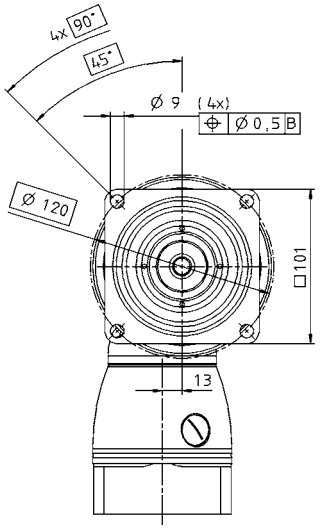
[a)] Other ratios up to i=1000 available on request
[b)] Higher speeds are possible if the nominal torque is reduced
[c)] For higher ambient temperatures, please reduce input speed
[d)] Idling torques decrease during operation
[e)] Refers to center of the output shaft or flange

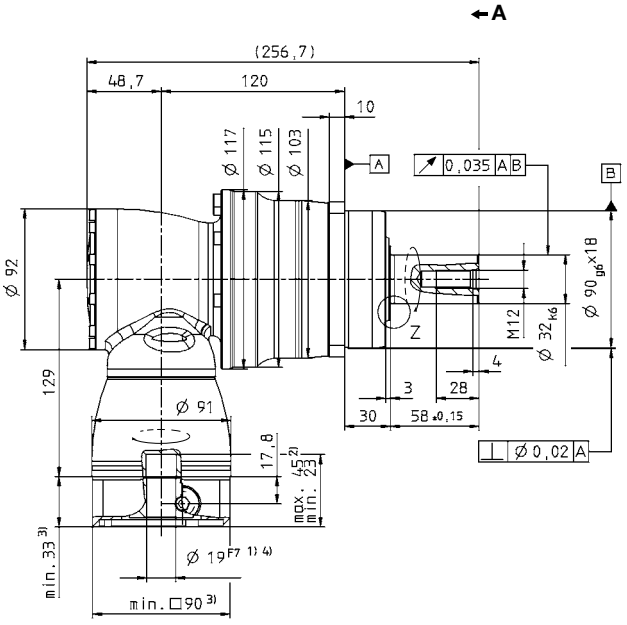
All technical data for front output side applies.
Technical data for rearward output versions, see page 428.

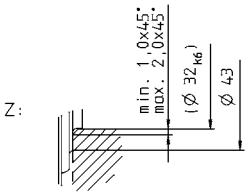
Please contact us for information on the best configuration for S1 conditions of use (continuous operation).

View A

2-stage:

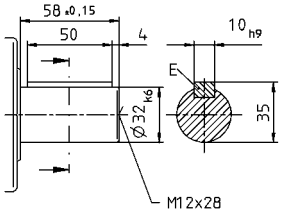




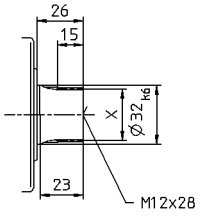


Alternatives: Output shaft variants

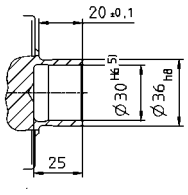
Keywayed output shaft in mm
E = key as per DIN 6885, sheet 1, form A



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*			**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		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 n_{1N})	T_{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)	T_{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 T_{2N} and 20°C ambient temperature) [b), c)]	n_{1N}	rpm		3500	3500	3500	3500	3500	3500	3500	3800	3500	3800	4500	4500	4500	4500
Max. continuous speed (with 20% T_{2N} and 20°C ambient temperature)	n_{1Ncym}	rpm		4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500
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		0.4	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	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
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	%		92													
Service life (For calculation, see the Chapter "Information")	L_h	h		> 20000													
Weight incl. standard adapter plate	*m*	kg		10.3													
		lb_m		22.8													
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]	C 14	J_1	kgcm²	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	0.18
			10^{-3} in.lb.s²	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	0.16
	E 19	J_1	kgcm²	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	0.63
			10^{-3} in.lb.s²	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	0.56

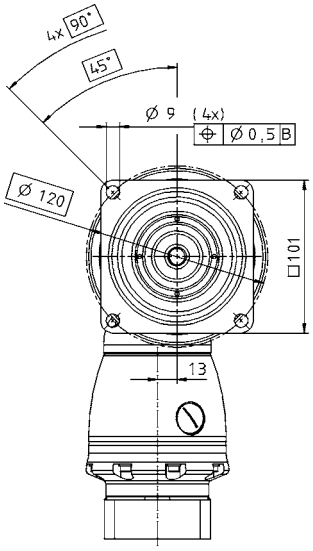
[a)] Other ratios up to i=1000 available on request
[b)] Higher speeds are possible if the nominal torque is reduced
[c)] For higher ambient temperatures, please reduce input speed
[d)] Idling torques decrease during operation
[e)] Refers to center of the output shaft or flange

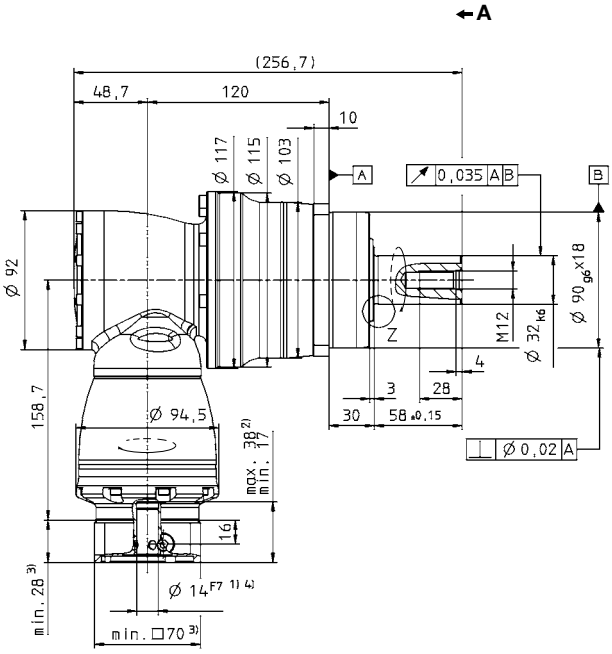
All technical data for front output side applies.
Technical data for rearward output versions, see page 428.

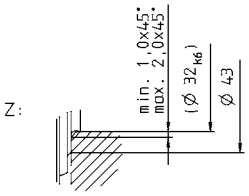
Please contact us for information on the best configuration for S1 conditions of use (continuous operation).

View A

3-stage:





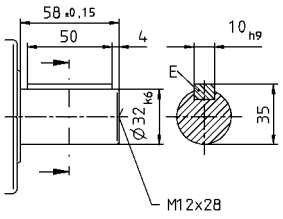


Right-angle gearheads
High End

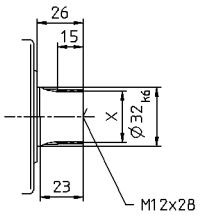
SPK+

Alternatives: Output shaft variants

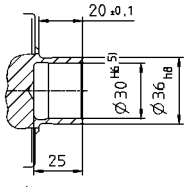
Keywayed output shaft in mm
E = key as per DIN 6885, sheet 1, form A



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

				2-stage									
Ratio [a]			*i*	**12**	**16**	**20**	**25**	**28**	**35**	**40**	**50**	**70**	**100**
Max. acceleration torque (max. 1000 cycles per hour)			T_{2B} Nm	600	600	600	600	600	600	500	600	600	480
			T_{2B} in.lb	5310	5310	5310	5310	5310	5310	4425	5310	5310	4248
Nominal output torque (with n_{1N})			T_{2N} Nm	360	360	360	360	360	360	320	360	360	220
			T_{2N} 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)			T_{2Not} Nm	1000	1000	1250	1250	1250	1250	1000	1250	1250	1000
			T_{2Not} in.lb	8850	8850	11063	11063	11063	11063	8850	11063	11063	8850
Nominal input speed (with T_{2N} and 20°C ambient temperature) [b), c)]			n_{1N} rpm	1900	2300	2300	2600	2300	2300	2300	2300	2300	2300
Max. continuous speed (with 20% T_{2N} and 20°C ambient temperature)			n_{1Ncym} rpm	2700	3100	3100	3500	3100	3000	3000	3000	3000	3000
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	4.0	3.7	3.6	2.8	3.5	3.9	3.1	3.1	3.1	3.1
			T_{012} in.lb	35.4	32.7	31.9	24.8	31	34.5	27.4	27.4	27.4	27.4
Max. torsional backlash			j_t arcmin	Standard ≤ 4 / Reduced ≤ 2									
Torsional rigidity			C_{t21} Nm/ arcmin	53									
			C_{t21} in.lb/ arcmin	469									
Max. axial force [e)]			F_{2AMax} N	9870									
			F_{2AMax} lb_f	2221									
Max. radial force [e)]			F_{2RMax} N	9450									
			F_{2RMax} lb_f	2126									
Max. tilting moment			M_{2KMax} Nm	952									
			M_{2KMax} 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	20									
			m lb_m	44									
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]	H	28	J_1 kgcm²	4.68	3.82	3.75	3.31	3.68	2.97	2.80	2.79	2.78	2.77
			J_1 10^{-3} in.lb.s²	4.14	3.38	3.32	2.93	3.26	2.63	2.48	2.47	2.46	2.45
	K	38	J_1 kgcm²	11.8	11.0	10.9	10.5	10.9	10.1	9.96	9.95	9.94	9.94
			J_1 10^{-3} in.lb.s²	10.5	9.73	9.66	9.27	9.60	8.97	8.82	8.81	8.80	8.79

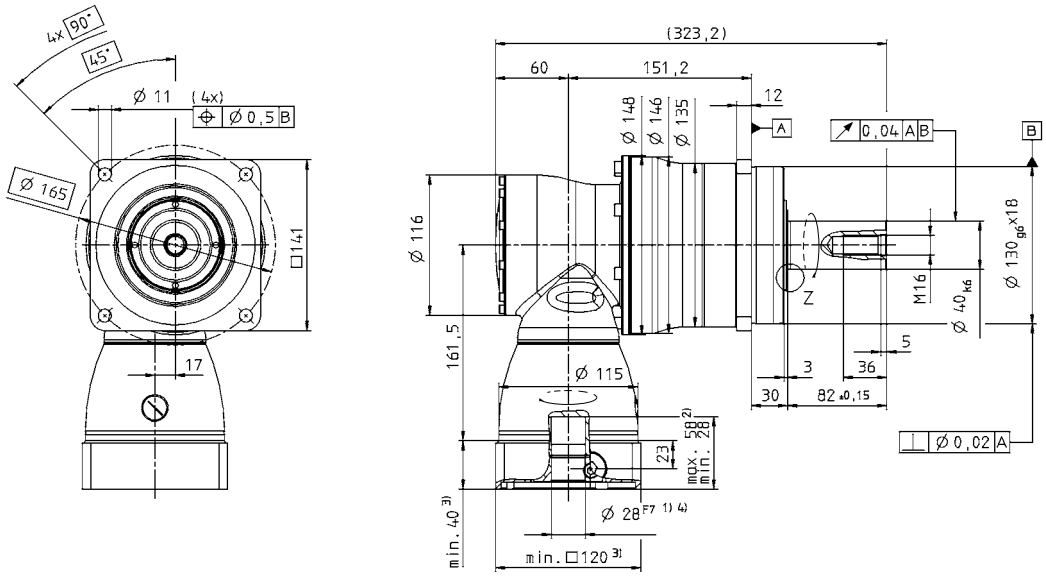
[a)] Other ratios up to i=1000 available on request
[b)] Higher speeds are possible if the nominal torque is reduced
[c)] For higher ambient temperatures, please reduce input speed
[d)] Idling torques decrease during operation
[e)] Refers to center of the output shaft or flange

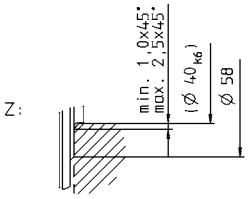
All technical data for front output side applies.
Technical data for rearward output versions, see page 428.

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

View A

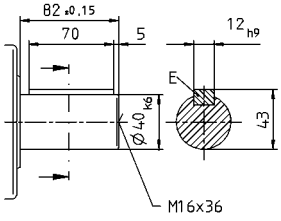
2-stage:



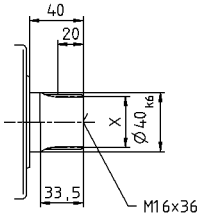


Alternatives: Output shaft variants

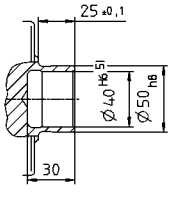
Keywayed output shaft in mm
E = key as per DIN 6885, sheet 1, form A



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*			**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	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	4425	5310	5310	4248
Nominal output torque (with n_{1N})	T_{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	2832	3186	3186	1947
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	1000
			in.lb	8850	8850	11063	11063	11063	11063	11063	11063	11063	11063	8850	11063	11063	8850
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	53													
			in.lb/ arcmin	469													
Max. axial force [e)]	F_{2AMax}		N	9870													
			lb_f	2221													
Max. radial force [e)]	F_{2RMax}		N	9450													
			lb_f	2126													
Max. tilting moment	M_{2KMax}		Nm	952													
			in.lb	8425													
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	20.7													
			lb_m	45.7													
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													
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	kgcm²	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	0.69
				10^{-3} in.lb.s²	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	0.61
	G	24	J_1	kgcm²	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	2.25
				10^{-3} in.lb.s²	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	1.99

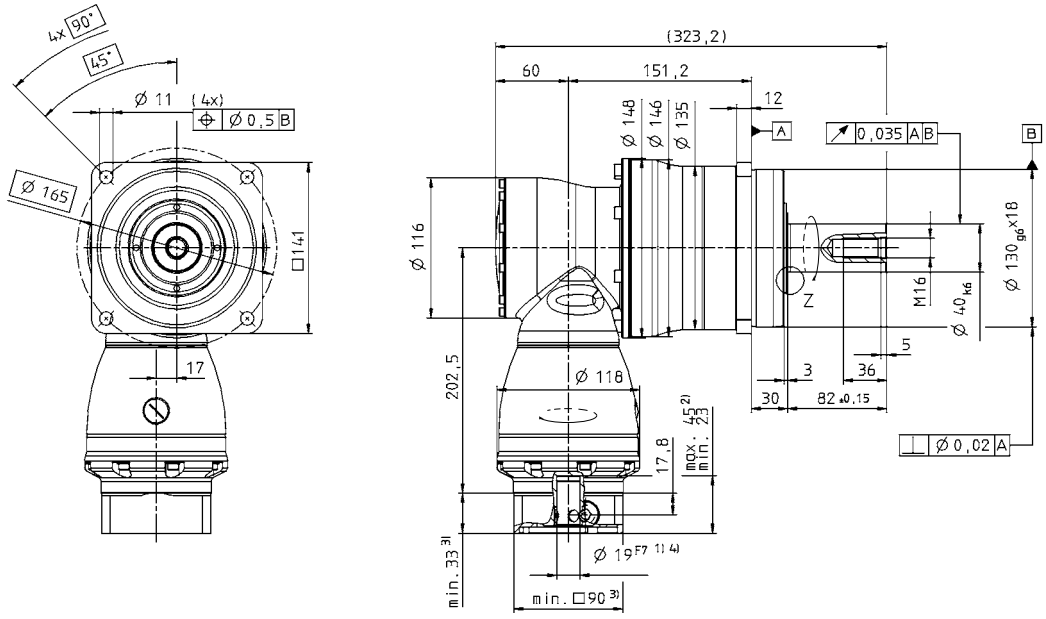
[a)] Other ratios up to i=1000 available on request
[b)] Higher speeds are possible if the nominal torque is reduced
[c)] For higher ambient temperatures, please reduce input speed
[d)] Idling torques decrease during operation
[e)] Refers to center of the output shaft or flange

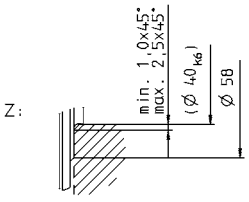
All technical data for front output side applies.
Technical data for rearward output versions, see page 428.

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

View A

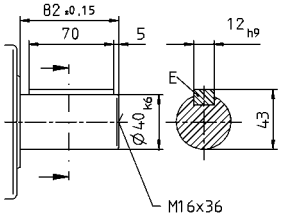
3-stage:



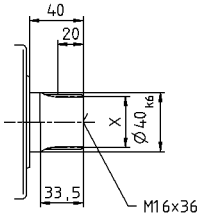


Alternatives: Output shaft variants

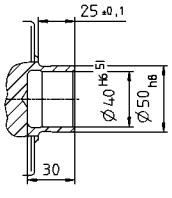
Keywayed output shaft in mm
E = key as per DIN 6885, sheet 1, form A



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

				2-stage									
Ratio [a]			*i*	**12**	**16**	**20**	**25**	**28**	**35**	**40**	**50**	**70**	**100**
Max. acceleration torque (max. 1000 cycles per hour)			T_{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 n_{1N})			T_{2N} Nm	750	750	750	750	750	750	640	750	750	750
			in.lb	6638	6638	6638	6638	6638	6638	5664	6638	6638	6638
Emergency stop torque (permitted 1000 times during the service life of the gearhead)			T_{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 T_{2N} and 20°C ambient temperature) [b), c)]			n_{1N} rpm	1600	1900	1900	2100	1900	2100	2100	2100	2100	2100
Max. continuous speed (with 20% T_{2N} and 20°C ambient temperature)			n_{1Ncym} rpm	2300	2600	2600	2800	2600	3000	3000	3000	3000	3000
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	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
Max. torsional backlash			j_t arcmin	Standard ≤ 4 / Reduced ≤ 2									
Torsional rigidity			C_{t21} Nm/ arcmin	175									
			in.lb/ arcmin	1549									
Max. axial force [e)]			F_{2AMax} N	14150									
			lb_f	3184									
Max. radial force [e)]			F_{2RMax} N	14700									
			lb_f	3308									
Max. tilting moment			M_{2KMax} Nm	1600									
			in.lb	14160									
Efficiency at full load			η %	94									
Service life (For calculation, see the Chapter "Information")			L_h h	> 20000									
Weight incl. standardadapter plate			*m* kg	45									
			lb_m	99									
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				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 kgcm²	24.7	19.5	19.0	16.3	18.6	14.0	12.9	12.8	12.7	12.7
			10^{-3} in.lb.s²	21.9	17.2	16.8	14.4	16.5	12.4	11.4	11.3	11.3	11.2

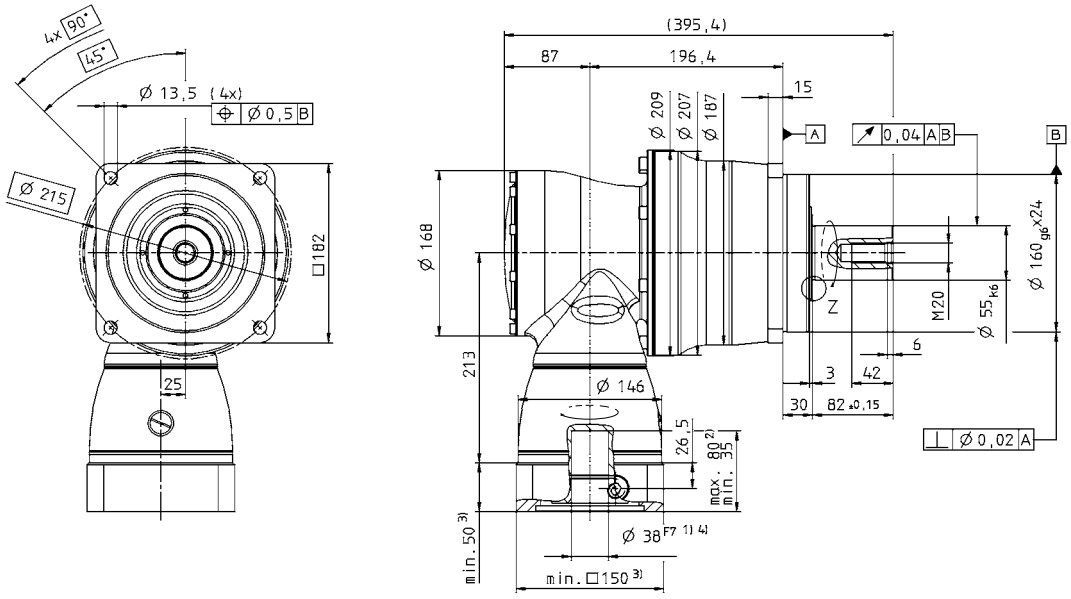
[a)] Other ratios up to i=1000 available on request
[b)] Higher speeds are possible if the nominal torque is reduced
[c)] For higher ambient temperatures, please reduce input speed
[d)] Idling torques decrease during operation
[e)] Refers to center of the output shaft or flange

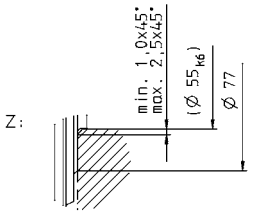
All technical data for front output side applies.
Technical data for rearward output versions, see page 428.

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

View A

2-stage:



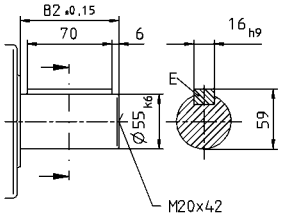


Right-angle gearheads
High End

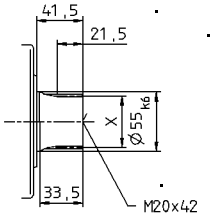
SPK+

Alternatives: Output shaft variants

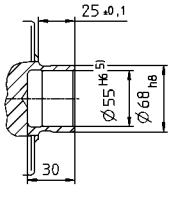
Keywayed output shaft in mm
E = key as per DIN 6885, sheet 1, form A



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

					3-stage													
Ratio [a]			*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	1100	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	7434	9293	9735	7788
Nominal output torque (with n_{1N})			T_{2N}	Nm	750	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	5664	6638	6638	6638
Emergency stop torque (permitted 1000 times during the service life of the gearhead)			T_{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	24338	17700	14160	17700	24338	19470
Nominal input speed (with T_{2N} and 20°C ambient temperature) [b), c)]			n_{1N}	rpm	2900	2900	2900	2900	2900	2900	2900	3200	2900	3200	3900	3900	3900	3900
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	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			j_t	arcmin	Standard ≤ 4 / Reduced ≤ 2													
Torsional rigidity			C_{t21}	Nm/ arcmin	175													
				in.lb/ arcmin	1549													
Max. axial force [e)]			F_{2AMax}	N	14150													
				lb_f	3184													
Max. radial force [e)]			F_{2RMax}	N	14700													
				lb_f	3308													
Max. tilting moment			M_{2KMax}	Nm	1600													
				in.lb	14160													
Efficiency at full load			η	%	92													
Service life (For calculation, see the Chapter "Information")			L_h	h	> 20000													
Weight incl. standardadapter plate			*m*	kg	47.4													
				lb_m	104.8													
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	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	kgcm²	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.s²	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	J_1	kgcm²	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.s²	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

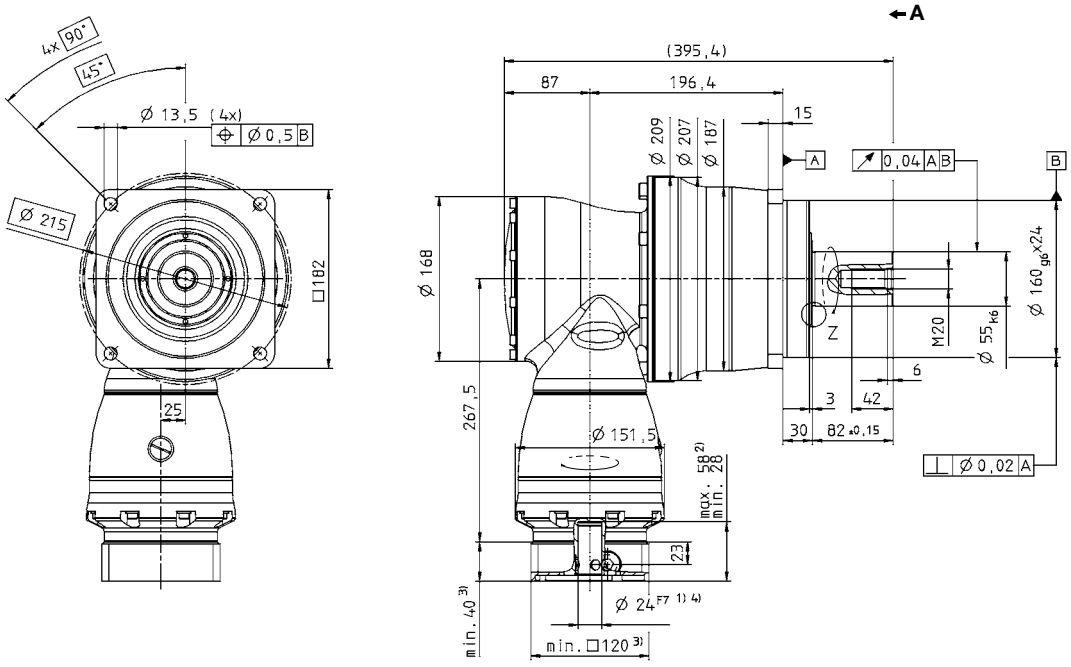
[a)] Other ratios up to i=1000 available on request
[b)] Higher speeds are possible if the nominal torque is reduced
[c)] For higher ambient temperatures, please reduce input speed
[d)] Idling torques decrease during operation
[e)] Refers to center of the output shaft or flange

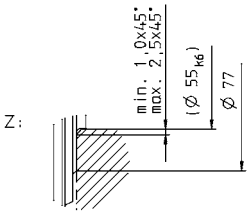
All technical data for front output side applies.
Technical data for rearward output versions, see page 428.

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

View A

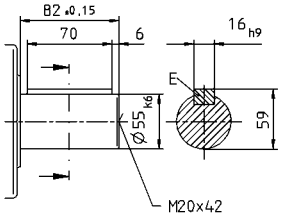
3-stage:



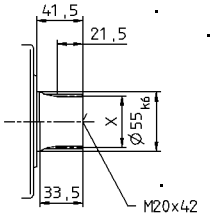


Alternatives: Output shaft variants

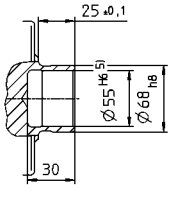
Keywayed output shaft in mm
E = key as per DIN 6885, sheet 1, form A



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

			2-stage									
Ratio [a]	*i*		**12**	**16**	**20**	**25**	**28**	**35**	**40**	**50**	**70**	**100**
Max. acceleration torque (max. 1000 cycles per hour)	T_{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 n_{1N})	T_{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)	T_{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 T_{2N} and 20°C ambient temperature) [b), c)]	n_{1N}	rpm	1500	1700	1700	1900	1700	1900	1700	1700	1700	1700
Max. continuous speed (with 20 % T_{2N} and 20°C ambient temperature)	n_{1Ncym}	rpm	1900	2300	2300	2700	2300	2700	2400	2400	2400	2400
Max. input speed	n_{1Max}	rpm	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000
Mean no load running torque (with n_1 = 3000 rpm and 20°C gearhead temperature) [d)]	T_{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	j_t	arcmin	Standard ≤4 / Reduced ≤2									
Torsional rigidity	C_{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)]	F_{2AMax}	N	30000									
		lb_f	6750									
Max. radial force [e)]	F_{2RMax}	N	21000									
		lb_f	4725									
Max. tilting moment	M_{2KMax}	Nm	3100									
		in.lb	27435									
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	82									
		lb_m	181									
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]** M 48	J_1	$kgcm^2$	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

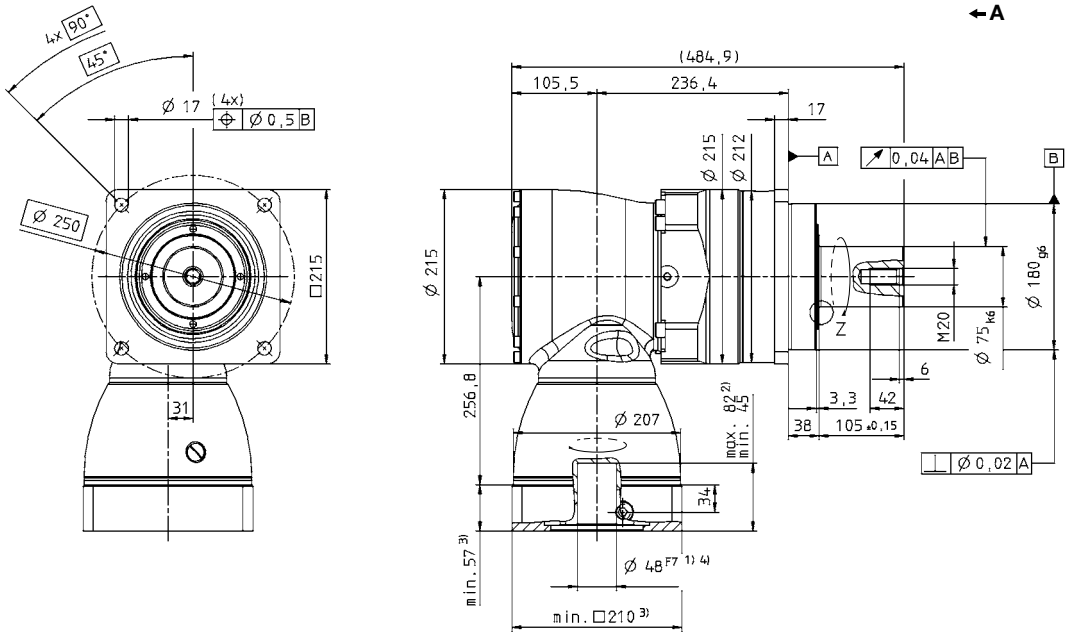
[a)] Other ratios available on request
[b)] Higher speeds are possible if the nominal torque is reduced
[c)] For higher ambient temperatures, please reduce input speed
[d)] Idling torques decrease during operation
[e)] Refers to center of the output shaft or flange

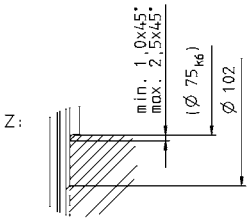
All technical data for front output side applies.
Technical data for rearward output versions, see page 428.

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

View A

2-stage:



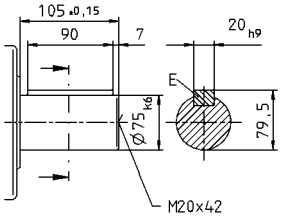


Right-angle gearheads
High End

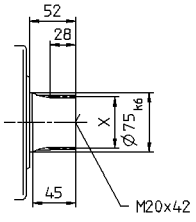
SPK+

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 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

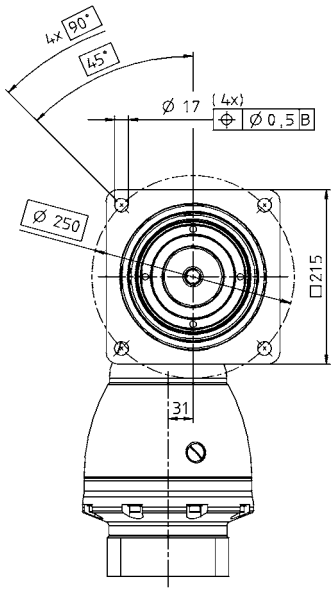
				3-stage													
Ratio [a]			*i*	**64**	**84**	**100**	**125**	**140**	**175**	**200**	**250**	**280**	**350**	**400**	**500**	**700**	**1000**
Max. acceleration torque (max. 1000 cycles per hour)			T_{2B} Nm	2400	2400	2500	2500	2500	2500	2500	2500	2400	2400	1900	2350	2400	1900
			T_{2B} in.lb	21240	21240	22125	22125	22125	22125	22125	22125	21240	21240	16815	20798	21240	16815
Nominal output torque (with n_{1N})			T_{2N} Nm	1500	1500	1500	1500	1500	1500	1500	1500	1400	1400	1500	1500	1400	1000
			T_{2N} 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)			T_{2Not} Nm	4200	3600	5200	5200	5200	5200	5200	5200	5200	5200	3600	4500	5200	5000
			T_{2Not} in.lb	37170	31860	46020	46020	46020	46020	46020	46020	46020	46020	31860	39825	46020	44250
Nominal input speed (with T_{2N} and 20°C ambient temperature) [b), c)]			n_{1N} rpm	2700	2700	2700	2700	2700	2700	2700	2900	2700	2900	3400	3400	3400	3400
Max. continuous speed (with 20 % T_{2N} and 20°C ambient temperature)			n_{1Ncym} rpm	3500	3500	3500	3500	3500	3500	3500	3500	3500	3500	3500	3500	3800	3800
Max. input speed			n_{1Max} rpm	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000
Mean no load running torque (with n_1 = 3000 rpm and 20°C gearhead temperature) [d)]			T_{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
			T_{012} 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			j_t arcmin	Standard ≤4 / Reduced ≤2													
Torsional rigidity			C_{t21} Nm/ arcmin	300	300	300	300	300	300	300	300	300	300	300	300	300	300
			C_{t21} 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)]			F_{2AMax} N	30000													
			F_{2AMax} lb_f	6750													
Max. radial force [e)]			F_{2RMax} N	21000													
			F_{2RMax} lb_f	4725													
Max. tilting moment			M_{2KMax} Nm	3100													
			M_{2KMax} in.lb	27435													
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	86													
			m lb_m	190													
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 kgcm²	14.00	10.90	12.30	12.00	10.90	10.70	10.10	10.00	10.10	10.00	9.90	9.90	9.90	9.90
			J_1 10^{-3} in.lb.s²	12.39	9.65	10.89	10.62	9.65	9.47	8.94	8.85	8.94	8.85	8.76	8.76	8.76	8.76
	M	48	J_1 kgcm²	28.70	25.60	27.10	26.70	26.70	25.60	24.80	24.70	24.80	24.70	24.60	24.60	24.60	24.60
			J_1 10^{-3} in.lb.s²	25.40	22.66	23.98	23.63	23.63	22.66	21.95	21.86	21.95	21.86	21.77	21.77	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

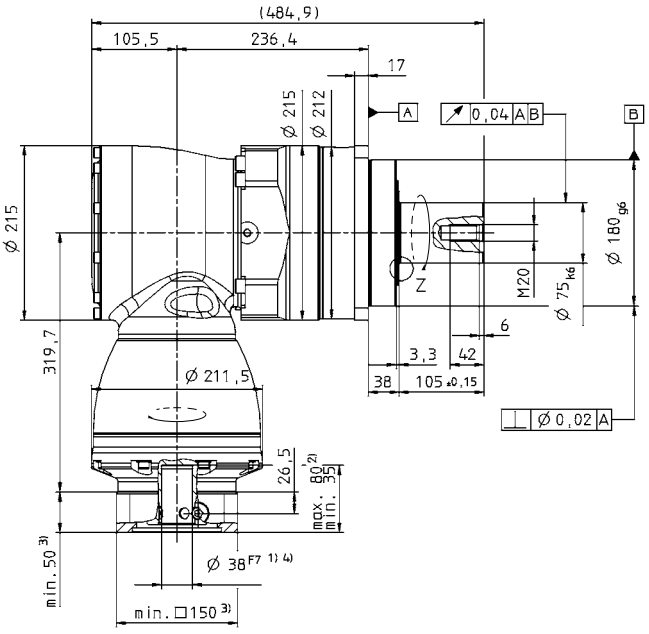
All technical data for front output side applies.
Technical data for rearward output versions, see page 428.

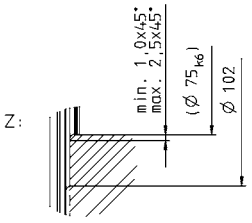
Please contact us for information on the best configuration for S1 conditions of use (continuous operation).

3-stage:



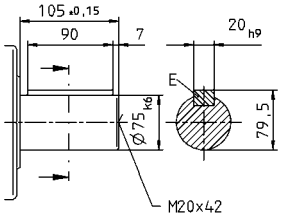
←A



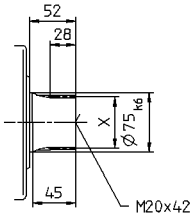


Alternatives: Output shaft variants

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



Involute gearing DIN 5480 in mm
X = W 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

			3-stage													
Ratio [a]	i		**48**	**64**	**100**	**125**	**140**	**175**	**200**	**250**	**280**	**350**	**400**	**500**	**700**	**1000**
Max. acceleration torque (max. 1000 cycles per hour)	T_{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 n_{1N})	T_{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)	T_{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 T_{2N} and 20°C ambient temperature) [b), c)]	n_{1N}	rpm	1800	1900	1900	2100	1900	2100	2100	2100	2100	2100	2100	2100	2100	2100
Max. continuous speed (with 20 % T_{2N} and 20°C ambient temperature)	n_{1Ncym}	rpm	2000	2200	2600	2600	2300	2300	2300	2300	2300	2300	2300	2300	2300	2300
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	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	j_t	arcmin	Standard ≤ 5,5 / Reduced ≤ 3,5													
Torsional rigidity	C_{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)]	F_{2AMax}	N	33000													
		lb_f	7425													
Max. radial force [e)]	F_{2RMax}	N	30000													
		lb_f	6750													
Max. tilting moment	M_{2KMax}	Nm	5000													
		in.lb	44250													
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	93													
		lb_m	206													
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	$kgcm^2$	26.5	20.00	17.00	17.00	15.00	15.00	13.00	13.00	13.00	13.00	13.00	13.00	13.00	13.00
		10^{-3} in.lb.s²	23.40	17.70	15.05	15.05	13.28	13.28	11.51	11.51	11.51	11.51	11.51	11.51	11.51	11.51

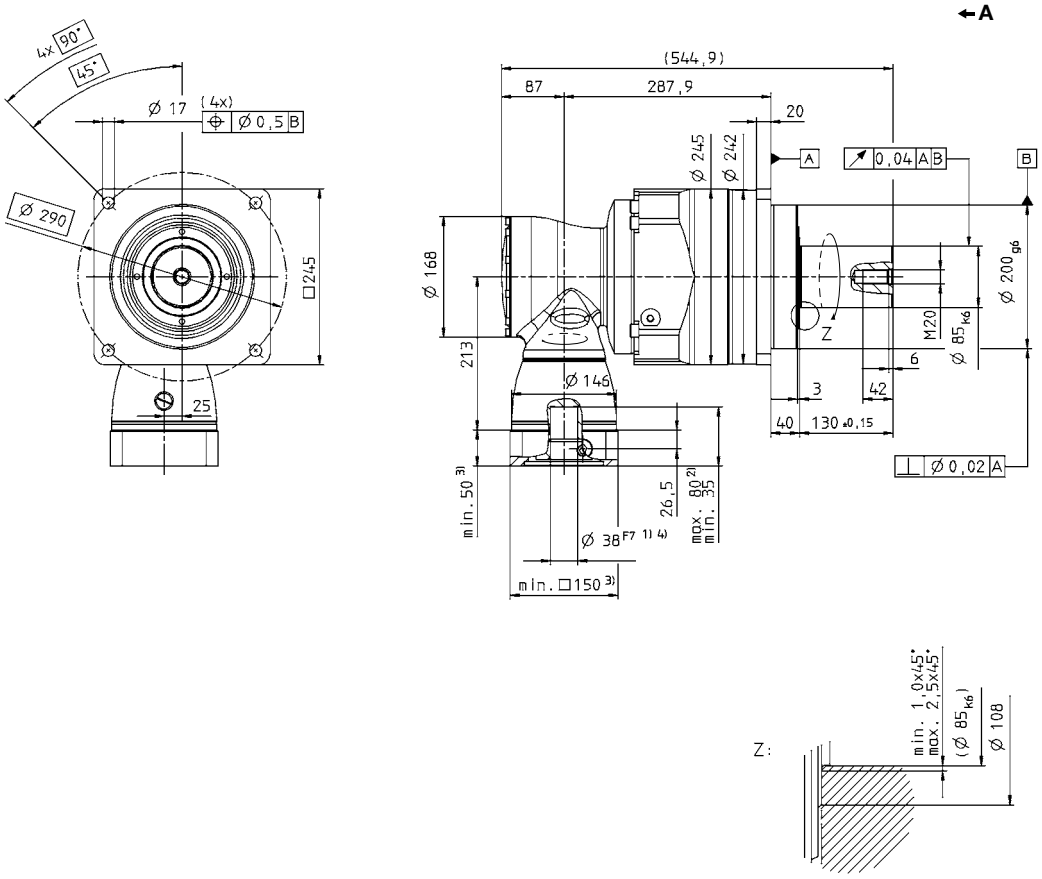
[a)] Other ratios available on request
[b)] Higher speeds are possible if the nominal torque is reduced
[c)] For higher ambient temperatures, please reduce input speed
[d)] Idling torques decrease during operation
[e)] Refers to center of the output shaft or flange

All technical data for front output side applies.
Technical data for rearward output versions, see page 428.

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

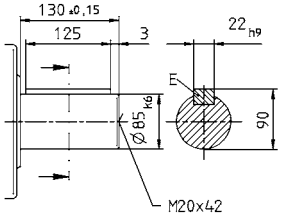
View A

3-stage:

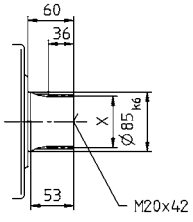


Alternatives: Output shaft variants

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*	**144**	**192**	**256**	**300**	**375**	**420**	**500**	**560**	**600**	**700**	**800**	**875**	**1000**
Max. acceleration torque (max. 1000 cycles per hour)			T_{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
Nominal output torque (with n_{1N})			T_{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
Emergency stop torque (permitted 1000 times during the service life of the gearhead)			T_{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
Nominal input speed (with T_{2N} and 20°C ambient temperature) [b), c)]			n_{1N} rpm	2700	2900	2900	2900	2900	2900	2900	2900	2900	2900	2900	2900	3200
Max. continuous speed (with 20 % T_{2N} and 20°C ambient temperature)			n_{1Ncym} rpm	3800	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4200
Max. input speed			n_{1Max} rpm	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	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			j_t arcmin	Standard ≤5,5 / Reduced ≤3,5												
Torsional rigidity			C_{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)]			F_{2AMax} N	33000												
			lb_f	7425												
Max. radial force [e)]			F_{2RMax} N	30000												
			lb_f	6750												
Max. tilting moment			M_{2KMax} Nm	5000												
			in.lb	44250												
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	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]	G	24	J_1 kgcm²	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.s²	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	J_1 kgcm²	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.s²	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

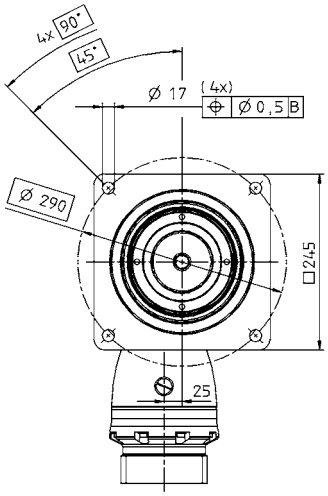
[a)] Other ratios available on request
[b)] Higher speeds are possible if the nominal torque is reduced
[c)] For higher ambient temperatures, please reduce input speed
[d)] Idling torques decrease during operation
[e)] Refers to center of the output shaft or flange

All technical data for front output side applies.
Technical data for rearward output versions, see page 428.

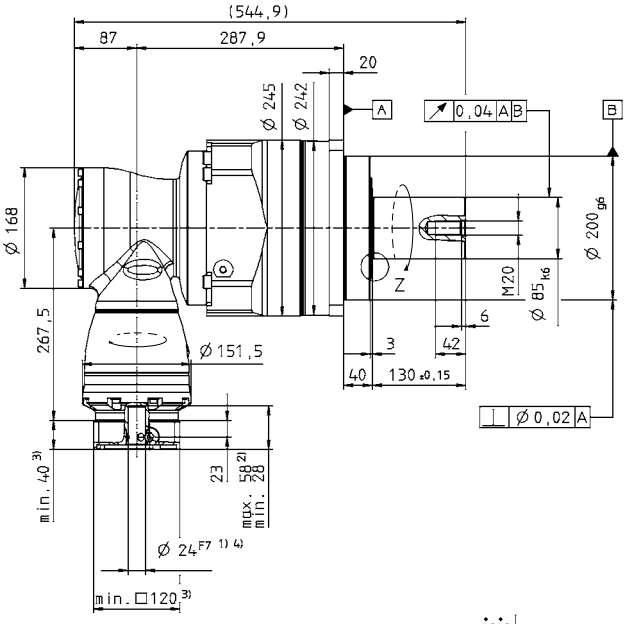
Please contact us for information on the best configuration for S1 conditions of use (continuous operation).

View A

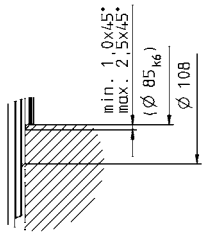
4-stage:



←A

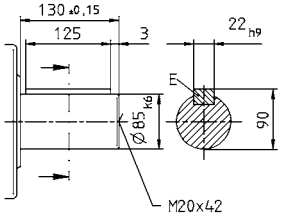


Z:

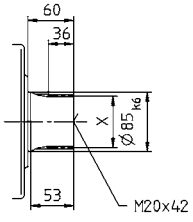


Alternatives: Output shaft variants

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*	**1225**	**1400**	**1750**	**2000**	**2800**	**3500**	**5000**	**7000**	**10000**
Max. acceleration torque (max. 1000 cycles per hour)			T_{2B} Nm	4500	4500	4500	4200	4300	4500	4300	4300	3400
			T_{2B} in.lb	39825	39825	39825	37170	38055	39825	38055	38055	30090
Nominal output torque (with n_{1N})			T_{2N} Nm	2500	2500	2500	2500	2300	2500	2500	2300	1700
			T_{2N} in.lb	22125	22125	22125	22125	20355	22125	22125	20355	15045
Emergency stop torque (permitted 1000 times during the service life of the gearhead)			T_{2Not} Nm	8500	8500	8500	8000	8500	8500	8500	8500	6800
			T_{2Not} in.lb	75225	75225	75225	70800	75225	75225	75225	75225	60180
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	0.3	0.3
			T_{012} in.lb	5.3	5.3	3.5	3.5	3.5	3.5	3.5	2.7	2.7
Max. torsional backlash			j_t arcmin	Standard ≤ 5,5 / Reduced ≤ 3,5								
Torsional rigidity			C_{t21} Nm/ arcmin	510	510	510	510	510	510	510	510	510
			C_{t21} 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)]			F_{2AMax} N	33000								
			F_{2AMax} lb_f	7425								
Max. radial force [e)]			F_{2RMax} N	30000								
			F_{2RMax} lb_f	6750								
Max. tilting moment			M_{2KMax} Nm	5000								
			M_{2KMax} in.lb	44250								
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	96								
			m 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]	G	24	J_1 kgcm²	2.73	2.49	2.46	2.42	2.42	2.42	2.42	2.42	2.42
			J_1 10^{-3} in.lb.s²	2.42	2.20	2.17	2.14	2.14	2.14	2.14	2.14	2.14
	K	38	J_1 kgcm²	9.64	9.40	9.37	9.33	9.33	9.33	9.33	9.33	9.33
			J_1 10^{-3} in.lb.s²	8.53	8.32	8.29	8.26	8.26	8.26	8.26	8.26	8.26

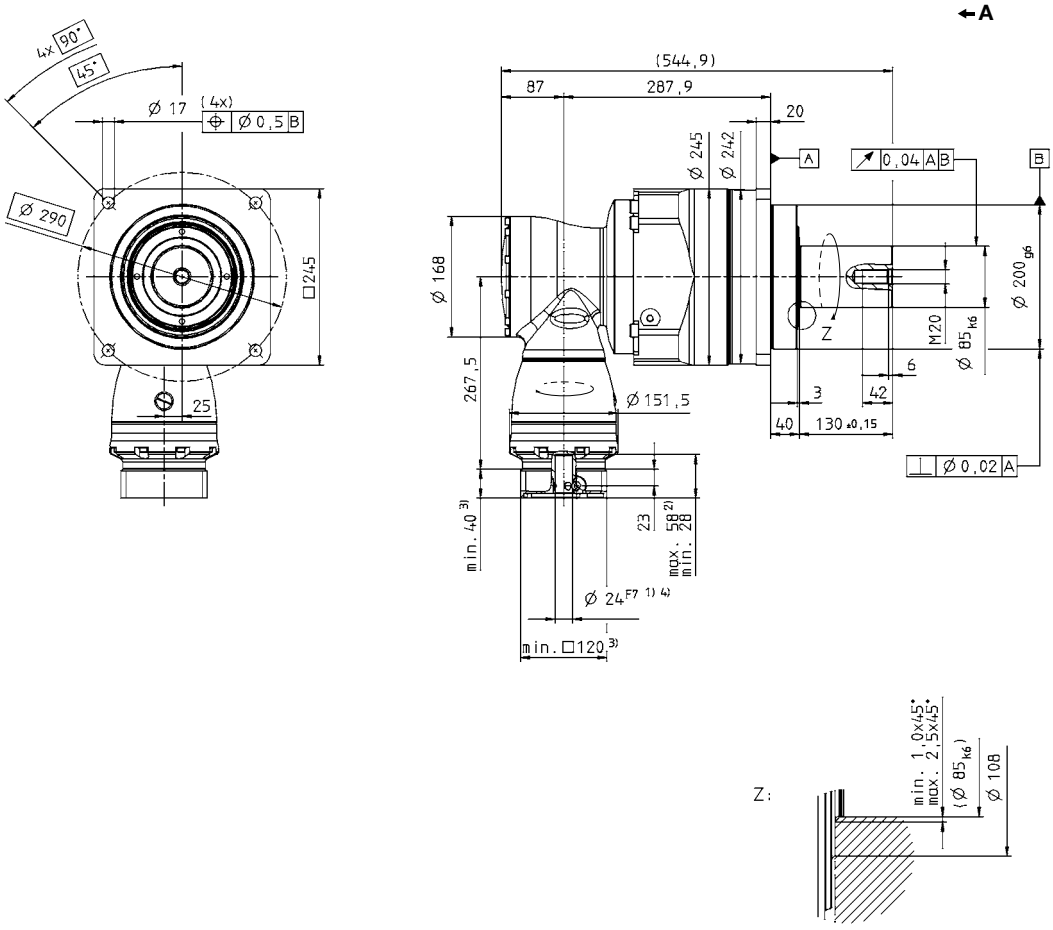
[a)] Other ratios available on request
[b)] Higher speeds are possible if the nominal torque is reduced
[c)] For higher ambient temperatures, please reduce input speed
[d)] Idling torques decrease during operation
[e)] Refers to center of the output shaft or flange

All technical data for front output side applies.
Technical data for rearward output versions, see page 428.

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

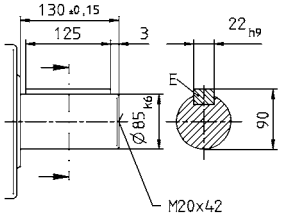
View A

4-stage:

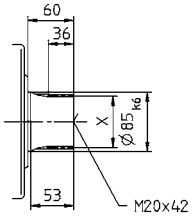


Alternatives: Output shaft variants

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

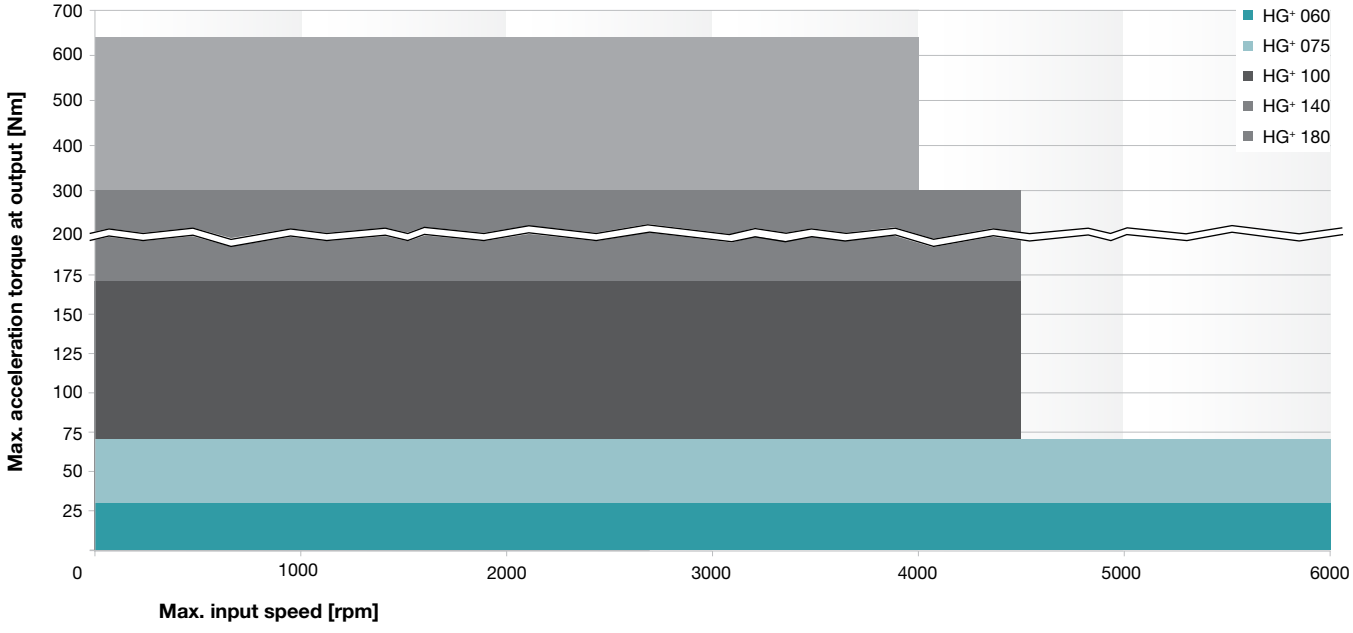
HG+ – Precise hollow shaft solution

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 ≤ 60%) or continuous operation (DC ≥ 60%)



Versions and Applications

Features	HG+ MF version page 250
Power density	• •
Positioning accuracy (e.g clamped drives)	• •
Highly dynamic applications	• •

Product features

Ratios [c]		3 – 100
Torsional backlash [arcmin] [c]	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

You can find order information for the relevant type of output on page 424.

HG+ 060 MF 1/2-stage

				1-stage					2-stage									
Ratio [a]			*i*	**3**	**4**	**5**	**7**	**10**	**12**	**16**	**20**	**25**	**28**	**35**	**40**	**50**	**70**	**100**
Max. acceleration torque (max. 1000 cycles per hour)			T_{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 n_{1N})			T_{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	177	133
Emergency stop torque (permitted 1000 times during the service life of the gearhead)			T_{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	398	354
Nominal input speed (with T_{2N} and 20°C ambient temperature) [b), c)]			n_{1N} rpm	2500	2700	3000	3000	3000	4400	4400	4400	4400	4400	4400	4400	4800	5500	5500
Max. continuous speed (with 20% T_{2N} and 20°C ambient temperature)			n_{1Ncym} rpm	3000	3500	4000	3500	3500	5000	5000	5000	5000	5000	5000	5000	5000	5500	5500
Max. input speed			n_{1Max} rpm	6000	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	1.3	1.2	1.1	1.3	1.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	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	0.9	0.9	0.9	0.9
Max. torsional backlash			j_t arcmin	≤ 5														
Torsional rigidity			C_{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	2.4	2.2	1.9
			in.lb/ arcmin	19	20	21	19	17	20	20	20	20	20	20	20	21	19	17
Max. axial force [e)]			F_{2AMax} N	2400														
			lb_f	540														
Max. radial force [e)]			F_{2RMax} N	2700														
			lb_f	608														
Max. tilting moment			M_{2KMax} Nm	251														
			in.lb	2220														
Efficiency at full load			η %	96					94									
Service life (For calculation, see the Chapter "Information")			L_h h	> 20000														
Weight incl. standard adapter plate			*m* kg	2.9					3.2									
			lb_m	6.4					7.1									
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	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)	B	11	J_1 kgcm²	–	–	–	–	–	0.09	0.09	0.07	0.07	0.06	0.06	0.06	0.06	0.06	0.06
			10^{-3} in.lb.s²						0.08	0.08	0.07	0.06	0.06	0.06	0.05	0.05	0.05	0.05
Clamping hub diameter [mm]	C	14	J_1 kgcm²	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	0.17
			10^{-3} in.lb.s²	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	0.15
	E	19	J_1 kgcm²	0.87	0.79	0.75	0.71	0.70	–	–	–	–	–	–	–	–	–	–
			10^{-3} in.lb.s²	0.77	0.70	0.66	0.63	0.62										

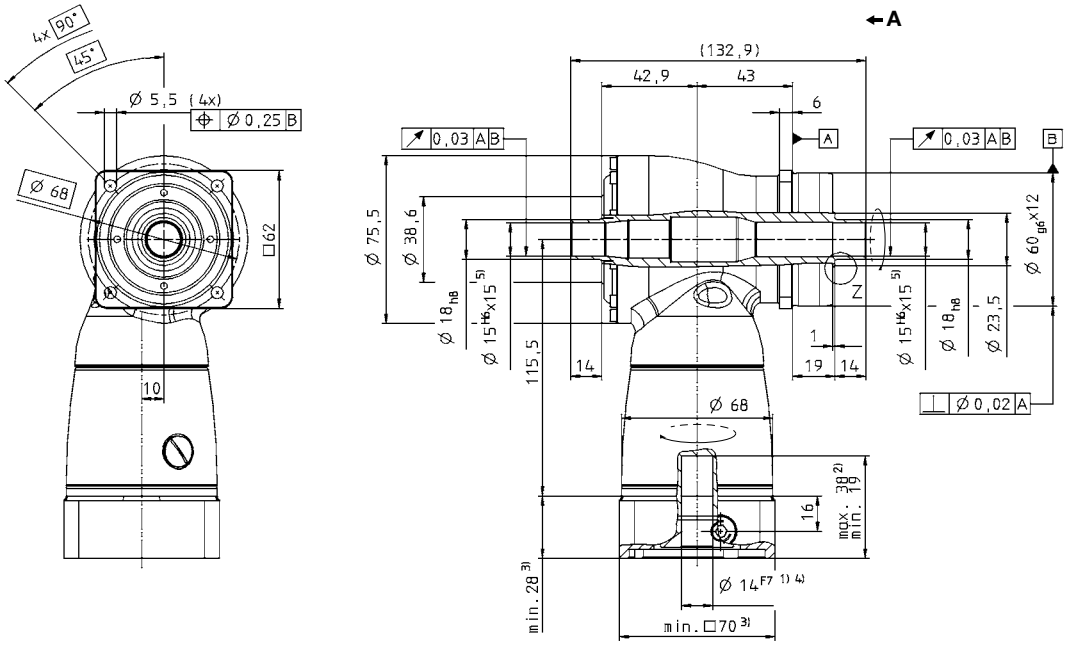
Please contact us for information on the best configuration for S1 conditions of use (continuous operation).

[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

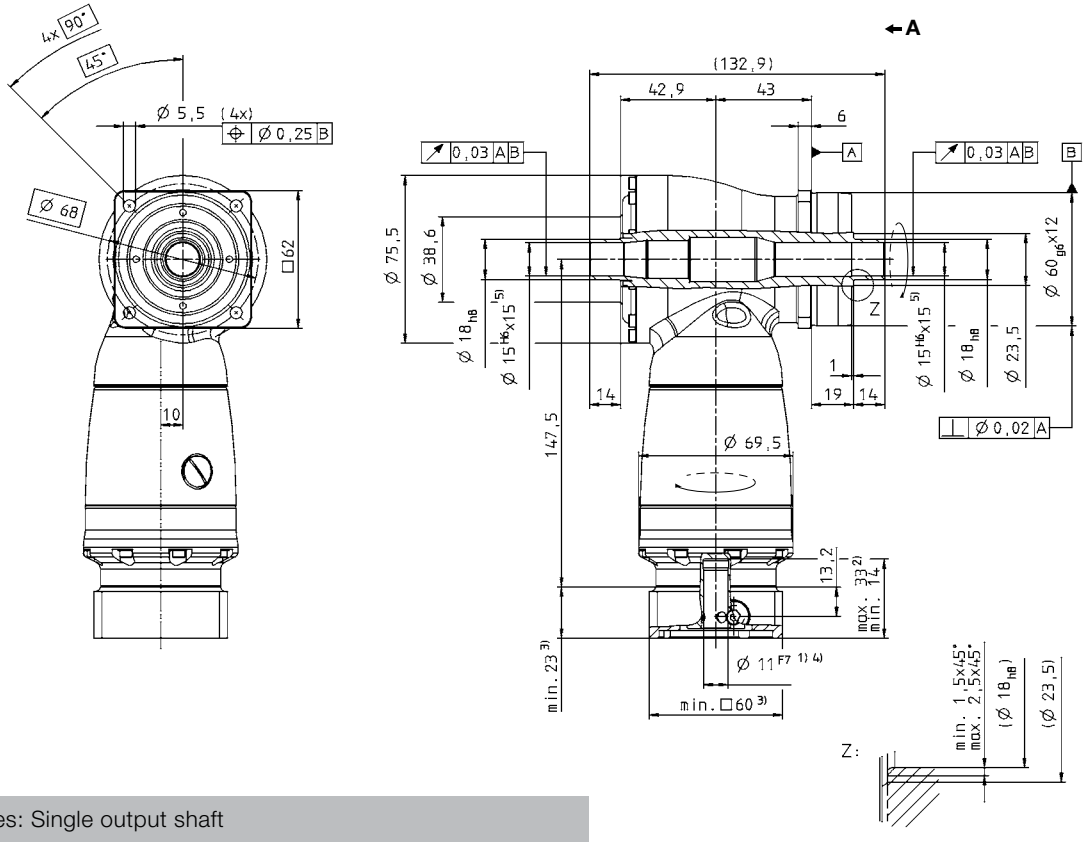
All technical data for front output side applies.
Technical data for rearward output versions, see page 428.

View A

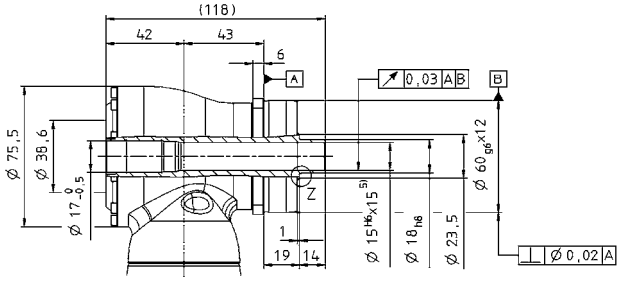
1-stage:



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

HG+ 075 MF 1/2-stage

					1-stage					2-stage									
Ratio [a]			*i*		**3**	**4**	**5**	**7**	**10**	**12**	**16**	**20**	**25**	**28**	**35**	**40**	**50**	**70**	**100**
Max. acceleration torque (max. 1000 cycles per hour)			T_{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	531	443
Nominal output torque (with n_{1N})			T_{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	398	354
Emergency stop torque (permitted 1000 times during the service life of the gearhead)			T_{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	974	885
Nominal input speed (with T_{2N} and 20°C ambient temperature) [b), c)]			n_{1N}	rpm	2300	2500	2800	2800	2800	3500	3500	3500	3500	3500	3500	3500	3800	4500	4500
Max. continuous speed (with 20?% T_{2N} and 20°C ambient temperature)			n_{1Ncym}	rpm	3000	3500	4000	3500	3500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500
Max. input speed			n_{1Max}	rpm	6000	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	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	0.9	0.9	0.9	0.9
Max. torsional backlash			j_t	arcmin	≤ 4														
Torsional rigidity			C_{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	6.7	6.6	6.5
				in.lb/ arcmin	47	52	60	58	57	52	52	52	52	52	52	52	59	58	58
Max. axial force [e)]			F_{2AMax}	N	3400														
				lb_f	765														
Max. radial force [e)]			F_{2RMax}	N	4000														
				lb_f	900														
Max. tilting moment			M_{2KMax}	Nm	437														
				in.lb	3867														
Efficiency at full load			η	%	96					94									
Service life (For calculation, see the Chapter "Information")			L_h	h	> 20000														
Weight incl. standard adapter plate			*m*	kg	4.8					5.1									
				lb_m	10.6					11.3									
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]	C	14	J_1	kgcm²	–	–	–	–	–	0.28	0.27	0.23	0.23	0.20	0.20	0.18	0.18	0.18	0.18
				10^{-3} in.lb.s²						0.25	0.24	0.21	0.20	0.18	0.18	0.16	0.16	0.16	0.16
	E	19	J_1	kgcm²	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.s²	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	J_1	kgcm²	2.86	2.60	2.47	2.36	2.31	–	–	–	–	–	–	–	–	–	–
				10^{-3} in.lb.s²	2.53	2.30	2.19	2.09	2.04										

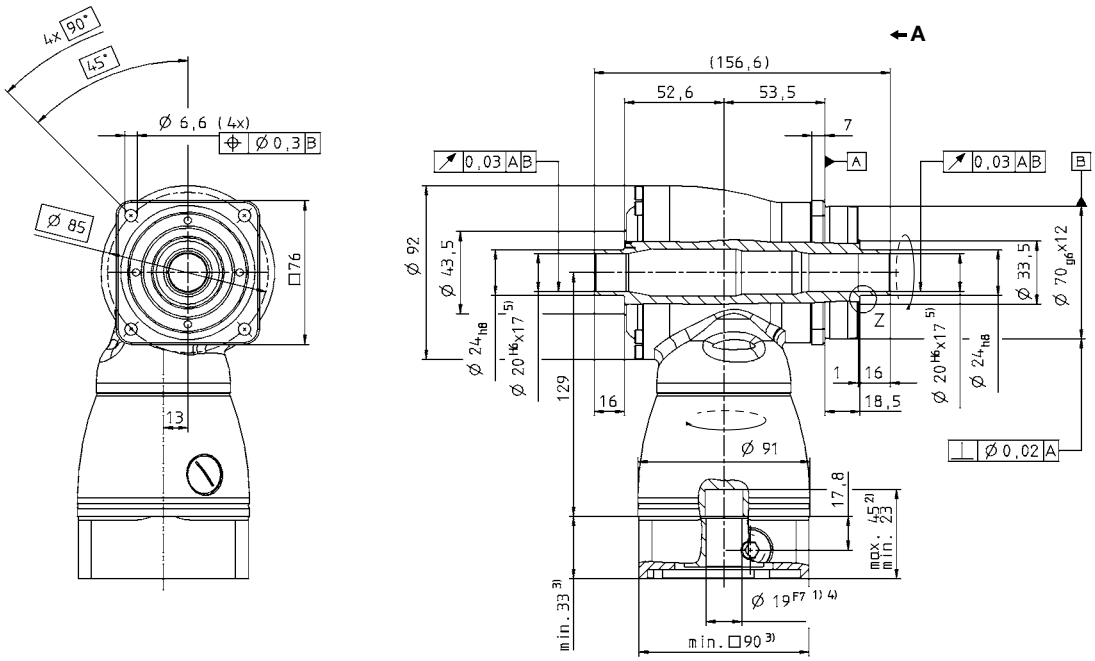
Please contact us for information on the best configuration for S1 conditions of use (continuous operation).

[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

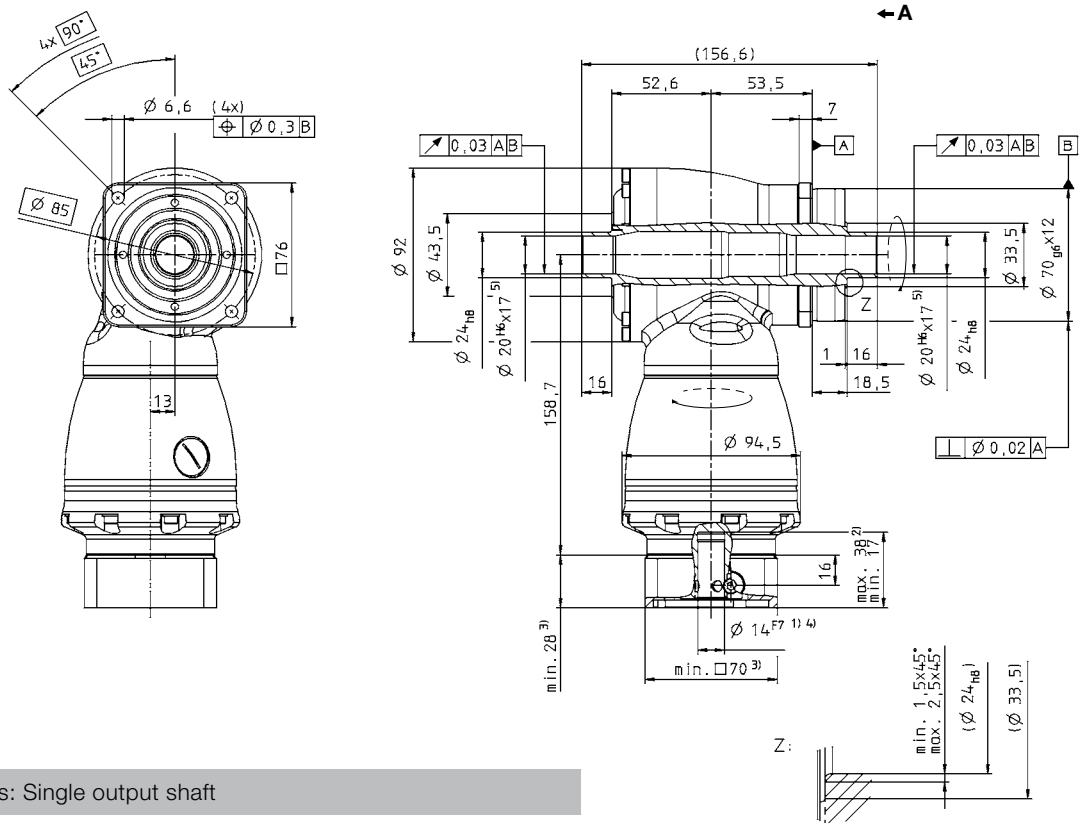
All technical data for front output side applies.
Technical data for rearward output versions, see page 428.

View A

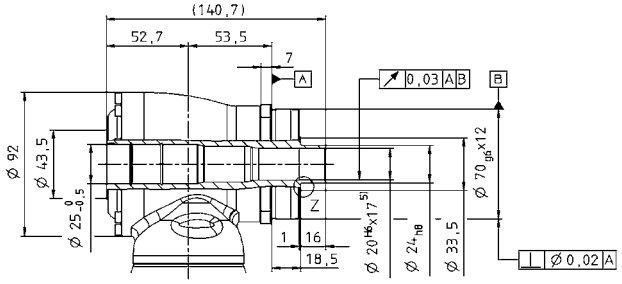
1-stage:



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

HG+ 100 MF 1/2-stage

					1-stage					2-stage									
Ratio [a]			*i*		**3**	**4**	**5**	**7**	**10**	**12**	**16**	**20**	**25**	**28**	**35**	**40**	**50**	**70**	**100**
Max. acceleration torque (max. 1000 cycles per hour)			T_{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 n_{1N})			T_{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)			T_{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 T_{2N} and 20°C ambient temperature) [b), c)]			n_{1N}	rpm	2200	2400	2700	2500	2500	3100	3100	3100	3100	3100	3100	3100	3500	4200	4200
Max. continuous speed (with 20% T_{2N} and 20°C ambient temperature)			n_{1Ncym}	rpm	3000	3400	3800	3400	3400	4000	4000	4000	4000	4000	4000	4000	4000	4200	4200
Max. input speed			n_{1Max}	rpm	4500	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	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			j_t	arcmin	≤ 4														
Torsional rigidity			C_{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)]			F_{2AMax}	N	5700														
				lb_f	1283														
Max. radial force [e)]			F_{2RMax}	N	6300														
				lb_f	1418														
Max. tilting moment			M_{2KMax}	Nm	833														
				in.lb	7370														
Efficiency at full load			η	%	96					94									
Service life (For calculation, see the Chapter "Information")			L_h	h	> 20000														
Weight incl. standard adapter plate			*m*	kg	9.3					9.5									
				lb_m	21					21									
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]	E	19	J_1	kgcm²	–	–	–	–	–	1.02	0.97	0.86	0.84	0.75	0.74	0.69	0.69	0.68	0.68
				10^{-3} in.lb.s²						0.91	0.86	0.76	0.74	0.66	0.66	0.61	0.61	0.60	0.60
	G	24	J_1	kgcm²	–	–	–	–	–	2.59	2.54	2.42	2.40	2.31	2.30	2.26	2.25	2.25	2.25
				10^{-3} in.lb.s²						2.29	2.25	2.14	2.13	2.05	2.04	2.00	1.99	1.99	1.99
	H	28	J_1	kgcm²	4.64	3.80	3.34	2.98	2.79	–	–	–	–	–	–	–	–	–	–
				10^{-3} in.lb.s²	4.10	3.36	2.95	2.64	2.47										
	K	38	J_1	kgcm²	11.8	11.0	10.6	10.2	10.0	–	–	–	–	–	–	–	–	–	–
				10^{-3} in.lb.s²	10.4	9.73	9.34	9.04	8.88										

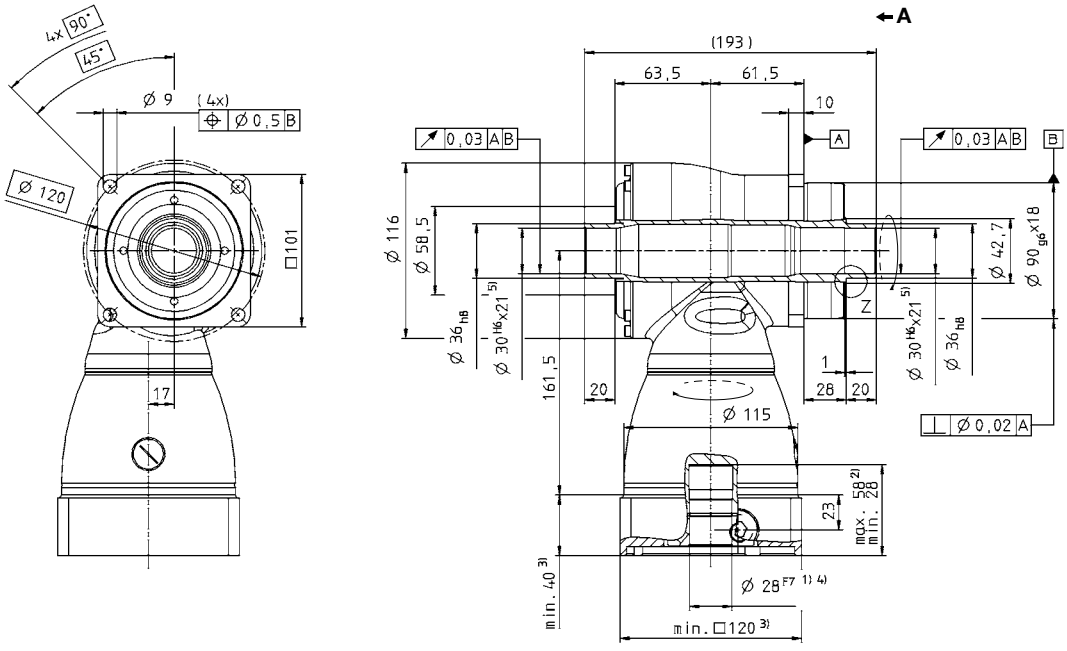
Please contact us for information on the best configuration for S1 conditions of use (continuous operation).

[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

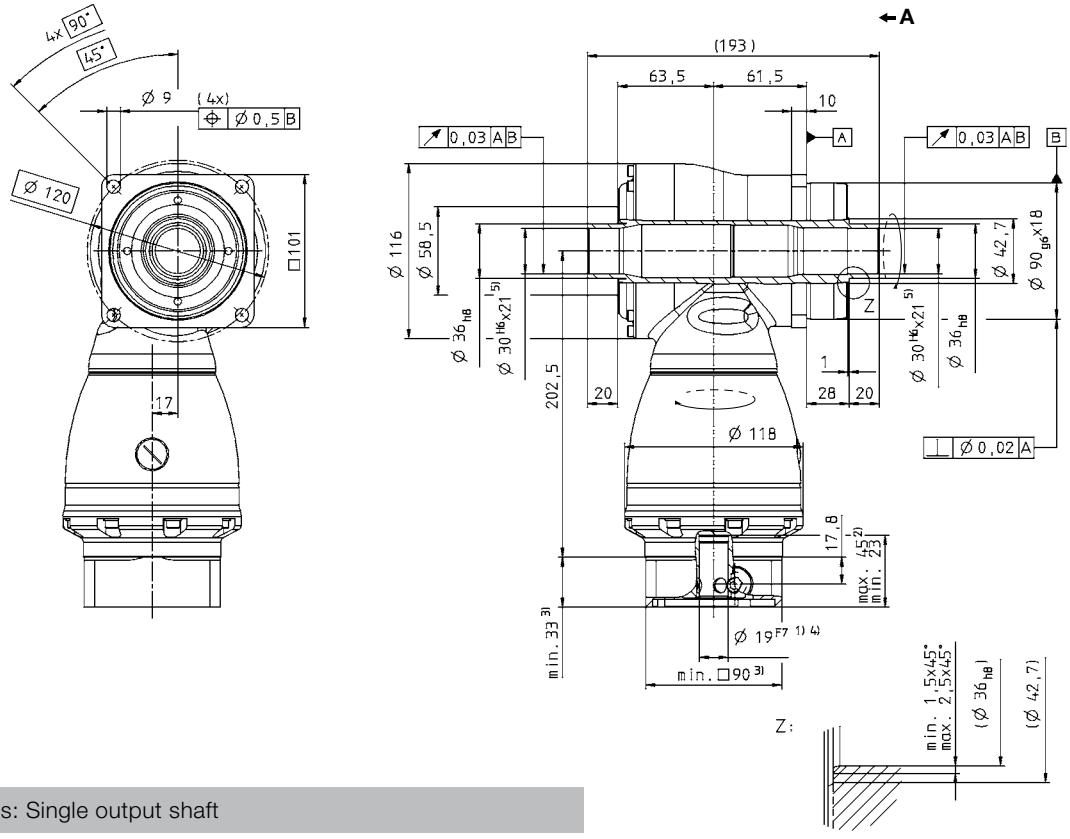
All technical data for front output side applies.
Technical data for rearward output versions, see page 428.

View A

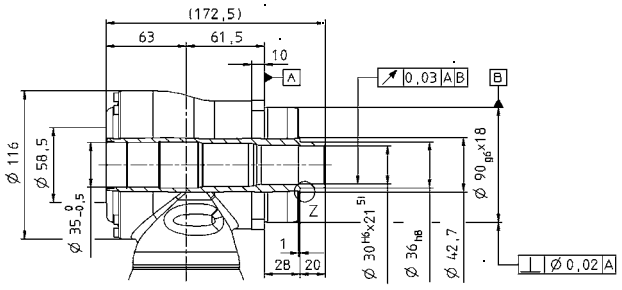
1-stage:



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

HG+ 140 MF 1/2-stage

				1-stage					2-stage									
Ratio [a]			*i*	**3**	**4**	**5**	**7**	**10**	**12**	**16**	**20**	**25**	**28**	**35**	**40**	**50**	**70**	**100**
Max. acceleration torque (max. 1000 cycles per hour)			T_{2B} Nm	300	300	300	250	210	300	300	300	300	300	300	300	300	250	210
			T_{2B} in.lb	2655	2655	2655	2213	1859	2655	2655	2655	2655	2655	2655	2655	2655	2213	1859
Nominal output torque (with n_{1N})			T_{2N} Nm	190	190	190	175	160	190	190	190	190	190	190	190	190	175	160
			T_{2N} in.lb	1682	1682	1682	1549	1416	1682	1682	1682	1682	1682	1682	1682	1682	1549	1416
Emergency stop torque (permitted 1000 times during the service life of the gearhead)			T_{2Not} Nm	400	500	500	450	400	500	500	500	500	500	500	500	500	450	400
			T_{2Not} in.lb	3540	4425	4425	3983	3540	4425	4425	4425	4425	4425	4425	4425	4425	3983	3540
Nominal input speed (with T_{2N} and 20°C ambient temperature) [b), c)]			n_{1N} rpm	1900	2000	2200	2000	2000	2900	2900	2900	2900	2900	2900	2900	3200	3200	3900
Max. continuous speed (with 20% T_{2N} and 20°C ambient temperature)			n_{1Ncym} rpm	2500	2800	3100	2800	2800	4000	4000	4000	4000	4000	4000	4000	4200	4200	4200
Max. input speed			n_{1Max} rpm	4500	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	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
			T_{012} 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			j_t arcmin	≤ 4														
Torsional rigidity			C_{t21} Nm/ arcmin	32	36	41	39	38	36	36	36	36	36	36	36	41	39	38
			C_{t21} in.lb/ arcmin	287	321	360	346	337	319	319	319	319	319	319	319	363	345	336
Max. axial force [e)]			F_{2AMax} N	9900														
			F_{2AMax} lb_f	2228														
Max. radial force [e)]			F_{2RMax} N	9500														
			F_{2RMax} lb_f	2138														
Max. tilting moment			M_{2KMax} Nm	1692														
			M_{2KMax} in.lb	14974														
Efficiency at full load			η %	96					94									
Service life (For calculation, see the Chapter "Information")			L_h h	> 20000														
Weight incl. standardadapter plate			*m* kg	22.6					24									
			m lb_m	50					53									
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)	G	24	J_1 kgcm²	–	–	–	–	–	4.20	3.84	3.27	3.16	2.78	2.73	2.48	2.45	2.43	2.42
			J_1 10^{-3} in.lb.s²						3.71	3.40	2.90	2.80	2.46	2.41	2.20	2.17	2.15	2.14
Clamping hub diameter [mm]	K	38	J_1 kgcm²	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
			J_1 10^{-3} in.lb.s²	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

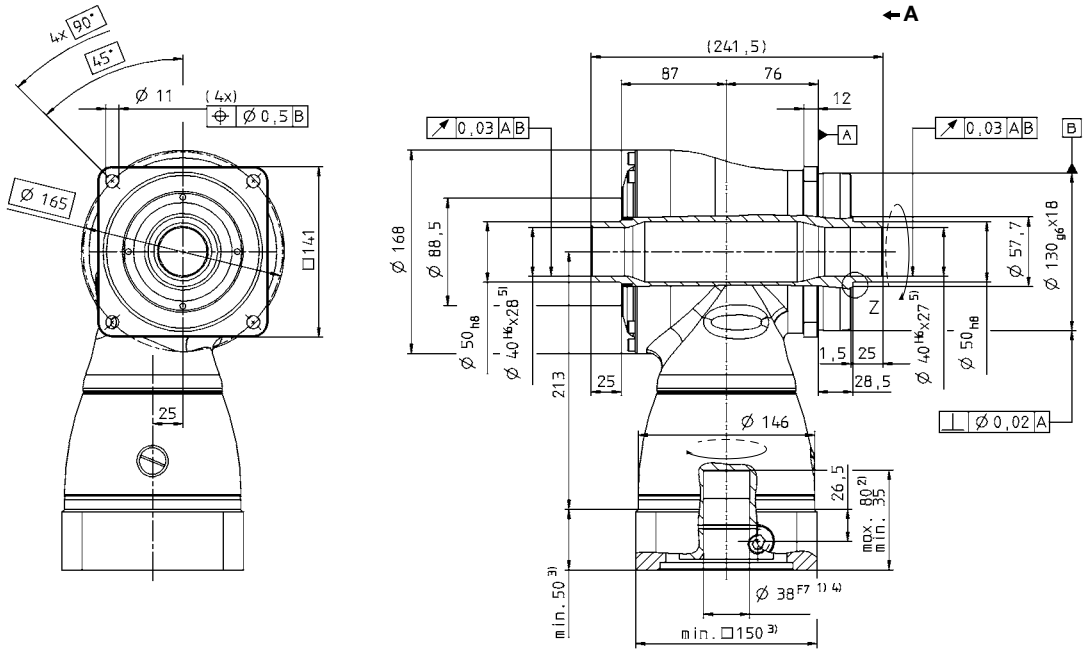
Please contact us for information on the best configuration for S1 conditions of use (continuous operation).

[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

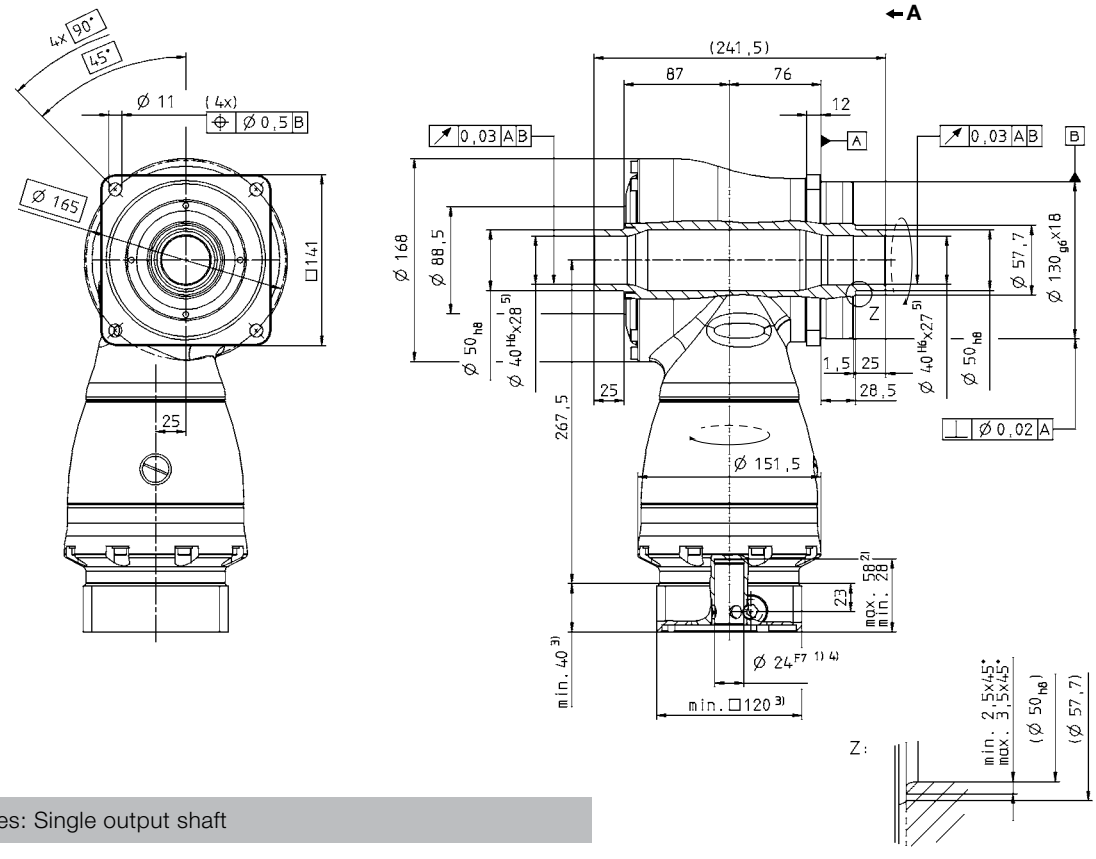
All technical data for front output side applies.
Technical data for rearward output versions, see page 428.

View A

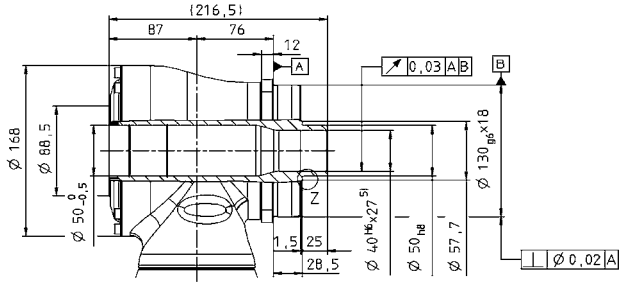
1-stage:



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

HG+ 180 MF 1/2-stage

				1-stage					2-stage									
Ratio [a]			*i*	**3**	**4**	**5**	**7**	**10**	**12**	**16**	**20**	**25**	**28**	**35**	**40**	**50**	**70**	**100**
Max. acceleration torque (max. 1000 cycles per hour)			T_{2B} Nm	640	640	640	550	470	640	640	640	640	640	640	640	640	550	470
			T_{2B} in.lb	5664	5664	5664	4868	4160	5664	5664	5664	5664	5664	5664	5664	5664	4868	4160
Nominal output torque (with n_{1N})			T_{2N} Nm	400	400	400	380	360	400	400	400	400	400	400	400	400	380	360
			T_{2N} in.lb	3540	3540	3540	3363	3186	3540	3540	3540	3540	3540	3540	3540	3540	3363	3186
Emergency stop torque (permitted 1000 times during the service life of the gearhead)			T_{2Not} Nm	900	1050	1050	970	900	1050	1050	1050	1050	1050	1050	1050	1050	970	900
			T_{2Not} in.lb	7965	9293	9293	8585	7965	9293	9293	9293	9293	9293	9293	9293	9293	8585	7965
Nominal input speed (with T_{2N} and 20°C ambient temperature) [b), c)]			n_{1N} rpm	1600	1800	2000	1800	1800	2700	2700	2700	2700	2700	2700	2700	2900	3200	3400
Max. continuous speed (with 20% T_{2N} and 20°C ambient temperature)			n_{1Ncym} rpm	2000	2400	2800	2500	2500	3500	3500	3500	3500	3500	3500	3500	3500	3800	3800
Max. input speed			n_{1Max} rpm	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000
Mean no load running torque (with n_1 = 3000 rpm and 20°C gearhead temperature) [d)]			T_{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
			T_{012} 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			j_t arcmin	≤ 4														
Torsional rigidity			C_{t21} Nm/ arcmin	71	80	91	89	88	80	80	80	80	80	80	80	91	89	88
			C_{t21} in.lb/ arcmin	633	711	803	791	780	708	708	708	708	708	708	708	805	788	779
Max. axial force [e)]			F_{2AMax} N	14200														
			F_{2AMax} lb_f	3195														
Max. radial force [e)]			F_{2RMax} N	14700														
			F_{2RMax} lb_f	3308														
Max. tilting moment			M_{2KMax} Nm	3213														
			M_{2KMax} in.lb	28435														
Efficiency at full load			η %	96					94									
Service life (For calculation, see the Chapter "Information")			L_h h	> 20000														
Weight incl. standardadapter plate			*m* kg	45.4					47									
			m lb_m	100					104									
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]	K	38	J_1 kgcm²	–	–	–	–	–	15.3	13.9	12.3	12.0	10.9	10.7	10.1	10.0	9.95	9.91
			J_1 10^{-3} in.lb.s²						13.5	12.3	10.9	10.6	9.65	9.48	8.96	8.88	8.80	8.77
	M	48	J_1 kgcm²	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
			J_1 10^{-3} in.lb.s²	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

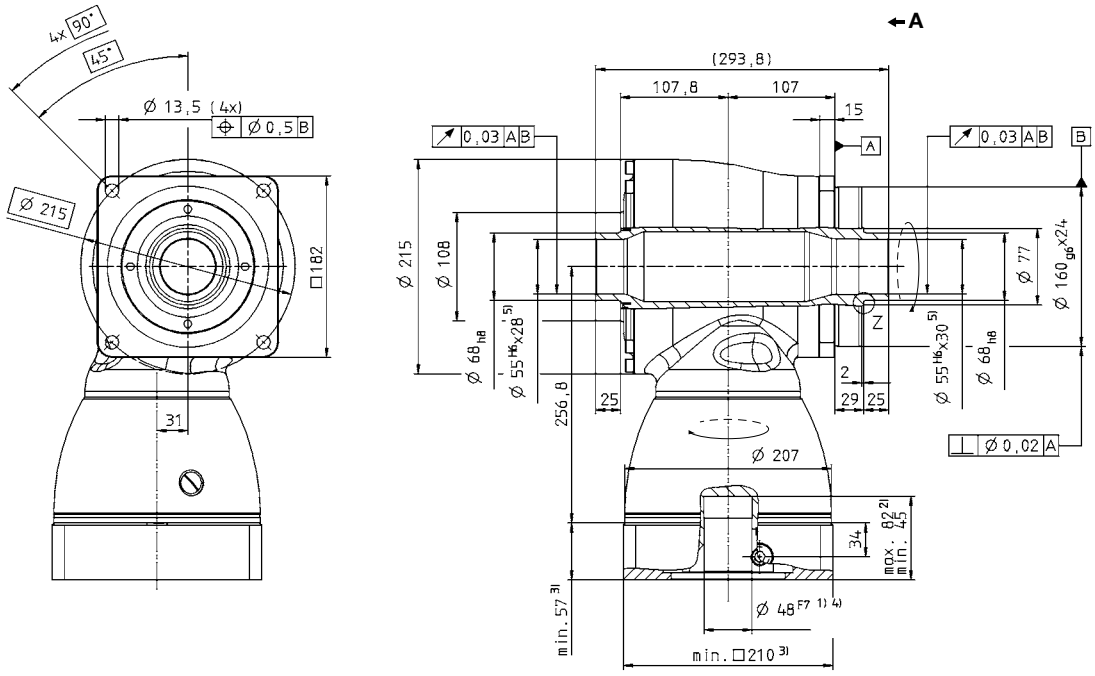
Please contact us for information on the best configuration for S1 conditions of use (continuous operation).

[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

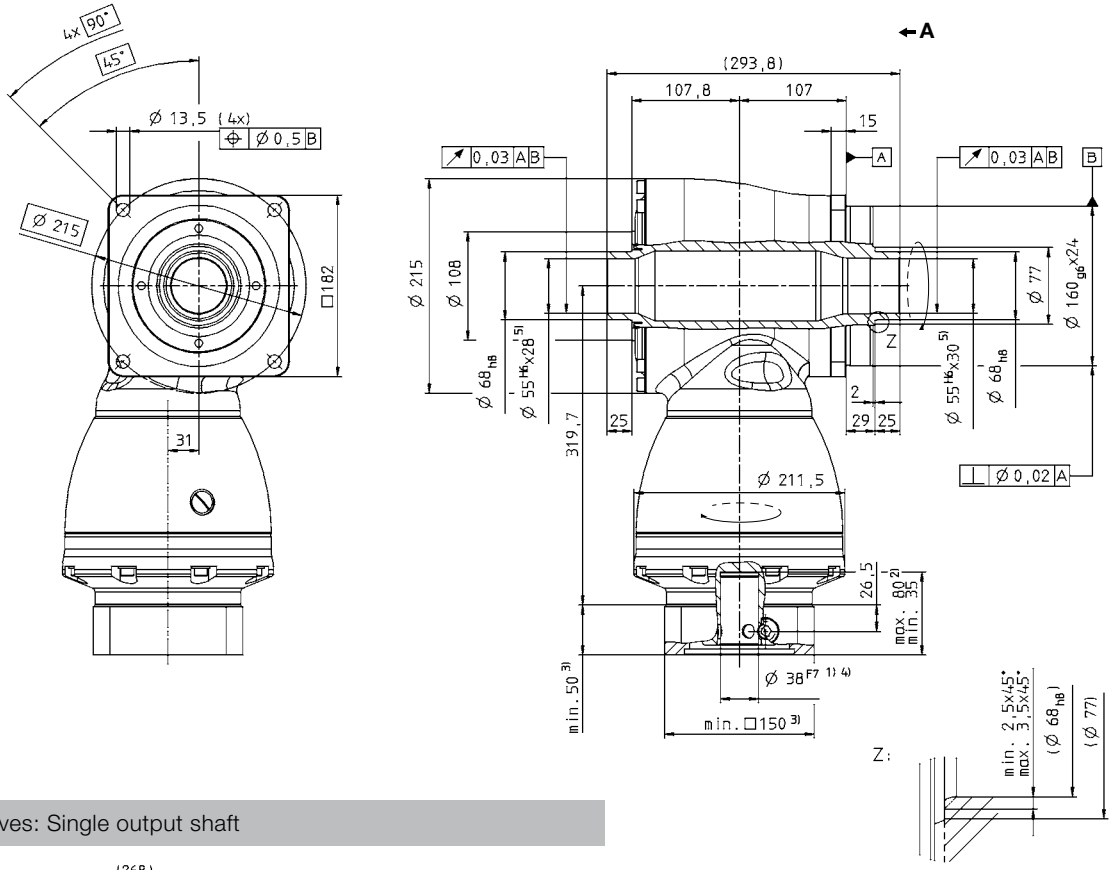
All technical data for front output side applies.
Technical data for rearward output versions, see page 428.

View A

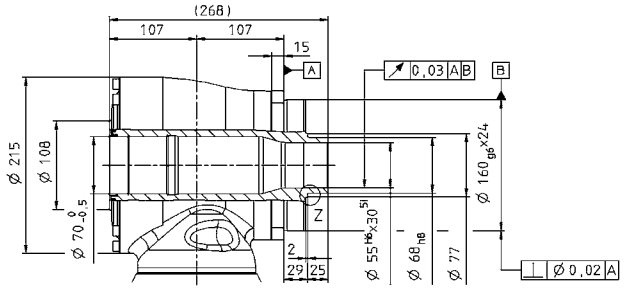
1-stage:



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

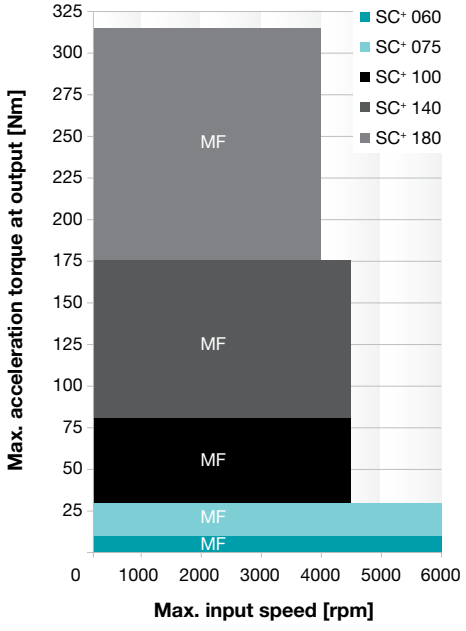
Motor mounting according to operating manual

SC+/SPC+/TPC+ – High performance with low ratios

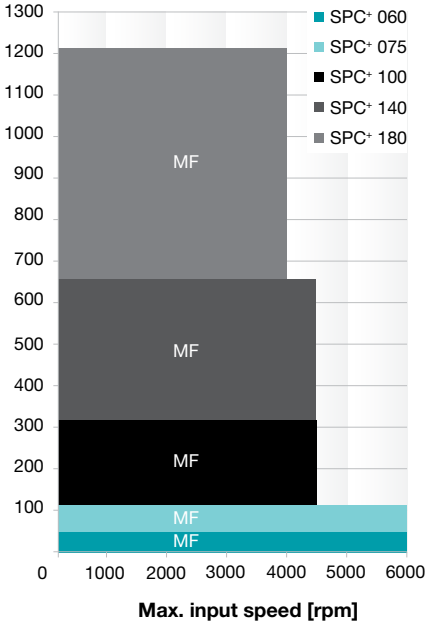
Low backlash right-angle gearheads with output shaft or output flange. This gearhead series is used in dynamic applications with low transmission ratios and demanding requirements with regard to precision, torque, and efficiency.

Quick size selection

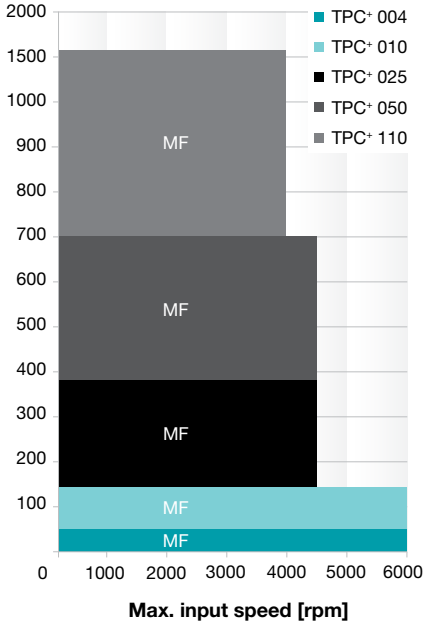
SC+ MF (example for i = 1)
For applications in cyclic operation
(duty cycle ≤ 60 %) or continuous operation
(duty cycle ≥ 60%)



SPC+ MF (example for i = 5)
For applications in cyclic operation
(duty cycle ≤ 60 %) or continuous operation
(duty cycle ≥ 60%)



TPC+ MF (example for i = 5)
For applications in cyclic operation
(duty cycle ≤ 60%) or continuous operation
(duty cycle ≥ 60%)



Versions and their uses

Features	SC+ MF version Catalog page 262	SPC+ MF version Catalog page 272	TPC+ MF version Catalog page 282
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

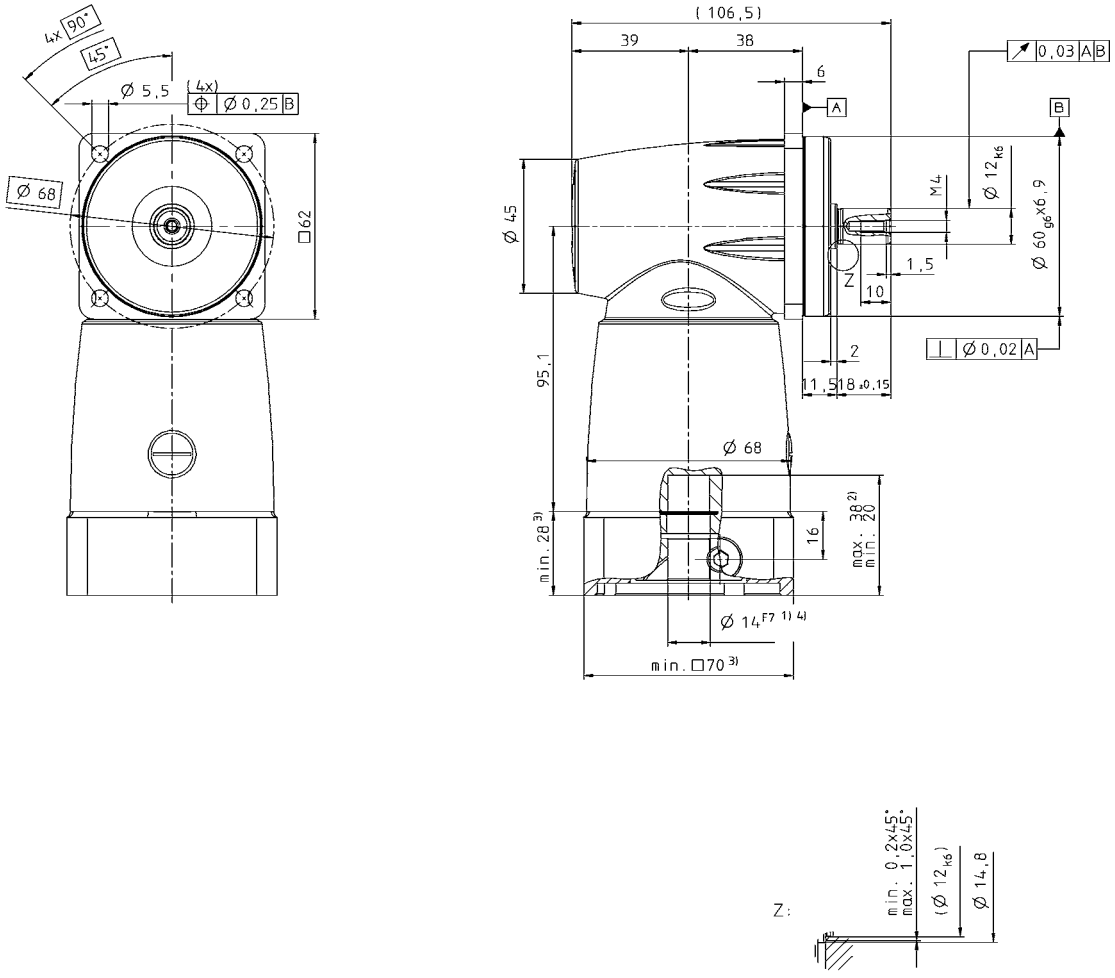
					1-stage	
Ratio [a]			***i***		**1**	**2**
Max. acceleration torque (max. 1000 cycles per hour)			T_{2B}	Nm	10	10
				in.lb	89	89
Nominal output torque (with n_{1N})			T_{2N}	Nm	7	7
				in.lb	62	62
Emergency stop tourque (permitted 1000 times during the service life of the gearhead)			T_{2Not}	Nm	25	25
				in.lb	221	221
Nominal input speed (with T_{2N} and 20°C ambient temperature) [b), c)]			n_{1N}	rpm	5000	5500
Max. input speed			n_{1max}	rpm	6000	6000
Average no-load running torque (with n_1=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_{t21}	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 (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 n_1 = 3000 rpm without 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_1	kgcm²	0.66	0.42
				10^{-3} in.lb.s²	0.58	0.37
Clamping hub diameter [mm]	E	19	J_1	kgcm²	0.99	0.75
				10^{-3} in.lb.s²	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] Refers to center of the output shaft or flange

View A

1-stage:



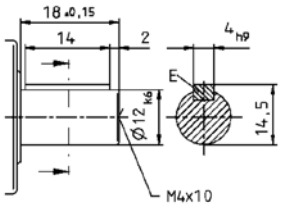
Right-angle gearheads
High End

SC+

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

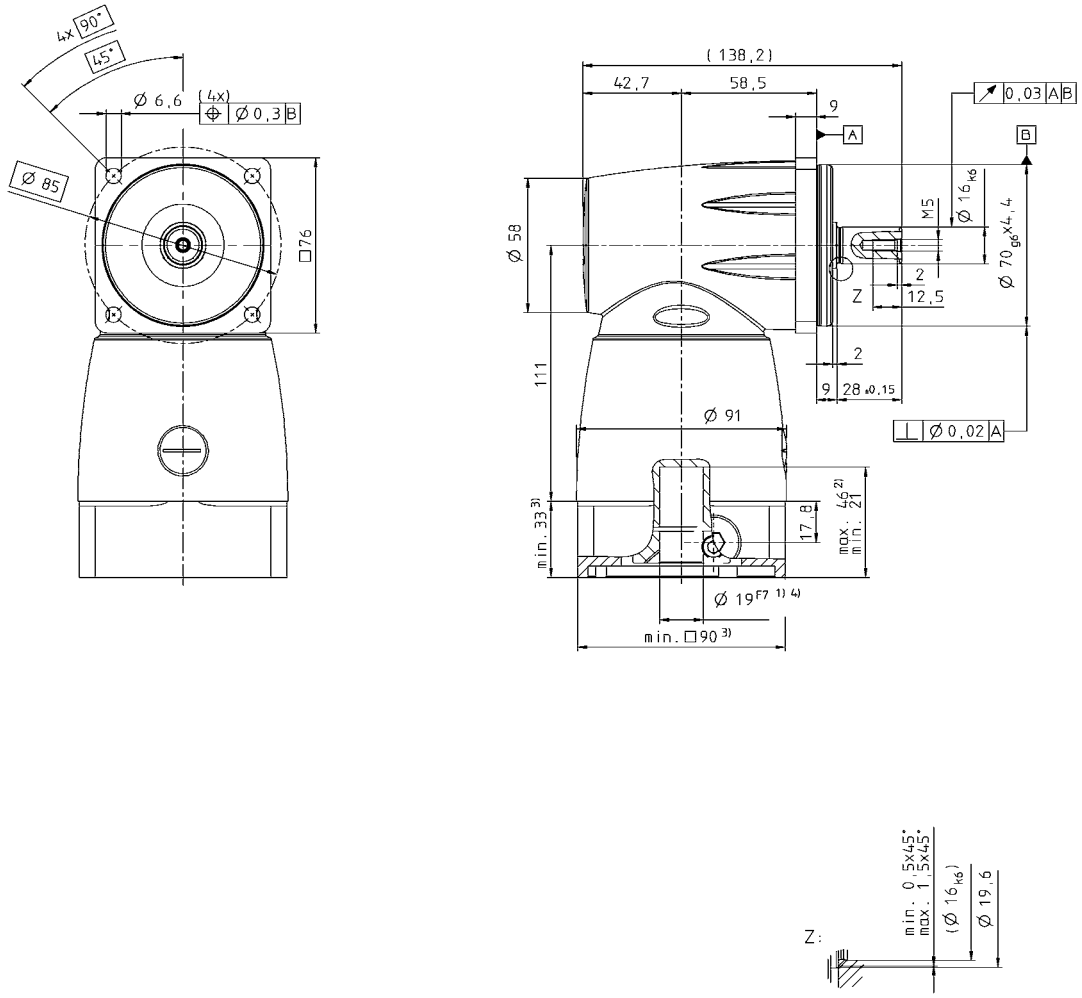
					1-stage	
Ratio [a]			***i***		**1**	**2**
Max. acceleration torque (max. 1000 cycles per hour)			T_{2B}	Nm	30	30
				in.lb	266	266
Nominal output torque (with n_{1N})			T_{2N}	Nm	20	20
				in.lb	177	177
Emergency stop tourque (permitted 1000 times during the service life of the gearhead)			T_{2Not}	Nm	48	62
				in.lb	425	549
Nominal input speed (with T_{2N} and 20°C ambient temperature) [b), c)]			n_{1N}	rpm	2600	4000
Max. input speed			n_{1max}	rpm	6000	6000
Average no-load running torque (with n_1=3000 rpm and 20°C gearhead temperature)			T_{012}	Nm	0.9	0.3
				in.lb	8.0	2.7
Max. torsional backlash			j_t	arcmin	≤ 4	
Torsional rigidity			C_{t21}	Nm/ arcmin	1.0	1.5
				in.lb/ arcmin	8.9	13.3
Max. axial force			F_{2AMax}	N	700	
				lb_f	158	
Max. radial force			F_{2RMax}	N	1300	
				lb_f	293	
Max. tilting moment			M_{2KMax}	Nm	131	
				in.lb	1159	
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	3.6	
				lb_m	8.0	
Operating noise (with n_1 = 3000 rpm without 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)	E	19	J_1	kgcm²	1.99	1.19
				10^{-3} in.lb.s²	1.76	1.05
Clamping hub diameter [mm]	H	28	J_1	kgcm²	3.43	2.63
				10^{-3} in.lb.s²	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] Refers to center of the output shaft or flange

View A

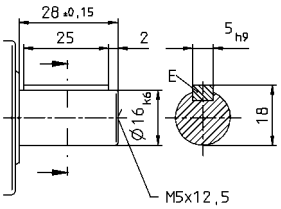
1-stage:



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

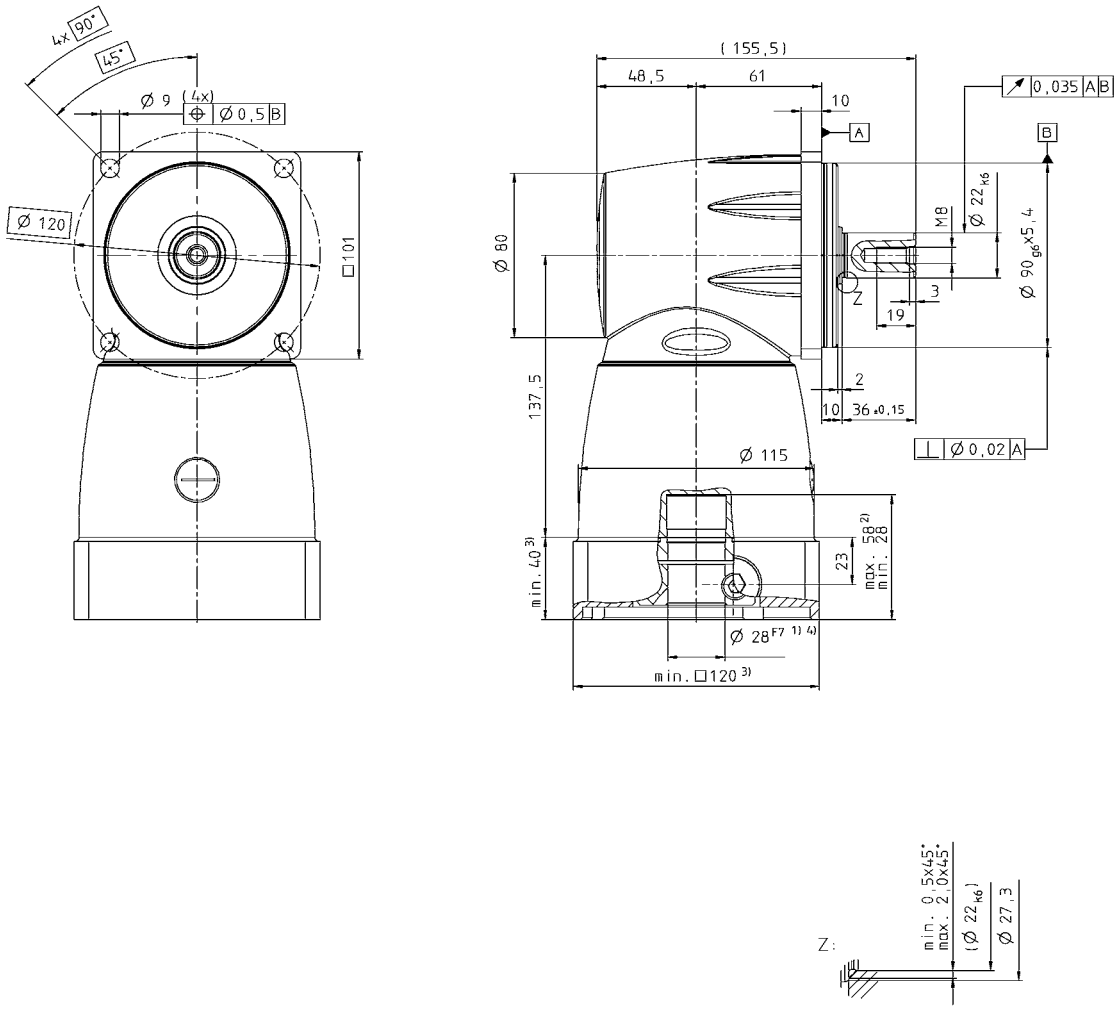
Motor mounting according to operating manual

					1-stage	
Ratio [a]			***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) [b), c)]			n_{1N}	rpm	2500	2800
Max. input speed			n_{1max}	rpm	4500	4500
Average 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_{t21}	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 (For calculation, see the Chapter "Information")			L_h	h	> 20000	
Weight incl. standard adapter plate			*m*	kg	7.0	
				lb_m	15.5	
Operating noise (with n_1 = 3000 rpm without 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	kgcm²	7.1	4.8
				10^{-3} in.lb.s²	6.28	4.25
Clamping hub diameter [mm]	K	38	J_1	kgcm²	14.2	11.9
				10^{-3} in.lb.s²	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] Refers to center of the output shaft or flange

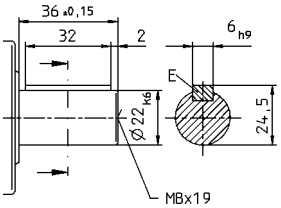
1-stage:



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

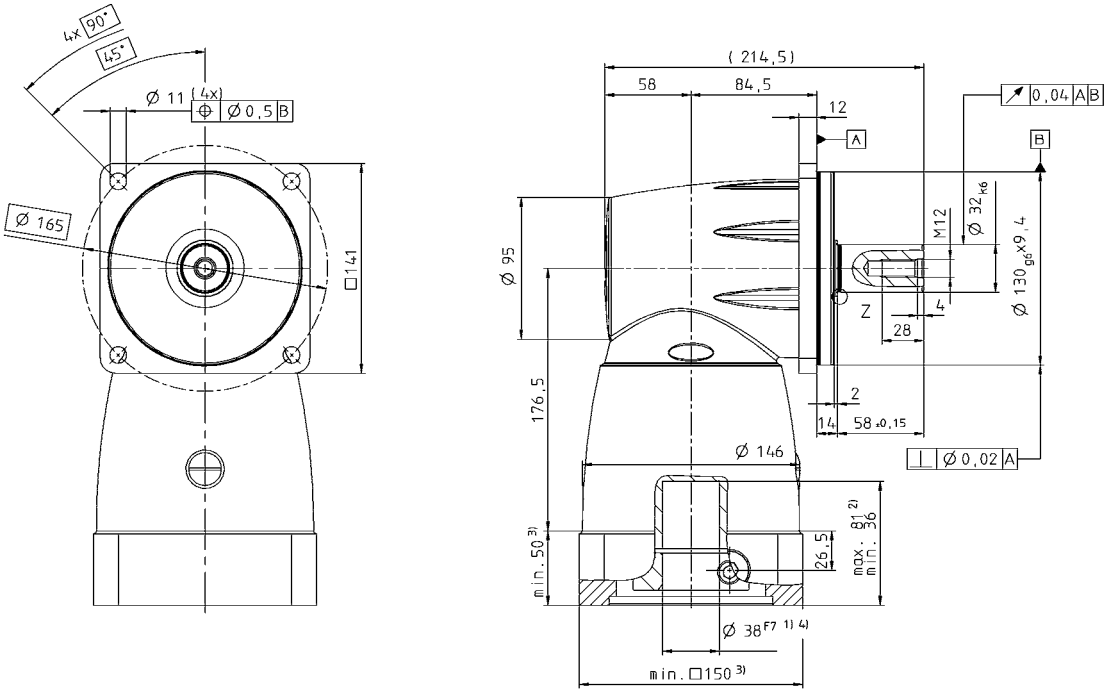
					1-stage	
Ratio [a]			***i***		**1**	**2**
Max. acceleration torque (max. 1000 cycles per hour)			T_{2B}	Nm	175	175
				in.lb	1549	1549
Nominal output torque (with n_{1N})			T_{2N}	Nm	110	110
				in.lb	974	974
Emergency stop tourque (permitted 1000 times during the service life of the gearhead)			T_{2Not}	Nm	240	310
				in.lb	2124	2744
Nominal input speed (with T_{2N} and 20°C ambient temperature) [b), c)]			n_{1N}	rpm	1600	2100
Max. input speed			n_{1max}	rpm	4500	4500
Average 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_{t21}	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 (For calculation, see the Chapter "Information")			L_h	h	> 20000	
Weight incl. standard adapter plate			*m*	kg	14.7	
				lb_m	32.5	
Operating noise (with n_1 = 3000 rpm without 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)	K	38	J_t	$kgcm^2$	41.3	21.3
Clamping hub diameter [mm]				10^{-3} in.lb.s²	36.55	18.85

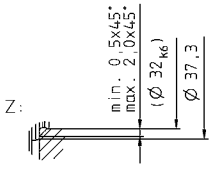
Please contact us for information on the best configuration for S1 conditions of use (continuous operation).

[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] Refers to center of the output shaft or flange

View A

1-stage:





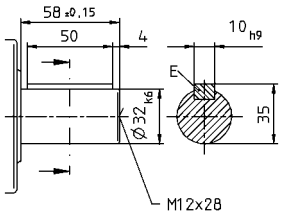
Right-angle gearheads
High End

SC+

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

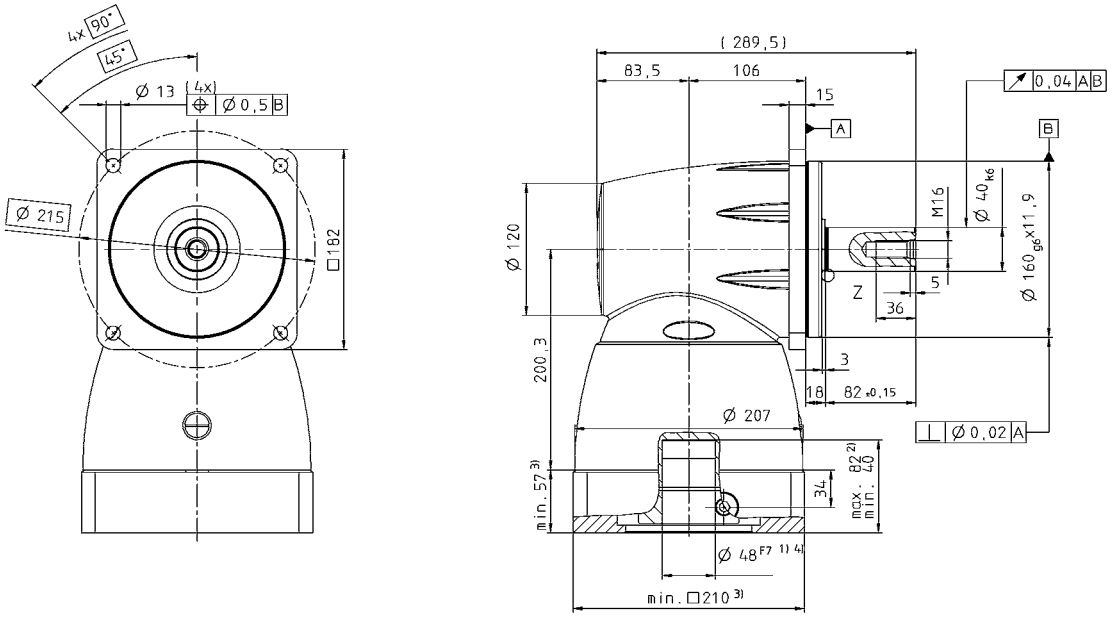
Motor mounting according to operating manual

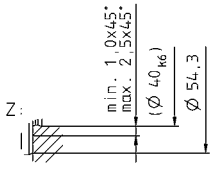
					1-stage	
Ratio [a]			***i***		**1**	**2**
Max. acceleration torque (max. 1000 cycles per hour)			T_{2B}	Nm	315	315
				in.lb	2788	2788
Nominal output torque (with n_{1N})			T_{2N}	Nm	200	200
				in.lb	1770	1770
Emergency stop tourque (permitted 1000 times during the service life of the gearhead)			T_{2Not}	Nm	390	685
				in.lb	3452	6062
Nominal input speed (with T_{2N} and 20°C ambient temperature) [b), c)]			n_{1N}	rpm	1200	1500
Max. input speed			n_{1max}	rpm	4000	4000
Average 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_{t21}	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 (For calculation, see the Chapter "Information")			L_h	h	> 20000	
Weight incl. standard adapter plate			*m*	kg	31.4	
				lb_m	69.4	
Operating noise (with n_1 = 3000 rpm without 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)	M	48	J_1	$kgcm^2$	99.5	46.7
Clamping hub diameter [mm]				10^{-3} in.lb.s²	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] Refers to center of the output shaft or flange

1-stage:

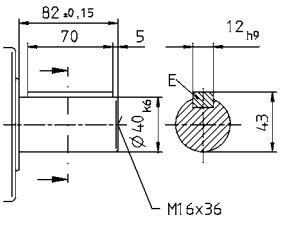




Alternatives: Output shaft variants

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
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Motor mounting according to operating manual

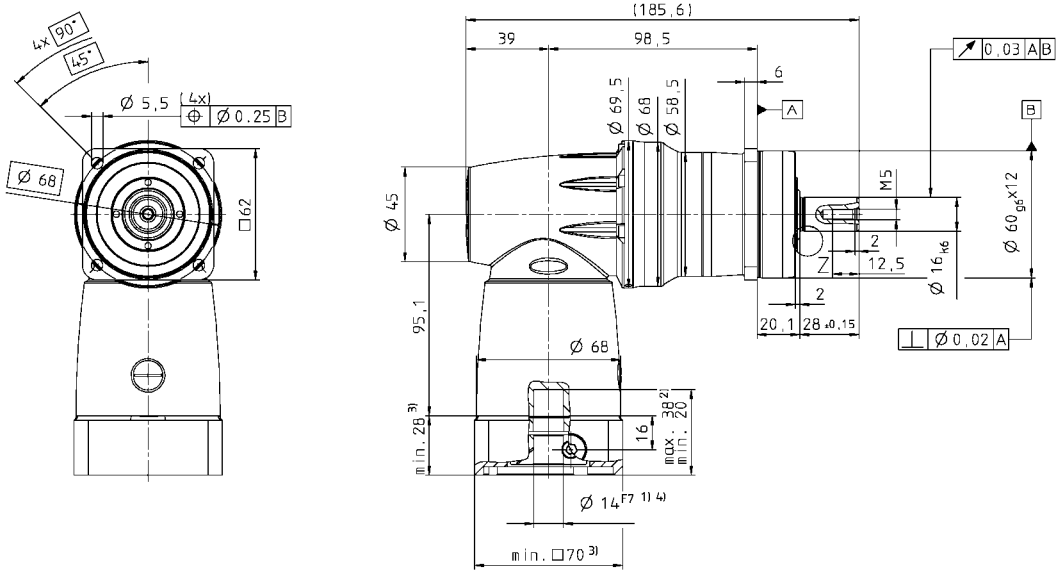
				2-stage						
Ratio [a]			*i*	**4**	**5**	**7**	**8**	**10**	**14**	**20**
Max. acceleration torque (max. 1000 cycles per hour)			T_{2B} Nm	40	42	42	40	42	42	32
			T_{2B} in.lb	354	372	372	354	372	372	283
Nominal output torque (with n_{1N})			T_{2N} Nm	26	26	26	26	26	26	17
			T_{2N} in.lb	230	230	230	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
			T_{2Not} in.lb	885	885	885	885	885	885	708
Nominal input speed (with T_{2N} and 20°C ambient temperature) [b), c)]			n_{1N} rpm	3000	3000	3200	3400	3400	3600	3600
Max. input speed			n_{1max} rpm	6000	6000	6000	6000	6000	6000	6000
Average no-load running torque (with n_1=3000 rpm and 20°C gearhead temperature)			T_{012} Nm	1.2	1.1	0.9	0.6	0.6	0.5	0.4
			T_{012} 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
			C_{t21} in.lb/ arcmin	21	24	27	24	27	28	29
Max. axial force			F_{2AMax} N	2400						
			F_{2AMax} lb_f	540						
Max. radial force			F_{2RMax} N	2800						
			F_{2RMax} lb_f	630						
Max. tilting moment			M_{2KMax} Nm	152						
			M_{2KMax} in.lb	1345.2						
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	3.1						
			m lb_m	6.851						
Operating noise (with n_1 = 3000 rpm without 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 kgcm²	0.72	0.7	0.66	0.44	0.43	0.43	0.43
			J_1 10^{-3} in.lb.s²	0.64	0.62	0.58	0.39	0.38	0.38	0.38
Clamping hub diameter [mm]	E	19	J_1 kgcm²	1.05	1.03	0.99	0.77	0.76	0.76	0.75
			J_1 10^{-3} in.lb.s²	0.93	0.91	0.88	0.68	0.67	0.67	0.66

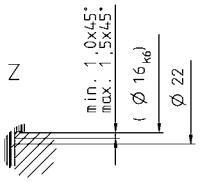
Please contact us for information on the best configuration for S1 conditions of use (continuous operation).

[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] Refers to center of the output shaft or flange

View A

2-stage:



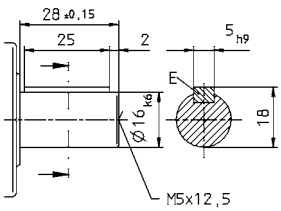


Right-angle gearheads
High End

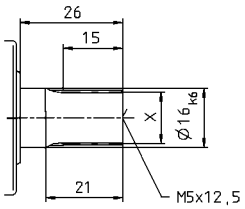
SPC+

Alternatives: Output shaft variants

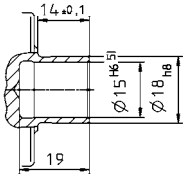
Keywayed output shaft in mm
E = key as per DIN 6885, sheet 1, form A



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

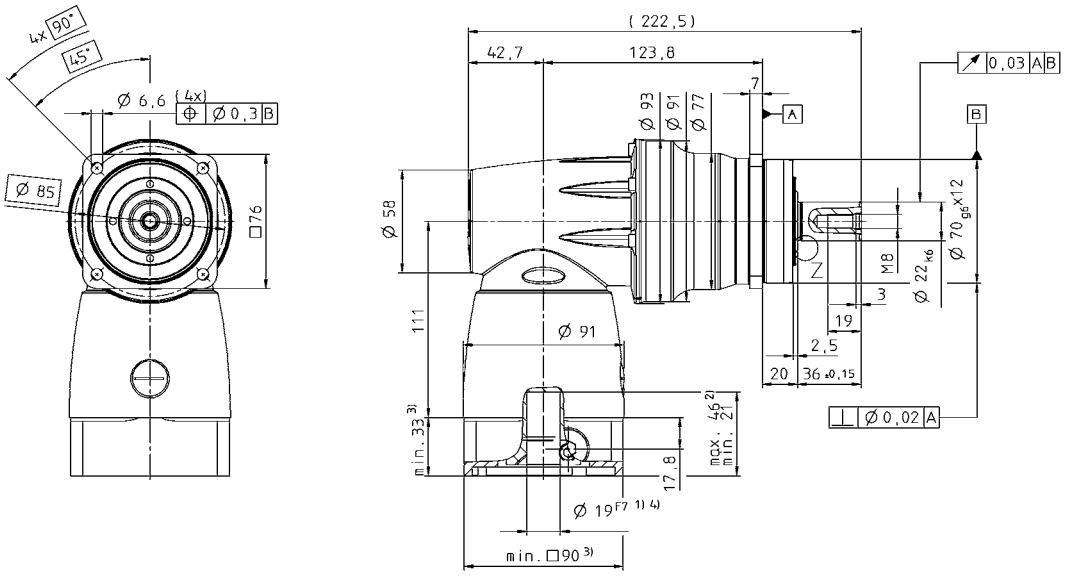
				2-stage						
Ratio [a]			***i***	**4**	**5**	**7**	**8**	**10**	**14**	**20**
Max. acceleration torque (max. 1000 cycles per hour)			T_{2B} Nm	110	110	110	110	110	110	95
			T_{2B} in.lb	974	974	974	974	974	974	841
Nominal output torque (with n_{1N})			T_{2N} Nm	75	75	75	75	75	75	52
			T_{2N} in.lb	664	664	664	664	664	664	460
Emergency stop tourque (permitted 1000 times during the service life of the gearhead)			T_{2Not} Nm	195	245	250	250	250	250	200
			T_{2Not} in.lb	1726	2168	2213	2213	2213	2213	1770
Nominal input speed (with T_{2N} and 20°C ambient temperature) [b), c)]			n_{1N} rpm	2200	2200	2400	2650	2650	2800	2800
Max. input speed			n_{1max} rpm	6000	6000	6000	6000	6000	6000	6000
Average no-load running torque (with n_1=3000 rpm and 20°C gearhead temperature)			T_{012} Nm	2.3	2.0	1.7	1.0	0.9	0.7	0.6
			T_{012} in.lb	20	18	15	9	8	6	5
Max. torsional backlash			j_t arcmin	Standard ≤ 4 / Reduced ≤ 2						
Torsional rigidity			C_{t21} Nm/ arcmin	6.6	7.5	8.6	7.6	8.3	9.1	9.5
			C_{t21} in.lb/ arcmin	58	66	76	67	73	81	84
Max. axial force			F_{2AMax} N	3350						
			F_{2AMax} lb_f	753.75						
Max. radial force			F_{2RMax} N	4200						
			F_{2RMax} lb_f	945						
Max. tilting moment			M_{2KMax} Nm	236						
			M_{2KMax} in.lb	2088.6						
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	5.9						
			m lb_m	13.039						
Operating noise (with n_1 = 3000 rpm without 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_1 kgcm²	2.23	2.15	1.99	1.25	1.23	1.21	1.2
			J_1 10^{-3} in.lb.s²	1.97	1.90	1.76	1.11	1.09	1.07	1.06
Clamping hub diameter [mm]	H	28	J_1 kgcm²	3.66	3.59	3.43	2.68	2.67	2.65	2.64
			J_1 10^{-3} in.lb.s²	3.24	3.18	3.04	2.37	2.36	2.35	2.34

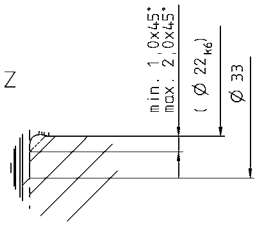
Please contact us for information on the best configuration for S1 conditions of use (continuous operation).

[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] Refers to center of the output shaft or flange

View A

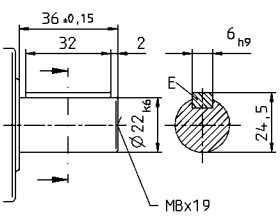
2-stage:



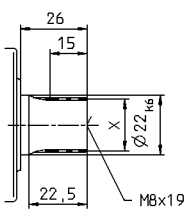


Alternatives: Output shaft variants

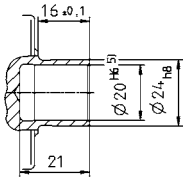
Keywayed output shaft in mm
E = key as per DIN 6885, sheet 1, form A



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

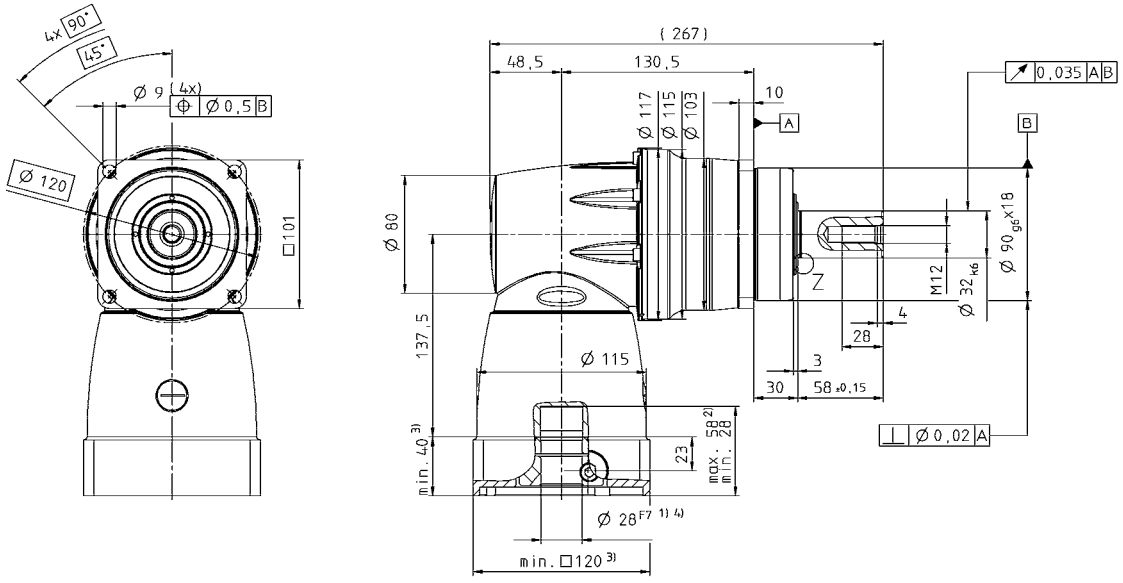
					2-stage						
Ratio [a]			***i***		**4**	**5**	**7**	**8**	**10**	**14**	**20**
Max. acceleration torque (max. 1000 cycles per hour)			T_{2B}	Nm	315	315	315	315	315	315	235
				in.lb	2788	2788	2788	2788	2788	2788	2080
Nominal output torque (with n_{1N})			T_{2N}	Nm	180	175	170	180	175	170	120
				in.lb	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) [b), c)]			n_{1N}	rpm	2000	2000	2200	2300	2300	2400	2400
Max. input speed			n_{1max}	rpm	4500	4500	4500	4500	4500	4500	4500
Average no-load running torque (with n_1=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 (For calculation, see the Chapter "Information")			L_h	h	> 20000						
Weight incl. standard adapter plate			*m*	kg	11.7						
				lb_m	25.857						
Operating noise (with n_1 = 3000 rpm without 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_1	kgcm²	8	7.6	7	5	4.9	4.9	4.8
				10^{-3} in.lb.s²	7.08	6.73	6.20	4.43	4.34	4.34	4.25
Clamping hub diameter [mm]	K	38	J_1	kgcm²	15	14.7	14.1	12.1	12	11.9	11.9
				10^{-3} in.lb.s²	13.28	13.01	12.48	10.71	10.62	10.53	10.53

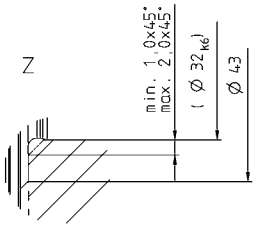
Please contact us for information on the best configuration for S1 conditions of use (continuous operation).

[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] Refers to center of the output shaft or flange

View A

2-stage:



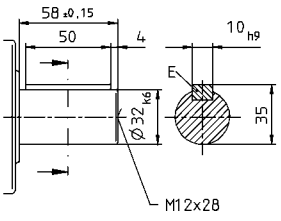


Right-angle gearheads
High End

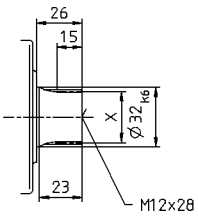
SPC+

Alternatives: Output shaft variants

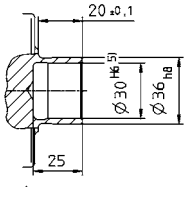
Keywayed output shaft in mm
E = key as per DIN 6885, sheet 1, form A



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

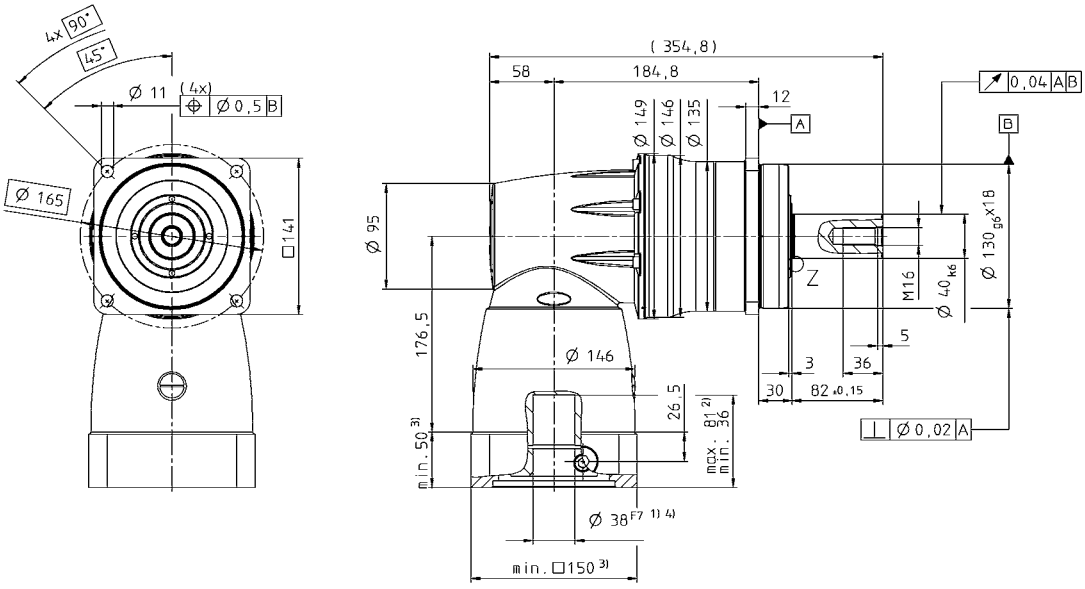
				2-stage						
Ratio [a]			*i*	**4**	**5**	**7**	**8**	**10**	**14**	**20**
Max. acceleration torque (max. 1000 cycles per hour)			T_{2B} Nm	660	660	660	660	660	660	530
			T_{2B} in.lb	5841	5841	5841	5841	5841	5841	4691
Nominal output torque (with n_{1N})			T_{2N} Nm	360	360	360	360	360	360	220
			T_{2N} 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
			T_{2Not} in.lb	8496	10620	11063	11063	11063	11063	8850
Nominal input speed (with T_{2N} and 20°C ambient temperature) [b), c)]			n_{1N} rpm	1300	1300	1400	1500	1500	1600	1600
Max. input speed			n_{1max} rpm	4500	4500	4500	4500	4500	4500	4500
Average 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
			T_{012} 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
			C_{t21} in.lb/ arcmin	327	363	407	363	398	425	451
Max. axial force			F_{2AMax} N	9870						
			F_{2AMax} lb_f	2220.75						
Max. radial force			F_{2RMax} N	9900						
			F_{2RMax} lb_f	2227.5						
Max. tilting moment			M_{2KMax} Nm	952						
			M_{2KMax} in.lb	8425.2						
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	24.7						
			m lb_m	54.587						
Operating noise (with n_1 = 3000 rpm without 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
Clamping hub diameter [mm]			J_1 10^{-3} in.lb.s²	27.08	26.28	24.69	16.73	16.55	16.37	16.28

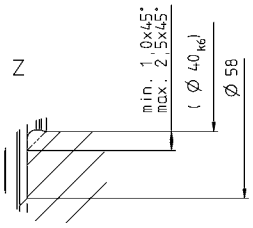
Please contact us for information on the best configuration for S1 conditions of use (continuous operation).

[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] Refers to center of the output shaft or flange

View A

2-stage:



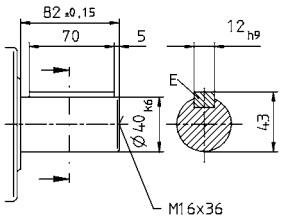


Right-angle gearheads
High End

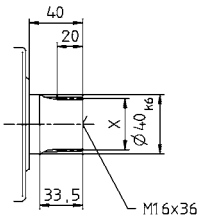
SPC+

Alternatives: Output shaft variants

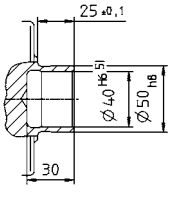
Keywayed output shaft in mm
E = key as per DIN 6885, sheet 1, form A



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

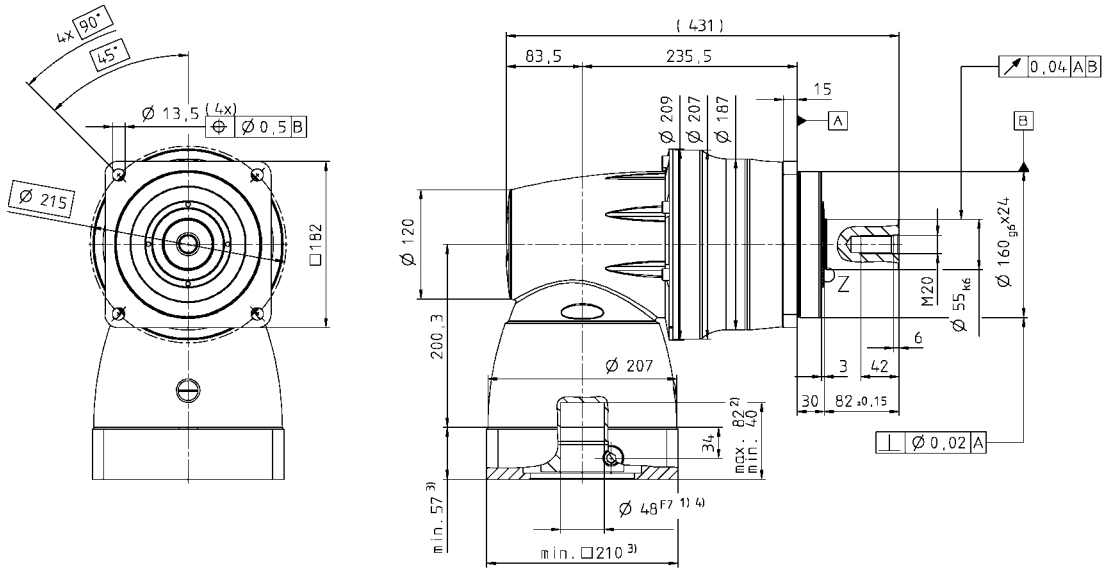
			2-stage						
Ratio [a]	***i***		**4**	**5**	**7**	**8**	**10**	**14**	**20**
Max. acceleration torque (max. 1000 cycles per hour)	T_{2B}	Nm	1210	1210	1210	1210	1210	1210	970
		in.lb	10709	10709	10709	10709	10709	10709	8585
Nominal output torque (with n_{1N})	T_{2N}	Nm	750	750	750	750	750	750	750
		in.lb	6638	6638	6638	6638	6638	6638	6638
Emergency stop tourque (permitted 1000 times during the service life of the gearhead)	T_{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) [b), c)]	n_{1N}	rpm	1000	1000	1100	1200	1200	1300	1300
Max. input speed	n_{1max}	rpm	4000	4000	4000	4000	4000	4000	4000
Average no-load running torque (with n_1=3000 rpm and 20°C gearhead temperature)	T_{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	j_t	arcmin	Standard ≤ 4 / Reduced ≤ 2						
Torsional rigidity	C_{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	F_{2AMax}	N	14150						
		lb_f	3183.75						
Max. radial force	F_{2RMax}	N	15400						
		lb_f	3465						
Max. tilting moment	M_{2KMax}	Nm	1600						
		in.lb	14160						
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	54.7						
		lb_m	120.887						
Operating noise (with n_1 = 3000 rpm without 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)	J_1	kgcm²	109.5	105	94.7	49.2	48.1	46.9	46.2
Clamping hub diameter [mm] M 48		10^{-3} in.lb.s²	96.91	92.93	83.81	43.54	42.57	41.51	40.89

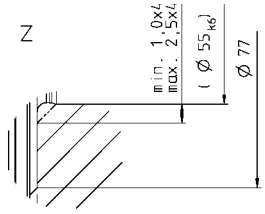
Please contact us for information on the best configuration for S1 conditions of use (continuous operation).

[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] Refers to center of the output shaft or flange

View A

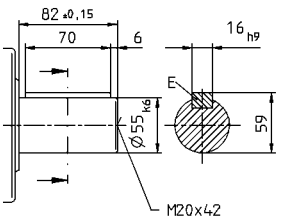
2-stage:



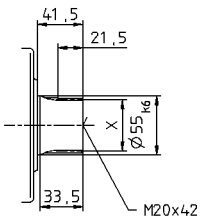


Alternatives: Output shaft variants

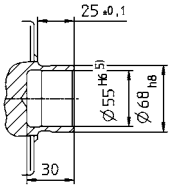
Keywayed output shaft in mm
E = key as per DIN 6885, sheet 1, form A



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

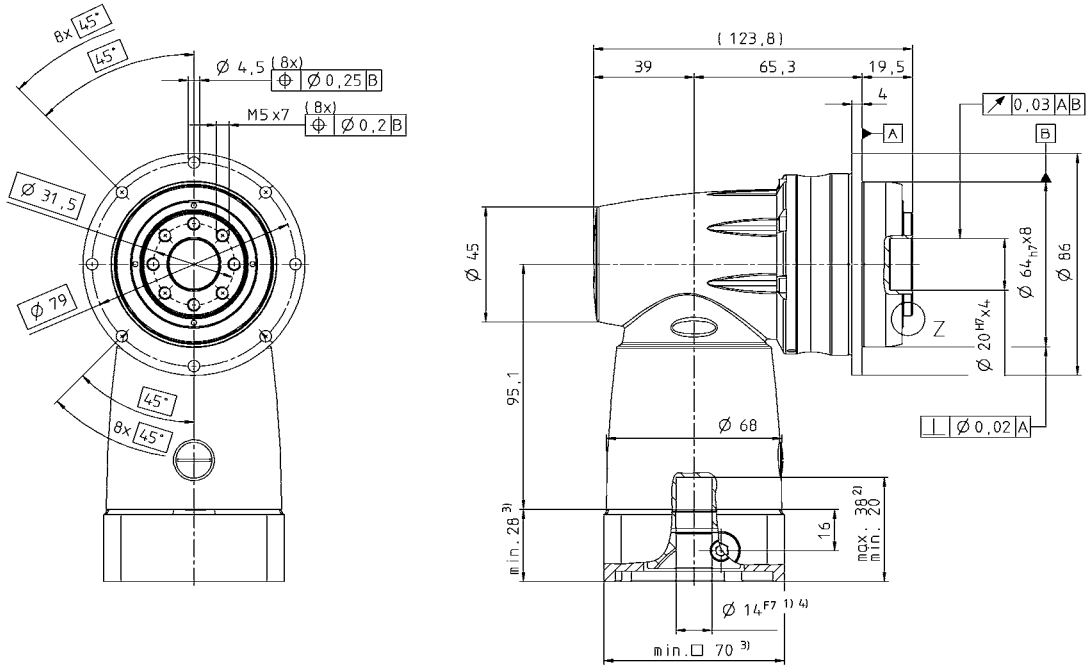
				2-stage						
Ratio [a]			***i***	**4**	**5**	**7**	**8**	**10**	**14**	**20**
Max. acceleration torque (max. 1000 cycles per hour)			T_{2B} Nm	40	50	55	40	50	55	35
			T_{2B} in.lb	354	443	487	354	443	487	310
Nominal output torque (with n_{1N})			T_{2N} Nm	28	28	28	28	28	28	18
			T_{2N} in.lb	248	248	248	248	248	248	159
Emergency stop tourque (permitted 1000 times during the service life of the gearhead)			T_{2Not} Nm	100	100	100	100	100	100	100
			T_{2Not} in.lb	885	885	885	885	885	885	885
Nominal input speed (with T_{2N} and 20°C ambient temperature) [b), c)]			n_{1N} rpm	2900	2900	3100	3400	3400	3600	3600
Max. input speed			n_{1max} rpm	6000	6000	6000	6000	6000	6000	6000
Average 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
			T_{012} 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
			C_{t21} in.lb/ arcmin	42	55	67	54	65	75	65
Tilting rigidity			C_{2K} Nm/ arcmin	-						
			C_{2K} in.lb/ arcmin	-						
Max. axial force			F_{2AMax} N	1630.0						
			F_{2AMax} lb_f	366.8						
Max. tilting moment			M_{2KMax} Nm	110.0						
			M_{2KMax} in.lb	973.5						
Efficiency at full load			η %	95.0						
Service life (For calculation, see the Chapter "Information")			L_h h	> 20000						
Weight incl. standard adapter plate			*m* kg	2.6						
			m lb_m	5.7						
Operating noise (with n_1 = 3000 rpm without 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 kgcm²	0.72	0.7	0.66	0.44	0.43	0.43	0.43
			J_1 10^{-3} in.lb.s²	0.64	0.62	0.58	0.39	0.38	0.38	0.38
Clamping hub diameter [mm]	E	19	J_1 kgcm²	1.05	1.03	0.99	0.77	0.76	0.76	0.75
			J_1 10^{-3} in.lb.s²	0.93	0.91	0.88	0.68	0.67	0.67	0.66

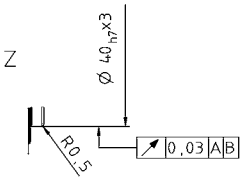
Please contact us for information on the best configuration for S1 conditions of use (continuous operation).

[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] 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.

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http://www.wittenstein-alpha.de/en/info-and-cad-finder.html

Motor mounting according to operating manual

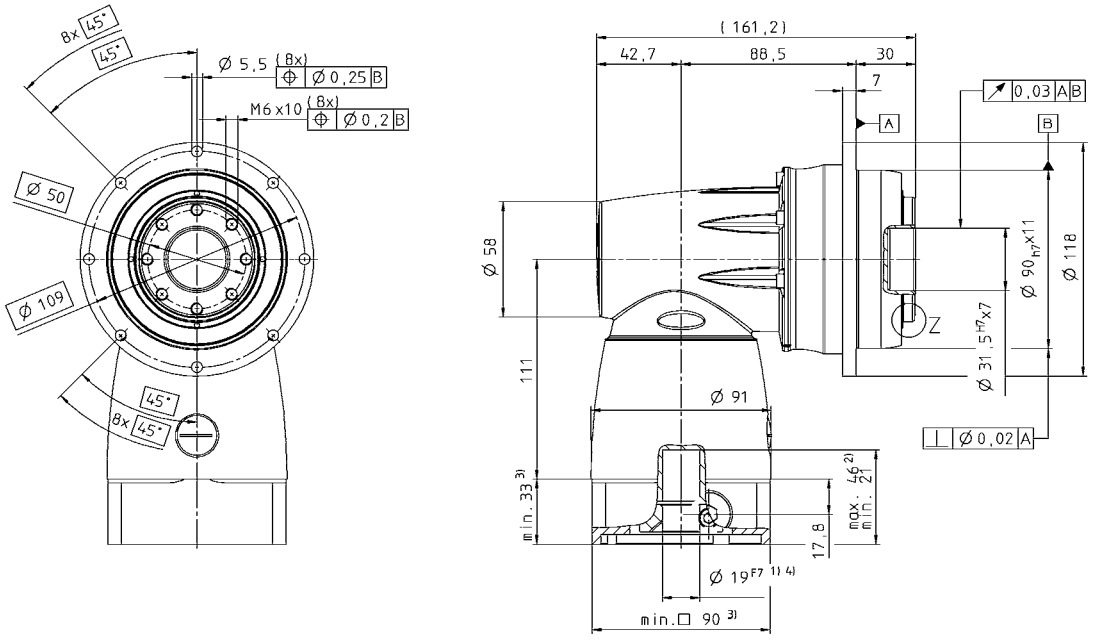
					2-stage						
Ratio [a]			***i***		**4**	**5**	**7**	**8**	**10**	**14**	**20**
Max. acceleration torque (max. 1000 cycles per hour)			T_{2B}	Nm	120	143	143	120	143	143	105
				in.lb	1062	1266	1266	1062	1266	1266	929
Nominal output torque (with n_{1N})			T_{2N}	Nm	75	75	75	75	75	75	60
				in.lb	664	664	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) [b), c)]			n_{1N}	rpm	2100	2100	2300	2650	2650	2800	2800
Max. input speed			n_{1max}	rpm	6000	6000	6000	6000	6000	6000	6000
Average no-load running torque (with n_1=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 (For calculation, see the Chapter "Information")			L_h	h	> 20000						
Weight incl. standard adapter plate			*m*	kg	6						
				lb_m	13						
Operating noise (with n_1 = 3000 rpm without 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_1	kgcm²	2.41	2.27	1.99	1.29	1.26	122	1.21
				10^{-3} in.lb.s²	2.13	2.01	1.76	1.14	1.12	107.97	1.07
Clamping hub diameter [mm]	H	28	J_1	kgcm²	3.85	3.71	3.43	2.73	2.7	2.66	2.64
				10^{-3} in.lb.s²	3.41	3.28	3.04	2.42	2.39	2.35	2.34

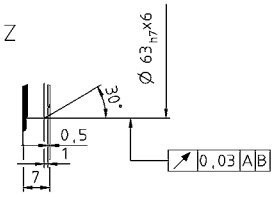
Please contact us for information on the best configuration for S1 conditions of use (continuous operation).

[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] 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

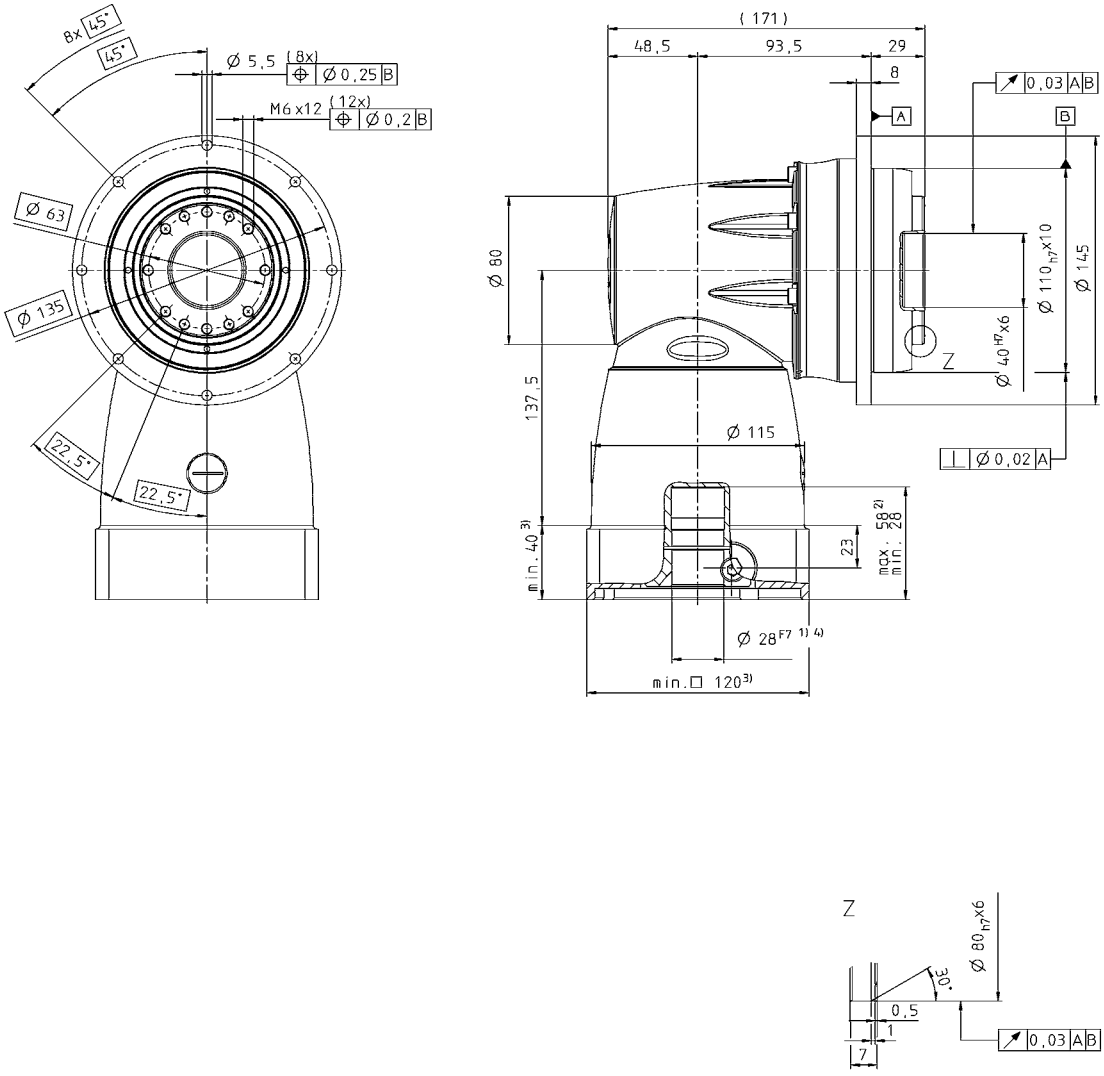
					2-stage						
Ratio [a]			***i***		**4**	**5**	**7**	**8**	**10**	**14**	**20**
Max. acceleration torque (max. 1000 cycles per hour)			T_{2B}	Nm	320	380	330	320	380	330	265
				in.lb	2832	3363	2921	2832	3363	2921	2345
Nominal output torque (with n_{1N})			T_{2N}	Nm	170	170	170	170	170	170	120
				in.lb	1505	1505	1505	1505	1505	1505	1062
Emergency stop tourque (permitted 1000 times during the service life of the gearhead)			T_{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) [b), c)]			n_{1N}	rpm	1900	1900	2100	2300	2300	2400	2400
Max. input speed			n_{1max}	rpm	4500	4500	4500	4500	4500	4500	4500
Average no-load running torque (with n_1=3000 rpm and 20°C gearhead temperature)			T_{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			j_t	arcmin	Standard ≤ 4 / Reduced ≤ 2						
Torsional rigidity			C_{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			C_{2K}	Nm/ arcmin	550						
				in.lb/ arcmin	4868						
Max. axial force			F_{2AMax}	N	4150						
				lb_f	934						
Max. tilting moment			M_{2KMax}	Nm	440						
				in.lb	3894						
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	11						
				lb_m	23						
Operating noise (with n_1 = 3000 rpm without 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_1	kgcm²	8.3	7.9	7	5.1	5	4.9	4.8
				10^{-3} in.lb.s²	7.35	6.99	6.20	4.51	4.43	4.34	4.25
Clamping hub diameter [mm]	K	38	J_1	kgcm²	15.4	14.9	14.1	12.2	12.1	12	11.9
				10^{-3} in.lb.s²	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] 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.
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Motor mounting according to operating manual

				2-stage						
Ratio [a]	i			**4**	**5**	**7**	**8**	**10**	**14**	**20**
Max. acceleration torque (max. 1000 cycles per hour)	T_{2B}	Nm		700	700	700	700	700	700	540
		in.lb		6195	6195	6195	6195	6195	6195	4779
Nominal output torque (with n_{1N})	T_{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)	T_{2Not}	Nm		960	1200	1250	1250	1250	1250	1250
		in.lb		8496	10620	11063	11063	11063	11063	11063
Nominal input speed (with T_{2N} and 20°C ambient temperature) [b), c)]	n_{1N}	rpm		1200	1200	1300	1500	1500	1600	1600
Max. input speed	n_{1max}	rpm		4500	4500	4500	4500	4500	4500	4500
Average no-load running torque (with n_1=3000 rpm and 20°C gearhead temperature)	T_{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	j_t	arcmin		Standard ≤ 4 / Reduced ≤ 2						
Torsional rigidity	C_{t21}	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	C_{2K}	Nm/ arcmin		560						
		in.lb/ arcmin		4956						
Max. axial force	F_{2AMax}	N		6130						
		lb_f		1379						
Max. tilting moment	M_{2KMax}	Nm		1335						
		in.lb		11815						
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		22						
		lb_m		48						
Operating noise (with n_1 = 3000 rpm without 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	32.3	30.8	27.90	19.4	19.00	18.7	18.50
Clamping hub diameter [mm]				10^{-3} in.lb.s²	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).

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[b] Higher speeds are possible if the nominal torque is reduced
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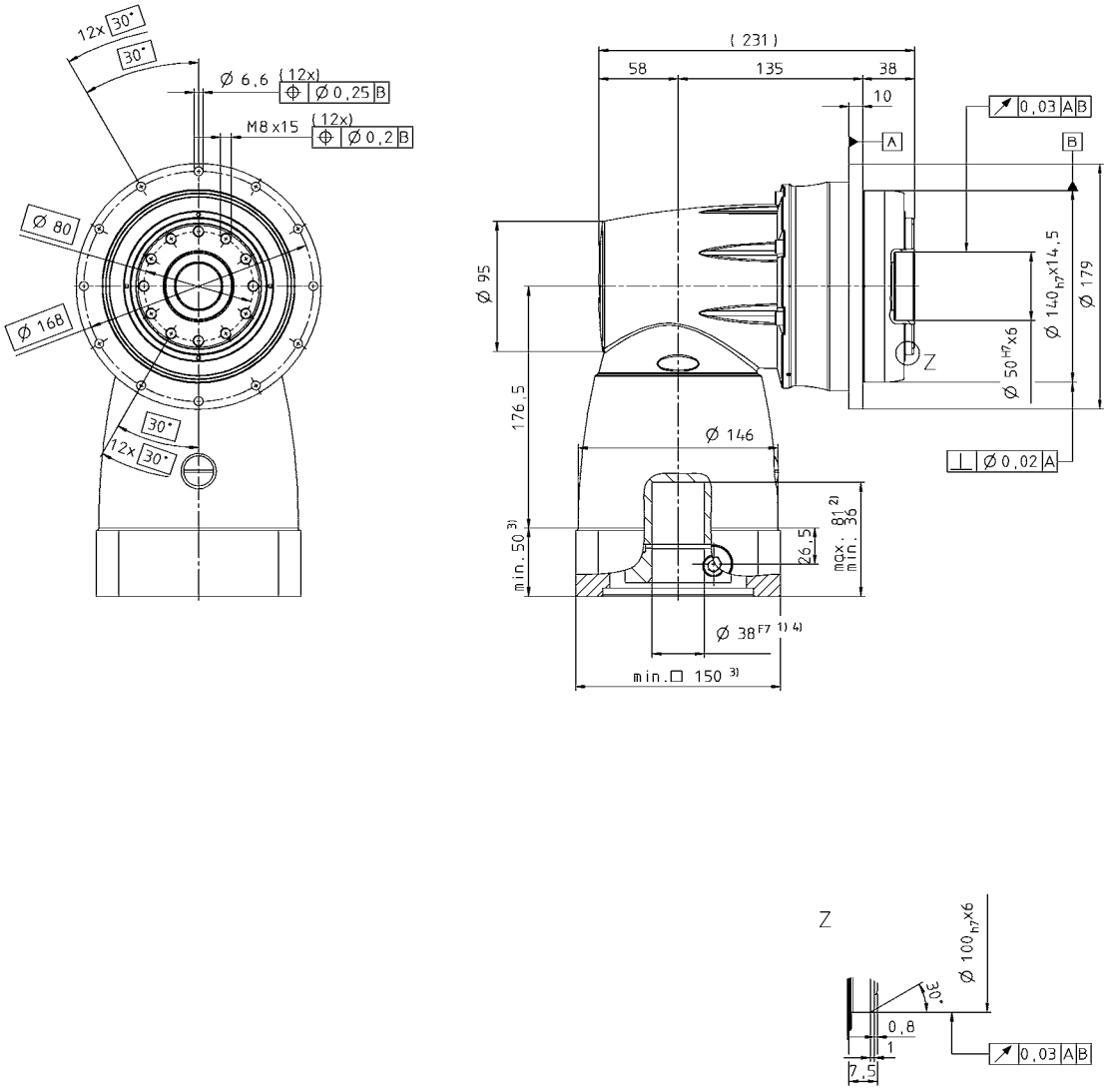
2-stage:



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

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http://www.wittenstein-alpha.de/en/info-and-cad-finder.html

Motor mounting according to operating manual

				2-stage						
Ratio [a]	i			**4**	**5**	**7**	**8**	**10**	**14**	**20**
Max. acceleration torque (max. 1000 cycles per hour)	T_{2B}	Nm		1260	1575	1600	1260	1575	1600	1400
		in.lb		11151	13939	14160	11151	13939	14160	12390
Nominal output torque (with n_{1N})	T_{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)	T_{2Not}	Nm		1560	1955	2735	2750	2750	2750	2750
		in.lb		13806	17302	24205	24338	24338	24338	24338
Nominal input speed (with T_{2N} and 20°C ambient temperature) [b), c)]	n_{1N}	rpm		900	900	1000	1200	1200	1300	1300
Max. input speed	n_{1max}	rpm		4000	4000	4000	4000	4000	4000	4000
Average no-load running torque (with n_1=3000 rpm and 20°C gearhead temperature)	T_{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	j_t	arcmin		Standard ≤ 4 / Reduced ≤ 2						
Torsional rigidity	C_{t21}	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	C_{2K}	Nm/ arcmin		1452						
		in.lb/ arcmin		12850						
Max. axial force	F_{2AMax}	N		10050						
		lb_f		2261						
Max. tilting moment	M_{2KMax}	Nm		3280						
		in.lb		29028						
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		51						
		lb_m		112						
Operating noise (with n_1 = 3000 rpm without 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)	J_1	kgcm²		121.2	112.6	94.7	52.1	50	47.9	46.7
Clamping hub diameter [mm]		10^{-3} in.lb.s²		107.26	99.65	83.81	46.11	44.25	42.39	41.33
	M	48								

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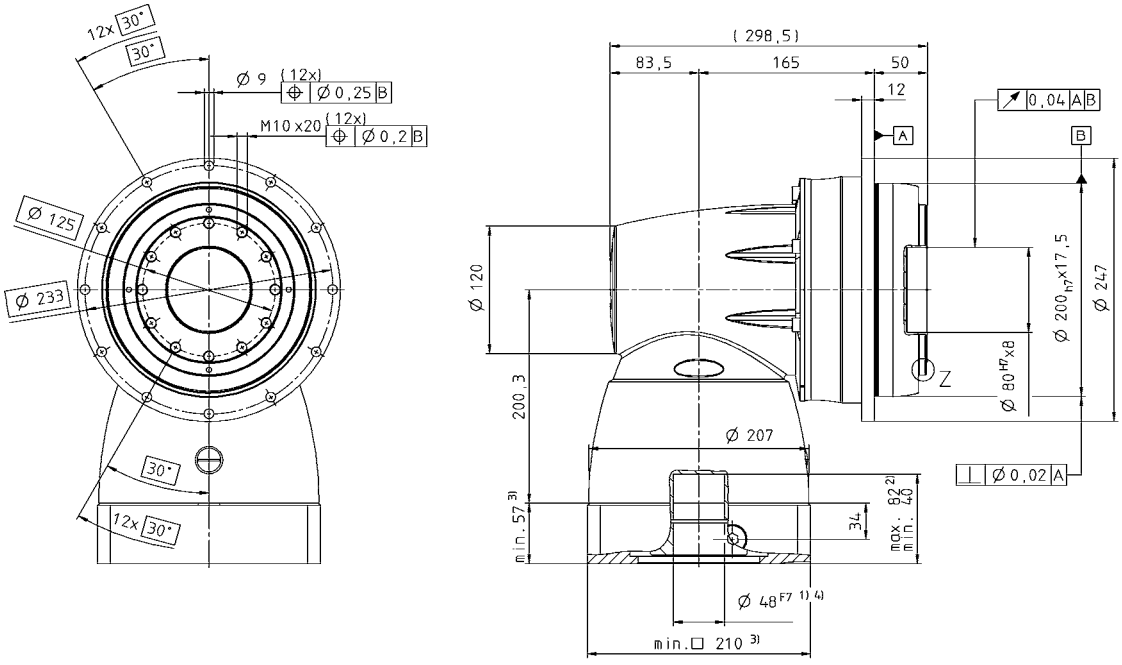
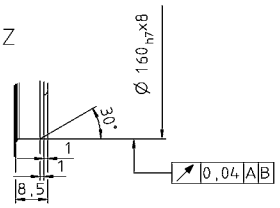
2-stage:





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

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Motor mounting according to operating manual

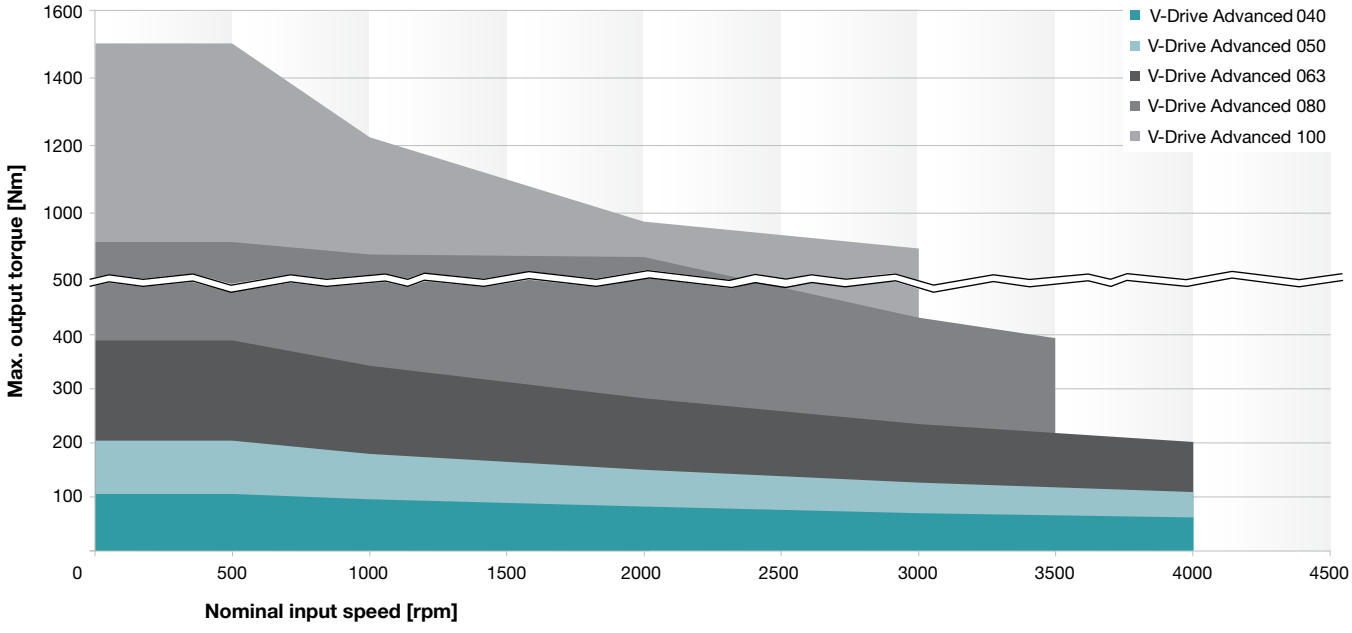
V-Drive Advanced – Powerful torque but quiet running

Servo worm gearheads with the solid shaft, hollow shaft and flanged hollow shaft types. The V-Drive Advanced impresses with its high power density and low torsional backlash. It is especially suitable for continuous duty applications.

VDT+ VDH+ VDS+

Quick size selection

V-Drive Advanced (example for i = 28)
For applications in cyclic operation (DC ≤ 60%) or continuous operation (DC ≥ 60%)



Versions and Applications

Features	VDT+ with Flanged hollow shaft page 294	VDH+ with smooth/keyed hollow shaft page 302	VDS+ with smooth/keyed shaft or involute shaft page 312
Power density	••	••	••
Positioning accuracy	••	••	••
Torsional rigidity	•••	••	••
Smooth-running	•••	•••	•••

Product features

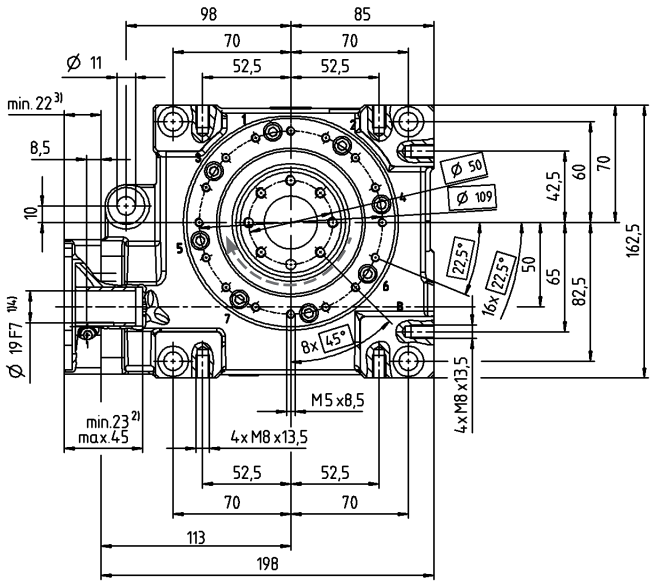
Ratios		4 – 40	4 – 40	4 – 40
Torsional backlash [arcmin]	Standard	≤ 3	≤ 3	≤ 3
	Reduced	≤ 2	≤ 2	≤ 2
Output type				
Smooth output shaft				•
Keywayed output shaft				•
Output shaft with involute gearing				•
Output flange		•		
Hollow shaft interface Connected via shrink disc			•	
Hollow shaft interface, 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		•		

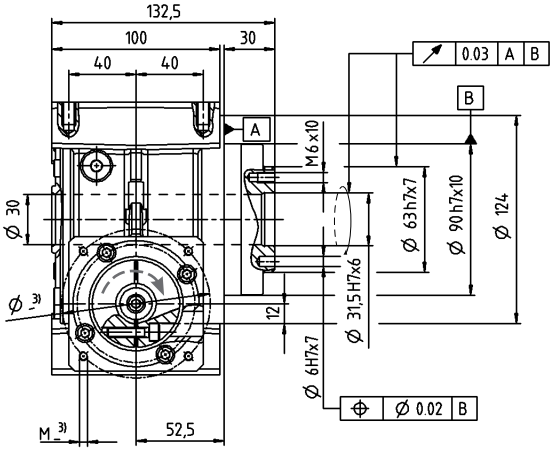
[a] Please contact WITTENSTEIN alpha

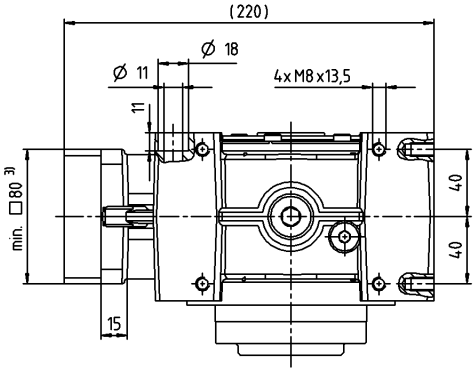
				1-stage					
Ratio			***i***	**4**	**7**	**10**	**16**	**28**	**40**
n_{1N}=500 rpm			T_{2Max} Nm	165	180	182	193	204	183
			T_{2Max} in.lb	1460	1593	1611	1708	1805	1620
			T_{2Servo} Nm	54	71	74	81	90	74
			T_{2Servo} in.lb	478	628	655	717	797	655
			η %	92	89	86	82	72	64
n_{1N}=1000 rpm			T_{2Max} Nm	137	154	158	172	182	164
			T_{2Max} in.lb	1212	1363	1398	1522	1611	1451
			T_{2Servo} Nm	58	76	80	88	97	81
			T_{2Servo} in.lb	513	673	708	779	858	717
			η %	94	91	89	85	77	69
n_{1N}=2000 rpm			T_{2Max} Nm	100	118	124	139	149	134
			T_{2Max} in.lb	885	1044	1097	1230	1319	1186
			T_{2Servo} Nm	60	78	82	89	99	83
			T_{2Servo} in.lb	531	690	726	788	876	735
			η %	95	93	91	88	75	75
n_{1N}=3000 rpm			T_{2Max} Nm	77	94	101	116	126	114
			T_{2Max} in.lb	681	832	894	1027	1115	1009
			T_{2Servo} Nm	59	77	81	88	97	81
			T_{2Servo} in.lb	522	681	717	779	858	717
			η %	96	94	93	90	83	78
n_{1N}=4000 rpm			T_{2Max} Nm	62	77	84	99	108	98
			T_{2Max} in.lb	549	681	743	876	956	867
			T_{2Servo} Nm	58	76	79	87	96	80
			T_{2Servo} in.lb	513	673	699	770	850	708
			η %	96	95	93	91	85	80
Emergency stop torque			T_{2Not} Nm	230	242	242	250	262	236
			T_{2Not} in.lb	2036	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	2.3	2.2	1.6	1.5	1.2	1.1
			T_{012} in.lb	20.4	19.5	14.2	13.3	10.6	9.7
Max. torsional backlash			j_t arcmin	Standard ≤ 3 / Reduced ≤ 2					
Torsional rigidity			C_{t21} Nm/arcmin	17					
			C_{t21} in.lb/arcmin	150					
Max. axial force [b]			F_{2AMax} N	5000					
			F_{2AMax} lb_f	1125					
Max. radial force [b]			F_{2RMax} N	3800					
			F_{2RMax} lb_f	855					
Max. tilting moment			M_{2KMax} Nm	409					
			M_{2KMax} in.lb	3620					
Tilting rigidity			C_{2K} Nm/arcmin	504					
			C_{2K} in.lb/arcmin	4460					
Service life (For calculation see "Information")			L_h h	> 20000					
Weight incl. standardadapter plate			m kg	8,8					
			m lb_m	19,4					
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)	E	19	J_1 kgcm²	2.59	2.12	1.98	1.86	1.82	1.86
Clamping hub diameter [mm]			J_1 10^{-3} in.lb.s²	2.29	1.87	1.75	1.64	1.61	1.65

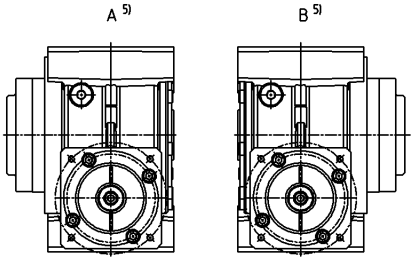
For a detailed design, please refer to the notes on p. 426

[a] Idling torques decrease during operation
[b] Refers to center of output shaft or flange at n_2 = 300 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 with a minimum thickness of 1 mm.
5) Output side

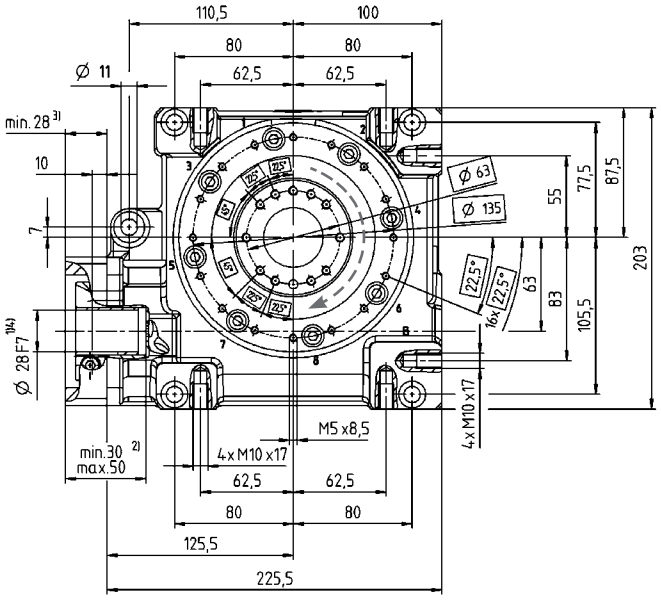
CAD data is available under www.wittenstein-alpha.com

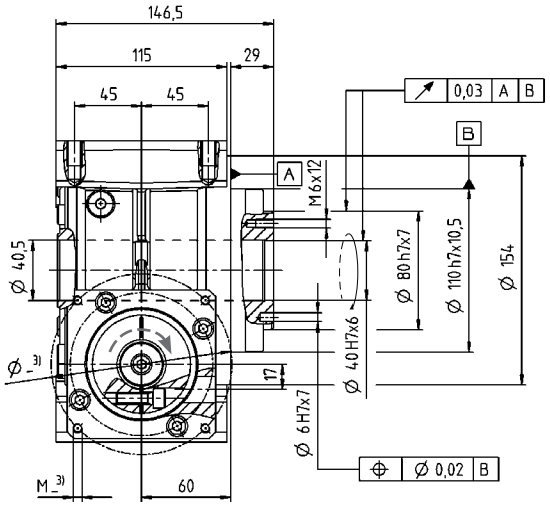
Motor mounting according to operating manual

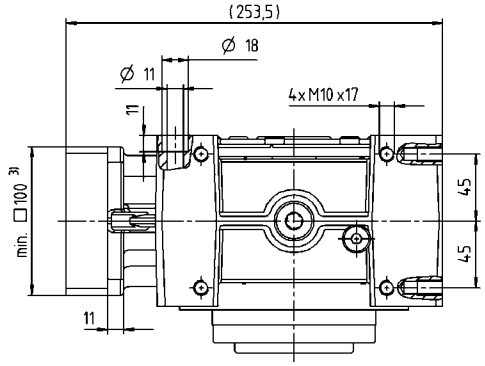
				1-stage					
Ratio			***i***	**4**	**7**	**10**	**16**	**28**	**40**
n_{1N}=500 rpm			T_{2Max} Nm	319	353	364	372	392	363
			T_{2Max} in.lb	2823	3124	3221	3292	3469	3213
			T_{2Servo} Nm	198	210	225	221	229	226
			T_{2Servo} in.lb	1752	1859	1991	1956	2027	2000
			η %	93	91	88	83	74	68
n_{1N}=1000 rpm			T_{2Max} Nm	264	297	312	324	342	321
			T_{2Max} in.lb	2336	2628	2761	2867	3027	2841
			T_{2Servo} Nm	192	228	240	238	245	241
			T_{2Servo} in.lb	1699	2018	2124	2106	2168	2133
			η %	94	93	91	86	78	73
n_{1N}=2000 rpm			T_{2Max} Nm	202	243	262	271	282	278
			T_{2Max} in.lb	1788	2151	2319	2398	2496	2460
			T_{2Servo} Nm	174	212	230	238	248	243
			T_{2Servo} in.lb	1540	1876	2036	2106	2195	2151
			η %	96	94	93	89	83	78
n_{1N}=3000 rpm			T_{2Max} Nm	164	190	202	209	235	231
			T_{2Max} in.lb	1451	1682	1788	1850	2080	2044
			T_{2Servo} Nm	128	166	184	209	198	194
			T_{2Servo} in.lb	1133	1469	1628	1850	1752	1717
			η %	96	95	94	91	85	81
n_{1N}=4000 rpm			T_{2Max} Nm	128	148	164	175	201	198
			T_{2Max} in.lb	1133	1310	1451	1549	1779	1752
			T_{2Servo} Nm	104	132	152	175	165	162
			T_{2Servo} in.lb	920	1168	1345	1549	1460	1434
			η %	97	96	94	92	86	83
Emergency stop torque			T_{2Not} Nm	460	484	491	494	518	447
			T_{2Not} 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	4.2	3.1	3.0	2.4	2.3	2.2
			T_{012} in.lb	37.2	27.4	26.6	21.2	20.4	19.5
Max. torsional backlash			j_t arcmin	Standard ≤ 3 / Reduced ≤ 2					
Torsional rigidity			C_{t21} Nm/arcmin	50					
			C_{t21} in.lb/arcmin	443					
Max. axial force [b]			F_{2AMax} N	8250					
			F_{2AMax} lb_f	1856					
Max. radial force [b]			F_{2RMax} N	6000					
			F_{2RMax} lb_f	1350					
Max. tilting moment			M_{2KMax} Nm	843					
			M_{2KMax} in.lb	7461					
Tilting rigidity			C_{2K} Nm/arcmin	603					
			C_{2K} in.lb/arcmin	5337					
Service life (For calculation see "Information")			L_h h	> 20000					
Weight incl. standard adapter plate			*m* kg	14,5					
			m lb_m	32					
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)	H	28	J_1 kgcm²	7.45	6.02	5.65	5.49	5.42	5.36
Clamping hub diameter [mm]			J_1 10^{-3} in.lb.s²	6.60	5.33	5.00	4.86	4.80	4.75

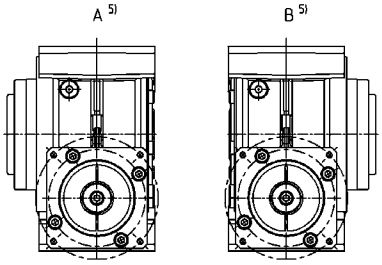
For a detailed design, please refer to the notes on p. 426

[a] Idling torques decrease during operation
[b] Refers to center of output shaft or flange at n_2 = 300 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 with a minimum thickness of 1 mm.
5) Output side

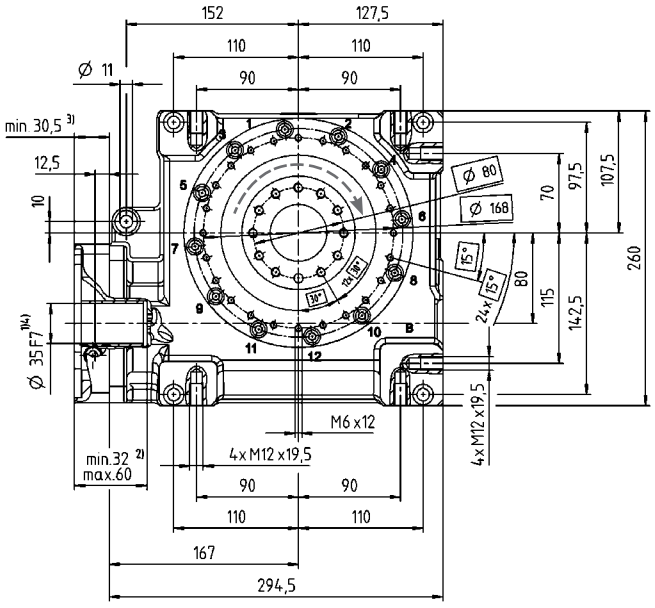
CAD data is available under www.wittenstein-alpha.com

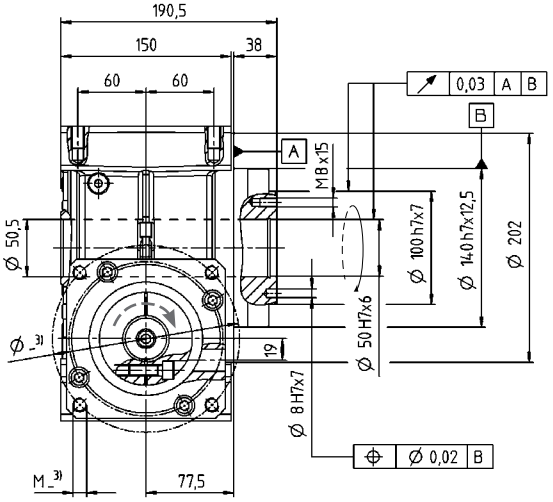
Motor mounting according to operating manual

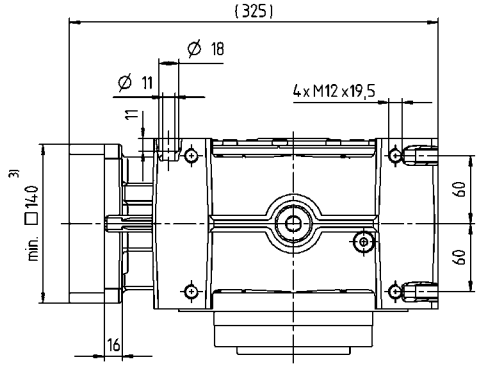
				1-stage					
Ratio			***i***	**4**	**7**	**10**	**16**	**28**	**40**
n_{1N}=500 rpm			T_{2Max} Nm	578	646	672	702	785	676
			T_{2Max} in.lb	5115	5717	5947	6213	6947	5983
			T_{2Servo} Nm	469	601	613	677	764	631
			T_{2Servo} in.lb	4151	5319	5425	5991	6761	5584
			η %	94	92	89	86	77	70
n_{1N}=1000 rpm			T_{2Max} Nm	514	602	588	656	698	613
			T_{2Max} in.lb	4549	5328	5204	5806	6177	5425
			T_{2Servo} Nm	491	574	561	625	665	584
			T_{2Servo} in.lb	4345	5080	4965	5531	5885	5168
			η %	95	93	91	88	81	74
n_{1N}=2000 rpm			T_{2Max} Nm	350	435	431	500	536	470
			T_{2Max} in.lb	3098	3850	3814	4425	4744	4160
			T_{2Servo} Nm	335	415	411	476	511	448
			T_{2Servo} in.lb	2965	3673	3637	4213	4522	3965
			η %	96	95	93	89	84	79
n_{1N}=3000 rpm			T_{2Max} Nm	259	336	334	400	433	380
			T_{2Max} in.lb	2292	2974	2956	3540	3832	3363
			T_{2Servo} Nm	247	320	319	381	413	362
			T_{2Servo} in.lb	2186	2832	2823	3372	3655	3204
			η %	97	96	94	92	86	81
n_{1N}=3500 rpm			T_{2Max} Nm	227	299	300	362	394	346
			T_{2Max} in.lb	2009	2646	2655	3204	3487	3062
			T_{2Servo} Nm	217	285	286	345	376	330
			T_{2Servo} in.lb	1920	2522	2531	3053	3328	2921
			η %	97	96	94	92	87	82
Emergency stop torque			T_{2Not} Nm	938	993	963	1005	1064	941
			T_{2Not} 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	7.2	7.1	6.5	5.0	4.8	4.5
			T_{012} in.lb	63.7	62.8	57.5	44.3	42.5	39.8
Max. torsional backlash			j_t arcmin	Standard ≤ 3 / Reduced ≤ 2					
Torsional rigidity			C_{t21} Nm/arcmin	113					
			C_{t21} in.lb/arcmin	1000					
Max. axial force [b]			F_{2AMax} N	13900					
			F_{2AMax} lb_f	3128					
Max. radial force [b]			F_{2RMax} N	9000					
			F_{2RMax} lb_f	2025					
Max. tilting moment			M_{2KMax} Nm	1544					
			M_{2KMax} in.lb	13664					
Tilting rigidity			C_{2K} Nm/arcmin	1178					
			C_{2K} in.lb/arcmin	10425					
Service life (For calculation see "Information")			L_h h	> 20000					
Weight incl. standard adapter plate			m kg	31					
			m 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	35	J_1 kgcm²	23.99	18.64	18.23	16.54	16.32	16.94
Clamping hub diameter [mm]			J_1 10^{-3} in.lb.s²	21.23	16.49	16.13	14.64	14.44	14.99

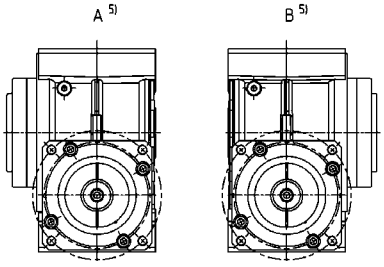
For a detailed design, please refer to the notes on p. 426

[a] Idling torques decrease during operation
[b] Refers to center of output shaft or flange at n_2 = 300 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.
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4) Smaller motor shaft diameter is compensated by a bushing with a minimum thickness of 1 mm.
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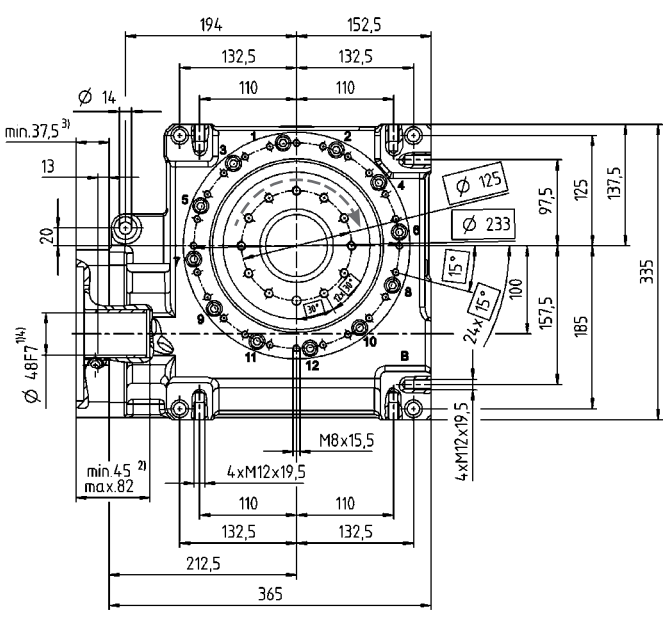
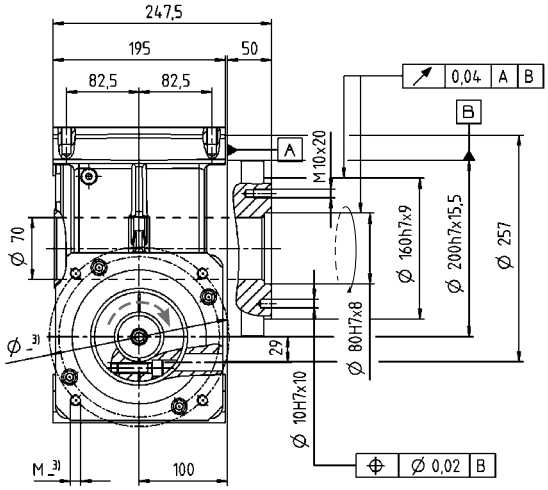
Motor mounting according to operating manual

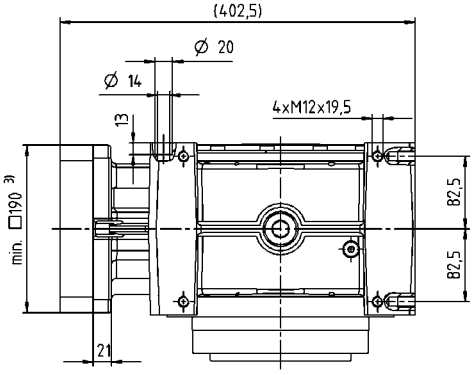
				1-stage					
Ratio			***i***	**4**	**7**	**10**	**16**	**28**	**40**
n_{1N}=500 rpm			T_{2Max} Nm	1184	1336	1377	1392	1505	1376
			T_{2Max} in.lb	10478	11824	12186	12319	13319	12178
			T_{2Servo} Nm	1155	1304	1343	1359	1469	1343
			T_{2Servo} in.lb	10222	11540	11886	12027	13001	11886
			η %	95	93	91	87	80	76
n_{1N}=1000 rpm			T_{2Max} Nm	905	1070	1122	1140	1251	1162
			T_{2Max} in.lb	8009	9470	9930	10089	11071	10284
			T_{2Servo} Nm	883	1044	1095	1113	1221	1134
			T_{2Servo} in.lb	7815	9239	9691	9850	10806	10036
			η %	95	94	92	88	82	79
n_{1N}=2000 rpm			T_{2Max} Nm	595	748	807	830	930	883
			T_{2Max} in.lb	5266	6620	7142	7346	8231	7815
			T_{2Servo} Nm	581	730	788	810	908	862
			T_{2Servo} in.lb	5142	6461	6974	7169	8036	7629
			η %	96	95	94	91	86	82
n_{1N}=3000 rpm [c]			T_{2Max} Nm	430	564	621	644	735	709
			T_{2Max} in.lb	3806	4991	5496	5699	6505	6275
			T_{2Servo} Nm	420	551	606	629	718	692
			T_{2Servo} in.lb	3717	4876	5363	5567	6354	6124
			η %	97	96	95	92	87	84
n_{1N}=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
			T_{2Not} 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	12.2	10.5	9.8	9.1	8.2	7.2
			T_{012} in.lb	108.0	92.9	86.7	80.5	72.6	63.7
Max. torsional backlash			j_t arcmin	Standard ≤ 3 / Reduced ≤ 2					
Torsional rigidity			C_{t21} Nm/arcmin	213					
			C_{t21} in.lb/arcmin	1885					
Max. axial force [b]			F_{2AMax} N	19500					
			F_{2AMax} lb_f	4388					
Max. radial force [b]			F_{2RMax} N	14000					
			F_{2RMax} lb_f	3150					
Max. tilting moment			M_{2KMax} Nm	3059					
			M_{2KMax} in.lb	27072					
Tilting rigidity			C_{2K} Nm/arcmin	2309					
			C_{2K} in.lb/arcmin	20435					
Service life (For calculation see "Information")			L_h h	> 20000					
Weight incl. standardadapter plate			m kg	62					
			m 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) Clamping hub diameter [mm]	M	48	J_1 kgcm²	83.51	64.27	59.95	59.40	56.32	56.49
			J_1 10^{-3} in.lb.s²	73.90	56.88	53.06	52.56	49.85	50.00

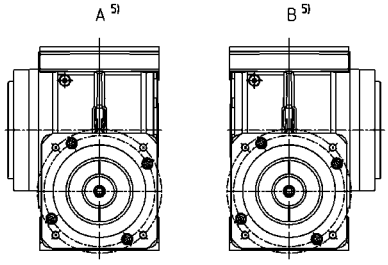
For a detailed design, please refer to the notes on p. 426

[a] Idling torques decrease during operation
[b] Refers to center of output shaft or flange at n_2 = 300 rpm
[c] Reduce by 20% in S1 operation at 20°C ambient temperature.









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

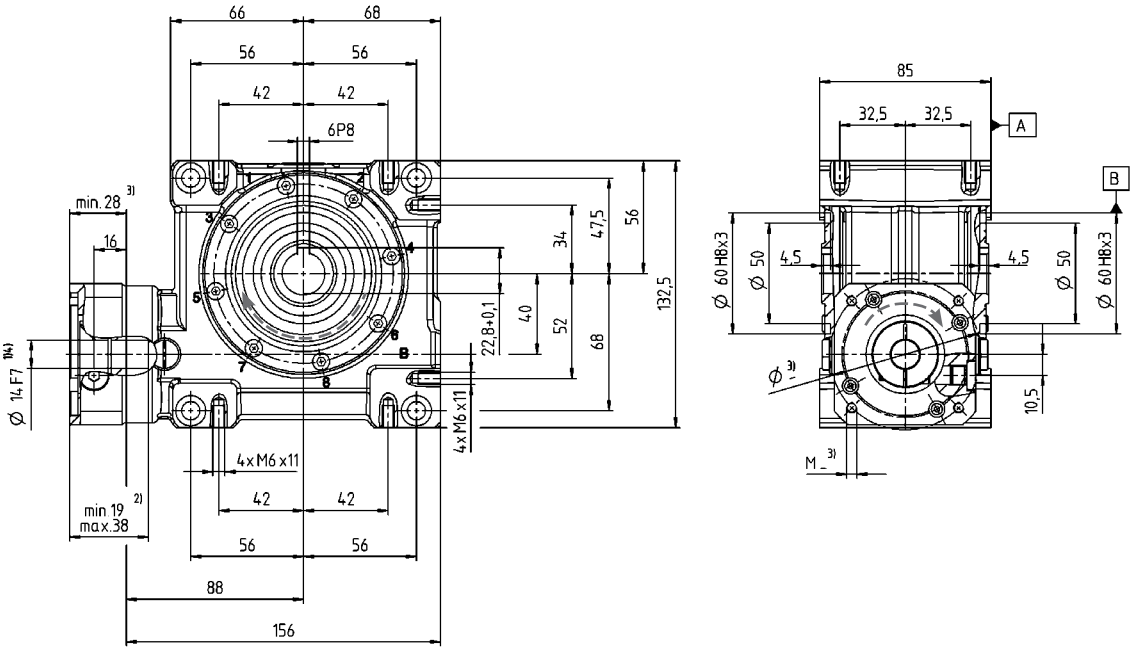
CAD data is available under www.wittenstein-alpha.com

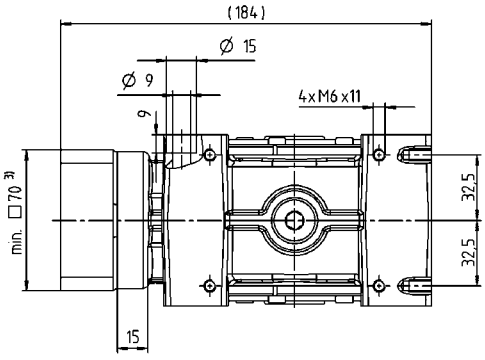
Motor mounting according to operating manual

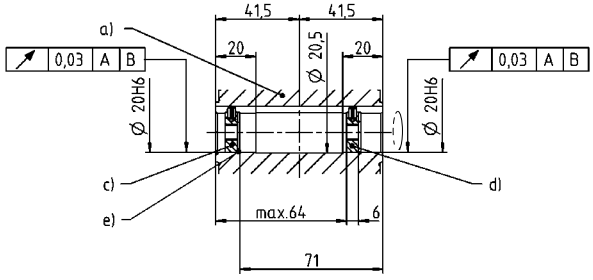
					1-stage					
Ratio			***i***		**4**	**7**	**10**	**16**	**28**	**40**
n_{1N}=500 rpm			T_{2Max}	Nm	74	82	98	101	106	98
				in.lb	655	726	867	894	938	867
			T_{2Servo}	Nm	17	24	25	26	29	25
				in.lb	150	212	221	230	257	221
			η	%	93	90	88	82	73	67
n_{1N}=1000 rpm			T_{2Max}	Nm	63	73	87	92	96	90
				in.lb	558	646	770	814	850	797
			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_{1N}=2000 rpm			T_{2Max}	Nm	47	58	71	76	81	77
				in.lb	416	513	628	673	717	681
			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_{1N}=3000 rpm			T_{2Max}	Nm	37	47	59	65	70	66
				in.lb	327	416	522	575	620	584
			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_{1N}=4000 rpm			T_{2Max}	Nm	31	40	51	56	61	59
				in.lb	274	354	451	496	540	522
			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	0.6	0.5	0.4	0.4
				in.lb	7.1	6.2	5.3	4.4	3.5	3.5
Max. torsional backlash			j_t	arcmin	Standard ≤ 3 / Reduced ≤ 2					
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)	C	14	J_1	kgcm²	0.52	0.38	0.34	0.32	0.32	0.31
Moments of inertia for motor shaft diameter 14 and 19 mm				10^{-3} in.lb.s²	0.46	0.34	0.30	0.28	0.28	0.27
	E	19	J_1	kgcm²	0.54	0.40	0.37	0.35	0.34	0.33
				10^{-3} in.lb.s²	0.48	0.35	0.33	0.31	0.30	0.29

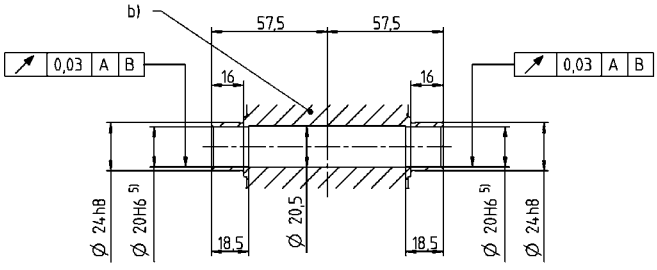
For a detailed design, please refer to the notes on p. 426

[a] Idling torques decrease during operation
[b] Refers to center of output shaft or flange at n_2 = 300 rpm









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

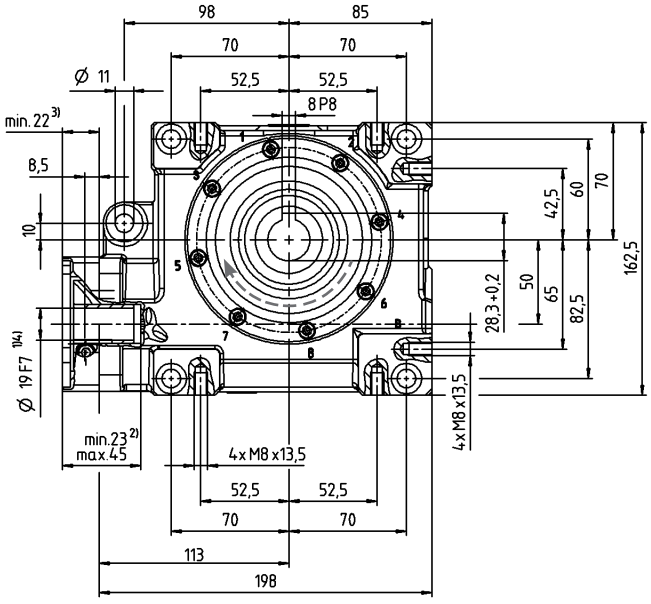
Motor mounting according to operating manual

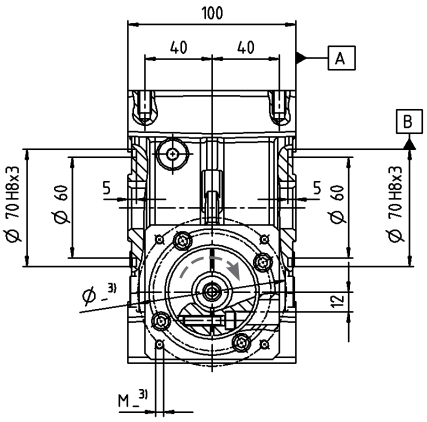
				1-stage					
Ratio			***i***	**4**	**7**	**10**	**16**	**28**	**40**
n_{1N}=500 rpm			T_{2Max}	Nm	165	180	182	193	204	183
				in.lb	1460	1593	1611	1708	1805	1620
			T_{2Servo}	Nm	54	71	74	81	90	74
				in.lb	478	628	655	717	797	655
			η	%	92	89	86	82	72	64
n_{1N}=1000 rpm			T_{2Max}	Nm	137	154	158	172	182	164
				in.lb	1212	1363	1398	1522	1611	1451
			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_{1N}=2000 rpm			T_{2Max}	Nm	100	118	124	139	149	134
				in.lb	885	1044	1097	1230	1319	1186
			T_{2Servo}	Nm	60	78	82	89	99	83
				in.lb	531	690	726	788	876	735
			η	%	95	93	91	88	75	75
n_{1N}=3000 rpm			T_{2Max}	Nm	77	94	101	116	126	114
				in.lb	681	832	894	1027	1115	1009
			T_{2Servo}	Nm	59	77	81	88	97	81
				in.lb	522	681	717	779	858	717
			η	%	96	94	93	90	83	78
n_{1N}=4000 rpm			T_{2Max}	Nm	62	77	84	99	108	98
				in.lb	549	681	743	876	956	867
			T_{2Servo}	Nm	58	76	79	87	96	80
				in.lb	513	673	699	770	850	708
			η	%	96	95	93	91	85	80
Emergency stop torque			T_{2Not}	Nm	230	242	242	250	262	236
				in.lb	2036	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	2.3	2.2	1.6	1.5	1.2	1.1
				in.lb	20.4	19.5	14.2	13.3	10.6	9.7
Max. torsional backlash			j_t	arcmin	Standard ≤ 3 / Reduced ≤ 2					
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. standard adapter 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) Clamping hub diameter [mm]	E	19	J_1	kgcm²	2.31	2.02	1.93	1.84	1.81	1.86
				10^{-3} in.lb.s²	2.04	1.79	1.71	1.63	1.60	1.64

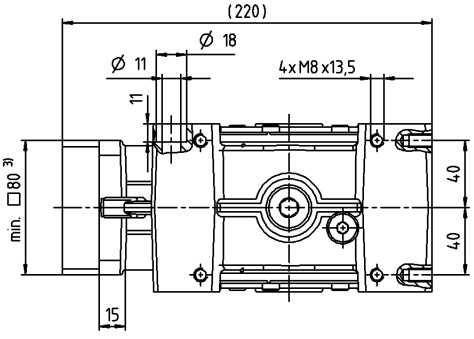
For a detailed design, please refer to the notes on p. 426

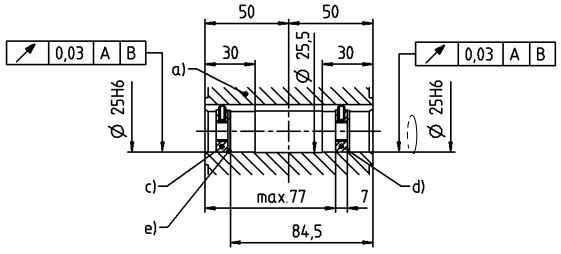
[a] Idling torques decrease during operation

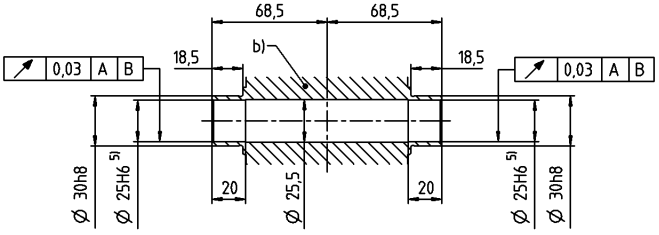
[b] Refers to center of output shaft or flange at n_2 = 300 rpm











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

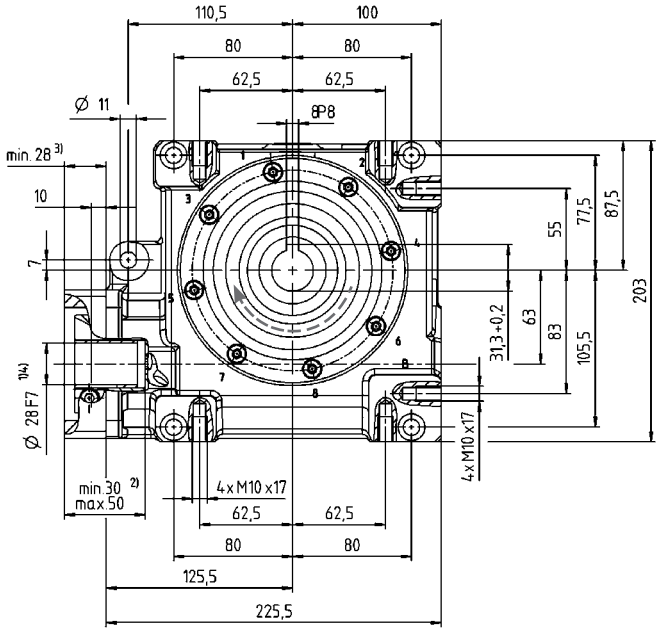
Motor mounting according to operating manual

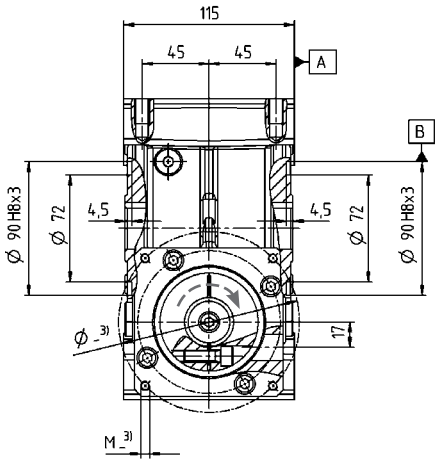
				1-stage					
Ratio			***i***	**4**	**7**	**10**	**16**	**28**	**40**
n_{1N}=500 rpm			T_{2Max} Nm	319	353	364	372	392	363
			T_{2Max} in.lb	2823	3124	3221	3292	3469	3213
			T_{2Servo} Nm	198	210	225	221	229	226
			T_{2Servo} in.lb	1752	1859	1991	1956	2027	2000
			η %	93	91	88	83	74	68
n_{1N}=1000 rpm			T_{2Max} Nm	264	297	312	324	342	321
			T_{2Max} in.lb	2336	2628	2761	2867	3027	2841
			T_{2Servo} Nm	192	228	240	238	245	241
			T_{2Servo} in.lb	1699	2018	2124	2106	2168	2133
			η %	94	93	91	86	78	73
n_{1N}=2000 rpm			T_{2Max} Nm	202	243	262	271	282	278
			T_{2Max} in.lb	1788	2151	2319	2398	2496	2460
			T_{2Servo} Nm	174	212	230	238	248	243
			T_{2Servo} in.lb	1540	1876	2036	2106	2195	2151
			η %	96	94	93	89	83	78
n_{1N}=3000 rpm			T_{2Max} Nm	164	190	202	209	235	231
			T_{2Max} in.lb	1451	1682	1788	1850	2080	2044
			T_{2Servo} Nm	128	166	184	209	198	194
			T_{2Servo} in.lb	1133	1469	1628	1850	1752	1717
			η %	96	95	94	91	85	81
n_{1N}=4000 rpm			T_{2Max} Nm	128	148	164	175	201	198
			T_{2Max} in.lb	1133	1310	1451	1549	1779	1752
			T_{2Servo} Nm	104	132	152	175	165	162
			T_{2Servo} in.lb	920	1168	1345	1549	1460	1434
			η %	97	96	94	92	86	83
Emergency stop torque			T_{2Not} Nm	460	484	491	494	518	447
			T_{2Not} 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	4.2	3.1	3.0	2.4	2.3	2.2
			T_{012} in.lb	37.2	27.4	26.6	21.2	20.4	19.5
Max. torsional backlash			j_t arcmin	Standard ≤ 3 / Reduced ≤ 2					
Torsional rigidity			C_{t21} Nm/arcmin	28					
			in.lb/arcmin	248					
Max. axial force [b]			F_{2AMax} N	8250					
			F_{2AMax} lb_f	1856					
Max. radial force [b]			F_{2RMax} N	6000					
			F_{2RMax} lb_f	1350					
Max. tilting moment			M_{2KMax} Nm	843					
			M_{2KMax} in.lb	7461					
Service life (For calculation see "Information")			L_h h	> 20000					
Weight incl. standard adapter plate			m kg	12					
			m 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) Clamping hub diameter [mm]	H	28	J_1 kgcm²	6.68	5.77	5.53	5.44	5.40	5.35
			J_1 10^{-3} in.lb.s²	5.91	5.11	4.89	4.81	4.78	4.74

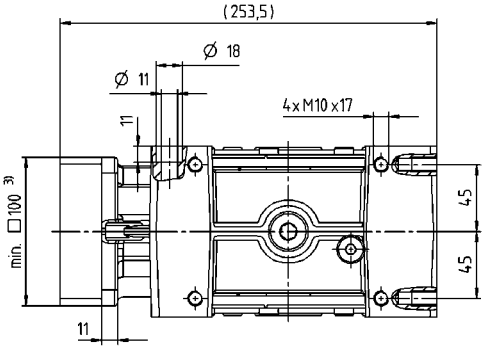
For a detailed design, please refer to the notes on p. 426

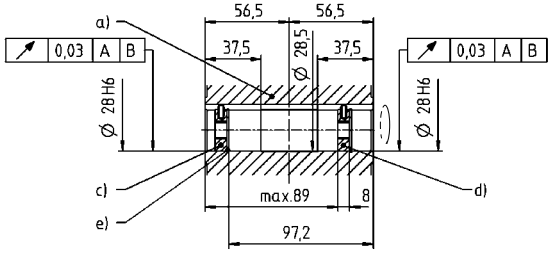
[a] Idling torques decrease during operation

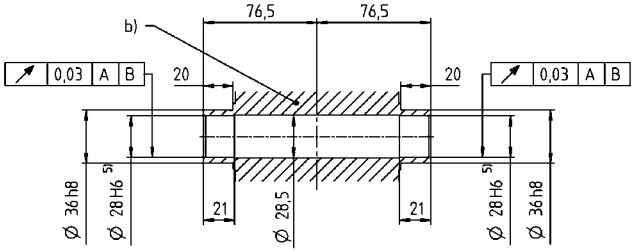
[b] Refers to center of output shaft or flange at n_2 = 300 rpm











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

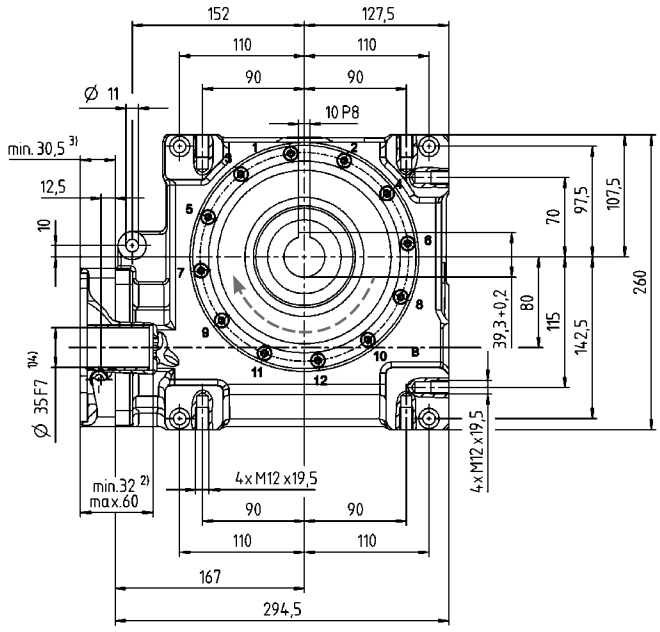
Motor mounting according to operating manual

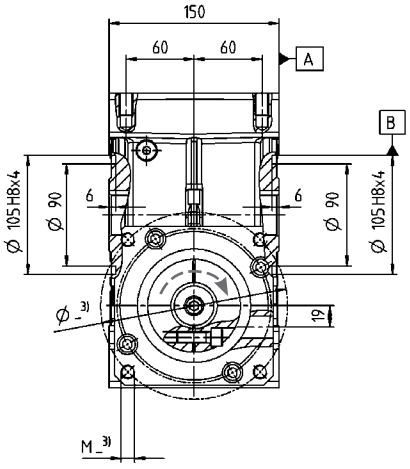
				1-stage					
Ratio			***i***	**4**	**7**	**10**	**16**	**28**	**40**
n_{1N}=500 rpm			T_{2Max}	Nm	578	646	672	702	785	676
				in.lb	5115	5717	5947	6213	6947	5983
			T_{2Servo}	Nm	469	601	613	677	764	631
				in.lb	4151	5319	5425	5991	6761	5584
			η	%	94	92	89	86	77	70
n_{1N}=1000 rpm			T_{2Max}	Nm	514	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
			η	%	95	93	91	88	81	74
n_{1N}=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
			η	%	96	95	93	89	84	79
n_{1N}=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
			η	%	97	96	94	92	86	81
n_{1N}=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
			η	%	97	96	94	92	87	82
Emergency stop torque			T_{2Not}	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	7.2	7.1	6.5	5.0	4.8	4.5
				in.lb	63.7	62.8	57.5	44.3	42.5	39.8
Max. torsional backlash			j_t	arcmin	Standard ≤ 3 / Reduced ≤ 2					
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_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) Clamping hub diameter [mm]	J	35	J_1	kgcm²	21.31	17.76	17.80	16.38	16.27	16.91
				10^{-3} in.lb.s²	18.86	15.72	15.75	14.49	14.40	14.97

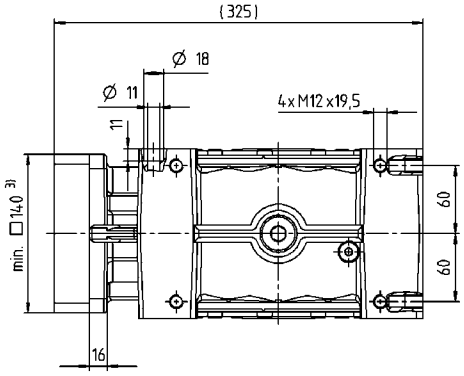
For a detailed design, please refer to the notes on p. 426

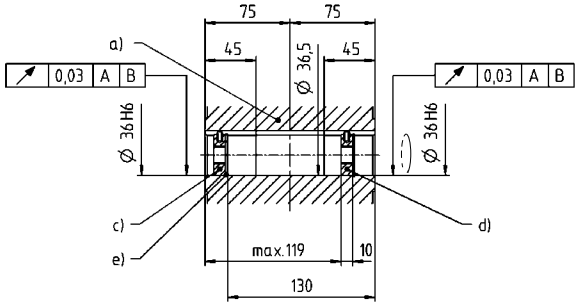
[a] Idling torques decrease during operation

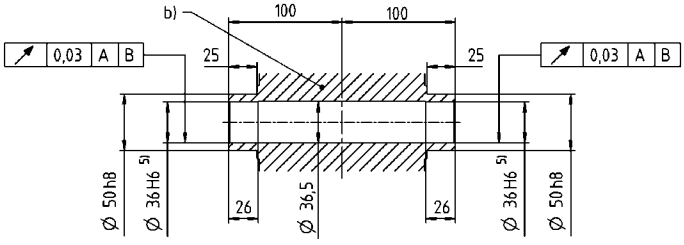
[b] Refers to center of output shaft or flange at n_2 = 300 rpm











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.

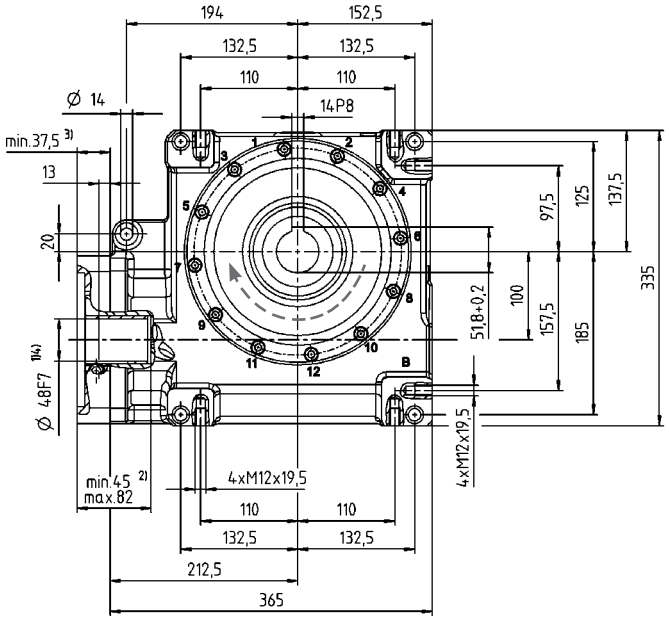
CAD data is available under www.wittenstein-alpha.com

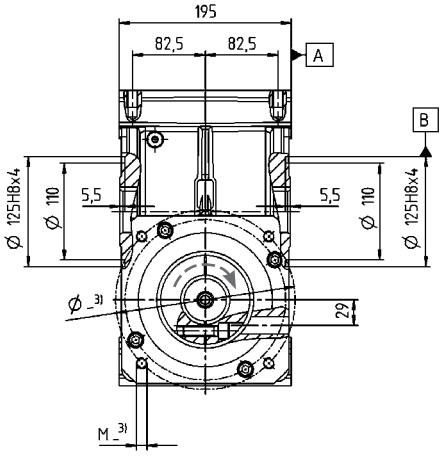
Motor mounting according to operating manual

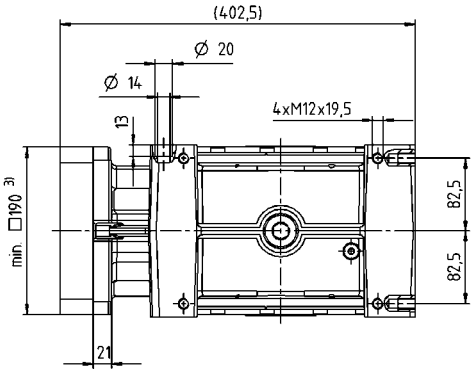
				1-stage					
Ratio			***i***	**4**	**7**	**10**	**16**	**28**	**40**
n_{1N}=500 rpm			T_{2Max}	Nm	1184	1336	1377	1392	1505	1376
				in.lb	10478	11824	12186	12319	13319	12178
			T_{2Servo}	Nm	1155	1304	1343	1359	1469	1343
				in.lb	10222	11540	11886	12027	13001	11886
			η	%	95	93	91	87	80	76
n_{1N}=1000 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_{1N}=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_{1N}=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_{1N}=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	12.2	10.5	9.8	9.1	8.2	7.2
				in.lb	108.0	92.9	86.7	80.5	72.6	63.7
Max. torsional backlash			j_t	arcmin	Standard ≤ 3 / Reduced ≤ 2					
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) Clamping hub diameter [mm]	M	48	J_1	kgcm²	65.82	56.27	54.34	55.19	52.72	53.04
				10^{-3} in.lb.s²	58.25	49.80	48.09	48.84	46.66	46.94

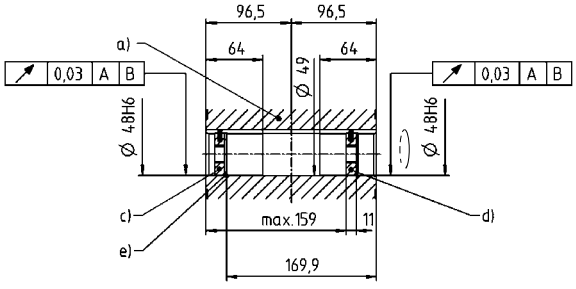
For a detailed design, please refer to the notes on p. 426

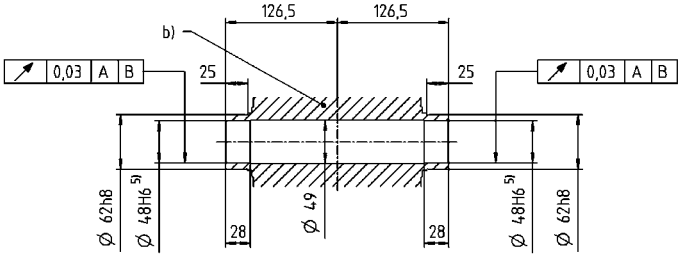
[a] Idling torques decrease during operation
[b] Refers to center of output shaft or flange at n_2 = 300 rpm
[c] Reduce by 20% in S1 operation at 20°C ambient temperature.











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

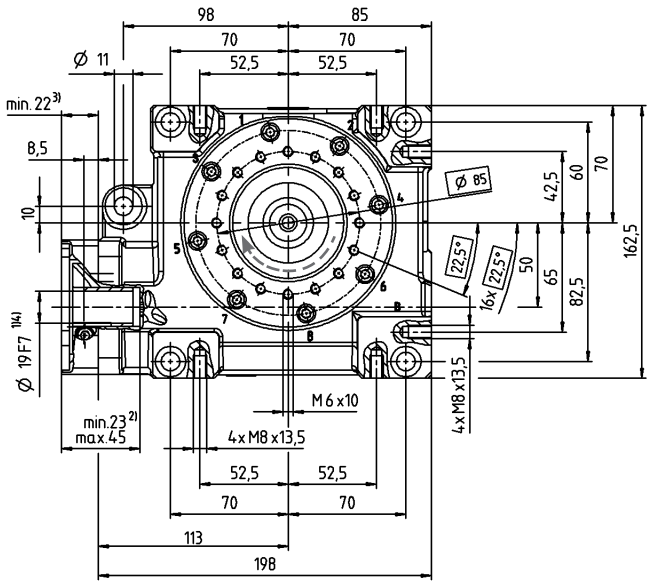
Motor mounting according to operating manual

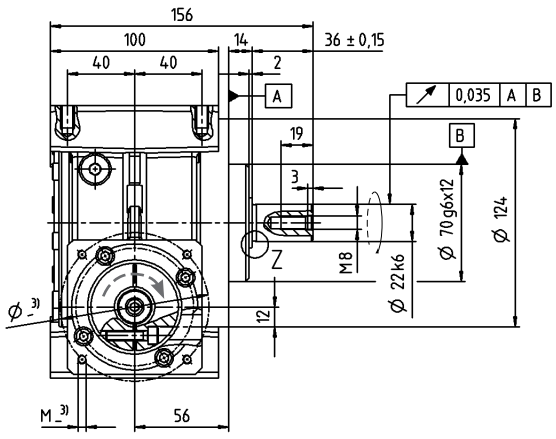
				1-stage					
Ratio			***i***	**4**	**7**	**10**	**16**	**28**	**40**
n_{1N}=500 rpm			T_{2Max} Nm	165	180	182	193	204	183
			T_{2Max} in.lb	1460	1593	1611	1708	1805	1620
			T_{2Servo} Nm	54	71	74	81	90	74
			T_{2Servo} in.lb	478	628	655	717	797	655
			η %	92	89	86	82	72	64
n_{1N}=1000 rpm			T_{2Max} Nm	137	154	158	172	182	164
			T_{2Max} in.lb	1212	1363	1398	1522	1611	1451
			T_{2Servo} Nm	58	76	80	88	97	81
			T_{2Servo} in.lb	513	673	708	779	858	717
			η %	94	91	89	85	77	69
n_{1N}=2000 rpm			T_{2Max} Nm	100	118	124	139	149	134
			T_{2Max} in.lb	885	1044	1097	1230	1319	1186
			T_{2Servo} Nm	60	78	82	89	99	83
			T_{2Servo} in.lb	531	690	726	788	876	735
			η %	95	93	91	88	75	75
n_{1N}=3000 rpm			T_{2Max} Nm	77	94	101	116	126	114
			T_{2Max} in.lb	681	832	894	1027	1115	1009
			T_{2Servo} Nm	59	77	81	88	97	81
			T_{2Servo} in.lb	522	681	717	779	858	717
			η %	96	94	93	90	83	78
n_{1N}=4000 rpm			T_{2Max} Nm	62	77	84	99	108	98
			T_{2Max} in.lb	549	681	743	876	956	867
			T_{2Servo} Nm	58	76	79	87	96	80
			T_{2Servo} in.lb	513	673	699	770	850	708
			η %	96	95	93	91	85	80
Emergency stop torque			T_{2Not} Nm	230	242	242	250	262	236
			T_{2Not} in.lb	2036	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	2.3	2.2	1.6	1.5	1.2	1.1
			T_{012} in.lb	20.4	19.5	14.2	13.3	10.6	9.7
Max. torsional backlash			j_t arcmin	Standard ≤ 3 / Reduced ≤ 2					
Torsional rigidity			C_{t21} Nm/arcmin	8					
			in.lb/arcmin	71					
Max. axial force [b]			F_{2AMax} N	5000					
			F_{2AMax} lb_f	1125					
Max. radial force [b]			F_{2RMax} N	3800					
			F_{2RMax} lb_f	855					
Max. tilting moment			M_{2KMax} Nm	409					
			M_{2KMax} in.lb	3620					
Service life (For calculation see "Information")			L_h h	> 20000					
Weight incl. standard adapter plate			m kg	8,5					
			m lb_m	18,8					
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) Clamping hub diameter [mm]	E	19	J_1 kgcm²	2.27	2.03	1.94	1.84	1.81	1.86
			J_1 10^{-3} in.lb.s²	2.01	1.80	1.72	1.63	1.60	1.64

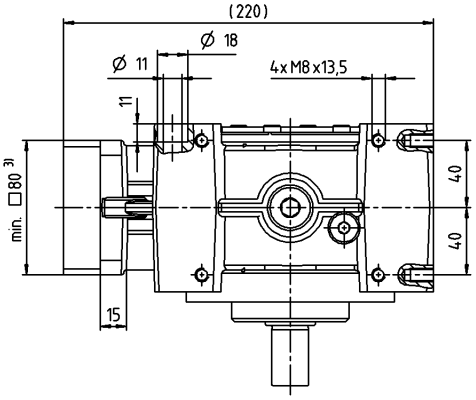
For a detailed design, please refer to the notes on p. 426

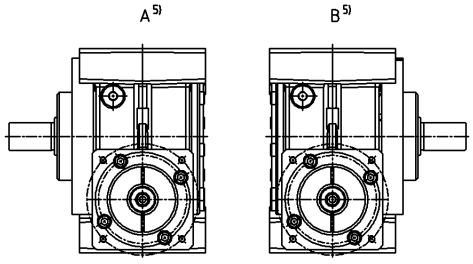
[a] Idling torques decrease during operation

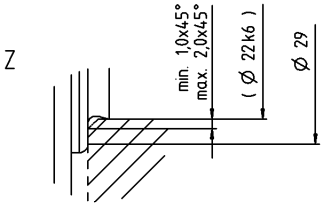
[b] Refers to center of output shaft or flange at n_2 = 300 rpm

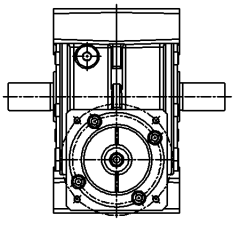










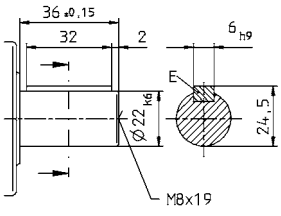


Optional dual-shaft output. Drawings available upon request.
Involute gearing is not possible.

Alternatives: Output shaft variants

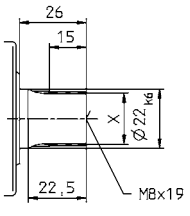
Keywayed output shaft in mm

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



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

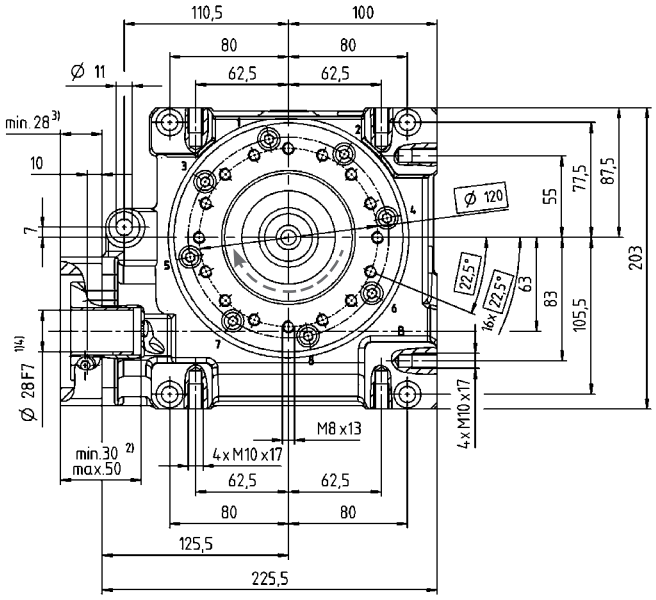
Motor mounting according to operating manual

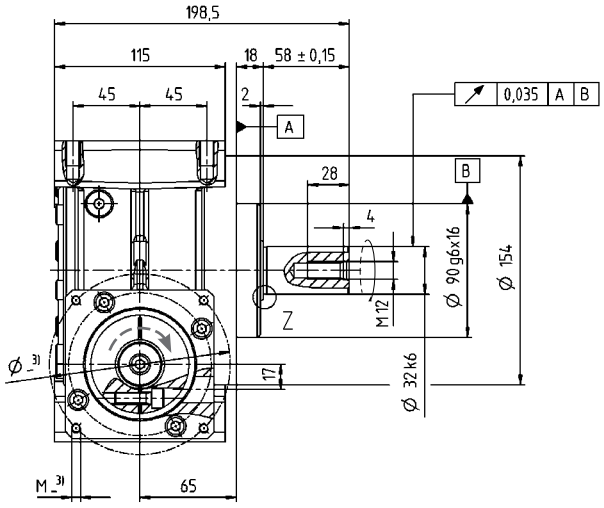
				1-stage					
Ratio			***i***	**4**	**7**	**10**	**16**	**28**	**40**
n_{1N}=500 rpm			T_{2Max} Nm	319	353	364	372	392	363
			T_{2Max} in.lb	2823	3124	3221	3292	3469	3213
			T_{2Servo} Nm	198	210	225	221	229	226
			T_{2Servo} in.lb	1752	1859	1991	1956	2027	2000
			η %	93	91	88	83	74	68
n_{1N}=1000 rpm			T_{2Max} Nm	264	297	312	324	342	321
			T_{2Max} in.lb	2336	2628	2761	2867	3027	2841
			T_{2Servo} Nm	192	228	240	238	245	241
			T_{2Servo} in.lb	1699	2018	2124	2106	2168	2133
			η %	94	93	91	86	78	73
n_{1N}=2000 rpm			T_{2Max} Nm	202	243	262	271	282	278
			T_{2Max} in.lb	1788	2151	2319	2398	2496	2460
			T_{2Servo} Nm	174	212	230	238	248	243
			T_{2Servo} in.lb	1540	1876	2036	2106	2195	2151
			η %	96	94	93	89	83	78
n_{1N}=3000 rpm			T_{2Max} Nm	164	190	202	209	235	231
			T_{2Max} in.lb	1451	1682	1788	1850	2080	2044
			T_{2Servo} Nm	128	166	184	209	198	194
			T_{2Servo} in.lb	1133	1469	1628	1850	1752	1717
			η %	96	95	94	91	85	81
n_{1N}=4000 rpm			T_{2Max} Nm	128	148	164	175	201	198
			T_{2Max} in.lb	1133	1310	1451	1549	1779	1752
			T_{2Servo} Nm	104	132	152	175	165	162
			T_{2Servo} in.lb	920	1168	1345	1549	1460	1434
			η %	97	96	94	92	86	83
Emergency stop torque			T_{2Not} Nm	460	484	491	494	518	447
			T_{2Not} 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	4.2	3.1	3.0	2.4	2.3	2.2
			T_{012} in.lb	37.2	27.4	26.6	21.2	20.4	19.5
Max. torsional backlash			j_t arcmin	Standard ≤ 3 / Reduced ≤ 2					
Torsional rigidity			C_{t21} Nm/arcmin	28					
			in.lb/arcmin	248					
Max. axial force [b]			F_{2AMax} N	8250					
			F_{2AMax} lb_f	1856					
Max. radial force [b]			F_{2RMax} N	6000					
			F_{2RMax} lb_f	1350					
Max. tilting moment			M_{2KMax} Nm	843					
			M_{2KMax} in.lb	7461					
Service life (For calculation see "Information")			L_h h	> 20000					
Weight incl. standard adapter plate			m kg	15					
			m 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) Clamping hub diameter [mm]	H	28	J_1 kgcm²	6.72	5.79	5.54	5.44	5.41	5.35
			J_1 10^{-3} in.lb.s²	5.95	5.12	4.90	4.82	4.78	4.74

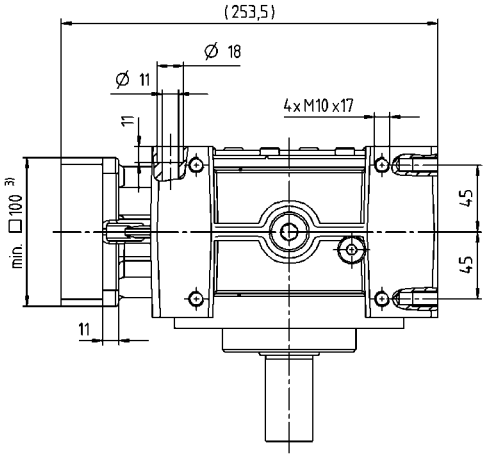
For a detailed design, please refer to the notes on p. 426

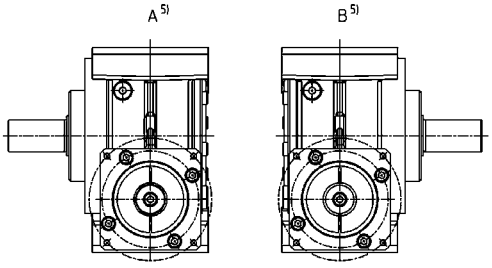
[a] Idling torques decrease during operation

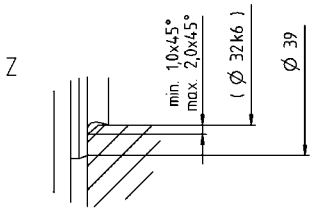
[b] Refers to center of output shaft or flange at n_2 = 300 rpm

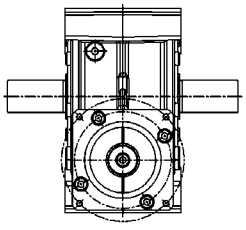










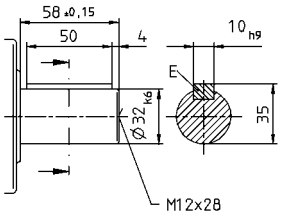


Optional dual-shaft output. Drawings available upon request.
Involute gearing is not possible.

Alternatives: Output shaft variants

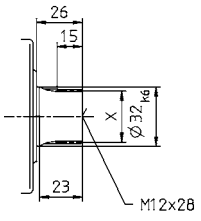
Keywayed output shaft in mm

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 6m



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

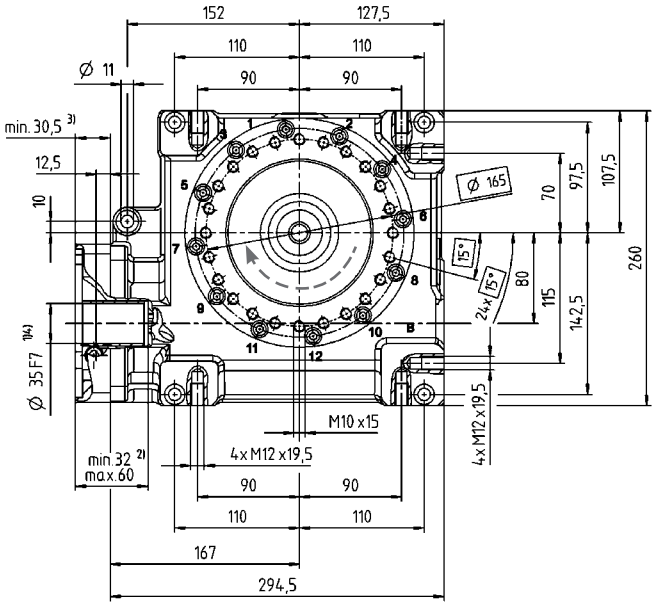
Motor mounting according to operating manual

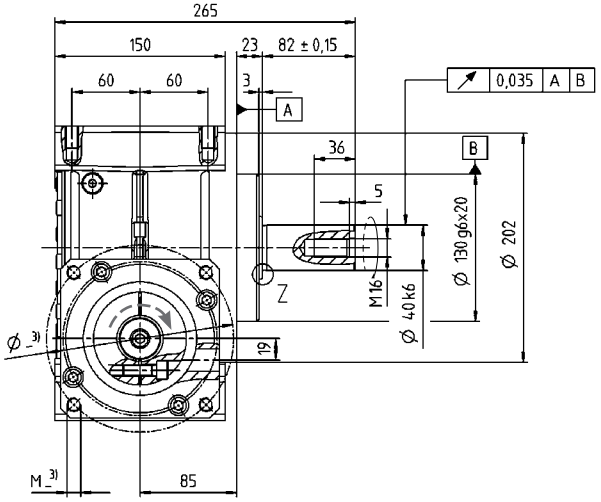
				1-stage					
Ratio			***i***	**4**	**7**	**10**	**16**	**28**	**40**
n_{1N}=500 rpm			T_{2Max}	Nm	578	646	672	702	785	676
				in.lb	5115	5717	5947	6213	6947	5983
			T_{2Servo}	Nm	469	601	613	677	764	631
				in.lb	4151	5319	5425	5991	6761	5584
			η	%	94	92	89	86	77	70
n_{1N}=1000 rpm			T_{2Max}	Nm	514	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
			η	%	95	93	91	88	81	74
n_{1N}=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
			η	%	96	95	93	89	84	79
n_{1N}=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
			η	%	97	96	94	92	86	81
n_{1N}=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
			η	%	97	96	94	92	87	82
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	7.2	7.1	6.5	5.0	4.8	4.5
				in.lb	63.7	62.8	57.5	44.3	42.5	39.8
Max. torsional backlash			j_t	arcmin	Standard ≤ 3 / Reduced ≤ 2					
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) Clamping hub diameter [mm]	J	35	J_1	kgcm²	20.74	17.57	17.70	16.34	16.25	16.91
				10^{-3} in.lb.s²	18.36	15.55	15.67	14.46	14.38	14.96

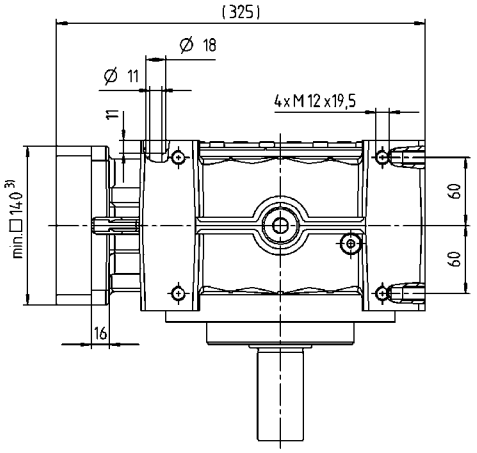
For a detailed design, please refer to the notes on p. 426

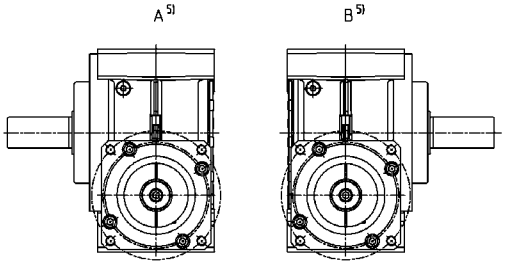
[a] Idling torques decrease during operation

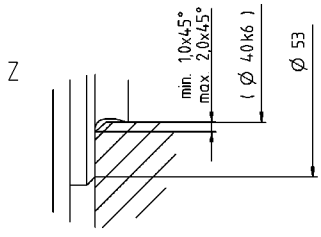
[b] Refers to center of output shaft or flange at n_2 = 300 rpm

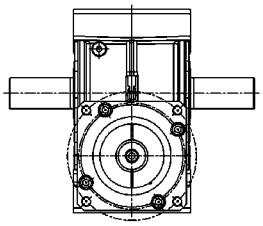










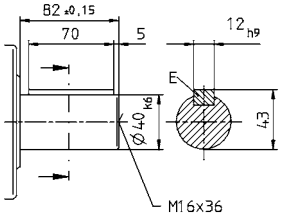


Optional dual-shaft output. Drawings available upon request.
Involute gearing is not possible.

Alternatives: Output shaft variants

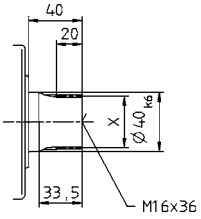
Keywayed output shaft in mm

E = key as per DIN 6885, sheet 1, form A



Involute gearing DIN 5480

X = W 40 x 2 x 30 x 18 x 6m



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

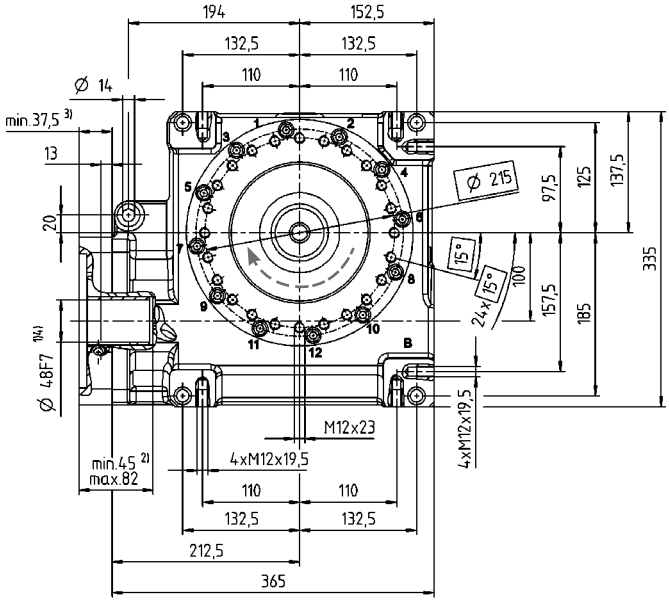
CAD data is available under www.wittenstein-alpha.com

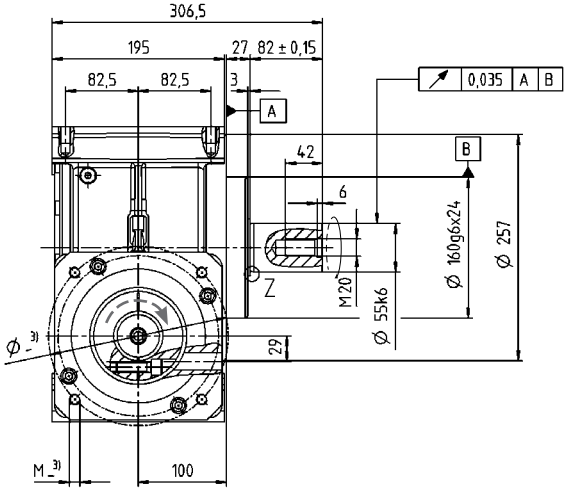
Motor mounting according to operating manual

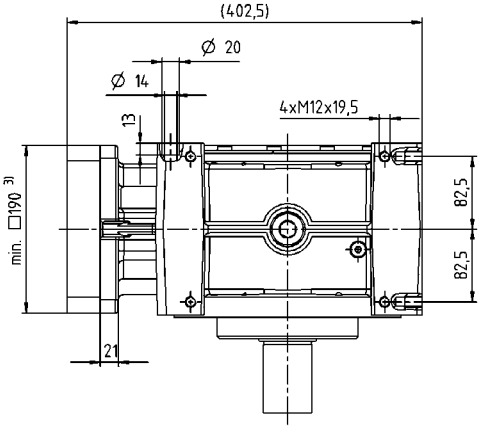
				1-stage					
Ratio			***i***	**4**	**7**	**10**	**16**	**28**	**40**
n_{1N}=500 rpm			T_{2Max}	Nm	1184	1336	1377	1392	1505	1376
				in.lb	10478	11824	12186	12319	13319	12178
			T_{2Servo}	Nm	1155	1304	1343	1359	1469	1343
				in.lb	10222	11540	11886	12027	13001	11886
			η	%	95	93	91	87	80	76
n_{1N}=1000 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_{1N}=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_{1N}=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_{1N}=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	12.2	10.5	9.8	9.1	8.2	7.2
				in.lb	108.0	92.9	86.7	80.5	72.6	63.7
Max. torsional backlash			j_t	arcmin	Standard ≤ 3 / Reduced ≤ 2					
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	35	J_1	kgcm²	65.59	56.20	54.30	55.17	52.71	53.04
Clamping hub diameter [mm]				10^{-3} in.lb.s²	58.05	49.73	48.06	48.83	46.65	46.94

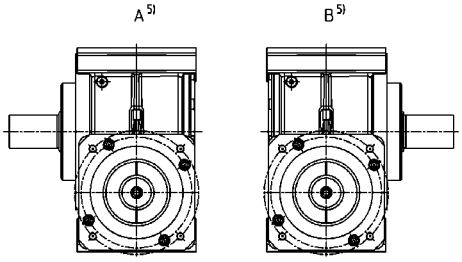
For a detailed design, please refer to the notes on p. 426

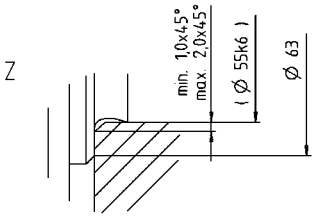
[a] Idling torques decrease during operation
[b] Refers to center of output shaft or flange at n_2 = 300 rpm
[c] Reduce by 20% in S1 operation at 20°C ambient temperature.

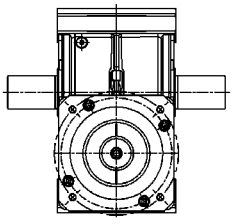










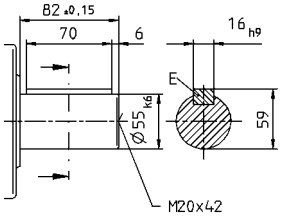


Optional dual-shaft output. Drawings available upon request.
Involute gearing is not possible.

Alternatives: Output shaft variants

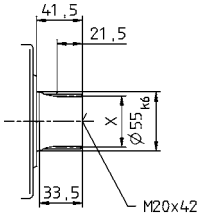
Keywayed output shaft in mm

E = key as per DIN 6885, sheet 1, form A



Involute gearing DIN 5480

X = W 55 x 2 x 30 x 26 x 6m



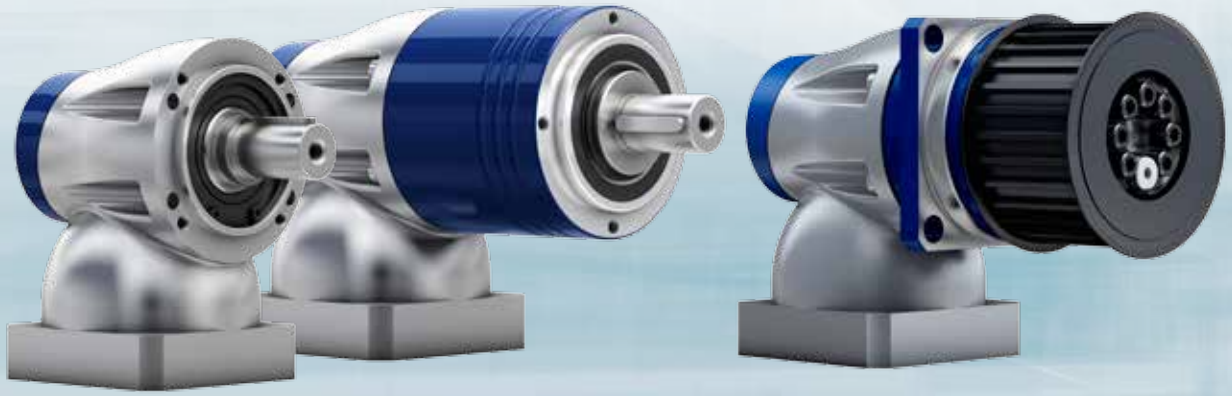
Non-tolerated dimensions ± 1 mm

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

Servo right-angle gearheads General



LK⁺/LPK⁺
Economical right-angle precision

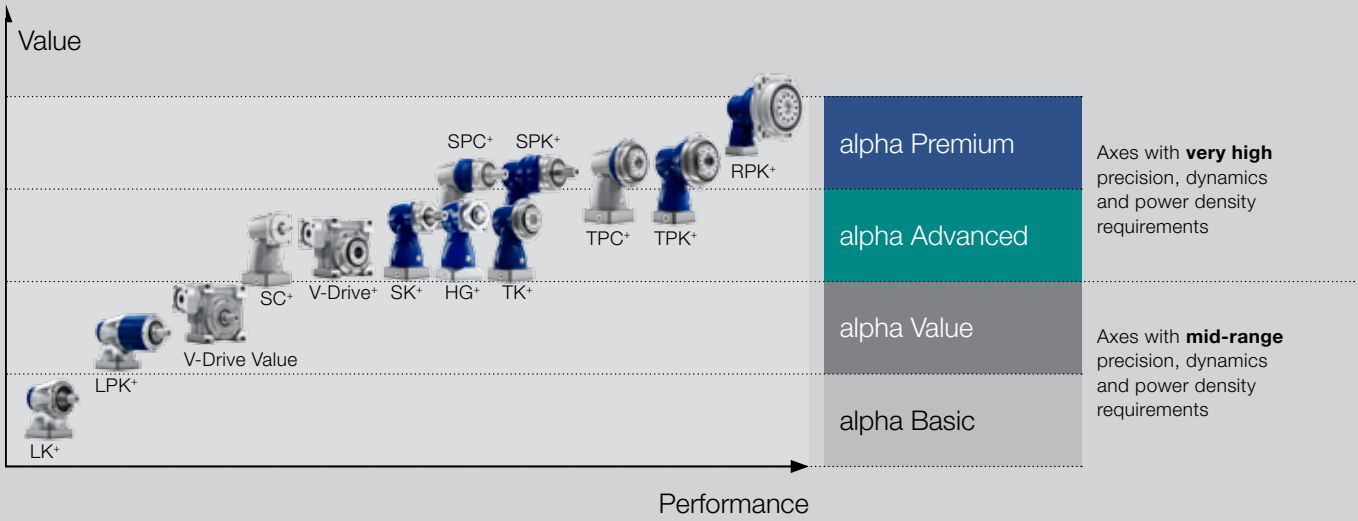
- Low backlash bevel gears with output shaft
- Applications in cyclic or continuous operation
- Torsional backlash: ≤ 8 arcmin
- Ratios: 1-100

Product highlights
- Diverse range of transmission ratios
- High nominal speeds

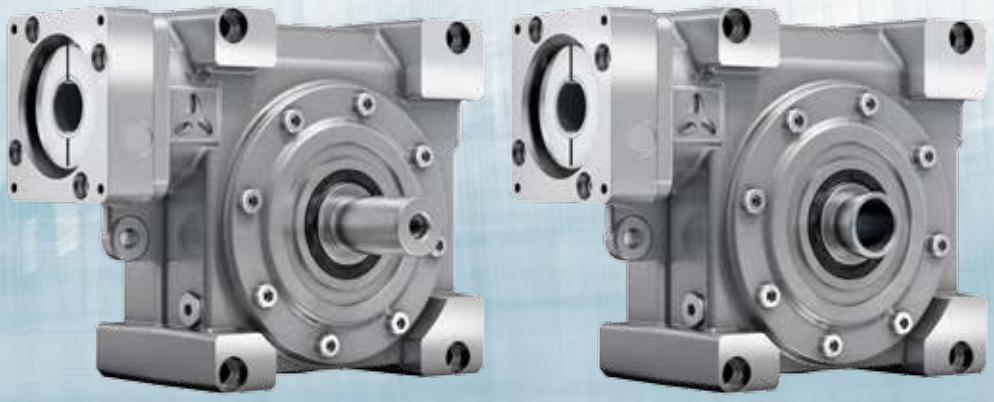
LPBK⁺
Economical right-angle precision

- Low backlash bevel gears with output flange
- Applications in cyclic or continuous operation
- Torsional backlash: ≤ 8 arcmin
- Ratios: 3-100

Product highlights
- Diverse range of transmission ratios
- High nominal speeds
- Optionally available with belt pulley



Now with even higher torques!



V-Drive Value
Economical servo worm

- Low backlash servo worm gearhead with output shaft and hollow shaft
- Applications in cyclic or continuous operation
- Torsional backlash: ≤ 6 arcmin
- Ratios: 4-40

Product highlights:
- Hollow shaft version
- Single-stage up to i=40
- Smooth-running

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.

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.

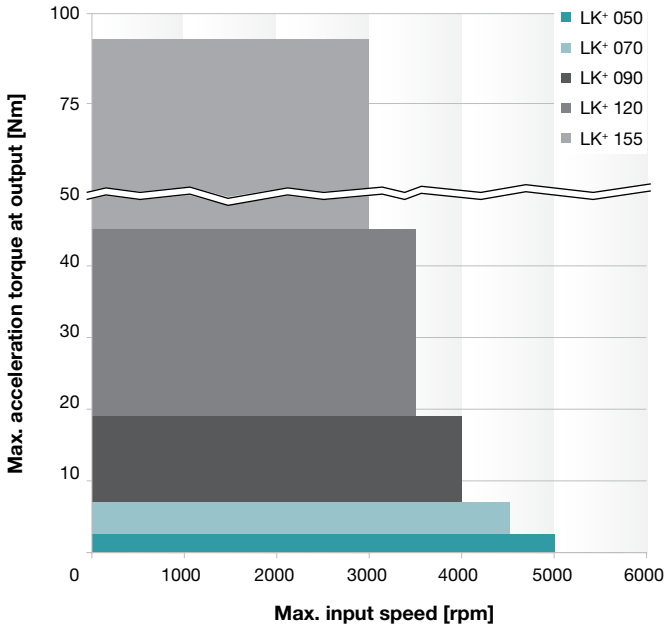
LK+/LPK+/LPBK+ – Economical right-angle precision

Low backlash right-angle gearheads with output shaft or output flange. This gearhead series is suitable for economical applications.

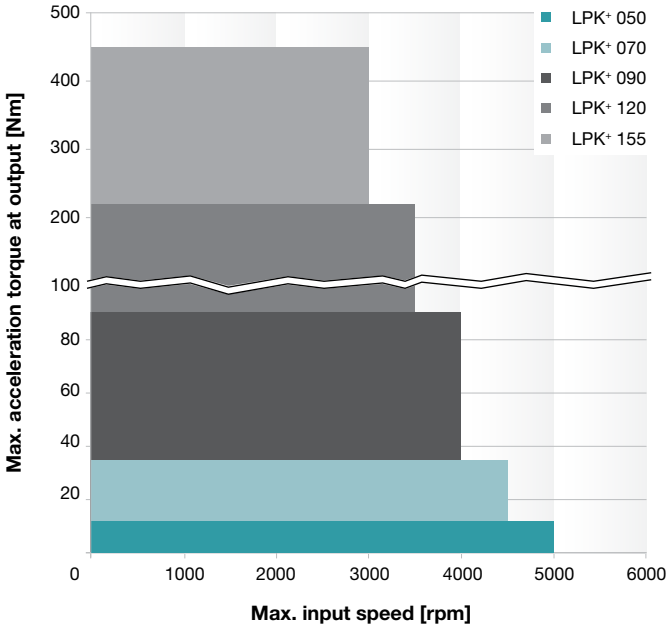
The LPBK+ is especially suitable for compact belt drives.

Quick size selection

LK+ (example for i = 1)
For applications in cyclic operation (DC ≤ 60%)
or continuous operation (DC ≥ 60%)



LPK+/LPBK+ (example for i = 5)
For applications in cyclic operation (DC ≤ 60%)
or continuous operation (DC ≥ 60%)



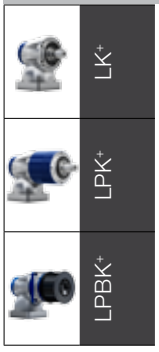
Versions and Applications

Features	**LK⁺** MO version page 324	**LPK⁺** MO version page 334	**LPBK⁺** MO version page 344
Power density	•	• •	• •
Positioning accuracy	•	• •	• •
High input speeds	• •	• •	• •
Torsional rigidity	•	•	• •
Space-saving design	• •	• •	• • •

Product features

Ratios [c]		1 – 1	3 – 100	3 – 100
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		•	•	

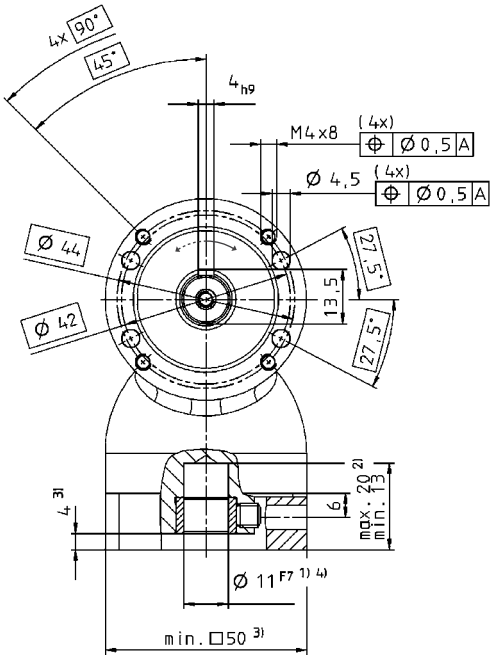
[a] Power reduction: technical data available upon request [b] Please contact WITTENSTEIN alpha [c] In relation to reference sizes

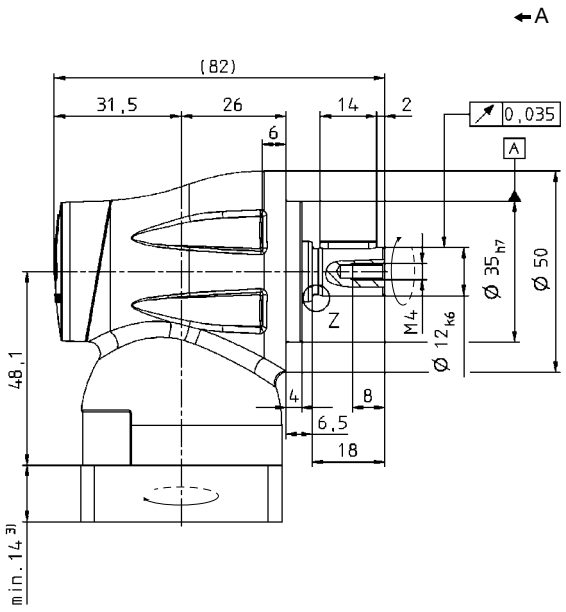


			1-stage
Ratio	i		**1**
Max. acceleration torque (max. 1000 cycles per hour)	T_{2B}	Nm	2.5
		in.lb	22
Nominal output torque (with n_{1N})	T_{2N}	Nm	1.2
		in.lb	11
Emergency stop torque (permitted 1000 times during the service life of the gearhead)	T_{2Not}	Nm	5
		in.lb	44
Nominal input speed (with T_{2N} 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_{t21}	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	0.7
		lb_m	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	$kgcm^2$	0.14
		10^{-3} in.lb.s²	0.12

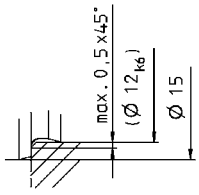
[a] For higher ambient temperatures, please reduce input speed
[b] Refers to center of the output shaft, if n_2 = 1000 rpm

1-stage:





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.

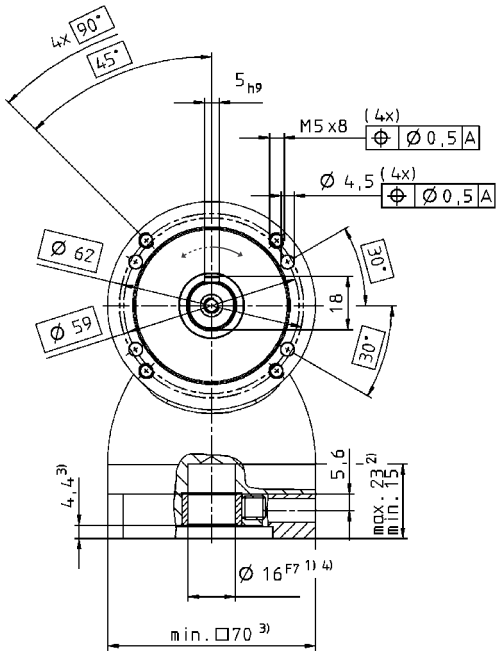
CAD data is available under
http://www.wittenstein-alpha.de/en/info-and-cad-finder.html

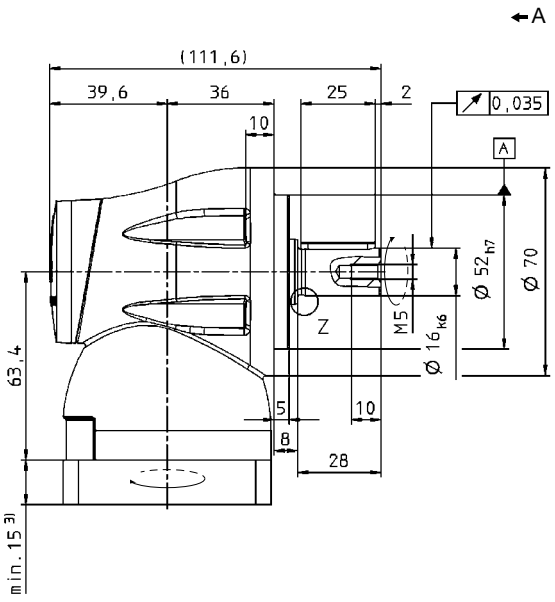
Motor mounting according to operating manual

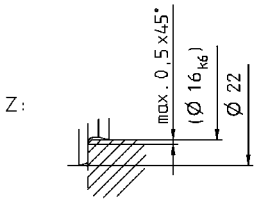
			1-stage
Ratio	i		**1**
Max. acceleration torque (max. 1000 cycles per hour)	T_{2B}	Nm	7
		in.lb	60
Nominal output torque (with n_{1N})	T_{2N}	Nm	3.7
		in.lb	33
Emergencye stop torque (permitted 1000 times during the service life of the gearhead)	T_{2Not}	Nm	15
		in.lb	130
Nominal input speed (with T_{2N} 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_{t21}	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	1.9
		lb_m	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	$kgcm^2$	0.7
		10^{-3} in.lb.s²	0.6

[a] For higher ambient temperatures, please reduce input speed
[b] Refers to center of the output shaft, if n_2 = 1000 rpm

1-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.

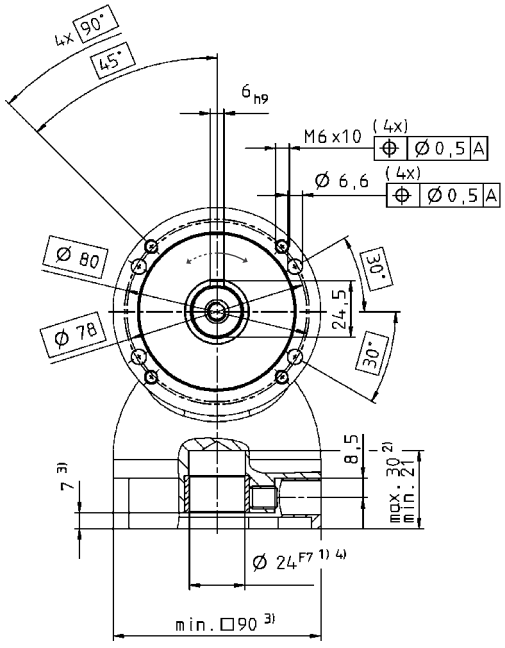
CAD data is available under
http://www.wittenstein-alpha.de/en/info-and-cad-finder.html

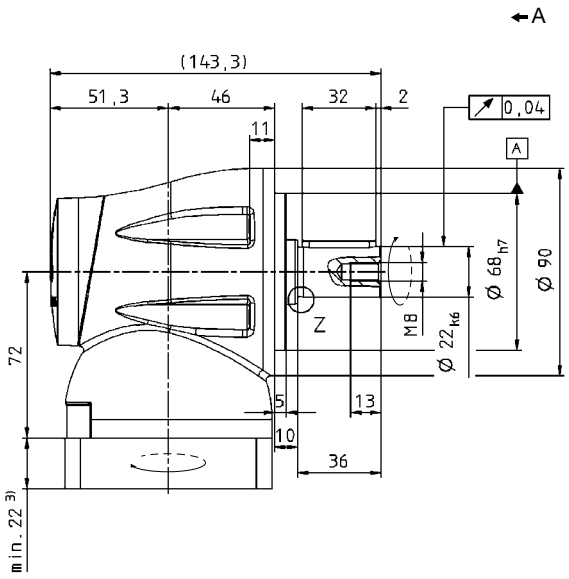
Motor mounting according to operating manual

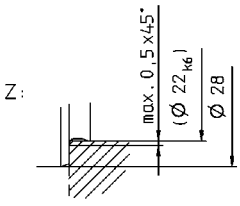
			1-stage
Ratio	i		**1**
Max. acceleration torque (max. 1000 cycles per hour)	T_{2B}	Nm	19
		in.lb	170
Nominal output torque (with n_{1N})	T_{2N}	Nm	9.3
		in.lb	82
Emergencye stop torque (permitted 1000 times during the service life of the gearhead)	T_{2Not}	Nm	37
		in.lb	330
Nominal input speed (with 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_{t21}	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.s²	2.9

[a] For higher ambient temperatures, please reduce input speed
[b] Refers to center of the output shaft, if n_2 = 1000 rpm

1-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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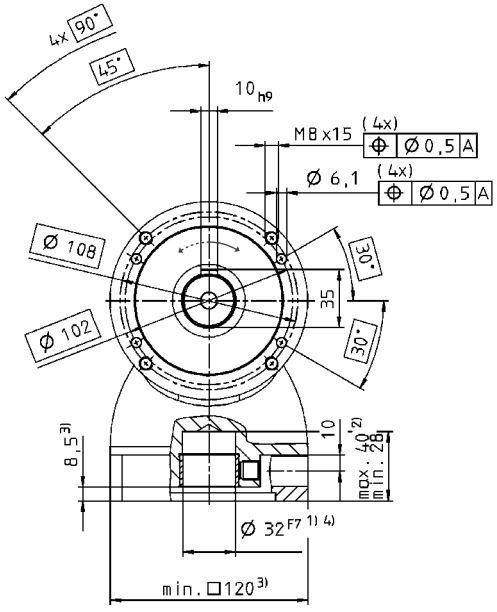
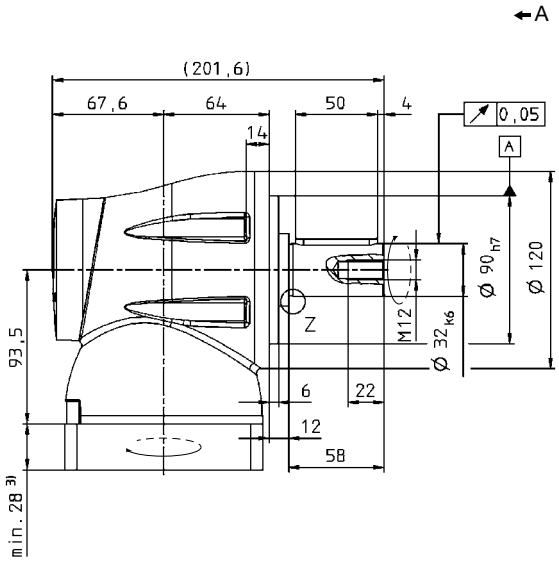
Motor mounting according to operating manual

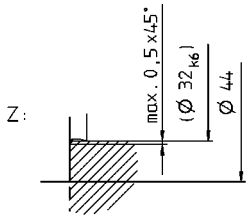
			1-stage
Ratio	i		**1**
Max. acceleration torque (max. 1000 cycles per hour)	T_{2B}	Nm	45
		in.lb	400
Nominal output torque (with n_{1N})	T_{2N}	Nm	23
		in.lb	200
Emergency stop torque (permitted 1000 times during the service life of the gearhead)	T_{2Not}	Nm	93
		in.lb	820
Nominal input speed (with T_{2N} 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_{t21}	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	8.9
		lb_m	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	$kgcm^2$	14
		10^{-3} in.lb.s²	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:







Non-tolerated dimensions ±1 mm

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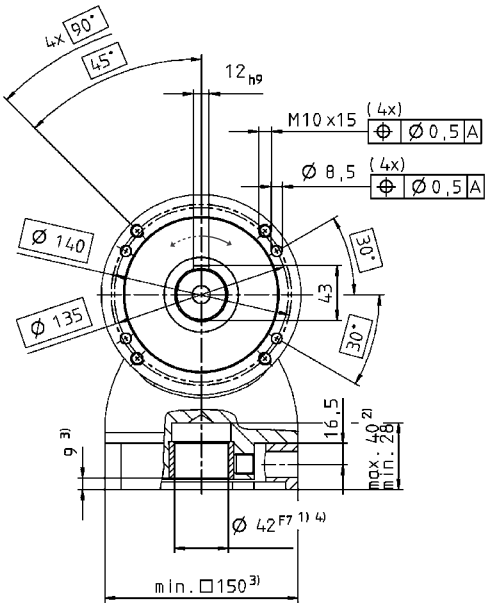
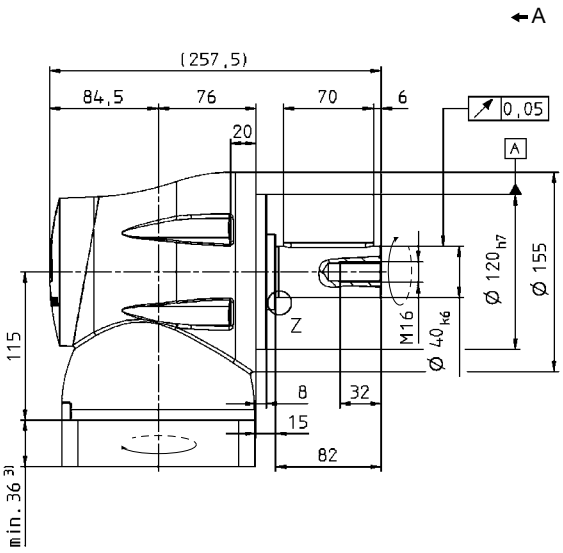
Motor mounting according to operating manual

			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_{t21}	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.s²	51

[a] For higher ambient temperatures, please reduce input speed
[b] Refers to center of the output shaft, if n_2 = 1000 rpm

1-stage:





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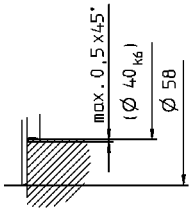

Non-tolerated dimensions ±1 mm

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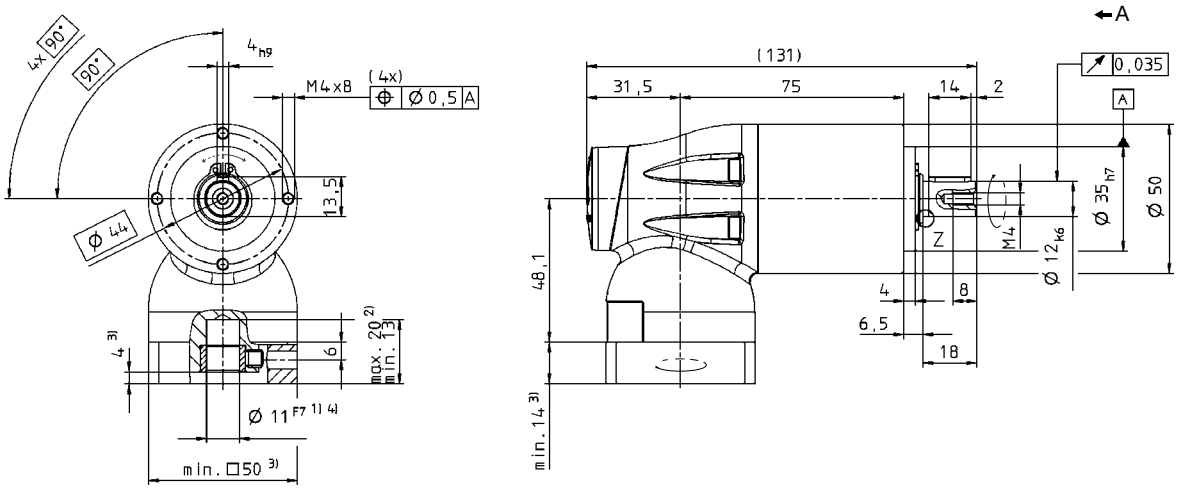
Motor mounting according to operating manual

			2-stage				3-stage						
Ratio	***i***		**4**	**5**	**7**	**10**	**16**	**20**	**25**	**35**	**50**	**70**	**100**
Max. acceleration torque (max. 1000 cycles per hour)	T_{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 n_{1N})	T_{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)	T_{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 T_{2N} and 20°C ambient temperature) [a]	n_{1N}	rpm	3200	3200	3200	3200	3200	3200	3200	3200	3200	3200	3200
Max. input speed	n_{1Max}	rpm	5000	5000	5000	5000	5000	5000	5000	5000	5000	5000	5000
Mean no load running torque (with n_1 = 3000 rpm and 20°C gearhead temperature)	T_{012}	Nm	0.17	0.17	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15
		in.lb	1.5	1.5	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3
Max. torsional backlash	j_t	arcmin	≤ 16				≤ 15						
Torsional rigidity	C_{t21}	Nm/ arcmin	–				–						
		in.lb/ arcmin											
Max. axial force [b]	F_{2AMax}	N	700				700						
		lb_f	160				160						
Max. radial force [b]	F_{2RMax}	N	650				650						
		lb_f	150				150						
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	1.4				1.6						
		lb_m	3.1				3.5						
Operating noise (for i = 10 and n_1 = 3000 rpm without 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			Blue RAL 5002										
Direction of rotation			Motor and gearhead same direction										
Protection class			IP 64										
Moment of inertia (relates to the drive)	J_1	$kgcm^2$	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16
		10^{-3} in.lb.s²	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14

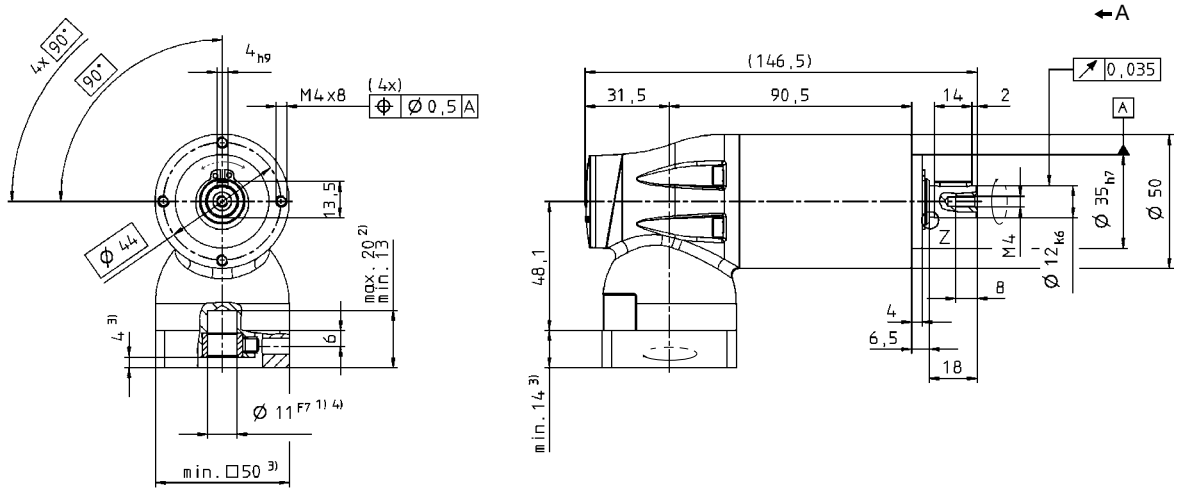
[a] For higher ambient temperatures, please reduce input speed

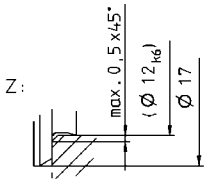
[b] Refers to center of the output shaft, if n_2 = 100 rpm

2-stage:



3-stage:





Non-tolerated dimensions ±1 mm

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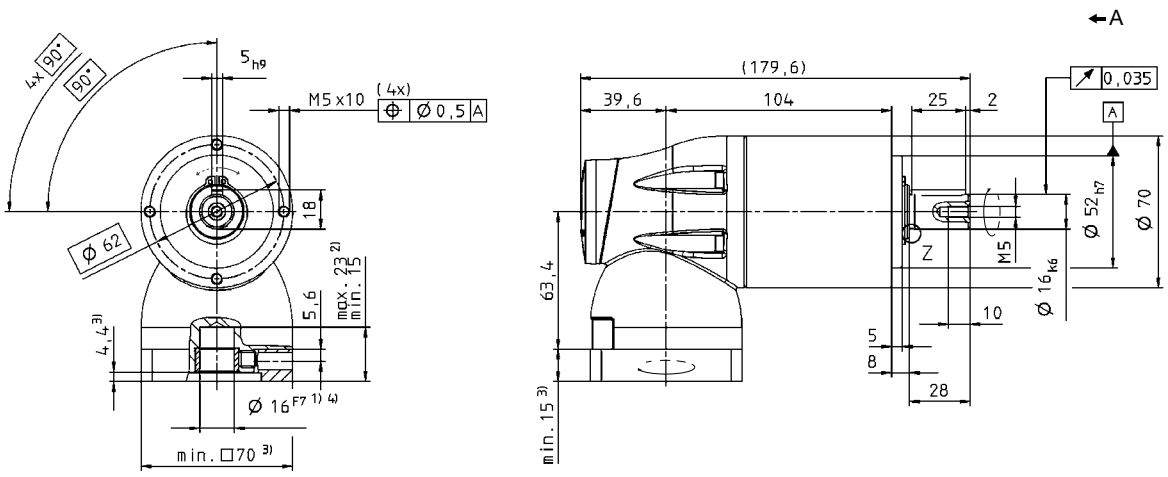
Motor mounting according to operating manual

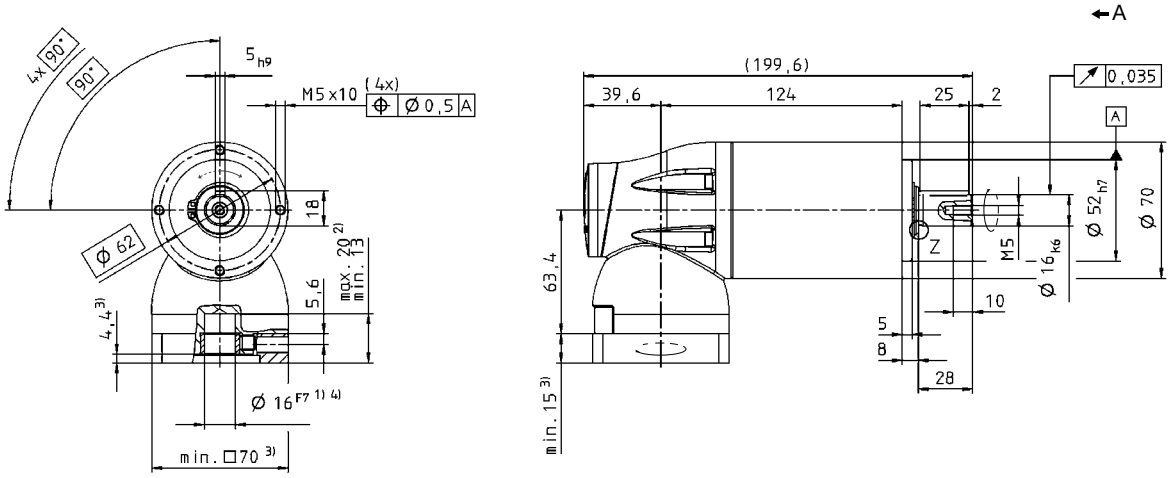
			2-stage					3-stage						
Ratio [c]	i		**3**	**4**	**5**	**7**	**10**	**16**	**20**	**25**	**30**	**50**	**70**	**100**
Max. acceleration torque (max. 1000 cycles per hour)	T_{2B}	Nm	22	29	35	35	32	35	35	35	32	35	35	32
		in.lb	190	260	310	310	280	310	310	310	280	310	310	280
Nominal output torque (with n_{1N})	T_{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)	T_{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 T_{2N} and 20°C ambient temperature) [a]	n_{1N}	rpm	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000
Max. input speed	n_{1Max}	rpm	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)	T_{012}	Nm	0.72	0.71	0.67	0.66	0.62	0.63	0.63	0.59	0.59	0.59	0.59	0.59
		in.lb	6.4	6.3	2.9	5.8	5.5	5.6	5.6	5.2	5.2	5.2	5.2	5.2
Max. torsional backlash	j_t	arcmin	≤ 14					≤ 12						
Torsional rigidity	C_{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]	F_{2AMax}	N	1550					1550						
		lb_f	350					350						
Max. radial force [b]	F_{2RMax}	N	1450					1450						
		lb_f	330					330						
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	3.8					4.2						
		lb_m	8.4					9.3						
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	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

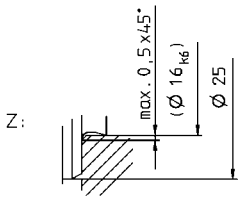
[a] For higher ambient temperatures, please reduce input speed
[b] Refers to center of the output shaft, if n_2 = 100 rpm
[c] Other ratios are available on request: i = 15, 21, 28 and 35

2-stage:



3-stage:





Non-tolerated dimensions ±1 mm

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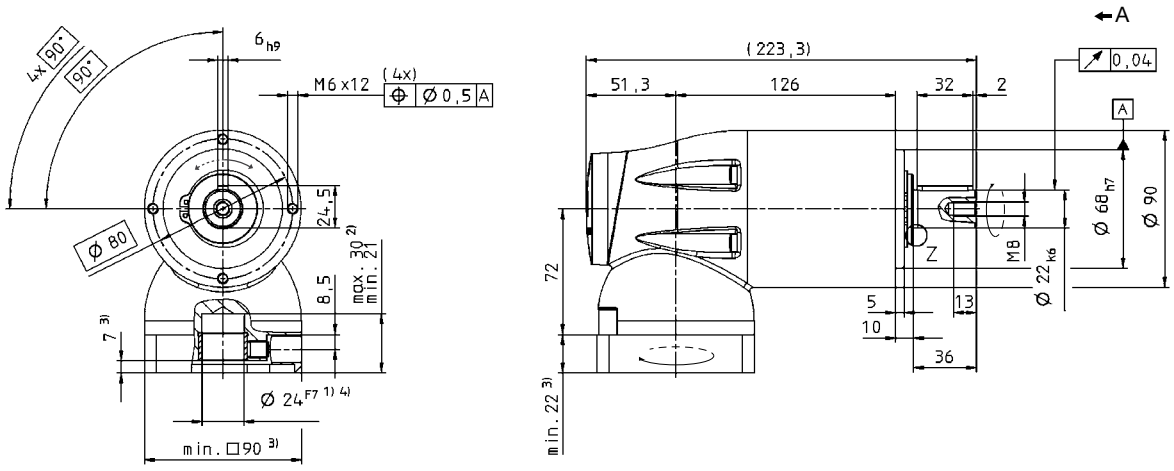
Motor mounting according to operating manual

			2-stage					3-stage						
Ratio [c]	i		**3**	**4**	**5**	**7**	**10**	**16**	**20**	**25**	**30**	**50**	**70**	**100**
Max. acceleration torque (max. 1000 cycles per hour)	T_{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 n_{1N})	T_{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)	T_{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 T_{2N} and 20°C ambient temperature) [a]	n_{1N}	rpm	2700	2700	2700	2700	2700	2700	2700	2700	2700	2700	2700	2700
Max. input speed	n_{1Max}	rpm	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000
Mean no load running torque (with n_1 = 3000 rpm and 20°C gearhead temperature)	T_{012}	Nm	1.83	1.83	1.72	1.63	1.63	1.6	1.6	1.6	1.6	1.6	1.6	1.6
		in.lb	16	16	15	14	14	14	14	14	14	14	14	14
Max. torsional backlash	j_t	arcmin	≤ 12					≤ 11						
Torsional rigidity	C_{t21}	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]	F_{2AMax}	N	1900					1900						
		lb_f	430					430						
Max. radial force [b]	F_{2RMax}	N	2400					2400						
		lb_f	540					540						
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	6.9					7.9						
		lb_m	15					17						
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_1	$kgcm^2$	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

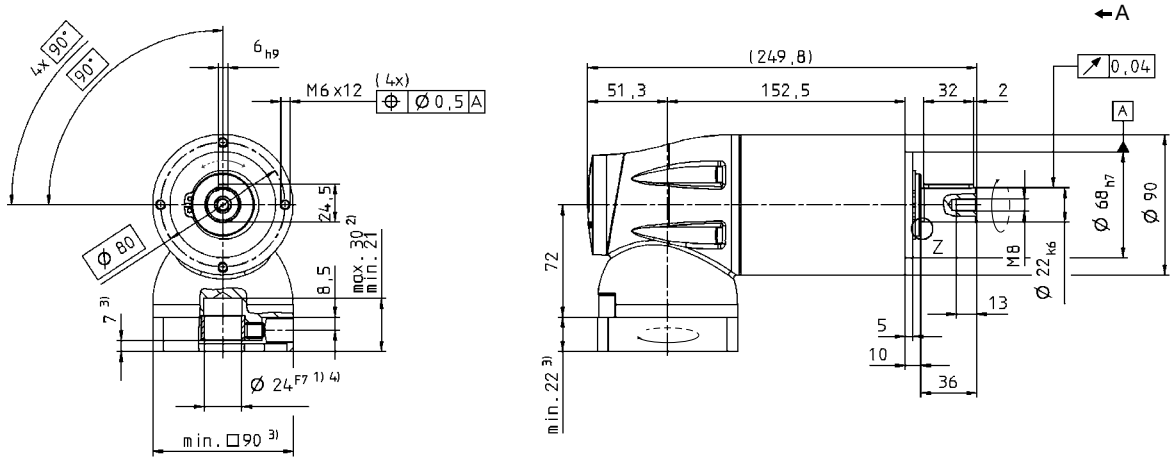
[a] For higher ambient temperatures, please reduce input speed
[b] Refers to center of the output shaft, if n_2 = 100 rpm
[c] Other ratios are available on request: i = 15, 21, 28 and 35

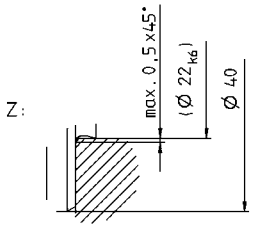
View A

2-stage:



3-stage:





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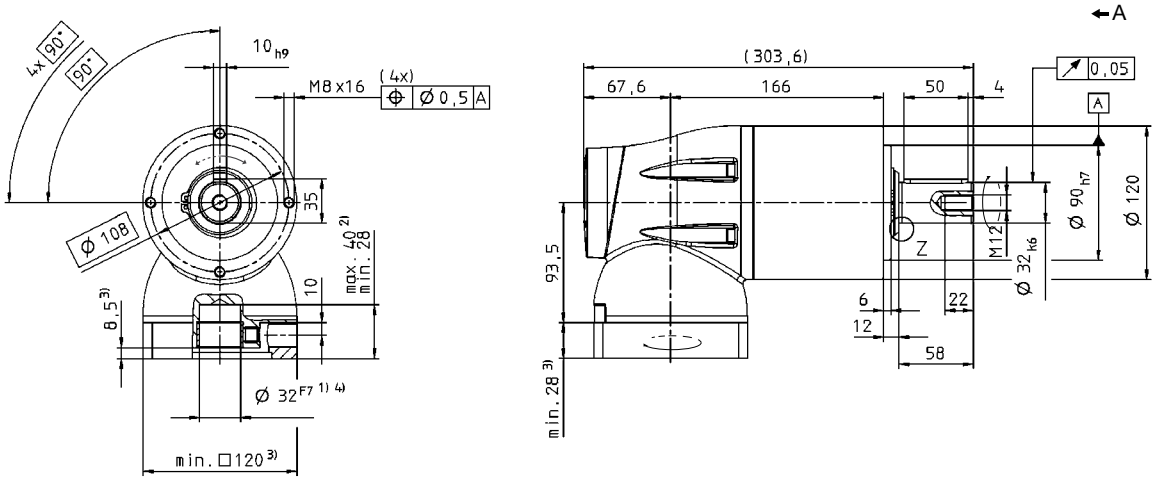
Motor mounting according to operating manual

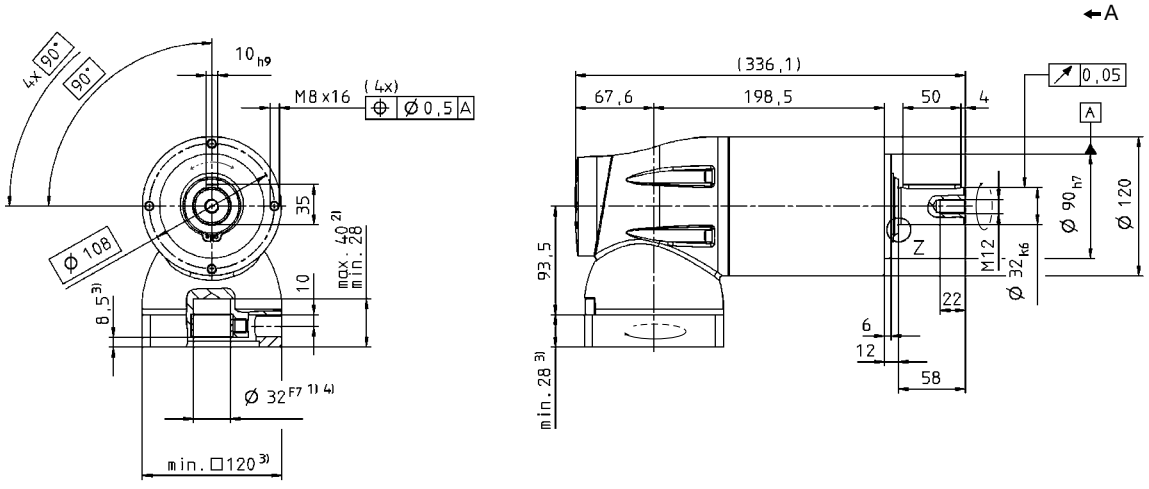
			2-stage					3-stage						
Ratio [c]	i		**3**	**4**	**5**	**7**	**10**	**16**	**20**	**25**	**30**	**50**	**70**	**100**
Max. acceleration torque (max. 1000 cycles per hour)	T_{2B}	Nm	136	181	220	220	200	220	220	220	200	220	220	200
		in.lb	1200	1600	1950	1950	1770	1950	1950	1950	1770	1950	1950	1770
Nominal output torque (with n_{1N})	T_{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)	T_{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 T_{2N} and 20°C ambient temperature) [a]	n_{1N}	rpm	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Max. input speed	n_{1Max}	rpm	3500	3500	3500	3500	3500	3500	3500	3500	3500	3500	3500	3500
Mean no load running torque (with n_1 = 3000 rpm and 20°C gearhead temperature)	T_{012}	Nm	3.3	3.3	3.09	3.09	3.09	2.96	2.96	2.96	2.96	2.52	2.52	2.52
		in.lb	29	29	27	27	27	26	26	26	26	22	22	22
Max. torsional backlash	j_t	arcmin	≤ 11					≤ 11						
Torsional rigidity	C_{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]	F_{2AMax}	N	4000					4000						
		lb_f	900					900						
Max. radial force [b]	F_{2RMax}	N	4600					4600						
		lb_f	1040					1040						
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	17					19						
		lb_m	37					42						
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_1	$kgcm^2$	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

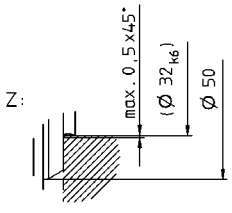
[a] For higher ambient temperatures, please reduce input speed
[b] Refers to center of the output shaft, if n_2 = 100 rpm
[c] Other ratios are available on request: i = 15, 21, 28 and 35

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.

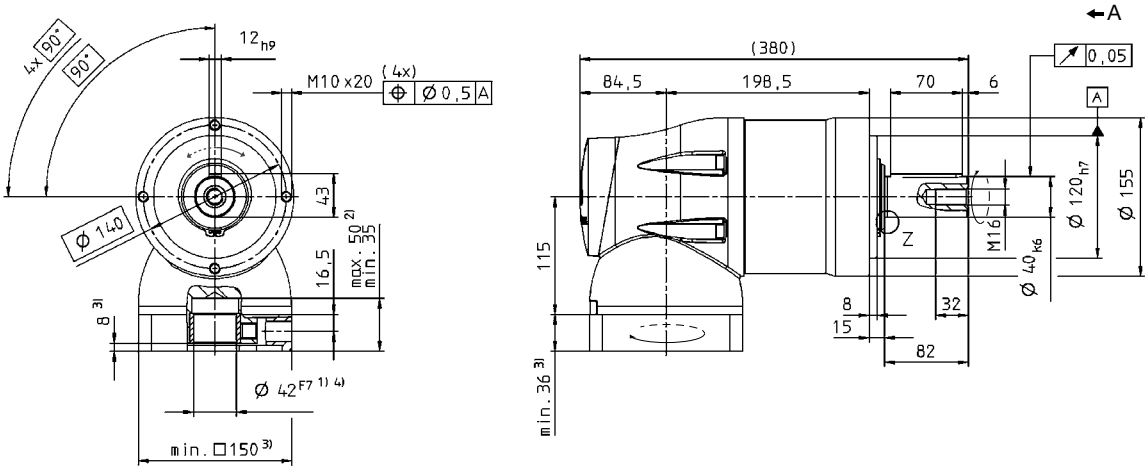
CAD data is available under
http://www.wittenstein-alpha.de/en/info-and-cad-finder.html

Motor mounting according to operating manual

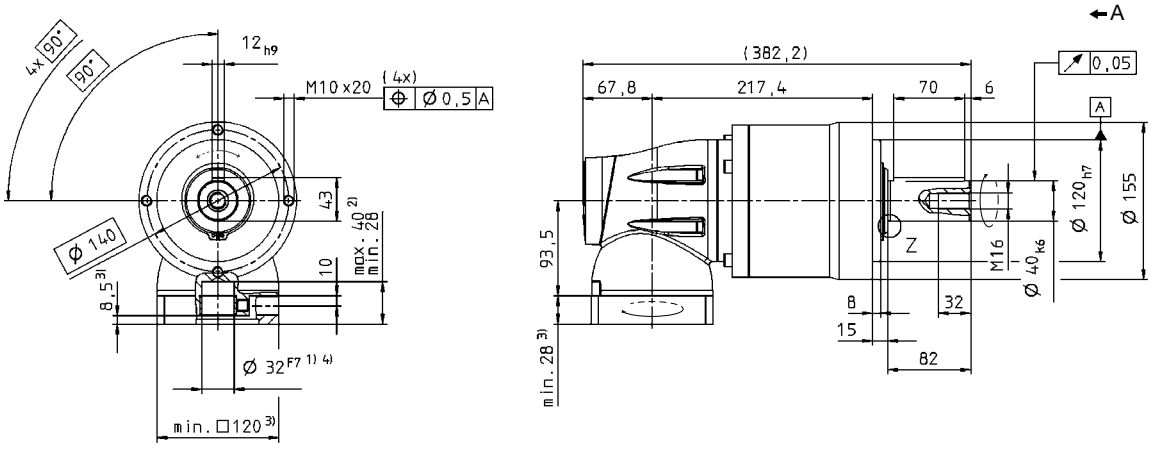
			2-stage		3-stage		
Ratio	***i***		**5**	**10**	**25**	**50**	**100**
Max. acceleration torque (max. 1000 cycles per hour)	T_{2B}	Nm	450	350	450	450	350
		in.lb	4000	3100	4000	4000	3100
Nominal output torque (with n_{1N})	T_{2N}	Nm	320	190	320	320	190
		in.lb	2800	1700	2800	2800	1700
Emergency stop torque (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.s²	66	66	15	15	15

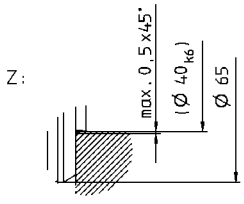
[a] For higher ambient temperatures, please reduce input speed
[b] Refers to center of the output shaft, if = 100 rpm

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.
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

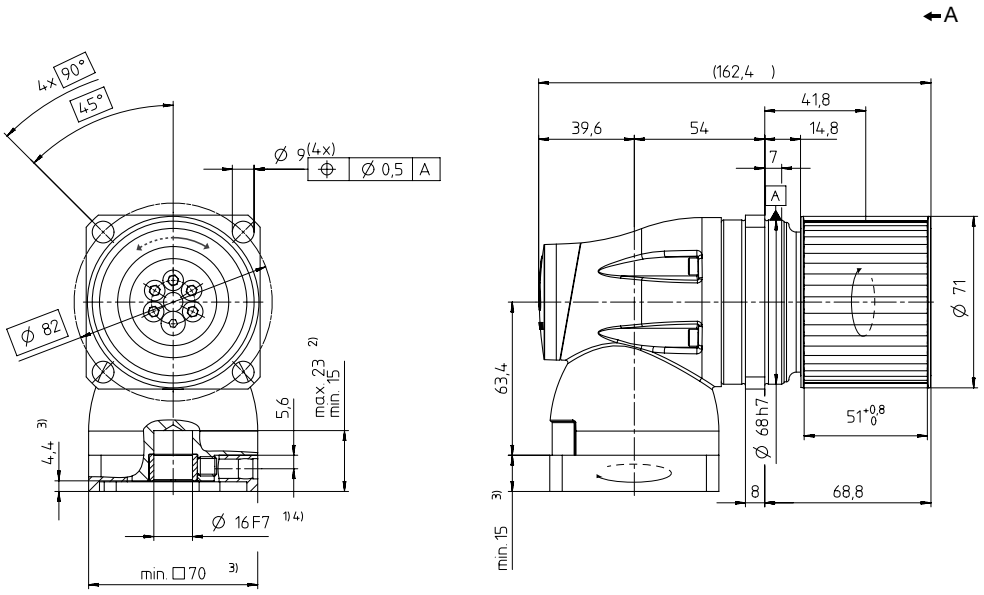
LPBK+ 070 2-/3-stage

			2-stage					3-stage							
Ratio	***i***		**3**	**4**	**5**	**7**	**10**	**16**	**20**	**25**	**30**	**35**	**50**	**70**	**100**
Max. acceleration torque (max. 1000 cycles per hour)	T_{2B}	Nm	22	29	35	35	32	35	35	35	32	35	35	35	32
		in.lb	190	260	310	310	280	310	310	310	280	310	310	310	280
Nominal output torque (with n_{1N})	T_{2N}	Nm	11	15	18	18	16.5	18	18	18	16,5	18	18	18	16,5
		in.lb	100	130	160	160	150	160	160	160	150	160	160	160	150
Emergency stop torque (permitted 1000 times during the service life of the gearhead)	T_{2Not}	Nm	45	60	75	75	75	75	75	75	75	75	75	75	75
		in.lb	400	530	660	660	660	664	664	664	664	664	664	664	664
Nominal input speed (with T_{2N} and 20°C ambient temperature) [a]	n_{1N}	rpm	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000
Max. input speed	n_{1Max}	rpm	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)	T_{012}	Nm	0.72	0.71	0.67	0.66	0.62	0.63	0.63	0.59	0.59	0.59	0.59	0.59	0.59
		in.lb	6.4	6.3	2.9	5.8	5.5	5.6	5.6	5.2	5.2	5.2	5.2	5.2	5.2
Max. torsional backlash	j_t	arcmin	≤ 14					≤ 12							
Torsional rigidity	C_{t21}	Nm/ arcmin	–	–	–	–	–	–	–	–	–	–	–	–	–
		in.lb/ arcmin	–	–	–	–	–	–	–	–	–	–	–	–	–
Max. axial force [b]	F_{2AMax}	N	1550					1550							
		lb_f	350					350							
Max. radial force [c]	F_{2RMax}	N	3000					3000							
		lb_f	680					680							
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	3.4					3.8							
		lb_m	7.5					8.4							
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	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	0.75

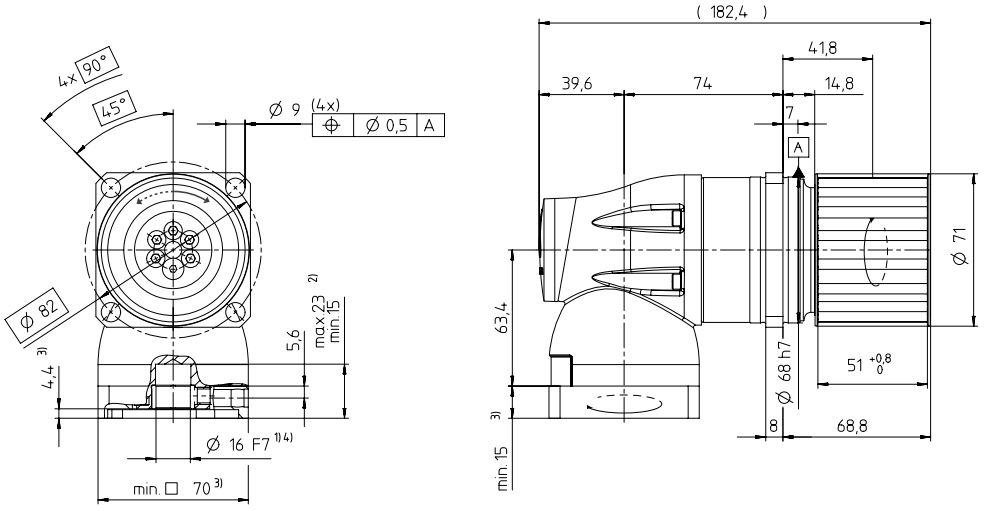
[a] For higher ambient temperatures, please reduce input speed
[b] Refers to center of the output shaft, if n_2 = 100 rpm
[c] With mounted PLPB+ belt pulley and 100 rpm

View A

2-stage:



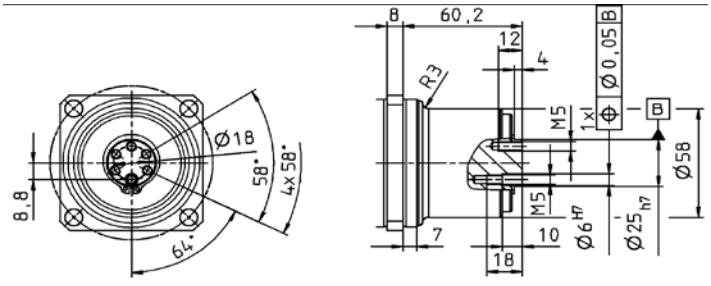
3-stage:



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*	kgcm²	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
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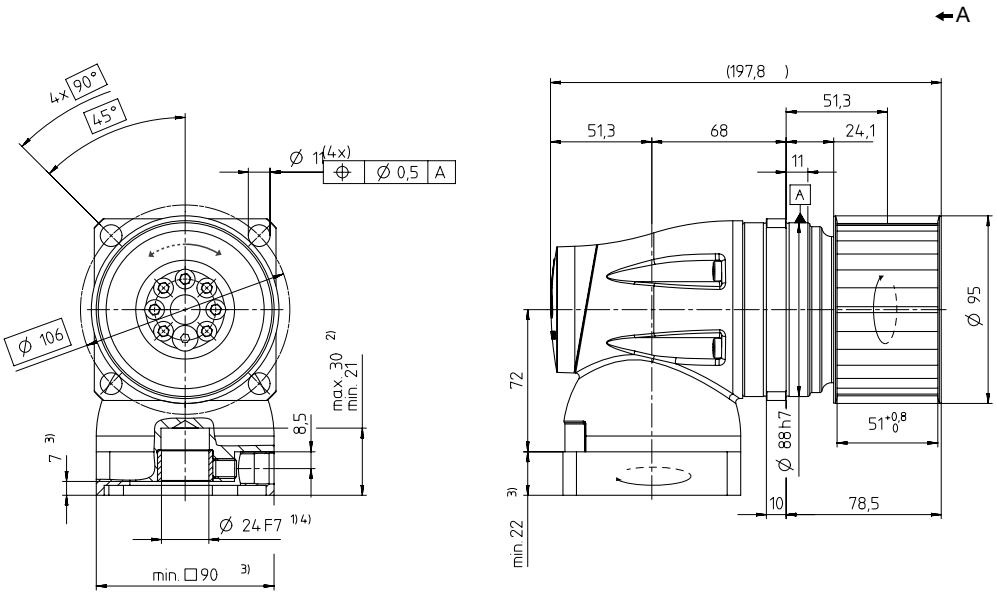
Motor mounting according to operating manual

			2-stage					3-stage							
Ratio	***i***		**3**	**4**	**5**	**7**	**10**	**16**	**20**	**25**	**30**	**35**	**50**	**70**	**100**
Max. acceleration torque (max. 1000 cycles per hour)	T_{2B}	Nm	56	74	90	90	80	90	90	90	80	90	90	90	80
		in.lb	500	650	800	800	710	800	800	800	710	800	800	800	710
Nominal output torque (with n_{1N})	T_{2N}	Nm	28	37	45	45	40	45	45	45	40	45	45	45	40
		in.lb	250	330	400	400	350	400	400	400	350	400	400	400	350
Emergency stop torque (permitted 1000 times during the service life of the gearhead)	T_{2Not}	Nm	110	150	190	190	190	190	190	190	190	190	190	190	190
		in.lb	970	1330	1680	1680	1680	1680	1680	1680	1680	1680	1680	1680	1680
Nominal input speed (with T_{2N} and 20°C ambient temperature) [a]	n_{1N}	rpm	2700	2700	2700	2700	2700	2700	2700	2700	2700	2700	2700	2700	2700
Max. input speed	n_{1Max}	rpm	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000
Mean no load running torque (with n_1 = 3000 rpm and 20°C gearhead temperature)	T_{012}	Nm	1.83	1.83	1.72	1.63	1.63	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
		in.lb	16	16	15	14	14	14	14	14	14	14	14	14	14
Max. torsional backlash	j_t	arcmin	≤ 12					≤ 11							
Torsional rigidity	C_{t21}	Nm/ arcmin	–	–	–	–	–	–	–	–	–	–	–	–	–
		in.lb/ arcmin	–	–	–	–	–	–	–	–	–	–	–	–	–
Max. axial force [b]	F_{2AMax}	N	1900					1900							
		lb_f	430					430							
Max. radial force [c]	F_{2RMax}	N	4300					4300							
		lb_f	970					970							
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	6.2					6.9							
		lb_m	14					15							
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	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	3.6

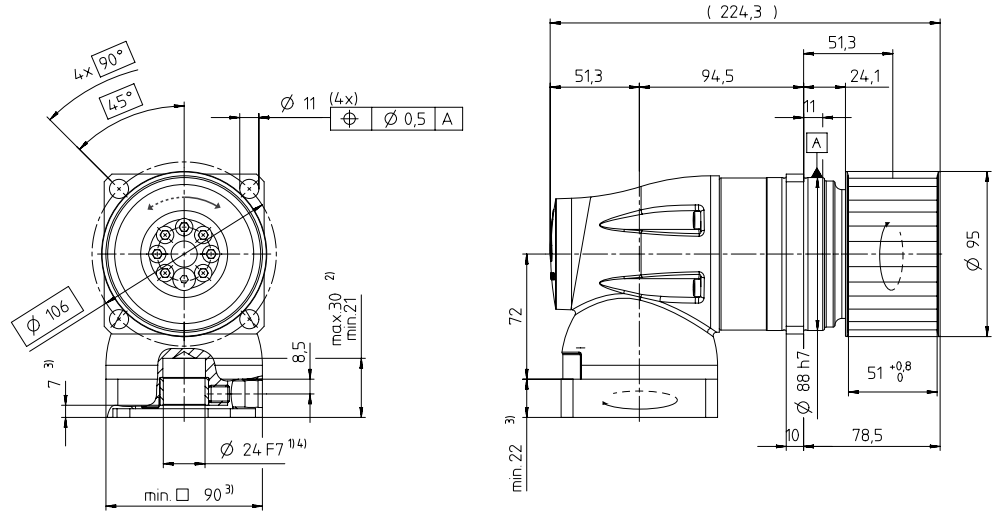
[a] For higher ambient temperatures, please reduce input speed
[b] Refers to center of the output shaft, if n_2 = 100 rpm
[c] With mounted PLPB+ belt pulley and 100 rpm

View A

2-stage:



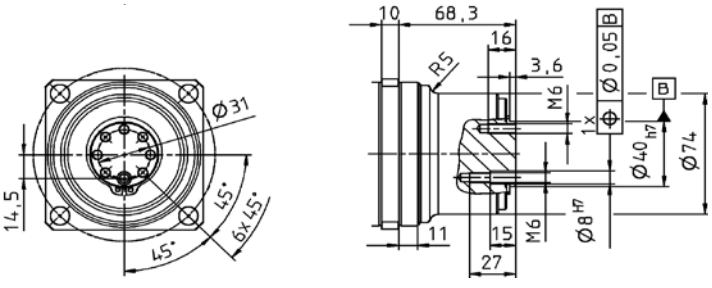
3-stage:



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*	kgcm²	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

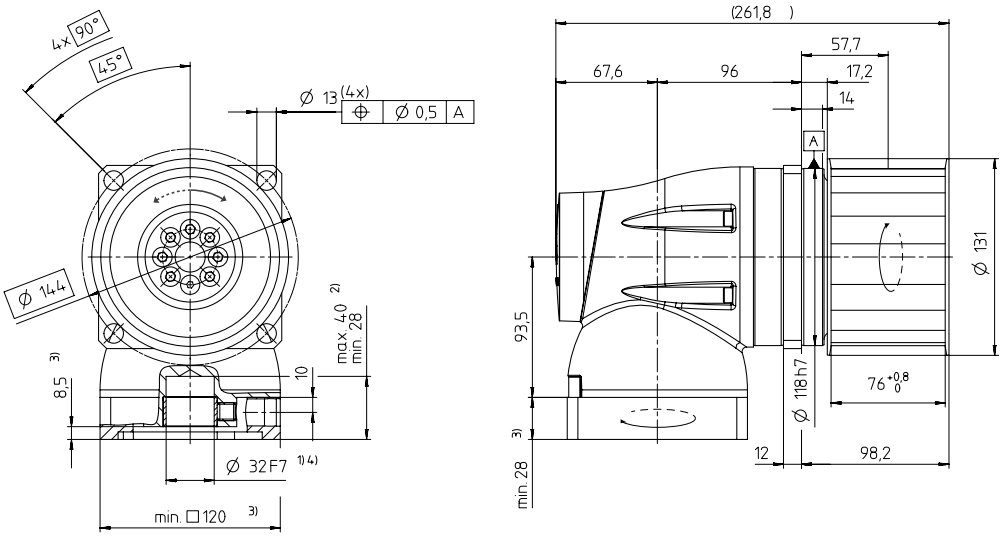
Motor mounting according to operating manual

			2-stage					3-stage							
Ratio	***i***		**3**	**4**	**5**	**7**	**10**	**16**	**20**	**25**	**30**	**35**	**50**	**70**	**100**
Max. acceleration torque (max. 1000 cycles per hour)	T_{2B}	Nm	136	181	220	220	200	220	220	220	200	220	220	220	200
		in.lb	1200	1600	1950	1950	1770	1950	1950	1950	1770	1950	1950	1950	1770
Nominal output torque (with n_{1N})	T_{2N}	Nm	68	91	110	110	100	110	110	110	100	110	110	110	100
		in.lb	600	810	970	970	890	970	970	970	890	970	970	970	890
Emergency stop torque (permitted 1000 times during the service life of the gearhead)	T_{2Not}	Nm	280	380	480	480	480	480	480	480	480	480	480	480	480
		in.lb	2500	3400	4200	4200	4200	4200	4200	4200	4200	4200	4200	4200	4200
Nominal input speed (with T_{2N} and 20°C ambient temperature) [a]	n_{1N}	rpm	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Max. input speed	n_{1Max}	rpm	3500	3500	3500	3500	3500	3500	3500	3500	3500	3500	3500	3500	3500
Mean no load running torque (with n_1 = 3000 rpm and 20°C gearhead temperature)	T_{012}	Nm	3.3	3.3	3.09	3.09	3.09	2.96	2.96	2.96	2.96	2.52	2.52	2.52	2.52
		in.lb	29	29	27	27	27	26	26	26	26	22	22	22	22
Max. torsional backlash	j_t	arcmin	≤ 11					≤ 11							
Torsional rigidity	C_{t21}	Nm/ arcmin	–	–	–	–	–	–	–	–	–	–	–	–	–
		in.lb/ arcmin	–	–	–	–	–	–	–	–	–	–	–	–	–
Max. axial force [b]	F_{2AMax}	N	4000					4000							
		lb_f	900					900							
Max. radial force [c]	F_{2RMax}	N	9500					9500							
		lb_f	2100					2100							
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	16					17							
		lb_m	34					37							
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_1	$kgcm^2$	17	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	15

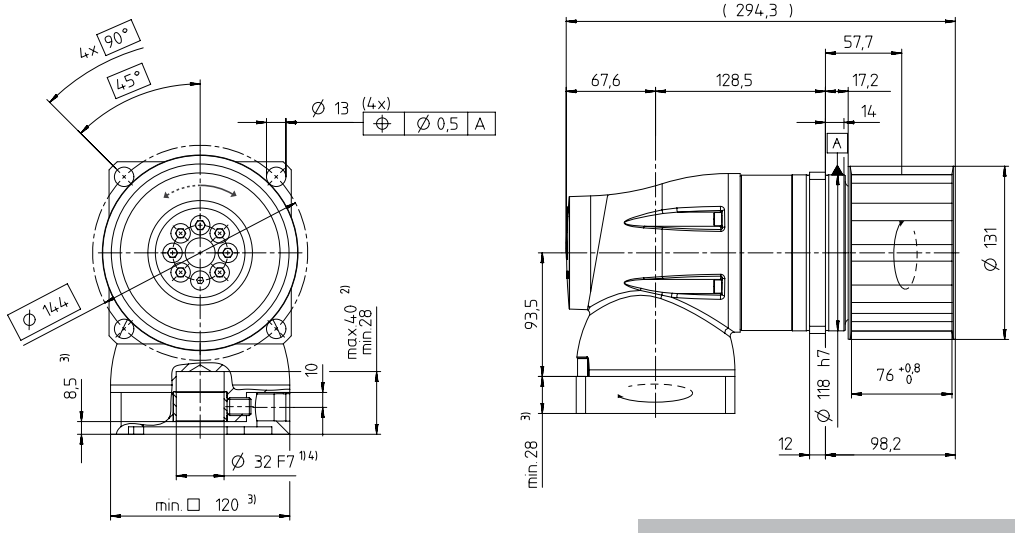
[a] For higher ambient temperatures, please reduce input speed
[b] Refers to center of the output shaft, if n_2 = 100 rpm
[c] With mounted PLPB+ belt pulley and 100 rpm

View A

2-stage:



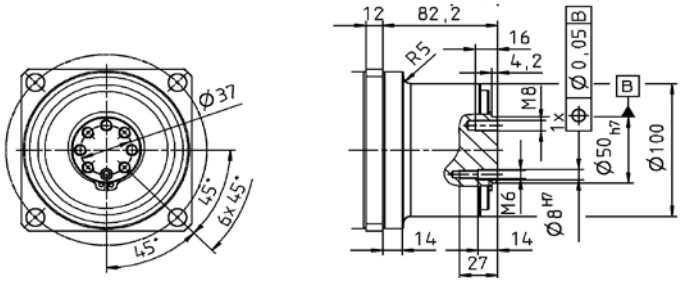
3-stage:



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*	kgcm²	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 Value – Economical servo worm

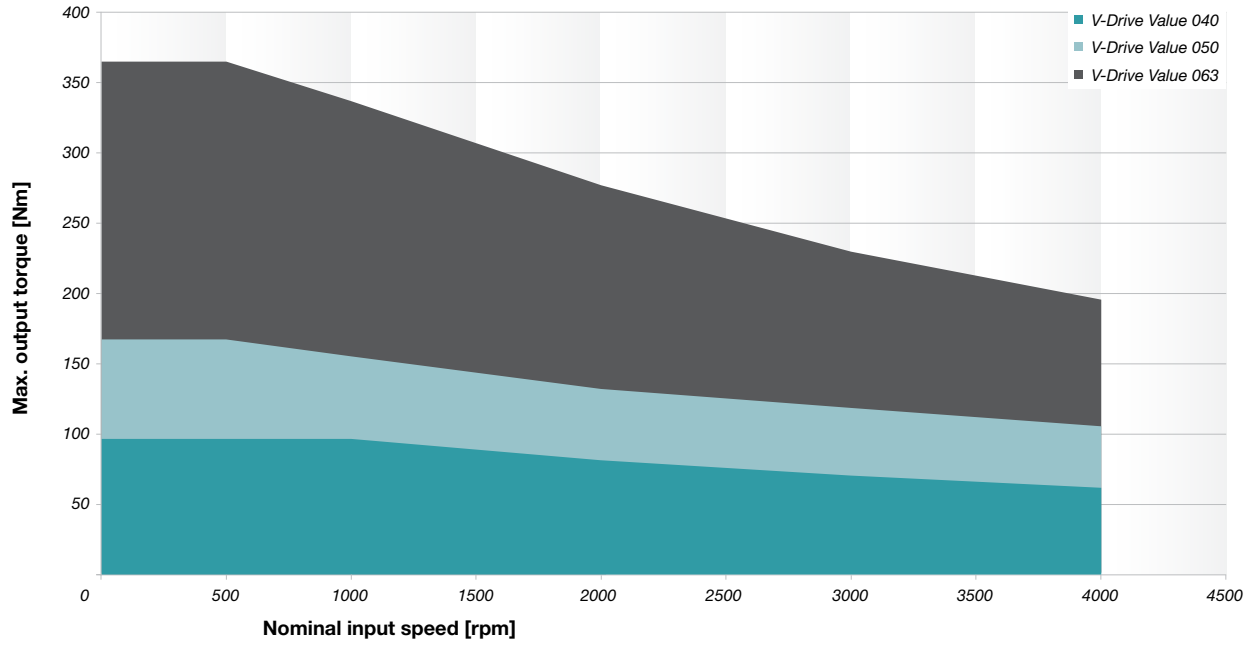
VDSe

VDHe

Low backlash servo worm gearheads with output shaft and hollow shaft. The V-Drive Value impresses with its high power density and medium torsional backlash.
It is especially suitable for economical applications in continuous operation.

Quick size selection

V-Drive Value (example for i = 28)
For applications in cyclic operation (DC ≤ 60%) or continuous operation (DC ≥ 60%)



Versions and Applications

Features	**VDHe** with smooth/keyed hollow shaft page 352	**VDSe** with smooth/keywayed solid shaft page 358
Power density	••	••
Smooth-running	•••	•••

Product features

Ratios	4 – 40	4 – 40
Torsional backlash [arcmin]	≤ 6	≤ 6
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

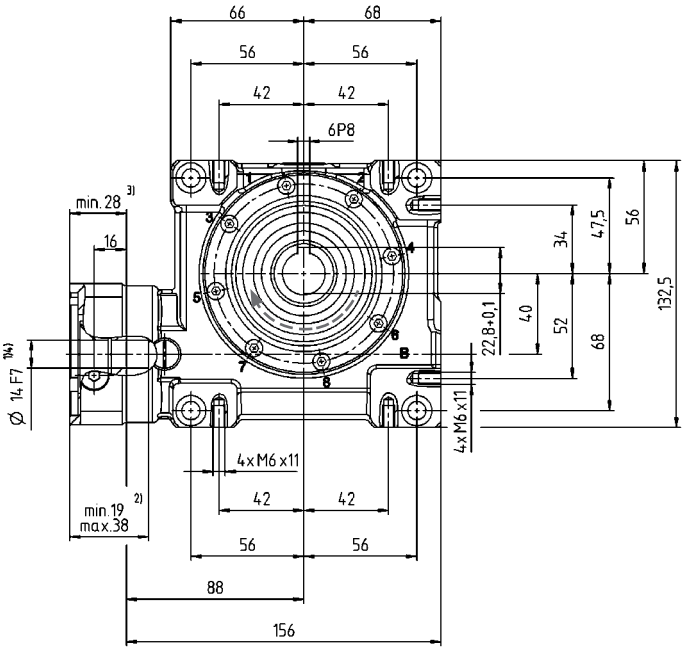
VDH Value 040 1-stage

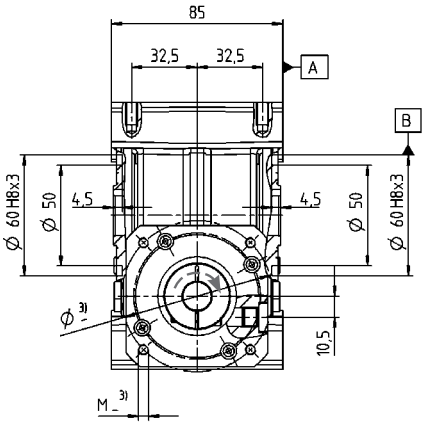
				1-stage					
Ratio			***i***	**4**	**7**	**10**	**16**	**28**	**40**
n_{1N}=500 rpm			T_{2Max} Nm	74	82	91	94	98	91
			T_{2Max} in.lb	655	726	805	832	867	805
			T_{2Servo} Nm	17	24	25	26	29	25
			T_{2Servo} in.lb	150	212	221	230	257	221
			η %	93	90	88	82	73	67
n_{1N}=1000 rpm			T_{2Max} Nm	63	73	87	89	96	84
			T_{2Max} in.lb	558	646	770	788	850	743
			T_{2Servo} Nm	19	26	28	29	32	28
			T_{2Servo} in.lb	168	230	248	257	283	248
			η %	94	92	90	86	77	73
n_{1N}=2000 rpm			T_{2Max} Nm	47	58	71	76	81	72
			T_{2Max} in.lb	416	513	628	673	717	637
			T_{2Servo} Nm	19	26	28	29	33	29
			T_{2Servo} in.lb	168	230	248	257	292	257
			η %	96	94	92	88	81	77
n_{1N}=3000 rpm			T_{2Max} Nm	37	47	59	65	70	62
			T_{2Max} in.lb	327	416	522	575	620	549
			T_{2Servo} Nm	19	26	28	29	32	28
			T_{2Servo} in.lb	168	230	248	257	283	248
			η %	96	95	93	90	83	79
n_{1N}=4000 rpm			T_{2Max} Nm	31	38	48	56	61	55
			T_{2Max} in.lb	274	336	425	496	540	487
			T_{2Servo} Nm	19	25	27	28	31	27
			T_{2Servo} 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
			T_{2Not} 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	0.6	0.5	0.4	0.4
			T_{012} in.lb	7.1	6.2	5.3	4.4	3.5	3.5
Max. torsional backlash			j_t arcmin	≤ 6					
Torsional rigidity			C_{t21} Nm/arcmin	4,5					
			C_{t21} in.lb/arcmin	40					
Max. axial force [b]			F_{2AMax} N	3000					
			F_{2AMax} lb_f	675					
Max. radial force [b]			F_{2RMax} N	2400					
			F_{2RMax} lb_f	540					
Max. tilting moment			M_{2KMax} Nm	205					
			M_{2KMax} in.lb	1814					
Service life (For calculation see "Information")			L_h h	> 20000					
Weight incl. standardadapter plate			m kg	4,0					
			m 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_1 kgcm²	0.52	0.38	0.34	0.32	0.32	0.31
			J_1 10^{-3} in.lb.s²	0.46	0.34	0.30	0.28	0.28	0.27
	E	19	J_1 kgcm²	0.54	0.40	0.37	0.35	0.34	0.33
			J_1 10^{-3} in.lb.s²	0.48	0.35	0.33	0.31	0.30	0.29

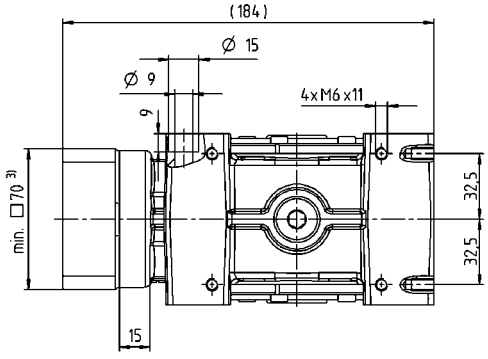
Please contact us for information on the best configuration for S1 conditions of use (continuous operation).

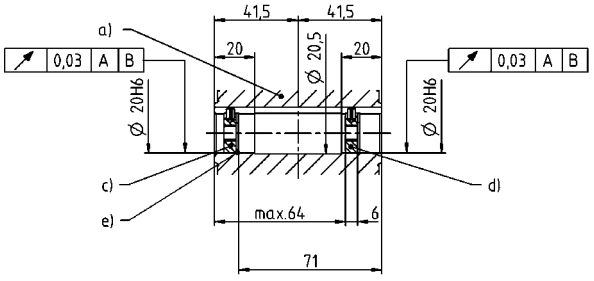
[a] Idling torques decrease during operation

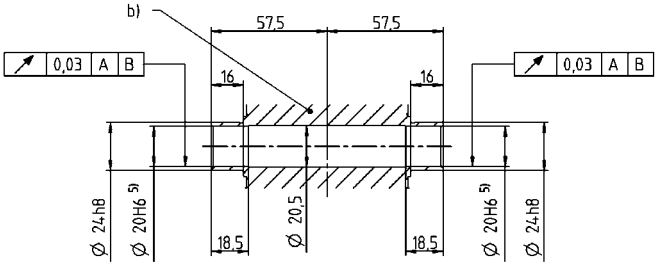
[b] Refers to center of output shaft or flange at n_2 = 300 rpm











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

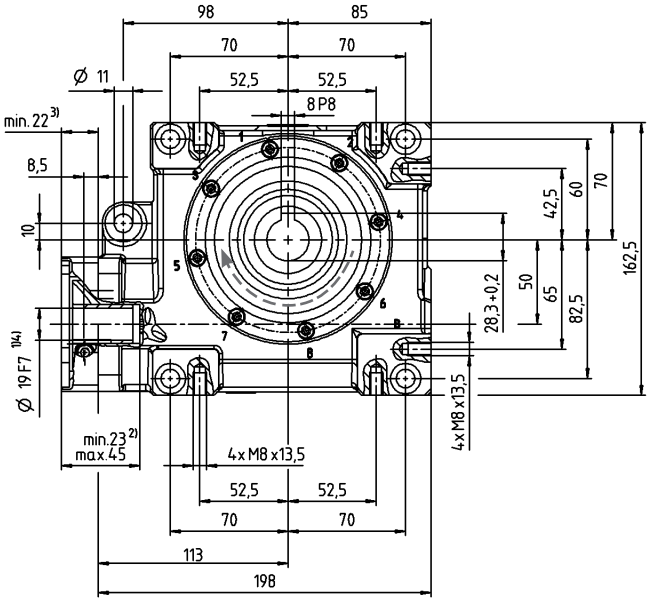
Motor mounting according to operating manual

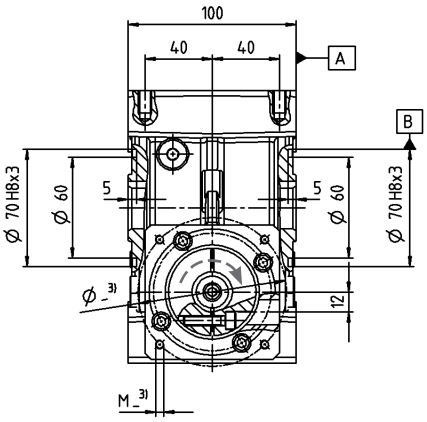
				1-stage					
Ratio			***i***	**4**	**7**	**10**	**16**	**28**	**40**
n_{1N}=500 rpm			T_{2Max}	Nm	–	150	153	157	167	141
				in.lb	–	1328	1354	1389	1478	1248
			T_{2Servo}	Nm	–	62	64	70	78	64
				in.lb	–	549	566	620	690	566
			η	%	–	89	86	82	72	64
n_{1N}=1000 rpm			T_{2Max}	Nm	–	127	130	146	155	112
				in.lb	–	1124	1151	1292	1372	991
			T_{2Servo}	Nm	–	66	70	76	84	70
				in.lb	–	584	620	673	743	620
			η	%	–	91	89	85	77	69
n_{1N}=2000 rpm			T_{2Max}	Nm	–	104	109	124	132	115
				in.lb	–	920	965	1097	1168	1018
			T_{2Servo}	Nm	–	68	71	77	86	72
				in.lb	–	602	628	681	761	637
			η	%	–	93	91	88	75	75
n_{1N}=3000 rpm			T_{2Max}	Nm	–	90	94	107	119	101
				in.lb	–	797	832	947	1053	894
			T_{2Servo}	Nm	–	67	70	76	84	70
				in.lb	–	593	620	673	743	620
			η	%	–	94	93	90	83	78
n_{1N}=4000 rpm			T_{2Max}	Nm	–	77	82	97	105	91
				in.lb	–	681	726	858	929	805
			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	–	2.2	1.6	1.5	1.2	1.1
				in.lb	–	19.5	14.2	13.3	10.6	9.7
Max. torsional backlash			j_t	arcmin	≤ 6					
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)	E	19	J_1	kgcm²	–	2,02	1,93	1,84	1,81	1,86
Clamping hub diameter [mm]				10^{-3} in.lb.s²	–	1,79	1,71	1,63	1,60	1,64

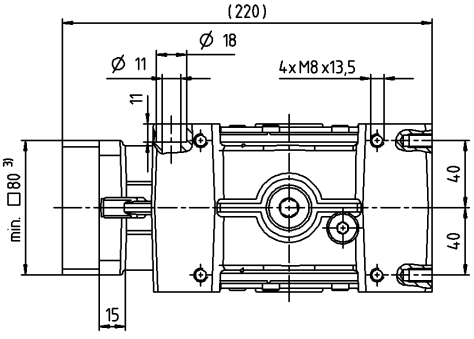
Please contact us for information on the best configuration for S1 conditions of use (continuous operation).

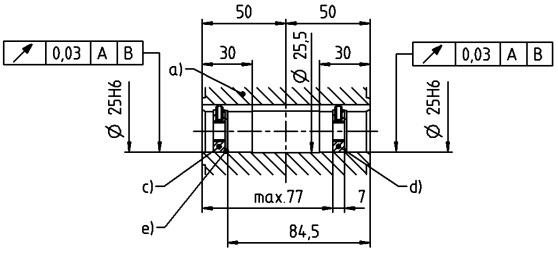
[a] Idling torques decrease during operation

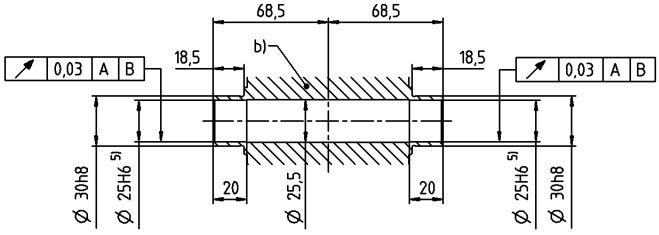
[b] Refers to center of output shaft or flange at n_2 = 300 rpm











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

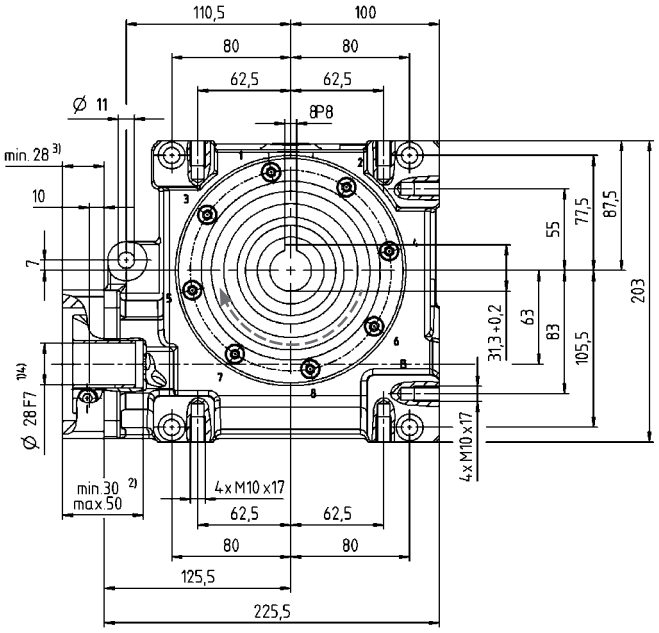
Motor mounting according to operating manual

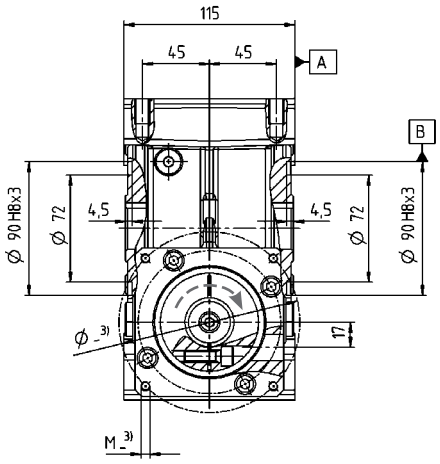
				1-stage					
Ratio			***i***	**4**	**7**	**10**	**16**	**28**	**40**
n_{1N}=500 rpm			T_{2Max}	Nm	–	303	319	331	365	321
				in.lb	–	2682	2823	2929	3230	2841
			T_{2Servo}	Nm	–	183	195	198	215	201
				in.lb	–	1620	1726	1752	1903	1779
			η	%	–	91	88	83	74	68
n_{1N}=1000 rpm			T_{2Max}	Nm	–	269	287	302	337	308
				in.lb	–	2381	2540	2673	2982	2726
			T_{2Servo}	Nm	–	197	208	212	230	215
				in.lb	–	1743	1841	1876	2036	1903
			η	%	–	93	91	86	78	73
n_{1N}=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_{1N}=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_{1N}=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	–	3.1	3.0	2.4	2.3	2.2
				in.lb	–	27.4	26.6	21.2	20.4	19.5
Max. torsional backlash			j_t	arcmin	≤ 6					
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) Clamping hub diameter [mm]	H	28	J_1	kgcm²	–	5,77	5,53	5,44	5,40	5,35
				10^{-3} in.lb.s²	–	5,11	4,89	4,81	4,78	4,74

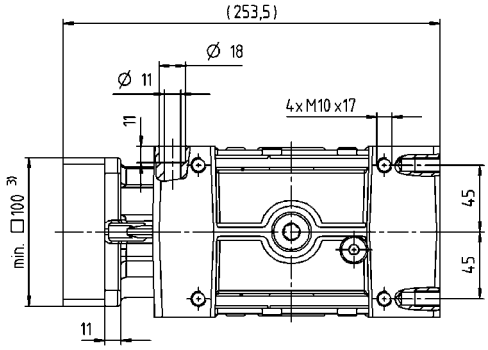
Please contact us for information on the best configuration for S1 conditions of use (continuous operation).

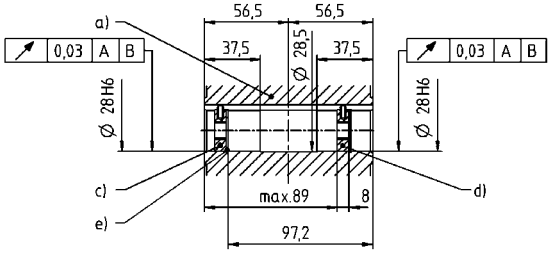
[a] Idling torques decrease during operation

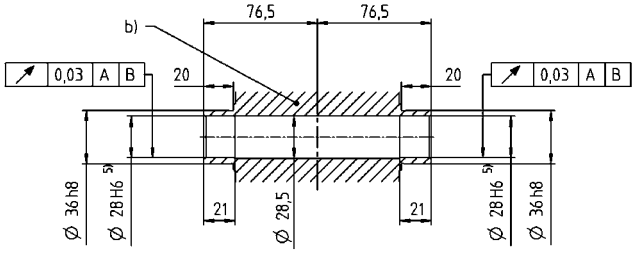
[b] Refers to center of output shaft or flange at n_2 = 300 rpm











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

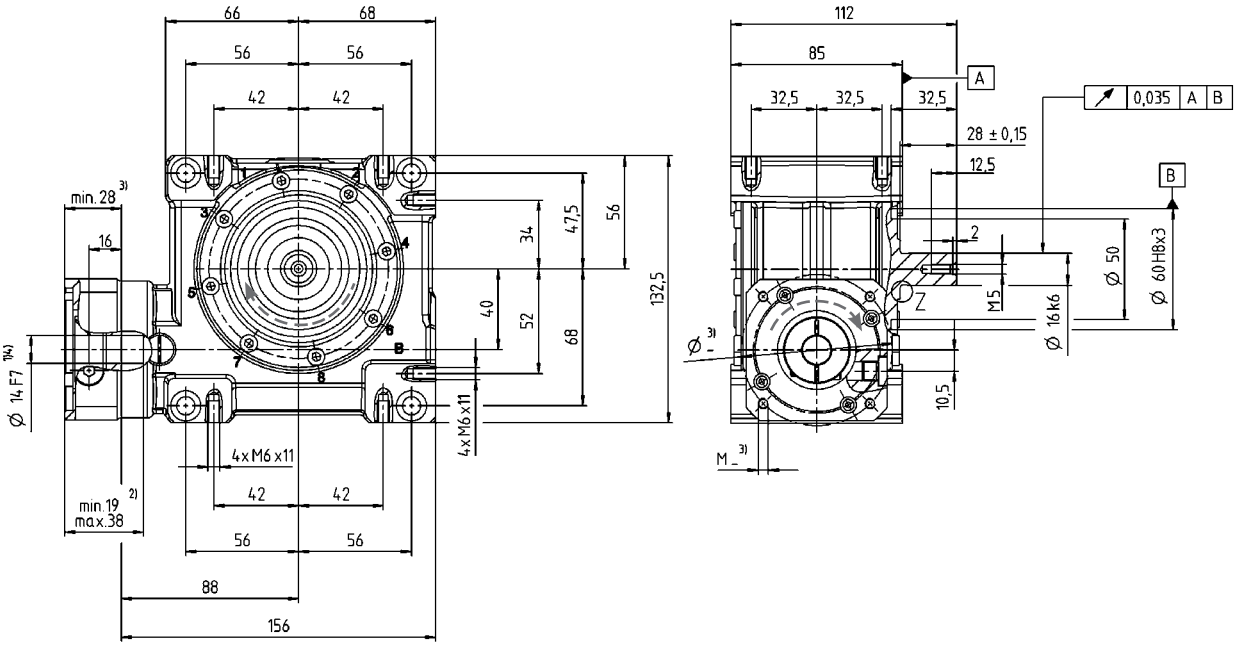
VDS Value 040 1-stage

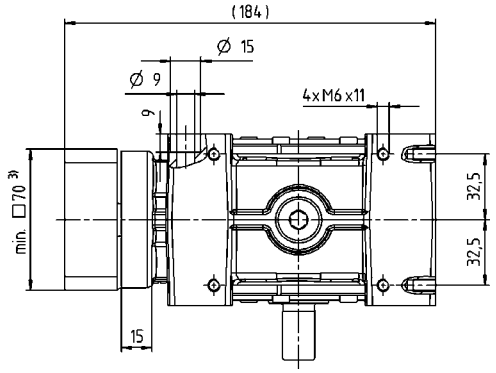
				1-stage					
Ratio			***i***	**4**	**7**	**10**	**16**	**28**	**40**
n_{1N}=500 rpm			T_{2Max} Nm	63	73	87	89	96	84
			T_{2Max} in.lb	558	646	770	788	850	743
			T_{2Servo} Nm	19	26	28	29	32	28
			T_{2Servo} in.lb	168	230	248	257	283	248
			η %	93	90	88	82	73	67
n_{1N}=1000 rpm			T_{2Max} Nm	63	73	87	89	96	84
			T_{2Max} in.lb	558	646	770	788	850	743
			T_{2Servo} Nm	19	26	28	29	32	28
			T_{2Servo} in.lb	168	230	248	257	283	248
			η %	94	92	90	86	77	73
n_{1N}=2000 rpm			T_{2Max} Nm	47	58	71	76	81	72
			T_{2Max} in.lb	416	513	628	673	717	637
			T_{2Servo} Nm	19	26	28	29	33	29
			T_{2Servo} in.lb	168	230	248	257	292	257
			η %	96	94	92	88	81	77
n_{1N}=3000 rpm			T_{2Max} Nm	37	47	59	65	70	62
			T_{2Max} in.lb	327	416	522	575	620	549
			T_{2Servo} Nm	19	26	28	29	32	28
			T_{2Servo} in.lb	168	230	248	257	283	248
			η %	96	95	93	90	83	79
n_{1N}=4000 rpm			T_{2Max} Nm	31	38	48	56	61	55
			T_{2Max} in.lb	274	336	425	496	540	487
			T_{2Servo} Nm	19	25	27	28	31	27
			T_{2Servo} 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
			T_{2Not} 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	0.6	0.5	0.4	0.4
			T_{012} in.lb	7.1	6.2	5.3	4.4	3.5	3.5
Max. torsional backlash			j_t arcmin	≤ 6					
Torsional rigidity			C_{t21} Nm/arcmin	4,5					
			C_{t21} in.lb/arcmin	40					
Max. axial force [b]			F_{2AMax} N	3000					
			F_{2AMax} lb_f	675					
Max. radial force [b]			F_{2RMax} N	2400					
			F_{2RMax} lb_f	540					
Max. tilting moment			M_{2KMax} Nm	205					
			M_{2KMax} in.lb	1814					
Service life (For calculation see "Information")			L_h ~~h~~	> 20000					
Weight incl. standardadapter plate			m kg	4,1					
			m 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_1 kgcm²	0.52	0.38	0.34	0.32	0.32	0.31
			J_1 10^{-3} in.lb.s²	0.46	0.34	0.30	0.28	0.28	0.27
	E	19	J_1 kgcm²	0.54	0.40	0.37	0.35	0.34	0.33
			J_1 10^{-3} in.lb.s²	0.48	0.35	0.33	0.31	0.30	0.29

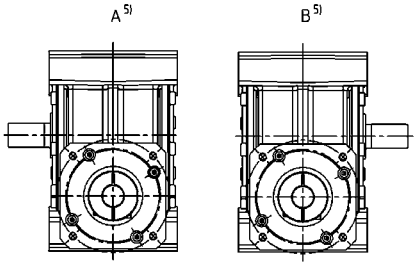
Please contact us for information on the best configuration for S1 conditions of use (continuous operation).

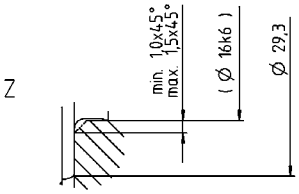
[a] Idling torques decrease during operation

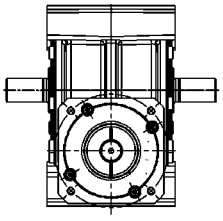
[b] Refers to center of output shaft or flange at n_2 = 300 rpm









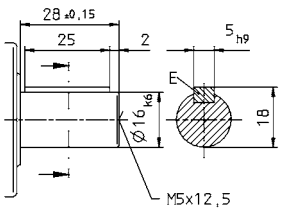


Optional dual-shaft output. Drawings available upon request.

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

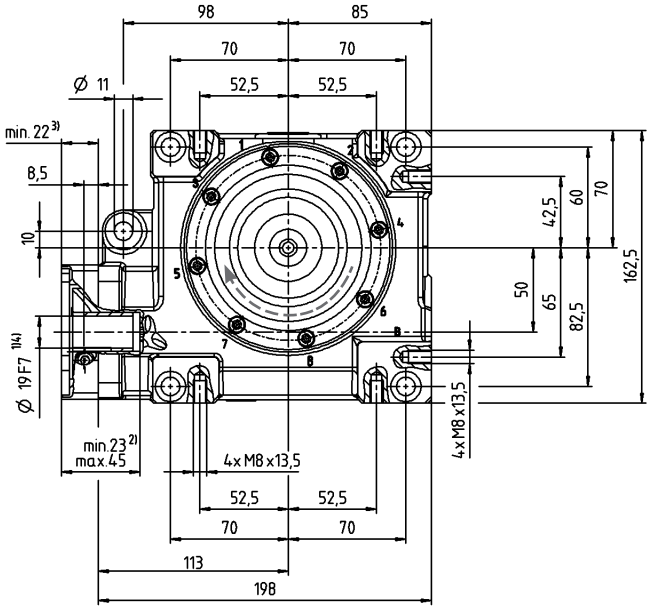
VDS value 050 1-stage

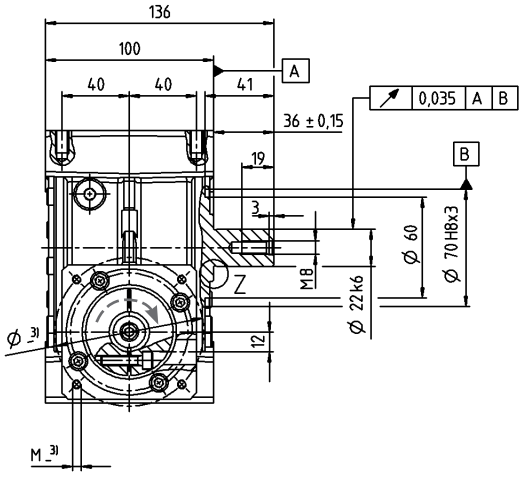
				1-stage					
Ratio			***i***	**4**	**7**	**10**	**16**	**28**	**40**
n_{1N}=500 rpm			T_{2Max}	Nm	–	150	153	157	167	141
				in.lb	–	1328	1354	1389	1478	1248
			T_{2Servo}	Nm	–	62	64	70	78	64
				in.lb	–	549	566	620	690	566
			η	%	–	89	86	82	72	64
n_{1N}=1000 rpm			T_{2Max}	Nm	–	127	130	146	155	112
				in.lb	–	1124	1151	1292	1372	991
			T_{2Servo}	Nm	–	66	70	76	84	70
				in.lb	–	584	620	673	743	620
			η	%	–	91	89	85	77	69
n_{1N}=2000 rpm			T_{2Max}	Nm	–	104	109	124	132	115
				in.lb	–	920	965	1097	1168	1018
			T_{2Servo}	Nm	–	68	71	77	86	72
				in.lb	–	602	628	681	761	637
			η	%	–	93	91	88	75	75
n_{1N}=3000 rpm			T_{2Max}	Nm	–	90	94	107	119	101
				in.lb	–	797	832	947	1053	894
			T_{2Servo}	Nm	–	67	70	76	84	70
				in.lb	–	593	620	673	743	620
			η	%	–	94	93	90	83	78
n_{1N}=4000 rpm			T_{2Max}	Nm	–	77	82	97	105	91
				in.lb	–	681	726	858	929	805
			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	–	2.2	1.6	1.5	1.2	1.1
				in.lb	–	19.5	14.2	13.3	10.6	9.7
Max. torsional backlash			j_t	arcmin	≤ 6					
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) Clamping hub diameter [mm]	E	19	J_1	kgcm²	–	2,01	1,93	1,84	1,81	1,86
				10^{-3} in.lb.s²	–	1,78	1,71	1,63	1,60	1,64

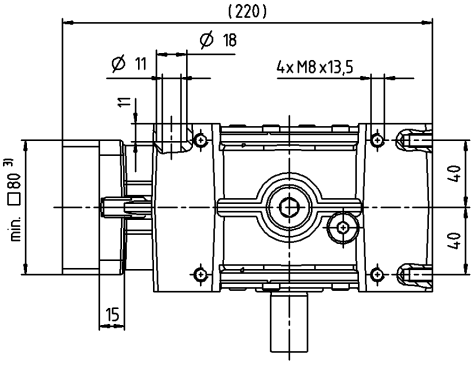
Please contact us for information on the best configuration for S1 conditions of use (continuous operation).

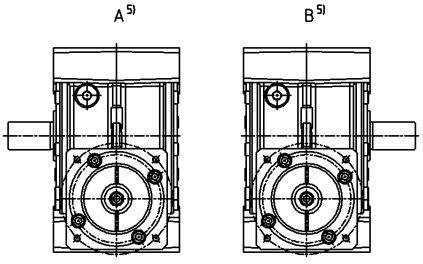
[a] Idling torques decrease during operation

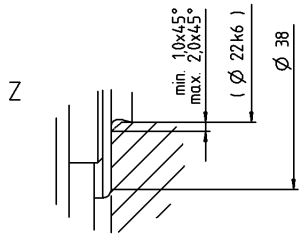
[b] Refers to center of output shaft or flange at n_2 = 300 rpm

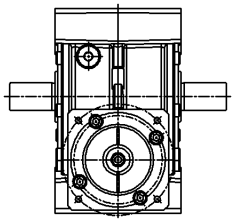










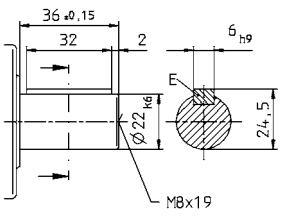


Optional dual-shaft output. Drawings available upon request.

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.
5) Output side

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

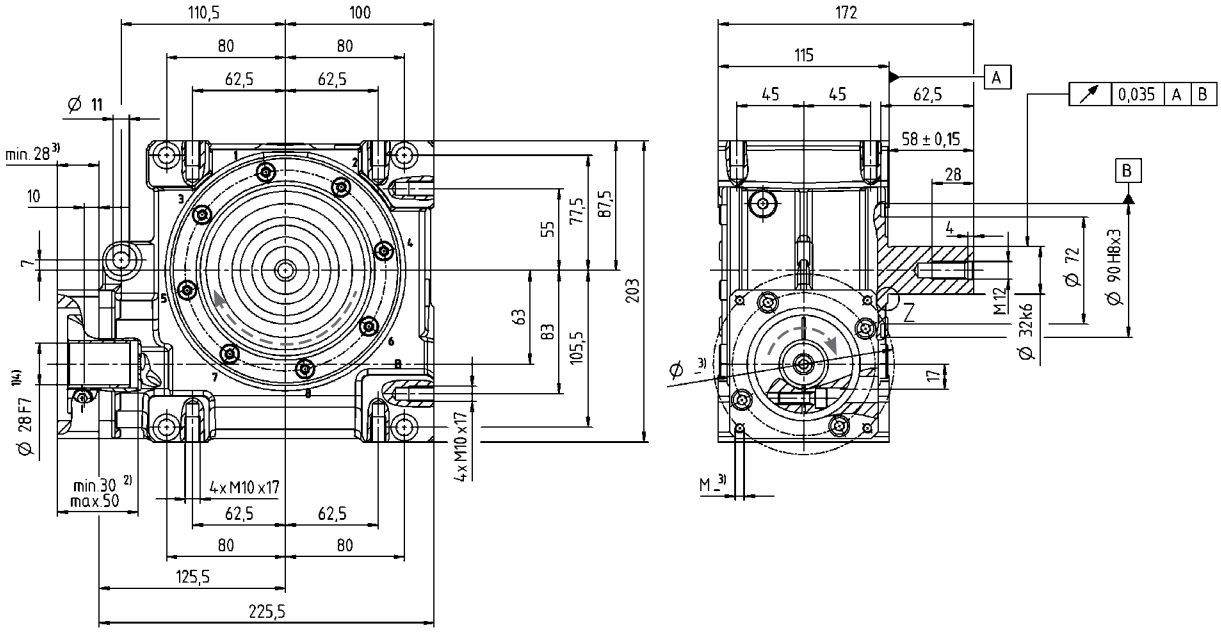
Motor mounting according to operating manual

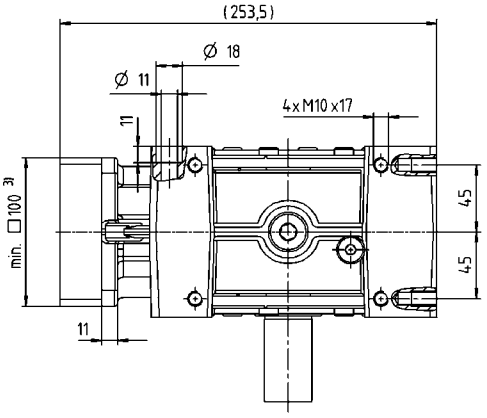
				1-stage					
Ratio			***i***	**4**	**7**	**10**	**16**	**28**	**40**
n_{1N}=500 rpm			T_{2Max}	Nm	–	303	319	331	365	321
				in.lb	–	2682	2823	2929	3230	2841
			T_{2Servo}	Nm	–	183	195	198	215	201
				in.lb	–	1620	1726	1752	1903	1779
			η	%	–	91	88	83	74	68
n_{1N}=1000 rpm			T_{2Max}	Nm	–	269	287	302	337	308
				in.lb	–	2381	2540	2673	2982	2726
			T_{2Servo}	Nm	–	197	208	212	230	215
				in.lb	–	1743	1841	1876	2036	1903
			η	%	–	93	91	86	78	73
n_{1N}=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_{1N}=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_{1N}=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	–	3.1	3.0	2.4	2.3	2.2
				in.lb	–	27.4	26.6	21.2	20.4	19.5
Max. torsional backlash			j_t	arcmin	≤ 6					
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)	H	28	J_1	kgcm²	–	5,78	5,53	5,44	5,40	5,35
Clamping hub diameter [mm]				10^{-3} in.lb.s²	–	5,12	4,90	4,82	4,78	4,74

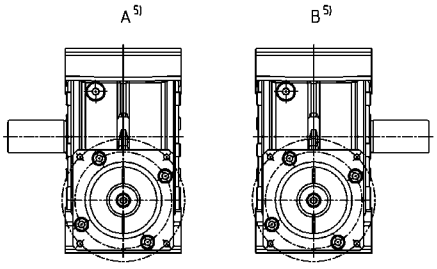
Please contact us for information on the best configuration for S1 conditions of use (continuous operation).

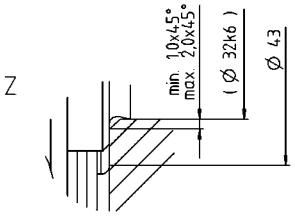
[a] Idling torques decrease during operation

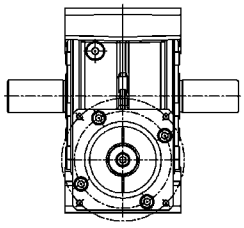
[b] Refers to center of output shaft or flange at n_2 = 300 rpm









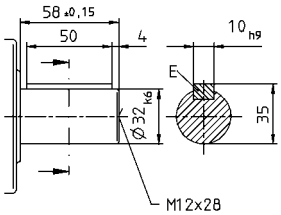


Optional dual-shaft output. Drawings available upon request.

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.
5) Output side

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

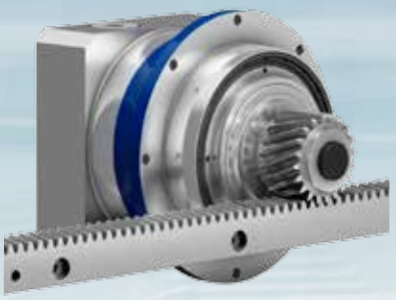
Motor mounting according to operating manual

System solutions

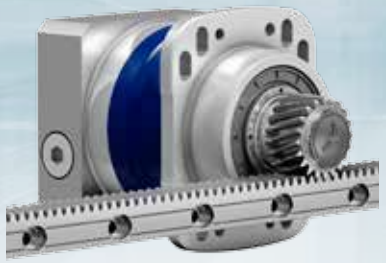
alpha rack & pinion system
Precise rack and pinion drives tailored to your applications

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.

High Performance Linear System



Precision System



Performance Linear System

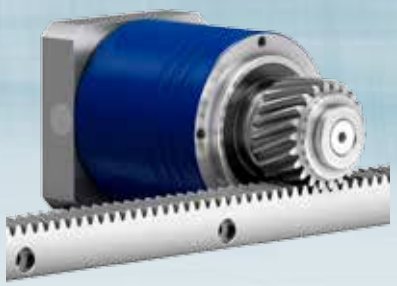
Your benefits:

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

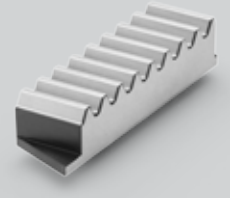
Standard System



Economy System

Accessories

Lubrication



Assembly jig

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.

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

Worse — Better

Features	Ball screw	Linear motor	alpha linear system
Movement speed			
Moving force			
Acceleration			
Surface finish			
Noise level			
Energy requirement			
Safety in the event of a power failure			
Service life			
Sensitivity in the event of a crash			
Service friendliness			
Investment costs			
Repair costs			
Operating efficiency (under extreme load)			
Operating efficiency (low load			

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*

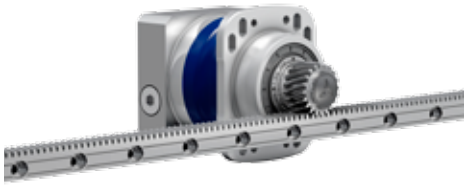
* Compared to industry standard

You can download the system catalog from
www.wittenstein-alpha.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

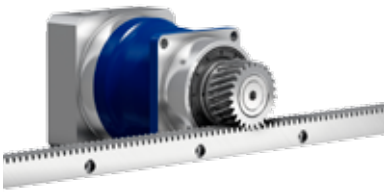
Planetary gearhead alpheno®
Premium Class+ pinion
Performance Class rack

- 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 µm 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

Machine accuracy [µm]*

Sample applications

- Eroding machines
- Grinding machines
- HSC portal milling machines
- Turning machines
- Machining centers
- Laser machines
- Boring machines
- Punching machines
- Water jet cutting machines
- Wood/plastic machining centers
- Pipe bending machines
- Gas cutting machines
- Automation engineering
- Foam cutting machines

Direct measuring system

Indirect measuring system

1
5
20
50
100
200
> 300

Master/slave with Precision/Performance Linear System
Contact us!

Precision System
Page 378 – 381

Performance Linear System
Page 382/383

Standard System
Page 384/385

Economy System
Page 386/387

20.000

40.000

Automation engineering
Source: MOTOMAN Robotics Europe AB

Gas cutting machines
Source: LIND GmbH Industrial Equipment

CNC wood/plastic processing machines
Source: MAKA – Max Mayer Maschinenbau GmbH © MAKA

Profile machining centers
Source: Handtmann A-Punkt Automation GmbH

HSC portal milling machines
Source: F. Zimmermann GmbH

Master/slave with High Performance Linear System
Contact us!

High Performance Linear System
Page 383

alpha rack & pinion systems

60.000 80.000 100.000 120.000 240.000

Moving force [N]

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:**

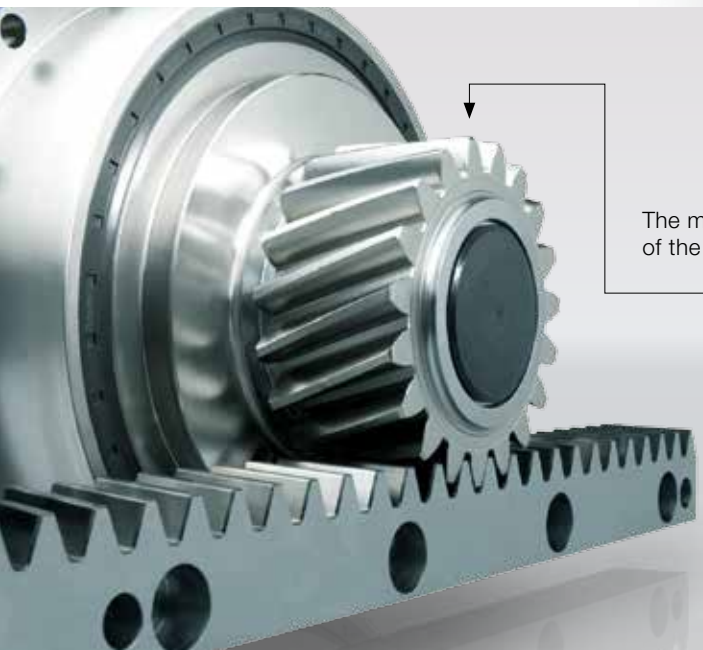
- Tested quality through 100% final inspection
- Highest quality and reliability, perfect setting of the tooth backlash between pinion and rack through aligned pinion and marked high point*
- Prevention of potential sources of error during assembly at your plant

*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.wittenstein-alpha.com**

Value Class rack

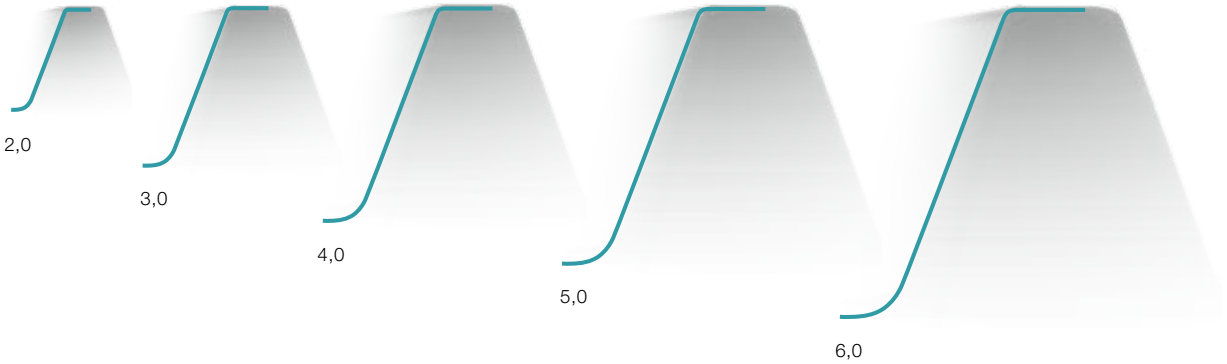
In conjunction with Economy system

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!



Toothing 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	l	l_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]
[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	l	l_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]
[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

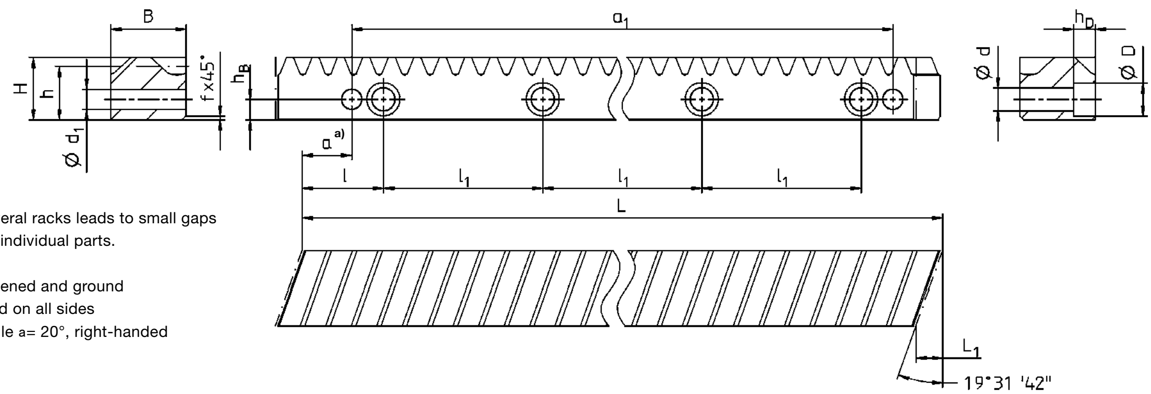
Value Class rack

Module	p_t	L	z	a	a_1	B	d	d_1 [b)]	D	$f^{+0,5}$	h	h_B	h_D	H	l	l_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]
[b)] Recommended tolerance dimension: $6^{H7}/8^{H7}/10^{H7}/12^{H7}/16^{H7}$

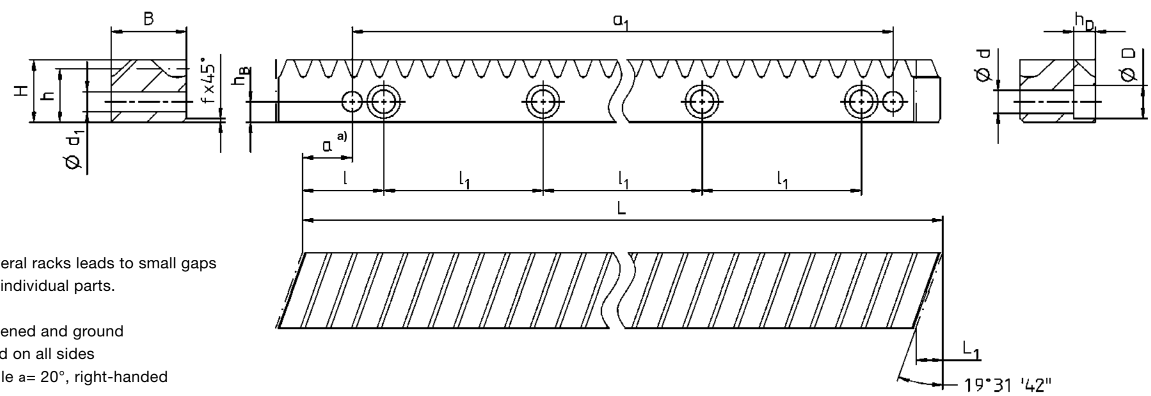
p_t = Reference circle pitch
z = Number of teeth
m = Mass in kg

Please refer to the operating instructions available at **www.wittenstein-alpha.com** for instructions on assembly and design of the machine bed



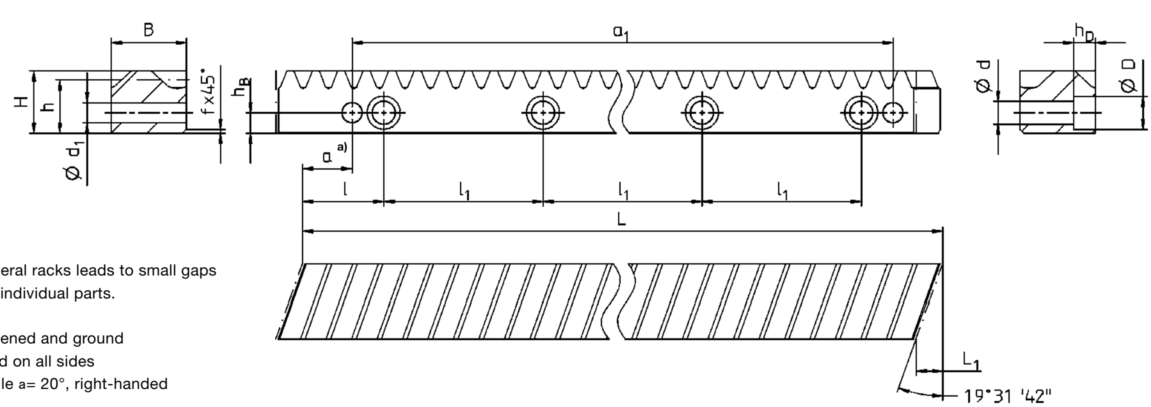
[a] Installing several racks leads to small gaps between the individual parts.

Gearing hardened and ground
Profile ground on all sides
Pressure angle a= 20°, 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°, 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°, 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 α=20°, inclination angle β=19.5283° left-handed)

Gearhead size [b]	Module	z	A ±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	7.5
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	7.5
	3	20	59.031	31	29	72.3	63.662	0.4	76.0	52.5	23.5	9.0	38.0	8.0
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	8.0
	4	20	78.241	41	39	94.8	84.882	0.2	97.0	67.5	29.5	10.0	48.0	9.0
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	9.0
	5	19	86.399	51	49	115.1	100.798	0.4	120.0	85.0	35.0	10.5	60.5	9.5
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	9.5
	6	19	105.879	61	59	138.0	120.958	0.4	146.5	106.0	40.0	10.5	76.5	10
TP+ / TPK+ 500	6	19	105.879	61	59	138.0	120.958	0.4	155.5	115.0	43.5	14.0	89.0	10

All dimensions in [mm]

[a] Align mechanism recommended (alignment dimension ± 0.3 mm)

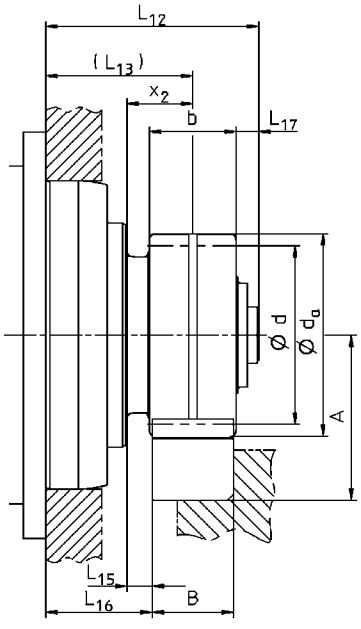
[b] Output type: 3 – system output

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 α=20°,inclination angle β=19.5283° left-handed)

Gearhead size [c]	Module	z	A ±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+/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+/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

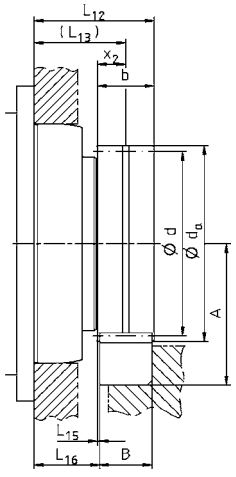
z = Number of teeth
d_a = Tip diameter
d = Partial circle diameter
x = Profile correction factor

Planetary gearhead TP+ HIGH TORQUE / right-angle gearhead TPK+ HIGH TORQUE with Premium Class RTP pinion and Premium Class rack (all pinions, pressure angle α=20°,inclination angle β=19.5283° left-handed)

Gearhead size [c]	Module	z	A ±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	149.0	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_f]	[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+/ TPK+ 300	5	32	25111	5650	2131	18865	267	175	7.7	16.9
TP+/ 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_f]	[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!

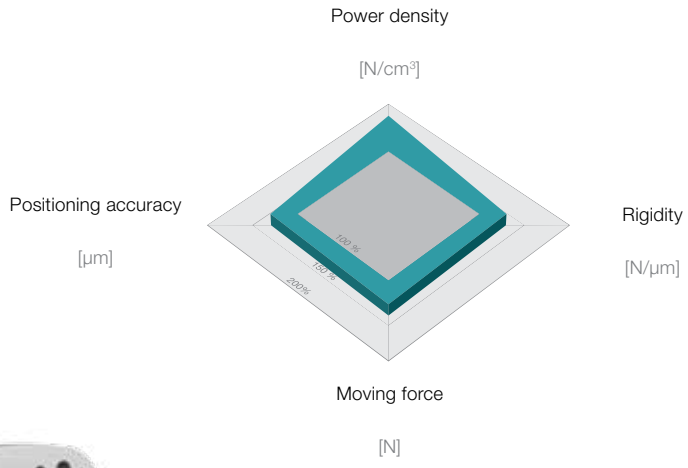
The Performance Linear System meets customer requirements for compact and efficient solutions of the highest quality. In addition to the extended design options, possibilities for the efficiency enhancement of existing applications are also available to users.
And there are plenty of customization options as well. Users can size and optimize the Performance package according to their requirements.

The right linear drive system for your application

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

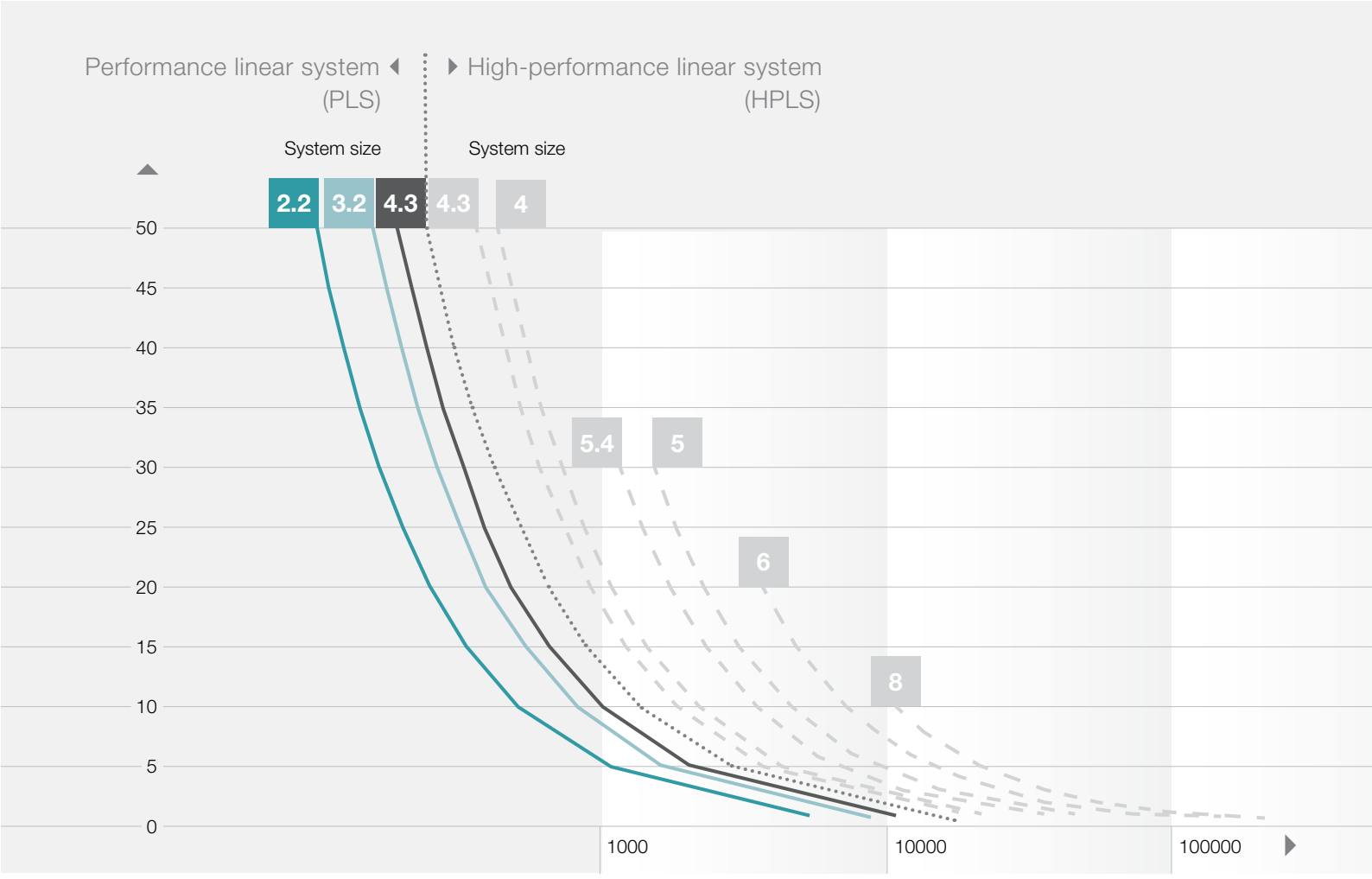
Comparison of technical data between the industry standard and the Performance Linear System



Performance Linear System
with a positioning accuracy of < 5 µm and an efficiency of ≤ 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.wittenstein-alpha.com**

Quick system selection



Planetary gearhead SP+/ right-angle gearhead SK+/ SPK+ with Standard Class RSP pinion and Value Class rack (all pinions, pressure angle α=20°, inclination angle β=19.5283° left-handed)

Gearhead size [b]	Module	z	A ±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)

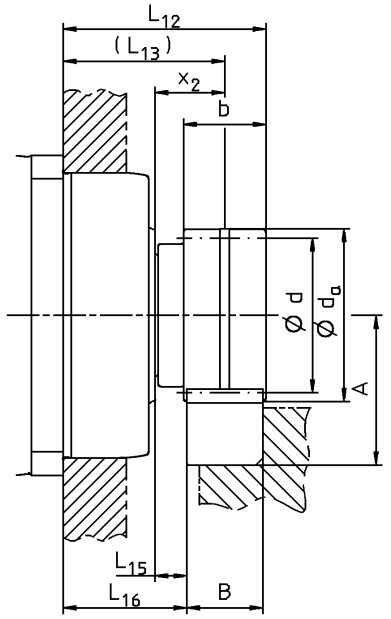
[b] Output type: 2 – Involute as per DIN5480; also available with V-Drive worm gearhead

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	14000	3150	742	6567	278	182	2.8	6.17
SP+ 240	5	24	22000	4950	1400	12391	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 α=20°, inclination angle β=19.5283° left-handed)

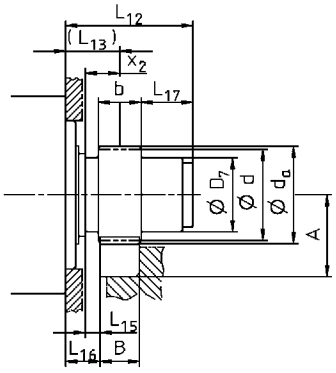
Gearhead size [b]	Module	z	A ±0,3 [a]	b	B	d_a	d	x	L12	L13	x2	L15	L16	L17
LP+/ LK+/ LPK+ 070	2	18	41.899	26	24	43.7	38.197	0.4	42.0	27.0	19.0	7.0	15.0	2.0
LP+/ LK+/ LPK+ 090	2	22	45.743	26	24	51.4	46.686	0.2	52.0	30.0	20.0	8.0	18.0	9.0
LP+/ LK+/ LPK+ 120	2	26	49.587	26	24	59.1	55.174	0	77.5	33.0	21.0	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 α=20°, inclination angle β=19.5283° left-handed)

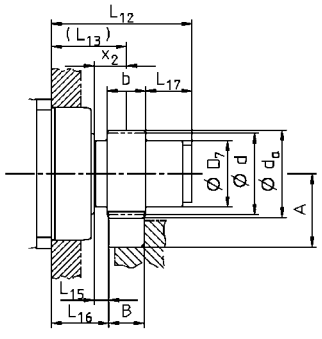
Gearhead size [b]	Module	z	A ±0,3 [a]	b	B	d_a	d	x	L12	L13	x2	L15	L16	L17
SP+/ SK+ 060	2	18	41.899	26	24	43.7	38.197	0.4	54.0	39.0	19.0	7.0	27.0	2.0
SP+/ SK+/ SPK+ 075	2	22	45.743	26	24	51.4	46.686	0.2	62.0	40.0	20.0	8.0	28.0	9.0
SP+/ SK+/ SPK+ 100	2	26	49.587	26	24	59.1	55.174	0	95.5	51.0	21.0	9.0	39.0	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	4300	968	119	1053	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

Replaceable lubricant container 400 ccm

Up to 4 outlets with up to 2 different, freely adjustable lubricant quantities

Control and voltage supply via machine control system

Lubricator LUC⁺ 400
Solution for decentralized lubrication – a solution you can rely on.

High-pressure plastic hose
Pre-filled, suitable for cable tracks

Open pore polyurethane foam stores the lubricant and dispenses it evenly

Axle has no interference contour (countersunk screw)

Low-wearing thanks to integrated bearing bushing

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. 112x196x94mm
Weight	1120g
Lubricant volume	400 cm³
Lubricant type	Grease up to NLGI 3
Method of operation	Piston pump
Operating pressure	Max. 70 bar
Metering volume/stroke	0.15 cm³ (output/pulse signal)
No. of outlets	1, 2, 3, 4
Outlet	Rotating, right-angled hose connections 6mm to 150bar
Operating voltage	24 VDC
Current input	I_{max} during operation 350mA (regular < 200mA)
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	2m	20058416
LUC+400-0521-02	2	1	WITTENSTEIN alpha G11	2 x 2m	20058418
LUC+400-0531-02	3	2	WITTENSTEIN alpha G11	3 x 2m	20058420
LUC+400-0541-02	4	2	WITTENSTEIN alpha G11	4 x 2m	20058422
LUC+400-0551-02	2	2	WITTENSTEIN alpha G11	2 x 2m	20058424

Lengths up to 10m per outlet via hose connector 6-0 and LUH hose possible. Sets with 5m 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 cm³	20058120
Grease gun cartridge LGC-400-05 [b]	-	G11	400 cm³	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

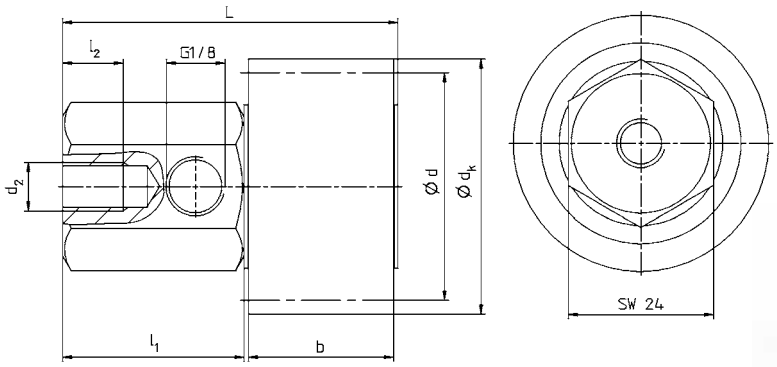
alpha rack & pinion system accessory range – Dimensions of lubricating pinion and fastening axles

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.



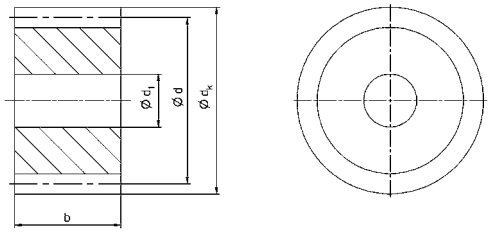
Lubricating pinion for racks, left-handed

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	17 LH	Rack	90,2	20	100,2	50	RLU 500-PU-17L1-050	20053689
	17 RH	Pinion					RLU 500-PU-17R1-050	20053690
6	17 LH	Rack	108,2	20	120,2	60	RLU 600-PU-17L1-060	20053691
	17 RH	Pinion					RLU 600-PU-17R1-060	20053692
8	17 LH	Rack	144,3	20	160,3	80	RLU 800-PU-17L1-080	20053693
	17 RH	Pinion					RLU 800-PU-17R1-080	20053694

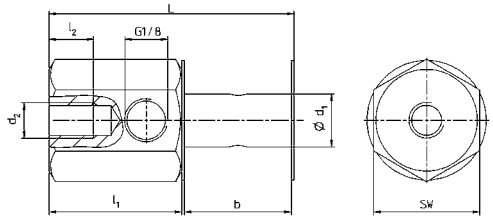
Lubricating pinions must be soaked in lubricant before operation.
Customized pinions: We also have solutions for your special requirements, please contact us!



Fastening axle, right-angle

Module	L	l_1	l_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

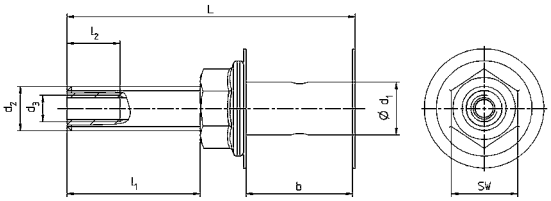
Connector for hose Ø 6 x 4 mm included in scope of delivery.



Fastening axle, straight

Module	L	l_1	l_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	49	12	50	20	M16	24	G1/8"	LAS-050-020-0	20053701
6	126	49	12	60	20	M16	24	G1/8"	LAS-060-020-0	20053703
8	146	49	12	80	20	M16	24	G1/8"	LAS-080-020-0	20053705

Connector for hose Ø 6 x 4 mm included in scope of delivery.



Lubricating pinion – general information

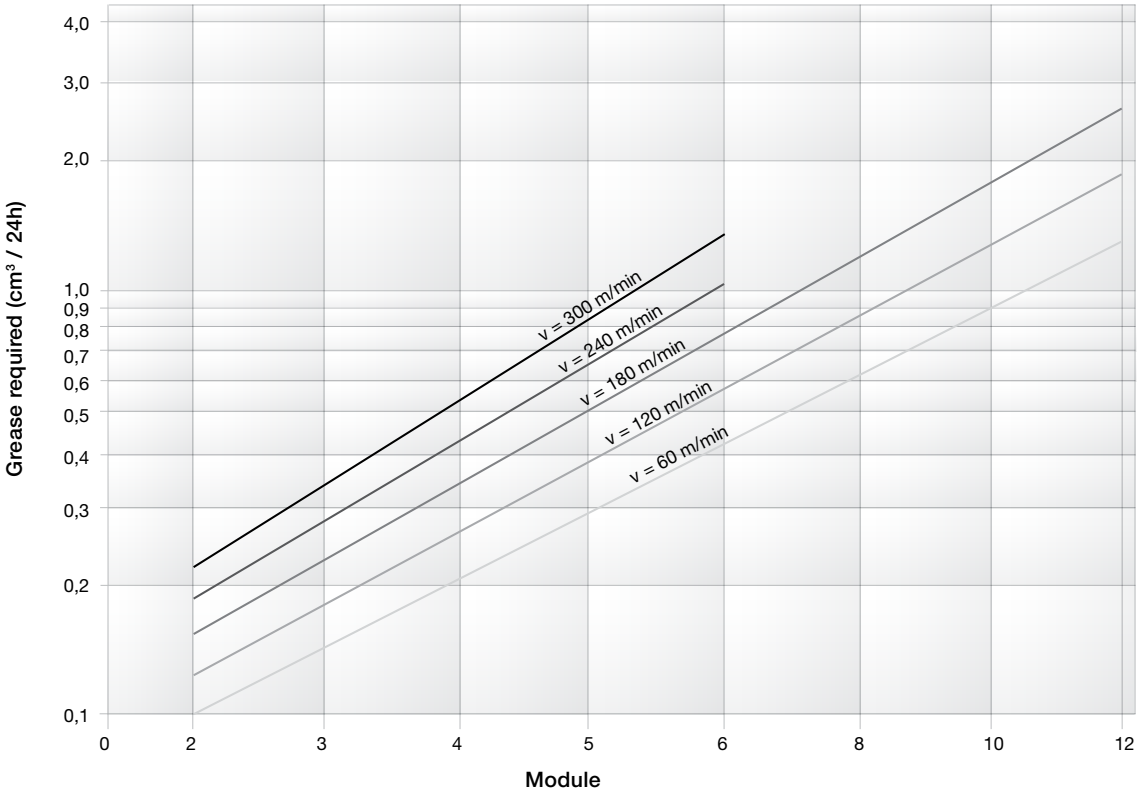
Due to the possibility of high moving forces and dynamics of the drives used, the open toothing of our rack and pinion drives must be lubricated. We recommend automatic re-lubrication using our polyurethane lubricating pinions.

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

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 endurable
- 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 endurable
- 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.

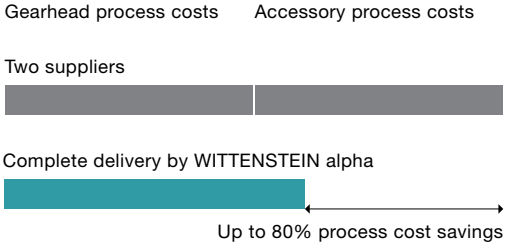
- Reliable torque transmission
- Simple mounting and removal
- Quick selection, easy and convenient
- Optional: Corrosion resistant version

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/

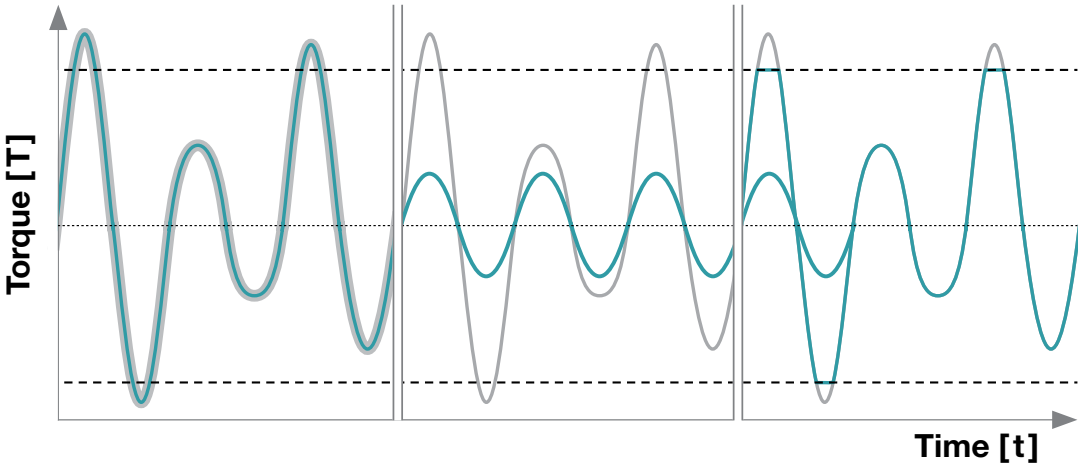
Quick coupling selection

		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)						•	•			

BCT – bellows coupling with flange connection

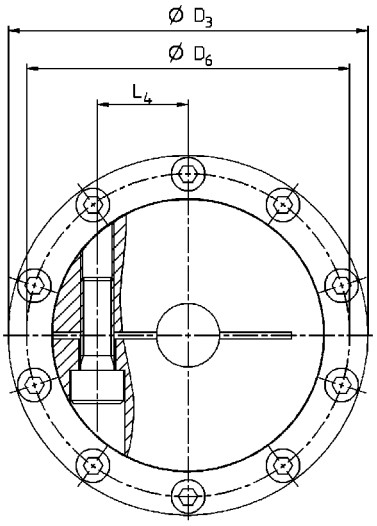
			Standard series					HIGH TORQUE series	
Technical data			**15**	**60**	**150**	**300**	**1500**	**1500**	**4000**
Gearhead output	TP+, TPK+, TK+, VDT+, TPM, TPC		**004 MF**	**010 MF**	**025 MF**	**050 MF**	**110 MF**	**110 MA**	**300 MA**
Max. acceleration torque [a] (max. 1000 cycles per hour)	T_B	Nm	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	0.25	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_t	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	Al	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_S)	L_1	mm	51.5	73.5	77.5	96.5	148	136.5	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_S)	L_7	mm	48.5	67	72	90	140	128.5	195
Screw head length	L_S	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

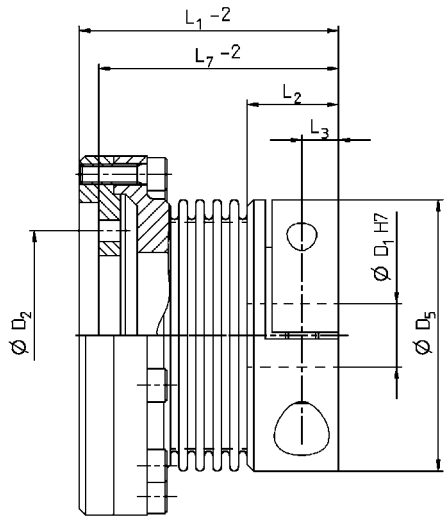
[a] valid for maximum bore diameter (see D_1)

[b] Tolerance for shaft/hub connection 0.01-0.05 mm.

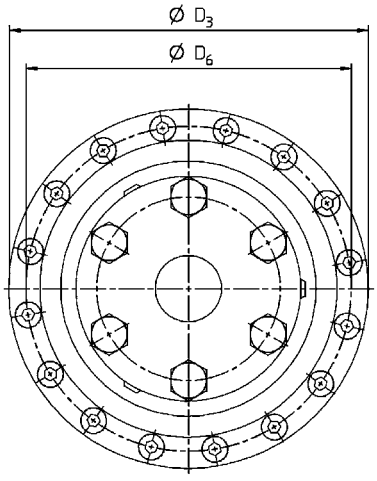
[c] Adapter flange and screws included in scope of delivery

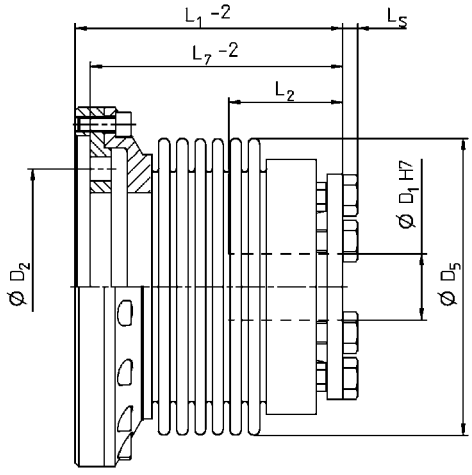
BCT Standard
with Standard clamping hub





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

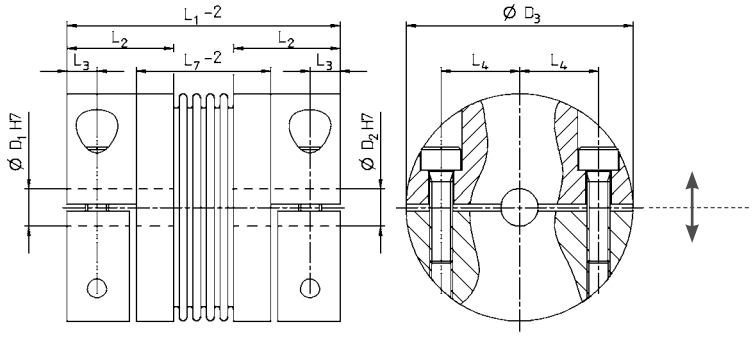
BCH – bellows coupling with split clamping hub

Technical data			Series																			
			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	0.4
Axial spring stiffness	C_a	N/mm	25	15	50	30	72	48	48	32	82	52	90	60	105	71	70	48	100	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



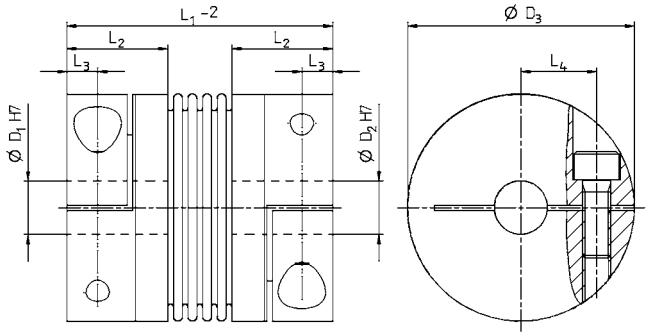
BC2 – bellows coupling with clamping hub

Technical data			Series																							
			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	kgcm²	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.s²	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	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		2 x 65	2 x 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



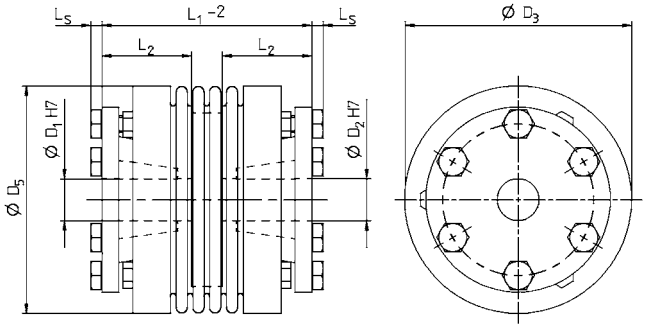
BC3 – bellows coupling with conical clamping hub

			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_S)	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 - 56		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



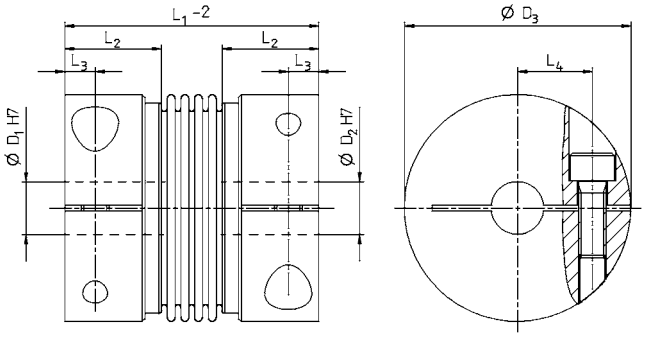
EC2 – bellows coupling Economy with clamping hub

Technical data			Series									
			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	kgcm²	0.02	0.07	0.16	0.65	1.2	3	7.5	18	75	117
		10^{-3} in.lb.s²	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.

ELC

EL6

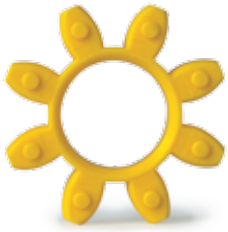
Your benefits:
- Compensation for shaft misalignment
- Completely backlash free
- Selectable torsional rigidity/damping
- Compact design
- Extremely simple installation (plug-in)
- Maintenance-free and fatigue endurable
- Ideal for connection to spindle drives, toothed belt drives and linear modules

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

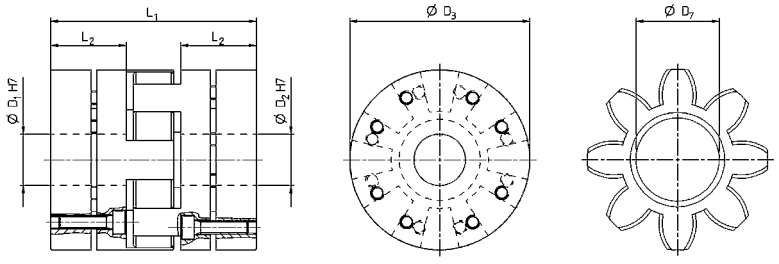
EL6 – elastomer coupling with conical clamping ring

Technical data			Series																			
			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	12.6	16	4.0	17	21	6.0	60	75	20	160	200	42	325	405	84	530	660	95	950	1100	240
		in.lb	112	142	35	150	186	53	531	664	177	1416	1770	372	2876	3584	743	4691	5841	841	8408	9735	2124
Max. acceleration torque (max. 1000 cycles per hour)	T_{BE}	Nm	25	32	6	34	42	12	120	150	35	320	400	85	650	810	170	1060	1350	190	1900	2150	400
		in.lb	221	283	53	301	372	106	1062	1328	310	2832	3540	752	5753	7169	1505	9381	11948	1682	16815	19028	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	0.076	0.17	0.026	0.33	0.73	0.15	0.96	2.8	0.41	1.4	3.1	0.33	3.6	5.2	0.37	4.4	7.9	1.2	12	19	3.0
		in.lb/arcmin	0.67	1.5	0.23	2.9	6.5	1.3	8.5	24.8	3.6	12.4	27.4	2.9	31.9	46	3.3	38.9	69.9	10.6	106	168	26.6
Dynamic torsional rigidity (at T_{BE})	C_{Tdy}	Nm/arcmin	0.16	0.48	0.065	0.74	1.3	0.25	2.3	3.5	0.39	3.9	8.5	1	6.9	12	1.8	16	24	3.4	24	52	8.3
		in.lb/arcmin	1.4	4.2	0.58	6.6	11.5	2.2	20.4	31.0	3.5	34.5	75.2	8.9	61.1	106	15.9	142	212	30.1	212	460	73.5
Moment of inertia	J	$kgcm^2$	0.08			0.30			1.0			2.0			6.0			17			184		
		10^{-3} in.lb.s^2	0.07			0.27			0.89			1.8			5.3			15			163		
Hub material			Al			Al			Al			Al			Al			Al			Steel		
Elastomer material			Polymer																				
Approx. weight	m	kg	0.08			0.12			0.3			0.5			0.9			1.5			9.6		
		lb	0.18			0.27			0.66			1.1			2.0			3.3			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			66.5			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

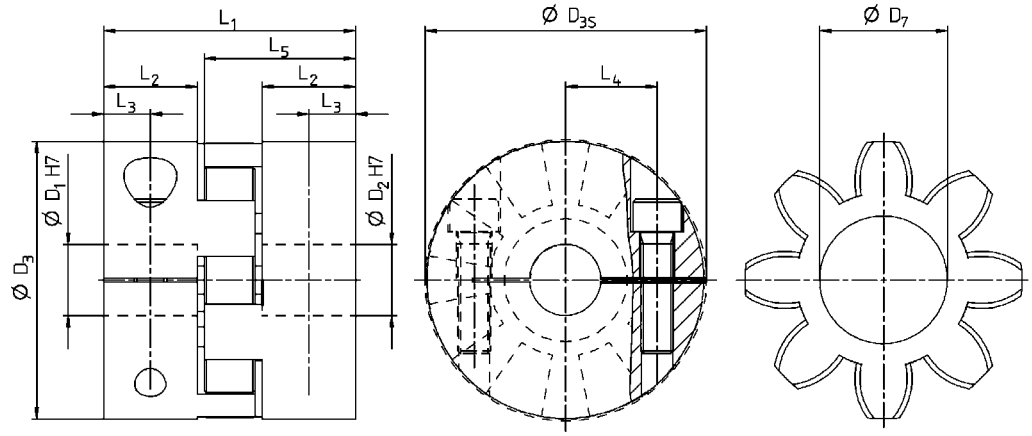
Technical data			Series																										
			2			5			10			20			60			150			300			450			800		
Elastomer insert version (see order code)			A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C
Max. rated torque for elastomer insert [a]	T_{NE}	Nm	2	2.4	0.5	9	12	2	12.5	16	4	17	21	6	60	75	20	160	200	42	325	405	84	530	660	95	950	1100	240
		in.lb	18	21	4.4	80	106	18	111	142	35	150	186	53	531	664	177	1416	1770	372	2876	3584	743	4691	5841	841	8408	9735	2124
Max. acceleration torque of elastomer insert (max. 1000 cycles per hour) [a]	T_{BE}	Nm	4	4.8	1.0	18	24	4	25	32	6	34	42	12	120	150	35	320	400	85	650	810	170	1060	1350	190	1900	2150	400
		in.lb	35	42	8.9	159	212	35	221	283	53	301	372	106	1062	1328	310	2832	3540	752	5753	7169	1505	9381	11948	1682	16815	19028	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	0.02	0.03	0.01	0.04	0.10	0.02	0.08	0.17	0.03	0.33	0.73	0.15	0.96	2.8	0.41	1.4	3.1	0.33	3.6	5.2	0.37	4.4	7.9	1.2	12	19	3.0
		in.lb/arcmin	0.13	0.29	0.04	0.39	0.89	0.13	0.67	1.5	0.23	2.9	6.5	1.33	8.5	25	3.6	12	27	2.9	32	46	3.3	39	70	11	106	168	27
Dynamic torsional rigidity at (T_{BE})	C_{Tdy}	Nm/arcmin	0.03	0.07	0.01	0.09	0.2	0.03	0.16	0.48	0.07	0.74	1.3	0.25	2.3	3.5	0.39	3.9	8.5	1.0	6.9	12	1.8	16	24	3.4	24	52	8.3
		in.lb/arcmin	0.26	0.59	0.09	0.77	1.8	0.27	1.4	4.2	0.58	6.5	12	2.2	20	30.9	3.5	35	75	8.9	61	106	16	142	212	30	212	460	73
Moment of inertia	J	kgcm²	0.01			0.04			0.06			0.20			0.80			1.60			6.00			13.2			160		
		10^{-3} in.lb.s²	0.01			0.04			0.05			0.18			0.71			1.42			5.31			11.7			142		
Hub material			Al			Al			Al			Al			Al			Al			Al			Al			Steel		
Elastomer material			Polymer																										
Approx. weight	m	kg	0.008			0.02			0.05			0.12			0.30			0.50			0.90			1.5			8.5		
		lb	0.018			0.044			0.11			0.27			0.66			1.1			2.0			3.3			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.

TL1

TL2

TL3

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 disengagement (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*

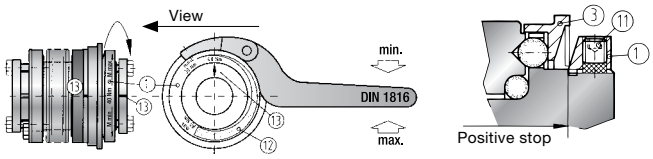
Applications:
- Particularly for vertical axes such as presses, load-lifting equipment

*(For suitable switches, see Page 409)

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



(1) Adjustment nut
(3) Steel actuation ring
(13) Marking
(11) Locking screw
(12) Adjustment range

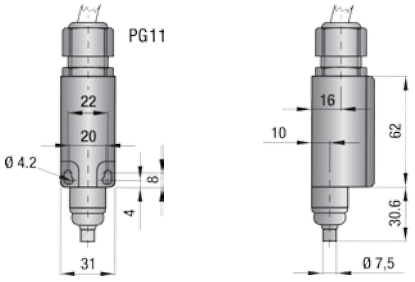
Smaller coupling sizes do not require a torque adjusting wrench. The adjusting nut for the 1.5 / 2 / 4.5 / 10 series can be adjusted with a bolt or pin.

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

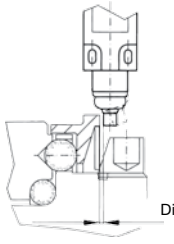
*Function systems: single position (W), multi-position (D), load holding (G), full disengagement (F)

Mechanical limit switch (emergency cut-off)

Dimension drawings

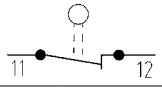


Important:
The switch function must always be checked 100 % after mounting.



The actuation tappet should be positioned as close as possible to the actuation ring of the torque limiter (approx. 0.1 – 0.2 mm).

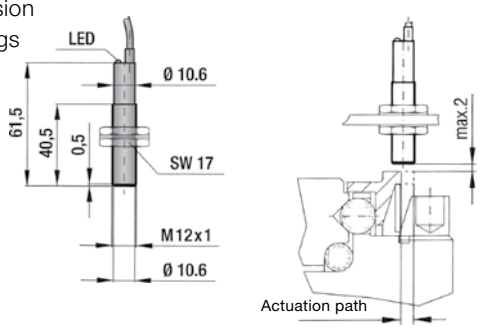
Distance approx. 0.1 – 0.2 mm

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:	

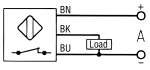
The mechanical limit switch is suitable for size 30 and above.

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	**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
		in.lb		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	**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
		in.lb		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	**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
		in.lb		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	**D**	-	-	-	-	35-70	50-100	-	-	250-400	-	-	-	-	-
		in.lb		-	-	-	-	310-620	443-885	-	-	222-3540	-	-	-	-	-
Adjustment range from min. to max. disengagement torque T_{Dis} (approx. values) Function system: Full disengagement (F)	T_{Dis}	Nm	**A**	0.3-0.8	0.2-1	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
		in.lb		3-8	2-9	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	**B**	0.6-1.3	0.7-2	-	4-10	-	16-30	20-40	40-80	130-200	160-300	100-300	450-850	1250-1500	1800-2700
		in.lb		6-12	7-18	-	36-89	-	142-266	177-354	354-708	1151-1770	1416-2655	885-2655	3983-7523	11063-13275	15930-23895
		Nm	**C**	-	-	-	8-15	-	-	30-60	80-150	-	300 - 450	250-500	-	-	-
		in.lb		-	-	-	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	N		50	100	200	500	1400	1800	2300	3000	3500	4500	5600	8000	12000	20000
	S	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	kgcm²		0.1	0.2	0.5	0.7	1.5	2.5	5.0	16	27	52	86	200	315	2100
		in.lb.s².10⁻³		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)

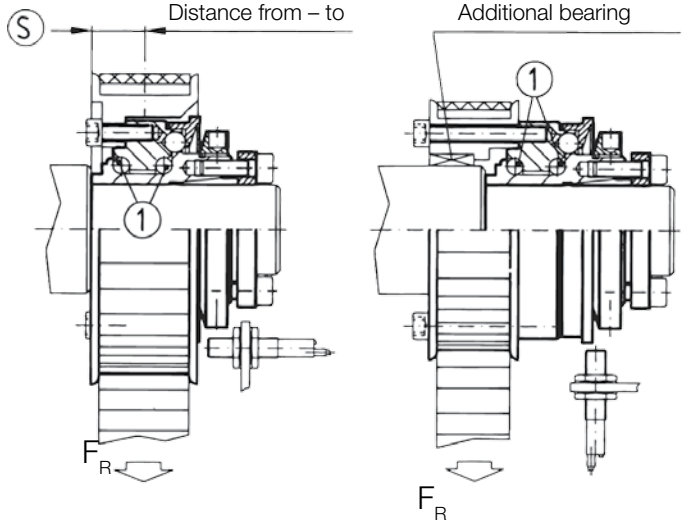
[b] If you have more stringent requirements, please contact WITTENSTEIN alpha

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



1: Integrated bearings
F_R: Permitted radial force (radial load capacity)
S: permitted distance range

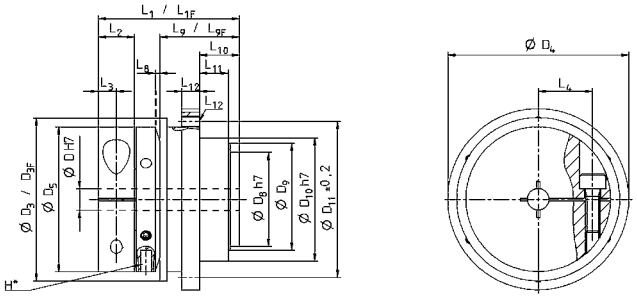
Dimensions

			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_S)	L_1	mm	23	28	32	39	40	50	54	58	63	70	84	95	109	146
Overall length F (without L_S)	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_8	mm	0.7	0.8	0.8	1.2	1.5	1.7	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			4xM2	4xM2.5	6xM2.5	6xM3	6xM4	6xM5	6xM5	6xM6	6xM6	6xM8	6xM8	6xM10	6xM12	6xM16
Thread length	L_{12}	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_S	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	6-16	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_8	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

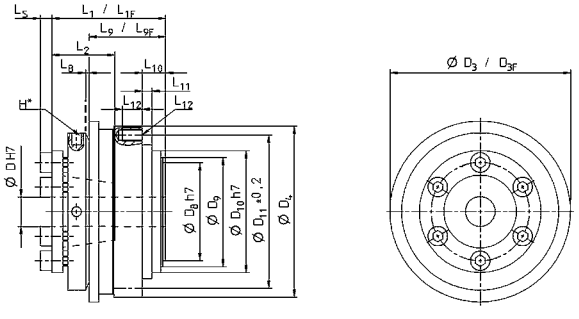
[b] Tolerance for shaft/hub connection 0.01-0.05 mm.

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 409

TL2 – Torque limiter

Technical data

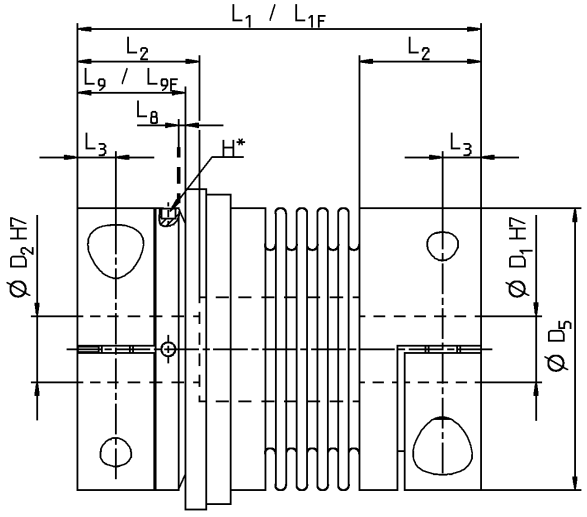
Series				1.5	2		4.5		10		15		30		60		80		150		200		300		500		800	1500
Length options (see order codes)				A	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	A
Adjustment range from min. to max. disengagement torque T_{Dis} (approx. values) Function systems: single position (W), multi-position (D) and load holding (G)	T_{Dis}	Nm	A	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
		in.lb		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	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
		in.lb		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	C	0.8-1.5	-		-		-		-		-		-		-		80-180		120-240		200-320		300-500		650-850	1000-1800
		in.lb		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 disengagement (F)	T_{Dis}	Nm	A	0.3-0.8	0.2-1		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
		in.lb		3-8	2-9		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	B	0.6-1.3	0.7-2		-		5-10		-		16-30		30-60		40-80		40-80		130-200		160-300		100-300		450-800	1250-1500
		in.lb		6-12	7-18				45-89				142-266		268-531		354-708		354-708		1151-1770		1416-2655		885-2655		3983-7080	11063-13275
		Nm	C	-	-		-		-		-		-		-		-		80-150		-		-		250-500		-	-
		in.lb																	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	2.5	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
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
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/arc-min		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)	

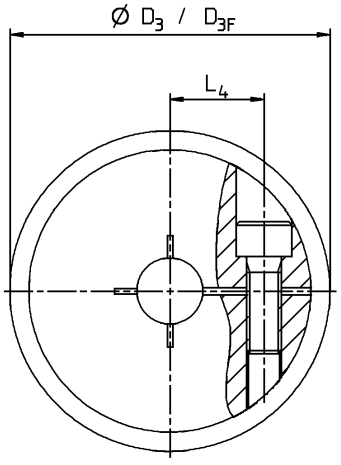
[b] If you have more stringent requirements, please contact WITTENSTEIN alpha

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 - 8	4-12		5-14		6-16		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 409

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 disengagement (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)		

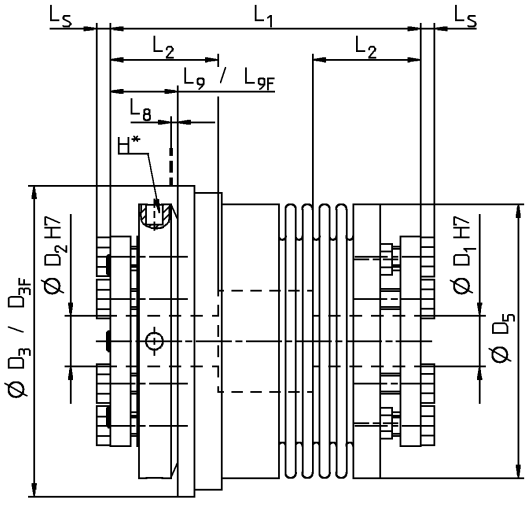
[b] If you have more stringent requirements, please contact WITTENSTEIN alpha

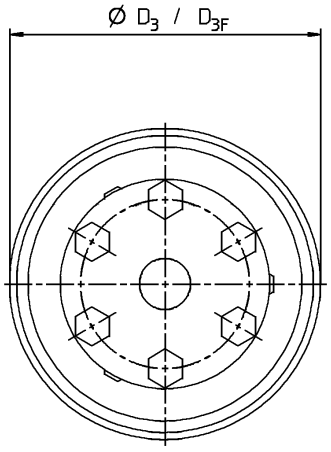
Dimensions

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_S)	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_9	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_{9F}	mm	13		14		17		18		17		20		22		20	26	31
Screw head length	L_S	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_{9F}, D_{3F} = Full disengagement version F





* Bore for torque adjusting wrench, see Page 409

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/T_{max}**				Geometry					
		Standard	Nickel plated	Stainless steel	d	D	A	H*	H2*	J [kgcm²]
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						
	T_{max} [Nm]	100	51	51						
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						
	T_{max} [Nm]	250	136	136						
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						
	T_{max} [Nm]	650	575	450						
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						
	T_{max} [Nm]	1320	1015	770						
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						
	T_{max} [Nm]	2450	1820	1500						

* Apply for the unclamped state.
** Maximum torque without axial forces
Shrink discs suitable for alpheno® and PKF gearheads upon request.

Gearhead type	Order code/Article code/T_{max}**				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						
	T_{max} [Nm]	250	136	136						
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						
	T_{max} [Nm]	550	375	230						
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						
	T_{max} [Nm]	640	560	450						
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						
	T_{max} [Nm]	1400	950	900						
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						
	T_{max} [Nm]	2300	1540	1000						

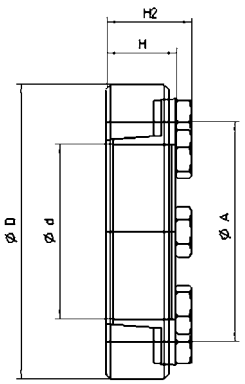
* Apply for the unclamped state.
** Maximum torque without axial forces
Shrink discs suitable for alpheno® and PKF gearheads upon request.

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 ≤ Rz 16
Minimum yield strength Rp 0.2 ≥ 385 N/mm²

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, especially 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

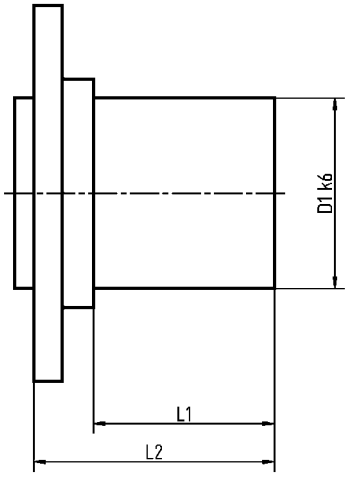
- Simple selection
- Greater design freedom
- A flexible solution for your drive

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:
Yield strength R_p: ≤ 245N/mm²
Tolerance k6
Surface roughness R_z: ≤ 25

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

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**

Calculate the duty cycle ED

$$ED = \frac{(t_b + t_c + t_d)}{(t_b + t_c + t_d + t_e)} \cdot 100\,[\%]$$

$$ED = t_b + t_c + t_d \quad [\text{min}]\ ^{a)}$$

ED ≤ 60 % **and** ED ≤ 20 min.

ED > 60 % **or** ED > 20 min

Cyclic operation:
Use standard gearhead:

Continuous operation: recommended
Use SP⁺ HIGH SPEED or LP⁺
(otherwise consult us)

$$Z_h\ ^{a)} = \frac{3600\ [\text{s/h}]}{(t_b + t_c + t_d + t_e)}$$

a) see diagram 1 “Shock factor”

Calculate the number of cycles Z_h [1/h]

f_s is dependent on Z_h (diagram 1)

Calculate the shock factor f_s (see diagram 1)

T_{2b} = depends on the application

$T_{2b,\,fs} = T_{2b} \cdot f_s$

Calculate the max. acceleration torque at the output including the shock factor $T_{2b,fs}$ [Nm] or [in.lb]

$T_{2b,\,fs} < T_{2B}$ — **no** → Select a larger gearhead

yes

n_{2max} depends on the application

Calculate the max. output speed n_{2max} [rpm] (see diagram 2)

i depends on
n – required output speed (for the application)
– reasonable input speed (gearhead/motor)

$$n_{1max} = n_{2max} \cdot i$$

$$n_{1max} \le n_{1Mot\ max}$$

T – consisting of corresponding output and input torque

$$T_{1b} = T_{2b} \cdot \frac{1}{i} \cdot \frac{1}{\eta} \qquad T_{1b} \le T_{Mot\ max}$$

λ – from resulting inertia ratio.
Guide value: 1 ≤ λ ≤ 10
(see **alpha**bet for calculation)

Calculate the ratio i

$n_{1max} < n_{1Max}$ — **no** → Smaller ratio i

yes

Calculate the EMERGENCY STOP torque T_{2not} [Nm] or [in.lb]

T_{2not} depends on the application

$T_{2not} < T_{2Not}$ — **no** → Select a larger gearhead

Please refer to the relevant technical data for information on the max. permissible characteristic values for your gearhead. To design a V-Drive gearhead, see Chapter “V-Drive – Detailed sizing”.

Calculate the average output torque T_{2m} [Nm] or [in.lb] (see diagram 2)

$$T_{2m} = \sqrt[3]{\frac{|n_{2b}| \cdot t_b \cdot |T_{2b}|^3 + \ldots + |n_{2n}| \cdot t_n \cdot |T_{2n}|^3}{|n_{2b}| \cdot t_b + \ldots + |n_{2n}| \cdot t_n}}$$

$T_{2m} < T_{2N}$ — **no** → Select a larger gearhead

yes

Calculate the average input speed n_{1m} [rpm] (see diagram 2)

$$n_{2m} = \frac{|n_{2b}| \cdot t_b + \ldots + |n_{2n}| \cdot t_n}{t_b + \ldots + t_n}$$ incl. pause time

$n_{1m} < n_{1N}$ — **no** → Smaller ratio i

$$n_{1m} = n_{2m} \cdot i$$

yes

Select a motor

Compare clamping hub with motor shaft diameter — **no** → Select other motors or gearheads (contact us)

$D_{W,\,Mot} \leq D_{clamping\ hub}$

The motor shaft must be inserted far enough into the clamping hub.

yes

Compare motor shaft length with min./max. dimensions in the gearhead dimension sheet — **no** → Select other motors or gearheads (contact us)

1. The motor shaft must protrude far enough into the clamping hub without making contact.

yes

$T_{2max\ (Motor)} \leq T_{2B}$ — **no** → Limit motor current

$$T_{2max\ (Motor)} = T_{1max\ (Motor)} \cdot i \cdot \eta_{gearhead}$$

yes

Calculate the bearing load and bearing lifespan (see Chapter “Bearing lifespan“)

2. The gearhead should not be damaged when the motor operates at full load, limit the motor current if necessary.

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.

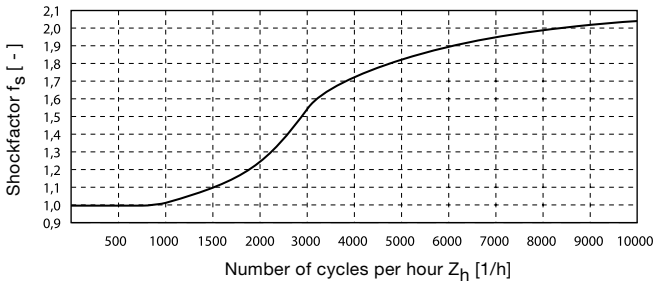
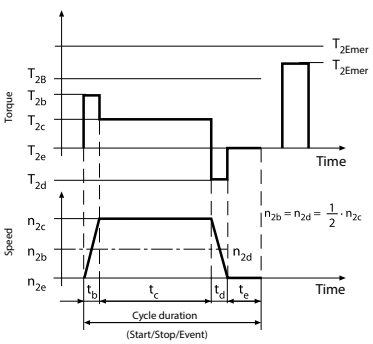
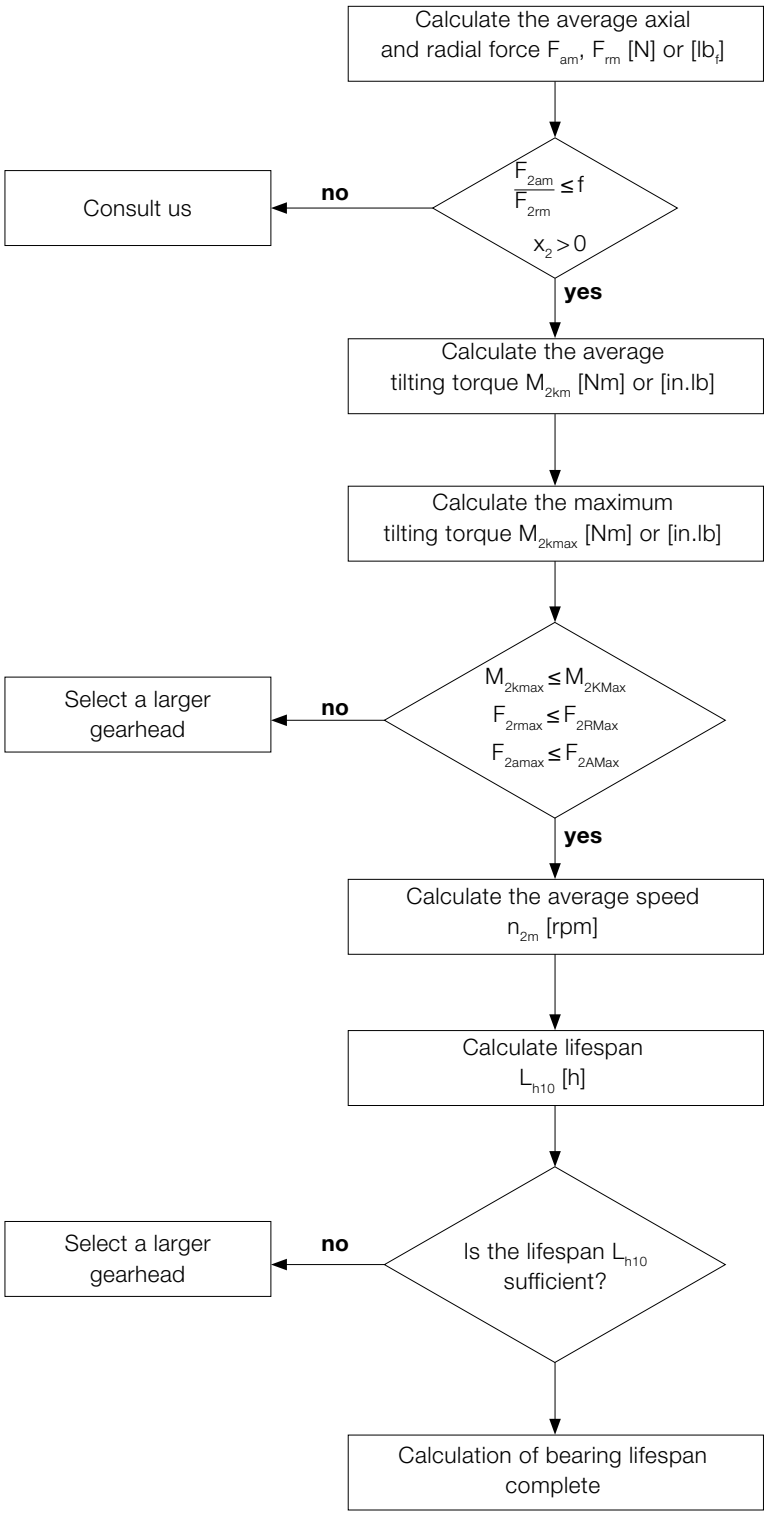


Diagram 2
Standard collective load at output
If the load on the gearhead in continuous operation S1 is less than or equal to the rated torque T_{2N}, the gearing is. At input speeds less than/equal to the rated speed n_{1N}, the temperature of the gearhead will not exceed 90 °C under average ambient conditions.



Bearing lifespan L_{h10} **(output bearing)**



$$F_{2am} = \sqrt[3]{\frac{|n_{2b}| \cdot t_b \cdot |F_{2ab}|^3 + \ldots + |n_{2n}| \cdot t_n| \cdot F_{2an}|^3}{|n_{2b}| \cdot t_b + \ldots + |n_{2n}| \cdot t_n}}$$

$$F_{2rm} = \sqrt[3]{\frac{|n_{2b}| \cdot t_b \cdot |F_{2rb}|^3 + \ldots + |n_{2n}| \cdot t_n| \cdot F_{2rn}|^3}{|n_{2b}| \cdot t_b + \ldots + |n_{2n}| \cdot t_n}}$$

$$M_{2km} = \frac{F_{2am} \cdot y_2 + F_{2rm} \cdot (x_2 + z_2)^{\,a)}}{W}$$

$$M_{2kmax} = \frac{F_{2amax} \cdot y_2 + F_{2rmax} \cdot (x_2 + z_2)^{\,a)}}{W}$$

[a] x_2, y_2, z_2 in mm or in

$$n_{2m} = \frac{n_{2b} \cdot t_b + \ldots + n_{2n} \cdot t_n}{t_b + \ldots + t_n}$$

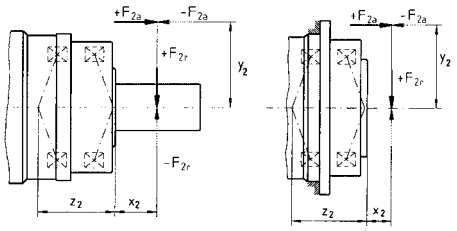
$$L_{h10} = \frac{16666}{n_{2m}} \cdot \left[\frac{K1_2}{M_{2km}} \right]^{p_2}$$

	metric	inch
W	1000	1

	TP+/TPK+	SP+/SPK+	LP+/LPB+ LPK+	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

Example with output shaft and flange:



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
$K1_2$	[Nm]	15.7	70.0	157.0	255.0
	[in.lb]	139	620	1389	2257
p_2		3	3	3	3

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

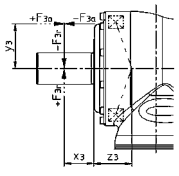
TP+/TPK+		004	010	025	050	110	300	500	2000	4000
z_2	[mm]	57.6	82.7	94.5	81.2	106.8	140.6	157	216	283
	[in]	2.27	3.26	3.72	3.20	4.21	5.48	6.12	8.50	11.1
$K1_2$	[Nm]	536	1325	1896	4048	9839	18895	27251	96400	184000
	[in.lb]	4744	11726	16780	35825	87075	167220	241171	853140	1628400
p_2		3.33	3.33	3.33	3.33	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			

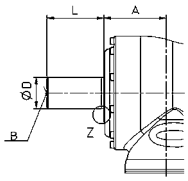
[a] Connection via shrink discs (see from page 416)
[b] Refers to center of shaft
[c] Index as small letter = existing value (application-dependent);
index as capital letter = permissible value
(see catalog values from page 158)

Rearward drive:

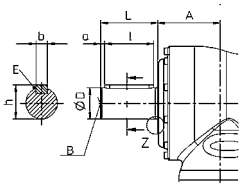


$$M_{3k} = F_{3a} \cdot y_3 + F_{3r} \cdot (x_3 + z_3)$$

Solid shaft

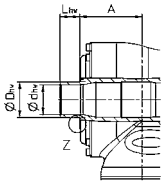


with key



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

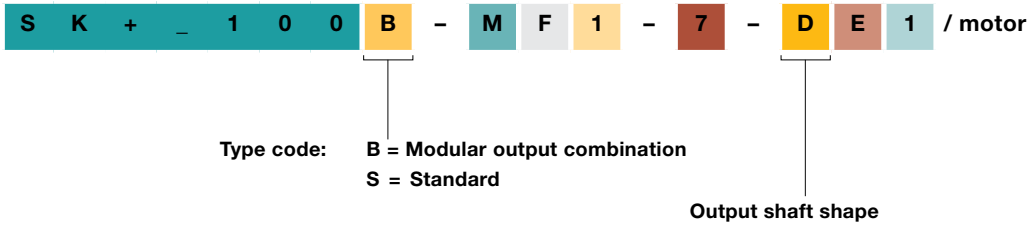
No connection possible

Closed cover

No connection possible

Modular system matrix **"Output type"**

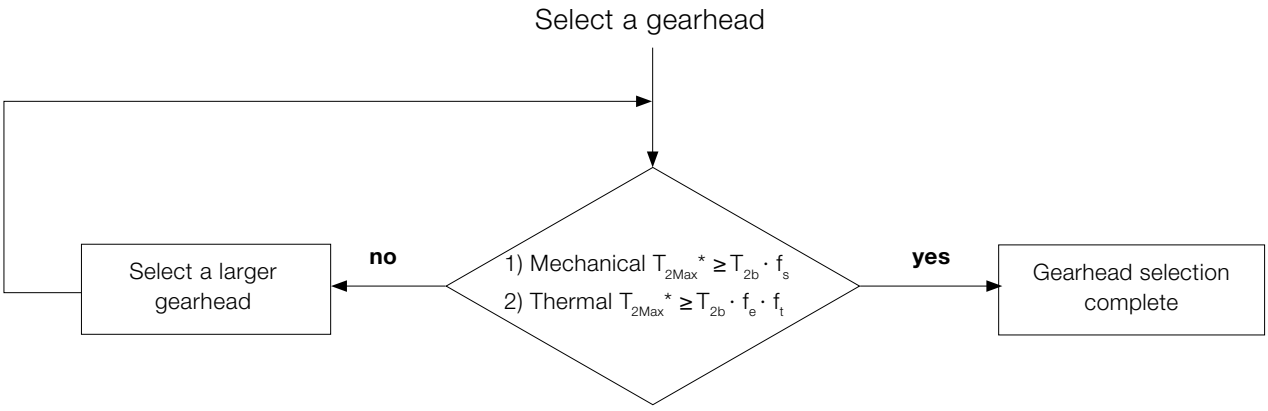
HG+/SK+/SPK+/TK+/TPK+



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".

	Backward / Output type / 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+	 Flange	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

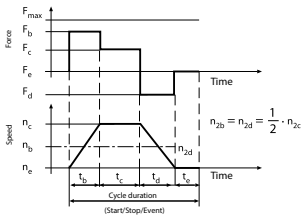
	VD 040						VD 050					
Ratio	**4**	**7**	**10**	**16**	**28**	**40**	**4**	**7**	**10**	**16**	**28**	**40**
n_{1N}= 500 rpm	0,53	0,53	0,53	0,53	0,53	0,53	0,53	0,53	0,53	0,53	0,53	0,53
n_{1N}= 1,000 rpm	0,53	0,53	0,53	0,53	0,53	0,53	0,53	0,53	0,53	0,53	0,53	0,53
n_{1N}= 2,000 rpm	0,53	0,53	0,53	0,53	0,53	0,53	0,53	0,53	0,53	0,56	0,61	0,53
n_{1N}= 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_{1N}= 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
	VD 063						**VD 080**					
Ratio	**4**	**7**	**10**	**16**	**28**	**40**	**4**	**7**	**10**	**16**	**28**	**40**
n_{1N}= 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_{1N}= 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_{1N}= 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_{1N}= 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_{1N}= 4,000 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
	VD 100											
Ratio	**4**	**7**	**10**	**16**	**28**	**40**						
n_{1N}= 500 rpm	0,62	0,7	0,72	0,73	0,79	0,69						
n_{1N}= 1,000 rpm	0,79	0,93	0,98	0,99	1,09	0,94						
n_{1N}= 2,000 rpm	1,18	1,3	1,4	1,44	1,62	1,53						
n_{1N}= 3,000 rpm	1,83	1,96	2,16	2,24	2,56	2,46						
n_{1N}= 3,500 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 with maximum precision requirements throughout lifespan, T_{2Servo} should be used

Bearing lifespan L_{h10} (output bearing)



Output (VDT⁺-, VDH⁺-, VDHe-, VDS⁺- & VDSe- version)

Calculate the average axial and radial force F_{2am}, F_{2rm} [N]

$\frac{F_{2am}}{F_{2rm}} \le 0.4$; $x_2 > 0$

yes — Index "2" ≙ output

no

Please contact us!

$$F_{2am} = \sqrt[3]{\frac{n_{2b} \cdot t_b \cdot F_{2ab}{}^3 + \ldots + n_{2n} \cdot t_n \cdot F_{2an}{}^3}{n_{2b} \cdot t_b + \ldots + n_{2n} \cdot t_n}}$$

$$F_{2rm} = \sqrt[3]{\frac{n_{2b} \cdot t_b \cdot F_{2rb}{}^3 + \ldots + n_{2n} \cdot t_n \cdot F_{2rn}{}^3}{n_{2b} \cdot t_b + \ldots + n_{2n} \cdot t_n}}$$

$$M_{2km} = \frac{F_{2am} \cdot y_2 + F_{2rm} \cdot (x_2 + z_2)}{W}$$

Calculate the average tilting torque $M_{2k\,m}$ [Nm]

	metric
W	1,000

Z_2 [mm]	VDT⁺	VDH⁺/VDHe/ VDSe	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

$$M_{2\,k\,max} = \frac{F_{2\,a\,max} \cdot y_2 + F_{2\,r\,max} \cdot (x_2 + z_2)}{W}$$

Calculate the maximum tilting torque $M_{2k\,max}$ [Nm]

Type	VD 040	VD 050	VD 063	VD 080	VD 100
$M_{2K\,Max}$ [Nm]	205	409	843	1,544	3,059
$F_{2R\,Max}$ [N]	2,400	3,800	6,000	9,000	14,000
$F_{2A\,Max}$ [N]	3,000	5,000	8,250	13,900	19,500

$M_{2\,k\,max} \le M_{2\,K\,Max}$
$F_{2\,r\,max} \le F_{2\,R\,Max}$
$F_{2\,a\,max} \le F_{2\,A\,Max}$

no

Select a larger gearhead

$$T_{2m} = \sqrt[3]{\frac{|n_{2b}| \cdot t_b \cdot |T_{2b}|^3 + \ldots + |n_{2n}| \cdot t_n \cdot |T_{2n}|^3}{|n_{2b}| \cdot t_b + \ldots + |n_{2n}| \cdot t_n}}$$

yes

$K1_2$ [Nm]	VDT⁺	VDH⁺/VDHe/ VDSe	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

$$n_{2\,m} = \frac{n_{2\,b} \cdot t_b + \ldots + n_{2\,n} \cdot t_n}{t_b + \ldots + t_n}$$

Calculate the average speed $n_{2\,m}$ [rpm]

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

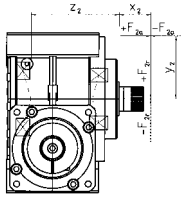
$$L_{h10} = \frac{16666}{n_{2m}} \cdot \left[\frac{K1_2}{p_t \cdot T_{2m} + M_{2km}} \right]^{3.33}$$

Calculate lifespan L_{h10} [h]

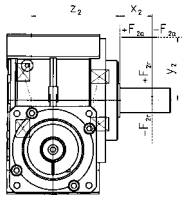
no — Is the lifespan L_{h10} sufficient? — **yes**

Gearhead selection complete

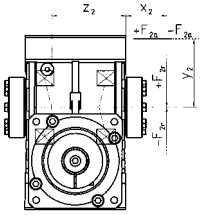
VDS⁺ involute



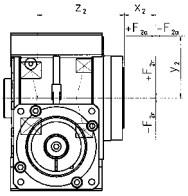
VDS⁺ / VDSe smooth, keywayed



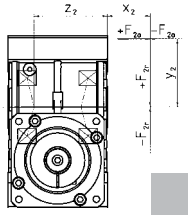
VDH⁺ /VDHe smooth



VDT⁺



VDH⁺ /VDHe keywayed



Metal bellows and torque limiters – Detailed sizing (EC2, BC2, BC3, BCH, BCT, TL1, TL2, TL3)

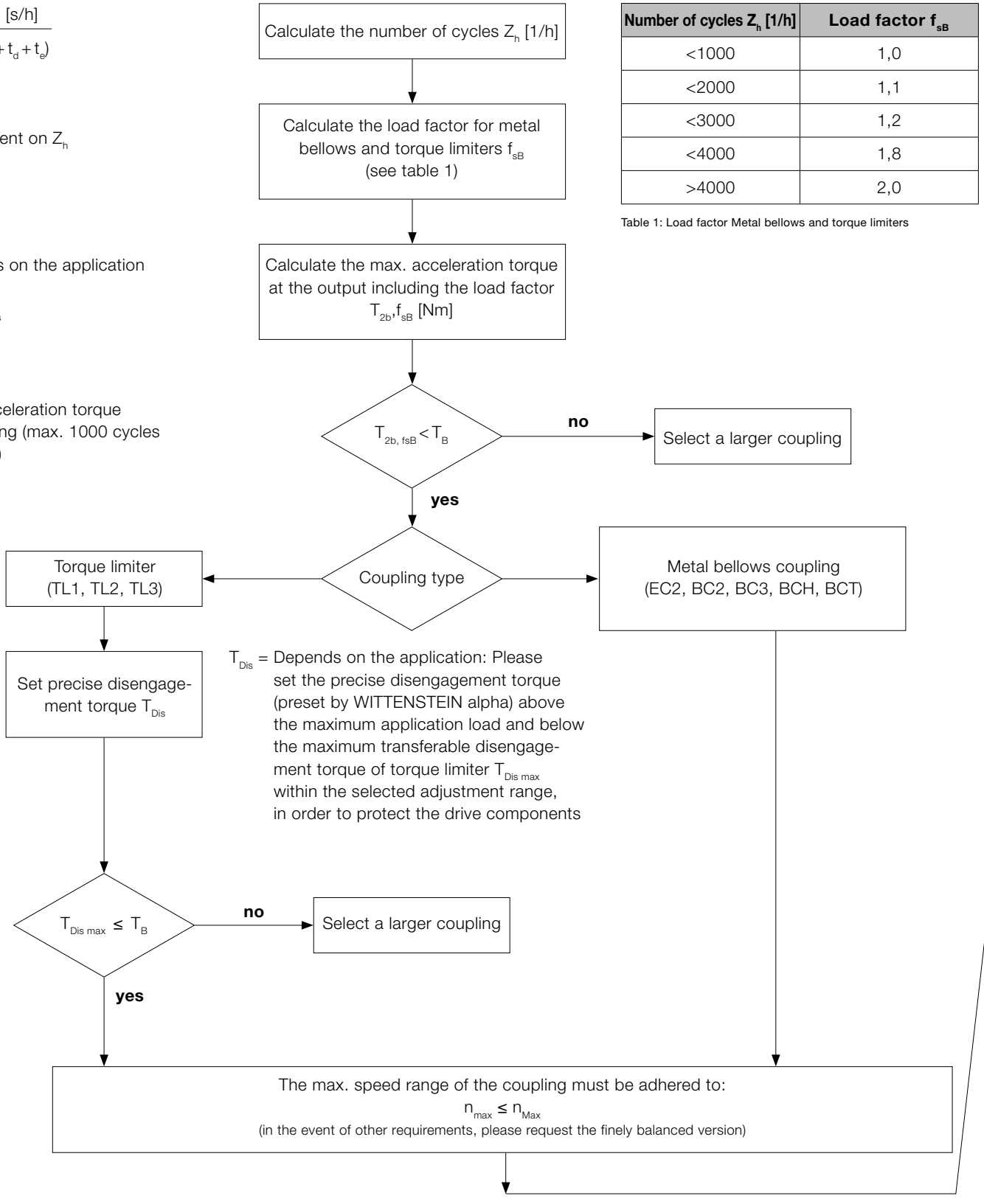
$$Z_h = \frac{3600\ [s/h]}{(t_b + t_c + t_d + t_e)}$$

f_{sB} is dependent on Z_h (table 1)

T_{2b} = depends on the application

$T_{2b,\ f_{sB}} = T_{2b} \cdot f_s$

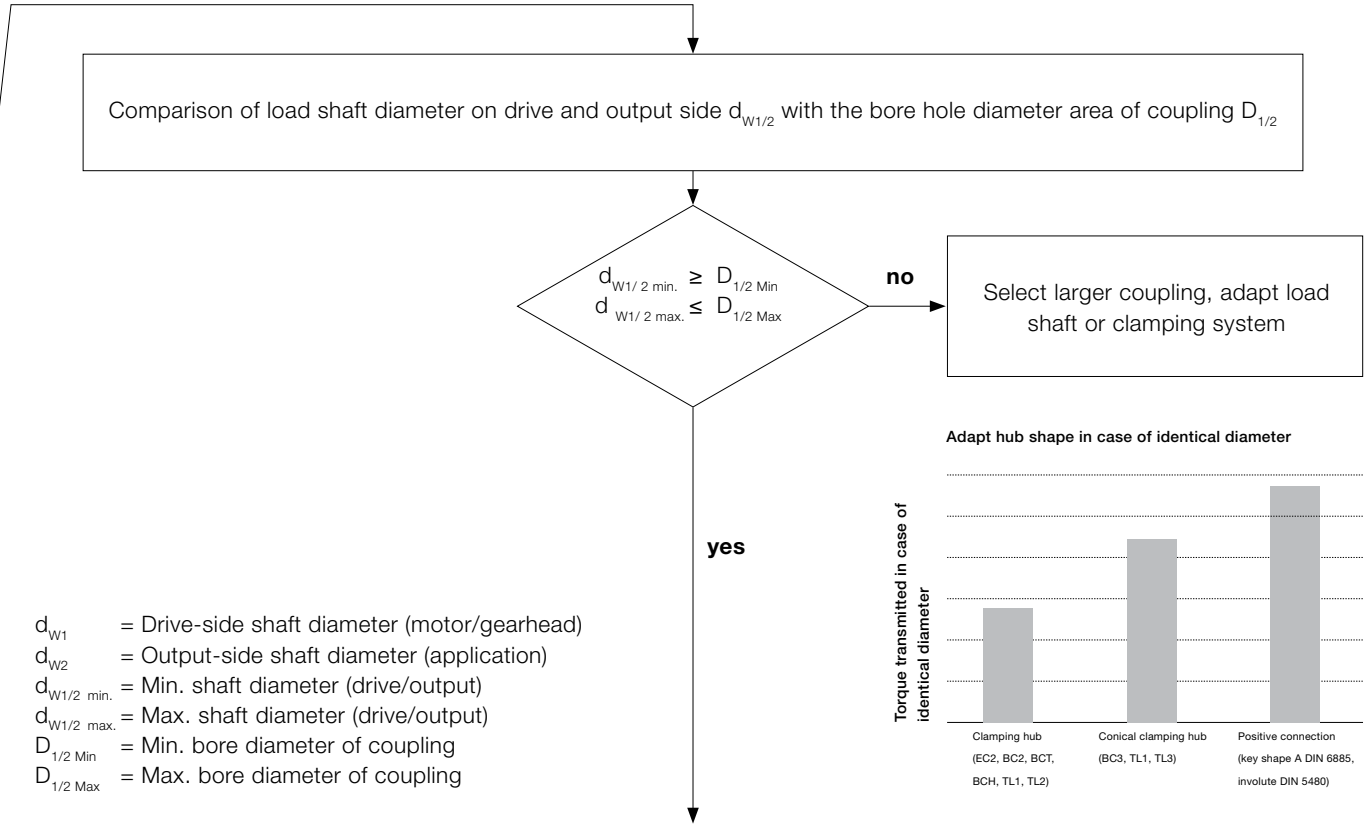
T_B = Max. acceleration torque of coupling (max. 1000 cycles per hour)



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 disengagement torque of torque limiter $T_{Dis\ max}$ within the selected adjustment range, in order to protect the drive components

Number of cycles Z_h [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



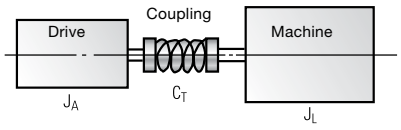
d_{W1} = Drive-side shaft diameter (motor/gearhead)
d_{W2} = Output-side shaft diameter (application)
$d_{W1/2\ min.}$ = Min. shaft diameter (drive/output)
$d_{W1/2\ max.}$ = Max. shaft diameter (drive/output)
$D_{1/2\ Min}$ = Min. bore diameter of coupling
$D_{1/2\ Max}$ = Max. bore diameter of coupling

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



$$f_e = \frac{1}{2 \cdot \pi} \sqrt{C_T \cdot \frac{J_A + J_L}{J_A \cdot J_L}} \quad [Hz]$$

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)

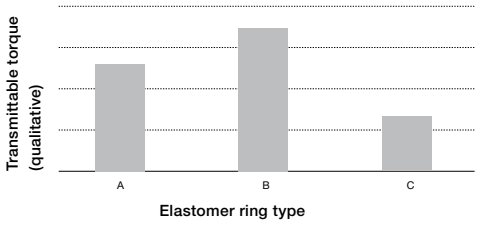
T_{2n} = Depends on the application

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

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



Calculate the rated torque of the application T_{2n} [Nm]

Calculate the temperature factor f_{tE} (see table 1)

$T_{2n} \times f_{tE} \leq T_{NE}^{*}$ — **no** → Select larger coupling or different elastomer ring

yes

$$Z_h = \frac{3600\ [s/h]}{(t_b + t_c + t_d + t_e)}$$

Calculate the number of cycles Z_h [1/h]

Number of cycles Zh [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

f_{sE} The load factor of elastomer couplings is dependent on Z_h (table 2)

Calculate the load factor of elastomer couplings f_{sE} (see table 2)

T_{2b} = depends on the application

$T_{2b,fsE,ftE} = T_{2b} \cdot f_{sE} \cdot f_{tE}$

Calculate the max. acceleration torque at the output including the temperature factor and load factor for elastomer couplings $T_{2b,fsE,ftE}$ [Nm]

T_{BE} = max. acceleration torque of elastomer (max. 1000 cycles per hour)

* = 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)

Coupling model

EL6

$T_{2b,fsE,ftE} \leq T_{BE}$ — **no** → Select larger coupling, different elastomer ring or bore diameter

ELC

$T_{2b,fsE,ftE} \leq T_{BE^{*}}$ — **no** → Select larger coupling, different elastomer ring or bore diameter

The max. speed range of the coupling must be adhered to:

$n_{max} \leq n_{Max}$

(in the event of other requirements, please request the finely balanced version)

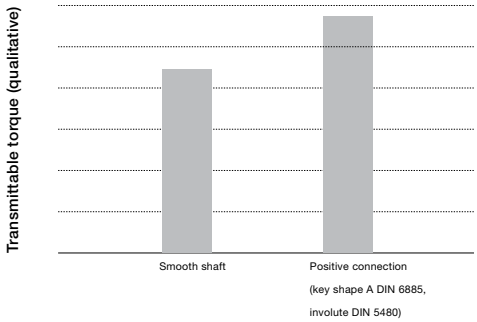
Comparison of load shaft diameter on drive and output side $d_{W\,1/\,2}$ with the bore hole diameter area of coupling $D_{1/2}$

$d_{W1/\,2\,min.} \geq D_{1/2\,Min}$
$d_{W1/\,2\,max.} \leq D_{1/2\,Max}$

no → Select larger coupling, adapt load shaft or clamping system

yes

Adapt clamping system in the event of identical diameter



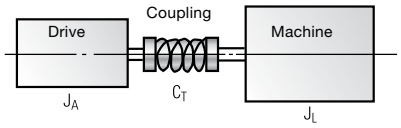
d_{W1} = Drive-side shaft diameter (motor/gearhead)
d_{W2} = Output-side shaft diameter (application)
$d_{W1/2\ min.}$ = Min. shaft diameter (drive/output)
$d_{W1/2\ max.}$ = Max. shaft diameter (drive/output)
$D_{1/2\ Min}$ = Min. bore diameter of coupling
$D_{1/2\ Max}$ = Max. bore diameter of coupling

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



$$f_e = \frac{1}{2 \cdot \pi} \sqrt{C_T \cdot \frac{J_A + J_L}{J_A \cdot J_L}} \quad [Hz]$$

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:
$n_{max} \leq n_{Max}$ (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):

$$\phi = \frac{180}{\pi} \cdot \frac{T_{2b}}{C_T} \quad [degrees]$$

ϕ = angle of turn [degrees]
C_T = torsional rigidity of coupling [Nm/rad]
T_{2b} = max. available acceleration torque [Nm]

The **alpha**bet

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 ≤ 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.

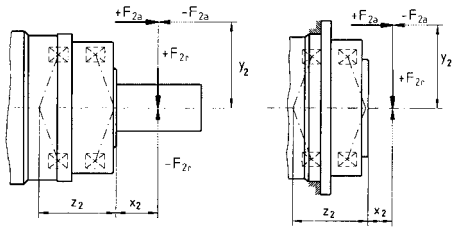
Angular minute

A degree is subdivided into 60 angular minutes (= 60 arcmin = 60'). In other words, if the torsional backlash is specified as 1 arcmin, for example, the output can be turned 1/60°. The repercussions for the actual application are determined by the arc length: $b = 2 \cdot \pi \cdot r \cdot \alpha° / 360°$. A pinion with a radius r = 50 mm on a gearhead with standard torsional backlash $j_t = 3'$ can be turned b = 0.04 mm.

Axial force (F_{2AMax})

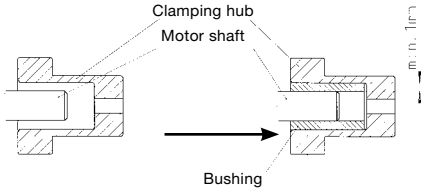
In the case of SP+/LP+/SPK+, the axial force F_{2AMax} acting on a gearhead runs parallel to its output shaft. On a TP+, the force runs perpendicular to its output shaft. It may be applied with axial offset via a lever arm y_2 under certain circumstances, in which case it also generates a bending moment. 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.

Example: **IP65**

Protection against impurities (Dust resistance)	Protection against 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.

$$ED\,[\%] = \left[\frac{t_b + t_c + t_d}{t_b + t_c + t_d + t_e}\right] \cdot 100 \quad \frac{\text{Motion duration}}{\text{Cycle duration}}$$

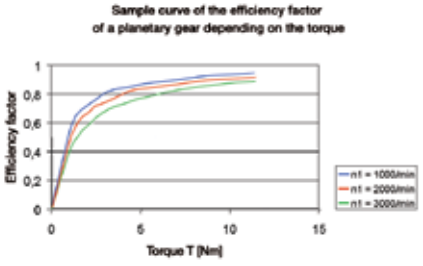
$$ED\,[\text{min}] = t_b + t_c + t_d$$

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 %.

$\eta = P_{out} / P_{in} = (P_{in} - P_{lost}) / P_{in}$

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.

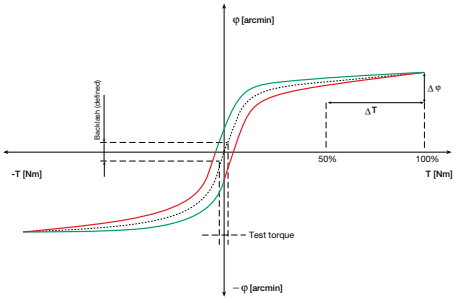
HIGH TORQUE (MA)

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 CP 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**)

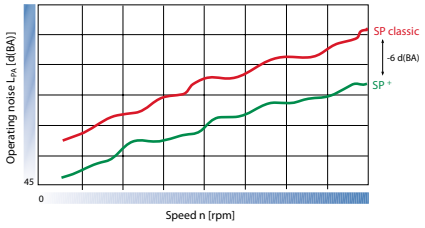
When selecting a gearhead, it is important to consider whether the motion profile is characterized by frequent acceleration and deceleration phases in cyclic operation (S5) as well as pauses, or whether it is designed for continuous operation (S1), i.e. with long phases of constant motion.

Operating noise (L_{PA})

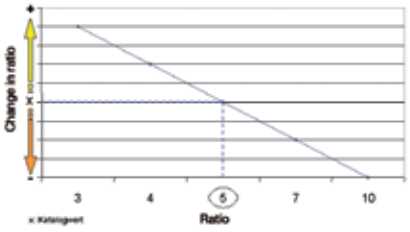
Low noise level L_{PA} is a factor of growing importance for environmental and health reasons. WITTENSTEIN alpha has succeeded in reducing the noise of the new SP+ gearheads by another 6 dB(A) over the former SP units (i.e. sound reduced to one quarter). Noise levels are now currently 64 - 70 dB(A) depending 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 (λ = 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 $1/i^2$.

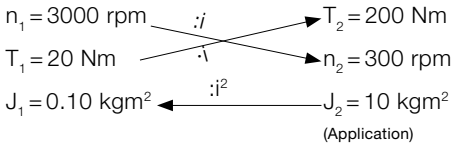
$$\lambda = \frac{J_{external}}{J_{internal}}$$

$J_{external}$ reduced to the gear input:
$J'_{external} = J_{external} / i^2$

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).

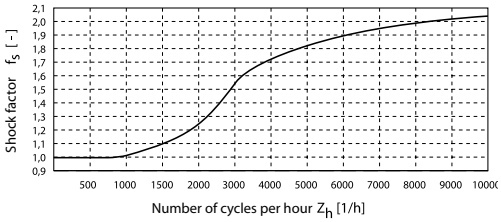


Safety notice

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)

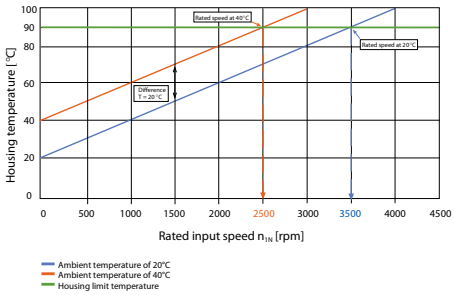
The maximum permissible acceleration torque during cyclic operation specified in the catalog applies for a cycle rate less than 1000/h. Higher cycle rates combined with short acceleration times can cause vibrations in the drive train. Use the shock factor f_s to include the resulting excess torque values 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

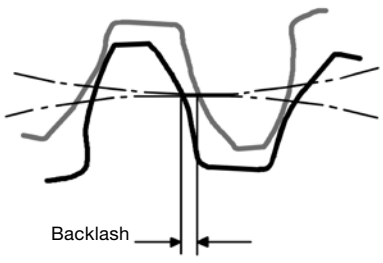
The AT profile of the Wittenstein standard belt pulley is a flank-centered profile for backlash-free torque transmission.
Effective diameter
d0 = Number of teeth z x Pitch p / Pi
Recommended preload per strand for linear drives Fv ≥ Fu
Radial force at the output shaft for the determination of the bearing life:
Fr = 2 x Fv

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.



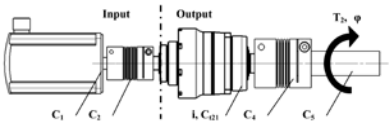
The output is then loaded with a defined test torque in order to overcome the internal gearhead friction. The main factor affecting torsional backlash is the face clearance between the gear teeth. The low torsional backlash of WITTENSTEIN alpha gearheads is due to their high manufacturing accuracy and the specific combination of gear wheels.

→ Refer to this term for further details.

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:

$C_{(n),output} = C_{(n),input} * i^2$

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

$1/C_{ges} = 1/C_{1,output} + 1/C_{2,output} + \ldots + 1/C_{(n)}$

Torsion angle Φ [arcmin]

$\Phi = T_2 * 1/C_{ges}$
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 = An [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]	$F_{frict} = m \cdot g \cdot \mu$	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)	$v_{sp} = \omega \cdot h / (2 \cdot \pi)$	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	Type code	Gearhead variations	Gearhead model	Number of stages
TP+ 004 – TP+ 4000 SP+ 060 – SP+ 240	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]	M = Motor attachment gearhead S = Separate version	F = Standard A = HIGH TORQUE (only TP+) C = HIGH SPEED (only SP+)	1 = 1-stage 2 = 2-stage 3 = 3-stage

[a] Order shrink discs separately, see section accessories, shrink discs on page 416
[b] Reduced specification available on request

Gearhead type	Type code	Gearhead variations	Gearhead model	Number of stages
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	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]	M = Motor attachment gearhead	F = Standard A = HIGH TORQUE (only TPK+)	1 = 1-stage 2 = 2-stage 3 = 3-stage 4 = 4-stage

[a] Order shrink discs separately, see section accessories, shrink discs on page 416
[b] Reduced specification available on request
[c] See modular system matrix, page 430
[d] SK+/TK+/HG+ only

Gearhead type	Type code	Gearhead variations	Gearhead model	Number of stages
LP+ 050 – LP+ 155 LPB+ 070 – LPB+ 120	S = Standard F = Food lubrication	M = Motor attachment gearhead	F = Standard	1 = 1-stage 2 = 2-stage

Gearhead type	Gearhead variations	Gearhead model	Number of stages	Ratios
LK 050 – LK 155 LPK 050 – LPK 155 LPBK 070 – LPBK 120 CP 040 – CP 115	M = Motor attachment gearhead	O = Standard L = Food-grade grease	1 = 1-stage 2 = 2-stage 3 = 3-stage (LPK+)	See technical data sheets.

Gearhead type	Gearhead version	Distance between axes	Gearhead variations	Gearhead model	Number of stages
VDT = TP flange VDH = hollow shaft VDS = shaft	e = value (only for VDH and VDS, size 040, 050 and 063)	040, 050, 063, 080, 100	M = Motor attachment gearhead	F = Standard L = Food-grade lubrication W = Corrosion resistant	1 = 1-stage

** See section accessories, shrink discs on page 416

Ratios
See technical data sheets.

Output shape
0 = Csmooth 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 value 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⁺, VDSe)
9 = Dual-shaft output with key (VDS⁺, VDSe)

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)

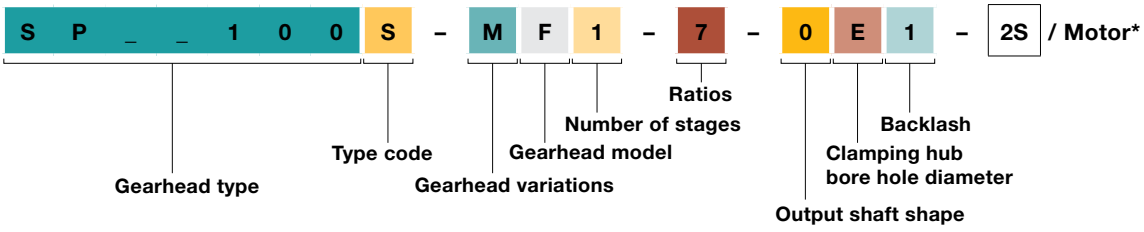
Backlash
1 = Standard
0 = Reduced

VDH – number of shrink discs**
0 = no shrink disc
1 = one shrink disc
2 = two shrink discs

X = Special model

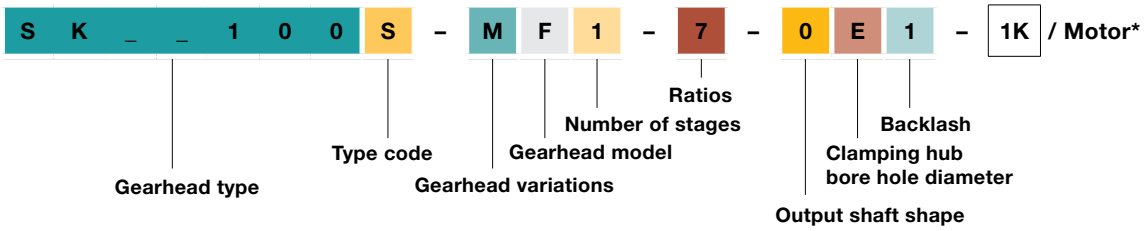
Order codes

TP+/SP+



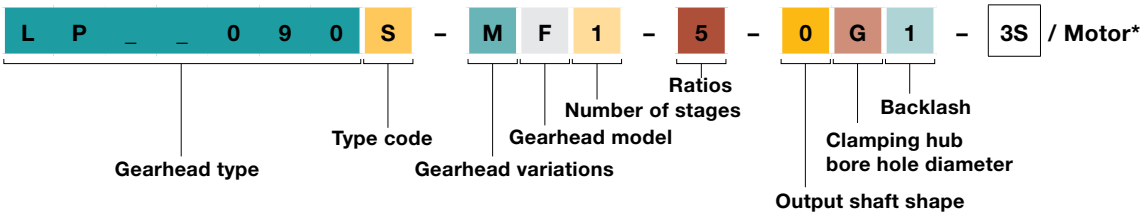
* Full motor designation only required for determining gearhead attached components!

TK+/TPK+/SK+/SPK+/HG+/SC+/SPC+/TPC+

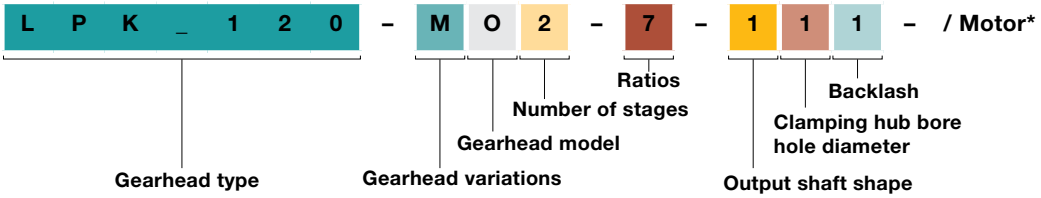


* Full motor designation only required for determining gearhead attached components!

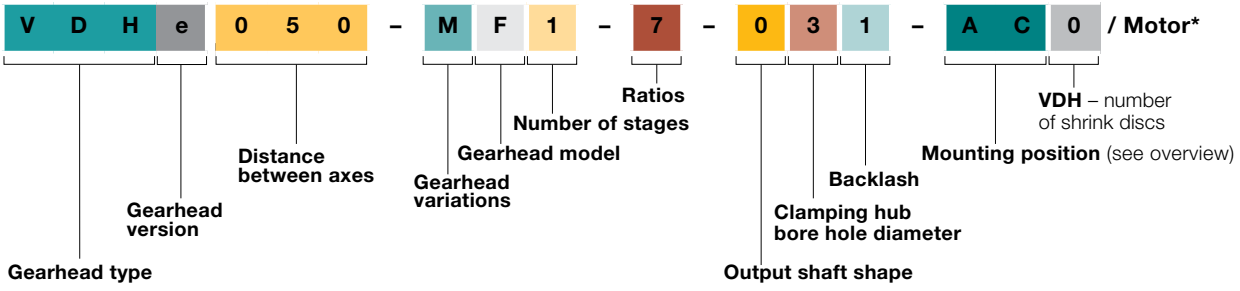
LP+/LPB+ Generation 3



LK+/LPK+/LPBK+/CP



V-Drive

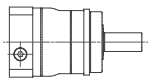


Mounting positions and clamping hub diameters

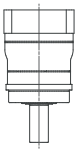
Coaxial gearheads

TP⁺ 2000/4000: Please contact WITTENSTEIN alpha

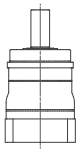
B5 – horizontal



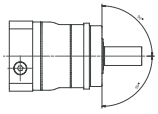
V1 – vertical
Output shaft downwards



V3 – vertical
Output shaft upwards



S – can be tilted
±90° from a horizontal position



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)

Code letter	mm	Code letter	mm
B	11	I	32
C	14	K	38
D	16	L	42
E	19	M	48
G	24	N	55
H	28	O	60

Intermediate diameters possible in combination with a bushing with a minimum thickness of 1 mm.

Right-angle gearheads

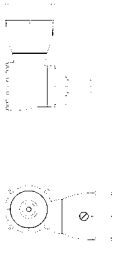
For information purposes only – not required when placing orders!

Permitted standard mounting positions for right-angle gearheads (see illustrations)

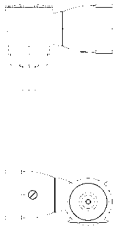
If the mounting position is different, contact WITTENSTEIN alpha

B5/V3
Output shaft, horizontal
Motor shaft upwards

B5/V1
Output shaft, horizontal
Motor shaft downwards



V1/B5
Output shaft, vertical
Motor shaft, horizontal



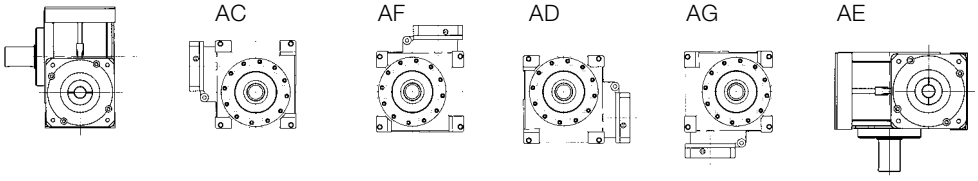
V3/B5
Output shaft, vertical, upwards
Motor shaft, horizontal

B5/B5
Output shaft, horizontal
Motor shaft, horizontal

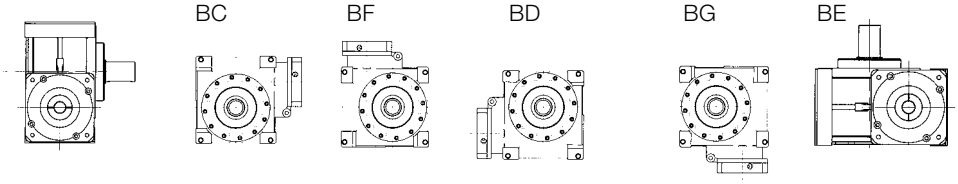
Worm gearheads

Mounting position (only relevant for oil volume)

Output side A:
View of motor interface
Only valid for VDS⁺, VDSe and VDT⁺



Output side B:
View of motor interface
Only valid for VDS⁺, VDSe und VDT⁺



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)

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)

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)

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 disengagement
Metal bellows coupling function (BC, EC)
A = Standard
B = incl. self-opening clamp system (EC2)
Elastomer coupling function (EL)
A = Standard

Internal diameter D_1 (drive side)
TL1: $D_1 = D_2$
BCT: D_1 = Output side

Bore version D_1
0 = Smooth
1 = Key shape A DIN 6885
2 = Involute DIN 5480 (on request)
3 = Key shape A ANSI B17.1

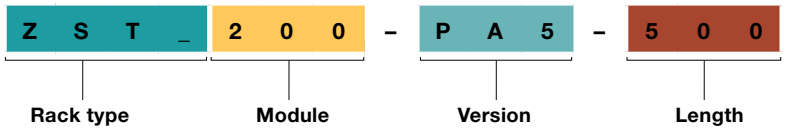
Internal diameter D_2 (output side)
TL1: $D_1 = D_2$
BCT: D_2 = TP+ flange hole circle

Bore version D_2
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

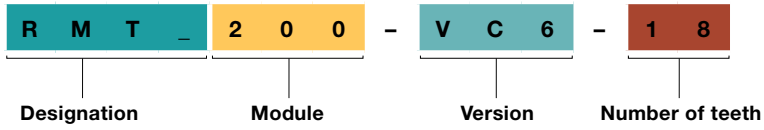
Torque limiter (TL) adjustment range
A = First series
B = Second series
C = Third series
D = Fourth series (for TL1 only)

Disengagement torque Torque limiter T_{Dis} [Nm]
(see technical data sheets for torque limiter)

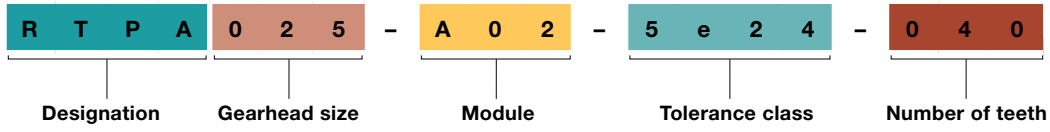
Order codes



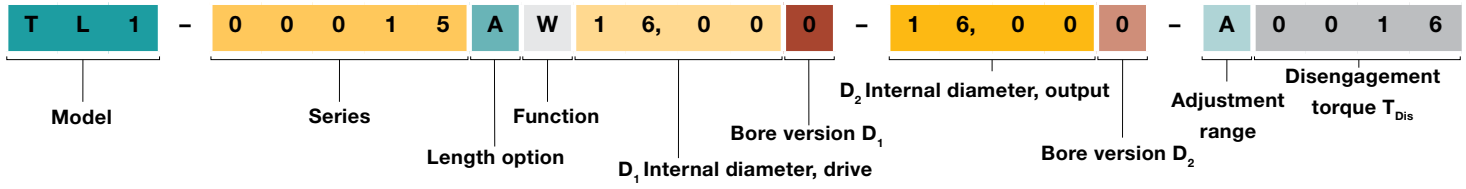
Premium Class+ and Value Class pinion



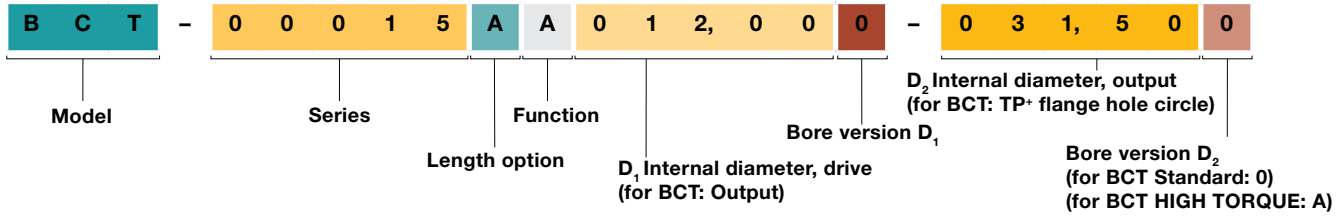
Premium Class RTP and Standard Class RSP pinions



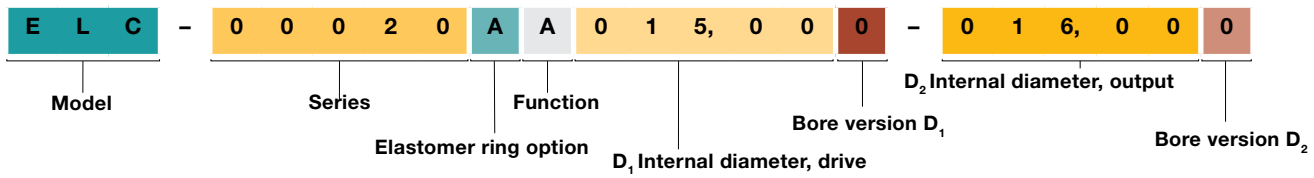
Torque limiter



Bellows coupling



Elastomer coupling



YOUR NOTE

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