

## alpha Advanced Line Product catalog

Powerful  
Compact  
Precise



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All technical specifications were correct at the time of going to print. We are continually developing our products and therefore reserve the right to make modifications. This documentation is subject to occasional errors. Please appreciate that legal claims cannot be asserted as a result of incorrect specifications, illustrations or descriptions. The text, photos, technical drawings and any other illustrations printed in this publication are protected property of WITTENSTEIN alpha GmbH.

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Dear Business Associates,

Even though we are extremely passionate about technology and innovation, the success of our customers is our top priority. We have designed our products and services to help you achieve a competitive advantage – through consistently high quality, permanent availability and the best service worldwide.

The product portfolio is divided into four product segments, which have already been successfully established on the market. The alpha Premium Line offers unique, individual solutions. Our alpha Advanced Line provides maximum power density, compact precision and outstanding positioning accuracy. Gearboxes of the alpha Basic and alpha Value Line are especially suitable for applications requiring cost-oriented, particularly flexible yet efficient solutions.

You are sure to find the right solution quickly and easily from our product range. We offer holistic mechanical and mechatronic drive solutions for all types of axis. We also provide complete solutions from a single source on request. Our range of products and solutions will continue to grow in the future because we never stop developing new ideas to make your work easier.

Take our word for it!

Norbert Pastoors  
Managing Director WITTENSTEIN alpha GmbH





# YOUR WORLD IS OUR DRIVE.

## FOR MORE THAN 40 YEARS.



SP



LP



Linear systems



TPM+



High Performance Linear System



alpha Value Line

1983

1994

1996

1999

2002

2004

2006

2007

2011

2013

2015

TP



cymex®  
sizing software



XP+ / TP+ / SP+ / LP+



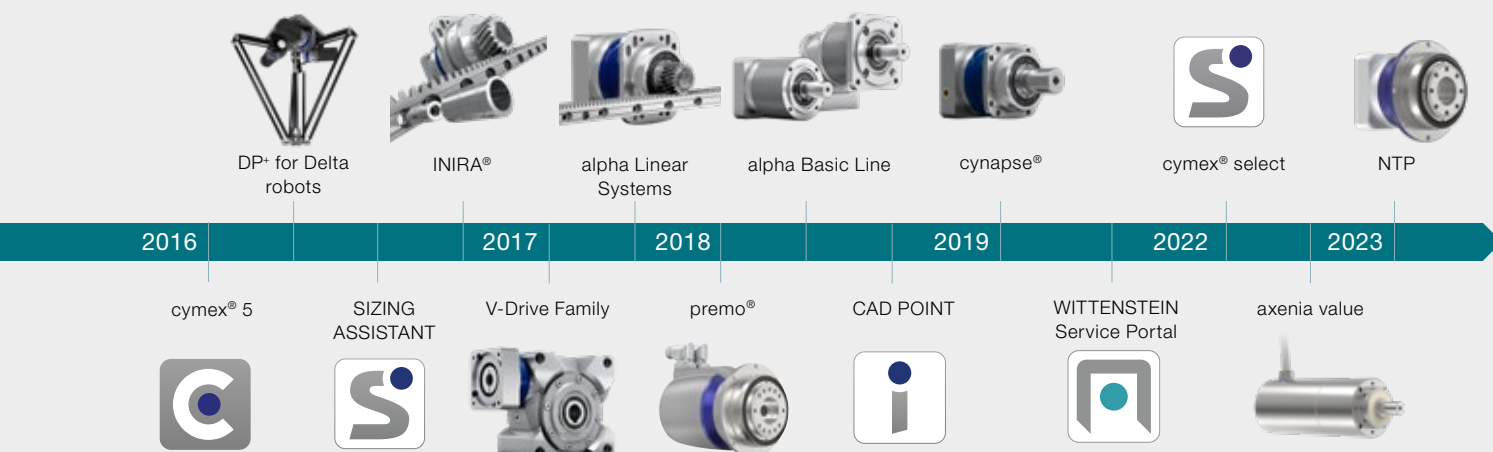
TPK+ / SPK+ /  
HG+ / SK+ / TK+



HDV  
Hygienic Design







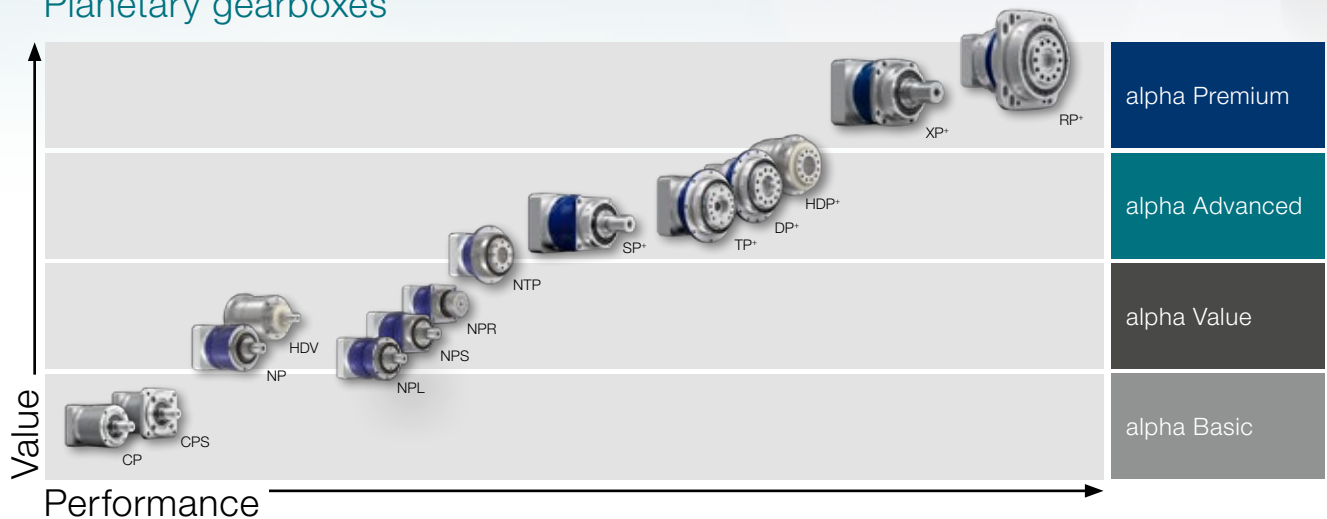
# WITTENSTEIN alpha on all axes

## Complete drive solutions under one roof

We offer the best solutions for almost every application. In addition to gearboxes, our product portfolio includes a wide range of drive solutions with linear systems and servo actuators. Adapted accessories such as couplings and shrink disks round off the product portfolio.

The diagrams below provide a quick overview of our product portfolio for a wide variety of requirements and applications:

### Planetary gearboxes



### Hypoid, bevel and worm gearboxes

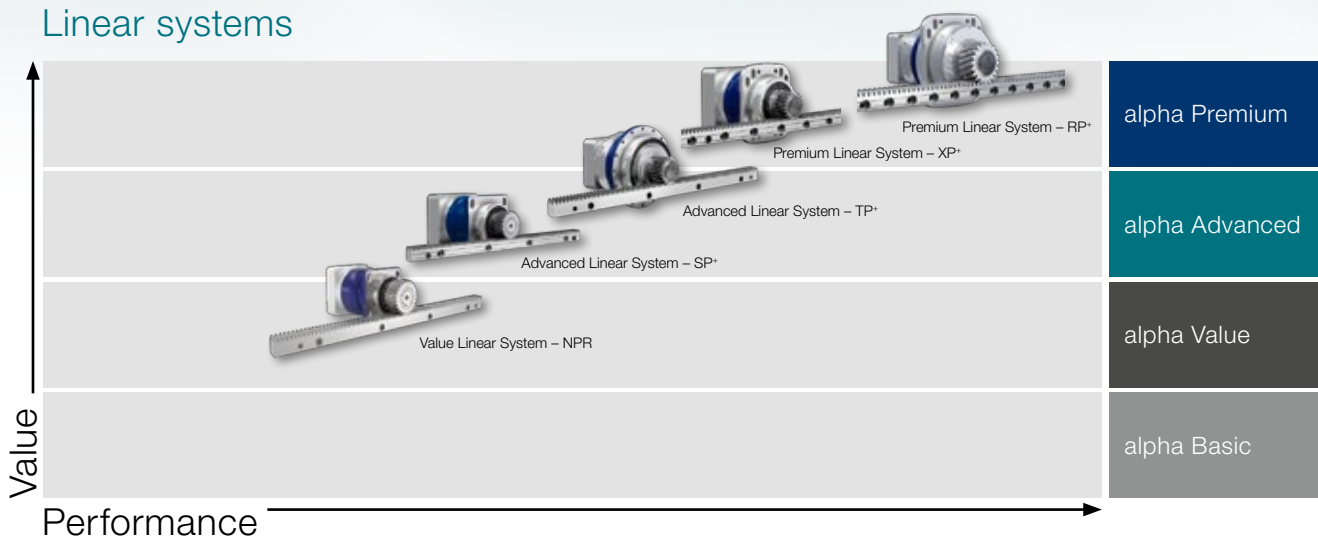


## Know-how in every sector

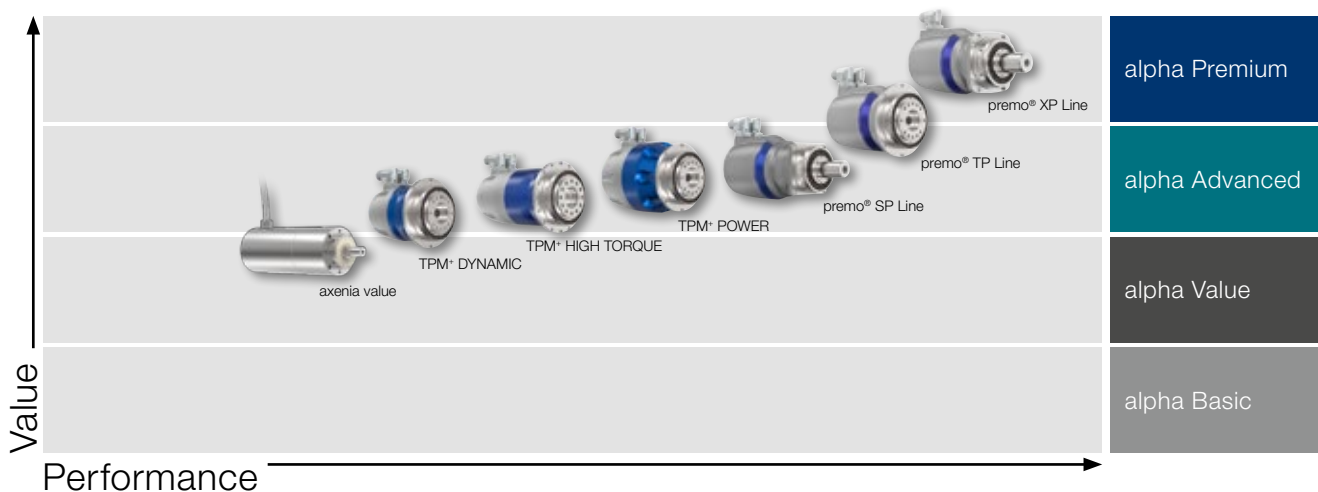
Our solutions range from high-precision axes in manufacturing systems to packaging machines that must operate with maximum productivity in the smallest installation space. Overview:

- Machine tools and production technology
- Food and packaging machines
- Wood working machinery
- Printing and paper machines
- Robotics and automation

### Linear systems



### Servo actuators



# WITTENSTEIN alpha Engineering Tools – many ways to reach your goals

Our software portfolio helps you choose the optimal drive

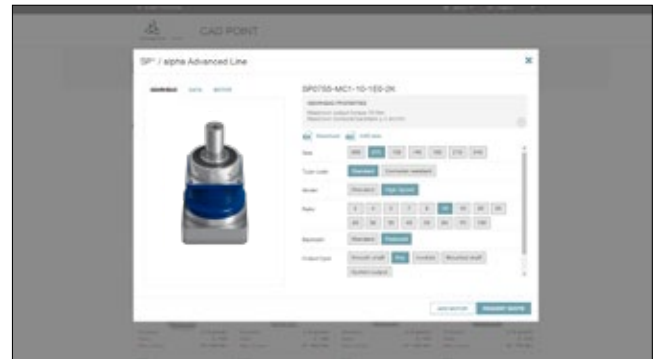
You can conveniently download dimension sheets and CAD data, select the best gearbox quickly and easily design complex kinematic sequences in detail – our software solutions offer various methods of selecting the best, most reliable drive on all axes.



## CAD POINT – Your smart catalog

- Performance data, dimension sheets and CAD data for all types of gearboxes
- Available online without logging in
- Comprehensive documentation of the selection

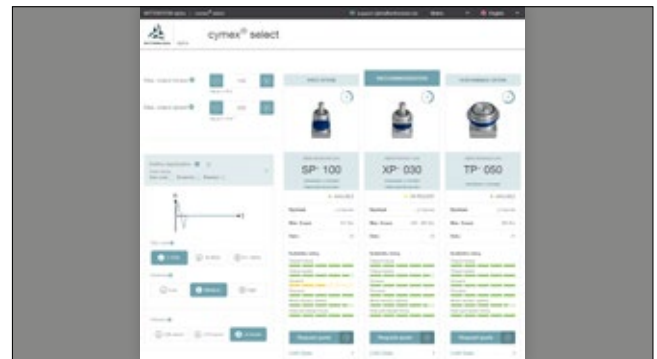
[www.wittenstein-cad-point.com](http://www.wittenstein-cad-point.com)



## cymex® select – Best solution within seconds

- Efficient and customizable product selection in seconds
- Top three product recommendations for your requirements
- Available online without login
- Possibility of requesting quotation quickly and directly

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



## cymex® 5 – Calculate on the Best

- Detailed calculation of complete drive trains
- Precise simulation of motion and load variables
- Downloadable software for complex designs

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





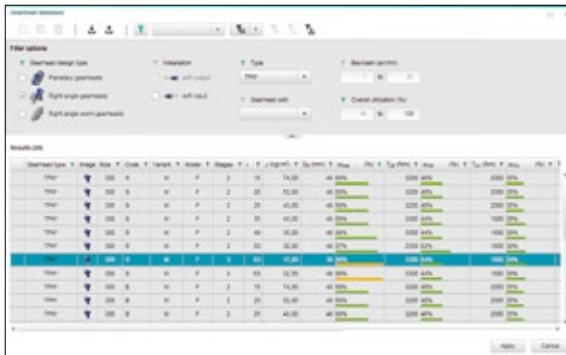







# cymex® 5 is the current standard

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

 **cymex® 5 can define any number of axes simultaneously**

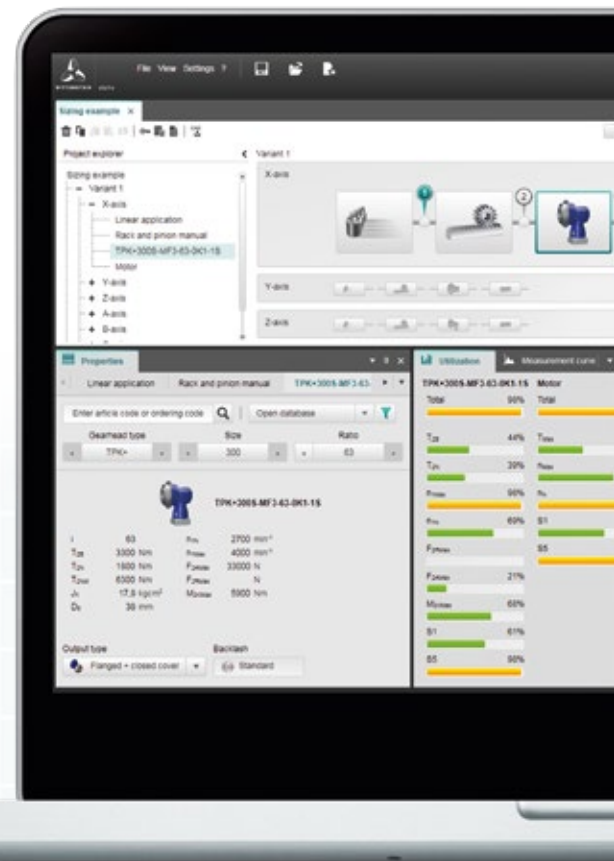
In contrast to other design tools, cymex® 5 can define any number of axes at the same time. The version calculation is up to 60 % quicker as a result.



Overhead type	Image	Size	Class	Variant	Motor	Stages	Ratio	Input speed	Output speed	Efficiency	Power	Speed	Life	Cost
TPK		500	S	10	P	2	20	14,000	400	90%	2,000	1,400	100,000	1,200
TPK		500	S	10	P	2	20	14,000	400	90%	2,000	1,400	100,000	1,200
TPK		500	S	10	P	2	20	14,000	400	90%	2,000	1,400	100,000	1,200
TPK		500	S	10	P	2	20	14,000	400	90%	2,000	1,400	100,000	1,200
TPK		500	S	10	P	2	20	14,000	400	90%	2,000	1,400	100,000	1,200

 **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 gearbox versions from WITTENSTEIN alpha and over 200 combinations of linear systems with all relevant technical specifications can be found here.

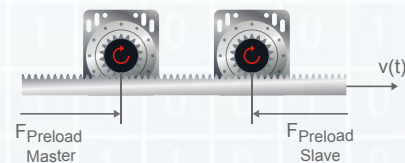



Free download

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



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



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

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

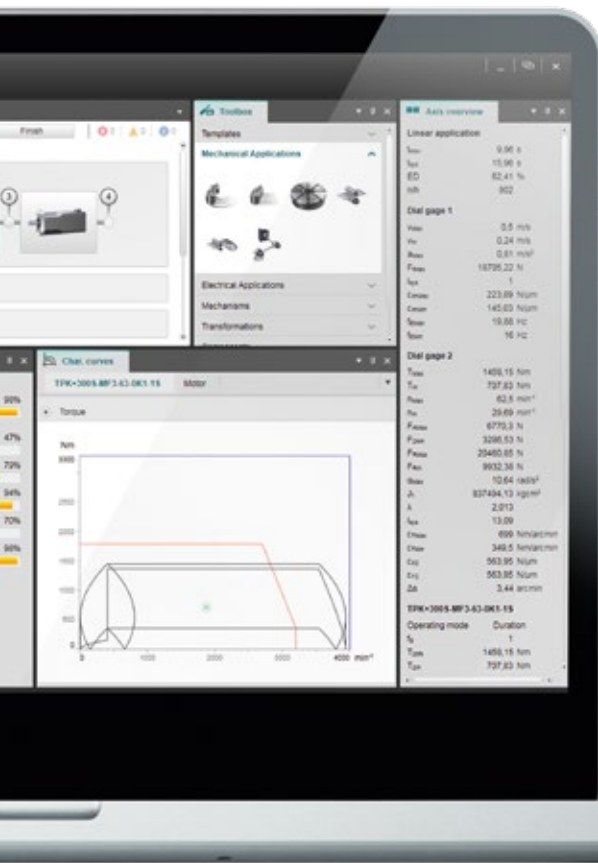
\*Premium function, on request.

# cymex® 5



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

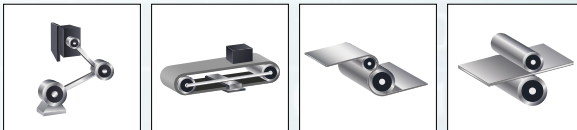
During the design process, cymex® 5 provides optimization suggestions for the selected gearbox, which increase reliability and efficiency while ensuring your gearbox has the perfect dimensions e.g. through downsizing. This saves on costs and reduces the installation space in the machine.



Linear application		cymex® 5	
Power	9.96 kW	Power	9.96 kW
Torque	15.96 Nm	Torque	15.96 Nm
ED	82.41 %	ED	82.41 %
Ratio	802	Ratio	802
Speed	0.00 m/s	Speed	0.00 m/s
Force	0.24 mN	Force	0.24 mN
Pressure	0.81 mPa	Pressure	0.81 mPa
Flow	18795.22 l/s	Flow	18795.22 l/s
Temp	1	Temp	1
Length	223.89 N/mm	Length	223.89 N/mm
Curvature	145.63 N/mm	Curvature	145.63 N/mm
Stress	19.68 Hz	Stress	19.68 Hz
Strain	16 Hz	Strain	16 Hz
Time	1408.15 Nm	Time	1408.15 Nm
Force	797.83 Nm	Force	797.83 Nm
Pressure	62.8 mm <sup>2</sup>	Pressure	62.8 mm <sup>2</sup>
Flow	29.69 mm <sup>3</sup>	Flow	29.69 mm <sup>3</sup>
Power	8779.3 N	Power	8779.3 N
Force	3266.53 N	Force	3266.53 N
Pressure	20460.85 N	Pressure	20460.85 N
Flow	9932.36 N	Flow	9932.36 N
Time	10.64 rad/s <sup>2</sup>	Time	10.64 rad/s <sup>2</sup>
Force	837494.13 kg/m <sup>3</sup>	Force	837494.13 kg/m <sup>3</sup>
Pressure	2.913	Pressure	2.913
Flow	13.88	Flow	13.88
Time	499.5 mm/m	Time	499.5 mm/m
Force	348.5 mm/m	Force	348.5 mm/m
Pressure	563.95 N/mm	Pressure	563.95 N/mm
Flow	563.95 N/mm	Flow	563.95 N/mm
Time	3.44 mm/m	Time	3.44 mm/m
Power	TPK-300S-MP3-43-0K1-15	Power	TPK-300S-MP3-43-0K1-15
Operating mode	Duration	Operating mode	Duration
Force	1	Force	1
Pressure	1408.15 Nm	Pressure	1408.15 Nm
Flow	797.83 Nm	Flow	797.83 Nm

## ✚ cymex® 5 offers comprehensive documentation

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



11 languages

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

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



# alpha Advanced Line – the perfect solution for demanding applications

Our SP<sup>+</sup> planetary gearbox has been setting the benchmark for decades

The seed of WITTENSTEIN alpha was planted more than 40 years ago and many generations of SP<sup>+</sup> planetary gearboxes have consistently set new standards among planetary gearboxes ever since. Our engineers are determined to make each new generation of gearboxes even better and more powerful than the one before. As a result, we manufacture superior products which are ideal for the demanding applications of our customers.

## The latest alpha Advanced Line – even more powerful

Our SP<sup>+</sup> and TP<sup>+</sup> bestsellers have been further developed to significantly increase the power density. This optimization has increased speed and torque values considerably while simultaneously reducing running noise. Lower no-load running torques reduce occurring losses. This significantly increases the overall energy efficiency. The HIGH SPEED and HIGH TORQUE variants achieve even greater performance dimensions and higher speeds. At the same time the extremely compact design provides significant space savings, which is especially important in small installation spaces.

## Suitable for all requirements

Whether planetary, hypoid, bevel or worm gears, the alpha Advanced Line always offers our customers a suitable solution for their specific applications, regardless of the required performance range. With more than 30 product variants in the alpha Advanced Line alone, applications can be fully equipped with our gearboxes, even in combination with compatible linear systems. The high-precision all-rounders of the alpha Advanced Line operate with an impressive accuracy range of 1 - 5 arcmin and can be used in any application.

### Your benefits at a glance

- **Maximum power density**
- **Maximum speeds, torques and positioning accuracies**
- **Low operating noise**
- **Wide variety of variants and systems**
- **Extensive experience and outstanding safety**





# alpha Advanced Line – Product overview

## Planetary gearboxes

This series is characterized by outstanding power density resulting from an extremely compact design. The HIGH SPEED and HIGH TORQUE variants achieve even greater torsional rigidity values and performance dimensions with regard to speed and torque.



SP+ / SP+ HIGH SPEED



TP+



TP+ HIGH TORQUE

## Hypoid gearboxes

Maximum performance in restricted mounting situations. Our hypoid gearboxes are characterized by an extremely high power density with a wide variety of variants. This strong combination can meet virtually any application requirements.



HG+



SK+



SPK+



TK+



TPK+



TPK+ HIGH TORQUE



## Bevel gearboxes

High performances at low gear ratios is the main strength of this series, which can be installed in the smallest of spaces. Additionally a high efficiency of 97 % ensures efficient operation.



SC+



SPC+



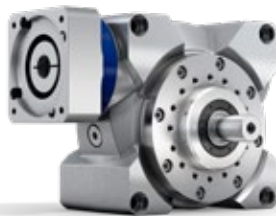
TPC+

## Worm gearboxes

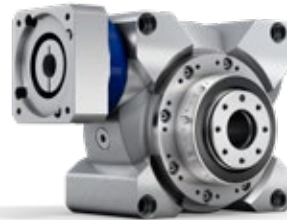
In addition to an extremely high power density, our powerful V-Drive Advanced series is characterized by a consistently low backlash throughout the product life cycle. Flexible output shapes allow the gearbox to be used in a wide range of applications. The servo worm gears are suitable both for cyclic operation and applications in continuous operation.



VH+



VS+



VT+

## Application-specific solutions

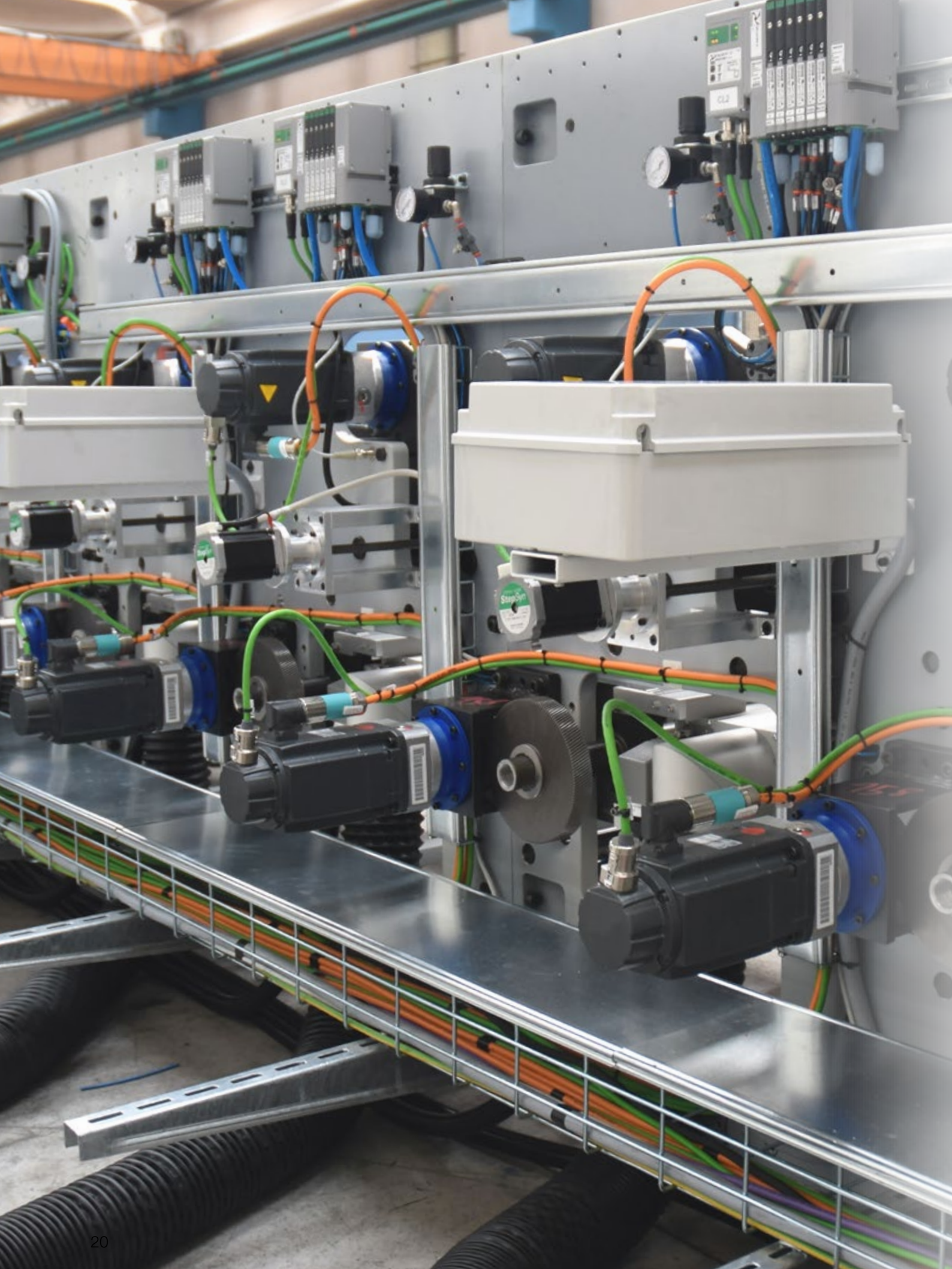
Special requirements need special solutions. Whether in highly dynamic Delta robotics applications or the food industry with a focus on hygienic design. We offer optimal solutions for your specific applications.



DP+



HDP+

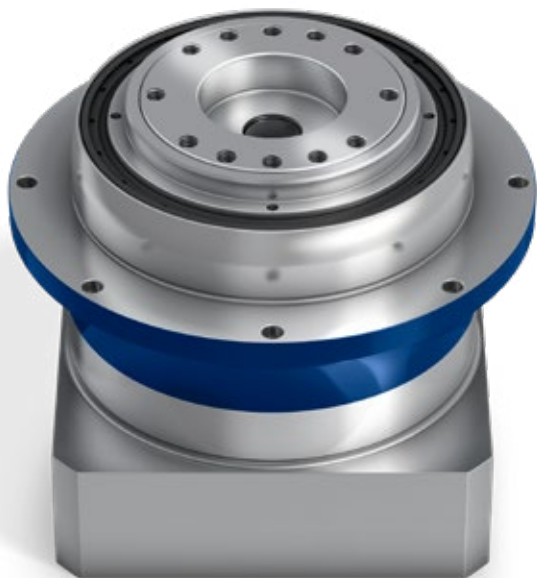




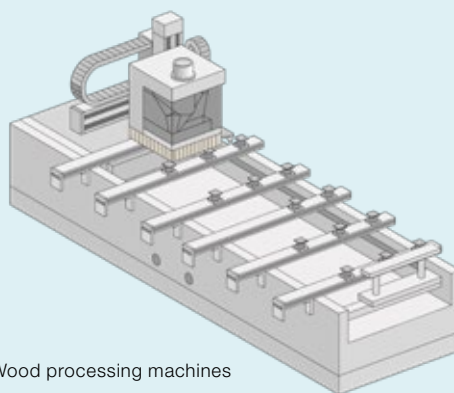
# alpha Advanced Line in action

## TP+ / TP+ HIGH TORQUE – Compact precision

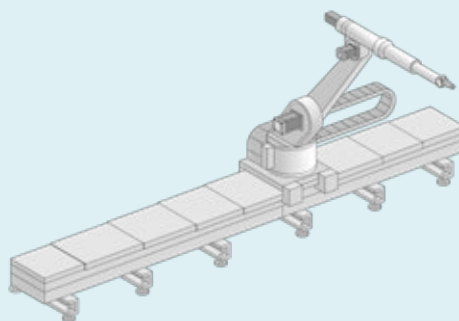
Maximum precision, perfect true-running accuracy and high speeds are essential requirements for flexographic printing presses. The TP+ and TP+ HIGH TORQUE planetary gearboxes of WITTENSTEIN alpha incorporate all of these characteristics, resulting in a uniquely high printing quality and increased machine output.



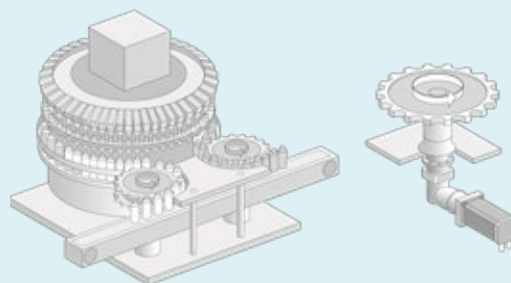
Advanced Line products can also be used in machines that generate rotary movements under extreme loads such as wood working machinery, 7th axis applications or in bottling plants.



Wood processing machines



7<sup>th</sup> axis



Bottling plant





SP<sup>+</sup> and TP<sup>+</sup> planetary gearboxes  
When maximum power density  
is vital.

## SP<sup>+</sup> / SP<sup>+</sup> HIGH SPEED – The classic all-rounder



SP<sup>+</sup>

### Product highlights

**Max. torsional backlash [arcmin]  $\leq 1 - 6$**

**Multiple output configurations for greater flexibility**

Smooth shaft, shaft with key, splined shaft (DIN 5480), blind hollow shaft

**High nominal speeds**

SP<sup>+</sup> HIGH SPEED version for applications in continuous operation

**Flexible drive options**

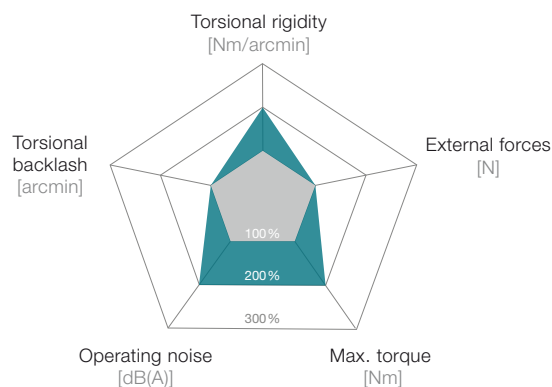
Clamping hub socket, coupling, optimized mass inertia, keyed clamping hub socket

**Other gearbox models**

Corrosion resistant design, ATEX, food-grade lubrication, low friction version

The standard version of these low-backlash planetary gearboxes with output shaft is ideally suited for high positioning accuracy and highly dynamic cyclic operation. The SP<sup>+</sup> HIGH SPEED is particularly appropriate for applications with maximum speeds during continuous operation.

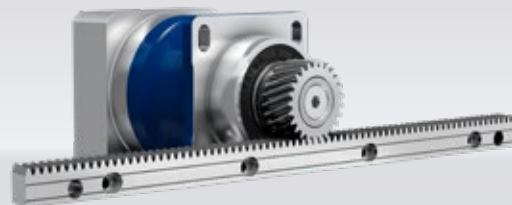
The SP<sup>+</sup> compared to the industry standard



— SP<sup>+</sup> / SP<sup>+</sup> HIGH SPEED — industry standard



SP<sup>+</sup> planetary gearbox in corrosion resistant design



SP<sup>+</sup> with R-flange and rack and pinion

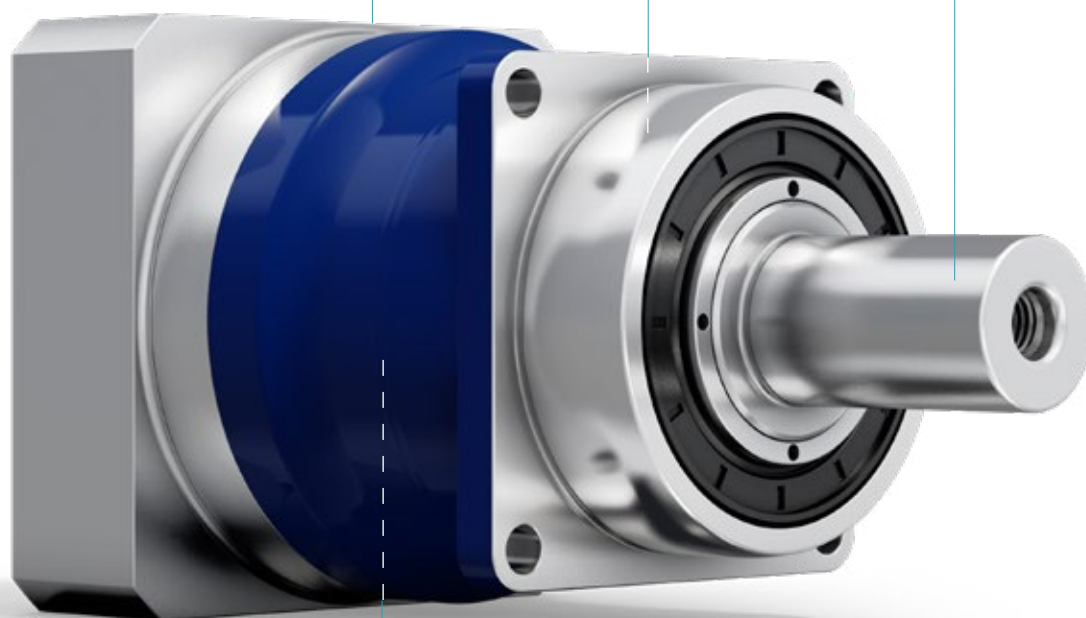


Connectivity of the motor shafts due to the large number of clamping hub diameters

Various output configurations

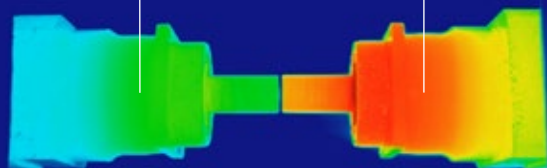
Tapered roller bearing for absorbing axial and radial forces

Extremely smooth running due to helical toothing



Heat build-up approx. 40°C

Heat build-up approx. 80°C



SP\* HIGH SPEED  
MC version

Industry standard



SP\* with metal bellows coupling

# SP<sup>+</sup> 060 MF 1-stage

				1-stage						
Ratio			<i>i</i>		3	4	5	7	8	10
Max. torque <sup>a) b) e)</sup>			<i>T</i> <sub>2a</sub>	<i>Nm</i>	48	67	67	67	51	51
				<i>in.lb</i>	425	595	595	595	453	453
Max. acceleration torque <sup>b) e)</sup> (max. 1000 cycles per hour)			<i>T</i> <sub>2B</sub>	<i>Nm</i>	36	50	50	50	38	38
				<i>in.lb</i>	319	443	443	443	336	336
Nominal torque (at <i>n</i> <sub>IN</sub> )			<i>T</i> <sub>2N</sub>	<i>Nm</i>	21	27	27	26	26	27
				<i>in.lb</i>	190	239	236	226	230	237
Emergency stop torque <sup>a) b) e)</sup> (permitted 1000 times during the service life of the gearbox)			<i>T</i> <sub>2Not</sub>	<i>Nm</i>	96	109	109	109	100	100
				<i>in.lb</i>	850	965	965	965	885	885
Permitted average input speed (at <i>T</i> <sub>2N</sub> and 20 °C ambient temperature) <sup>e)</sup>			<i>n</i> <sub>1N</sub>	<i>rpm</i>	3300	3300	3300	4000	4000	4000
Max. input speed			<i>n</i> <sub>1Max</sub>	<i>rpm</i>	7500	7500	7500	7500	7500	7500
Mean no load running torque <sup>b)</sup> (at <i>n</i> <sub>i</sub> = 3000 rpm and 20 °C gearbox temperature)			<i>T</i> <sub>012</sub>	<i>Nm</i>	0.68	0.52	0.48	0.34	0.32	0.32
				<i>in.lb</i>	6.0	4.6	4.2	3.0	2.8	2.8
Max. backlash			<i>j</i> <sub>t</sub>	<i>arcmin</i>	Standard ≤ 4 / Reduced ≤ 2					
Torsional rigidity <sup>b)</sup>			<i>C</i> <sub>t21</sub>	<i>Nm/arcmin</i>	3.5					
				<i>in.lb/arcmin</i>	31					
Max. axial force <sup>c)</sup>			<i>F</i> <sub>2AMax</sub>	<i>N</i>	2400					
				<i>lb<sub>f</sub></i>	540					
Max. lateral force <sup>c)</sup>			<i>F</i> <sub>2QMax</sub>	<i>N</i>	2800					
				<i>lb<sub>f</sub></i>	630					
Max. tilting moment			<i>M</i> <sub>2KMax</sub>	<i>Nm</i>	160					
				<i>in.lb</i>	1416					
Efficiency at full load			<i>η</i>	%	97					
Service life <sup>f)</sup>			<i>L</i> <sub>h</sub>	<i>h</i>	> 20000					
Weight (incl. standard adapter plate)			<i>m</i>	<i>kg</i>	1.9					
				<i>lb<sub>m</sub></i>	4.2					
Operating noise (at reference ratio and reference speed – ratio-specific values available in cymex®)			<i>L</i> <sub>PA</sub>	<i>dB(A)</i>	≤ 58					
Max. permitted housing temperature				°C	+90					
				<i>F</i>	194					
Ambient temperature				°C	–15 to +40					
				<i>F</i>	5 to 104					
Lubrication					Lubricated for life					
Direction of rotation					In- and output same direction					
Protection class					IP 65					
Metal bellows coupling (recommended product type – validate sizing with cymex®)					BC2-00060AA016.000-X					
				<i>mm</i>	X = 012.000 - 035.000					
Mass moment of inertia (relates to the drive)  Clamping hub diameter [mm] Optimized mass inertia version available on request	B	11	<i>J</i> <sub>i</sub>	<i>kgcm</i> <sup>2</sup>	0.21	0.15	0.12	0.10	0.10	0.09
				<i>10<sup>-3</sup> in.lb.s</i> <sup>2</sup>	0.19	0.13	0.11	0.09	0.09	0.08
	C	14	<i>J</i> <sub>i</sub>	<i>kgcm</i> <sup>2</sup>	0.28	0.22	0.20	0.18	0.16	0.16
				<i>10<sup>-3</sup> in.lb.s</i> <sup>2</sup>	0.25	0.19	0.18	0.16	0.14	0.14
	E	19	<i>J</i> <sub>i</sub>	<i>kgcm</i> <sup>2</sup>	0.61	0.55	0.52	0.50	0.49	0.49
				<i>10<sup>-3</sup> in.lb.s</i> <sup>2</sup>	0.54	0.49	0.46	0.44	0.43	0.43

Please use our sizing software cymex<sup>®</sup> for a detailed sizing – [www.wittenstein-cymex.com](http://www.wittenstein-cymex.com)

<sup>a)</sup> At max. 10 %  $F_{2QMax}$

<sup>b)</sup> Valid for standard clamping hub diameter

<sup>c)</sup> Refers to center of the output shaft or flange

<sup>d)</sup> Please reduce input speed at higher ambient temperatures

<sup>e)</sup> Smooth shaft

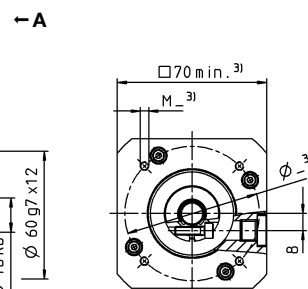
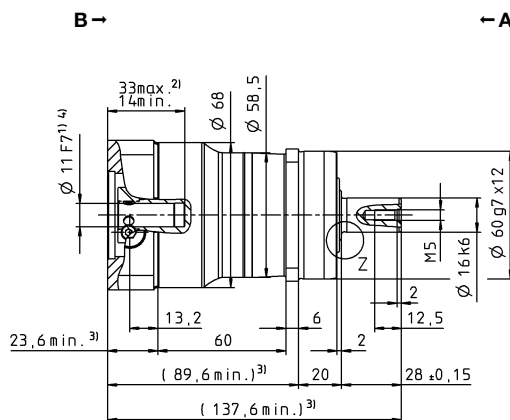
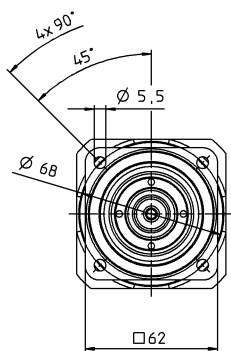
<sup>f)</sup> Please contact us to discuss  
application-specific service lifetimes

View A

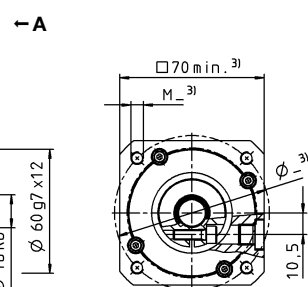
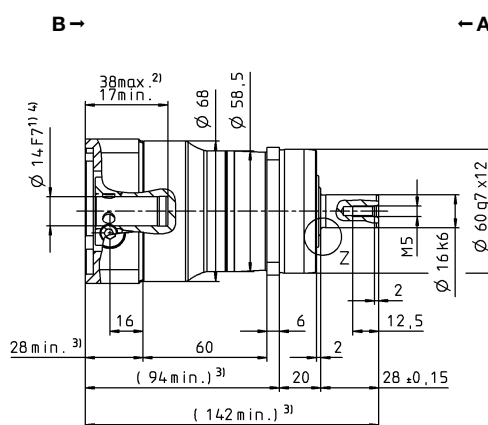
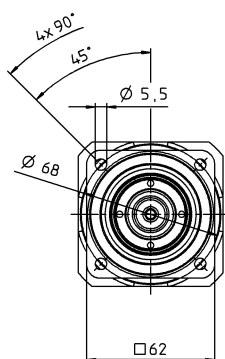
View B

# 1-stage

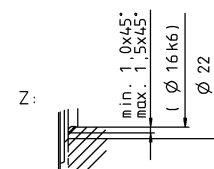
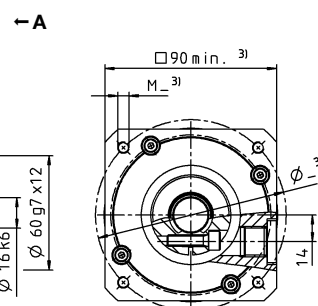
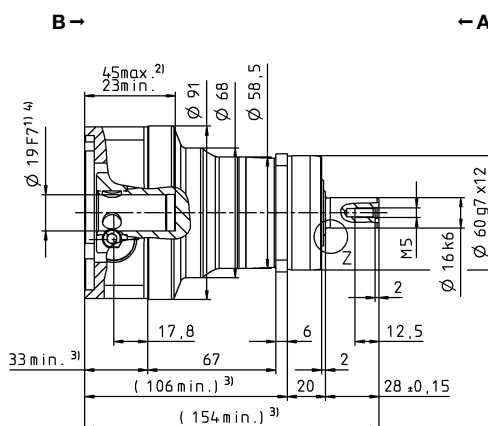
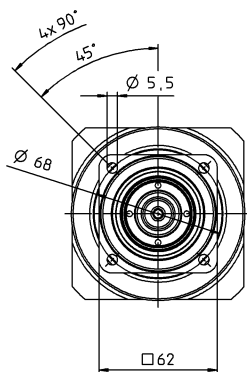
up to 11<sup>4)</sup> (B)  
clamping hub  
diameter



up to 14<sup>4)</sup> (C)<sup>5)</sup>  
clamping hub  
diameter

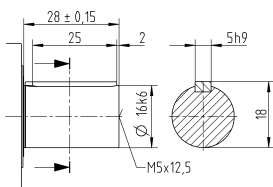


up to 19<sup>4)</sup> (E)  
clamping hub  
diameter

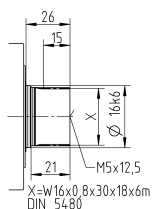


## Other output variants

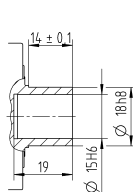
Shaft with key



Splined shaft (DIN 5480)



Shaft mounted



Non-tolerated dimensions are nominal dimensions

<sup>1)</sup> Check motor shaft fit

<sup>2)</sup> Min./Max. permissible motor shaft length. Longer motor shafts are possible, please contact alpha.

<sup>3)</sup> The dimensions depend on the motor

<sup>4)</sup> Smaller motor shaft diameter is compensated by a bushing with a minimum wall thickness of 1 mm

<sup>5)</sup> Standard clamping hub diameter

# SP<sup>+</sup> 060 MF 2-stage

				2-stage											
Ratio			<i>i</i>		16	20	25	28	32	35	40	50	64	70	100
Max. torque <sup>a) b) e)</sup>			<i>T</i> <sub>2a</sub>	<i>Nm</i>	57	57	67	57	57	67	57	67	48	56	48
				<i>in.lb</i>	507	507	595	507	507	595	507	595	423	499	423
Max. acceleration torque <sup>b) e)</sup> (max. 1000 cycles per hour)			<i>T</i> <sub>2B</sub>	<i>Nm</i>	50	50	50	50	50	50	50	50	38	50	38
				<i>in.lb</i>	443	443	443	443	443	443	443	443	336	443	336
Nominal torque (at <i>n</i> <sub>N</sub> )			<i>T</i> <sub>2N</sub>	<i>Nm</i>	38	40	40	40	38	40	40	40	31	40	31
				<i>in.lb</i>	332	354	351	357	333	357	357	357	270	357	272
Emergency stop torque <sup>a) b) e)</sup> (permitted 1000 times during the service life of the gearbox)			<i>T</i> <sub>2Not</sub>	<i>Nm</i>	109	109	109	109	109	109	109	109	109	109	100
				<i>in.lb</i>	965	965	965	965	965	965	965	965	965	965	885
Permitted average input speed (at <i>T</i> <sub>2N</sub> and 20 °C ambient temperature) <sup>d)</sup>			<i>n</i> <sub>1N</sub>	<i>rpm</i>	4400	4400	4400	4400	4400	4400	4400	4800	4800	5500	5500
Max. input speed			<i>n</i> <sub>1Max</sub>	<i>rpm</i>	8500	8500	8500	8500	8500	8500	8500	8500	8500	8500	8500
Mean no load running torque <sup>b)</sup> (at <i>n</i> <sub>1</sub> = 3000 rpm and 20 °C gearbox temperature)			<i>T</i> <sub>012</sub>	<i>Nm</i>	0.28	0.25	0.23	0.22	0.24	0.20	0.20	0.19	0.19	0.17	0.18
				<i>in.lb</i>	2.5	2.2	2.0	1.9	2.1	1.8	1.8	1.7	1.7	1.5	1.6
Max. backlash			<i>j</i> <sub>t</sub>	<i>arcmin</i>	Standard ≤ 6 / Reduced ≤ 4										
Torsional rigidity <sup>b)</sup>			<i>C</i> <sub>121</sub>	<i>Nm/arcmin</i>	3.5										
				<i>in.lb/arcmin</i>	31										
Max. axial force <sup>c)</sup>			<i>F</i> <sub>2AMax</sub>	<i>N</i>	2400										
				<i>lb<sub>f</sub></i>	540										
Max. lateral force <sup>c)</sup>			<i>F</i> <sub>2QMax</sub>	<i>N</i>	2800										
				<i>lb<sub>f</sub></i>	630										
Max. tilting moment			<i>M</i> <sub>2KMax</sub>	<i>Nm</i>	160										
				<i>in.lb</i>	1416										
Efficiency at full load			<i>η</i>	%	94										
Service life <sup>f)</sup>			<i>L</i> <sub>h</sub>	<i>h</i>	> 20000										
Weight (incl. standard adapter plate)			<i>m</i>	<i>kg</i>	2.0										
				<i>lb<sub>m</sub></i>	4.4										
Operating noise (at reference ratio and reference speed – ratio-specific values available in cymex®)			<i>L</i> <sub>PA</sub>	<i>dB(A)</i>	≤ 57										
Max. permitted housing temperature				°C	+90										
				<i>F</i>	194										
Ambient temperature				°C	–15 to +40										
				<i>F</i>	5 to 104										
Lubrication					Lubricated for life										
Direction of rotation					In- and output same direction										
Protection class					IP 65										
Metal bellows coupling (recommended product type – validate sizing with cymex®)					BC2-00060AA016.000-X										
				Bore diameter of coupling on the application side	<i>mm</i>	X = 012.000 - 035.000									
Mass moment of inertia (relates to the drive)  Clamping hub diameter [mm]  Optimized mass inertia version available on request	B	11	<i>J</i> <sub>i</sub>	<i>kgcm<sup>2</sup></i>	0.077	0.069	0.068	0.061	0.061	0.061	0.057	0.057	0.056	0.056	0.056
				<i>10<sup>-3</sup> in.lb.s<sup>2</sup></i>	0.068	0.061	0.060	0.054	0.054	0.054	0.050	0.050	0.050	0.050	0.050
	C	14	<i>J</i> <sub>i</sub>	<i>kgcm<sup>2</sup></i>	0.17	0.16	0.16	0.16	0.16	0.16	0.15	0.15	0.15	0.15	0.15
				<i>10<sup>-3</sup> in.lb.s<sup>2</sup></i>	0.15	0.14	0.14	0.14	0.14	0.14	0.13	0.13	0.13	0.13	0.13

Please use our sizing software cymex<sup>®</sup> for a detailed sizing – [www.wittenstein-cymex.com](http://www.wittenstein-cymex.com)

<sup>a)</sup> At max. 10 %  $F_{2QMax}$

<sup>b)</sup> Valid for standard clamping hub diameter

<sup>c)</sup> Refers to center of the output shaft or flange

<sup>d)</sup> Please reduce input speed at higher ambient temperatures

<sup>e)</sup> Smooth shaft

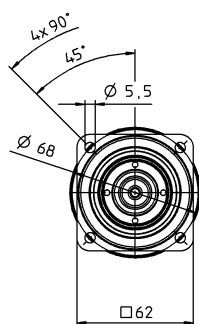
<sup>f)</sup> Please contact us to discuss  
application-specific service lifetimes

View A

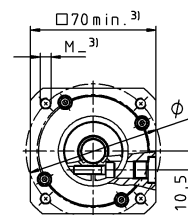
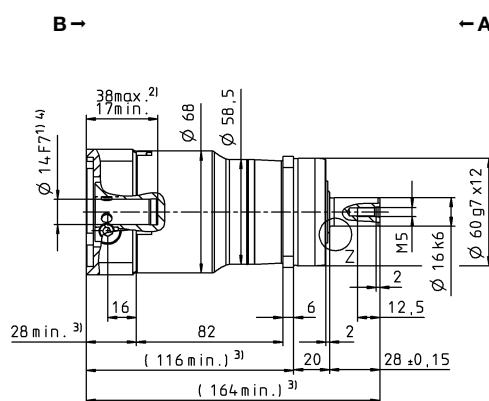
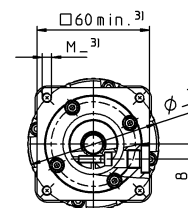
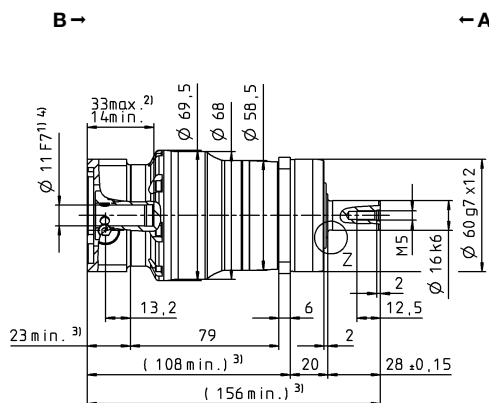
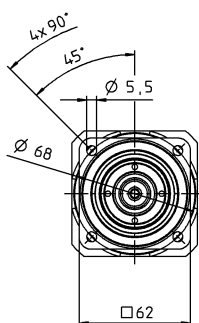
View B

# 2-stage

up to 11 <sup>4)</sup> (B) <sup>5)</sup>  
clamping hub  
diameter



up to 14 <sup>4)</sup> (C)  
clamping hub  
diameter



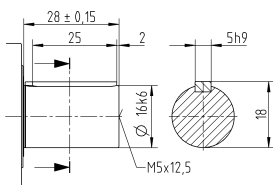
Planetary gearboxes

SP<sup>+</sup>

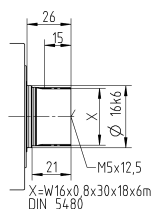
MF

## Other output variants

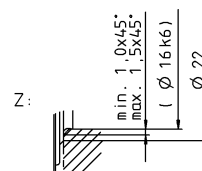
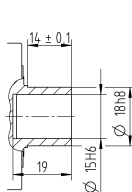
Shaft with key



Splined shaft (DIN 5480)



Shaft mounted



Non-tolerated dimensions are nominal dimensions

<sup>1)</sup> Check motor shaft fit

<sup>2)</sup> Min./Max. permissible motor shaft length. Longer motor shafts are possible, please contact alpha.

<sup>3)</sup> The dimensions depend on the motor

<sup>4)</sup> Smaller motor shaft diameter is compensated by a bushing with a minimum wall thickness of 1 mm

<sup>5)</sup> Standard clamping hub diameter

# SP<sup>+</sup> 075 MF 1-stage

				1-stage						
Ratio			<i>i</i>		3	4	5	7	8	10
Max. torque <sup>a) b) e)</sup>			<i>T</i> <sub>2a</sub>	<i>Nm</i>	136	176	176	176	152	152
				<i>in.lb</i>	1204	1558	1558	1558	1345	1345
Max. acceleration torque <sup>b) e)</sup> (max. 1000 cycles per hour)			<i>T</i> <sub>2B</sub>	<i>Nm</i>	102	132	132	132	114	114
				<i>in.lb</i>	903	1168	1168	1168	1009	1009
Nominal torque (at <i>n</i> <sub>IN</sub> )			<i>T</i> <sub>2N</sub>	<i>Nm</i>	63	81	81	81	80	81
				<i>in.lb</i>	558	719	716	719	712	720
Emergency stop torque <sup>a) b) e)</sup> (permitted 1000 times during the service life of the gearbox)			<i>T</i> <sub>2Not</sub>	<i>Nm</i>	139	185	250	250	250	250
				<i>in.lb</i>	1230	1640	2213	2213	2213	2213
Permitted average input speed (at <i>T</i> <sub>2N</sub> and 20 °C ambient temperature) <sup>e)</sup>			<i>n</i> <sub>1N</sub>	<i>rpm</i>	2900	2900	2900	3100	3100	3100
Max. input speed			<i>n</i> <sub>1Max</sub>	<i>rpm</i>	7500	7500	7500	7500	7500	7500
Mean no load running torque <sup>b)</sup> (at <i>n</i> <sub>i</sub> = 3000 rpm and 20 °C gearbox temperature)			<i>T</i> <sub>012</sub>	<i>Nm</i>	1.5	1.4	0.96	0.72	0.55	0.52
				<i>in.lb</i>	14	12	8.5	6.4	4.9	4.6
Max. backlash			<i>j</i> <sub>t</sub>	<i>arcmin</i>	Standard ≤ 4 / Reduced ≤ 2					
Torsional rigidity <sup>b)</sup>			<i>C</i> <sub>t21</sub>	<i>Nm/arcmin</i>	10					
				<i>in.lb/arcmin</i>	89					
Max. axial force <sup>c)</sup>			<i>F</i> <sub>2AMax</sub>	<i>N</i>	3350					
				<i>lb<sub>f</sub></i>	754					
Max. lateral force <sup>c)</sup>			<i>F</i> <sub>2QMax</sub>	<i>N</i>	4200					
				<i>lb<sub>f</sub></i>	945					
Max. tilting moment			<i>M</i> <sub>2KMax</sub>	<i>Nm</i>	260					
				<i>in.lb</i>	2301					
Efficiency at full load			<i>η</i>	%	97					
Service life <sup>f)</sup>			<i>L</i> <sub>h</sub>	<i>h</i>	> 20000					
Weight (incl. standard adapter plate)			<i>m</i>	<i>kg</i>	3.9					
				<i>lb<sub>m</sub></i>	8.6					
Operating noise (at reference ratio and reference speed – ratio-specific values available in cymex®)			<i>L</i> <sub>PA</sub>	<i>dB(A)</i>	≤ 59					
Max. permitted housing temperature				°C	+90					
				<i>F</i>	194					
Ambient temperature				°C	–15 to +40					
				<i>F</i>	5 to 104					
Lubrication					Lubricated for life					
Direction of rotation					In- and output same direction					
Protection class					IP 65					
Metal bellows coupling (recommended product type – validate sizing with cymex®)					BC2-00150AA022.000-X					
				<i>mm</i>	X = 019.000 - 042.000					
Mass moment of inertia (relates to the drive)  Clamping hub diameter [mm]  Optimized mass inertia version available on request	C	14	<i>J</i> <sub>i</sub>	<i>kgcm<sup>2</sup></i>	0.86	0.61	0.51	0.42	0.38	0.38
				<i>10<sup>-3</sup> in.lb.s<sup>2</sup></i>	0.76	0.54	0.45	0.37	0.34	0.34
	E	19	<i>J</i> <sub>i</sub>	<i>kgcm<sup>2</sup></i>	1.03	0.78	0.68	0.59	0.54	0.54
				<i>10<sup>-3</sup> in.lb.s<sup>2</sup></i>	0.91	0.69	0.60	0.52	0.48	0.48
	G	24	<i>J</i> <sub>i</sub>	<i>kgcm<sup>2</sup></i>	2.40	2.15	2.05	1.96	1.91	1.91
				<i>10<sup>-3</sup> in.lb.s<sup>2</sup></i>	2.12	1.90	1.81	1.73	1.69	1.69

Please use our sizing software cymex<sup>®</sup> for a detailed sizing – [www.wittenstein-cymex.com](http://www.wittenstein-cymex.com)

<sup>a)</sup> At max. 10 %  $F_{2QMax}$

<sup>b)</sup> Valid for standard clamping hub diameter

<sup>c)</sup> Refers to center of the output shaft or flange

<sup>d)</sup> Please reduce input speed at higher ambient temperatures

<sup>e)</sup> Smooth shaft

<sup>f)</sup> Please contact us to discuss  
application-specific service lifetimes

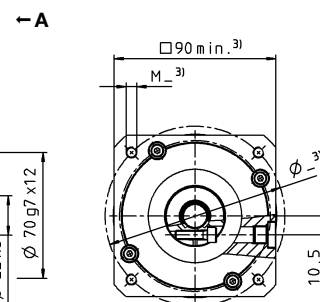
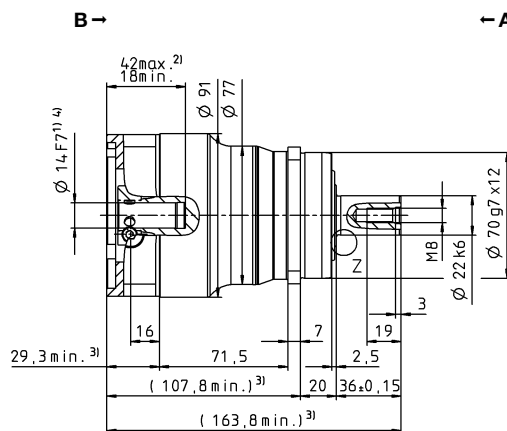
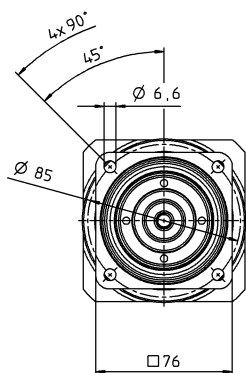


View A

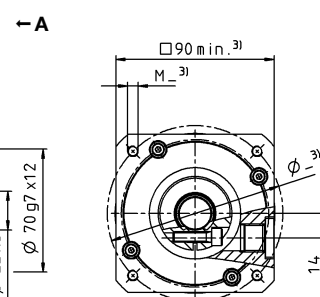
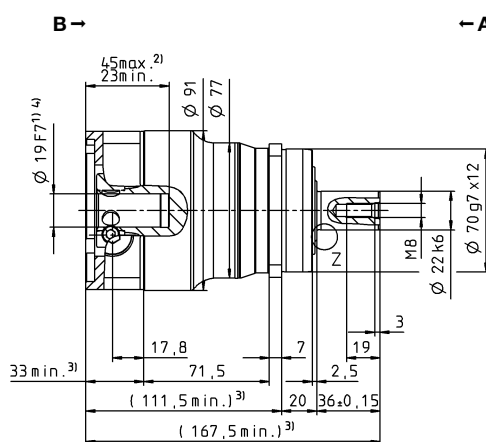
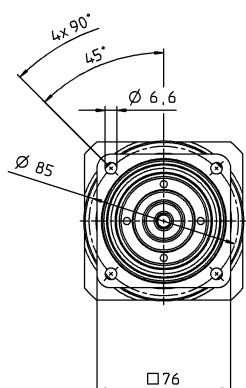
View B

# 1-stage

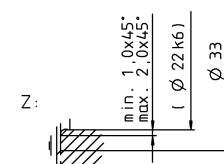
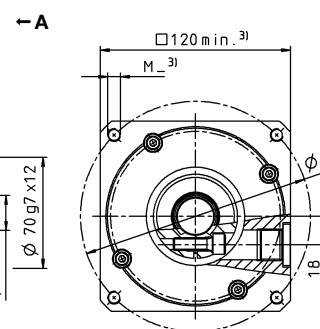
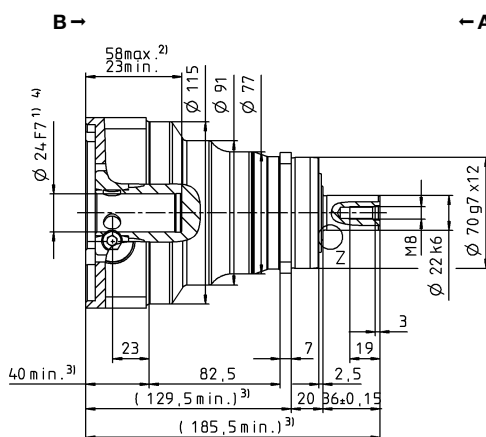
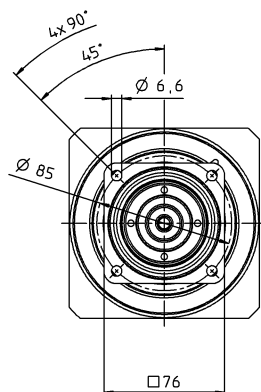
up to 14<sup>4)</sup> (C)  
clamping hub  
diameter



up to 19<sup>4)</sup> (E)<sup>5)</sup>  
clamping hub  
diameter

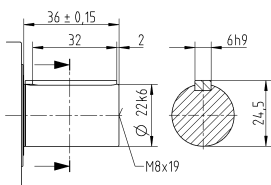


up to 24<sup>4)</sup> (G)  
clamping hub  
diameter

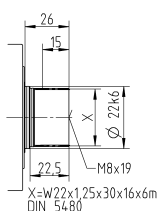


## Other output variants

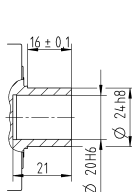
Shaft with key



Splined shaft (DIN 5480)



Shaft mounted



Non-tolerated dimensions are nominal dimensions

<sup>1)</sup> Check motor shaft fit

<sup>2)</sup> Min./Max. permissible motor shaft length. Longer motor shafts are possible, please contact alpha.

<sup>3)</sup> The dimensions depend on the motor

<sup>4)</sup> Smaller motor shaft diameter is compensated by a bushing with a minimum wall thickness of 1 mm

<sup>5)</sup> Standard clamping hub diameter

# SP<sup>+</sup> 075 MF 2-stage

				2-stage													
Ratio			<i>i</i>		16	20	25	28	32	35	40	50	64	70	100		
Max. torque <sup>a) b) e)</sup>			<i>T</i> <sub>2a</sub>	<i>Nm</i>	126	126	158	126	126	158	126	158	105	113	105		
				<i>in.lb</i>	1118	1118	1398	1118	1118	1398	1118	1398	932	998	932		
Max. acceleration torque <sup>b) e)</sup> (max. 1000 cycles per hour)			<i>T</i> <sub>2B</sub>	<i>Nm</i>	126	126	132	126	126	132	126	132	105	113	105		
				<i>in.lb</i>	1118	1118	1168	1118	1118	1168	1118	1168	932	998	932		
Nominal torque (at <i>n</i> <sub>IN</sub> )			<i>T</i> <sub>2N</sub>	<i>Nm</i>	101	101	106	101	101	106	101	106	84	90	84		
				<i>in.lb</i>	895	895	935	895	895	935	895	935	746	799	746		
Emergency stop torque <sup>a) b) e)</sup> (permitted 1000 times during the service life of the gearbox)			<i>T</i> <sub>2Not</sub>	<i>Nm</i>	250	250	250	250	250	250	250	250	250	250	250		
				<i>in.lb</i>	2213	2213	2213	2213	2213	2213	2213	2213	2213	2213	2213		
Permitted average input speed (at <i>T</i> <sub>2N</sub> and 20 °C ambient temperature) <sup>d)</sup>			<i>n</i> <sub>1N</sub>	<i>rpm</i>	3500	3500	3500	3500	3500	3500	3500	3800	3800	4500	4500		
Max. input speed			<i>n</i> <sub>1Max</sub>	<i>rpm</i>	8500	8500	8500	8500	8500	8500	8500	8500	8500	8500	8500		
Mean no load running torque <sup>b)</sup> (at <i>n</i> <sub>i</sub> = 3000 rpm and 20 °C gearbox temperature)			<i>T</i> <sub>012</sub>	<i>Nm</i>	0.50	0.41	0.35	0.32	0.44	0.28	0.26	0.23	0.23	0.21	0.23		
				<i>in.lb</i>	4.4	3.6	3.1	2.8	3.9	2.5	2.3	2.0	2.0	1.9	2.0		
Max. backlash			<i>j</i> <sub>t</sub>	<i>arcmin</i>	Standard ≤ 6 / Reduced ≤ 4												
Torsional rigidity <sup>b)</sup>			<i>C</i> <sub>t21</sub>	<i>Nm/arcmin</i>	10												
				<i>in.lb/arcmin</i>	89												
Max. axial force <sup>c)</sup>			<i>F</i> <sub>2AMax</sub>	<i>N</i>	3350												
				<i>lb<sub>f</sub></i>	754												
Max. lateral force <sup>c)</sup>			<i>F</i> <sub>2QMax</sub>	<i>N</i>	4200												
				<i>lb<sub>f</sub></i>	945												
Max. tilting moment			<i>M</i> <sub>2KMax</sub>	<i>Nm</i>	260												
				<i>in.lb</i>	2301												
Efficiency at full load			<i>η</i>	%	94												
Service life <sup>f)</sup>			<i>L</i> <sub>h</sub>	<i>h</i>	> 20000												
Weight (incl. standard adapter plate)			<i>m</i>	<i>kg</i>	3.6												
				<i>lb<sub>m</sub></i>	8.0												
Operating noise (at reference ratio and reference speed – ratio-specific values available in cymex®)			<i>L</i> <sub>PA</sub>	<i>dB(A)</i>	≤ 55												
Max. permitted housing temperature				°C	+90												
				<i>F</i>	194												
Ambient temperature				°C	–15 to +40												
				<i>F</i>	5 to 104												
Lubrication					Lubricated for life												
Direction of rotation					In- and output same direction												
Protection class					IP 65												
Metal bellows coupling (recommended product type – validate sizing with cymex®)					BC2-00150AA022.000-X												
					X = 019.000 - 042.000												
Bore diameter of coupling on the application side				<i>mm</i>													
Mass moment of inertia (relates to the drive)  Clamping hub diameter [mm]  Optimized mass inertia version available on request			B	11	<i>J</i> <sub>i</sub>	<i>kgcm<sup>2</sup></i>	0.16	0.13	0.13	0.10	0.10	0.10	0.09	0.09	0.09	0.09	
						<i>10<sup>-3</sup> in.lb.s<sup>2</sup></i>	0.14	0.12	0.12	0.09	0.09	0.09	0.08	0.08	0.08	0.08	
			C	14	<i>J</i> <sub>i</sub>	<i>kgcm<sup>2</sup></i>	0.23	0.20	0.20	0.18	0.18	0.18	0.16	0.16	0.16	0.16	0.16
						<i>10<sup>-3</sup> in.lb.s<sup>2</sup></i>	0.20	0.18	0.18	0.16	0.16	0.16	0.14	0.14	0.14	0.14	0.14
			E	19	<i>J</i> <sub>i</sub>	<i>kgcm<sup>2</sup></i>	0.55	0.53	0.52	0.50	0.50	0.50	0.49	0.49	0.49	0.49	0.49
						<i>10<sup>-3</sup> in.lb.s<sup>2</sup></i>	0.49	0.47	0.46	0.44	0.44	0.44	0.43	0.43	0.43	0.43	0.43

Please use our sizing software cymex<sup>®</sup> for a detailed sizing – [www.wittenstein-cymex.com](http://www.wittenstein-cymex.com)

<sup>a)</sup> At max. 10 %  $F_{2QMax}$

<sup>b)</sup> Valid for standard clamping hub diameter

<sup>c)</sup> Refers to center of the output shaft or flange

<sup>d)</sup> Please reduce input speed at higher ambient temperatures

<sup>e)</sup> Smooth shaft

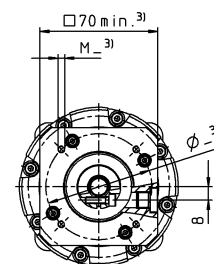
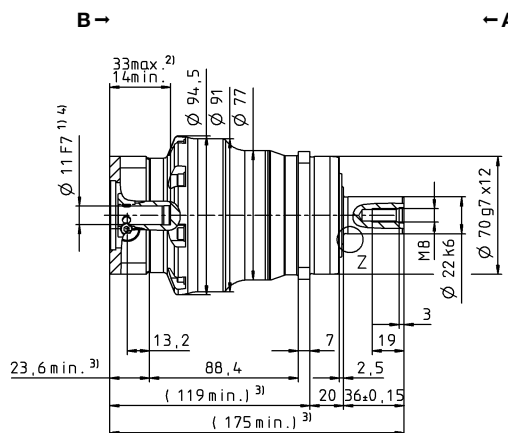
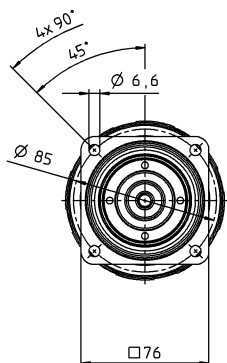
<sup>f)</sup> Please contact us to discuss  
application-specific service lifetimes

View A

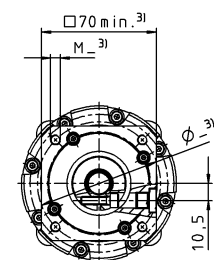
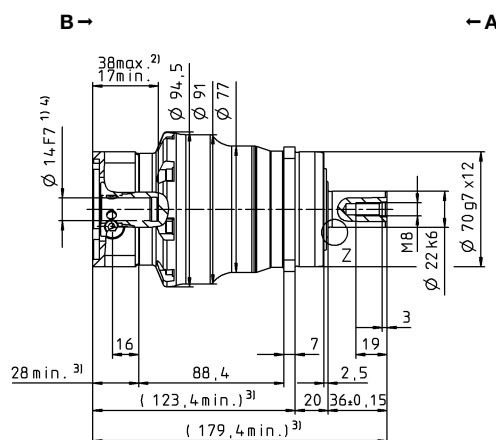
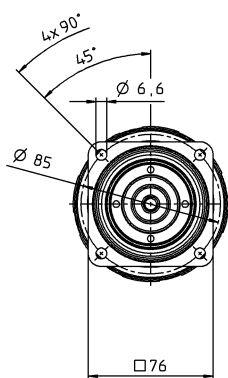
View B

# 2-stage

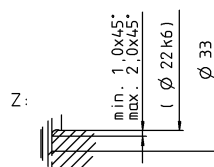
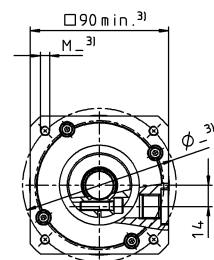
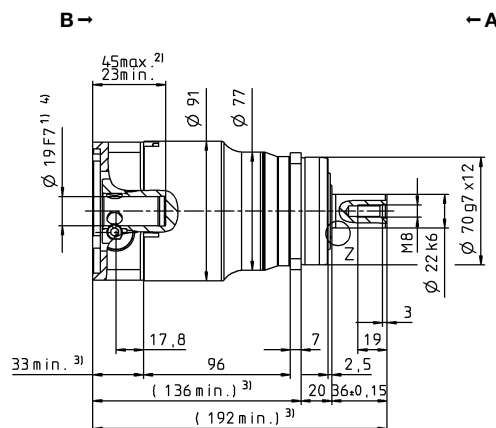
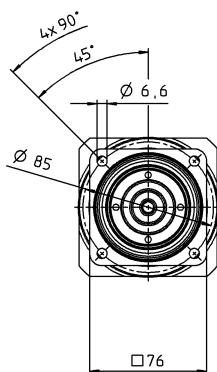
up to 11<sup>4)</sup> (B)  
clamping hub  
diameter



up to 14<sup>4)</sup> (C)<sup>5)</sup>  
clamping hub  
diameter

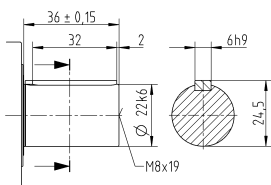


up to 19<sup>4)</sup> (E)  
clamping hub  
diameter

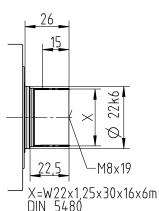


## Other output variants

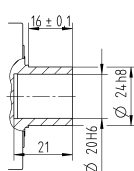
Shaft with key



Splined shaft (DIN 5480)



Shaft mounted



Non-tolerated dimensions are nominal dimensions

<sup>1)</sup> Check motor shaft fit

<sup>2)</sup> Min./Max. permissible motor shaft length. Longer motor shafts are possible, please contact alpha.

<sup>3)</sup> The dimensions depend on the motor

<sup>4)</sup> Smaller motor shaft diameter is compensated by a bushing with a minimum wall thickness of 1 mm

<sup>5)</sup> Standard clamping hub diameter

# SP<sup>+</sup> 100 MF 1-stage

				1-stage							
Ratio				<i>i</i>		3	4	5	7	8	10
Max. torque <sup>a) b) e)</sup>				<i>T</i> <sub>2a</sub>	<i>Nm</i>	376	495	495	428	376	376
					<i>in.lb</i>	3328	4381	4381	3784	3328	3328
Max. acceleration torque <sup>b) e)</sup> (max. 1000 cycles per hour)				<i>T</i> <sub>2B</sub>	<i>Nm</i>	282	378	378	378	282	282
					<i>in.lb</i>	2496	3346	3346	3346	2496	2496
Nominal torque (at <i>n</i> <sub>IN</sub> )				<i>T</i> <sub>2N</sub>	<i>Nm</i>	131	171	169	166	166	174
					<i>in.lb</i>	1157	1510	1498	1473	1470	1538
Emergency stop torque <sup>a) b) e)</sup> (permitted 1000 times during the service life of the gearbox)				<i>T</i> <sub>2Not</sub>	<i>Nm</i>	500	625	625	625	625	625
					<i>in.lb</i>	4425	5532	5532	5532	5532	5532
Permitted average input speed (at <i>T</i> <sub>2N</sub> and 20 °C ambient temperature) <sup>d)</sup>				<i>n</i> <sub>1N</sub>	<i>rpm</i>	2500	2500	2500	2800	2800	2800
Max. input speed				<i>n</i> <sub>1Max</sub>	<i>rpm</i>	5500	5500	5500	5500	5500	5500
Mean no load running torque <sup>b)</sup> (at <i>n</i> <sub>i</sub> = 3000 rpm and 20 °C gearbox temperature)				<i>T</i> <sub>012</sub>	<i>Nm</i>	3.1	2.4	2.1	1.3	1.0	1.0
					<i>in.lb</i>	28	21	18	12	9.2	9.2
Max. backlash				<i>j</i> <sub>t</sub>	<i>arcmin</i>	Standard ≤ 3 / Reduced ≤ 1					
Torsional rigidity <sup>b)</sup>				<i>C</i> <sub>t21</sub>	<i>Nm/arcmin</i>	31					
					<i>in.lb/arcmin</i>	274					
Max. axial force <sup>c)</sup>				<i>F</i> <sub>2AMax</sub>	<i>N</i>	5650					
					<i>lb<sub>f</sub></i>	1271					
Max. lateral force <sup>c)</sup>				<i>F</i> <sub>2QMax</sub>	<i>N</i>	6300					
					<i>lb<sub>f</sub></i>	1418					
Max. tilting moment				<i>M</i> <sub>2KMax</sub>	<i>Nm</i>	500					
					<i>in.lb</i>	4425					
Efficiency at full load				<i>η</i>	%	97					
Service life <sup>f)</sup>				<i>L</i> <sub>h</sub>	<i>h</i>	> 20000					
Weight (incl. standard adapter plate)				<i>m</i>	<i>kg</i>	7.7					
					<i>lb<sub>m</sub></i>	17					
Operating noise (at reference ratio and reference speed – ratio-specific values available in cymex®)				<i>L</i> <sub>PA</sub>	<i>dB(A)</i>	≤ 58					
Max. permitted housing temperature					°C	+90					
					<i>F</i>	194					
Ambient temperature					°C	-15 to +40					
					<i>F</i>	5 to 104					
Lubrication						Lubricated for life					
Direction of rotation						In- and output same direction					
Protection class						IP 65					
Metal bellows coupling (recommended product type – validate sizing with cymex®)						BC2-00300AA032.000-X					
					<i>mm</i>	X = 024.000 - 060.000					
Mass moment of inertia (relates to the drive) Clamping hub diameter [mm] Optimized mass inertia version available on request	E	19	<i>J</i> <sub>1</sub>	<i>kgcm<sup>2</sup></i>	3.29	2.35	1.92	1.60	1.38	1.38	
				<i>10<sup>-3</sup> in.lb.s<sup>2</sup></i>	2.91	2.08	1.70	1.42	1.22	1.22	
	G	24	<i>J</i> <sub>1</sub>	<i>kgcm<sup>2</sup></i>	3.99	3.04	2.61	2.29	2.07	2.07	
				<i>10<sup>-3</sup> in.lb.s<sup>2</sup></i>	3.53	2.69	2.31	2.03	1.83	1.83	
	H	28	<i>J</i> <sub>1</sub>	<i>kgcm<sup>2</sup></i>	3.59	2.65	2.22	1.90	1.68	1.68	
				<i>10<sup>-3</sup> in.lb.s<sup>2</sup></i>	3.18	2.35	1.96	1.68	1.49	1.49	
	K	38	<i>J</i> <sub>1</sub>	<i>kgcm<sup>2</sup></i>	11.1	10.1	9.68	9.36	9.14	9.14	
				<i>10<sup>-3</sup> in.lb.s<sup>2</sup></i>	9.82	8.94	8.57	8.28	8.09	8.09	

Please use our sizing software cymex<sup>®</sup> for a detailed sizing – [www.wittenstein-cymex.com](http://www.wittenstein-cymex.com)

<sup>a)</sup> At max. 10 %  $F_{2QMax}$

<sup>b)</sup> Valid for standard clamping hub diameter

<sup>c)</sup> Refers to center of the output shaft or flange

<sup>d)</sup> Please reduce input speed at higher ambient temperatures

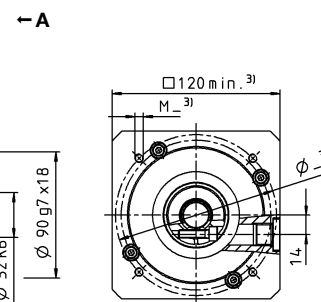
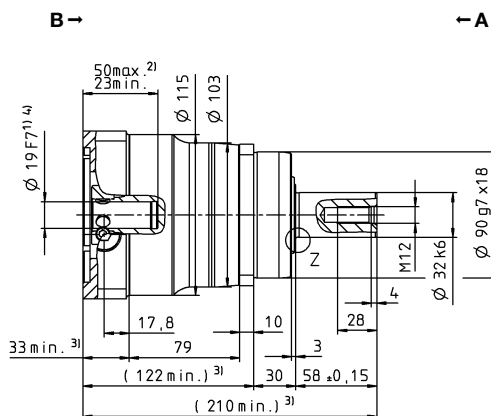
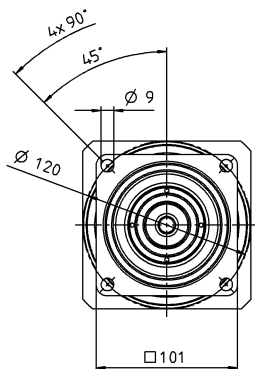
<sup>e)</sup> Smooth shaft

<sup>f)</sup> Please contact us to discuss  
application-specific service lifetimes

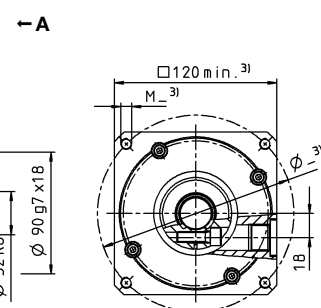
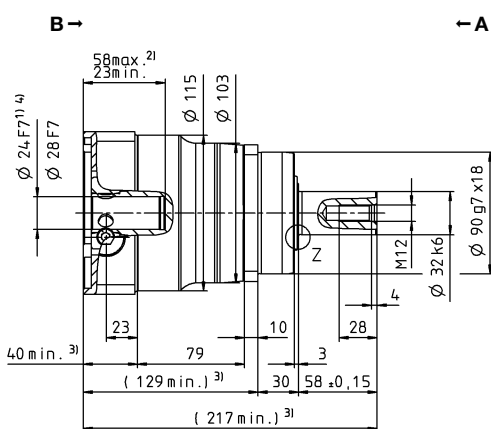
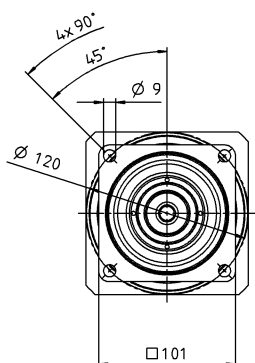


# 1-stage

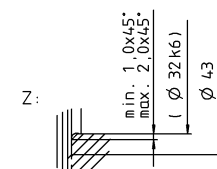
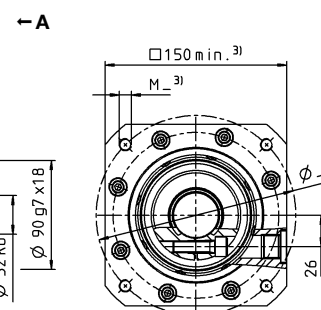
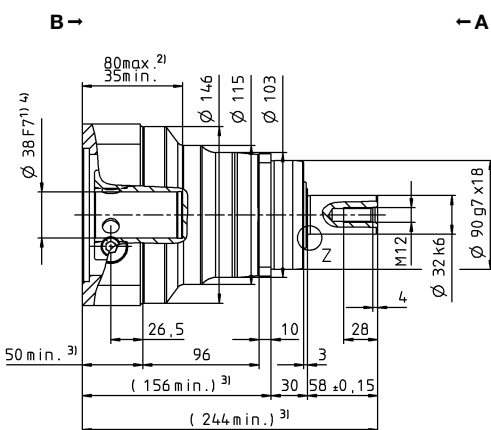
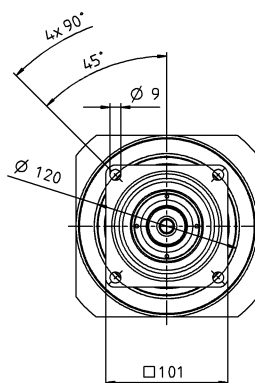
up to 19<sup>4)</sup> (E)  
clamping hub diameter



up to 24/28<sup>4)</sup>  
(G<sup>5)</sup>/H) clamping  
hub diameter

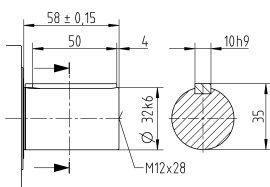


up to 38<sup>4)</sup> (K)  
clamping hub diameter

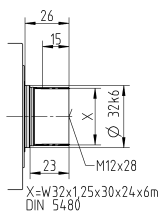


## Other output variants

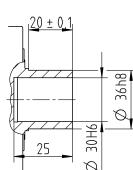
Shaft with key



Spined shaft (DIN 5480)



Shaft mounted



Non-tolerated dimensions are nominal dimensions

<sup>1)</sup> Check motor shaft fit

<sup>2)</sup> Min./Max. permissible motor shaft length. Longer motor shafts are possible, please contact alpha.

<sup>3)</sup> The dimensions depend on the motor

<sup>4)</sup> Smaller motor shaft diameter is compensated by a bushing with a minimum wall thickness of 1 mm

<sup>5)</sup> Standard clamping hub diameter

# SP<sup>+</sup> 100 MF 2-stage

				2-stage												
Ratio			<i>i</i>		16	20	25	28	32	35	40	50	64	70	100	
Max. torque <sup>a) b) e)</sup>			<i>T</i> <sub>2a</sub>	Nm	347	347	347	347	347	347	347	347	259	347	259	
				in.lb	3067	3067	3067	3067	3067	3067	3067	3067	2288	3067	2288	
Max. acceleration torque <sup>b) e)</sup> (max. 1000 cycles per hour)			<i>T</i> <sub>2B</sub>	Nm	347	347	347	347	347	347	347	347	259	347	259	
				in.lb	3067	3067	3067	3067	3067	3067	3067	3067	2288	3067	2288	
Nominal torque (at <i>n</i> <sub>IN</sub> )			<i>T</i> <sub>2N</sub>	Nm	243	259	257	277	243	277	277	277	207	277	207	
				in.lb	2146	2295	2277	2453	2153	2453	2453	2453	1830	2453	1830	
Emergency stop torque <sup>a) b) e)</sup> (permitted 1000 times during the service life of the gearbox)			<i>T</i> <sub>2Not</sub>	Nm	625	625	625	625	625	625	625	625	625	625	625	
				in.lb	5532	5532	5532	5532	5532	5532	5532	5532	5532	5532	5532	
Permitted average input speed (at <i>T</i> <sub>2N</sub> and 20 °C ambient temperature) <sup>d)</sup>			<i>n</i> <sub>1N</sub>	rpm	3100	3100	3100	3100	3100	3100	3100	3500	3500	4200	4200	
Max. input speed			<i>n</i> <sub>1Max</sub>	rpm	6500	6500	6500	6500	6500	6500	6500	6500	6500	6500	6500	
Mean no load running torque <sup>b)</sup> (at <i>n</i> <sub>1</sub> = 3000 rpm and 20 °C gearbox temperature)			<i>T</i> <sub>012</sub>	Nm	1.0	0.93	0.85	0.77	0.86	0.54	0.54	0.46	0.46	0.39	0.37	
				in.lb	9.2	8.2	7.5	6.8	7.6	4.8	4.8	4.1	4.1	3.5	3.3	
Max. backlash			<i>j</i> <sub>t</sub>	arcmin	Standard ≤ 5 / Reduced ≤ 3											
Torsional rigidity <sup>b)</sup>			<i>C</i> <sub>t21</sub>	Nm/arcmin	31											
				in.lb/arcmin	274											
Max. axial force <sup>c)</sup>			<i>F</i> <sub>2AMax</sub>	N	5650											
				lb <sub>f</sub>	1271											
Max. lateral force <sup>c)</sup>			<i>F</i> <sub>2QMax</sub>	N	6300											
				lb <sub>f</sub>	1418											
Max. tilting moment			<i>M</i> <sub>2KMax</sub>	Nm	500											
				in.lb	4425											
Efficiency at full load			<i>η</i>	%	94											
Service life <sup>f)</sup>			<i>L</i> <sub>h</sub>	h	> 20000											
Weight (incl. standard adapter plate)			<i>m</i>	kg	7.9											
				lb <sub>m</sub>	17.5											
Operating noise (at reference ratio and reference speed – ratio-specific values available in cymex®)			<i>L</i> <sub>PA</sub>	dB(A)	≤ 56											
Max. permitted housing temperature				°C	+90											
				F	194											
Ambient temperature				°C	–15 to +40											
				F	5 to 104											
Lubrication					Lubricated for life											
Direction of rotation					In- and output same direction											
Protection class					IP 65											
Metal bellows coupling (recommended product type – validate sizing with cymex®)					BC2-00300AA032.000-X											
				mm	X = 024.000 - 060.000											
Mass moment of inertia (relates to the drive)  Clamping hub diameter [mm]  Optimized mass inertia version available on request	C	14	<i>J</i> <sub>1</sub>	kgcm <sup>2</sup>	0.64	0.54	0.52	0.43	0.43	0.43	0.38	0.38	0.54	0.37	0.37	
				10 <sup>-3</sup> in.lb.s <sup>2</sup>	0.57	0.48	0.46	0.38	0.38	0.38	0.34	0.34	0.48	0.33	0.33	
	E	19	<i>J</i> <sub>1</sub>	kgcm <sup>2</sup>	0.81	0.70	0.68	0.60	0.60	0.59	0.55	0.54	0.38	0.54	0.54	
				10 <sup>-3</sup> in.lb.s <sup>2</sup>	0.72	0.62	0.60	0.53	0.53	0.52	0.49	0.48	0.34	0.48	0.48	
	G	24	<i>J</i> <sub>1</sub>	kgcm <sup>2</sup>	2.18	2.07	2.05	1.97	1.97	1.96	1.92	1.91	1.91	1.91	1.91	
				10 <sup>-3</sup> in.lb.s <sup>2</sup>	1.93	1.83	1.81	1.74	1.74	1.73	1.70	1.69	1.69	1.69	1.69	
	H	28	<i>J</i> <sub>1</sub>	kgcm <sup>2</sup>	1.98	1.90	1.88	1.81	1.81	1.80	1.76	1.75	1.75	1.75	1.75	1.75
				10 <sup>-3</sup> in.lb.s <sup>2</sup>	1.75	1.68	1.66	1.60	1.60	1.59	1.56	1.55	1.55	1.55	1.55	

Please use our sizing software cymex<sup>®</sup> for a detailed sizing – [www.wittenstein-cymex.com](http://www.wittenstein-cymex.com)

<sup>a)</sup> At max. 10 %  $F_{2QMax}$

<sup>b)</sup> Valid for standard clamping hub diameter

<sup>c)</sup> Refers to center of the output shaft or flange

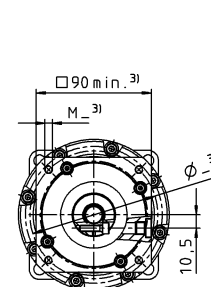
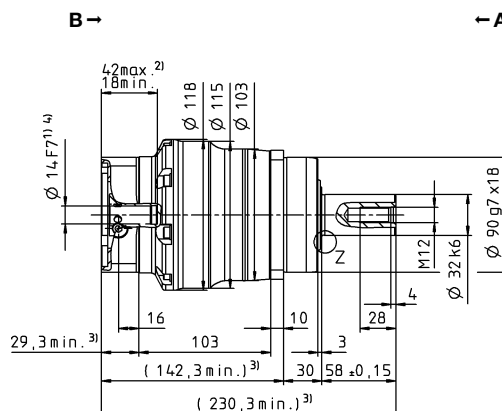
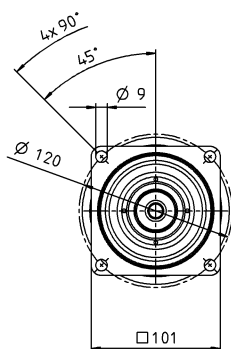
<sup>d)</sup> Please reduce input speed at higher ambient temperatures

<sup>e)</sup> Smooth shaft

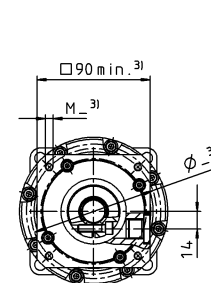
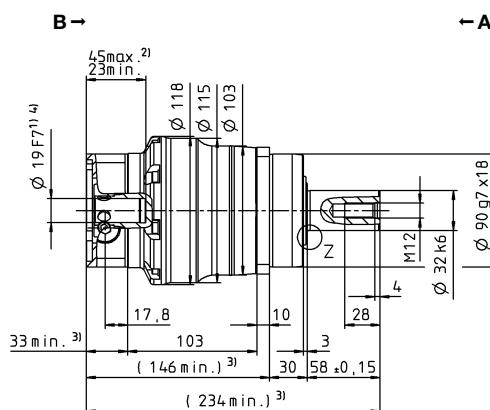
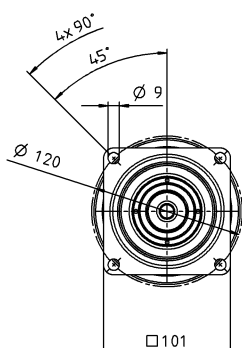
<sup>f)</sup> Please contact us to discuss  
application-specific service lifetimes

# 2-stage

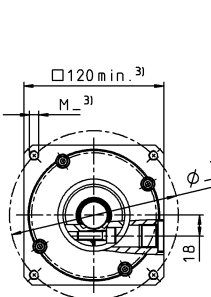
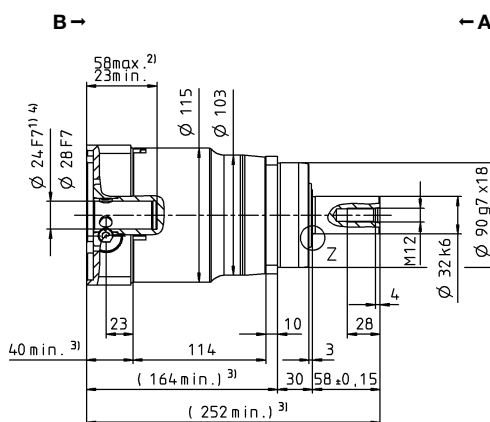
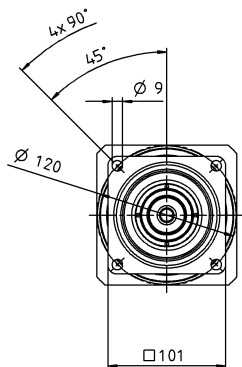
up to 14<sup>4)</sup> (C)  
clamping hub  
diameter



up to 19<sup>4)</sup> (E)<sup>5)</sup>  
clamping hub  
diameter

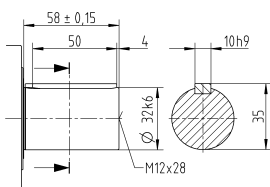


up to 24/28<sup>4)</sup>  
(G/H) clamping  
hub diameter

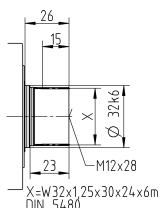


## Other output variants

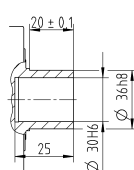
Shaft with key



Spined shaft (DIN 5480)



Shaft mounted



Non-tolerated dimensions are nominal dimensions

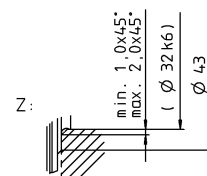
<sup>1)</sup> Check motor shaft fit

<sup>2)</sup> Min./Max. permissible motor shaft length. Longer motor shafts are possible, please contact alpha.

<sup>3)</sup> The dimensions depend on the motor

<sup>4)</sup> Smaller motor shaft diameter is compensated by a bushing with a minimum wall thickness of 1 mm

<sup>5)</sup> Standard clamping hub diameter



# SP<sup>+</sup> 140 MF 1-stage

				1-stage									
Ratio				i		3	4	5	7	8	10		
Max. torque <sup>a) b) e)</sup>				T <sub>2a</sub>	Nm	624	1056	1056	825	720	720		
					in.lb	5523	9346	9346	7302	6373	6373		
Max. acceleration torque <sup>b) e)</sup> (max. 1000 cycles per hour)				T <sub>2B</sub>	Nm	468	792	792	792	636	636		
					in.lb	4142	7010	7010	7010	5629	5629		
Nominal torque (at n <sub>IN</sub> )				T <sub>2N</sub>	Nm	202	335	333	319	312	327		
					in.lb	1786	2962	2944	2820	2763	2894		
Emergency stop torque <sup>a) b) e)</sup> (permitted 1000 times during the service life of the gearbox)				T <sub>2Not</sub>	Nm	1250	1350	1350	1350	1250	1250		
					in.lb	11064	11949	11949	11949	11064	11064		
Permitted average input speed (at T <sub>2N</sub> and 20 °C ambient temperature) <sup>d)</sup>				n <sub>1N</sub>	rpm	2100	2100	2100	2600	2600	2600		
Max. input speed				n <sub>1Max</sub>	rpm	5000	5000	5000	5000	5000	5000		
Mean no load running torque <sup>b)</sup> (at n <sub>i</sub> = 3000 rpm and 20 °C gearbox temperature)				T <sub>012</sub>	Nm	6.7	5.4	4.4	3.0	2.5	2.2		
					in.lb	60	47	39	27	23	19		
Max. backlash				j <sub>t</sub>	arcmin	Standard ≤ 3 / Reduced ≤ 1							
Torsional rigidity <sup>b)</sup>				C <sub>t21</sub>	Nm/arcmin	53							
					in.lb/arcmin	469							
Max. axial force <sup>c)</sup>				F <sub>2AMax</sub>	N	9870							
					lb <sub>f</sub>	2221							
Max. lateral force <sup>c)</sup>				F <sub>2QMax</sub>	N	9600							
					lb <sub>f</sub>	2160							
Max. tilting moment				M <sub>2KMax</sub>	Nm	1000							
					in.lb	8851							
Efficiency at full load				η	%	97							
Service life <sup>f)</sup>				L <sub>h</sub>	h	> 20000							
Weight (incl. standard adapter plate)				m	kg	17.2							
					lb <sub>m</sub>	38							
Operating noise (at reference ratio and reference speed – ratio-specific values available in cymex®)				L <sub>PA</sub>	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							
Direction of rotation						In- and output same direction							
Protection class						IP 65							
Metal bellows coupling (recommended product type – validate sizing with cymex®)						BC2-00800AA040.000-X							
Bore diameter of coupling on the application side					mm	X = 040.000 - 075.000							
Mass moment of inertia (relates to the drive) Clamping hub diameter [mm] Optimized mass inertia version available on request				G	24	J <sub>1</sub>	kgcm <sup>2</sup>	10.7	7.82	6.79	5.84	5.28	
							10 <sup>-3</sup> in.lb.s <sup>2</sup>	9.47	6.92	6.01	5.17	4.67	4.67
				I	32	J <sub>1</sub>	kgcm <sup>2</sup>	13.8	11.0	9.95	9.00	8.44	8.44
							10 <sup>-3</sup> in.lb.s <sup>2</sup>	12.2	9.74	8.81	7.97	7.47	7.47
				K	38	J <sub>1</sub>	kgcm <sup>2</sup>	14.9	12.1	11.0	10.1	9.51	9.51
							10 <sup>-3</sup> in.lb.s <sup>2</sup>	13.2	10.7	9.74	8.94	8.42	8.42
				M	48	J <sub>1</sub>	kgcm <sup>2</sup>	29.5	26.7	25.6	24.7	24.2	24.2
							10 <sup>-3</sup> in.lb.s <sup>2</sup>	26.1	23.6	22.7	21.9	21.4	21.4

Please use our sizing software cymex<sup>®</sup> for a detailed sizing – [www.wittenstein-cymex.com](http://www.wittenstein-cymex.com)

<sup>a)</sup> At max. 10 %  $F_{2QMax}$

<sup>b)</sup> Valid for standard clamping hub diameter

<sup>c)</sup> Refers to center of the output shaft or flange

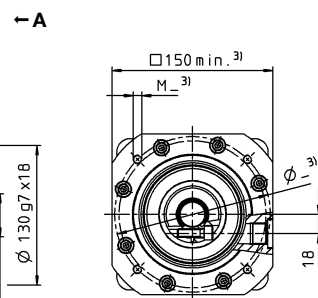
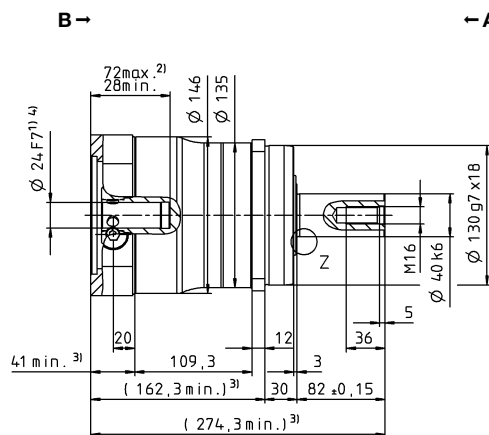
<sup>d)</sup> Please reduce input speed at higher ambient temperatures

<sup>e)</sup> Smooth shaft

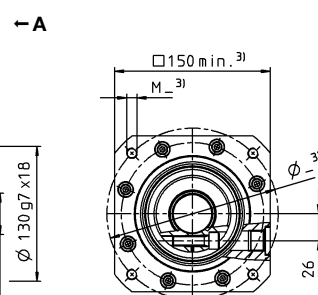
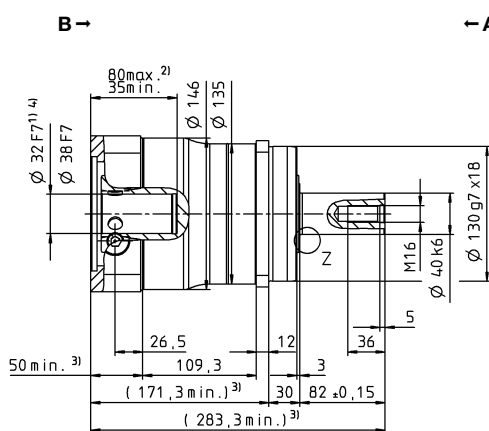
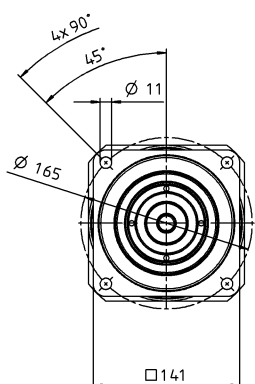
<sup>f)</sup> Please contact us to discuss  
application-specific service lifetimes



up to 24 <sup>4)</sup> (G)  
clamping hub  
diameter

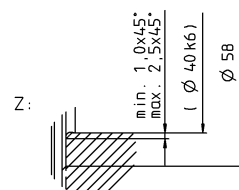
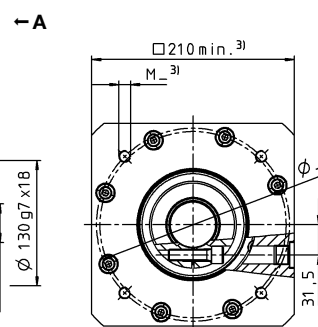
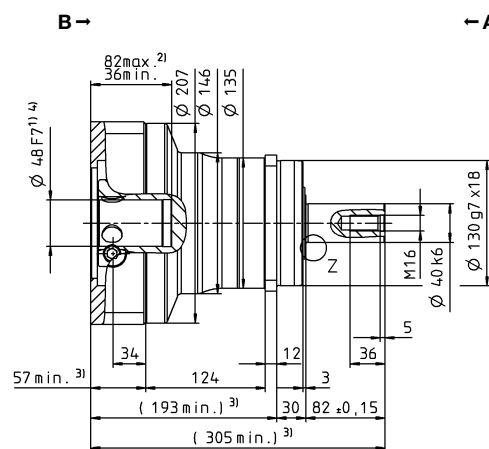
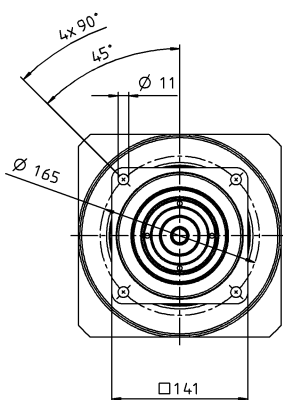


up to 32/38 <sup>4)</sup>  
(I/K<sup>5)</sup>) clamping  
hub diameter



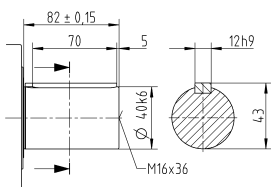
Motor shaft diameter [mm]

up to 48 <sup>4)</sup> (M)  
clamping hub  
diameter

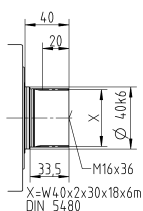


## Other output variants

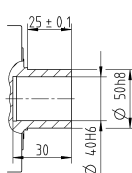
Shaft with key



Splined shaft (DIN 5480)



Shaft mounted



Non-tolerated dimensions are nominal dimensions

- 1) Check motor shaft fit

2) Min./Max. permissible motor shaft length. Longer motor shafts are possible, please contact alpha.

3) The dimensions depend on the motor

4) Smaller motor shaft diameter is compensated by a bushing with a minimum wall thickness of 1 mm

<sup>5)</sup> Standard clamping hub diameter

# SP<sup>+</sup> 140 MF 2-stage

				2-stage												
Ratio				i		16	20	25	28	32	35	40	50	64	70	100
Max. torque <sup>a) b) e)</sup>				T <sub>2a</sub>	Nm	726	726	670	726	726	670	726	670	583	726	583
					in.lb	6426	6426	5934	6426	6426	5934	6426	5934	5160	6426	5160
Max. acceleration torque <sup>b) e)</sup> (max. 1000 cycles per hour)				T <sub>2B</sub>	Nm	726	726	670	726	726	670	726	670	583	726	583
					in.lb	6426	6426	5934	6426	6426	5934	6426	5930	5164	6426	5160
Nominal torque (at n <sub>IN</sub> )				T <sub>2N</sub>	Nm	461	493	489	545	464	536	581	536	466	581	466
					in.lb	4078	4361	4332	4824	4104	4747	5141	4747	4128	5141	4128
Emergency stop torque <sup>a) b) e)</sup> (permitted 1000 times during the service life of the gearbox)				T <sub>2Not</sub>	Nm	1350	1350	1350	1350	1350	1350	1350	1350	1350	1350	1250
					in.lb	11949	11949	11949	11949	11949	11949	11949	11949	11949	11949	11064
Permitted average input speed (at T <sub>2N</sub> and 20 °C ambient temperature) <sup>d)</sup>				n <sub>1N</sub>	rpm	2900	2900	2900	2900	2900	2900	2900	3200	3200	3200	3900
Max. input speed				n <sub>1Max</sub>	rpm	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000
Mean no load running torque <sup>b)</sup> (at n <sub>i</sub> = 3000 rpm and 20 °C gearbox temperature)				T <sub>012</sub>	Nm	2.4	2.1	2.0	1.8	1.6	1.2	1.2	1.1	1.1	0.88	0.80
					in.lb	21	19	17	16	14	11	11	9.4	9.4	7.8	7.1
Max. backlash				j <sub>t</sub>	arcmin	Standard ≤ 5 / Reduced ≤ 3										
Torsional rigidity <sup>b)</sup>				C <sub>121</sub>	Nm/arcmin	53										
					in.lb/arcmin	469										
Max. axial force <sup>c)</sup>				F <sub>2AMax</sub>	N	9870										
					lb <sub>f</sub>	2221										
Max. lateral force <sup>c)</sup>				F <sub>2QMax</sub>	N	9600										
					lb <sub>f</sub>	2160										
Max. tilting moment				M <sub>2KMax</sub>	Nm	1000										
					in.lb	8851										
Efficiency at full load				η	%	94										
Service life <sup>f)</sup>				L <sub>n</sub>	h	> 20000										
Weight (incl. standard adapter plate)				m	kg	17										
					lb <sub>m</sub>	37.6										
Operating noise (at reference ratio and reference speed – ratio-specific values available in cymex <sup>®</sup> )				L <sub>PA</sub>	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										
Direction of rotation						In- and output same direction										
Protection class						IP 65										
Metal bellows coupling (recommended product type – validate sizing with cymex <sup>®</sup> )						BC2-00800AA040.000-X										
					mm	X = 040.000 - 075.000										
Mass moment of inertia (relates to the drive)  Clamping hub diameter [mm]  Optimized mass inertia version available on request	E	19	J <sub>i</sub>	kgcm <sup>2</sup>	2.50	2.01	1.97	1.65	1.65	1.63	1.40	1.39	1.39	1.38	1.38	
				10 <sup>-3</sup> in.lb.s <sup>2</sup>	2.21	1.78	1.74	1.46	1.46	1.44	1.24	1.23	1.23	1.22	1.22	
	G	24	J <sub>i</sub>	kgcm <sup>2</sup>	3.19	2.71	2.67	2.34	2.34	2.32	2.10	2.08	2.08	2.08	2.07	
				10 <sup>-3</sup> in.lb.s <sup>2</sup>	2.82	2.40	2.36	2.07	2.07	2.05	1.86	1.84	1.84	1.84	1.83	
	K	38	J <sub>i</sub>	kgcm <sup>2</sup>	10.3	9.77	9.73	9.41	9.41	9.39	9.16	9.15	9.15	9.14	9.14	
				10 <sup>-3</sup> in.lb.s <sup>2</sup>	9.07	8.65	8.61	8.33	8.33	8.31	8.11	8.10	8.10	8.09	8.09	

Please use our sizing software cymex<sup>®</sup> for a detailed sizing – [www.wittenstein-cymex.com](http://www.wittenstein-cymex.com)

<sup>a)</sup> At max. 10 %  $F_{2QMax}$

<sup>b)</sup> Valid for standard clamping hub diameter

<sup>c)</sup> Refers to center of the output shaft or flange

<sup>d)</sup> Please reduce input speed at higher ambient temperatures

<sup>e)</sup> Smooth shaft

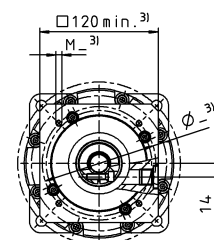
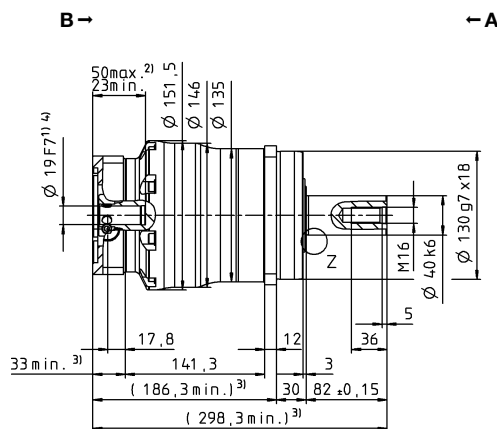
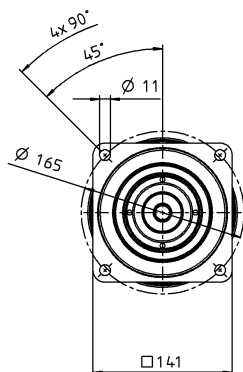
<sup>f)</sup> Please contact us to discuss  
application-specific service lifetimes

View A

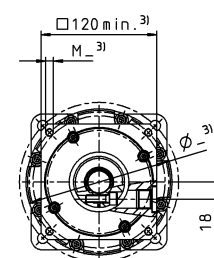
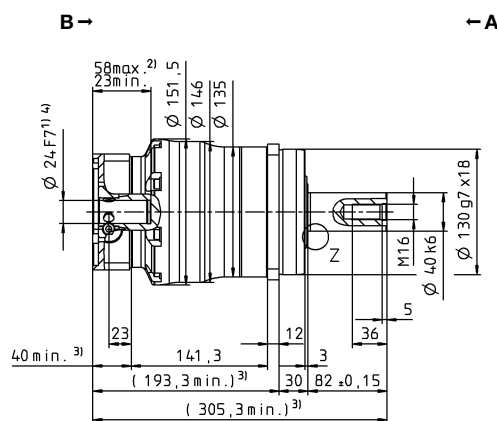
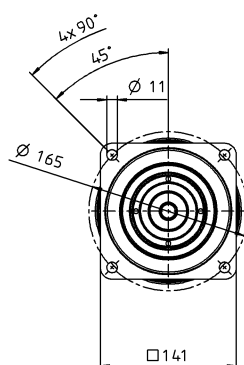
View B

# 2-stage

up to 19<sup>4)</sup> (E)  
clamping hub  
diameter

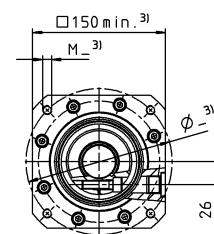
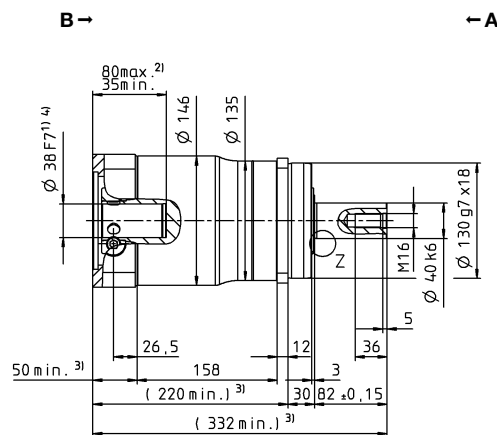
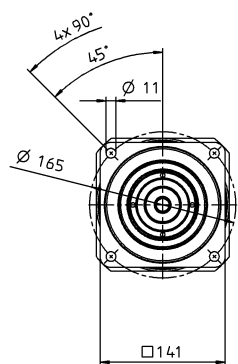


up to 24<sup>4)</sup> (G)<sup>5)</sup>  
clamping hub  
diameter



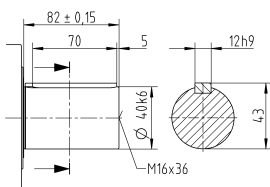
Motor shaft diameter [mm]

up to 38<sup>4)</sup> (K)  
clamping hub  
diameter

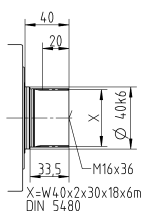


## Other output variants

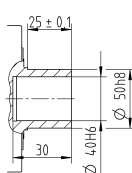
Shaft with key



Splined shaft (DIN 5480)



Shaft mounted



Non-tolerated dimensions are nominal dimensions

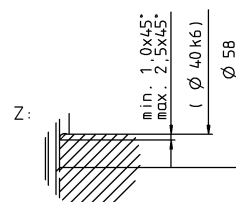
<sup>1)</sup> Check motor shaft fit

<sup>2)</sup> Min./Max. permissible motor shaft length. Longer motor shafts are possible, please contact alpha.

<sup>3)</sup> The dimensions depend on the motor

<sup>4)</sup> Smaller motor shaft diameter is compensated by a bushing with a minimum wall thickness of 1 mm

<sup>5)</sup> Standard clamping hub diameter



# SP<sup>+</sup> 180 MF 1-stage

				1-stage								
Ratio			<i>i</i>		3	4	5	7	8	10		
Max. torque <sup>a) b) e)</sup>			<i>T</i> <sub>2a</sub>	<i>Nm</i>	1552	1936	1936	1936	1552	1552		
				<i>in.lb</i>	13736	17135	17135	17135	13736	13736		
Max. acceleration torque <sup>b) e)</sup> (max. 1000 cycles per hour)			<i>T</i> <sub>2B</sub>	<i>Nm</i>	1164	1452	1452	1452	1164	1164		
				<i>in.lb</i>	10302	12851	12851	12851	10302	10302		
Nominal torque (at <i>n</i> <sub>IN</sub> )			<i>T</i> <sub>2N</sub>	<i>Nm</i>	513	927	919	825	825	864		
				<i>in.lb</i>	4544	8203	8134	7305	7305	7644		
Emergency stop torque <sup>a) b) e)</sup> (permitted 1000 times during the service life of the gearbox)			<i>T</i> <sub>2Not</sub>	<i>Nm</i>	2750	2750	2750	2750	2750	2750		
				<i>in.lb</i>	24340	24340	24340	24340	24340	24340		
Permitted average input speed (at <i>T</i> <sub>2N</sub> and 20 °C ambient temperature) <sup>d)</sup>			<i>n</i> <sub>1N</sub>	<i>rpm</i>	1500	1500	1500	2300	2300	2300		
Max. input speed			<i>n</i> <sub>1Max</sub>	<i>rpm</i>	4500	4500	4500	4500	4500	4500		
Mean no load running torque <sup>b)</sup> (at <i>n</i> <sub>i</sub> = 3000 rpm and 20 °C gearbox temperature)			<i>T</i> <sub>012</sub>	<i>Nm</i>	15	12	8.0	5.6	5.6	3.8		
				<i>in.lb</i>	135	103	71	50	50	34		
Max. backlash			<i>j</i> <sub>t</sub>	<i>arcmin</i>	Standard ≤ 3 / Reduced ≤ 1							
Torsional rigidity <sup>b)</sup>			<i>C</i> <sub>i21</sub>	<i>Nm/arcmin</i>	175							
				<i>in.lb/arcmin</i>	1549							
Max. axial force <sup>c)</sup>			<i>F</i> <sub>2AMax</sub>	<i>N</i>	15570							
				<i>lb<sub>f</sub></i>	3503							
Max. lateral force <sup>c)</sup>			<i>F</i> <sub>2QMax</sub>	<i>N</i>	15000							
				<i>lb<sub>f</sub></i>	3375							
Max. tilting moment			<i>M</i> <sub>2KMax</sub>	<i>Nm</i>	1800							
				<i>in.lb</i>	15931							
Efficiency at full load			<i>η</i>	%	97							
Service life <sup>f)</sup>			<i>L</i> <sub>h</sub>	<i>h</i>	> 20000							
Weight (incl. standard adapter plate)			<i>m</i>	<i>kg</i>	34							
				<i>lb<sub>m</sub></i>	75.1							
Operating noise (at reference ratio and reference speed – ratio-specific values available in cymex®)			<i>L</i> <sub>PA</sub>	<i>dB(A)</i>	≤ 62							
Max. permitted housing temperature				°C	+90							
				<i>F</i>	194							
Ambient temperature				°C	–15 to +40							
				<i>F</i>	5 to 104							
Lubrication					Lubricated for life							
Direction of rotation					In- and output same direction							
Protection class					IP 65							
Metal bellows coupling (recommended product type – validate sizing with cymex®)					BC2-01500AA055.000-X							
				<i>mm</i>	X = 050.000 - 080.000							
Mass moment of inertia (relates to the drive)  Clamping hub diameter [mm]  Optimized mass inertia version available on request			K	38	<i>J</i> <sub>i</sub>	<i>kgcm</i> <sup>2</sup>	50.8	33.9	27.9	22.2	22.2	19.2
						<i>10<sup>-3</sup> in.lb.s<sup>2</sup></i>	45.0	30.0	24.7	19.7	19.7	17.0
			M	48	<i>J</i> <sub>i</sub>	<i>kgcm</i> <sup>2</sup>	58.2	41.2	35.3	29.6	29.6	26.5
						<i>10<sup>-3</sup> in.lb.s<sup>2</sup></i>	51.5	36.5	31.2	26.2	26.2	23.5
			N	55	<i>J</i> <sub>i</sub>	<i>kgcm</i> <sup>2</sup>	65.7	49.7	44.0	38.5	38.5	35.4
						<i>10<sup>-3</sup> in.lb.s<sup>2</sup></i>	58.1	44.0	38.9	34.1	34.1	31.3

Please use our sizing software cymex<sup>®</sup> for a detailed sizing – [www.wittenstein-cymex.com](http://www.wittenstein-cymex.com)

<sup>a)</sup> At max. 10 %  $F_{2QMax}$

<sup>b)</sup> Valid for standard clamping hub diameter

<sup>c)</sup> Refers to center of the output shaft or flange

<sup>d)</sup> Please reduce input speed at higher ambient temperatures

<sup>e)</sup> Smooth shaft

<sup>f)</sup> Please contact us to discuss  
application-specific service lifetimes

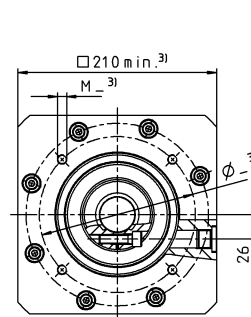
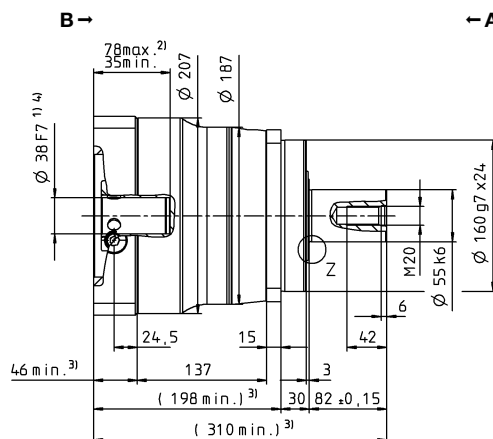
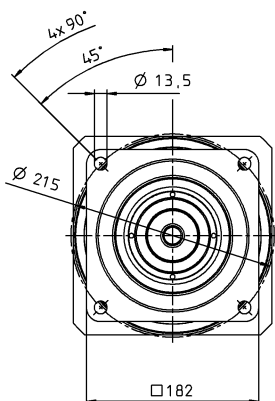


View A

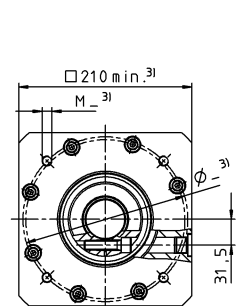
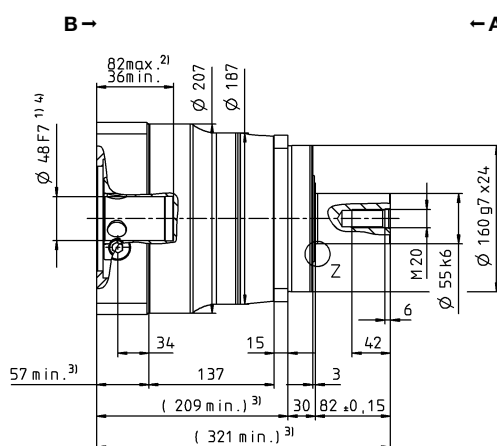
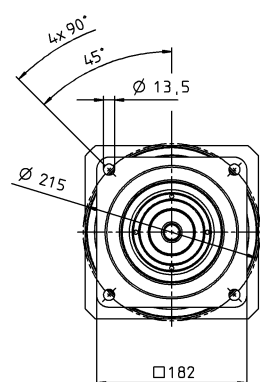
View B

# 1-stage

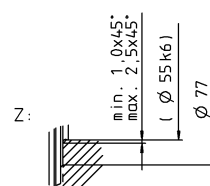
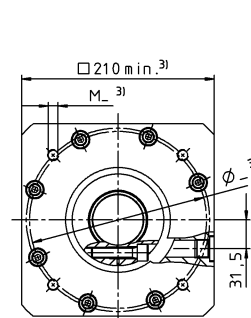
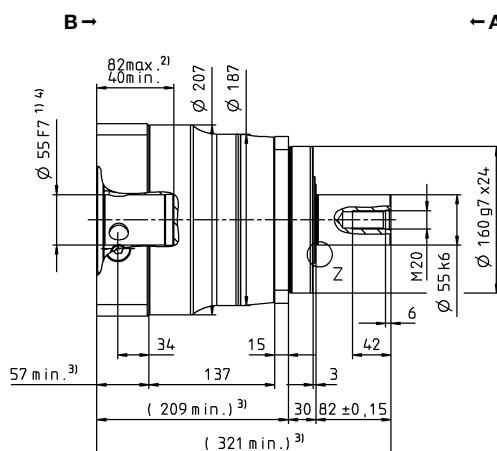
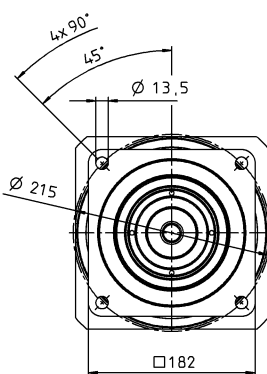
up to 38<sup>4)</sup> (K)  
clamping hub  
diameter



up to 48<sup>4)</sup> (M)<sup>5)</sup>  
clamping hub  
diameter

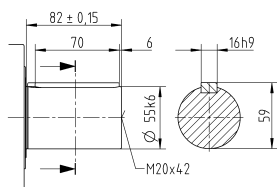


up to 55<sup>4)</sup> (N)<sup>5)</sup>  
clamping hub  
diameter

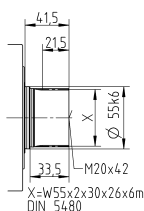


## Other output variants

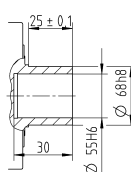
Shaft with key



Splined shaft (DIN 5480)



Shaft mounted



Non-tolerated dimensions are nominal dimensions

<sup>1)</sup> Check motor shaft fit

<sup>2)</sup> Min./Max. permissible motor shaft length. Longer motor shafts are possible, please contact alpha.

<sup>3)</sup> The dimensions depend on the motor

<sup>4)</sup> Smaller motor shaft diameter is compensated by a bushing with a minimum wall thickness of 1 mm

<sup>5)</sup> Standard clamping hub diameter

# SP<sup>+</sup> 180 MF 2-stage

				2-stage												
Ratio				i		16	20	25	28	32	35	40	50	64	70	100
Max. torque <sup>a) b) e)</sup>				T <sub>2a</sub>	Nm	1485	1485	1857	1485	1485	1857	1485	1857	1238	1356	1238
					in.lb	13146	13146	16432	13146	13146	16432	13146	16432	10955	12000	10955
Max. acceleration torque <sup>b) e)</sup> (max. 1000 cycles per hour)				T <sub>2B</sub>	Nm	1452	1452	1452	1452	1452	1452	1452	1452	1164	1356	1164
					in.lb	12851	12851	12851	12851	12851	12851	12851	12851	10302	12002	10302
Nominal torque (at n <sub>1N</sub> )				T <sub>2N</sub>	Nm	1162	1162	1162	1162	1162	1162	1162	1162	931	1085	931
					in.lb	10281	10281	10281	10281	10281	10281	10281	10281	10281	8242	9600
Emergency stop torque <sup>a) b) e)</sup> (permitted 1000 times during the service life of the gearbox)				T <sub>2Not</sub>	Nm	2750	2750	2750	2750	2750	2750	2750	2750	2750	2750	2750
					in.lb	24340	24340	24340	24340	24340	24340	24340	24340	24340	24340	24340
Permitted average input speed (at T <sub>2N</sub> and 20 °C ambient temperature) <sup>e)</sup>				n <sub>1N</sub>	rpm	2700	2700	2700	2700	2700	2700	2700	2900	2900	3200	3400
Max. input speed				n <sub>1Max</sub>	rpm	5000	5000	5000	5000	5000	5000	5000	5000	5000	5000	5000
Mean no load running torque <sup>b)</sup> (at n <sub>1</sub> = 3000 rpm and 20 °C gearbox temperature)				T <sub>012</sub>	Nm	4.7	3.9	3.6	3.3	3.3	2.8	2.2	1.9	2.2	1.8	1.8
					in.lb	42	35	32	29	29	25	20	17	20	16	16
Max. backlash				j <sub>t</sub>	arcmin	Standard ≤ 5 / Reduced ≤ 3										
Torsional rigidity <sup>b)</sup>				C <sub>i21</sub>	Nm/arcmin	175										
					in.lb/arcmin	1549										
Max. axial force <sup>c)</sup>				F <sub>2AMax</sub>	N	15570										
					lb <sub>f</sub>	3503										
Max. lateral force <sup>c)</sup>				F <sub>2QMax</sub>	N	15000										
					lb <sub>f</sub>	3375										
Max. tilting moment				M <sub>2KMax</sub>	Nm	1800										
					in.lb	15931										
Efficiency at full load				η	%	94										
Service life <sup>f)</sup>				L <sub>h</sub>	h	> 20000										
Weight (incl. standard adapter plate)				m	kg	36.4										
					lb <sub>m</sub>	80.4										
Operating noise (at reference ratio and reference speed – ratio-specific values available in cymex <sup>®</sup> )				L <sub>PA</sub>	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										
Direction of rotation						In- and output same direction										
Protection class						IP 65										
Metal bellows coupling (recommended product type – validate sizing with cymex <sup>®</sup> )						BC2-01500AA055.000-X										
					mm	X = 050.000 - 080.000										
Mass moment of inertia (relates to the drive)  Clamping hub diameter [mm]  Optimized mass inertia version available on request	G	24	J <sub>i</sub>	kgcm <sup>2</sup>	9.27	7.72	7.48	6.32	6.32	6.20	5.51	5.45	5.45	5.39	5.36	
				10 <sup>-3</sup> in.lb.s <sup>2</sup>	8.20	6.83	6.62	5.59	5.59	5.49	4.88	4.82	4.82	4.77	4.74	
	I	32	J <sub>i</sub>	kgcm <sup>2</sup>	12.4	10.9	10.6	9.48	9.48	9.36	8.67	9.68	8.55	8.55	8.52	
				10 <sup>-3</sup> in.lb.s <sup>2</sup>	11.0	9.63	9.42	8.39	8.39	8.28	7.67	8.57	7.57	7.54		
	K	38	J <sub>i</sub>	kgcm <sup>2</sup>	13.5	12.0	11.7	10.6	10.6	10.4	9.74	9.68	9.68	9.63	9.60	
				10 <sup>-3</sup> in.lb.s <sup>2</sup>	12.0	10.6	10.4	9.34	9.34	9.23	8.62	8.57	8.57	8.52	8.50	
	M	48	J <sub>i</sub>	kgcm <sup>2</sup>	28.1	26.6	26.3	25.2	25.2	25.1	24.4	24.3	24.3	24.3	24.3	
				10 <sup>-3</sup> in.lb.s <sup>2</sup>	24.9	23.5	23.3	22.3	22.3	22.2	21.6	21.5	21.5	21.5	21.5	

Please use our sizing software cymex<sup>®</sup> for a detailed sizing – [www.wittenstein-cymex.com](http://www.wittenstein-cymex.com)

<sup>a)</sup> At max. 10 %  $F_{2QMax}$

<sup>b)</sup> Valid for standard clamping hub diameter

<sup>c)</sup> Refers to center of the output shaft or flange

<sup>d)</sup> Please reduce input speed at higher ambient temperatures

<sup>e)</sup> Smooth shaft

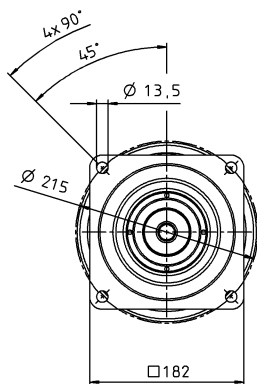
<sup>f)</sup> Please contact us to discuss  
application-specific service lifetimes

View A

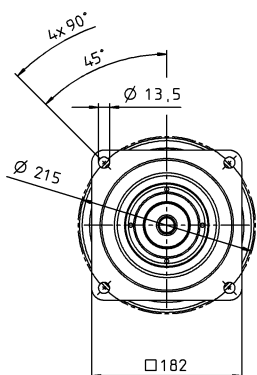
View B

# 2-stage

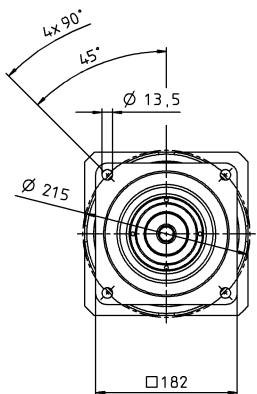
up to 24<sup>4)</sup> (G)  
clamping hub diameter



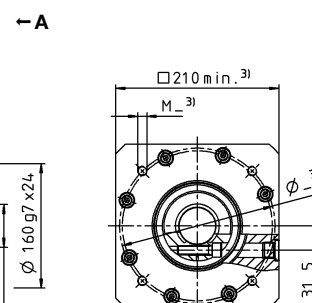
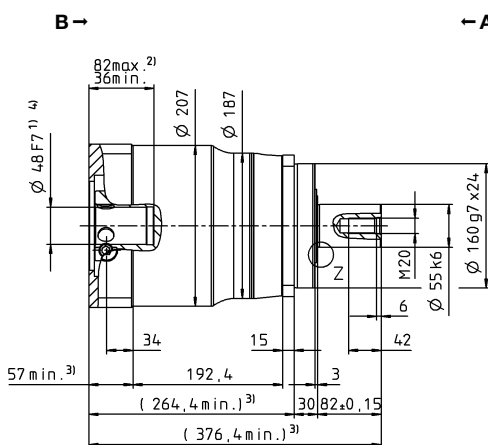
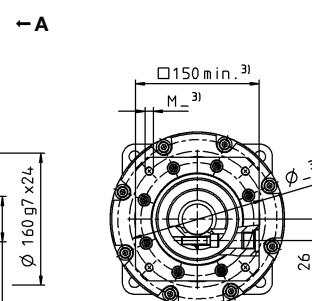
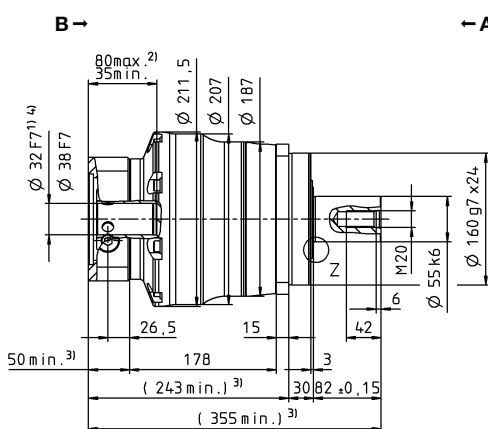
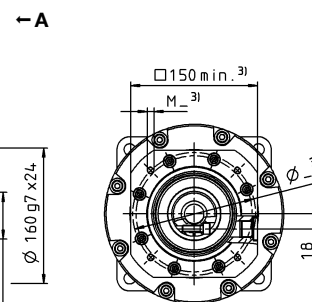
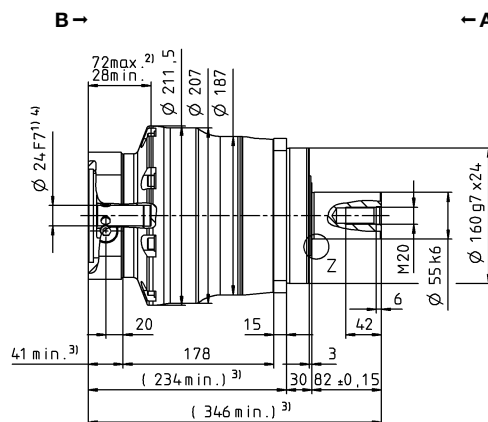
up to 32/38<sup>4)</sup>  
(I/K<sup>5)</sup>) clamping  
hub diameter



up to 48<sup>4)</sup> (M)  
clamping hub diameter

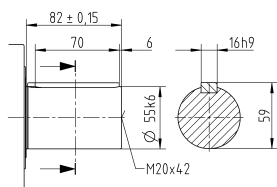


Motor shaft diameter [mm]

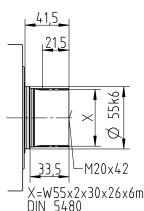


## Other output variants

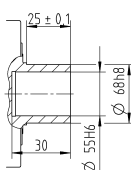
Shaft with key



Splined shaft (DIN 5480)



Shaft mounted



Non-tolerated dimensions are nominal dimensions

<sup>1)</sup> Check motor shaft fit

<sup>2)</sup> Min./Max. permissible motor shaft length. Longer motor shafts are possible, please contact alpha.

<sup>3)</sup> The dimensions depend on the motor

<sup>4)</sup> Smaller motor shaft diameter is compensated by a bushing with a minimum wall thickness of 1 mm

<sup>5)</sup> Standard clamping hub diameter

# SP<sup>+</sup> 210 MF 1-stage

			1-stage			
Ratio	<i>i</i>		4	5	7	10
Max. torque <sup>a) b) e)</sup>	$T_{2a}$	Nm	4000	4000	3840	2800
		in.lb	35403	35403	33987	24782
Max. acceleration torque <sup>b) e)</sup> (max. 1000 cycles per hour)	$T_{2B}$	Nm	3000	3000	2880	2280
		in.lb	26552	26552	25490	20180
Nominal torque (at $n_n$ )	$T_{2N}$	Nm	1895	1767	1731	1708
		in.lb	16772	15641	15323	15122
Emergency stop torque <sup>a) b) e)</sup> (permitted 1000 times during the service life of the gearbox)	$T_{2Not}$	Nm	5900	5900	5900	5900
		in.lb	52220	52220	52220	52220
Permitted average input speed (at $T_{2N}$ and 20 °C ambient temperature) <sup>d)</sup>	$n_{1N}$	rpm	1200	1500	1700	2000
Max. input speed	$n_{1Max}$	rpm	3000	3000	3000	3000
Mean no load running torque <sup>b)</sup> (at $n_i = 2000$ rpm and 20 °C gearbox temperature)	$T_{012}$	Nm	19	15	8.8	6.4
		in.lb	164	129	78	57
Max. backlash	$j_t$	arcmin	Standard $\leq 3$ / Reduced $\leq 1$			
Torsional rigidity <sup>b)</sup>	$C_{121}$	Nm/arcmin	400			
		in.lb/arcmin	3540			
Max. axial force <sup>c)</sup>	$F_{2AMax}$	N	30000			
		lb <sub>f</sub>	6750			
Max. lateral force <sup>c)</sup>	$F_{2QMax}$	N	21000			
		lb <sub>f</sub>	4725			
Max. tilting moment	$M_{2KMax}$	Nm	3100			
		in.lb	27437			
Efficiency at full load	$\eta$	%	97			
Service life <sup>f)</sup>	$L_h$	h	> 20000			
Weight (incl. standard adapter plate)	$m$	kg	56			
		lb <sub>m</sub>	123.8			
Operating noise (at reference ratio and reference speed – ratio-specific values available in cymex <sup>®</sup> )	$L_{PA}$	dB(A)	$\leq 64$			
Max. permitted housing temperature		°C	+90			
		F	194			
Ambient temperature		°C	-15 to +40			
		F	5 to 104			
Lubrication			Lubricated for life			
Direction of rotation			In- and output same direction			
Protection class			IP 65			
Metal bellows coupling (recommended product type – validate sizing with cymex <sup>®</sup> )			BC2-04000AA075.000-X			
Bore diameter of coupling on the application side		mm	X = 050.000 - 090.000			
Mass moment of inertia (relates to the drive) Clamping hub diameter [mm] Optimized mass inertia version available on request	N 55 $J_i$	kgcm <sup>2</sup>	94.3	76.9	61.5	53.1
		10 <sup>-3</sup> in.lb.s <sup>2</sup>	83.5	68.1	54.4	47.0

Please use our sizing software cymex<sup>®</sup> for a detailed sizing – [www.wittenstein-cymex.com](http://www.wittenstein-cymex.com)

<sup>a)</sup> At max. 10 %  $F_{2QMax}$

<sup>b)</sup> Valid for standard clamping hub diameter

<sup>c)</sup> Refers to center of the output shaft or flange

<sup>d)</sup> Please reduce input speed at higher ambient temperatures

<sup>e)</sup> Smooth shaft

<sup>f)</sup> Please contact us to discuss  
application-specific service lifetimes

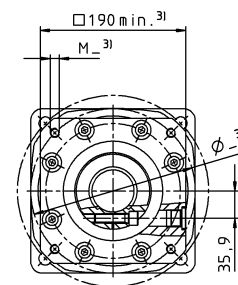
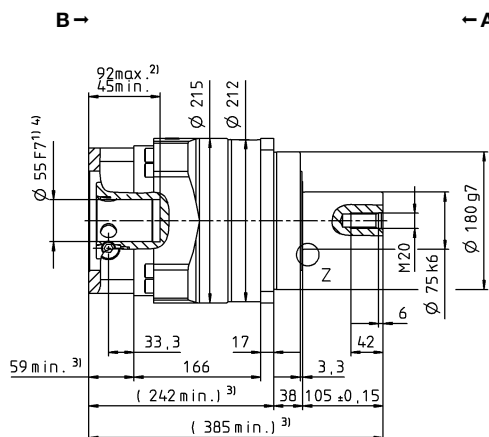
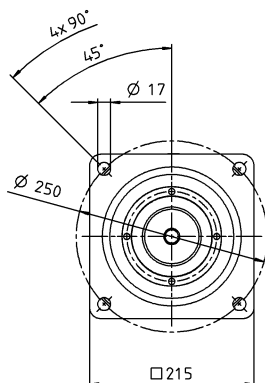


View A

View B

Motor shaft diameter [mm]

1-stage

up to 55 <sup>4)</sup> (N) <sup>5)</sup>  
clamping hub  
diameter


Planetary gearboxes

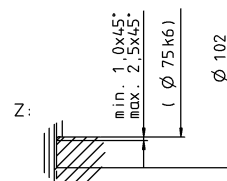
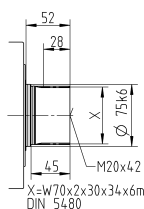
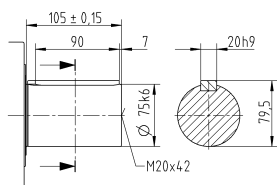
SP

MF

## Other output variants

Shaft with key

Splined shaft (DIN 5480)



Non-tolerated dimensions are nominal dimensions

<sup>1)</sup> Check motor shaft fit

<sup>2)</sup> Min./Max. permissible motor shaft length. Longer motor shafts are possible, please contact alpha.

<sup>3)</sup> The dimensions depend on the motor

<sup>4)</sup> Smaller motor shaft diameter is compensated by a bushing with a minimum wall thickness of 1 mm

<sup>5)</sup> Standard clamping hub diameter

# SP<sup>+</sup> 210 MF 2-stage

				2-stage									
Ratio		<i>i</i>		16	20	25	28	35	40	50	70	100	
Max. torque <sup>a) b) e)</sup>		<i>T</i> <sub>2a</sub>	<i>Nm</i>	3159	3159	3949	3159	3840	2880	3600	2457	2043	
			<i>in.lb</i>	27958	27958	34947	27958	33987	25490	31863	21745	18081	
Max. acceleration torque <sup>b) e)</sup> (max. 1000 cycles per hour)		<i>T</i> <sub>2B</sub>	<i>Nm</i>	2880	3000	3000	2880	2880	2840	2880	2457	2043	
			<i>in.lb</i>	25490	26552	26552	25490	25490	25136	25490	21745	18081	
Nominal torque (at <i>n</i> <sub>n</sub> )		<i>T</i> <sub>2N</sub>	<i>Nm</i>	1274	1266	1567	1294	1599	1358	1679	1965	1634	
			<i>in.lb</i>	11277	11205	13873	11452	14150	12019	14861	17396	14465	
Emergency stop torque <sup>a) b) e)</sup> (permitted 1000 times during the service life of the gearbox)		<i>T</i> <sub>2Not</sub>	<i>Nm</i>	5900	5900	5900	5900	5900	5900	5900	5900	5900	
			<i>in.lb</i>	52220	52220	52220	52220	52220	52220	52220	52220	52220	52220
Permitted average input speed (at <i>T</i> <sub>2n</sub> and 20 °C ambient temperature) <sup>d)</sup>		<i>n</i> <sub>1N</sub>	<i>rpm</i>	2500	2500	2500	2500	2500	2500	2500	3000	3000	
Max. input speed		<i>n</i> <sub>1Max</sub>	<i>rpm</i>	4500	4500	4500	4500	4500	4500	4500	4500	4500	
Mean no load running torque <sup>b)</sup> (at <i>n</i> <sub>i</sub> = 2000 rpm and 20 °C gearbox temperature)		<i>T</i> <sub>012</sub>	<i>Nm</i>	5.6	5.2	4.8	4.5	3.6	3.4	3.0	2.6	2.4	
			<i>in.lb</i>	50	46	43	39	32	30	27	23	21	
Max. backlash		<i>j</i> <sub>t</sub>	<i>arcmin</i>	Standard ≤ 5 / Reduced ≤ 3									
Torsional rigidity <sup>b)</sup>		<i>C</i> <sub>t21</sub>	<i>Nm/arcmin</i>	400									
			<i>in.lb/arcmin</i>	3540									
Max. axial force <sup>c)</sup>		<i>F</i> <sub>2AMax</sub>	<i>N</i>	30000									
			<i>lb<sub>f</sub></i>	6750									
Max. lateral force <sup>c)</sup>		<i>F</i> <sub>2QMax</sub>	<i>N</i>	21000									
			<i>lb<sub>f</sub></i>	4725									
Max. tilting moment		<i>M</i> <sub>2KMax</sub>	<i>Nm</i>	3100									
			<i>in.lb</i>	27437									
Efficiency at full load		<i>η</i>	%	94									
Service life <sup>f)</sup>		<i>L</i> <sub>h</sub>	<i>h</i>	> 20000									
Weight (incl. standard adapter plate)		<i>m</i>	<i>kg</i>	53									
			<i>lb<sub>m</sub></i>	117									
Operating noise (at reference ratio and reference speed – ratio-specific values available in cymex®)		<i>L</i> <sub>PA</sub>	<i>dB(A)</i>	≤ 57									
Max. permitted housing temperature			°C	+90									
			<i>F</i>	194									
Ambient temperature			°C	–15 to +40									
			<i>F</i>	5 to 104									
Lubrication				Lubricated for life									
Direction of rotation				In- and output same direction									
Protection class				IP 65									
Metal bellows coupling (recommended product type – validate sizing with cymex®)				BC2-04000AA075.000-X									
			<i>mm</i>	X = 050.000 - 090.000									
Mass moment of inertia (relates to the drive) Clamping hub diameter [mm] Optimized mass inertia version available on request	M	48	<i>J</i> <sub>i</sub>	<i>kgcm</i> <sup>2</sup>	34.5	31.5	30.8	30.0	29.7	28.5	28.3	28.1	28.0
				<i>10<sup>-3</sup> in.lb.s</i> <sup>2</sup>	30.5	27.9	27.3	26.6	26.3	25.2	25.0	24.9	24.8

Please use our sizing software cymex<sup>®</sup> for a detailed sizing – [www.wittenstein-cymex.com](http://www.wittenstein-cymex.com)

<sup>a)</sup> At max. 10 %  $F_{2QMax}$

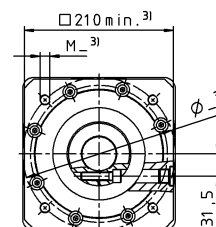
<sup>b)</sup> Valid for standard clamping hub diameter

<sup>c)</sup> Refers to center of the output shaft or flange

<sup>d)</sup> Please reduce input speed at higher ambient temperatures

<sup>e)</sup> Smooth shaft

<sup>f)</sup> Please contact us to discuss  
application-specific service lifetimes



MF

# SP+ 240 MF 1-stage

			1-stage			
Ratio	<i>i</i>		4	5	7	10
Max. torque <sup>a) b) e)</sup>	$T_{2a}$	Nm	5700	5700	5700	4000
		in.lb	50450	50450	50450	35403
Max. acceleration torque <sup>b) e)</sup> (max. 1000 cycles per hour)	$T_{2B}$	Nm	5400	5400	5160	4000
		in.lb	47794	47794	45670	35403
Nominal torque (at $n_n$ )	$T_{2N}$	Nm	3038	2872	2737	2735
		in.lb	26885	25418	24223	24208
Emergency stop torque <sup>a) b) e)</sup> (permitted 1000 times during the service life of the gearbox)	$T_{2Not}$	Nm	8500	8500	8500	6850
		in.lb	75232	75232	75232	60628
Permitted average input speed (at $T_{2N}$ and 20 °C ambient temperature) <sup>d)</sup>	$n_{1N}$	rpm	1000	1200	1500	1700
Max. input speed	$n_{1Max}$	rpm	3000	3000	3000	3000
Mean no load running torque <sup>b)</sup> (at $n_i = 2000$ rpm and 20 °C gearbox temperature)	$T_{012}$	Nm	24	19	12	10
		in.lb	212	164	106	89
Max. backlash	$j_t$	arcmin	Standard $\leq 3$ / Reduced $\leq 1$			
Torsional rigidity <sup>b)</sup>	$C_{121}$	Nm/arcmin	550			
		in.lb/arcmin	4868			
Max. axial force <sup>c)</sup>	$F_{2AMax}$	N	33000			
		lb <sub>f</sub>	7425			
Max. lateral force <sup>c)</sup>	$F_{2QMax}$	N	30000			
		lb <sub>f</sub>	6750			
Max. tilting moment	$M_{2KMax}$	Nm	5000			
		in.lb	44254			
Efficiency at full load	$\eta$	%	97			
Service life <sup>f)</sup>	$L_h$	h	> 20000			
Weight (incl. standard adapter plate)	$m$	kg	77			
		lb <sub>m</sub>	170.2			
Operating noise (at reference ratio and reference speed – ratio-specific values available in cymex <sup>®</sup> )	$L_{PA}$	dB(A)	$\leq 66$			
Max. permitted housing temperature		°C	+90			
		F	194			
Ambient temperature		°C	-15 to +40			
		F	5 to 104			
Lubrication			Lubricated for life			
Direction of rotation			In- and output same direction			
Protection class			IP 65			
Metal bellows coupling (recommended product type – validate sizing with cymex <sup>®</sup> )			BC2-06000AA085.000-X			
Bore diameter of coupling on the application side		mm	X = 060.000 - 140.000			
Mass moment of inertia (relates to the drive) Clamping hub diameter [mm] Optimized mass inertia version available on request	O 60 $J_i$	kgcm <sup>2</sup>	198	163	138	125
		10 <sup>-3</sup> in.lb.s <sup>2</sup>	175	144	122	110

Please use our sizing software cymex<sup>®</sup> for a detailed sizing – [www.wittenstein-cymex.com](http://www.wittenstein-cymex.com)

<sup>a)</sup> At max. 10 %  $F_{2QMax}$

<sup>b)</sup> Valid for standard clamping hub diameter

<sup>c)</sup> Refers to center of the output shaft or flange

<sup>d)</sup> Please reduce input speed at higher ambient temperatures

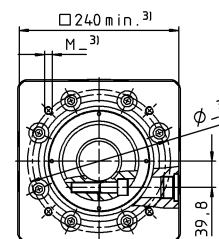
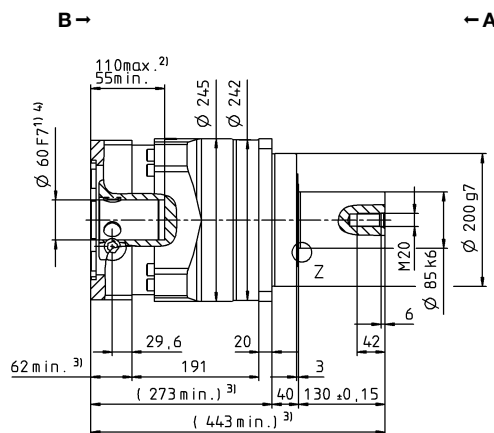
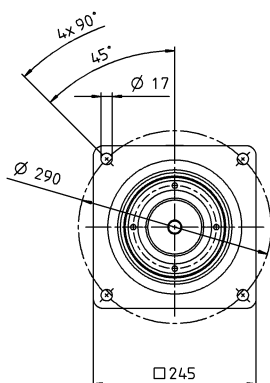
<sup>e)</sup> Smooth shaft

<sup>f)</sup> Please contact us to discuss  
application-specific service lifetimes



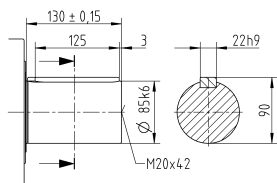
View B

up to 60 <sup>4)</sup> (O) <sup>5)</sup>  
clamping hub  
diameter

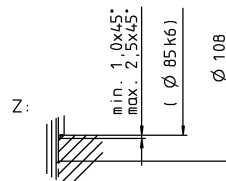
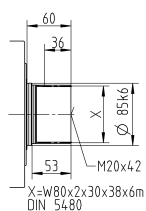
 $\dot{S}^+$ 

MF

Shaft with key



Splined shaft (DIN 5480)



Non-tolerated dimensions are nominal dimensions

- 1) Check motor shaft fit

2) Min. / Max. permissible motor shaft length. Longer motor shafts are possible, please contact alpha.

3) The dimensions depend on the motor

4) Smaller motor shaft diameter is compensated by a bushing with a minimum wall thickness of 1 mm

<sup>5)</sup> Standard clamping hub diameter

# SP<sup>+</sup> 240 MF 2-stage

				2-stage										
Ratio		<i>i</i>		16	20	25	28	35	40	50	70	100		
Max. torque <sup>a) b) e)</sup>		<i>T</i> <sub>2a</sub>	Nm	5446	5446	5700	5446	5700	5446	5700	5700	3642		
			in.lb	48202	48202	50450	48202	50450	48202	50450	50450	32236		
Max. acceleration torque <sup>b) e)</sup> (max. 1000 cycles per hour)		<i>T</i> <sub>2B</sub>	Nm	5400	5400	5400	5400	5400	4400	5160	4730	3642		
			in.lb	47794	47794	47794	47794	47794	38944	45670	41864	32236		
Nominal torque (at <i>n</i> <sub>IN</sub> )		<i>T</i> <sub>2N</sub>	Nm	2658	2596	3198	2667	3283	2803	3457	3784	2914		
			in.lb	23524	22976	28308	23607	29060	24811	30600	33491	25789		
Emergency stop torque <sup>a) b) e)</sup> (permitted 1000 times during the service life of the gearbox)		<i>T</i> <sub>2Not</sub>	Nm	8500	8500	8500	8500	8500	8500	8500	8500	6850		
			in.lb	75232	75232	75232	75232	75232	75232	75232	75232	60628		
Permitted average input speed (at <i>T</i> <sub>2a</sub> and 20 °C ambient temperature) <sup>d)</sup>		<i>n</i> <sub>1N</sub>	rpm	2300	2500	2500	2500	2500	2500	2500	2800	2800		
Max. input speed		<i>n</i> <sub>1Max</sub>	rpm	4500	4500	4500	4500	4500	4500	4500	4500	4500		
Mean no load running torque <sup>b)</sup> (at <i>n</i> <sub>i</sub> = 2000 rpm and 20 °C gearbox temperature)		<i>T</i> <sub>012</sub>	Nm	8.4	7.1	6.5	5.9	4.5	4.1	3.5	3.0	3.0		
			in.lb	74	63	58	52	40	36	31	26	26		
Max. backlash		<i>j</i> <sub>t</sub>	arcmin	Standard ≤ 5 / Reduced ≤ 3										
Torsional rigidity <sup>b)</sup>		<i>C</i> <sub>i21</sub>	Nm/arcmin	550										
			in.lb/arcmin	4868										
Max. axial force <sup>c)</sup>		<i>F</i> <sub>2AMax</sub>	N	33000										
			lb <sub>f</sub>	7425										
Max. lateral force <sup>c)</sup>		<i>F</i> <sub>2QMax</sub>	N	30000										
			lb <sub>f</sub>	6750										
Max. tilting moment		<i>M</i> <sub>2KMax</sub>	Nm	5000										
			in.lb	44254										
Efficiency at full load		<i>η</i>	%	94										
Service life <sup>f)</sup>		<i>L</i> <sub>h</sub>	h	> 20000										
Weight (incl. standard adapter plate)		<i>m</i>	kg	76										
			lb <sub>m</sub>	168										
Operating noise (at reference ratio and reference speed – ratio-specific values available in cymex®)		<i>L</i> <sub>PA</sub>	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										
Direction of rotation				In- and output same direction										
Protection class				IP 65										
Metal bellows coupling (recommended product type – validate sizing with cymex®)				BC2-06000AA085.000-X										
			mm	X = 060.000 - 140.000										
Mass moment of inertia (relates to the drive) Clamping hub diameter [mm] Optimized mass inertia version available on request		M	48	<i>J</i> <sub>i</sub>	kgcm <sup>2</sup>	39.2	34.6	33.2	30.5	29.7	28.2	27.9	27.6	27.5
					10 <sup>-3</sup> in.lb.s <sup>2</sup>	34.7	30.6	29.4	27.0	26.3	25.0	24.7	24.4	24.3

Please use our sizing software cymex<sup>®</sup> for a detailed sizing – [www.wittenstein-cymex.com](http://www.wittenstein-cymex.com)

<sup>a)</sup> At max. 10 %  $F_{2QMax}$

<sup>b)</sup> Valid for standard clamping hub diameter

<sup>c)</sup> Refers to center of the output shaft or flange

<sup>d)</sup> Please reduce input speed at higher ambient temperatures

<sup>e)</sup> Smooth shaft

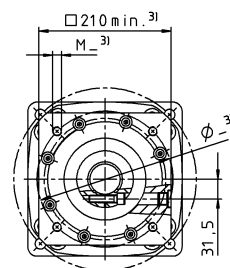
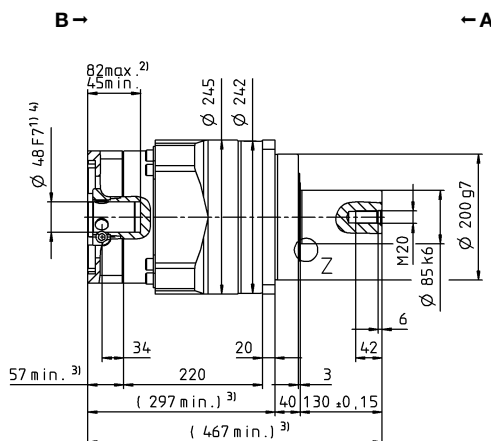
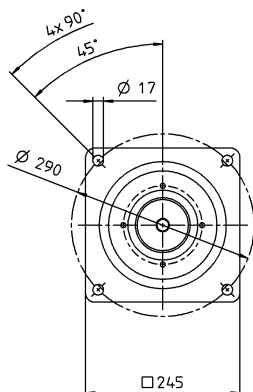
<sup>f)</sup> Please contact us to discuss application-specific service lifetimes

View A

View B

Motor shaft diameter [mm]

2-stage

up to 48 <sup>4)</sup> (M) <sup>5)</sup>  
clamping hub  
diameter


Planetary gearboxes

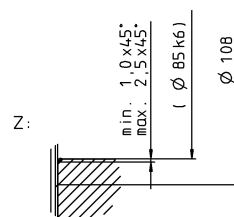
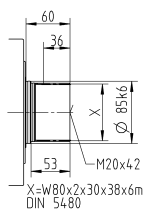
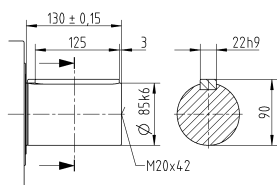
SP<sup>+</sup>

MF

## Other output variants

Shaft with key

Splined shaft (DIN 5480)



Non-tolerated dimensions are nominal dimensions

<sup>1)</sup> Check motor shaft fit

<sup>2)</sup> Min./Max. permissible motor shaft length. Longer motor shafts are possible, please contact alpha.

<sup>3)</sup> The dimensions depend on the motor

<sup>4)</sup> Smaller motor shaft diameter is compensated by a bushing with a minimum wall thickness of 1 mm

<sup>5)</sup> Standard clamping hub diameter

# SP<sup>+</sup> 075 MC 1-stage

				1-stage						
Ratio			<i>i</i>		3	4	5	7	8	10
Max. torque <sup>a) b) e)</sup>			<i>T</i> <sub>2a</sub>	<i>Nm</i>	68	90	90	90	70	70
				<i>in.lb</i>	602	797	797	797	620	620
Max. acceleration torque <sup>b) e)</sup> (max. 1000 cycles per hour)			<i>T</i> <sub>2B</sub>	<i>Nm</i>	68	90	90	90	70	70
				<i>in.lb</i>	602	797	797	797	620	620
Nominal torque (at <i>n</i> <sub>N</sub> )			<i>T</i> <sub>2N</sub>	<i>Nm</i>	41	51	51	52	50	53
				<i>in.lb</i>	362	448	447	459	441	468
Emergency stop torque <sup>a) b) e)</sup> (permitted 1000 times during the service life of the gearbox)			<i>T</i> <sub>2Not</sub>	<i>Nm</i>	139	185	250	250	213	213
				<i>in.lb</i>	1230	1640	2213	2213	1885	1885
Permitted average input speed (at <i>T</i> <sub>2N</sub> and 20 °C ambient temperature) <sup>d)</sup>			<i>n</i> <sub>1N</sub>	<i>rpm</i>	4500	4500	4500	4500	4500	4500
Max. input speed			<i>n</i> <sub>1Max</sub>	<i>rpm</i>	6000	6000	6000	6000	6000	6000
Mean no load running torque <sup>b)</sup> (at <i>n</i> <sub>i</sub> = 3000 rpm and 20 °C gearbox temperature)			<i>T</i> <sub>012</sub>	<i>Nm</i>	1.1	0.88	0.72	0.49	0.42	0.40
				<i>in.lb</i>	9.9	7.8	6.4	4.3	3.7	3.5
Max. backlash			<i>j</i> <sub>t</sub>	<i>arcmin</i>	Standard ≤ 6 / Reduced ≤ 4					
Torsional rigidity <sup>b)</sup>			<i>C</i> <sub>121</sub>	<i>Nm/arcmin</i>	10					
				<i>in.lb/arcmin</i>	89					
Max. axial force <sup>c)</sup>			<i>F</i> <sub>2AMax</sub>	<i>N</i>	3350					
				<i>lb<sub>f</sub></i>	754					
Max. lateral force <sup>c)</sup>			<i>F</i> <sub>2QMax</sub>	<i>N</i>	4200					
				<i>lb<sub>f</sub></i>	945					
Max. tilting moment			<i>M</i> <sub>2KMax</sub>	<i>Nm</i>	260					
				<i>in.lb</i>	2301					
Efficiency at full load			<i>η</i>	%	98.5					
Service life <sup>f)</sup>			<i>L</i> <sub>h</sub>	<i>h</i>	> 30000					
Weight (incl. standard adapter plate)			<i>m</i>	<i>kg</i>	3.9					
				<i>lb<sub>m</sub></i>	8.6					
Operating noise (at reference ratio and reference speed – ratio-specific values available in cymex <sup>®</sup> )			<i>L</i> <sub>PA</sub>	<i>dB(A)</i>	≤ 59					
Max. permitted housing temperature				°C	+90					
				<i>F</i>	194					
Ambient temperature				°C	-15 to +40					
				<i>F</i>	5 to 104					
Lubrication					Lubricated for life					
Direction of rotation					In- and output same direction					
Protection class					IP 65					
Metal bellows coupling (recommended product type – validate sizing with cymex <sup>®</sup> )					BC2-00080AA022.000-X					
			Bore diameter of coupling on the application side	<i>mm</i>	X = 014.000 - 042.000					
Mass moment of inertia (relates to the drive) Clamping hub diameter [mm]	E	19	<i>J</i> <sub>i</sub>	<i>kgcm</i> <sup>2</sup>	1.03	0.78	0.68	0.59	0.54	0.54
				10 <sup>-3</sup> <i>in.lb.s</i> <sup>2</sup>	0.91	0.69	0.60	0.52	0.48	0.48
	G	24	<i>J</i> <sub>i</sub>	<i>kgcm</i> <sup>2</sup>	2.40	2.15	2.05	1.96	1.91	1.91
				10 <sup>-3</sup> <i>in.lb.s</i> <sup>2</sup>	2.12	1.90	1.81	1.73	1.69	1.69

Please use our sizing software cymex<sup>®</sup> for a detailed sizing – [www.wittenstein-cymex.com](http://www.wittenstein-cymex.com)

<sup>a)</sup> At max. 10 %  $F_{2QMax}$

<sup>b)</sup> Valid for standard clamping hub diameter

<sup>c)</sup> Refers to center of the output shaft or flange

<sup>d)</sup> Please reduce input speed at higher ambient temperatures

<sup>e)</sup> Smooth shaft

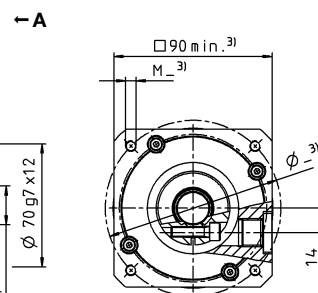
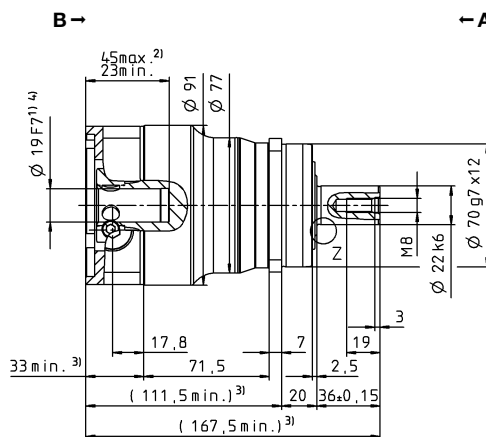
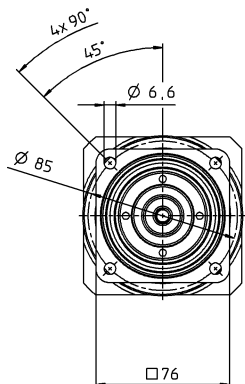
<sup>f)</sup> Please contact us to discuss  
application-specific service lifetimes

View A

View B

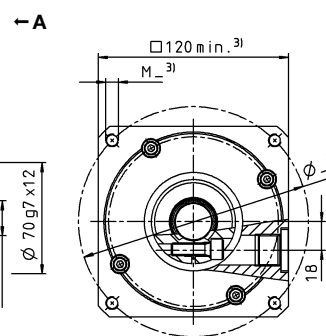
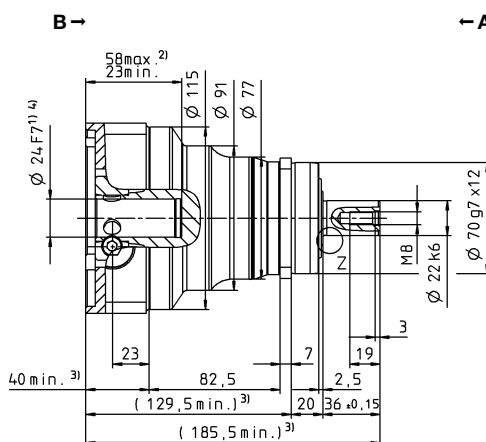
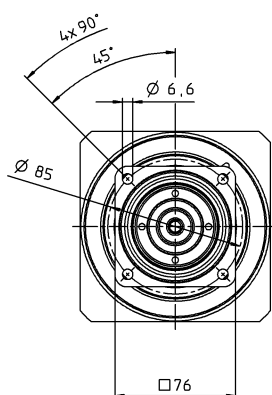
# 1-stage

up to 19 <sup>4)</sup> (E) <sup>5)</sup>  
clamping hub  
diameter



Motor shaft diameter [mm]

up to 24 <sup>4)</sup> (G)  
clamping hub  
diameter



Planetary gearboxes

SP<sup>+</sup>

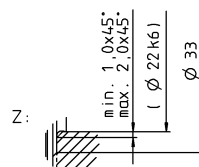
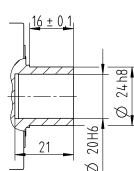
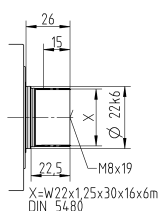
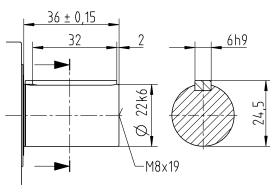
MC

## Other output variants

Shaft with key

Splined shaft (DIN 5480)

Shaft mounted



Non-tolerated dimensions are nominal dimensions

<sup>1)</sup> Check motor shaft fit

<sup>2)</sup> Min./Max. permissible motor shaft length. Longer motor shafts are possible, please contact alpha.

<sup>3)</sup> The dimensions depend on the motor

<sup>4)</sup> Smaller motor shaft diameter is compensated by a bushing with a minimum wall thickness of 1 mm

<sup>5)</sup> Standard clamping hub diameter



# SP<sup>+</sup> 075 MC 2-stage

				2-stage											
Ratio			<i>i</i>		16	20	25	28	32	35	40	50	64	70	100
Max. torque <sup>a) b) e)</sup>			<i>T</i> <sub>2a</sub>	Nm	90	90	90	90	90	90	90	90	70	90	70
				in.lb	797	797	797	797	797	797	797	797	620	797	620
Max. acceleration torque <sup>b) e)</sup> (max. 1000 cycles per hour)			<i>T</i> <sub>2B</sub>	Nm	90	90	90	90	90	90	90	90	70	90	70
				in.lb	797	797	797	797	797	797	797	797	620	797	620
Nominal torque (at <i>n</i> <sub>IN</sub> )			<i>T</i> <sub>2N</sub>	Nm	62	62	72	65	72	72	65	72	56	72	56
				in.lb	552	553	637	572	637	637	574	637	496	637	496
Emergency stop torque <sup>a) b) e)</sup> (permitted 1000 times during the service life of the gearbox)			<i>T</i> <sub>2Not</sub>	Nm	250	250	250	250	250	250	250	250	213	250	213
				in.lb	2213	2213	2213	2213	2213	2213	2213	2213	1885	2213	1885
Permitted average input speed (at <i>T</i> <sub>2N</sub> and 20 °C ambient temperature) <sup>d)</sup>			<i>n</i> <sub>1N</sub>	rpm	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500
Max. input speed			<i>n</i> <sub>1Max</sub>	rpm	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000
Mean no load running torque <sup>b)</sup> (at <i>n</i> <sub>l</sub> = 3000 rpm and 20 °C gearbox temperature)			<i>T</i> <sub>012</sub>	Nm	0.36	0.24	0.18	0.18	0.17	0.16	0.16	0.16	0.16	0.15	0.14
				in.lb	3.2	2.1	1.6	1.6	1.5	1.4	1.4	1.4	1.4	1.3	1.2
Max. backlash			<i>j</i> <sub>t</sub>	arcmin	Standard ≤ 8 / Reduced ≤ 6										
Torsional rigidity <sup>b)</sup>			<i>C</i> <sub>121</sub>	Nm/arcmin	10										
				in.lb/arcmin	89										
Max. axial force <sup>c)</sup>			<i>F</i> <sub>2AMax</sub>	N	3350										
				lb <sub>f</sub>	754										
Max. lateral force <sup>c)</sup>			<i>F</i> <sub>2QMax</sub>	N	4200										
				lb <sub>f</sub>	945										
Max. tilting moment			<i>M</i> <sub>2KMax</sub>	Nm	260										
				in.lb	2301										
Efficiency at full load			<i>η</i>	%	96.5										
Service life <sup>f)</sup>			<i>L</i> <sub>h</sub>	h	> 30000										
Weight (incl. standard adapter plate)			<i>m</i>	kg	3.6										
				lb <sub>m</sub>	8.0										
Operating noise (at reference ratio and reference speed – ratio-specific values available in cymex®)			<i>L</i> <sub>PA</sub>	dB(A)	≤ 55										
Max. permitted housing temperature				°C	+90										
				F	194										
Ambient temperature				°C	-15 to +40										
				F	5 to 104										
Lubrication					Lubricated for life										
Direction of rotation					In- and output same direction										
Protection class					IP 65										
Metal bellows coupling (recommended product type – validate sizing with cymex®)					BC2-00080AA022.000-X										
			Bore diameter of coupling on the application side	mm	X = 014.000 - 042.000										
Mass moment of inertia (relates to the drive) Clamping hub diameter [mm]	C	14	<i>J</i> <sub>l</sub>	kgcm <sup>2</sup>	0.23	0.20	0.20	0.18	0.18	0.18	0.16	0.16	0.16	0.16	0.16
				10 <sup>-3</sup> in.lb.s <sup>2</sup>	0.20	0.18	0.18	0.16	0.16	0.16	0.14	0.14	0.14	0.14	0.14
	E	19	<i>J</i> <sub>l</sub>	kgcm <sup>2</sup>	0.55	0.53	0.52	0.50	0.50	0.50	0.49	0.49	0.49	0.49	0.49
				10 <sup>-3</sup> in.lb.s <sup>2</sup>	0.49	0.47	0.46	0.44	0.44	0.44	0.43	0.43	0.43	0.43	0.43

Please use our sizing software cymex<sup>®</sup> for a detailed sizing – [www.wittenstein-cymex.com](http://www.wittenstein-cymex.com)

<sup>a)</sup> At max. 10 %  $F_{2QMax}$

<sup>b)</sup> Valid for standard clamping hub diameter

<sup>c)</sup> Refers to center of the output shaft or flange

<sup>d)</sup> Please reduce input speed at higher ambient temperatures

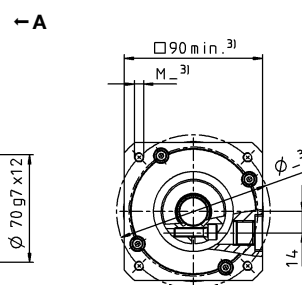
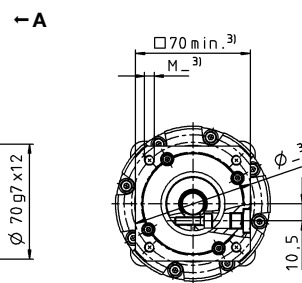
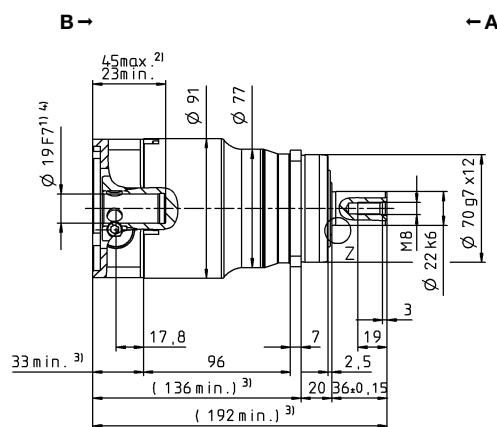
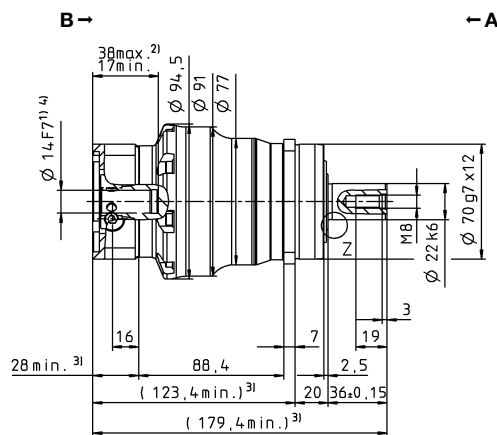
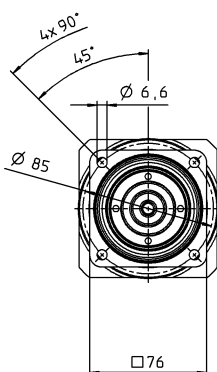
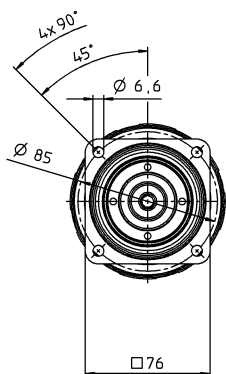
<sup>e)</sup> Smooth shaft

<sup>f)</sup> Please contact us to discuss  
application-specific service lifetimes

up to 14 <sup>4)</sup> (C) <sup>5)</sup>  
clamping hub  
diameter

Motor shaft diameter [mm]

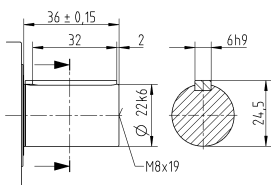
up to 19<sup>4)</sup> (E)  
clamping hub  
diameter

 $\frac{d}{ds}$ 

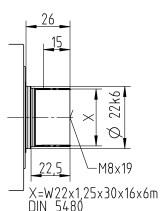
MC

## Other output variants

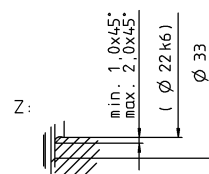
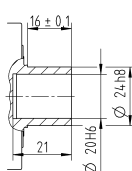
Shaft with key



Splined shaft (DIN 5480)



Shaft mounted



Non-tolerated dimensions are nominal dimensions

- 1) Check motor shaft fit.

2) Min. / Max. permissible motor shaft length. Longer motor shafts are possible, please contact alpha.

3) The dimensions depend on the motor

4) Smaller motor shaft diameter is compensated by a bushing with a minimum wall thickness of 1 mm

<sup>5)</sup> Standard clamping hub diameter

# SP<sup>+</sup> 100 MC 1-stage

				Standard version MC						Friction optimized version L						
Ratio			<i>i</i>		3	4	5	7	8	10	3	4	5	7	8	10
Max. torque <sup>a) b) e)</sup>			<i>T</i> <sub>2a</sub>	<i>Nm</i>	180	240	240	240	180	180	180	240	240	240	180	180
				<i>in.lb</i>	1593	2124	2124	2124	1593	1593	1593	2124	2124	2124	1593	1593
Max. acceleration torque <sup>b) e)</sup> (max. 1000 cycles per hour)			<i>T</i> <sub>2B</sub>	<i>Nm</i>	180	240	240	240	180	180	180	240	240	240	180	180
				<i>in.lb</i>	1593	2124	2124	2124	1593	1593	1593	2124	2124	2124	1593	1593
Nominal torque (at <i>n</i> <sub>IN</sub> )			<i>T</i> <sub>2N</sub>	<i>Nm</i>	76	95	91	93	93	97	76	95	91	93	93	97
				<i>in.lb</i>	677	838	806	823	821	861	677	838	806	823	821	861
Emergency stop torque <sup>a) b) e)</sup> (permitted 1000 times during the service life of the gearbox)			<i>T</i> <sub>2Not</sub>	<i>Nm</i>	454	625	625	625	599	599	454	625	625	625	599	599
				<i>in.lb</i>	4016	5532	5532	5532	5302	5302	4016	5532	5532	5532	5302	5302
Permitted average input speed (at <i>T</i> <sub>2N</sub> and 20 °C ambient temperature) <sup>d)</sup>			<i>n</i> <sub>1N</sub>	<i>rpm</i>	3500	4000	4500	4500	4500	4500	3500	4000	4500	4500	4500	4500
Max. input speed			<i>n</i> <sub>1Max</sub>	<i>rpm</i>	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000
Mean no load running torque <sup>b)</sup> (at <i>n</i> <sub>1</sub> = 3000 rpm and 20 °C gearbox temperature)			<i>T</i> <sub>012</sub>	<i>Nm</i>	2.0	1.8	1.4	0.84	0.78	0.64	0.9	0.8	0.6	0.5	0.4	0.4
				<i>in.lb</i>	17	16	12	7.4	6.9	5.7	8.0	7.1	5.3	4.4	3.5	3.5
Max. backlash			<i>j</i> <sub>t</sub>	<i>arcmin</i>	Standard ≤ 4 / Reduced ≤ 2											
Torsional rigidity <sup>b)</sup>			<i>C</i> <sub>121</sub>	<i>Nm/arcmin</i>	31											
				<i>in.lb/arcmin</i>	274											
Max. axial force <sup>c)</sup>			<i>F</i> <sub>2AMax</sub>	<i>N</i>	5650						2000					
				<i>lb<sub>f</sub></i>	1271						450					
Max. lateral force <sup>c)</sup>			<i>F</i> <sub>2QMax</sub>	<i>N</i>	6300						1000					
				<i>lb<sub>f</sub></i>	1418						225					
Max. tilting moment			<i>M</i> <sub>2KMax</sub>	<i>Nm</i>	500						72					
				<i>in.lb</i>	4425						637					
Efficiency at full load			<i>η</i>	%	98.5						99					
Service life <sup>f)</sup>			<i>L</i> <sub>h</sub>	<i>h</i>	> 30000											
Weight (incl. standard adapter plate)			<i>m</i>	<i>kg</i>	7.7											
				<i>lb<sub>m</sub></i>	17											
Operating noise (at reference ratio and reference speed – ratio-specific values available in cymex®)			<i>L</i> <sub>PA</sub>	<i>dB(A)</i>	≤ 58											
Max. permitted housing temperature				°C	+90											
				<i>F</i>	194											
Ambient temperature				°C	–15 to +40											
				<i>F</i>	5 to 104											
Lubrication					Lubricated for life											
Direction of rotation					In- and output same direction											
Protection class					IP 65						IP 52					
Metal bellows coupling (recommended product type – validate sizing with cymex®)					BC2-00300AA032.000-X											
				<i>mm</i>	X = 024.000 - 060.000											
Mass moment of inertia (relates to the drive) Clamping hub diameter [mm]	G	24	<i>J</i> <sub>i</sub>	<i>kgcm<sup>2</sup></i>	3.99	3.04	2.61	2.29	2.26	2.07	3.99	3.04	2.61	2.29	2.26	2.07
				<i>10<sup>-3</sup> in.lb.s<sup>2</sup></i>	3.53	2.69	2.31	2.03	2.00	1.83	3.53	2.69	2.31	2.03	2.00	1.83
	K	38	<i>J</i> <sub>i</sub>	<i>kgcm<sup>2</sup></i>	11.1	10.1	9.68	9.36	9.55	9.14	11.1	10.1	9.68	9.36	9.55	9.14
				<i>10<sup>-3</sup> in.lb.s<sup>2</sup></i>	9.82	8.94	8.57	8.28	8.45	8.09	9.82	8.94	8.57	8.28	8.45	8.09

Please use our sizing software cymex<sup>®</sup> for a detailed sizing – [www.wittenstein-cymex.com](http://www.wittenstein-cymex.com)

<sup>a)</sup> At max. 10 %  $F_{2QMax}$

<sup>b)</sup> Valid for standard clamping hub diameter

<sup>c)</sup> Refers to center of the output shaft or flange

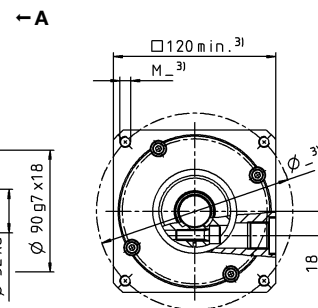
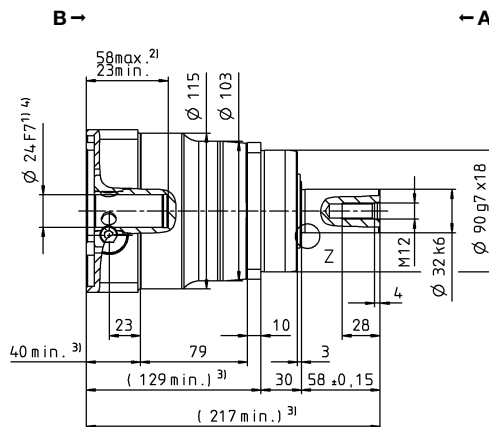
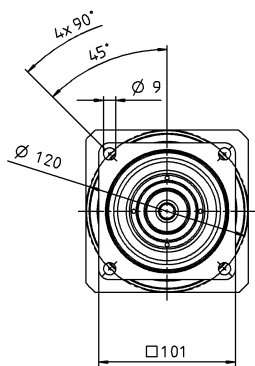
<sup>d)</sup> Please reduce input speed at higher ambient temperatures

<sup>e)</sup> Smooth shaft

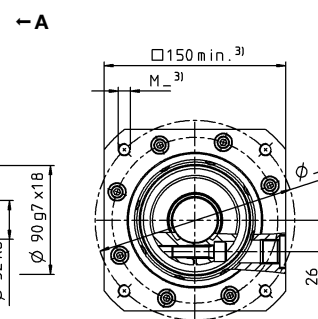
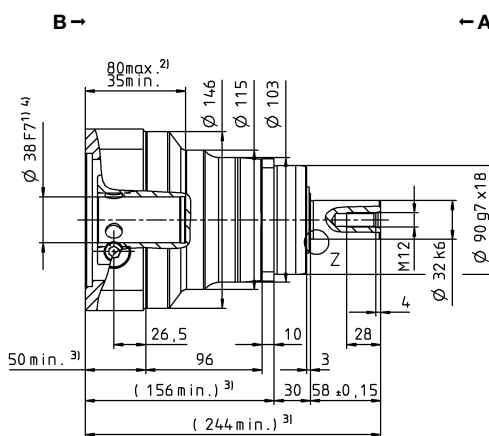
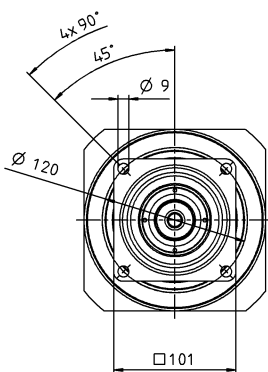
<sup>f)</sup> Please contact us to discuss  
application-specific service lifetimes

# 1-stage

up to 24 <sup>4)</sup> (G) <sup>5)</sup>  
clamping hub  
diameter



up to 38 <sup>4)</sup> (K)  
clamping hub  
diameter



Planetary gearboxes

SP

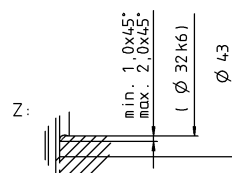
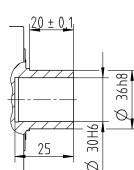
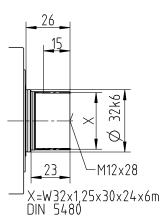
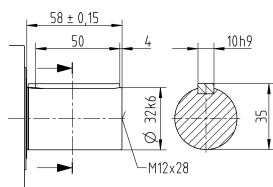
MC

## Other output variants

Shaft with key

Splined shaft (DIN 5480)

Shaft mounted



Non-tolerated dimensions are nominal dimensions

<sup>1)</sup> Check motor shaft fit

<sup>2)</sup> Min./Max. permissible motor shaft length. Longer motor shafts are possible, please contact alpha.

<sup>3)</sup> The dimensions depend on the motor

<sup>4)</sup> Smaller motor shaft diameter is compensated by a bushing with a minimum wall thickness of 1 mm

<sup>5)</sup> Standard clamping hub diameter

# SP<sup>+</sup> 100 MC 2-stage

				2-stage											
Ratio			<i>i</i>		16	20	25	28	32	35	40	50	64	70	100
Max. torque <sup>a) b) e)</sup>			<i>T</i> <sub>2a</sub>	Nm	240	240	240	240	240	240	240	240	180	240	180
				in.lb	2124	2124	2124	2124	2124	2124	2124	2124	1593	2124	1593
Max. acceleration torque <sup>b) e)</sup> (max. 1000 cycles per hour)			<i>T</i> <sub>2B</sub>	Nm	240	240	240	240	240	240	240	240	180	240	180
				in.lb	2124	2124	2124	2124	2124	2124	2124	2124	1593	2124	1593
Nominal torque (at <i>n</i> <sub>N</sub> )			<i>T</i> <sub>2N</sub>	Nm	138	148	149	164	141	164	183	182	144	189	144
				in.lb	1221	1313	1322	1453	1251	1450	1617	1614	1275	1673	1275
Emergency stop torque <sup>a) b) e)</sup> (permitted 1000 times during the service life of the gearbox)			<i>T</i> <sub>2Not</sub>	Nm	625	625	625	625	625	625	625	625	599	625	599
				in.lb	5532	5532	5532	5532	5532	5532	5532	5532	5302	5532	5302
Permitted average input speed (at <i>T</i> <sub>2N</sub> and 20 °C ambient temperature) <sup>d)</sup>			<i>n</i> <sub>1N</sub>	rpm	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500
Max. input speed			<i>n</i> <sub>1Max</sub>	rpm	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000
Mean no load running torque <sup>b)</sup> (at <i>n</i> <sub>1</sub> = 3000 rpm and 20 °C gearbox temperature)			<i>T</i> <sub>012</sub>	Nm	0.52	0.53	0.48	0.43	0.38	0.28	0.40	0.25	0.25	0.20	0.19
				in.lb	4.6	4.7	4.2	3.8	3.4	2.5	3.5	2.2	2.2	1.8	1.7
Max. backlash			<i>j</i> <sub>t</sub>	arcmin	Standard ≤ 6 / Reduced ≤ 4										
Torsional rigidity <sup>b)</sup>			<i>C</i> <sub>121</sub>	Nm/arcmin	31										
				in.lb/arcmin	274										
Max. axial force <sup>c)</sup>			<i>F</i> <sub>2AMax</sub>	N	5650										
				lb <sub>f</sub>	1271										
Max. lateral force <sup>c)</sup>			<i>F</i> <sub>2QMax</sub>	N	6300										
				lb <sub>f</sub>	1418										
Max. tilting moment			<i>M</i> <sub>2KMax</sub>	Nm	500										
				in.lb	4425										
Efficiency at full load			<i>η</i>	%	96.5										
Service life <sup>f)</sup>			<i>L</i> <sub>h</sub>	h	> 30000										
Weight (incl. standard adapter plate)			<i>m</i>	kg	7.9										
				lb <sub>m</sub>	17.5										
Operating noise (at reference ratio and reference speed – ratio-specific values available in cymex®)			<i>L</i> <sub>PA</sub>	dB(A)	≤ 56										
Max. permitted housing temperature				°C	+90										
				F	194										
Ambient temperature				°C	-15 to +40										
				F	5 to 104										
Lubrication					Lubricated for life										
Direction of rotation					In- and output same direction										
Protection class					IP 65										
Metal bellows coupling (recommended product type – validate sizing with cymex®)					BC2-00300AA032.000-X										
			Bore diameter of coupling on the application side	mm	X = 024.000 - 060.000										
Mass moment of inertia (relates to the drive) Clamping hub diameter [mm]	E	19	<i>J</i> <sub>1</sub>	kgcm <sup>2</sup>	0.81	0.70	0.68	0.60	0.43	0.59	0.55	0.54	0.38	0.54	0.54
				10 <sup>-3</sup> in.lb.s <sup>2</sup>	0.72	0.62	0.60	0.53	0.38	0.52	0.49	0.48	0.34	0.48	0.48
	G	24	<i>J</i> <sub>1</sub>	kgcm <sup>2</sup>	2.18	2.07	2.05	1.97	2.06	1.96	1.92	1.91	1.91	1.91	1.91
				10 <sup>-3</sup> in.lb.s <sup>2</sup>	1.93	1.83	1.81	1.74	1.82	1.73	1.70	1.69	1.69	1.69	1.69

Please use our sizing software cymex<sup>®</sup> for a detailed sizing – [www.wittenstein-cymex.com](http://www.wittenstein-cymex.com)

<sup>a)</sup> At max. 10 %  $F_{2QMax}$

<sup>b)</sup> Valid for standard clamping hub diameter

<sup>c)</sup> Refers to center of the output shaft or flange

<sup>d)</sup> Please reduce input speed at higher ambient temperatures

<sup>e)</sup> Smooth shaft

<sup>f)</sup> Please contact us to discuss  
application-specific service lifetimes

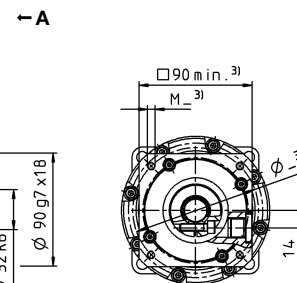
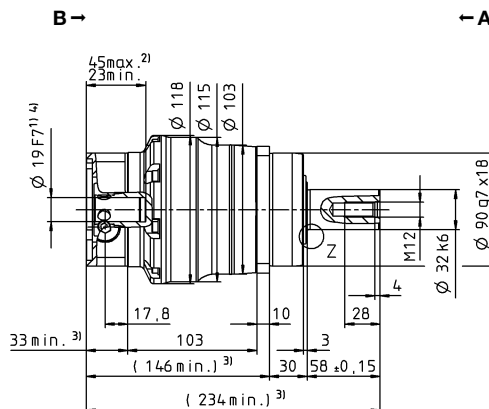
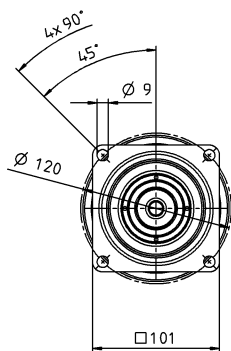


View A

View B

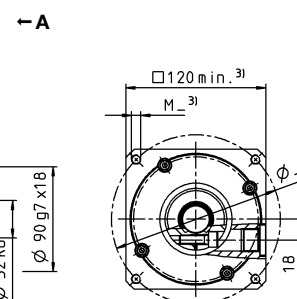
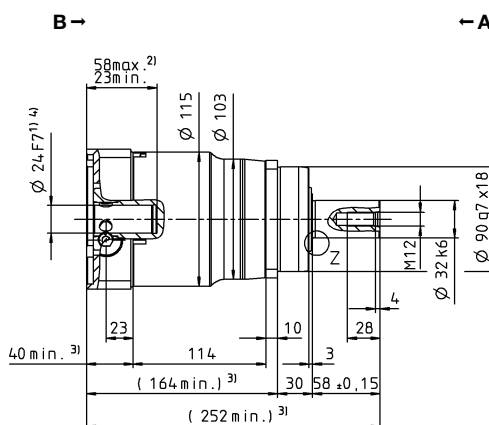
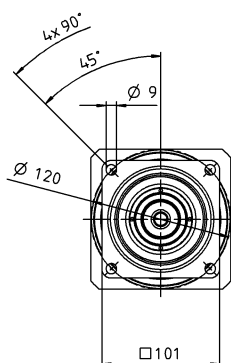
# 2-stage

up to 19 <sup>4)</sup> (E) <sup>5)</sup>  
clamping hub  
diameter



Motor shaft diameter [mm]

up to 24 <sup>4)</sup> (G)  
clamping hub  
diameter



Planetary gearboxes

SP

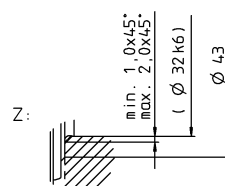
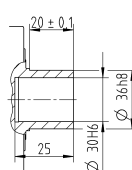
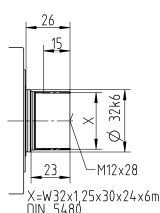
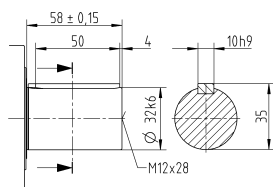
MC

## Other output variants

Shaft with key

Splined shaft (DIN 5480)

Shaft mounted



Non-tolerated dimensions are nominal dimensions

<sup>1)</sup> Check motor shaft fit

<sup>2)</sup> Min./Max. permissible motor shaft length. Longer motor shafts are possible, please contact alpha.

<sup>3)</sup> The dimensions depend on the motor

<sup>4)</sup> Smaller motor shaft diameter is compensated by a bushing with a minimum wall thickness of 1 mm

<sup>5)</sup> Standard clamping hub diameter

# SP<sup>+</sup> 140 MC 1-stage

				Standard version MC						Friction optimized version L						
Ratio			<i>i</i>		3	4	5	7	8	10	3	4	5	7	8	10
Max. torque <sup>a) b) e)</sup>			<i>T</i> <sub>2a</sub>	<i>Nm</i>	310	480	480	480	380	380	310	480	480	480	380	380
				<i>in.lb</i>	2744	4248	4248	4248	3363	3363	2744	4248	4248	4248	3363	3363
Max. acceleration torque <sup>b) e)</sup> (max. 1000 cycles per hour)			<i>T</i> <sub>2B</sub>	<i>Nm</i>	310	480	480	480	380	380	310	480	480	480	380	380
				<i>in.lb</i>	2744	4248	4248	4248	3363	3363	2744	4248	4248	4248	3363	3363
Nominal torque (at <i>n</i> <sub>IN</sub> )			<i>T</i> <sub>2N</sub>	<i>Nm</i>	127	195	182	187	186	195	127	195	182	187	186	195
				<i>in.lb</i>	1122	1730	1612	1656	1644	1727	1122	1730	1612	1656	1644	1727
Emergency stop torque <sup>a) b) e)</sup> (permitted 1000 times during the service life of the gearbox)			<i>T</i> <sub>2Not</sub>	<i>Nm</i>	1250	1350	1350	1350	1250	1250	1250	1350	1350	1350	1250	1250
				<i>in.lb</i>	11064	11949	11949	11949	11064	11064	11064	11949	11949	11949	11064	11064
Permitted average input speed (at <i>T</i> <sub>2N</sub> and 20 °C ambient temperature) <sup>d)</sup>			<i>n</i> <sub>1N</sub>	<i>rpm</i>	3000	3500	4500	4500	4500	4500	3000	3500	4500	4500	4500	4500
Max. input speed			<i>n</i> <sub>1Max</sub>	<i>rpm</i>	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000
Mean no load running torque <sup>b)</sup> (at <i>n</i> <sub>1</sub> = 3000 rpm and 20 °C gearbox temperature)			<i>T</i> <sub>012</sub>	<i>Nm</i>	4.1	3.5	3.0	2.2	1.8	1.7	2.0	1.5	1.2	1.0	0.9	0.9
				<i>in.lb</i>	36	31	27	20	16	15	18	13	11	8.9	8.0	8.0
Max. backlash			<i>j</i> <sub>t</sub>	<i>arcmin</i>	Standard ≤ 4 / Reduced ≤ 2											
Torsional rigidity <sup>b)</sup>			<i>C</i> <sub>121</sub>	<i>Nm/arcmin</i>	53											
				<i>in.lb/arcmin</i>	469											
Max. axial force <sup>c)</sup>			<i>F</i> <sub>2AMax</sub>	<i>N</i>	9870						3000					
				<i>lb<sub>f</sub></i>	2221						675					
Max. lateral force <sup>c)</sup>			<i>F</i> <sub>2QMax</sub>	<i>N</i>	9600						1200					
				<i>lb<sub>f</sub></i>	2160						270					
Max. tilting moment			<i>M</i> <sub>2KMax</sub>	<i>Nm</i>	1000						110					
				<i>in.lb</i>	8851						974					
Efficiency at full load			<i>η</i>	%	98.5						99					
Service life <sup>f)</sup>			<i>L</i> <sub>h</sub>	<i>h</i>	> 30000											
Weight (incl. standard adapter plate)			<i>m</i>	<i>kg</i>	17.2											
				<i>lb<sub>m</sub></i>	38											
Operating noise (at reference ratio and reference speed – ratio-specific values available in cymex®)			<i>L</i> <sub>PA</sub>	<i>dB(A)</i>	≤ 59											
Max. permitted housing temperature				°C	+90											
				<i>F</i>	194											
Ambient temperature				°C	–15 to +40											
				<i>F</i>	5 to 104											
Lubrication					Lubricated for life											
Direction of rotation					In- and output same direction											
Protection class					IP 65						IP 52					
Metal bellows coupling (recommended product type – validate sizing with cymex®)					BC2-00500AA040.000-X											
				<i>mm</i>	X = 035.000 - 060.000											
Mass moment of inertia (relates to the drive) Clamping hub diameter [mm]	K	38	<i>J</i> <sub>i</sub>	<i>kgcm<sup>2</sup></i>	14.9	12.1	11.0	10.1	10.1	9.5	14.9	12.1	11.0	10.1	10.1	9.5
				<i>10<sup>-3</sup> in.lb.s<sup>2</sup></i>	13.2	10.7	9.7	8.9	8.9	8.4	13.2	10.7	9.7	8.9	8.9	8.4
	M	48	<i>J</i> <sub>i</sub>	<i>kgcm<sup>2</sup></i>	29.5	26.7	25.6	24.7	24.7	24.2	29.5	26.7	25.6	24.7	24.7	24.2
				<i>10<sup>-3</sup> in.lb.s<sup>2</sup></i>	26.1	23.6	22.7	21.9	21.9	21.4	26.1	23.6	22.7	21.9	21.9	21.4

Please use our sizing software cymex<sup>®</sup> for a detailed sizing – [www.wittenstein-cymex.com](http://www.wittenstein-cymex.com)

<sup>a)</sup> At max. 10 %  $F_{2QMax}$

<sup>b)</sup> Valid for standard clamping hub diameter

<sup>c)</sup> Refers to center of the output shaft or flange

<sup>d)</sup> Please reduce input speed at higher ambient temperatures

<sup>e)</sup> Smooth shaft

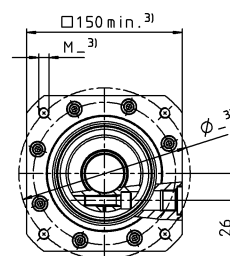
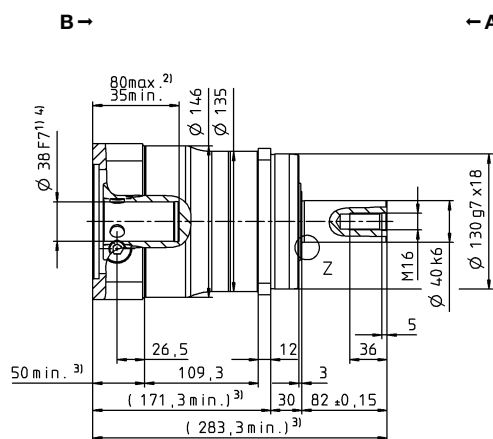
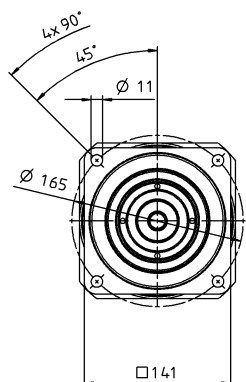
<sup>f)</sup> Please contact us to discuss  
application-specific service lifetimes

View A

View B

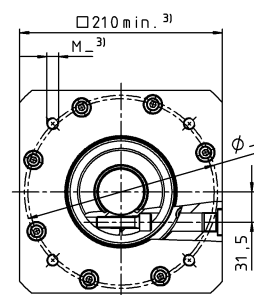
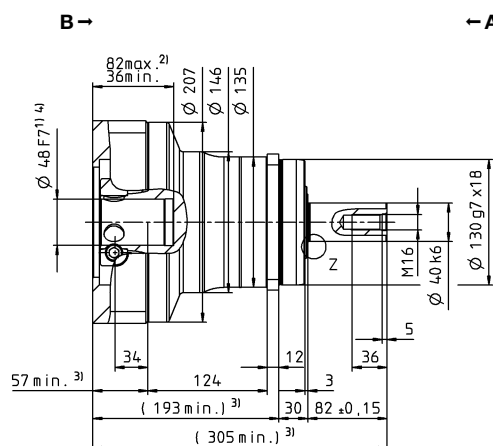
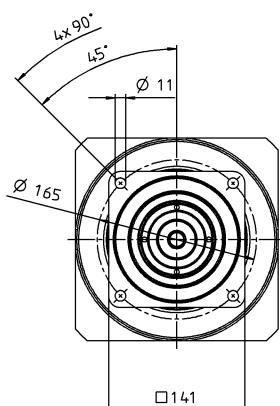
# 1-stage

up to 38 <sup>4)</sup> (K) <sup>5)</sup>  
clamping hub  
diameter



Motor shaft diameter [mm]

up to 48 <sup>4)</sup> (M)  
clamping hub  
diameter

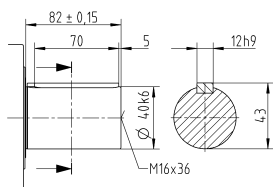

SP<sup>+</sup>

MC

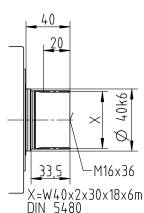
Planetary gearboxes

## Other output variants

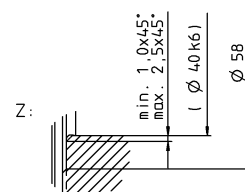
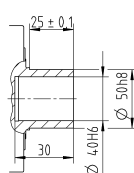
Shaft with key



Splined shaft (DIN 5480)



Shaft mounted



Non-tolerated dimensions are nominal dimensions

<sup>1)</sup> Check motor shaft fit

<sup>2)</sup> Min./Max. permissible motor shaft length. Longer motor shafts are possible, please contact alpha.

<sup>3)</sup> The dimensions depend on the motor

<sup>4)</sup> Smaller motor shaft diameter is compensated by a bushing with a minimum wall thickness of 1 mm

<sup>5)</sup> Standard clamping hub diameter

# SP<sup>+</sup> 140 MC 2-stage

				2-stage											
Ratio			<i>i</i>		16	20	25	28	32	35	40	50	64	70	100
Max. torque <sup>a) b) e)</sup>			<i>T</i> <sub>2a</sub>	<i>Nm</i>	480	480	480	480	480	480	480	480	380	480	380
				<i>in.lb</i>	4248	4248	4248	4248	4248	4248	4248	4248	3363	4248	3363
Max. acceleration torque <sup>b) e)</sup> (max. 1000 cycles per hour)			<i>T</i> <sub>2B</sub>	<i>Nm</i>	480	480	480	480	480	480	480	480	380	480	380
				<i>in.lb</i>	4248	4248	4248	4248	4248	4248	4248	4248	3363	4248	3363
Nominal torque (at <i>n</i> <sub>IN</sub> )			<i>T</i> <sub>2N</sub>	<i>Nm</i>	277	297	298	328	287	329	364	367	304	304	304
				<i>in.lb</i>	2447	2629	2636	2900	2544	2915	3219	3250	2691	2690	2691
Emergency stop torque <sup>a) b) e)</sup> (permitted 1000 times during the service life of the gearbox)			<i>T</i> <sub>2Not</sub>	<i>Nm</i>	1350	1350	1350	1350	1350	1350	1350	1350	1250	1350	1250
				<i>in.lb</i>	11949	11949	11949	11949	11949	11949	11949	11949	11064	11949	11064
Permitted average input speed (at <i>T</i> <sub>2N</sub> and 20 °C ambient temperature) <sup>d)</sup>			<i>n</i> <sub>1N</sub>	<i>rpm</i>	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500
Max. input speed			<i>n</i> <sub>1Max</sub>	<i>rpm</i>	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000
Mean no load running torque <sup>b)</sup> (at <i>n</i> <sub>1</sub> = 3000 rpm and 20 °C gearbox temperature)			<i>T</i> <sub>012</sub>	<i>Nm</i>	1.1	1.0	0.96	0.80	0.72	0.60	0.55	0.45	0.45	0.40	0.40
				<i>in.lb</i>	9.7	9.2	8.5	7.1	6.4	5.3	4.9	4.0	4.0	3.5	3.5
Max. backlash			<i>j</i> <sub>t</sub>	<i>arcmin</i>	Standard ≤ 6 / Reduced ≤ 4										
Torsional rigidity <sup>b)</sup>			<i>C</i> <sub>121</sub>	<i>Nm/arcmin</i>	53										
				<i>in.lb/arcmin</i>	469										
Max. axial force <sup>c)</sup>			<i>F</i> <sub>2AMax</sub>	<i>N</i>	9870										
				<i>lb<sub>f</sub></i>	2221										
Max. lateral force <sup>c)</sup>			<i>F</i> <sub>2QMax</sub>	<i>N</i>	9600										
				<i>lb<sub>f</sub></i>	2160										
Max. tilting moment			<i>M</i> <sub>2KMax</sub>	<i>Nm</i>	1000										
				<i>in.lb</i>	8851										
Efficiency at full load			<i>η</i>	%	96.5										
Service life <sup>f)</sup>			<i>L</i> <sub>h</sub>	<i>h</i>	> 30000										
Weight (incl. standard adapter plate)			<i>m</i>	<i>kg</i>	17										
				<i>lb<sub>m</sub></i>	37.6										
Operating noise (at reference ratio and reference speed – ratio-specific values available in cymex®)			<i>L</i> <sub>PA</sub>	<i>dB(A)</i>	≤ 59										
Max. permitted housing temperature				°C	+90										
				<i>F</i>	194										
Ambient temperature				°C	–15 to +40										
				<i>F</i>	5 to 104										
Lubrication					Lubricated for life										
Direction of rotation					In- and output same direction										
Protection class					IP 65										
Metal bellows coupling (recommended product type – validate sizing with cymex®)					BC2-00500AA040.000-X										
				<i>mm</i>	X = 035.000 - 060.000										
Mass moment of inertia (relates to the drive) Clamping hub diameter [mm]	G	24	<i>J</i> <sub>i</sub>	<i>kgcm<sup>2</sup></i>	3.19	2.71	2.67	2.34	1.65	2.32	2.10	2.08	2.08	2.08	2.07
				<i>10<sup>-3</sup> in.lb.s<sup>2</sup></i>	2.82	2.40	2.36	2.07	1.46	2.05	1.86	1.84	1.84	1.84	1.83
	K	38	<i>J</i> <sub>i</sub>	<i>kgcm<sup>2</sup></i>	10.3	9.77	9.73	9.41	2.34	9.39	9.16	9.15	1.39	9.14	9.14
				<i>10<sup>-3</sup> in.lb.s<sup>2</sup></i>	9.07	8.65	8.61	8.33	2.07	8.31	8.11	8.10	1.23	8.09	8.09

Please use our sizing software cymex<sup>®</sup> for a detailed sizing – [www.wittenstein-cymex.com](http://www.wittenstein-cymex.com)

<sup>a)</sup> At max. 10 %  $F_{2QMax}$

<sup>b)</sup> Valid for standard clamping hub diameter

<sup>c)</sup> Refers to center of the output shaft or flange

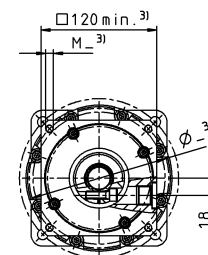
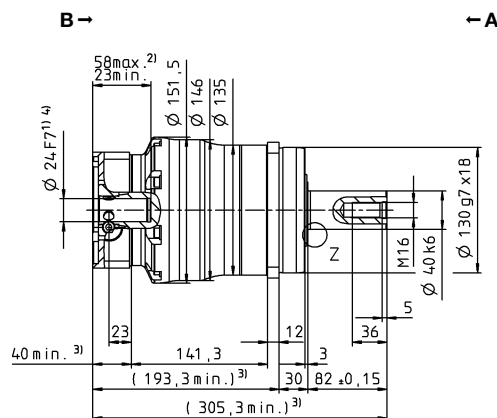
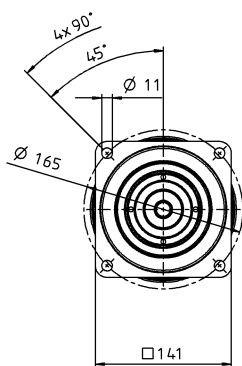
<sup>d)</sup> Please reduce input speed at higher ambient temperatures

<sup>e)</sup> Smooth shaft

<sup>f)</sup> Please contact us to discuss  
application-specific service lifetimes

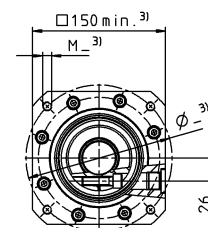
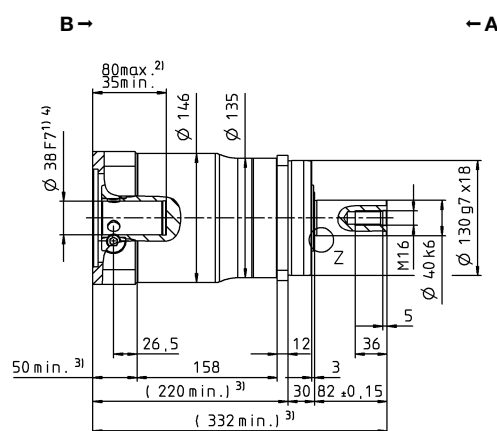
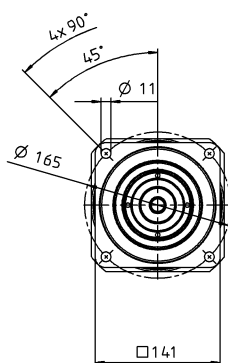
# 2-stage

up to 24 <sup>4)</sup> (G) <sup>5)</sup>  
clamping hub  
diameter



Motor shaft diameter [mm]

up to 38 <sup>4)</sup> (K)  
clamping hub  
diameter



Planetary gearboxes

SP

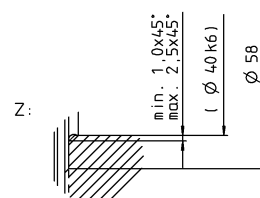
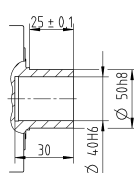
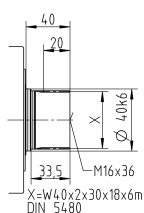
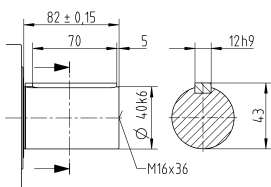
MC

## Other output variants

Shaft with key

Splined shaft (DIN 5480)

Shaft mounted



Non-tolerated dimensions are nominal dimensions

<sup>1)</sup> Check motor shaft fit

<sup>2)</sup> Min./Max. permissible motor shaft length. Longer motor shafts are possible, please contact alpha.

<sup>3)</sup> The dimensions depend on the motor

<sup>4)</sup> Smaller motor shaft diameter is compensated by a bushing with a minimum wall thickness of 1 mm

<sup>5)</sup> Standard clamping hub diameter



# SP<sup>+</sup> 180 MC 1-stage

			Standard version MC						Friction optimized version L							
Ratio			<i>i</i>		3	4	5	7	8	10	3	4	5	7	8	10
Max. torque <sup>a) b) e)</sup>			<i>T</i> <sub>2a</sub>	<i>Nm</i>	700	880	880	880	700	700	700	880	880	880	700	700
				<i>in.lb</i>	6196	7789	7789	7789	6196	6196	6196	7789	7789	7789	6196	6196
Max. acceleration torque <sup>b) e)</sup> (max. 1000 cycles per hour)			<i>T</i> <sub>2B</sub>	<i>Nm</i>	700	880	880	880	700	700	700	880	880	880	700	700
				<i>in.lb</i>	6196	7789	7789	7789	6196	6196	6196	7789	7789	7789	6196	6196
Nominal torque (at <i>n</i> <sub>IN</sub> )			<i>T</i> <sub>2N</sub>	<i>Nm</i>	289	492	379	469	465	488	289	492	379	469	465	488
				<i>in.lb</i>	2554	4355	3357	4151	4117	4316	2554	4355	3357	4151	4117	4316
Emergency stop torque <sup>a) b) e)</sup> (permitted 1000 times during the service life of the gearbox)			<i>T</i> <sub>2Not</sub>	<i>Nm</i>	2640	2750	2750	2750	2640	2640	2640	2750	2750	2750	2640	2640
				<i>in.lb</i>	23366	24340	24340	24340	23366	23366	23366	24340	24340	24340	23366	23366
Permitted average input speed (at <i>T</i> <sub>2N</sub> and 20 °C ambient temperature) <sup>d)</sup>			<i>n</i> <sub>1N</sub>	<i>rpm</i>	3000	3500	4500	4500	4500	4500	3000	3500	4500	4500	4500	4500
Max. input speed			<i>n</i> <sub>1Max</sub>	<i>rpm</i>	4500	6000	6000	6000	6000	6000	4500	6000	6000	6000	6000	6000
Mean no load running torque <sup>b)</sup> (at <i>n</i> <sub>1</sub> = 3000 rpm and 20 °C gearbox temperature)			<i>T</i> <sub>012</sub>	<i>Nm</i>	9.8	8.2	6.6	4.4	4.4	3.2	3.8	3.0	2.3	1.8	1.7	1.6
				<i>in.lb</i>	87	73	58	39	39	28	34	27	20	16	15	14
Max. backlash			<i>j</i> <sub>t</sub>	<i>arcmin</i>	Standard ≤ 4 / Reduced ≤ 2											
Torsional rigidity <sup>b)</sup>			<i>C</i> <sub>t21</sub>	<i>Nm/arcmin</i>	175											
				<i>in.lb/arcmin</i>	1549											
Max. axial force <sup>c)</sup>			<i>F</i> <sub>2AMax</sub>	<i>N</i>	14150						5000					
				<i>lb<sub>f</sub></i>	3184						1125					
Max. lateral force <sup>c)</sup>			<i>F</i> <sub>2QMax</sub>	<i>N</i>	15000						2000					
				<i>lb<sub>f</sub></i>	3375						450					
Max. tilting moment			<i>M</i> <sub>2KMax</sub>	<i>Nm</i>	1800						208					
				<i>in.lb</i>	15931						1841					
Efficiency at full load			<i>η</i>	%	98.5						99					
Service life <sup>f)</sup>			<i>L</i> <sub>h</sub>	<i>h</i>	> 30000											
Weight (incl. standard adapter plate)			<i>m</i>	<i>kg</i>	34											
				<i>lb<sub>m</sub></i>	75.1											
Operating noise (at reference ratio and reference speed – ratio-specific values available in cymex®)			<i>L</i> <sub>PA</sub>	<i>dB(A)</i>	≤ 62											
Max. permitted housing temperature				°C	+90											
				<i>F</i>	194											
Ambient temperature				°C	−15 to +40											
				<i>F</i>	5 to 104											
Lubrication					Lubricated for life											
Direction of rotation					In- and output same direction											
Protection class					IP 65						IP 52					
Metal bellows coupling (recommended product type – validate sizing with cymex®)					BC2-00800AA055.000-X											
			Bore diameter of coupling on the application side			<i>mm</i>	X = 040.000 - 075.000									
Mass moment of inertia (relates to the drive) Clamping hub diameter [mm]		M 48	<i>J</i> <sub>i</sub>	<i>kgcm²</i>	58.5	41.6	35.6	30.0	30.0	26.9	58.5	41.6	35.6	30.0	30.0	26.9
				<i>10<sup>-3</sup> in.lb.s²</i>	51.8	36.8	31.5	26.6	26.6	23.8	51.8	36.8	31.5	26.6	26.6	23.8

Please use our sizing software cymex<sup>®</sup> for a detailed sizing – [www.wittenstein-cymex.com](http://www.wittenstein-cymex.com)

<sup>a)</sup> At max. 10 %  $F_{2QMax}$

<sup>b)</sup> Valid for standard clamping hub diameter

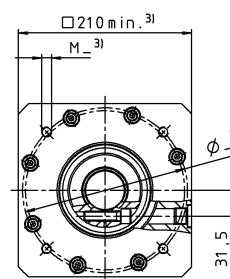
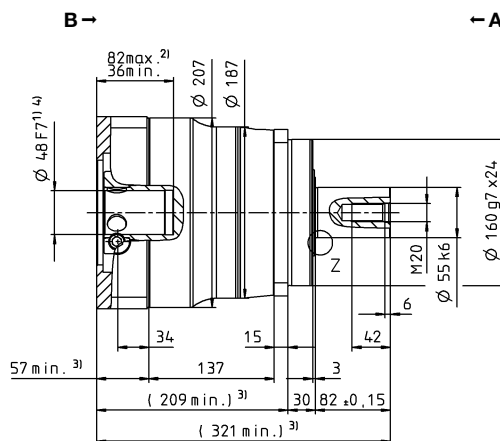
<sup>c)</sup> Refers to center of the output shaft or flange

<sup>d)</sup> Please reduce input speed at higher ambient temperatures

<sup>e)</sup> Smooth shaft

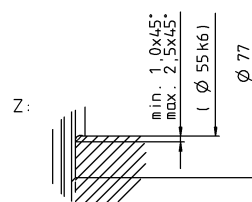
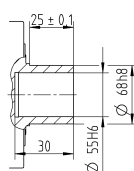
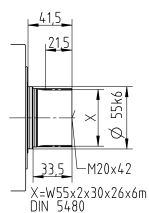
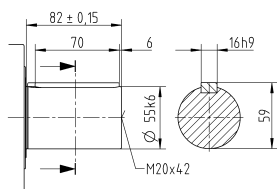
<sup>f)</sup> Please contact us to discuss  
application-specific service lifetimes

up to 48 <sup>4)</sup> (M) <sup>5)</sup>  
clamping hub  
diameter

 $\frac{d}{ds}$ 

MC

Shaft mounted

<sup>5)</sup> Standard clamping hub diameter

# SP<sup>+</sup> 180 MC 2-stage

				2-stage											
Ratio		<i>i</i>		16	20	25	28	32	35	40	50	64	70	100	
Max. torque <sup>a) b) e)</sup>		<i>T</i> <sub>2a</sub>	<i>Nm</i> <i>in.lb</i>	880 7789	880 7789	880 7789	880 7789	880 7789	880 7789	880 7789	880 7789	700 6196	880 7789	700 6196	
Max. acceleration torque <sup>b) e)</sup> (max. 1000 cycles per hour)		<i>T</i> <sub>2B</sub>	<i>Nm</i> <i>in.lb</i>	880 7789	880 7789	880 7789	880 7789	880 7789	880 7789	880 7789	880 7789	700 6196	880 7789	700 6196	
Nominal torque (at <i>n</i> <sub>N</sub> )		<i>T</i> <sub>2N</sub>	<i>Nm</i> <i>in.lb</i>	696 6156	704 6231	704 6231	704 6231	704 6231	704 6231	704 6231	704 6231	560 4956	704 6231	560 4956	
Emergency stop torque <sup>a) b) e)</sup> (permitted 1000 times during the service life of the gearbox)		<i>T</i> <sub>2Not</sub>	<i>Nm</i> <i>in.lb</i>	2750 24340	2750 24340	2750 24340	2750 24340	2750 24340	2750 24340	2750 24340	2750 24340	2640 23366	2750 24340	2640 23366	
Permitted average input speed (at <i>T</i> <sub>2N</sub> and 20 °C ambient temperature) <sup>d)</sup>		<i>n</i> <sub>1N</sub>	<i>rpm</i>	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	
Max. input speed		<i>n</i> <sub>1Max</sub>	<i>rpm</i>	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	
Mean no load running torque <sup>b)</sup> (at <i>n</i> <sub>1</sub> = 3000 rpm and 20 °C gearbox temperature)		<i>T</i> <sub>012</sub>	<i>Nm</i> <i>in.lb</i>	2.2 20	2.3 21	1.8 16	1.7 15	1.7 15	1.4 12	1.2 11	1.2 11	1.2 11	0.95 8.4	1.0 9.2	
Max. backlash		<i>j</i> <sub>t</sub>	<i>arcmin</i>	Standard ≤ 6 / Reduced ≤ 4											
Torsional rigidity <sup>b)</sup>		<i>C</i> <sub>t21</sub>	<i>Nm/arcmin</i> <i>in.lb/arcmin</i>	175 1549											
Max. axial force <sup>c)</sup>		<i>F</i> <sub>2AMax</sub>	<i>N</i> <i>lb<sub>f</sub></i>	14150 3184											
Max. lateral force <sup>c)</sup>		<i>F</i> <sub>2QMax</sub>	<i>N</i> <i>lb<sub>f</sub></i>	15000 3375											
Max. tilting moment		<i>M</i> <sub>2KMax</sub>	<i>Nm</i> <i>in.lb</i>	1800 15931											
Efficiency at full load		<i>η</i>	%	96.5											
Service life <sup>f)</sup>		<i>L</i> <sub>n</sub>	<i>h</i>	> 30000											
Weight (incl. standard adapter plate)		<i>m</i>	<i>kg</i> <i>lb<sub>m</sub></i>	36.4 80.4											
Operating noise (at reference ratio and reference speed – ratio-specific values available in cymex®)		<i>L</i> <sub>PA</sub>	<i>dB(A)</i>	≤ 58											
Max. permitted housing temperature			°C <i>F</i>	+90 194											
Ambient temperature			°C <i>F</i>	–15 to +40 5 to 104											
Lubrication				Lubricated for life											
Direction of rotation				In- and output same direction											
Protection class				IP 65											
Metal bellows coupling (recommended product type – validate sizing with cymex®)				BC2-00800AA055.000-X											
Bore diameter of coupling on the application side			<i>mm</i>	X = 040.000 - 075.000											
Mass moment of inertia (relates to the drive) Clamping hub diameter [mm]	K	38	<i>J</i> <sub>i</sub>	<i>kgcm<sup>2</sup></i>	13.5	12.0	11.7	10.6	10.6	10.4	9.74	9.68	5.45	9.63	9.60
				<i>10<sup>-3</sup> in.lb.s<sup>2</sup></i>	12.0	10.6	10.4	9.34	9.34	9.23	8.62	8.57	4.82	8.52	8.50

Please use our sizing software cymex<sup>®</sup> for a detailed sizing – [www.wittenstein-cymex.com](http://www.wittenstein-cymex.com)

<sup>a)</sup> At max. 10 %  $F_{2QMax}$

<sup>b)</sup> Valid for standard clamping hub diameter

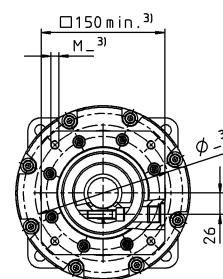
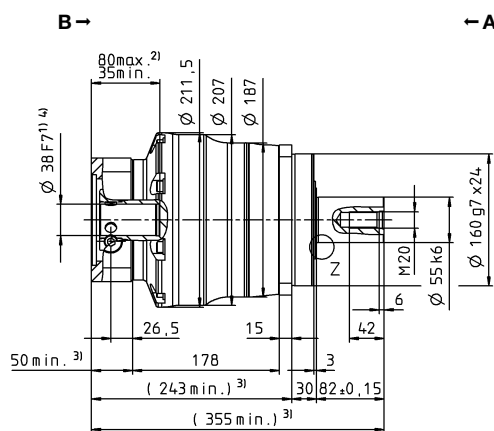
<sup>c)</sup> Refers to center of the output shaft or flange

<sup>d)</sup> Please reduce input speed at higher ambient temperatures

<sup>e)</sup> Smooth shaft

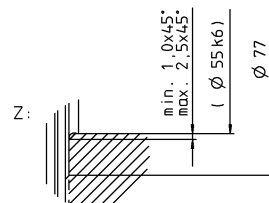
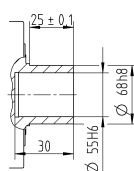
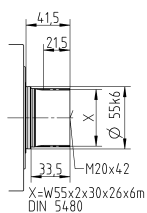
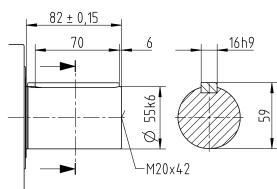
<sup>f)</sup> Please contact us to discuss application-specific service lifetimes

up to 38 <sup>4)</sup> (K) <sup>5)</sup>  
clamping hub  
diameter

 $\frac{d}{ds}$ 

MC

Shaft mounted

<sup>5)</sup> Standard clamping hub diameter

# SP<sup>+</sup> 210 MC 1-stage

				Standard version MC					Friction optimized version L						
Ratio			<i>i</i>		4	5	7	8	10	4	5	7	8	10	
Max. torque <sup>a) b) e)</sup>			<i>T</i> <sub>2a</sub>	<i>Nm</i>	2000	2000	1700	1200	1200	2000	2000	1700	1200	1200	
				<i>in.lb</i>	17702	17702	15046	10621	10621	17702	17702	15046	10621	10621	
Max. acceleration torque <sup>b) e)</sup> (max. 1000 cycles per hour)			<i>T</i> <sub>2B</sub>	<i>Nm</i>	2000	2000	1700	1200	1200	2000	2000	1700	1200	1200	
				<i>in.lb</i>	17702	17702	15046	10621	10621	17702	17702	15046	10621	10621	
Nominal torque (at <i>n</i> <sub>n</sub> )			<i>T</i> <sub>2N</sub>	<i>Nm</i>	1260	1141	1169	960	960	1260	1141	1169	960	960	
				<i>in.lb</i>	11148	10098	10347	8497	8497	11148	10098	10347	8497	8497	
Emergency stop torque <sup>a) b) e)</sup> (permitted 1000 times during the service life of the gearbox)			<i>T</i> <sub>2Not</sub>	<i>Nm</i>	5900	5900	5900	5900	5900	5900	5900	5900	5900	5900	
				<i>in.lb</i>	52220	52220	52220	52220	52220	52220	52220	52220	52220	52220	
Permitted average input speed (at <i>T</i> <sub>2a</sub> and 20 °C ambient temperature) <sup>d)</sup>			<i>n</i> <sub>1N</sub>	<i>rpm</i>	2500	3500	3500	3500	3500	2500	3500	3500	3500	3500	
Max. input speed			<i>n</i> <sub>1Max</sub>	<i>rpm</i>	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	
Mean no load running torque <sup>b)</sup> (at <i>n</i> <sub>i</sub> = 2000 rpm and 20 °C gearbox temperature)			<i>T</i> <sub>012</sub>	<i>Nm</i>	11	8.4	5.6	5.6	4.4	4.9	4.6	4.0	3.8	3.6	
				<i>in.lb</i>	99	74	50	50	39	43	41	35	34	32	
Max. backlash			<i>j</i> <sub>t</sub>	<i>arcmin</i>	Standard ≤ 4 / Reduced ≤ 2										
Torsional rigidity <sup>b)</sup>			<i>C</i> <sub>121</sub>	<i>Nm/arcmin</i>	400										
				<i>in.lb/arcmin</i>	3540										
Max. axial force <sup>c)</sup>			<i>F</i> <sub>2AMax</sub>	<i>N</i>	30000					8000					
				<i>lb<sub>f</sub></i>	6750					1800					
Max. lateral force <sup>c)</sup>			<i>F</i> <sub>2QMax</sub>	<i>N</i>	21000					2500					
				<i>lb<sub>f</sub></i>	4725					563					
Max. tilting moment			<i>M</i> <sub>2KMax</sub>	<i>Nm</i>	3100					310					
				<i>in.lb</i>	27437					2744					
Efficiency at full load			<i>η</i>	%	98.5					99					
Service life <sup>f)</sup>			<i>L</i> <sub>h</sub>	<i>h</i>	> 30000										
Weight (incl. standard adapter plate)			<i>m</i>	<i>kg</i>	56										
				<i>lb<sub>m</sub></i>	123.8										
Operating noise (at reference ratio and reference speed – ratio-specific values available in cymex®)			<i>L</i> <sub>PA</sub>	<i>dB(A)</i>	≤ 64										
Max. permitted housing temperature				°C	+90										
				<i>F</i>	194										
Ambient temperature				°C	–15 to +40										
				<i>F</i>	5 to 104										
Lubrication					Lubricated for life										
Direction of rotation					In- and output same direction										
Protection class					IP 65					IP 52					
Metal bellows coupling (recommended product type – validate sizing with cymex®)					BC2-04000AA075.000-X										
			Bore diameter of coupling on the application side			<i>mm</i>	X = 050.000 - 090.000								
Mass moment of inertia (relates to the drive) Clamping hub diameter [mm]		N	55	<i>J</i> <sub>i</sub>	<i>kgcm</i> <sup>2</sup>	94.3	76.9	61.5	61.5	53.1	94.3	76.9	61.5	61.5	53.1
					<i>10<sup>-3</sup> in.lb.s</i> <sup>2</sup>	83.5	68.1	54.4	54.4	47.0	83.5	68.1	54.4	54.4	47.0

Please use our sizing software cymex<sup>®</sup> for a detailed sizing – [www.wittenstein-cymex.com](http://www.wittenstein-cymex.com)

<sup>a)</sup> At max. 10 %  $F_{2QMax}$

<sup>b)</sup> Valid for standard clamping hub diameter

<sup>c)</sup> Refers to center of the output shaft or flange

<sup>d)</sup> Please reduce input speed at higher ambient temperatures

<sup>e)</sup> Smooth shaft

<sup>f)</sup> Please contact us to discuss  
application-specific service lifetimes

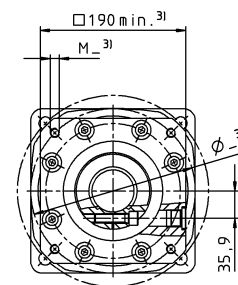
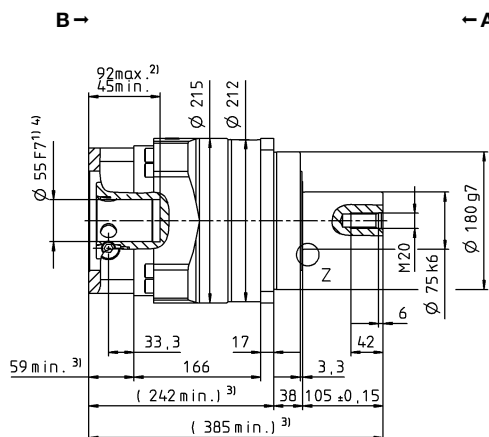
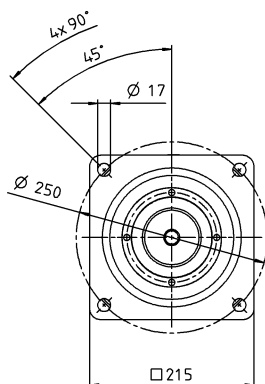


View A

View B

Motor shaft diameter [mm]

1-stage

up to 55 <sup>4)</sup> (N) <sup>5)</sup>  
clamping hub  
diameter


Planetary gearboxes

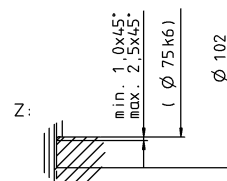
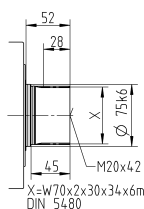
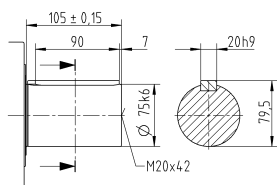
SP

MC

## Other output variants

Shaft with key

Splined shaft (DIN 5480)



Non-tolerated dimensions are nominal dimensions

<sup>1)</sup> Check motor shaft fit

<sup>2)</sup> Min./Max. permissible motor shaft length. Longer motor shafts are possible, please contact alpha.

<sup>3)</sup> The dimensions depend on the motor

<sup>4)</sup> Smaller motor shaft diameter is compensated by a bushing with a minimum wall thickness of 1 mm

<sup>5)</sup> Standard clamping hub diameter

# SP<sup>+</sup> 210 MC 2-stage

				2-stage												
Ratio			<i>i</i>		16	20	25	28	32	35	40	50	64	70	100	
Max. torque <sup>a) b) e)</sup>			<i>T</i> <sub>2a</sub>	<i>Nm</i>	1680	1800	2000	1680	1680	1920	1040	1300	1200	1700	1200	
				<i>in.lb</i>	14869	15931	17702	14869	14869	16994	9205	11506	10621	15046	10621	
Max. acceleration torque <sup>b) e)</sup> (max. 1000 cycles per hour)			<i>T</i> <sub>2B</sub>	<i>Nm</i>	1680	1800	2000	1680	1680	1920	1040	1300	1200	1700	1200	
				<i>in.lb</i>	14869	15931	17702	14869	14869	16994	9205	11506	10621	15046	10621	
Nominal torque (at <i>n</i> <sub>1N</sub> )			<i>T</i> <sub>2N</sub>	<i>Nm</i>	898	728	910	744	1344	929	787	984	960	1360	960	
				<i>in.lb</i>	7949	6445	8056	6581	11895	8226	6969	8711	8497	12037	8497	
Emergency stop torque <sup>a) b) e)</sup> (permitted 1000 times during the service life of the gearbox)			<i>T</i> <sub>2Not</sub>	<i>Nm</i>	5900	5900	5900	5900	5900	5900	5900	5900	5900	5900	5900	
				<i>in.lb</i>	52220	52220	52220	52220	52220	52220	52220	52220	52220	52220	52220	
Permitted average input speed (at <i>T</i> <sub>2N</sub> and 20 °C ambient temperature) <sup>d)</sup>			<i>n</i> <sub>1N</sub>	<i>rpm</i>	3500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	
Max. input speed			<i>n</i> <sub>1Max</sub>	<i>rpm</i>	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000
Mean no load running torque <sup>b)</sup> (at <i>n</i> <sub>1</sub> = 2000 rpm and 20 °C gearbox temperature)			<i>T</i> <sub>012</sub>	<i>Nm</i>	3.4	3.1	2.9	2.6	2.6	2.0	2.0	1.8	1.8	1.6	1.6	
				<i>in.lb</i>	30	27	25	23	23	18	18	16	16	14	14	
Max. backlash			<i>j</i> <sub>t</sub>	<i>arcmin</i>	Standard ≤ 5 / Reduced ≤ 4											
Torsional rigidity <sup>b)</sup>			<i>C</i> <sub>t21</sub>	<i>Nm/arcmin</i>	400											
				<i>in.lb/arcmin</i>	3540											
Max. axial force <sup>c)</sup>			<i>F</i> <sub>2AMax</sub>	<i>N</i>	30000											
				<i>lb<sub>f</sub></i>	6750											
Max. lateral force <sup>c)</sup>			<i>F</i> <sub>2QMax</sub>	<i>N</i>	21000											
				<i>lb<sub>f</sub></i>	4725											
Max. tilting moment			<i>M</i> <sub>2KMax</sub>	<i>Nm</i>	3100											
				<i>in.lb</i>	27437											
Efficiency at full load			<i>η</i>	%	96.5											
Service life <sup>f)</sup>			<i>L</i> <sub>h</sub>	<i>h</i>	> 30000											
Weight (incl. standard adapter plate)			<i>m</i>	<i>kg</i>	53											
				<i>lb<sub>m</sub></i>	117.1											
Operating noise (at reference ratio and reference speed – ratio-specific values available in cymex®)			<i>L</i> <sub>PA</sub>	<i>dB(A)</i>	≤ 57											
Max. permitted housing temperature				°C	+90											
				<i>F</i>	194											
Ambient temperature				°C	–15 to +40											
				<i>F</i>	5 to 104											
Lubrication					Lubricated for life											
Direction of rotation					In- and output same direction											
Protection class					IP 65											
Metal bellows coupling (recommended product type – validate sizing with cymex®)					BC2-04000AA075.000-X											
			Bore diameter of coupling on the application side	<i>mm</i>	X = 050.000 - 090.000											
Mass moment of inertia (relates to the drive) Clamping hub diameter [mm]	M	48	<i>J</i> <sub>i</sub>	<i>kgcm<sup>2</sup></i>	34.5	31.5	30.8	30.0	30.0	29.7	28.5	28.3	28.3	28.1	28.0	
				<i>10<sup>-3</sup> in.lb.s<sup>2</sup></i>	30.5	27.9	27.3	26.6	26.6	26.3	25.2	25.0	25.0	24.9	24.8	

Please use our sizing software cymex<sup>®</sup> for a detailed sizing – [www.wittenstein-cymex.com](http://www.wittenstein-cymex.com)

<sup>a)</sup> At max. 10 %  $F_{2QMax}$

<sup>b)</sup> Valid for standard clamping hub diameter

<sup>c)</sup> Refers to center of the output shaft or flange

<sup>d)</sup> Please reduce input speed at higher ambient temperatures

<sup>e)</sup> Smooth shaft

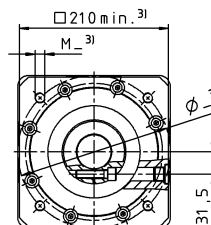
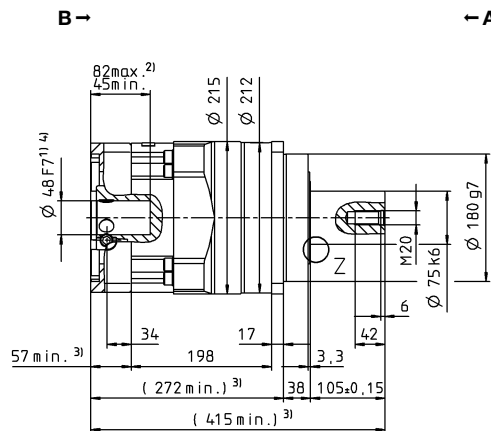
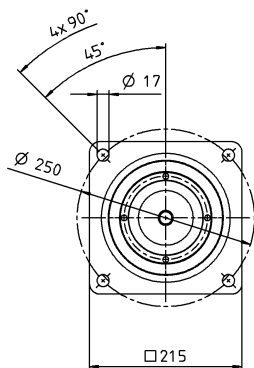
<sup>f)</sup> Please contact us to discuss  
application-specific service lifetimes

View A

View B

Motor shaft diameter [mm]

2-stage

up to 48 <sup>4)</sup> (M) <sup>5)</sup>  
clamping hub  
diameter


Planetary gearboxes

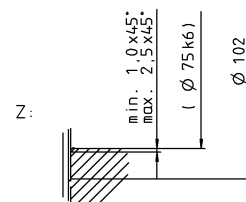
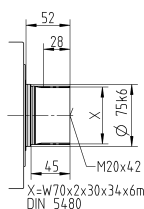
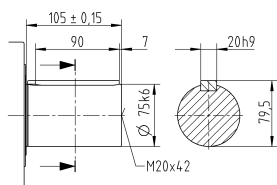
SP

MC

## Other output variants

Shaft with key

Splined shaft (DIN 5480)



Non-tolerated dimensions are nominal dimensions

<sup>1)</sup> Check motor shaft fit

<sup>2)</sup> Min./Max. permissible motor shaft length. Longer motor shafts are possible, please contact alpha.

<sup>3)</sup> The dimensions depend on the motor

<sup>4)</sup> Smaller motor shaft diameter is compensated by a bushing with a minimum wall thickness of 1 mm

<sup>5)</sup> Standard clamping hub diameter

# SP<sup>+</sup> 240 MC 1-stage

			Standard version MC					Friction optimized version L						
Ratio			<i>i</i>		4	5	7	8	10	4	5	7	8	10
Max. torque <sup>a) b) e)</sup>			<i>T</i> <sub>2a</sub>	<i>Nm</i>	3500	3600	2700	1800	1800	3500	3600	2700	1800	1800
				<i>in.lb</i>	30978	31863	23897	15931	15931	30978	31863	23897	15931	15931
Max. acceleration torque <sup>b) e)</sup> (max. 1000 cycles per hour)			<i>T</i> <sub>2B</sub>	<i>Nm</i>	3500	3600	2700	1800	1800	3500	3600	2700	1800	1800
				<i>in.lb</i>	30978	31863	23897	15931	15931	30978	31863	23897	15931	15931
Nominal torque (at <i>n</i> <sub>n</sub> )			<i>T</i> <sub>2N</sub>	<i>Nm</i>	2029	1861	1910	1440	1440	2029	1861	1910	1440	1440
				<i>in.lb</i>	17955	16471	16909	12745	12745	17955	16471	16909	12745	12745
Emergency stop torque <sup>a) b) e)</sup> (permitted 1000 times during the service life of the gearbox)			<i>T</i> <sub>2Not</sub>	<i>Nm</i>	8500	8500	8500	6850	6850	8500	8500	8500	6850	6850
				<i>in.lb</i>	75232	75232	75232	60628	60628	75232	75232	75232	60628	60628
Permitted average input speed (at <i>T</i> <sub>2N</sub> and 20 °C ambient temperature) <sup>d)</sup>			<i>n</i> <sub>1N</sub>	<i>rpm</i>	2250	3000	3000	3000	3000	2250	3000	3000	3000	3000
Max. input speed			<i>n</i> <sub>1Max</sub>	<i>rpm</i>	4000	5000	5000	5000	5000	4000	5000	5000	5000	5000
Mean no load running torque <sup>b)</sup> (at <i>n</i> <sub>i</sub> = 2000 rpm and 20 °C gearbox temperature)			<i>T</i> <sub>012</sub>	<i>Nm</i>	16	12	8.6	8.6	5.8	7.0	6.0	5.0	4.8	4.2
				<i>in.lb</i>	141	107	77	77	51	62	53	44	43	37
Max. backlash			<i>j</i> <sub>t</sub>	<i>arcmin</i>	Standard ≤ 4 / Reduced ≤ 2									
Torsional rigidity <sup>b)</sup>			<i>C</i> <sub>t21</sub>	<i>Nm/arcmin</i>	550									
				<i>in.lb/arcmin</i>	4868									
Max. axial force <sup>c)</sup>			<i>F</i> <sub>2AMax</sub>	<i>N</i>	33000					10000				
				<i>lb<sub>f</sub></i>	7425					2250				
Max. lateral force <sup>c)</sup>			<i>F</i> <sub>2QMax</sub>	<i>N</i>	30000					2000				
				<i>lb<sub>f</sub></i>	6750					450				
Max. tilting moment			<i>M</i> <sub>2KMax</sub>	<i>Nm</i>	5000					280				
				<i>in.lb</i>	44254					2478				
Efficiency at full load			<i>η</i>	%	98.5					99				
Service life <sup>f)</sup>			<i>L</i> <sub>h</sub>	<i>h</i>	> 30000									
Weight (incl. standard adapter plate)			<i>m</i>	<i>kg</i>	77									
				<i>lb<sub>m</sub></i>	170.2									
Operating noise (at reference ratio and reference speed – ratio-specific values available in cymex®)			<i>L</i> <sub>PA</sub>	<i>dB(A)</i>	≤ 66									
Max. permitted housing temperature				°C	+90									
				<i>F</i>	194									
Ambient temperature				°C	–15 to +40									
				<i>F</i>	5 to 104									
Lubrication					Lubricated for life									
Direction of rotation					In- and output same direction									
Protection class					IP 65					IP 52				
Metal bellows coupling (recommended product type – validate sizing with cymex®)					BC2-04000AA085.000-X									
				<i>mm</i>	X = 050.000 - 090.000									
Mass moment of inertia (relates to the drive) Clamping hub diameter [mm]		O 60	<i>J</i> <sub>i</sub>	<i>kgcm</i> <sup>2</sup>	198	163	138	138	125	198	163	138	138	125
				<i>10<sup>-3</sup> in.lb.s</i> <sup>2</sup>	175	144	122	122	110	175	144	122	122	110

Please use our sizing software cymex<sup>®</sup> for a detailed sizing – [www.wittenstein-cymex.com](http://www.wittenstein-cymex.com)

<sup>a)</sup> At max. 10 %  $F_{2QMax}$

<sup>b)</sup> Valid for standard clamping hub diameter

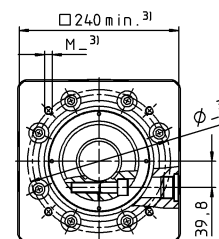
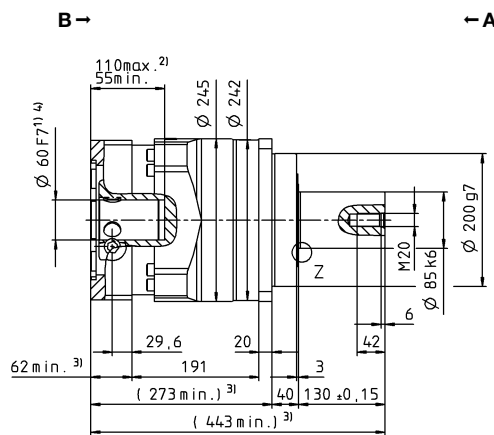
<sup>c)</sup> Refers to center of the output shaft or flange

<sup>d)</sup> Please reduce input speed at higher ambient temperatures

<sup>e)</sup> Smooth shaft

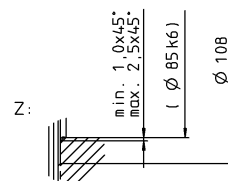
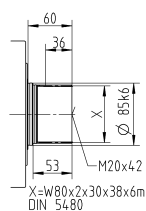
<sup>f)</sup> Please contact us to discuss  
application-specific service lifetimes

up to 60 <sup>4)</sup> (O) <sup>5)</sup>  
clamping hub  
diameter

 $\frac{d}{ds}$ 

MC

Technical drawing of a circular part with a central hole. The drawing includes a side view and a top view. The side view shows a total width of  $130 \pm 0.15$ , a central hole diameter of  $85k6$ , and a distance of 125 from the left edge to the center of the hole. A dimension of 3 is shown for the distance from the right edge to the center of the hole. The top view shows a circular part with a diameter of 90 and a central hole with a diameter of  $22h9$ . A dimension of 22h9 is also shown for the distance from the center of the hole to the edge of the part. A note "M20x2" is present near the bottom right of the side view.

<sup>5)</sup> Standard clamping hub diameter



# SP<sup>+</sup> 240 MC 2-stage

				2-stage											
Ratio		<i>i</i>		16	20	25	28	32	35	40	50	64	70	100	
Max. torque <sup>a) b) e)</sup>		<i>T</i> <sub>2a</sub>	<i>Nm</i>	3500	3500	3600	2900	2900	3600	1680	2100	1800	2700	1800	
			<i>in.lb</i>	30978	30978	31863	25667	25667	31863	14869	18587	15931	23897	15931	
Max. acceleration torque <sup>b) e)</sup> (max. 1000 cycles per hour)		<i>T</i> <sub>2B</sub>	<i>Nm</i>	3500	3500	3600	2900	2900	3600	1680	2100	1800	2700	1800	
			<i>in.lb</i>	30978	30978	31863	25667	25667	31863	14869	18587	15931	23897	15931	
Nominal torque (at <i>n</i> <sub>IN</sub> )		<i>T</i> <sub>2N</sub>	<i>Nm</i>	1950	1803	2266	1867	2320	2694	1344	1680	1440	2160	1440	
			<i>in.lb</i>	17255	15960	20058	16521	20534	23843	11895	14869	12745	19118	12745	
Emergency stop torque <sup>a) b) e)</sup> (permitted 1000 times during the service life of the gearbox)		<i>T</i> <sub>2Not</sub>	<i>Nm</i>	8500	8500	8500	8500	8500	8500	8500	8500	6850	8500	6850	
			<i>in.lb</i>	75232	75232	75232	75232	75232	75232	75232	75232	60628	75232	60628	
Permitted average input speed (at <i>T</i> <sub>2N</sub> and 20 °C ambient temperature) <sup>d)</sup>		<i>n</i> <sub>1N</sub>	<i>rpm</i>	3500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	
Max. input speed		<i>n</i> <sub>1Max</sub>	<i>rpm</i>	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	
Mean no load running torque <sup>b)</sup> (at <i>n</i> <sub>1</sub> = 2000 rpm and 20 °C gearbox temperature)		<i>T</i> <sub>012</sub>	<i>Nm</i>	4.8	4.4	4.0	3.6	3.6	2.8	2.4	2.0	2.0	1.6	1.4	
			<i>in.lb</i>	43	39	35	32	32	25	21	18	18	14	13	
Max. backlash		<i>j</i> <sub>t</sub>	<i>arcmin</i>	Standard ≤ 5 / Reduced ≤ 4											
Torsional rigidity <sup>b)</sup>		<i>C</i> <sub>121</sub>	<i>Nm/arcmin</i>	550											
			<i>in.lb/arcmin</i>	4868											
Max. axial force <sup>c)</sup>		<i>F</i> <sub>2AMax</sub>	<i>N</i>	33000											
			<i>lb<sub>f</sub></i>	7425											
Max. lateral force <sup>c)</sup>		<i>F</i> <sub>2QMax</sub>	<i>N</i>	30000											
			<i>lb<sub>f</sub></i>	6750											
Max. tilting moment		<i>M</i> <sub>2KMax</sub>	<i>Nm</i>	5000											
			<i>in.lb</i>	44254											
Efficiency at full load		<i>η</i>	%	96.5											
Service life <sup>f)</sup>		<i>L</i> <sub>h</sub>	<i>h</i>	> 30000											
Weight (incl. standard adapter plate)		<i>m</i>	<i>kg</i>	76											
			<i>lb<sub>m</sub></i>	168.0											
Operating noise (at reference ratio and reference speed – ratio-specific values available in cymex®)		<i>L</i> <sub>PA</sub>	<i>dB(A)</i>	≤ 58											
Max. permitted housing temperature			°C	+90											
			<i>F</i>	194											
Ambient temperature			°C	-15 to +40											
			<i>F</i>	5 to 104											
Lubrication				Lubricated for life											
Direction of rotation				In- and output same direction											
Protection class				IP 65											
Metal bellows coupling (recommended product type – validate sizing with cymex®)				BC2-04000AA085.000-X											
			<i>mm</i>	X = 050.000 - 090.000											
Mass moment of inertia (relates to the drive) Clamping hub diameter [mm]		M 48	<i>J</i> <sub>1</sub>	<i>kgcm<sup>2</sup></i>	34.5	31.5	30.8	30.0	30.0	29.7	28.5	28.3	28.3	28.1	28.0
				<i>10<sup>-3</sup> in.lb.s<sup>2</sup></i>	30.5	27.9	27.3	26.6	26.6	26.3	25.2	25.1	25.1	24.9	24.8

Please use our sizing software cymex<sup>®</sup> for a detailed sizing – [www.wittenstein-cymex.com](http://www.wittenstein-cymex.com)

<sup>a)</sup> At max. 10 %  $F_{2QMax}$

<sup>b)</sup> Valid for standard clamping hub diameter

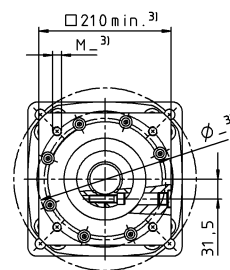
<sup>c)</sup> Refers to center of the output shaft or flange

<sup>d)</sup> Please reduce input speed at higher ambient temperatures

<sup>e)</sup> Smooth shaft

<sup>f)</sup> Please contact us to discuss  
application-specific service lifetimes

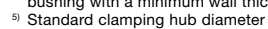
up to 48 <sup>4)</sup> (M) <sup>5)</sup>  
clamping hub  
diameter

 $\frac{d}{ds}$ 

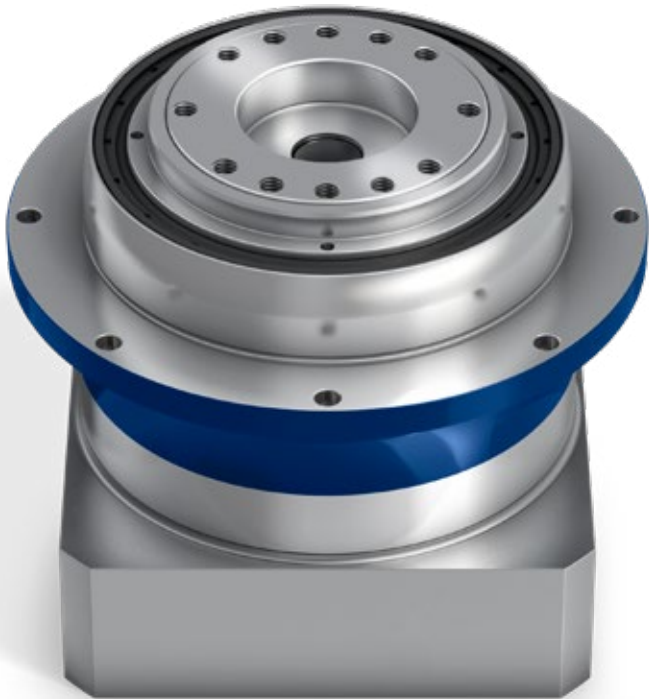
MC

Technical drawing of a square plate with the following dimensions and specifications:

- Overall width: 60
- Inner width: 36
- Overall height: 85
- Inner height: 6
- Material: M20x42
- Material specification: X=W80x2x30x38x6m
- Standard: DIN 5480



## TP+ / TP+ HIGH TORQUE – Compact precision



TP+

### Product highlights

**Max. torsional backlash** [arcmin]  $\leq 1 - 4$

**High torsional rigidity**

**Space-saving design**

**Available output types**

Flange, System output

**Flexible drive options**

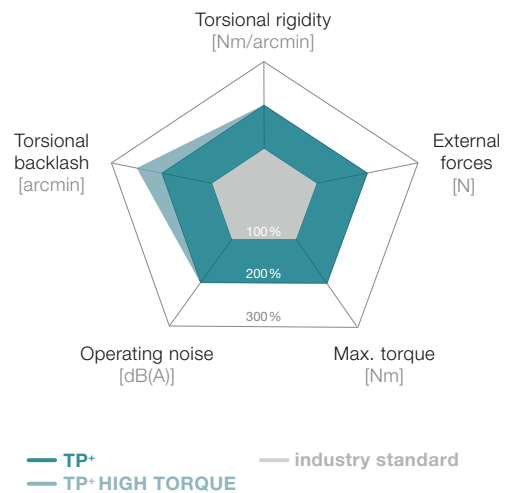
Clamping hub socket, optimized mass inertia, keyed clamping hub socket

**Other gearbox models**

Corrosion resistant design, food-grade lubrication

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 appropriate for high-precision applications in which high torsional rigidity is required.

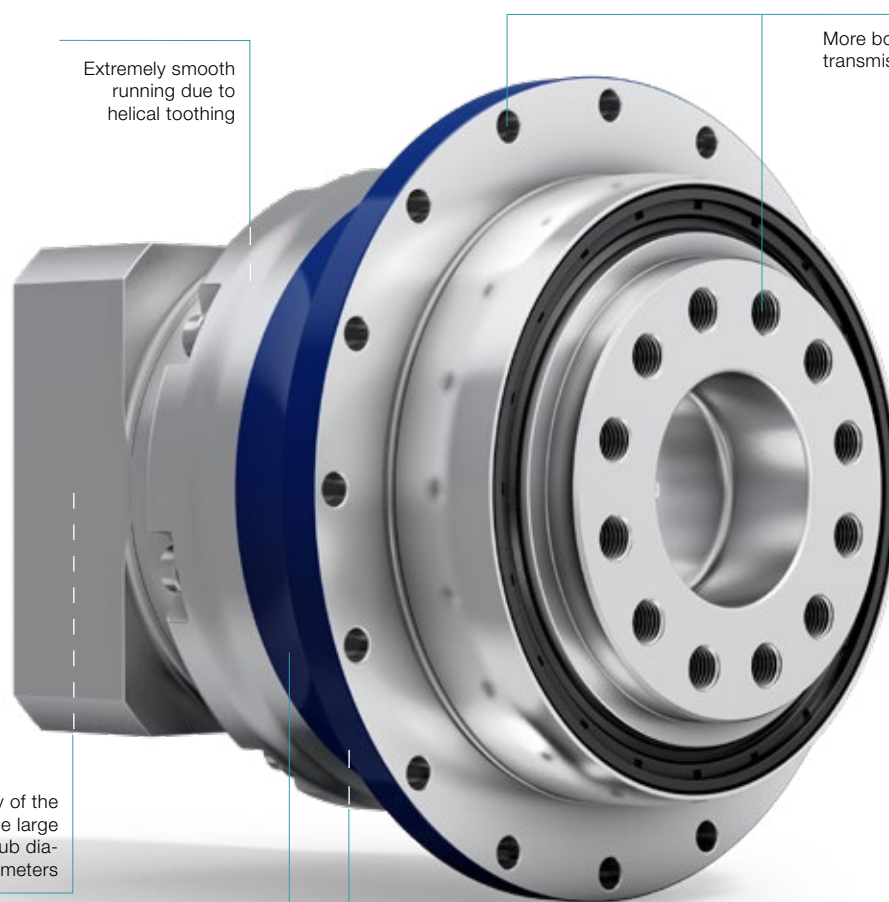
TP+ compared to the industry standard



TP+ 2000



TP+ in corrosion resistant design



Extremely smooth running due to helical toothing

More bores for very high torque transmission

Connectivity of the motor shafts due to the large number of clamping hub diameters

Very high torque density due to superior toothing concept

TP+ HIGH TORQUE

Tapered roller bearing for absorbing axial and radial forces



TP+ HIGH TORQUE with rack and pinion



premo® TP Line

# TP+ 004 MF 1-stage

				1-stage					
Ratio			<i>i</i>		4	5	7	8	10
Max. torque <sup>a) b)</sup>			<i>T</i> <sub>2a</sub>	<i>Nm</i>	83	83	83	56	56
				<i>in.lb</i>	735	735	735	496	496
Max. acceleration torque <sup>b)</sup> (max. 1000 cycles per hour)			<i>T</i> <sub>2B</sub>	<i>Nm</i>	66	66	66	42	42
				<i>in.lb</i>	584	584	584	372	372
Nominal torque (at <i>n</i> <sub>N</sub> )			<i>T</i> <sub>2N</sub>	<i>Nm</i>	27	27	26	26	27
				<i>in.lb</i>	239	236	226	230	237
Emergency stop torque <sup>a) b)</sup> (permitted 1000 times during the service life of the gearbox)			<i>T</i> <sub>2Not</sub>	<i>Nm</i>	100	100	100	100	100
				<i>in.lb</i>	885	885	885	885	885
Permitted average input speed (at <i>T</i> <sub>2N</sub> and 20 °C ambient temperature) <sup>d)</sup>			<i>n</i> <sub>1N</sub>	<i>rpm</i>	3300	3300	4000	4000	4000
Max. input speed			<i>n</i> <sub>1Max</sub>	<i>rpm</i>	7500	7500	7500	7500	7500
Mean no load running torque <sup>b)</sup> (at <i>n</i> <sub>i</sub> = 3000 rpm and 20 °C gearbox temperature)			<i>T</i> <sub>012</sub>	<i>Nm</i>	0.56	0.48	0.37	0.37	0.31
				<i>in.lb</i>	5.0	4.2	3.3	3.3	2.7
Max. backlash			<i>j</i> <sub>t</sub>	<i>arcmin</i>	Standard ≤ 4 / Reduced ≤ 2				
Torsional rigidity <sup>b)</sup>			<i>C</i> <sub>121</sub>	<i>Nm/arcmin</i>	12	12	11	8	8
				<i>in.lb/arcmin</i>	106	106	97	71	71
Tilting rigidity			<i>C</i> <sub>2K</sub>	<i>Nm/arcmin</i>	85				
				<i>in.lb/arcmin</i>	752				
Max. axial force <sup>c)</sup>			<i>F</i> <sub>2AMax</sub>	<i>N</i>	2119				
				<i>lb<sub>f</sub></i>	477				
Max. tilting moment			<i>M</i> <sub>2KMax</sub>	<i>Nm</i>	110				
				<i>in.lb</i>	974				
Efficiency at full load			<i>η</i>	%	97				
Service life <sup>f)</sup>			<i>L</i> <sub>h</sub>	<i>h</i>	> 20000				
Weight (incl. standard adapter plate)			<i>m</i>	<i>kg</i>	1.4				
				<i>lb<sub>m</sub></i>	3.1				
Operating noise (at reference ratio and reference speed – ratio-specific values available in cymex <sup>®</sup> )			<i>L</i> <sub>PA</sub>	<i>dB(A)</i>	≤ 55				
Max. permitted housing temperature				°C	+90				
				<i>F</i>	194				
Ambient temperature				°C	–15 to +40				
				<i>F</i>	5 to 104				
Lubrication					Lubricated for life				
Direction of rotation					In- and output same direction				
Protection class					IP 65				
Metal bellows coupling (recommended product type – validate sizing with cymex <sup>®</sup> )					BCT-00015AAX-031.500				
Bore diameter of coupling on the application side				<i>mm</i>	X = 012.000 - 028.000				
Mass moment of inertia (relates to the drive)  Clamping hub diameter [mm] Optimized mass inertia version available on request	B	11	<i>J</i> <sub>i</sub>	<i>kgcm</i> <sup>2</sup>	0.17	0.14	0.11	0.11	0.09
				<i>10<sup>-3</sup> in.lb.s</i> <sup>2</sup>	0.15	0.12	0.10	0.10	0.08
	C	14	<i>J</i> <sub>i</sub>	<i>kgcm</i> <sup>2</sup>	0.25	0.21	0.18	0.18	0.17
				<i>10<sup>-3</sup> in.lb.s</i> <sup>2</sup>	0.22	0.19	0.16	0.16	0.15
	E	19	<i>J</i> <sub>i</sub>	<i>kgcm</i> <sup>2</sup>	0.57	0.54	0.51	0.51	0.49
				<i>10<sup>-3</sup> in.lb.s</i> <sup>2</sup>	0.50	0.48	0.45	0.45	0.43

Please use our sizing software cymex<sup>®</sup> for a detailed sizing – [www.wittenstein-cymex.com](http://www.wittenstein-cymex.com)

<sup>a)</sup> At max. 10 %  $M_{2KMax}$

<sup>b)</sup> Valid for standard clamping hub diameter

<sup>c)</sup> Refers to center of the output shaft or flange

<sup>d)</sup> Please reduce input speed at higher ambient temperatures

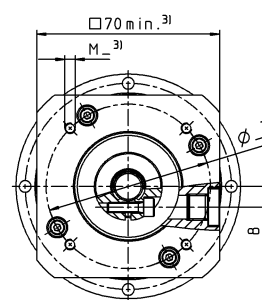
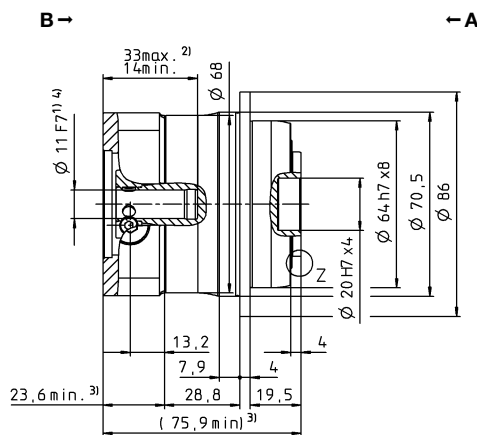
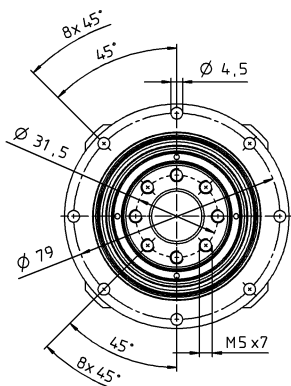
<sup>f)</sup> Please contact us to discuss  
application-specific service lifetimes

View A

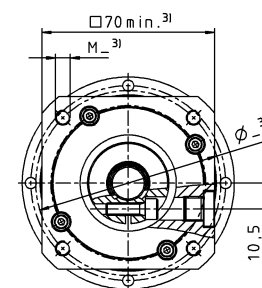
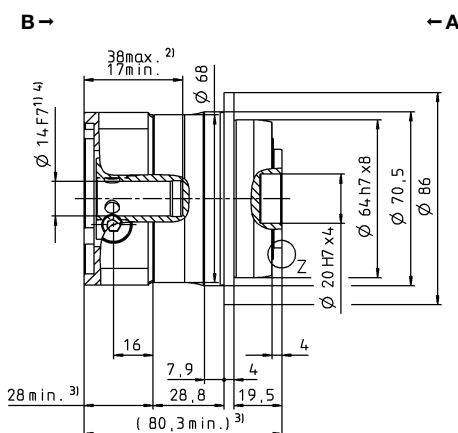
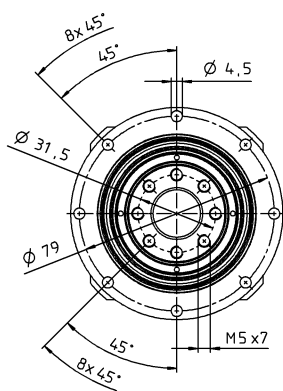
View B

# 1-stage

up to 11 <sup>4)</sup> (B)  
clamping hub  
diameter

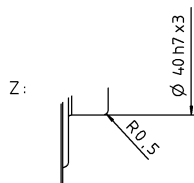
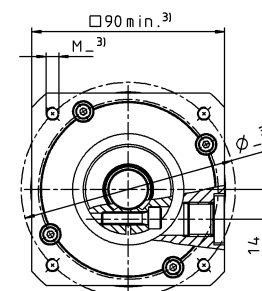
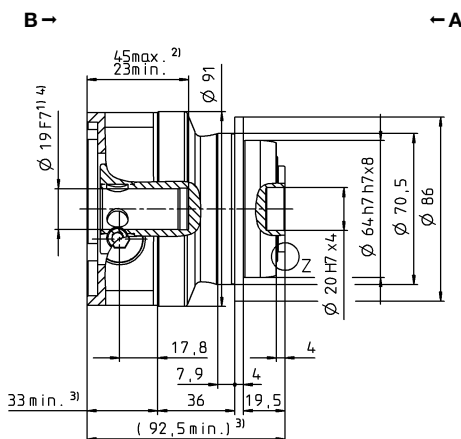
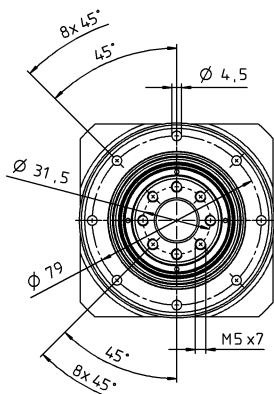


up to 14 <sup>4)</sup> (C) <sup>5)</sup>  
clamping hub  
diameter



Motor shaft diameter [mm]

up to 19 <sup>4)</sup> (E)  
clamping hub  
diameter



Non-tolerated dimensions are nominal dimensions

<sup>1)</sup> Check motor shaft fit

<sup>2)</sup> Min./Max. permissible motor shaft length. Longer motor shafts are possible, please contact alpha.

<sup>3)</sup> The dimensions depend on the motor

<sup>4)</sup> Smaller motor shaft diameter is compensated by a bushing with a minimum wall thickness of 1 mm

<sup>5)</sup> Standard clamping hub diameter



# TP+ 004 MF 2-stage

				2-stage																	
Ratio			<i>i</i>		16	20	21	25	28	31	32	35	40	50	61	64	70	91	100		
Max. torque <sup>a) b)</sup>			<i>T</i> <sub>2a</sub>	<i>Nm</i>	57	57	60	72	57	50	57	72	57	72	49	48	56	43	48		
				<i>in.lb</i>	507	507	533	634	507	442	507	634	507	634	435	423	499	385	423		
Max. acceleration torque <sup>b)</sup> (max. 1000 cycles per hour)			<i>T</i> <sub>2B</sub>	<i>Nm</i>	57	57	48	66	57	48	57	66	57	66	49	42	56	38	42		
				<i>in.lb</i>	507	507	425	584	504	425	507	584	507	584	434	372	496	336	372		
Nominal torque (at <i>n</i> <sub>n</sub> )			<i>T</i> <sub>2N</sub>	<i>Nm</i>	39	41	32	41	45	36	39	45	46	48	39	34	45	31	34		
				<i>in.lb</i>	342	365	286	361	403	320	343	399	406	421	341	297	399	272	297		
Emergency stop torque <sup>a) b)</sup> (permitted 1000 times during the service life of the gearbox)			<i>T</i> <sub>2Not</sub>	<i>Nm</i>	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100		
				<i>in.lb</i>	885	885	885	885	885	885	885	885	885	885	885	885	885	885	885	885	
Permitted average input speed (at <i>T</i> <sub>2n</sub> and 20 °C ambient temperature) <sup>d)</sup>			<i>n</i> <sub>1N</sub>	<i>rpm</i>	4000	4000	4000	4000	4000	4000	4000	4000	4000	4800	5500	4800	5500	5500	5500		
Max. input speed			<i>n</i> <sub>1Max</sub>	<i>rpm</i>	7500	7500	7500	7500	7500	7500	7500	7500	7500	7500	7500	7500	7500	7500	7500		
Mean no load running torque <sup>b)</sup> (at <i>n</i> <sub>i</sub> = 3000 rpm and 20 °C gearbox temperature)			<i>T</i> <sub>012</sub>	<i>Nm</i>	0.28	0.23	0.24	0.22	0.21	0.22	0.21	0.17	0.18	0.17	0.16	0.17	0.17	0.15	0.16		
				<i>in.lb</i>	2.5	2.0	2.1	1.9	1.9	1.9	1.9	1.5	1.6	1.5	1.4	1.5	1.5	1.3	1.4		
Max. backlash			<i>j</i> <sub>t</sub>	<i>arcmin</i>	Standard ≤ 4 / Reduced ≤ 2																
Torsional rigidity <sup>b)</sup>			<i>C</i> <sub>t21</sub>	<i>Nm/arcmin</i>	12	12	10	12	12	9	12	12	11	12	9	12	11	7	8		
				<i>in.lb/arcmin</i>	106	106	89	106	106	80	106	106	97	106	80	106	97	62	71		
Tilting rigidity			<i>C</i> <sub>2K</sub>	<i>Nm/arcmin</i>	85																
				<i>in.lb/arcmin</i>	752																
Max. axial force <sup>c)</sup>			<i>F</i> <sub>2AMax</sub>	<i>N</i>	2119																
				<i>lb<sub>f</sub></i>	477																
Max. tilting moment			<i>M</i> <sub>2KMax</sub>	<i>Nm</i>	110																
				<i>in.lb</i>	974																
Efficiency at full load			<i>η</i>	%	94																
Service life <sup>f)</sup>			<i>L</i> <sub>h</sub>	<i>h</i>	> 20000																
Weight (incl. standard adapter plate)			<i>m</i>	<i>kg</i>	1.5																
				<i>lb<sub>m</sub></i>	3.3																
Operating noise (at reference ratio and reference speed – ratio-specific values available in cymex®)			<i>L</i> <sub>PA</sub>	<i>dB(A)</i>	≤ 54																
Max. permitted housing temperature				°C	+90																
				<i>F</i>	194																
Ambient temperature				°C	-15 to +40																
				<i>F</i>	5 to 104																
Lubrication					Lubricated for life																
Direction of rotation					In- and output same direction																
Protection class					IP 65																
Metal bellows coupling (recommended product type – validate sizing with cymex®)					BCT-00015AAX-031.500																
Bore diameter of coupling on the application side				<i>mm</i>	X = 012.000 - 028.000																
Mass moment of inertia (relates to the drive)  Clamping hub diameter [mm]  Optimized mass inertia version available on request			B	11	<i>J</i> <sub>i</sub>	<i>kgcm<sup>2</sup></i>	0.078	0.070	0.074	0.068	0.062	0.072	0.062	0.061	0.057	0.057	0.058	0.060	0.056	0.057	0.056
						<i>10<sup>-3</sup> in.lb.s<sup>2</sup></i>	0.069	0.062	0.065	0.060	0.055	0.064	0.055	0.054	0.050	0.050	0.051	0.053	0.050	0.050	0.050
			C	14	<i>J</i> <sub>i</sub>	<i>kgcm<sup>2</sup></i>	0.17	0.17	0.17	0.16	0.16	0.17	0.16	0.16	0.15	0.15	0.15	0.16	0.15	0.15	0.15
						<i>10<sup>-3</sup> in.lb.s<sup>2</sup></i>	0.15	0.15	0.15	0.15	0.14	0.15	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.13	0.14

Please use our sizing software cymex<sup>®</sup> for a detailed sizing – [www.wittenstein-cymex.com](http://www.wittenstein-cymex.com)

<sup>a)</sup> At max. 10 %  $M_{2KMax}$

<sup>b)</sup> Valid for standard clamping hub diameter

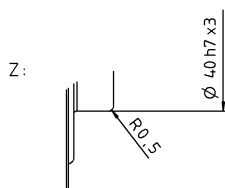
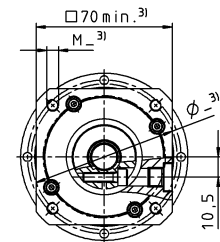
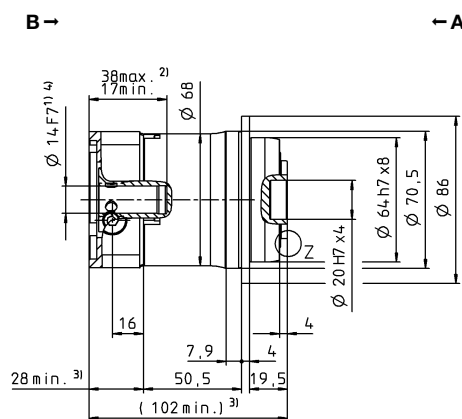
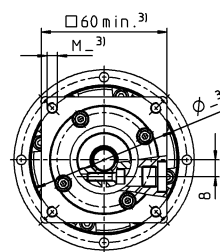
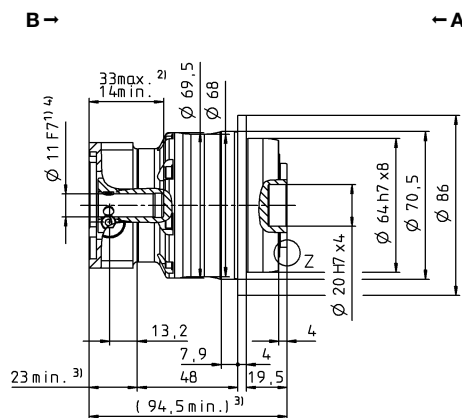
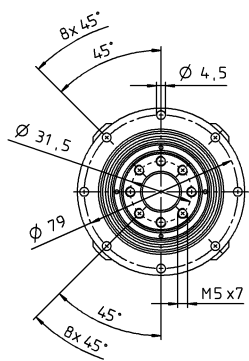
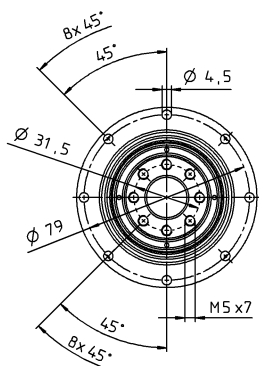
<sup>c)</sup> Refers to center of the output shaft or flange

<sup>d)</sup> Please reduce input speed at higher ambient temperatures

<sup>f)</sup> Please contact us to discuss  
application-specific service lifetimes

# 2-stage

up to 11 <sup>4)</sup> (B) <sup>5)</sup>  
clamping hub  
diameter



Non-tolerated dimensions are nominal dimensions

<sup>1)</sup> Check motor shaft fit

<sup>2)</sup> Min./Max. permissible motor shaft length. Longer motor shafts are possible, please contact alpha.

<sup>3)</sup> The dimensions depend on the motor

<sup>4)</sup> Smaller motor shaft diameter is compensated by a bushing with a minimum wall thickness of 1 mm

<sup>5)</sup> Standard clamping hub diameter

# TP+ 010 MF 1-stage

				1-stage					
Ratio			<i>i</i>		4	5	7	8	10
Max. torque <sup>a) b)</sup>			<i>T</i> <sub>2a</sub>	<i>Nm</i>	185	210	210	168	168
				<i>in.lb</i>	1640	1859	1859	1487	1487
Max. acceleration torque <sup>b)</sup> (max. 1000 cycles per hour)			<i>T</i> <sub>2B</sub>	<i>Nm</i>	172	172	172	126	126
				<i>in.lb</i>	1522	1522	1522	1115	1115
Nominal torque (at <i>n</i> <sub>n</sub> )			<i>T</i> <sub>2N</sub>	<i>Nm</i>	84	81	81	80	81
				<i>in.lb</i>	743	716	719	712	720
Emergency stop torque <sup>a) b)</sup> (permitted 1000 times during the service life of the gearbox)			<i>T</i> <sub>2Not</sub>	<i>Nm</i>	250	250	251	251	251
				<i>in.lb</i>	2213	2213	2222	2222	2222
Permitted average input speed (at <i>T</i> <sub>2N</sub> and 20 °C ambient temperature) <sup>d)</sup>			<i>n</i> <sub>1N</sub>	<i>rpm</i>	2600	2900	3100	3100	3100
Max. input speed			<i>n</i> <sub>1Max</sub>	<i>rpm</i>	7500	7500	7500	7500	7500
Mean no load running torque <sup>b)</sup> (at <i>n</i> <sub>i</sub> = 3000 rpm and 20 °C gearbox temperature)			<i>T</i> <sub>012</sub>	<i>Nm</i>	1.3	1.1	0.84	0.84	0.64
				<i>in.lb</i>	12	9.5	7.4	7.4	5.7
Max. backlash			<i>j</i> <sub>t</sub>	<i>arcmin</i>	Standard ≤ 3 / Reduced ≤ 1				
Torsional rigidity <sup>b)</sup>			<i>C</i> <sub>t21</sub>	<i>Nm/arcmin</i>	32	33	30	23	23
				<i>in.lb/arcmin</i>	283	292	266	204	204
Tilting rigidity			<i>C</i> <sub>2K</sub>	<i>Nm/arcmin</i>	225				
				<i>in.lb/arcmin</i>	1991				
Max. axial force <sup>c)</sup>			<i>F</i> <sub>2AMax</sub>	<i>N</i>	2795				
				<i>lb<sub>f</sub></i>	629				
Max. tilting moment			<i>M</i> <sub>2KMax</sub>	<i>Nm</i>	270				
				<i>in.lb</i>	2390				
Efficiency at full load			<i>η</i>	%	97				
Service life <sup>f)</sup>			<i>L</i> <sub>n</sub>	<i>h</i>	> 20000				
Weight (incl. standard adapter plate)			<i>m</i>	<i>kg</i>	3.8				
				<i>lb<sub>m</sub></i>	8.4				
Operating noise (at reference ratio and reference speed – ratio-specific values available in cymex®)			<i>L</i> <sub>PA</sub>	<i>dB(A)</i>	≤ 57				
Max. permitted housing temperature				°C	+90				
				<i>F</i>	194				
Ambient temperature				°C	–15 to +40				
				<i>F</i>	5 to 104				
Lubrication					Lubricated for life				
Direction of rotation					In- and output same direction				
Protection class					IP 65				
Metal bellows coupling (recommended product type – validate sizing with cymex®)					BCT-00060AAX-050.000				
Bore diameter of coupling on the application side				<i>mm</i>	X = 014.000 - 035.000				
Mass moment of inertia (relates to the drive)  Clamping hub diameter [mm] Optimized mass inertia version available on request	C	14	<i>J</i> <sub>i</sub>	<i>kgcm</i> <sup>2</sup>	0.78	0.62	0.48	0.48	0.40
				<i>10<sup>-3</sup> in.lb.s</i> <sup>2</sup>	0.69	0.55	0.42	0.42	0.35
	E	19	<i>J</i> <sub>i</sub>	<i>kgcm</i> <sup>2</sup>	0.95	0.79	0.64	0.64	0.57
				<i>10<sup>-3</sup> in.lb.s</i> <sup>2</sup>	0.84	0.70	0.57	0.57	0.50
	G	24	<i>J</i> <sub>i</sub>	<i>kgcm</i> <sup>2</sup>	2.32	2.16	2.02	2.02	1.94
				<i>10<sup>-3</sup> in.lb.s</i> <sup>2</sup>	2.05	1.91	1.79	1.79	1.72

Please use our sizing software cymex<sup>®</sup> for a detailed sizing – [www.wittenstein-cymex.com](http://www.wittenstein-cymex.com)

<sup>a)</sup> At max. 10 %  $M_{2KMax}$

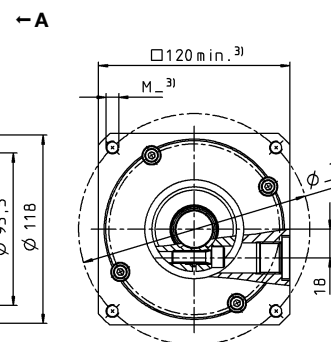
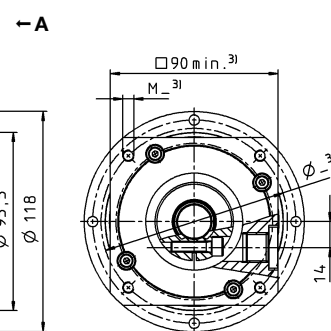
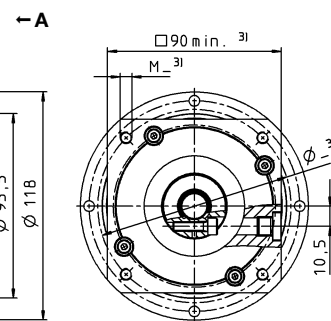
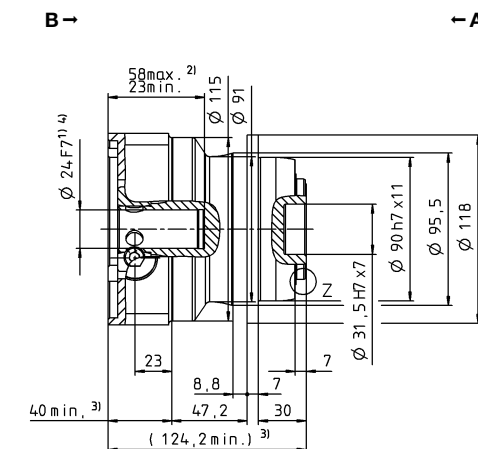
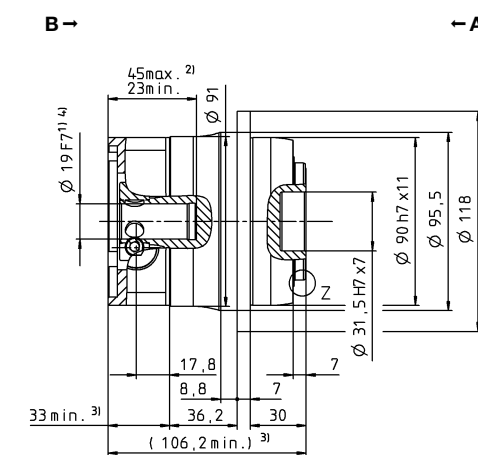
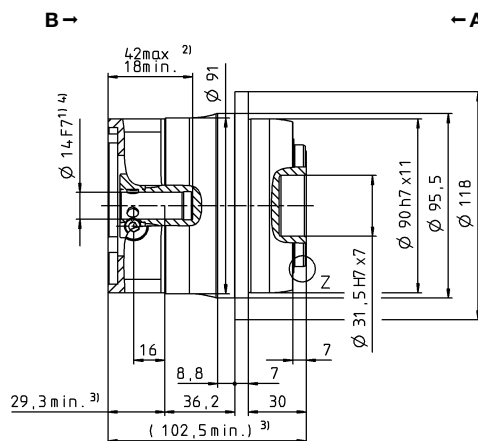
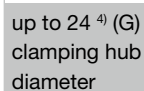
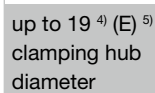
<sup>b)</sup> Valid for standard clamping hub diameter

<sup>c)</sup> Refers to center of the output shaft or flange

<sup>d)</sup> Please reduce input speed at higher ambient temperatures

<sup>f)</sup> Please contact us to discuss  
application-specific service lifetimes

up to 14 <sup>4)</sup> (C)  
clamping hub  
diameter



TP<sup>+</sup>

MF

Non-tolerated dimensions are nominal dimensions

- 1) Check motor shaft fit

2) Min./Max. permissible motor shaft length. Longer motor shafts are possible, please contact alpha.

3) The dimensions depend on the motor

4) Smaller motor shaft diameter is compensated by a bushing with a minimum wall thickness of 1 mm

<sup>5)</sup> Standard clamping hub diameter

# TP+ 010 MF 2-stage

				2-stage															
Ratio			<i>i</i>		16	20	21	25	28	31	32	35	40	50	61	64	70	91	100
Max. torque <sup>a) b)</sup>			<i>T</i> <sub>2a</sub>	<i>Nm</i>	157	126	133	158	157	121	157	158	154	158	121	105	157	96	105
				<i>in.lb</i>	1392	1118	1174	1398	1392	1071	1392	1398	1363	1398	1071	932	1392	848	932
Max. acceleration torque <sup>b)</sup> (max. 1000 cycles per hour)			<i>T</i> <sub>2B</sub>	<i>Nm</i>	157	126	120	158	157	121	157	158	154	158	121	105	157	96	105
				<i>in.lb</i>	1392	1118	1062	1398	1392	1071	1392	1398	1363	1398	1071	932	1392	848	932
Nominal torque (at <i>n</i> <sub>n</sub> )			<i>T</i> <sub>2N</sub>	<i>Nm</i>	106	101	96	124	107	87	119	126	112	126	97	84	126	77	84
				<i>in.lb</i>	935	895	850	1097	945	770	1053	1118	987	1118	857	746	1114	678	746
Emergency stop torque <sup>a) b)</sup> (permitted 1000 times during the service life of the gearbox)			<i>T</i> <sub>2Not</sub>	<i>Nm</i>	251	251	251	251	251	251	251	251	251	251	251	251	251	251	251
				<i>in.lb</i>	2222	2222	2222	2222	2222	2222	2222	2222	2222	2222	2222	2222	2222	2222	2222
Permitted average input speed (at <i>T</i> <sub>2N</sub> and 20 °C ambient temperature) <sup>d)</sup>			<i>n</i> <sub>1N</sub>	<i>rpm</i>	3500	3500	3500	3500	3500	3500	3500	3500	3500	3800	4500	3800	4500	4500	4500
Max. input speed			<i>n</i> <sub>1Max</sub>	<i>rpm</i>	7500	7500	7500	7500	7500	7500	7500	7500	7500	7500	7500	7500	7500	7500	7500
Mean no load running torque <sup>b)</sup> (at <i>n</i> <sub>i</sub> = 3000 rpm and 20 °C gearbox temperature)			<i>T</i> <sub>012</sub>	<i>Nm</i>	0.56	0.48	0.47	0.44	0.40	0.40	0.40	0.28	0.32	0.32	0.23	0.32	0.24	0.24	0.25
				<i>in.lb</i>	5.0	4.2	4.2	3.9	3.5	3.5	3.5	2.5	2.8	2.8	2.0	2.8	2.1	2.1	2.2
Max. backlash			<i>j</i> <sub>t</sub>	<i>arcmin</i>	Standard ≤ 3 / Reduced ≤ 1														
Torsional rigidity <sup>b)</sup>			<i>C</i> <sub>121</sub>	<i>Nm/arcmin</i>	32	32	26	32	31	24	31	32	30	30	24	30	28	21	22
				<i>in.lb/arcmin</i>	283	283	230	283	274	212	274	283	266	266	212	266	248	186	195
Tilting rigidity			<i>C</i> <sub>2K</sub>	<i>Nm/arcmin</i>	225														
				<i>in.lb/arcmin</i>	1991														
Max. axial force <sup>c)</sup>			<i>F</i> <sub>2AMax</sub>	<i>N</i>	2795														
				<i>lb<sub>f</sub></i>	629														
Max. tilting moment			<i>M</i> <sub>2KMax</sub>	<i>Nm</i>	270														
				<i>in.lb</i>	2390														
Efficiency at full load			<i>η</i>	%	94														
Service life <sup>f)</sup>			<i>L</i> <sub>h</sub>	<i>h</i>	> 20000														
Weight (incl. standard adapter plate)			<i>m</i>	<i>kg</i>	3.6														
				<i>lb<sub>m</sub></i>	8.0														
Operating noise (at reference ratio and reference speed – ratio-specific values available in cymex <sup>®</sup> )			<i>L</i> <sub>PA</sub>	<i>dB(A)</i>	≤ 55														
Max. permitted housing temperature				°C	+90														
				<i>F</i>	194														
Ambient temperature				°C	−15 to +40														
				<i>F</i>	5 to 104														
Lubrication					Lubricated for life														
Direction of rotation					In- and output same direction														
Protection class					IP 65														
Metal bellows coupling (recommended product type – validate sizing with cymex <sup>®</sup> )					BCT-00060AAX-050.000														
Bore diameter of coupling on the application side				<i>mm</i>	X = 014.000 - 035.000														
Mass moment of inertia (relates to the drive)  Clamping hub diameter [mm]  Optimized mass inertia version available on request	B	11	<i>J</i> <sub>i</sub>	<i>kgcm</i> <sup>2</sup>	0.17	0.14	0.15	0.13	0.11	0.14	0.11	0.10	0.09	0.09	0.09	0.10	0.09	0.09	0.09
				<i>10<sup>-3</sup> in.lb.s</i> <sup>2</sup>	0.15	0.12	0.13	0.12	0.10	0.12	0.10	0.09	0.08	0.08	0.08	0.09	0.08	0.08	0.08
	C	14	<i>J</i> <sub>i</sub>	<i>kgcm</i> <sup>2</sup>	0.24	0.21	0.22	0.20	0.18	0.21	0.18	0.18	0.17	0.17	0.17	0.17	0.16	0.17	0.16
				<i>10<sup>-3</sup> in.lb.s</i> <sup>2</sup>	0.21	0.19	0.20	0.18	0.16	0.18	0.16	0.16	0.15	0.15	0.15	0.15	0.15	0.15	0.14
	E	19	<i>J</i> <sub>i</sub>	<i>kgcm</i> <sup>2</sup>	0.56	0.53	0.55	0.53	0.51	0.53	0.51	0.50	0.49	0.49	0.49	0.52	0.49	0.49	0.49
				<i>10<sup>-3</sup> in.lb.s</i> <sup>2</sup>	0.50	0.47	0.48	0.47	0.45	0.47	0.45	0.44	0.43	0.43	0.43	0.43	0.46	0.43	0.43

Please use our sizing software cymex<sup>®</sup> for a detailed sizing – [www.wittenstein-cymex.com](http://www.wittenstein-cymex.com)

<sup>a)</sup> At max. 10 %  $M_{2KMax}$

<sup>b)</sup> Valid for standard clamping hub diameter

<sup>c)</sup> Refers to center of the output shaft or flange

<sup>d)</sup> Please reduce input speed at higher ambient temperatures

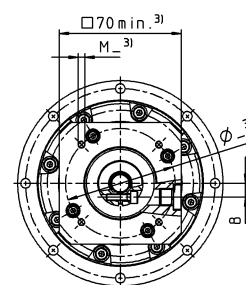
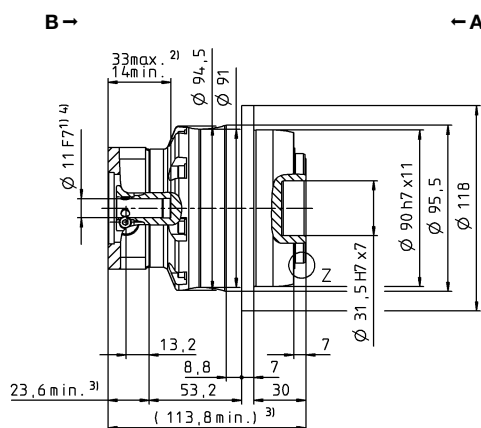
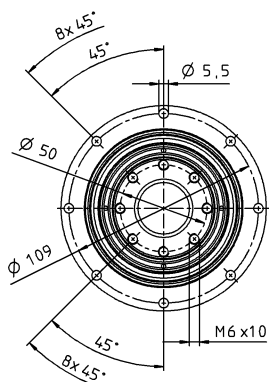
<sup>f)</sup> Please contact us to discuss  
application-specific service lifetimes

View A

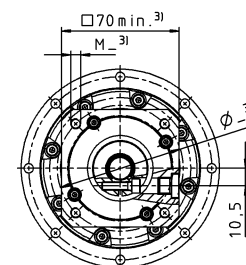
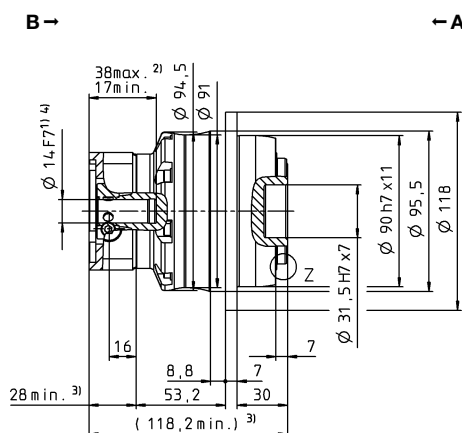
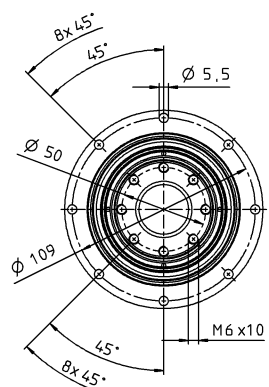
View B

# 2-stage

up to 11<sup>4)</sup> (B)  
clamping hub  
diameter

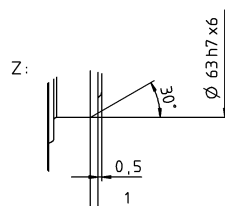
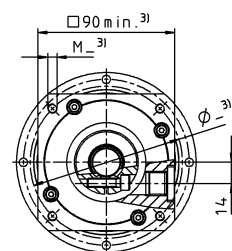
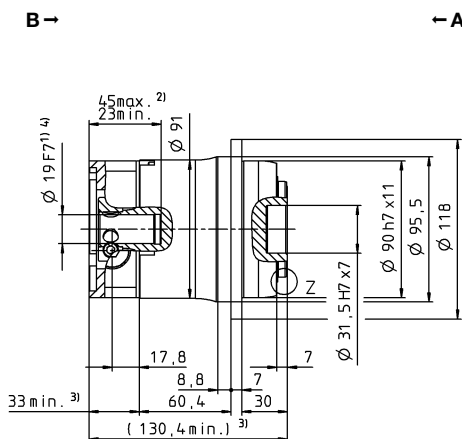
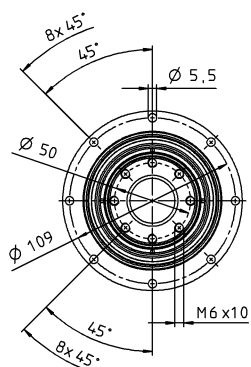


up to 14<sup>4)</sup> (C)<sup>5)</sup>  
clamping hub  
diameter



Motor shaft diameter [mm]

up to 19<sup>4)</sup> (E)  
clamping hub  
diameter



Non-tolerated dimensions are nominal dimensions

<sup>1)</sup> Check motor shaft fit

<sup>2)</sup> Min./Max. permissible motor shaft length. Longer motor shafts are possible, please contact alpha.

<sup>3)</sup> The dimensions depend on the motor

<sup>4)</sup> Smaller motor shaft diameter is compensated by a bushing with a minimum wall thickness of 1 mm

<sup>5)</sup> Standard clamping hub diameter



# TP+ 025 MF 1-stage

					1-stage				
Ratio			<i>i</i>		4	5	7	8	10
Max. torque <sup>a) b)</sup>			<i>T</i> <sub>2a</sub>	<i>Nm</i>	352	380	352	352	352
				<i>in.lb</i>	3115	3363	3115	3115	3115
Max. acceleration torque <sup>b)</sup> (max. 1000 cycles per hour)			<i>T</i> <sub>2B</sub>	<i>Nm</i>	352	380	352	318	318
				<i>in.lb</i>	3115	3363	3115	2815	2815
Nominal torque (at <i>n</i> <sub>N</sub> )			<i>T</i> <sub>2N</sub>	<i>Nm</i>	175	169	172	172	180
				<i>in.lb</i>	1548	1498	1524	1521	1591
Emergency stop torque <sup>a) b)</sup> (permitted 1000 times during the service life of the gearbox)			<i>T</i> <sub>2Not</sub>	<i>Nm</i>	625	625	625	625	625
				<i>in.lb</i>	5532	5532	5532	5532	5532
Permitted average input speed (at <i>T</i> <sub>2N</sub> and 20 °C ambient temperature) <sup>d)</sup>			<i>n</i> <sub>1N</sub>	<i>rpm</i>	2300	2500	2500	2500	2500
Max. input speed			<i>n</i> <sub>1Max</sub>	<i>rpm</i>	5500	5500	5500	5500	5500
Mean no load running torque <sup>b)</sup> (at <i>n</i> <sub>i</sub> = 3000 rpm and 20 °C gearbox temperature)			<i>T</i> <sub>012</sub>	<i>Nm</i>	2.8	2.3	1.7	1.7	1.2
				<i>in.lb</i>	25	20	15	15	10
Max. backlash			<i>j</i> <sub>t</sub>	<i>arcmin</i>	Standard ≤ 3 / Reduced ≤ 1				
Torsional rigidity <sup>b)</sup>			<i>C</i> <sub>121</sub>	<i>Nm/arcmin</i>	80	86	76	62	62
				<i>in.lb/arcmin</i>	708	761	673	549	549
Tilting rigidity			<i>C</i> <sub>2K</sub>	<i>Nm/arcmin</i>	550				
				<i>in.lb/arcmin</i>	4868				
Max. axial force <sup>c)</sup>			<i>F</i> <sub>2AMax</sub>	<i>N</i>	4800				
				<i>lb<sub>f</sub></i>	1080				
Max. tilting moment			<i>M</i> <sub>2KMax</sub>	<i>Nm</i>	440				
				<i>in.lb</i>	3894				
Efficiency at full load			<i>η</i>	%	97				
Service life <sup>f)</sup>			<i>L</i> <sub>h</sub>	<i>h</i>	> 20000				
Weight (incl. standard adapter plate)			<i>m</i>	<i>kg</i>	6.5				
				<i>lb<sub>m</sub></i>	14.4				
Operating noise (at reference ratio and reference speed – ratio-specific values available in cymex®)			<i>L</i> <sub>PA</sub>	<i>dB(A)</i>	≤ 61				
Max. permitted housing temperature				°C	+90				
				<i>F</i>	194				
Ambient temperature				°C	–15 to +40				
				<i>F</i>	5 to 104				
Lubrication					Lubricated for life				
Direction of rotation					In- and output same direction				
Protection class					IP 65				
Metal bellows coupling (recommended product type – validate sizing with cymex®)					BCT-00150AAX-063.000				
Bore diameter of coupling on the application side				<i>mm</i>	X = 019.000 - 042.000				
Mass moment of inertia (relates to the drive)  Clamping hub diameter [mm]  Optimized mass inertia version available on request	E	19	<i>J</i> <sub>1</sub>	<i>kgcm²</i>	2.59	2.11	1.69	1.69	1.45
				<i>10<sup>-3</sup> in.lb.s²</i>	2.29	1.87	1.50	1.50	1.28
	G	24	<i>J</i> <sub>1</sub>	<i>kgcm²</i>	3.28	2.80	2.38	2.38	2.14
				<i>10<sup>-3</sup> in.lb.s²</i>	2.90	2.48	2.11	2.11	1.89
	H	28	<i>J</i> <sub>1</sub>	<i>kgcm²</i>	2.89	2.41	1.99	1.99	1.75
				<i>10<sup>-3</sup> in.lb.s²</i>	2.56	2.13	1.76	1.76	1.55
	K	38	<i>J</i> <sub>1</sub>	<i>kgcm²</i>	10.3	9.87	9.45	9.45	9.21
				<i>10<sup>-3</sup> in.lb.s²</i>	9.12	8.73	8.36	8.36	8.15

Please use our sizing software cymex<sup>®</sup> for a detailed sizing – [www.wittenstein-cymex.com](http://www.wittenstein-cymex.com)

<sup>a)</sup> At max. 10 %  $M_{2KMax}$

<sup>b)</sup> Valid for standard clamping hub diameter

<sup>c)</sup> Refers to center of the output shaft or flange

<sup>d)</sup> Please reduce input speed at higher ambient temperatures

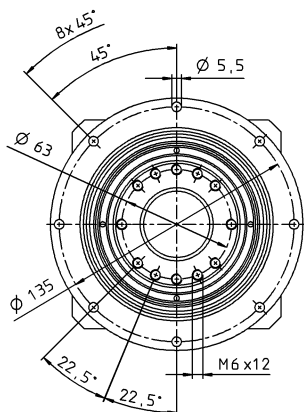
<sup>f)</sup> Please contact us to discuss  
application-specific service lifetimes

View A

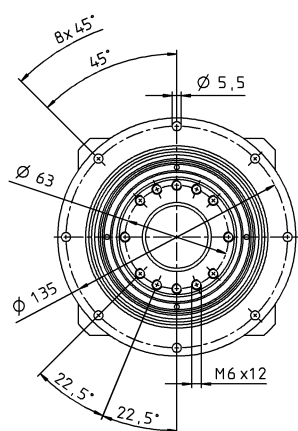
View B

# 1-stage

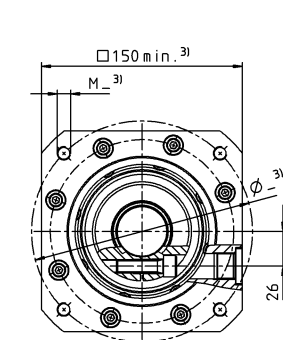
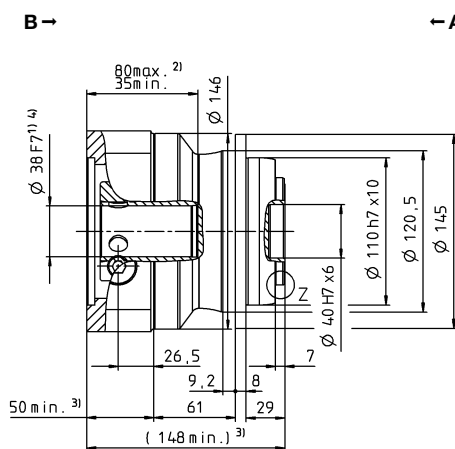
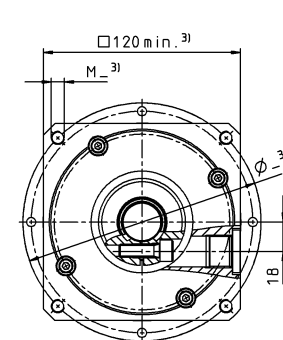
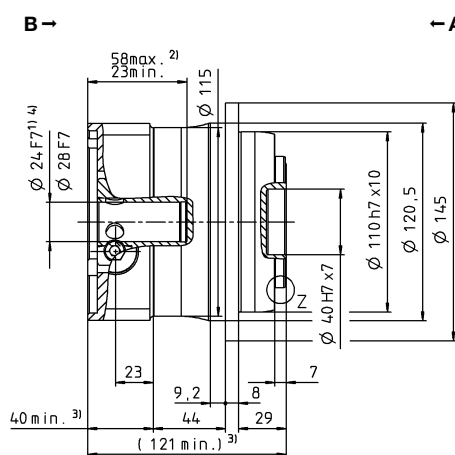
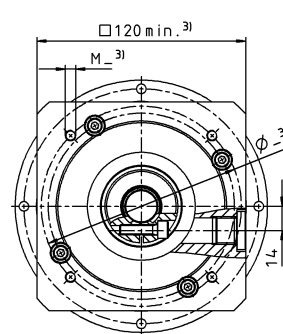
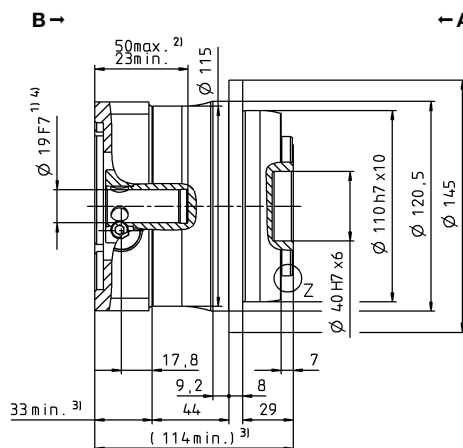
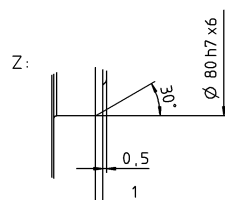
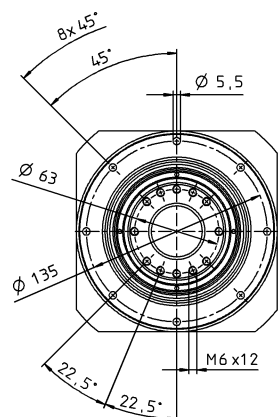
up to 19<sup>4)</sup> (E)  
clamping hub diameter



up to 24/28<sup>4)</sup>  
(G<sup>5)</sup>/H) clamping hub diameter



up to 38<sup>4)</sup> (K)  
clamping hub diameter



Non-tolerated dimensions are nominal dimensions

<sup>1)</sup> Check motor shaft fit

<sup>2)</sup> Min./Max. permissible motor shaft length. Longer motor shafts are possible, please contact alpha.

<sup>3)</sup> The dimensions depend on the motor

<sup>4)</sup> Smaller motor shaft diameter is compensated by a bushing with a minimum wall thickness of 1 mm

<sup>5)</sup> Standard clamping hub diameter

# TP+ 025 MF 2-stage

					2-stage														
Ratio			<i>i</i>		16	20	21	25	28	31	32	35	40	50	61	64	70	91	100
Max. torque <sup>a) b)</sup>			<i>T</i> <sub>2a</sub>	<i>Nm</i>	352	352	352	380	352	352	352	380	352	380	352	352	352	352	352
				<i>in.lb</i>	3115	3115	3115	3363	3115	3115	3115	3363	3115	3363	3115	3115	3115	3115	3115
Max. acceleration torque <sup>b)</sup> (max. 1000 cycles per hour)			<i>T</i> <sub>2B</sub>	<i>Nm</i>	352	352	330	380	352	330	352	380	352	380	308	292	352	275	292
				<i>in.lb</i>	3115	3115	2921	3363	3115	2921	3115	3363	3115	3363	2726	2584	3115	2434	2584
Nominal torque (at <i>n</i> <sub>n</sub> )			<i>T</i> <sub>2N</sub>	<i>Nm</i>	250	267	211	265	282	231	251	294	282	304	246	233	282	220	233
				<i>in.lb</i>	2213	2366	1872	2348	2492	2047	2220	2598	2492	2691	2181	2064	2492	1947	2064
Emergency stop torque <sup>a) b)</sup> (permitted 1000 times during the service life of the gearbox)			<i>T</i> <sub>2Not</sub>	<i>Nm</i>	625	625	625	625	625	625	625	625	625	625	625	625	625	625	625
				<i>in.lb</i>	5532	5532	5532	5532	5532	5532	5532	5532	5532	5532	5532	5532	5532	5532	5532
Permitted average input speed (at <i>T</i> <sub>2N</sub> and 20 °C ambient temperature) <sup>d)</sup>			<i>n</i> <sub>1N</sub>	<i>rpm</i>	2800	2800	2800	2800	2800	2800	2800	2800	2800	3100	3500	3100	3500	4200	4200
Max. input speed			<i>n</i> <sub>1Max</sub>	<i>rpm</i>	7500	7500	7500	7500	7500	7500	7500	7500	7500	7500	7500	7500	7500	7500	7500
Mean no load running torque <sup>b)</sup> (at <i>n</i> <sub>i</sub> = 3000 rpm and 20 °C gearbox temperature)			<i>T</i> <sub>012</sub>	<i>Nm</i>	1.2	1.0	1.1	0.90	0.80	0.84	0.80	0.60	0.59	0.50	0.48	0.50	0.42	0.48	0.38
				<i>in.lb</i>	10	8.9	9.9	8.0	7.1	7.4	7.1	5.3	5.2	4.4	4.2	4.4	3.7	4.2	3.4
Max. backlash			<i>j</i> <sub>t</sub>	<i>arcmin</i>	Standard ≤ 3 / Reduced ≤ 1														
Torsional rigidity <sup>b)</sup>			<i>C</i> <sub>t21</sub>	<i>Nm/arcmin</i>	81	81	70	83	80	54	80	82	76	80	61	80	71	55	60
				<i>in.lb/arcmin</i>	717	717	620	735	708	478	708	726	673	708	540	708	628	487	531
Tilting rigidity			<i>C</i> <sub>2K</sub>	<i>Nm/arcmin</i>	550														
				<i>in.lb/arcmin</i>	4868														
Max. axial force <sup>c)</sup>			<i>F</i> <sub>2AMax</sub>	<i>N</i>	4800														
				<i>lb<sub>f</sub></i>	1080														
Max. tilting moment			<i>M</i> <sub>2KMax</sub>	<i>Nm</i>	440														
				<i>in.lb</i>	3894														
Efficiency at full load			<i>η</i>	%	94														
Service life <sup>f)</sup>			<i>L</i> <sub>h</sub>	<i>h</i>	> 20000														
Weight (incl. standard adapter plate)			<i>m</i>	<i>kg</i>	6.7														
				<i>lb<sub>m</sub></i>	14.8														
Operating noise (at reference ratio and reference speed – ratio-specific values available in cymex®)			<i>L</i> <sub>PA</sub>	<i>dB(A)</i>	≤ 58														
Max. permitted housing temperature				°C	+90														
				<i>F</i>	194														
Ambient temperature				°C	–15 to +40														
				<i>F</i>	5 to 104														
Lubrication					Lubricated for life														
Direction of rotation					In- and output same direction														
Protection class					IP 65														
Metal bellows coupling (recommended product type – validate sizing with cymex®)					BCT-00150AAX-063.000														
Bore diameter of coupling on the application side				<i>mm</i>	X = 019.000 - 042.000														
Mass moment of inertia (relates to the drive) Clamping hub diameter [mm] Optimized mass inertia version available on request	C	14	<i>J</i> <sub>i</sub>	<i>kgcm²</i>	0.66	0.55	0.60	0.53	0.44	0.55	0.44	0.43	0.38	0.38	0.39	0.40	0.37	0.38	0.37
				<i>10<sup>-3</sup> in.lb.s²</i>	0.58	0.48	0.53	0.47	0.39	0.49	0.39	0.38	0.34	0.33	0.34	0.36	0.33	0.34	0.33
	E	19	<i>J</i> <sub>i</sub>	<i>kgcm²</i>	0.83	0.71	0.77	0.70	0.61	0.72	0.61	0.60	0.55	0.55	0.55	0.57	0.54	0.55	0.54
				<i>10<sup>-3</sup> in.lb.s²</i>	0.73	0.63	0.68	0.62	0.54	0.64	0.54	0.53	0.49	0.48	0.49	0.50	0.48	0.48	0.48
	G	24	<i>J</i> <sub>i</sub>	<i>kgcm²</i>	2.20	2.08	2.14	2.07	1.98	2.09	1.98	1.97	1.92	1.92	1.92	2.00	1.91	1.92	1.91
				<i>10<sup>-3</sup> in.lb.s²</i>	1.95	1.84	1.89	1.83	1.75	1.85	1.75	1.74	1.70	1.70	1.70	1.77	1.69	1.70	1.69
	H	28	<i>J</i> <sub>i</sub>	<i>kgcm²</i>	2.00	1.91	1.96	1.89	1.82	1.85	1.89	1.81	1.76	1.76	1.76	1.83	1.75	1.75	1.75
				<i>10<sup>-3</sup> in.lb.s²</i>	1.77	1.69	1.73	1.67	1.61	1.64	1.67	1.60	1.56	1.56	1.56	1.62	1.55	1.55	1.55

Please use our sizing software cymex<sup>®</sup> for a detailed sizing – [www.wittenstein-cymex.com](http://www.wittenstein-cymex.com)

<sup>a)</sup> At max. 10 %  $M_{2KMax}$

<sup>b)</sup> Valid for standard clamping hub diameter

<sup>c)</sup> Refers to center of the output shaft or flange

<sup>d)</sup> Please reduce input speed at higher ambient temperature

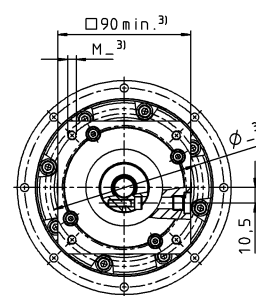
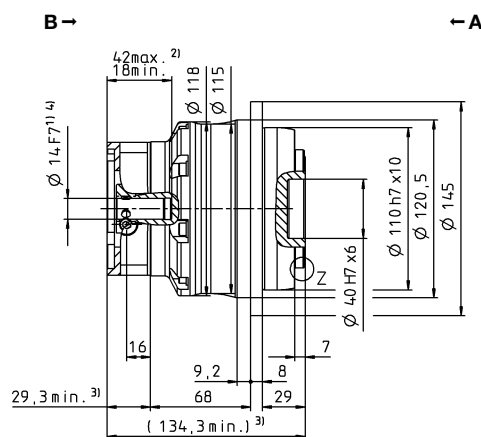
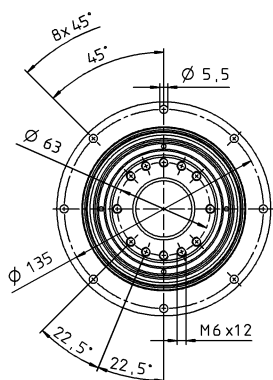
<sup>f)</sup> Please contact us to discuss  
application-specific service lifetimes

View A

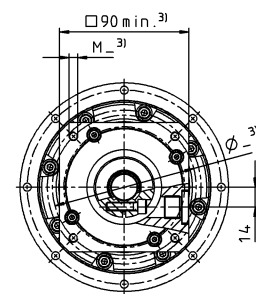
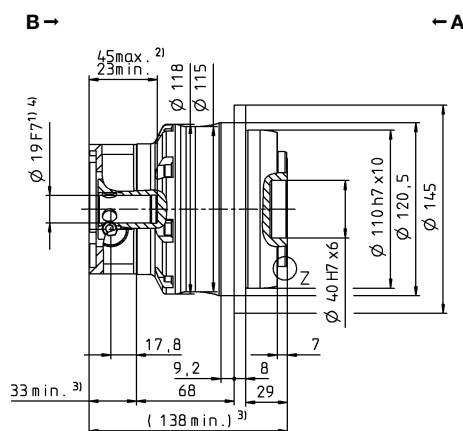
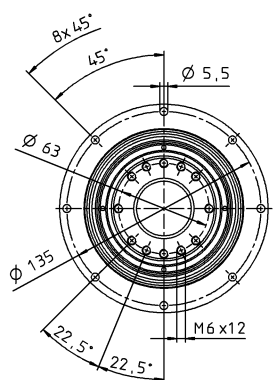
View B

# 2-stage

up to 14 <sup>4)</sup> (C)  
clamping hub  
diameter

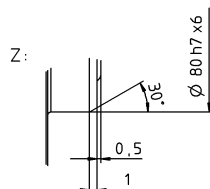
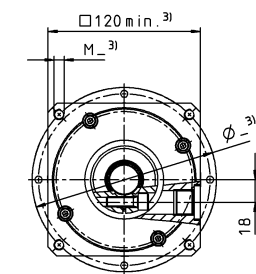
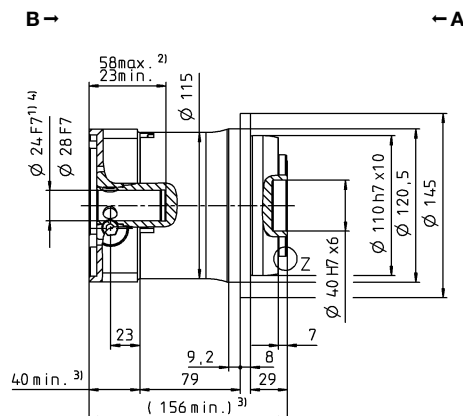
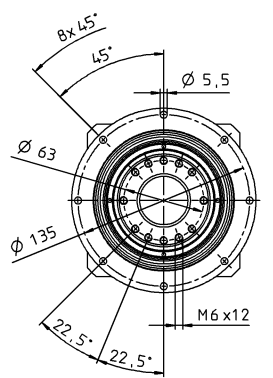


up to 19 <sup>4)</sup> (E) <sup>5)</sup>  
clamping hub  
diameter



Motor shaft diameter [mm]

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



Non-tolerated dimensions are nominal dimensions

<sup>1)</sup> Check motor shaft fit

<sup>2)</sup> Min./Max. permissible motor shaft length. Longer motor shafts are possible, please contact alpha.

<sup>3)</sup> The dimensions depend on the motor

<sup>4)</sup> Smaller motor shaft diameter is compensated by a bushing with a minimum wall thickness of 1 mm

<sup>5)</sup> Standard clamping hub diameter

# TP+ 050 MF 1-stage

					1-stage						
Ratio			<i>i</i>		4	5	7	8	10		
Max. torque <sup>a) b)</sup>			<i>T</i> <sub>2a</sub>	<i>Nm</i>	992	992	868	720	720		
				<i>in.lb</i>	8780	8780	7686	6373	6373		
Max. acceleration torque <sup>b)</sup> (max. 1000 cycles per hour)			<i>T</i> <sub>2B</sub>	<i>Nm</i>	840	840	840	648	648		
				<i>in.lb</i>	7435	7435	7435	5735	5735		
Nominal torque (at <i>n</i> <sub>N</sub> )			<i>T</i> <sub>2N</sub>	<i>Nm</i>	345	337	322	316	331		
				<i>in.lb</i>	3052	2987	2854	2796	2928		
Emergency stop torque <sup>a) b)</sup> (permitted 1000 times during the service life of the gearbox)			<i>T</i> <sub>2Not</sub>	<i>Nm</i>	1250	1250	1250	1250	1250		
				<i>in.lb</i>	11064	11064	11064	11064	11064		
Permitted average input speed (at <i>T</i> <sub>2N</sub> and 20 °C ambient temperature) <sup>d)</sup>			<i>n</i> <sub>1N</sub>	<i>rpm</i>	1900	2000	2500	2500	2500		
Max. input speed			<i>n</i> <sub>1Max</sub>	<i>rpm</i>	5000	5000	5000	5000	5000		
Mean no load running torque <sup>b)</sup> (at <i>n</i> <sub>1</sub> = 3000 rpm and 20 °C gearbox temperature)			<i>T</i> <sub>012</sub>	<i>Nm</i>	6.5	5.3	3.8	3.8	2.9		
				<i>in.lb</i>	57	47	33	33	26		
Max. backlash			<i>j</i> <sub>t</sub>	<i>arcmin</i>	Standard ≤ 3 / Reduced ≤ 1						
Torsional rigidity <sup>b)</sup>			<i>C</i> <sub>121</sub>	<i>Nm/arcmin</i>	190	187	159	123	123		
				<i>in.lb/arcmin</i>	1682	1655	1407	1089	1089		
Tilting rigidity			<i>C</i> <sub>2K</sub>	<i>Nm/arcmin</i>	560						
				<i>in.lb/arcmin</i>	4956						
Max. axial force <sup>c)</sup>			<i>F</i> <sub>2AMax</sub>	<i>N</i>	6130						
				<i>lb<sub>f</sub></i>	1379						
Max. tilting moment			<i>M</i> <sub>2KMax</sub>	<i>Nm</i>	1335						
				<i>in.lb</i>	11816						
Efficiency at full load			<i>η</i>	%	97						
Service life <sup>f)</sup>			<i>L</i> <sub>h</sub>	<i>h</i>	> 20000						
Weight (incl. standard adapter plate)			<i>m</i>	<i>kg</i>	14						
				<i>lb<sub>m</sub></i>	30.9						
Operating noise (at reference ratio and reference speed – ratio-specific values available in cymex®)			<i>L</i> <sub>PA</sub>	<i>dB(A)</i>	≤ 64						
Max. permitted housing temperature				°C	+90						
				<i>F</i>	194						
Ambient temperature				°C	–15 to +40						
				<i>F</i>	5 to 104						
Lubrication					Lubricated for life						
Direction of rotation					In- and output same direction						
Protection class					IP 65						
Metal bellows coupling (recommended product type – validate sizing with cymex®)					BCT-00300AAX-080.000						
Bore diameter of coupling on the application side				<i>mm</i>	X = 024.000 - 060.000						
Mass moment of inertia (relates to the drive)  Clamping hub diameter [mm]  Optimized mass inertia version available on request			G	24	<i>J</i> <sub>1</sub>	<i>kgcm<sup>2</sup></i>	9.47	7.85	6.39	6.39	5.54
						<i>10<sup>-3</sup> in.lb.s<sup>2</sup></i>	8.38	6.95	5.66	5.66	4.90
			I	32	<i>J</i> <sub>1</sub>	<i>kgcm<sup>2</sup></i>	12.6	11.0	9.55	9.55	8.10
						<i>10<sup>-3</sup> in.lb.s<sup>2</sup></i>	11.2	9.74	8.45	8.45	7.17
			K	38	<i>J</i> <sub>1</sub>	<i>kgcm<sup>2</sup></i>	13.7	12.1	10.6	10.6	9.78
						<i>10<sup>-3</sup> in.lb.s<sup>2</sup></i>	12.1	10.7	9.38	9.38	8.66
			M	48	<i>J</i> <sub>1</sub>	<i>kgcm<sup>2</sup></i>	28.3	26.7	25.3	25.3	24.4
						<i>10<sup>-3</sup> in.lb.s<sup>2</sup></i>	25.1	23.6	22.4	22.4	21.6

Please use our sizing software cymex<sup>®</sup> for a detailed sizing – [www.wittenstein-cymex.com](http://www.wittenstein-cymex.com)

<sup>a)</sup> At max. 10 %  $M_{2KMax}$

<sup>b)</sup> Valid for standard clamping hub diameter

<sup>c)</sup> Refers to center of the output shaft or flange

<sup>d)</sup> Please reduce input speed at higher ambient temperatures

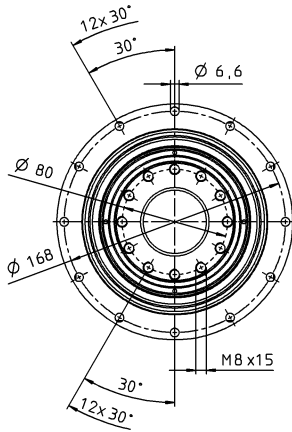
<sup>f)</sup> Please contact us to discuss  
application-specific service lifetimes

View A

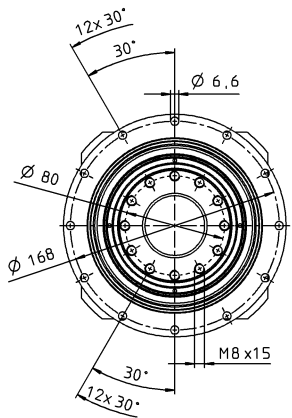
View B

# 1-stage

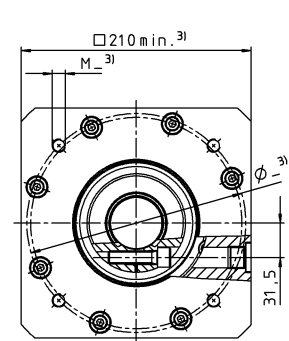
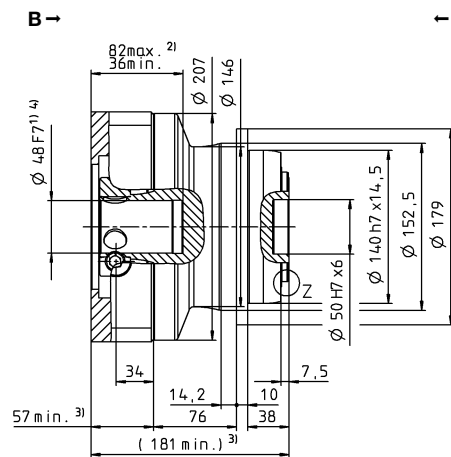
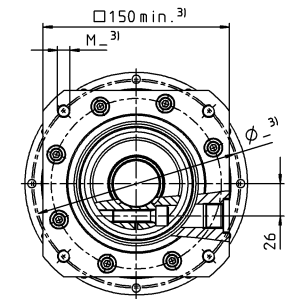
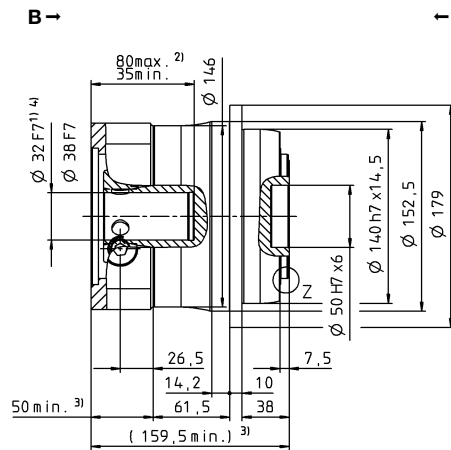
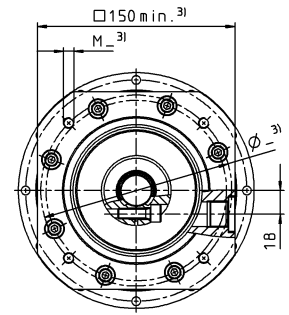
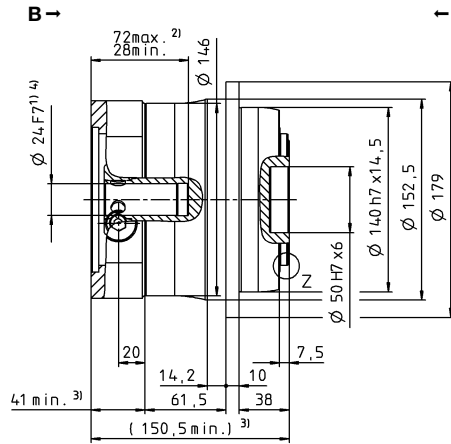
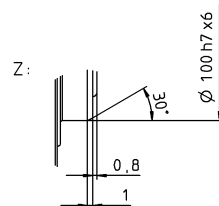
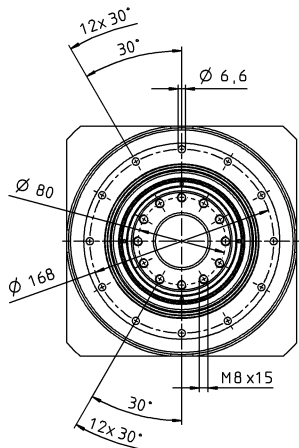
up to 24<sup>4)</sup> (G)  
clamping hub diameter



up to 32/38<sup>4)</sup>  
(I/K<sup>5)</sup>) clamping hub diameter



up to 48<sup>4)</sup> (M)  
clamping hub diameter



Non-tolerated dimensions are nominal dimensions

<sup>1)</sup> Check motor shaft fit

<sup>2)</sup> Min./Max. permissible motor shaft length. Longer motor shafts are possible, please contact alpha.

<sup>3)</sup> The dimensions depend on the motor

<sup>4)</sup> Smaller motor shaft diameter is compensated by a bushing with a minimum wall thickness of 1 mm

<sup>5)</sup> Standard clamping hub diameter



# TP+ 050 MF 2-stage

				2-stage															
Ratio		<i>i</i>		16	20	21	25	28	31	32	35	40	50	61	64	70	91	100	
Max. torque <sup>a) b)</sup>		<i>T</i> <sub>2a</sub>	<i>Nm</i>	825	825	660	825	825	682	825	825	825	825	605	594	770	550	594	
			<i>in.lb</i>	7302	7302	5842	7302	7302	6036	7302	7302	7302	7302	5355	5257	6815	4868	5257	
Max. acceleration torque <sup>b)</sup> (max. 1000 cycles per hour)		<i>T</i> <sub>2B</sub>	<i>Nm</i>	825	825	660	825	825	682	825	825	825	825	605	594	770	550	594	
			<i>in.lb</i>	7302	7302	5842	7302	7302	6036	7302	7302	7302	7302	5355	5257	6815	4868	5257	
Nominal torque (at <i>n</i> <sub>n</sub> )		<i>T</i> <sub>2N</sub>	<i>Nm</i>	461	493	393	489	545	431	464	541	607	585	425	475	598	440	475	
			<i>in.lb</i>	4078	4361	3476	4332	4824	3812	4104	4792	5370	5179	3765	4206	5291	3894	4206	
Emergency stop torque <sup>a) b)</sup> (permitted 1000 times during the service life of the gearbox)		<i>T</i> <sub>2Not</sub>	<i>Nm</i>	1250	1250	1250	1250	1250	1250	1250	1250	1250	1250	1250	1250	1250	1250	1250	
			<i>in.lb</i>	11064	11064	11064	11064	11064	11064	11064	11064	11064	11064	11064	11064	11064	11064	11064	11064
Permitted average input speed (at <i>T</i> <sub>2N</sub> and 20 °C ambient temperature) <sup>c)</sup>		<i>n</i> <sub>1N</sub>	<i>rpm</i>	2900	2900	2900	2900	2900	2900	2900	2900	2900	3200	3200	3200	3200	3900	3900	
Max. input speed		<i>n</i> <sub>1Max</sub>	<i>rpm</i>	6250	6250	6250	6250	6250	6250	6250	6250	6250	6250	6250	6250	6250	6250	6250	
Mean no load running torque <sup>b)</sup> (at <i>n</i> <sub>i</sub> = 3000 rpm and 20 °C gearbox temperature)		<i>T</i> <sub>012</sub>	<i>Nm</i>	2.8	2.4	2.2	2.6	2.0	1.9	2.0	1.5	1.5	1.2	1.0	1.2	1.1	0.96	0.88	
			<i>in.lb</i>	25	22	20	23	17	17	17	14	13	11	8.9	11	9.9	8.5	7.8	
Max. backlash		<i>j</i> <sub>t</sub>	<i>arcmin</i>	Standard ≤ 3 / Reduced ≤ 1															
Torsional rigidity <sup>b)</sup>		<i>C</i> <sub>t21</sub>	<i>Nm/arcmin</i>	180	185	145	180	180	130	180	175	175	175	123	175	145	100	115	
			<i>in.lb/arcmin</i>	1593	1637	1283	1593	1593	1151	1593	1549	1549	1549	1089	1549	1283	885	1018	
Tilting rigidity		<i>C</i> <sub>2K</sub>	<i>Nm/arcmin</i>	560															
			<i>in.lb/arcmin</i>	4956															
Max. axial force <sup>c)</sup>		<i>F</i> <sub>2AMax</sub>	<i>N</i>	6130															
			<i>lb<sub>f</sub></i>	1379															
Max. tilting moment		<i>M</i> <sub>2KMax</sub>	<i>Nm</i>	1335															
			<i>in.lb</i>	11816															
Efficiency at full load		<i>η</i>	%	94															
Service life <sup>f)</sup>		<i>L</i> <sub>h</sub>	<i>h</i>	> 20000															
Weight (incl. standard adapter plate)		<i>m</i>	<i>kg</i>	14.1															
			<i>lb<sub>m</sub></i>	31.2															
Operating noise (at reference ratio and reference speed – ratio-specific values available in cymex®)		<i>L</i> <sub>PA</sub>	<i>dB(A)</i>	≤ 58															
Max. permitted housing temperature			°C	+90															
			<i>F</i>	194															
Ambient temperature			°C	-15 to +40															
			<i>F</i>	5 to 104															
Lubrication				Lubricated for life															
Direction of rotation				In- and output same direction															
Protection class				IP 65															
Metal bellows coupling (recommended product type – validate sizing with cymex®)				BCT-00300AAX-080.000															
Bore diameter of coupling on the application side			<i>mm</i>	X = 024.000 - 060.000															
Mass moment of inertia (relates to the drive)  Clamping hub diameter [mm] Optimized mass inertia version available on request	E	19	<i>J</i> <sub>i</sub>	<i>kgcm</i> <sup>2</sup>	2.53	2.08	2.30	2.01	1.67	2.12	1.67	1.64	1.44	1.42	1.46	1.51	1.41	1.43	1.40
				10 <sup>-3 in.lb.s</sup> <sup>2</sup>	2.24	1.84	2.04	1.78	1.48	1.88	1.48	1.45	1.27	1.26	1.29	1.34	1.25	1.27	1.24
	G	24	<i>J</i> <sub>i</sub>	<i>kgcm</i> <sup>2</sup>	3.22	2.77	2.99	2.70	2.37	2.81	2.37	2.33	2.13	2.12	2.15	2.20	2.10	2.12	2.09
				10 <sup>-3 in.lb.s</sup> <sup>2</sup>	2.85	2.45	2.65	2.39	2.10	2.49	2.10	2.06	1.89	1.88	1.90	1.95	1.86	1.88	1.85
	K	38	<i>J</i> <sub>i</sub>	<i>kgcm</i> <sup>2</sup>	10.3	9.83	10.1	9.77	9.43	9.88	9.43	9.40	9.20	9.18	9.22	9.50	9.17	9.19	9.16
				10 <sup>-3 in.lb.s</sup> <sup>2</sup>	9.12	8.70	8.94	8.65	8.35	8.74	8.35	8.32	8.14	8.12	8.16	8.41	8.12	8.13	8.11

Please use our sizing software cymex<sup>®</sup> for a detailed sizing – [www.wittenstein-cymex.com](http://www.wittenstein-cymex.com)

<sup>a)</sup> At max. 10 %  $M_{2KMax}$

<sup>b)</sup> Valid for standard clamping hub diameter

<sup>c)</sup> Refers to center of the output shaft or flange

<sup>d)</sup> Please reduce input speed at higher ambient temperatures

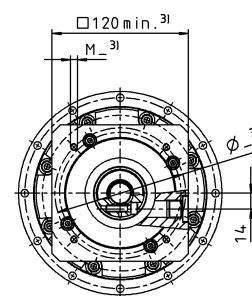
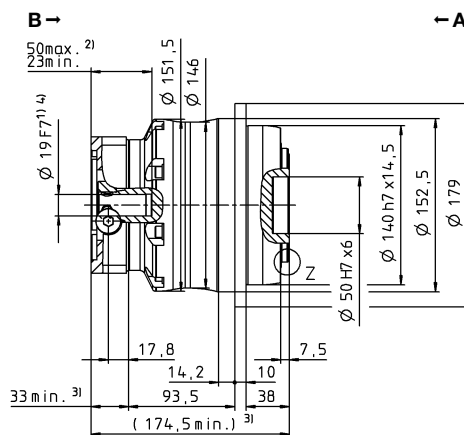
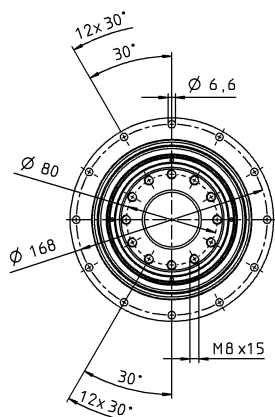
<sup>f)</sup> Please contact us to discuss  
application-specific service lifetimes

View A

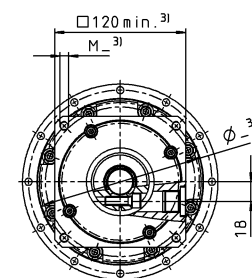
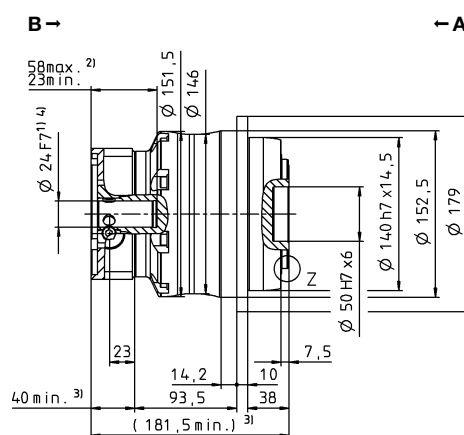
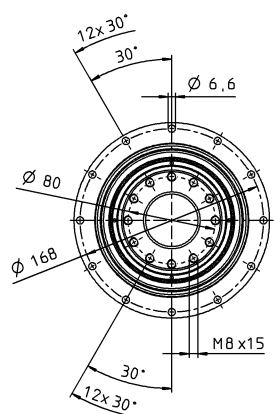
View B

# 2-stage

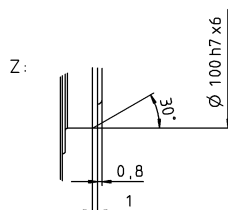
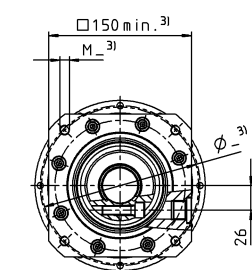
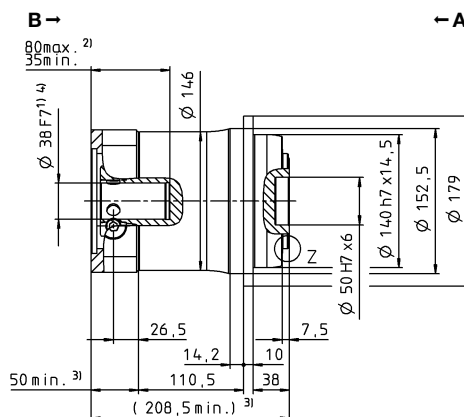
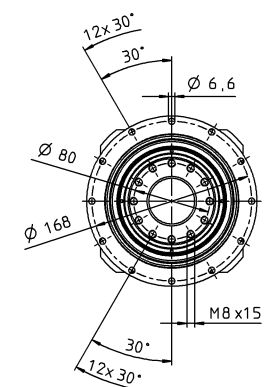
up to 19<sup>4)</sup> (E)  
clamping hub  
diameter



up to 24<sup>4)</sup> (G)<sup>5)</sup>  
clamping hub  
diameter



up to 38<sup>4)</sup> (K)  
clamping hub  
diameter



Non-tolerated dimensions are nominal dimensions

<sup>1)</sup> Check motor shaft fit

<sup>2)</sup> Min./Max. permissible motor shaft length. Longer motor shafts are possible, please contact alpha.

<sup>3)</sup> The dimensions depend on the motor

<sup>4)</sup> Smaller motor shaft diameter is compensated by a bushing with a minimum wall thickness of 1 mm

<sup>5)</sup> Standard clamping hub diameter

# TP+ 110 MF 1-stage

				1-stage					
Ratio			<i>i</i>		4	5	7	8	10
Max. torque <sup>a) b)</sup>			<i>T</i> <sub>2a</sub>	<i>Nm</i>	2560	2560	2560	2240	2240
				<i>in.lb</i>	22658	22658	22658	19826	19826
Max. acceleration torque <sup>b)</sup> (max. 1000 cycles per hour)			<i>T</i> <sub>2B</sub>	<i>Nm</i>	1920	1920	1920	1680	1680
				<i>in.lb</i>	16994	16994	16994	14869	14869
Nominal torque (at <i>n</i> <sub>n</sub> )			<i>T</i> <sub>2N</sub>	<i>Nm</i>	946	919	861	861	901
				<i>in.lb</i>	8375	8134	7618	7618	7972
Emergency stop torque <sup>a) b)</sup> (permitted 1000 times during the service life of the gearbox)			<i>T</i> <sub>2Not</sub>	<i>Nm</i>	3075	3075	3075	3075	3075
				<i>in.lb</i>	27216	27216	27216	27216	27216
Permitted average input speed (at <i>T</i> <sub>2N</sub> and 20 °C ambient temperature) <sup>d)</sup>			<i>n</i> <sub>1N</sub>	<i>rpm</i>	1400	1500	2000	2000	2000
Max. input speed			<i>n</i> <sub>1Max</sub>	<i>rpm</i>	4500	4500	4500	4500	4500
Mean no load running torque <sup>b)</sup> (at <i>n</i> <sub>i</sub> = 3000 rpm and 20 °C gearbox temperature)			<i>T</i> <sub>012</sub>	<i>Nm</i>	16	12	8.8	8.8	6.0
				<i>in.lb</i>	138	109	78	78	53
Max. backlash			<i>j</i> <sub>t</sub>	<i>arcmin</i>	Standard ≤ 3 / Reduced ≤ 1				
Torsional rigidity <sup>b)</sup>			<i>C</i> <sub>121</sub>	<i>Nm/arcmin</i>	610	610	550	445	445
				<i>in.lb/arcmin</i>	5399	5399	4868	3939	3939
Tilting rigidity			<i>C</i> <sub>2K</sub>	<i>Nm/arcmin</i>	1452				
				<i>in.lb/arcmin</i>	12851				
Max. axial force <sup>c)</sup>			<i>F</i> <sub>2AMax</sub>	<i>N</i>	10050				
				<i>lb<sub>f</sub></i>	2261				
Max. tilting moment			<i>M</i> <sub>2KMax</sub>	<i>Nm</i>	3280				
				<i>in.lb</i>	29031				
Efficiency at full load			<i>η</i>	%	97				
Service life <sup>f)</sup>			<i>L</i> <sub>h</sub>	<i>h</i>	> 20000				
Weight (incl. standard adapter plate)			<i>m</i>	<i>kg</i>	30				
				<i>lb<sub>m</sub></i>	66.3				
Operating noise (at reference ratio and reference speed – ratio-specific values available in cymex <sup>®</sup> )			<i>L</i> <sub>PA</sub>	<i>dB(A)</i>	≤ 68				
Max. permitted housing temperature				°C	+90				
				<i>F</i>	194				
Ambient temperature				°C	−15 to +40				
				<i>F</i>	5 to 104				
Lubrication					Lubricated for life				
Direction of rotation					In- and output same direction				
Protection class					IP 65				
Metal bellows coupling (recommended product type – validate sizing with cymex <sup>®</sup> )					BCT-01500AAX-125.000				
Bore diameter of coupling on the application side				<i>mm</i>	X = 050.000 - 080.000				
Mass moment of inertia (relates to the drive)  Clamping hub diameter [mm] Optimized mass inertia version available on request	K	38	<i>J</i> <sub>i</sub>	<i>kgcm</i> <sup>2</sup>	44.5	34.6	25.5	25.5	20.6
				<i>10<sup>-3</sup> in.lb.s</i> <sup>2</sup>	39.4	30.6	22.6	22.6	18.2
	M	48	<i>J</i> <sub>i</sub>	<i>kgcm</i> <sup>2</sup>	58.8	41.9	32.9	32.9	28.0
				<i>10<sup>-3</sup> in.lb.s</i> <sup>2</sup>	52.0	37.1	29.1	29.1	24.8
	N	55	<i>J</i> <sub>i</sub>	<i>kgcm</i> <sup>2</sup>	61.5	51.5	42.3	42.3	37.3
				<i>10<sup>-3</sup> in.lb.s</i> <sup>2</sup>	54.4	45.6	37.4	37.4	33.0

Please use our sizing software cymex<sup>®</sup> for a detailed sizing – [www.wittenstein-cymex.com](http://www.wittenstein-cymex.com)

<sup>a)</sup> At max. 10 %  $M_{2KMax}$

<sup>b)</sup> Valid for standard clamping hub diameter

<sup>c)</sup> Refers to center of the output shaft or flange

<sup>d)</sup> Please reduce input speed at higher ambient temperatures

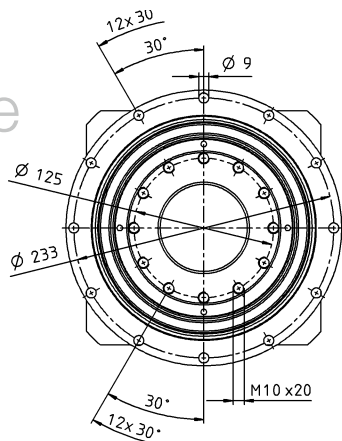
<sup>f)</sup> Please contact us to discuss  
application-specific service lifetimes

View A

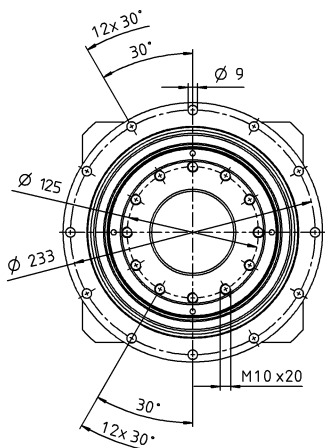
View B

# 1-stage

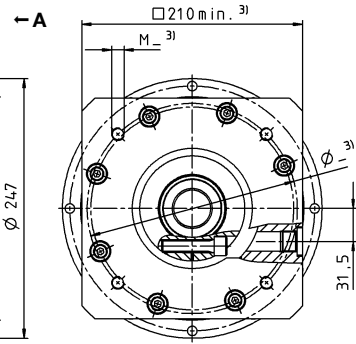
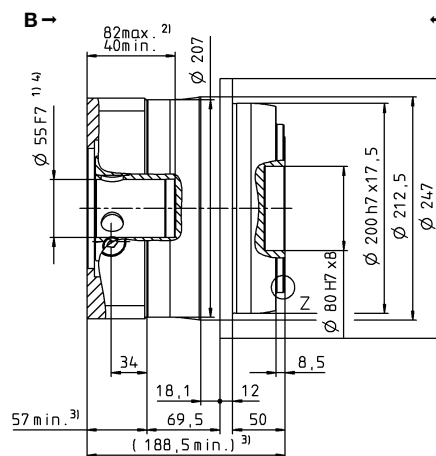
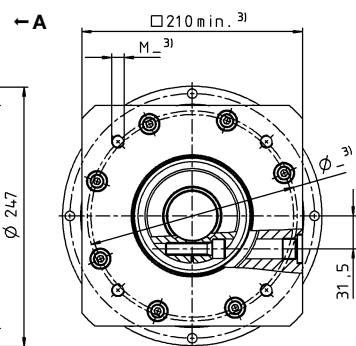
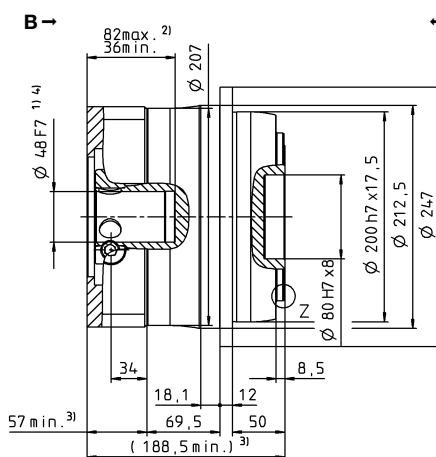
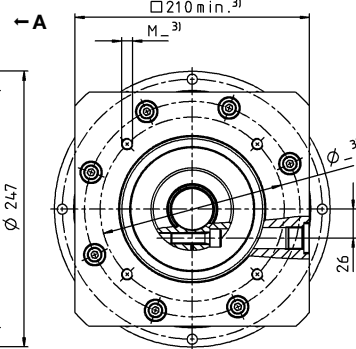
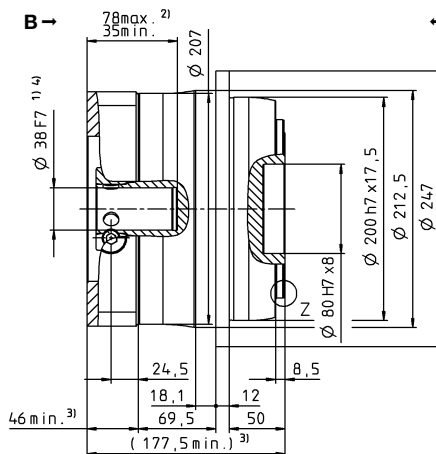
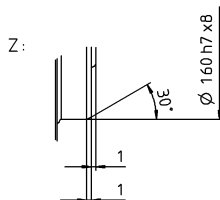
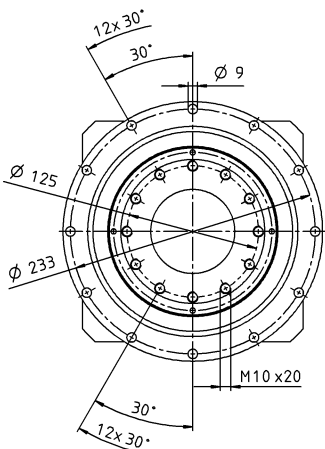
up to 38<sup>4)</sup> (K)  
clamping hub  
diameter



up to 48<sup>4)</sup> (M)<sup>5)</sup>  
clamping hub  
diameter



up to 55<sup>4)</sup> (N)  
clamping hub  
diameter



Non-tolerated dimensions are nominal dimensions

<sup>1)</sup> Check motor shaft fit

<sup>2)</sup> Min./Max. permissible motor shaft length. Longer motor shafts are possible, please contact alpha.

<sup>3)</sup> The dimensions depend on the motor

<sup>4)</sup> Smaller motor shaft diameter is compensated by a bushing with a minimum wall thickness of 1 mm

<sup>5)</sup> Standard clamping hub diameter

# TP+ 110 MF 2-stage

				2-stage															
Ratio		<i>i</i>		16	20	21	25	28	31	32	35	40	50	61	64	70	91	100	
Max. torque <sup>a) b)</sup>		<i>T</i> <sub>2a</sub>	<i>Nm</i>	1760	1760	1540	1760	1760	1760	1760	1760	1760	1760	1540	1540	1760	1430	1540	
			<i>in.lb</i>	15577	15577	13630	15577	15577	15577	15577	15577	15577	15577	13630	13630	15577	12657	13630	
Max. acceleration torque <sup>b)</sup> (max. 1000 cycles per hour)		<i>T</i> <sub>2B</sub>	<i>Nm</i>	1760	1760	1540	1760	1760	1760	1760	1760	1760	1760	1540	1540	1760	1430	1540	
			<i>in.lb</i>	15577	15577	13630	15577	15577	15577	15577	15577	15577	15577	13630	13630	15577	12657	13630	
Nominal torque (at <i>n</i> <sub>N</sub> )		<i>T</i> <sub>2N</sub>	<i>Nm</i>	1205	1240	1023	1278	1257	1065	1221	1408	1315	1408	1232	1232	1408	1144	1232	
			<i>in.lb</i>	10669	10976	9051	11312	11121	9422	10807	12462	11636	12462	10904	10904	12462	10125	10904	
Emergency stop torque <sup>a) b)</sup> (permitted 1000 times during the service life of the gearbox)		<i>T</i> <sub>2Not</sub>	<i>Nm</i>	3075	3075	3075	3075	3075	3075	3075	3075	3075	3075	3075	3075	3075	3075	3075	
			<i>in.lb</i>	27216	27216	27216	27216	27216	27216	27216	27216	27216	27216	27216	27216	27216	27216	27216	
Permitted average input speed (at <i>T</i> <sub>2N</sub> and 20 °C ambient temperature) <sup>c)</sup>		<i>n</i> <sub>1N</sub>	<i>rpm</i>	2500	2500	2500	2500	2500	2500	2500	2500	2500	2900	3200	2900	3200	3400	3400	
Max. input speed		<i>n</i> <sub>1Max</sub>	<i>rpm</i>	5625	5625	5625	5625	5625	5625	5625	5625	5625	5625	5625	5625	5625	5625	5625	
Mean no load running torque <sup>b)</sup> (at <i>n</i> <sub>i</sub> = 3000 rpm and 20 °C gearbox temperature)		<i>T</i> <sub>012</sub>	<i>Nm</i>	7.0	5.8	5.2	5.2	4.5	4.4	4.5	3.1	3.0	2.5	2.1	2.5	2.0	1.8	1.8	
			<i>in.lb</i>	52	52	46	46	40	39	40	28	27	22	18	22	18	16	16	
Max. backlash		<i>j</i> <sub>t</sub>	<i>arcmin</i>	Standard ≤ 3 / Reduced ≤ 1															
Torsional rigidity <sup>b)</sup>		<i>C</i> <sub>t21</sub>	<i>Nm/arcmin</i>	585	580	465	570	560	440	560	560	520	525	415	525	480	360	395	
			<i>in.lb/arcmin</i>	5178	5133	4116	5045	4956	3894	4956	4956	4602	4647	3673	4647	4248	3186	3496	
Tilting rigidity		<i>C</i> <sub>2K</sub>	<i>Nm/arcmin</i>	1452															
			<i>in.lb/arcmin</i>	12851															
Max. axial force <sup>c)</sup>		<i>F</i> <sub>2AMax</sub>	<i>N</i>	10050															
			<i>lb<sub>f</sub></i>	2261															
Max. tilting moment		<i>M</i> <sub>2KMax</sub>	<i>Nm</i>	3280															
			<i>in.lb</i>	29031															
Efficiency at full load		<i>η</i>	%	94															
Service life <sup>f)</sup>		<i>L</i> <sub>h</sub>	<i>h</i>	> 20000															
Weight (incl. standard adapter plate)		<i>m</i>	<i>kg</i>	34															
			<i>lb<sub>m</sub></i>	75.1															
Operating noise (at reference ratio and reference speed – ratio-specific values available in cymex®)		<i>L</i> <sub>PA</sub>	<i>dB(A)</i>	≤ 61															
Max. permitted housing temperature			°C	+90															
			<i>F</i>	194															
Ambient temperature			°C	-15 to +40															
			<i>F</i>	5 to 104															
Lubrication				Lubricated for life															
Direction of rotation				In- and output same direction															
Protection class				IP 65															
Metal bellows coupling (recommended product type – validate sizing with cymex®)				BCT-01500AAX-125.000															
Bore diameter of coupling on the application side			<i>mm</i>	X = 050.000 - 080.000															
Mass moment of inertia (relates to the drive) Clamping hub diameter [mm] Optimized mass inertia version available on request	G	24	<i>J</i> <sub>i</sub>	<i>kgcm<sup>2</sup></i>	8.51	8.21	8.98	7.82	6.57	8.09	6.57	6.37	5.63	5.54	5.63	5.78	5.44	5.51	5.40
				<i>10<sup>-3</sup> in.lb.s<sup>2</sup></i>	7.53	7.27	7.95	6.92	5.81	7.16	5.81	5.64	4.98	4.90	4.98	5.12	4.81	4.88	4.78
	I	32	<i>J</i> <sub>i</sub>	<i>kgcm<sup>2</sup></i>	11.7	11.4	12.1	11.0	9.73	11.3	9.73	9.54	8.80	8.70	8.80	8.95	8.61	8.67	8.56
				<i>10<sup>-3</sup> in.lb.s<sup>2</sup></i>	10.4	10.1	10.7	9.74	8.61	10.0	8.61	8.44	7.79	7.70	7.79	7.92	7.62	7.67	7.58
	K	38	<i>J</i> <sub>i</sub>	<i>kgcm<sup>2</sup></i>	12.7	12.5	13.2	12.1	10.8	12.3	10.8	10.6	9.87	9.77	9.87	10.0	9.68	9.74	9.63
				<i>10<sup>-3</sup> in.lb.s<sup>2</sup></i>	11.2	11.1	11.7	10.7	9.56	10.9	9.56	9.39	8.73	8.65	8.73	8.87	8.57	8.62	8.52
	M	48	<i>J</i> <sub>i</sub>	<i>kgcm<sup>2</sup></i>	27.4	27.1	27.8	26.7	25.4	26.9	25.4	25.3	24.5	24.4	24.5	24.9	24.3	24.4	24.3
				<i>10<sup>-3</sup> in.lb.s<sup>2</sup></i>	24.3	24.0	24.6	23.6	22.5	23.8	22.5	22.4	21.7	21.6	21.7	22.0	21.5	21.6	21.5

Please use our sizing software cymex<sup>®</sup> for a detailed sizing – [www.wittenstein-cymex.com](http://www.wittenstein-cymex.com)

<sup>a)</sup> At max. 10 %  $M_{2KMax}$

<sup>b)</sup> Valid for standard clamping hub diameter

<sup>c)</sup> Refers to center of the output shaft or flange

<sup>d)</sup> Please reduce input speed at higher ambient temperatures

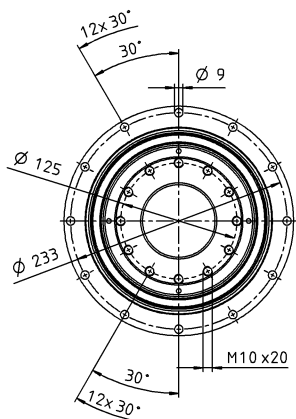
<sup>f)</sup> Please contact us to discuss  
application-specific service lifetimes

View A

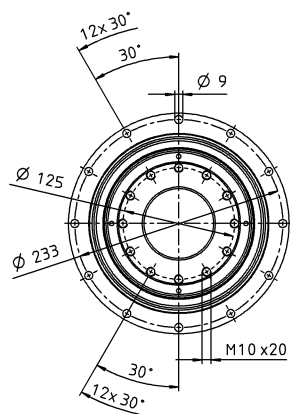
View B

# 2-stage

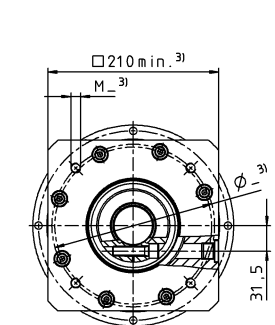
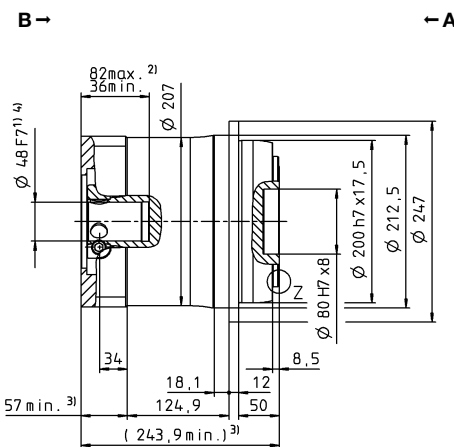
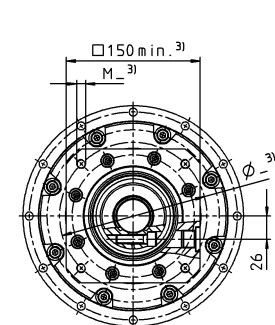
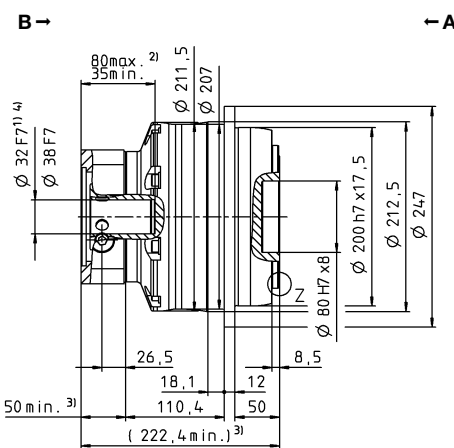
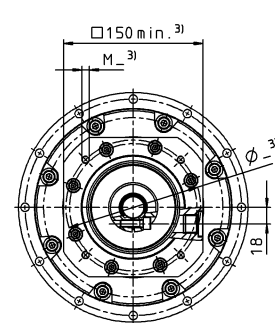
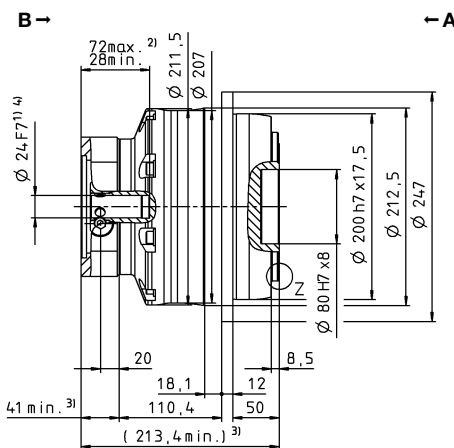
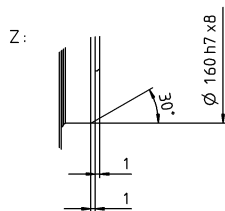
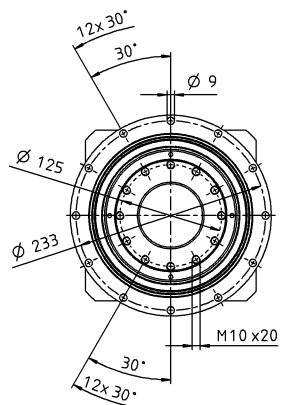
up to 24<sup>4)</sup> (G)  
clamping hub diameter



up to 32/38<sup>4)</sup>  
(I/K<sup>5)</sup>) clamping  
hub diameter



up to 48<sup>4)</sup> (M)  
clamping hub diameter



Non-tolerated dimensions are nominal dimensions

<sup>1)</sup> Check motor shaft fit

<sup>2)</sup> Min./Max. permissible motor shaft length. Longer motor shafts are possible, please contact alpha.

<sup>3)</sup> The dimensions depend on the motor

<sup>4)</sup> Smaller motor shaft diameter is compensated by a bushing with a minimum wall thickness of 1 mm

<sup>5)</sup> Standard clamping hub diameter



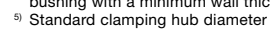
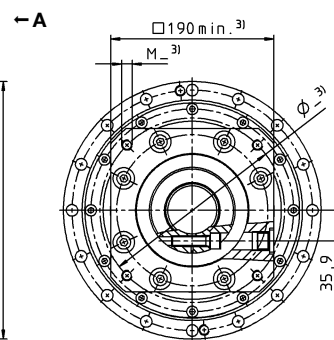
# TP+ 300 MF 1-stage

				1-stage			
Ratio		<i>i</i>		5	7	10	
Max. torque <sup>a) b)</sup>		<i>T</i> <sub>2a</sub>	<i>Nm</i>	5600	5250	2800	
			<i>in.lb</i>	49564	46467	24782	
Max. acceleration torque <sup>b)</sup> (max. 1000 cycles per hour)		<i>T</i> <sub>2B</sub>	<i>Nm</i>	4200	3960	2280	
			<i>in.lb</i>	37173	35049	20180	
Nominal torque (at <i>n</i> <sub>n</sub> )		<i>T</i> <sub>2N</sub>	<i>Nm</i>	1996	1835	1794	
			<i>in.lb</i>	17666	16242	15878	
Emergency stop torque <sup>a) b)</sup> (permitted 1000 times during the service life of the gearbox)		<i>T</i> <sub>2Not</sub>	<i>Nm</i>	9900	9900	8750	
			<i>in.lb</i>	87623	87623	77445	
Permitted average input speed (at <i>T</i> <sub>2a</sub> and 20 °C ambient temperature) <sup>d)</sup>		<i>n</i> <sub>1N</sub>	<i>rpm</i>	1000	1400	1700	
Max. input speed		<i>n</i> <sub>1Max</sub>	<i>rpm</i>	3000	3000	3000	
Mean no load running torque <sup>b)</sup> (at <i>n</i> <sub>i</sub> = 2000 rpm and 20 °C gearbox temperature)		<i>T</i> <sub>012</sub>	<i>Nm</i>	20	14	8.8	
			<i>in.lb</i>	177	120	78	
Max. backlash		<i>j</i> <sub>t</sub>	<i>arcmin</i>	Standard ≤ 3 / Reduced ≤ 1			
Torsional rigidity <sup>b)</sup>		<i>C</i> <sub>t21</sub>	<i>Nm/arcmin</i>	1000	900	700	
			<i>in.lb/arcmin</i>	8851	7966	6196	
Tilting rigidity		<i>C</i> <sub>2K</sub>	<i>Nm/arcmin</i>	5560			
			<i>in.lb/arcmin</i>	49210			
Max. axial force <sup>c)</sup>		<i>F</i> <sub>2AMax</sub>	<i>N</i>	33000			
			<i>lb<sub>f</sub></i>	7425			
Max. tilting moment		<i>M</i> <sub>2KMax</sub>	<i>Nm</i>	3900			
			<i>in.lb</i>	34518			
Efficiency at full load		<i>η</i>	%	95			
Service life <sup>f)</sup>		<i>L</i> <sub>h</sub>	<i>h</i>	> 20000			
Weight (incl. standard adapter plate)		<i>m</i>	<i>kg</i>	60			
			<i>lb<sub>m</sub></i>	132.6			
Operating noise (at reference ratio and reference speed – ratio-specific values available in cymex®)		<i>L</i> <sub>PA</sub>	<i>dB(A)</i>	≤ 64			
Max. permitted housing temperature			°C	+90			
			<i>F</i>	194			
Ambient temperature			°C	–15 to +40			
			<i>F</i>	5 to 104			
Lubrication				Lubricated for life			
Direction of rotation				In- and output same direction			
Protection class				IP 65			
Metal bellows coupling (recommended product type – validate sizing with cymex®)				–			
Bore diameter of coupling on the application side			<i>mm</i>	–			
Mass moment of inertia (relates to the drive) Clamping hub diameter [mm] Optimized mass inertia version available on request	N	55	<i>J</i> <sub>i</sub>	<i>kgcm</i> <sup>2</sup>	82.6	61.2	49.5
				<i>10<sup>-3</sup> in.lb.s</i> <sup>2</sup>	73.1	54.2	43.8

Please use our sizing software cymex<sup>®</sup> for a detailed sizing – [www.wittenstein-cymex.com](http://www.wittenstein-cymex.com)

- <sup>a)</sup> At max. 10 %  $M_{2KMax}$   
<sup>b)</sup> Valid for standard clamping hub diameter  
<sup>c)</sup> Refers to center of the output shaft or flange  
<sup>d)</sup> Please reduce input speed at higher ambient temperatures  
<sup>f)</sup> Please contact us to discuss application-specific service lifetimes

up to 55 <sup>4)</sup> (N) <sup>5)</sup>  
clamping hub  
diameter



Tip<sup>+</sup>

MF

# TP+ 300 MF 2-stage

				2-stage									
Ratio	<i>i</i>			20	21	25	31	35	50	61	70	91	100
Max. torque <sup>a) b)</sup>	$T_{2a}$	Nm		3850	3740	3949	3850	3949	3600	3080	3630	2800	2800
		in.lb		34076	33102	34947	34076	34947	31863	27260	32128	24782	24782
Max. acceleration torque <sup>b)</sup> (max. 1000 cycles per hour)	$T_{2B}$	Nm		3850	3740	3949	3850	3949	3600	3080	3630	2800	2800
		in.lb		34076	33102	34952	34076	34952	31863	27260	32128	24782	24782
Nominal torque (at $n_n$ )	$T_{2N}$	Nm		1354	1456	1676	2114	1710	1722	2070	2339	2240	2240
		in.lb		11981	12888	14834	18709	15131	15238	18320	20698	19826	19826
Emergency stop torque <sup>a) b)</sup> (permitted 1000 times during the service life of the gearbox)	$T_{2Not}$	Nm		9900	9870	9900	9156	9900	9900	9008	9900	8750	8750
		in.lb		87623	87357	87623	81035	87623	87623	79728	87623	77445	77445
Permitted average input speed (at $T_{2N}$ and 20 °C ambient temperature) <sup>d)</sup>	$n_{1N}$	rpm		2000	2000	2000	2000	2000	2300	2400	2400	2500	2500
Max. input speed	$n_{1Max}$	rpm		4375	4375	4375	4375	4375	4375	4375	4375	4375	4375
Mean no load running torque <sup>b)</sup> (at $n_i = 2000$ rpm and 20 °C gearbox temperature)	$T_{012}$	Nm		6.7	5.5	5.5	4.8	4.0	3.8	2.8	3.0	2.8	2.4
		in.lb		59	49	48	43	35	34	25	26	25	21
Max. backlash	$j_t$	arcmin		Standard ≤ 3 / Reduced ≤ 2									
Torsional rigidity <sup>b)</sup>	$C_{t21}$	Nm/arcmin		850	800	950	750	900	800	700	800	600	650
		in.lb/arcmin		7523	7081	8408	6638	7966	7081	6196	7081	5310	5753
Tilting rigidity	$C_{2K}$	Nm/arcmin		5560									
		in.lb/arcmin		49210									
Max. axial force <sup>c)</sup>	$F_{2AMax}$	N		33000									
		lb <sub>f</sub>		7425									
Max. tilting moment	$M_{2KMax}$	Nm		5900									
		in.lb		52220									
Efficiency at full load	$\eta$	%		94									
Service life <sup>f)</sup>	$L_h$	h		> 20000									
Weight (incl. standard adapter plate)	$m$	kg		58.5									
		lb <sub>m</sub>		129.3									
Operating noise (at reference ratio and reference speed – ratio-specific values available in cymex <sup>®</sup> )	$L_{PA}$	dB(A)		≤ 61									
Max. permitted housing temperature		°C		+90									
		F		194									
Ambient temperature		°C		-15 to +40									
		F		5 to 104									
Lubrication				Lubricated for life									
Direction of rotation				In- and output same direction									
Protection class				IP 65									
Metal bellows coupling (recommended product type – validate sizing with cymex <sup>®</sup> )				-									
Bore diameter of coupling on the application side		mm		-									
Mass moment of inertia (relates to the drive) Clamping hub diameter [mm] Optimized mass inertia version available on request	M	48	$J_1$	kgcm <sup>2</sup>	27.5	27.0	25.9	25.6	22.4	21.5	21.4	21.3	21.2
				10 <sup>-3</sup> in.lb.s <sup>2</sup>	24.3	23.9	22.9	22.7	19.8	19.0	18.9	18.9	18.8

Please use our sizing software cymex<sup>®</sup> for a detailed sizing – [www.wittenstein-cymex.com](http://www.wittenstein-cymex.com)

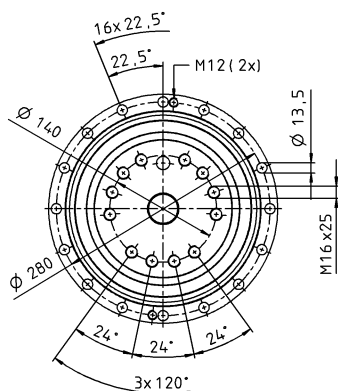
- <sup>a)</sup> At max. 10 %  $M_{2KMax}$   
<sup>b)</sup> Valid for standard clamping hub diameter  
<sup>c)</sup> Refers to center of the output shaft or flange  
<sup>d)</sup> Please reduce input speed at higher ambient temperatures  
<sup>f)</sup> Please contact us to discuss application-specific service lifetimes

View A

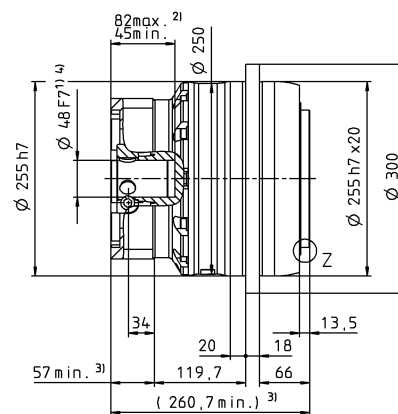
View B

Motor shaft diameter [mm]

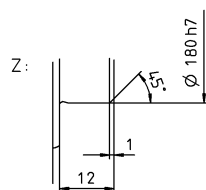
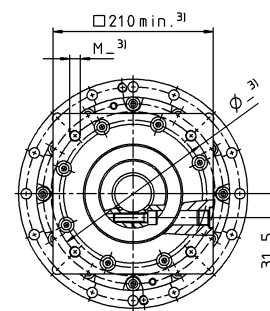
2-stage

up to 48<sup>4)</sup> (M)<sup>5)</sup>  
clamping hub  
diameter


B →



← A



Non-tolerated dimensions are nominal dimensions

<sup>1)</sup> Check motor shaft fit

<sup>2)</sup> Min./Max. permissible motor shaft length. Longer motor shafts are possible, please contact alpha.

<sup>3)</sup> The dimensions depend on the motor

<sup>4)</sup> Smaller motor shaft diameter is compensated by a bushing with a minimum wall thickness of 1 mm

<sup>5)</sup> Standard clamping hub diameter

# TP+ 500 MF 1-stage

			1-stage		
Ratio	<i>i</i>		5	7	10
Max. torque <sup>a) b)</sup>	$T_{2a}$	Nm	9600	6790	4000
		in.lb	84968	60097	35403
Max. acceleration torque <sup>b)</sup> (max. 1000 cycles per hour)	$T_{2B}$	Nm	7200	6000	4000
		in.lb	63726	53105	35403
Nominal torque (at $n_n$ )	$T_{2N}$	Nm	3131	2857	2840
		in.lb	27711	25286	25135
Emergency stop torque <sup>a) b)</sup> (permitted 1000 times during the service life of the gearbox)	$T_{2Not}$	Nm	15000	15000	15000
		in.lb	132762	132762	132762
Permitted average input speed (at $T_{2N}$ and 20 °C ambient temperature) <sup>d)</sup>	$n_{1N}$	rpm	900	1300	1500
Max. input speed	$n_{1Max}$	rpm	3000	3000	3000
Mean no load running torque <sup>b)</sup> (at $n_1 = 2000$ rpm and 20 °C gearbox temperature)	$T_{012}$	Nm	27	19	12
		in.lb	242	170	110
Max. backlash	$j_t$	arcmin	Standard $\leq 3$ / Reduced $\leq 1$		
Torsional rigidity <sup>b)</sup>	$C_{t21}$	Nm/arcmin	1450	1300	1100
		in.lb/arcmin	12834	11506	9736
Tilting rigidity	$C_{2K}$	Nm/arcmin	9480		
		in.lb/arcmin	83906		
Max. axial force <sup>c)</sup>	$F_{2AMax}$	N	50000		
		lb <sub>f</sub>	11250		
Max. tilting moment	$M_{2KMax}$	Nm	5500		
		in.lb	48679		
Efficiency at full load	$\eta$	%	95		
Service life <sup>f)</sup>	$L_h$	h	> 20000		
Weight (incl. standard adapter plate)	$m$	kg	82		
		lb <sub>m</sub>	181.2		
Operating noise (at reference ratio and reference speed – ratio-specific values available in cymex <sup>®</sup> )	$L_{PA}$	dB(A)	$\leq 64$		
Max. permitted housing temperature		°C	+90		
		F	194		
Ambient temperature		°C	-15 to +40		
		F	5 to 104		
Lubrication			Lubricated for life		
Direction of rotation			In- and output same direction		
Protection class			IP 65		
Metal bellows coupling (recommended product type – validate sizing with cymex <sup>®</sup> )			–		
Bore diameter of coupling on the application side		mm	–		
Mass moment of inertia (relates to the drive) Clamping hub diameter [mm] Optimized mass inertia version available on request	O 60	$J_1$	kgcm <sup>2</sup>	182	142
			10 <sup>-3</sup> in.lb.s <sup>2</sup>	161	126
				120	106

Please use our sizing software cymex<sup>®</sup> for a detailed sizing – [www.wittenstein-cymex.com](http://www.wittenstein-cymex.com)

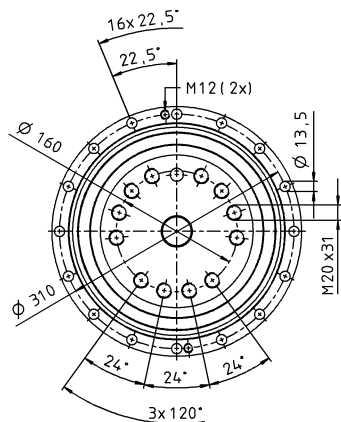
- <sup>a)</sup> At max. 10 %  $M_{2KMax}$   
<sup>b)</sup> Valid for standard clamping hub diameter  
<sup>c)</sup> Refers to center of the output shaft or flange  
<sup>d)</sup> Please reduce input speed at higher ambient temperatures  
<sup>f)</sup> Please contact us to discuss application-specific service lifetimes

View A

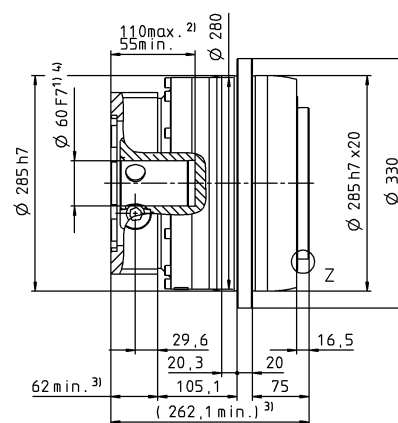
View B

Motor shaft diameter [mm]

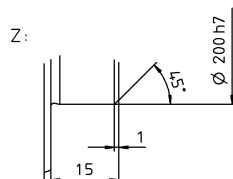
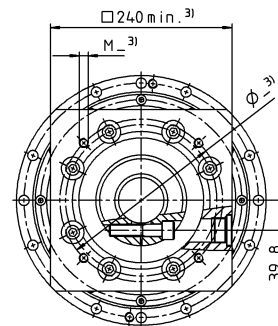
1-stage

up to 60 <sup>4)</sup> (O) <sup>5)</sup>  
clamping hub  
diameter


B →



← A



Non-tolerated dimensions are nominal dimensions

<sup>1)</sup> Check motor shaft fit

<sup>2)</sup> Min./Max. permissible motor shaft length. Longer motor shafts are possible, please contact alpha.

<sup>3)</sup> The dimensions depend on the motor

<sup>4)</sup> Smaller motor shaft diameter is compensated by a bushing with a minimum wall thickness of 1 mm

<sup>5)</sup> Standard clamping hub diameter

TP+

MF

Planetary gearboxes

# TP+ 500 MF 2-stage

				2-stage										
Ratio	<i>i</i>			20	21	25	31	35	50	61	70	91	100	
Max. torque <sup>a) b)</sup>	<i>T</i> <sub>2a</sub>	<i>Nm</i>		5446	5718	6808	6354	6808	4975	5280	5500	4800	4800	
		<i>in.lb</i>		48202	50612	60252	56239	60252	44033	46732	48679	42484	42484	
Max. acceleration torque <sup>b)</sup> (max. 1000 cycles per hour)	<i>T</i> <sub>2B</sub>	<i>Nm</i>		5446	5718	6808	6324	6808	4975	5280	5500	4800	4800	
		<i>in.lb</i>		48202	50612	60252	56239	60252	44033	46732	48679	42484	42484	
Nominal torque (at <i>n</i> <sub>n</sub> )	<i>T</i> <sub>2N</sub>	<i>Nm</i>		3026	3270	3729	4086	3828	3697	4224	4400	3840	3840	
		<i>in.lb</i>		26785	28944	33002	36160	33878	32720	37386	38944	33987	33987	
Emergency stop torque <sup>a) b)</sup> (permitted 1000 times during the service life of the gearbox)	<i>T</i> <sub>2Not</sub>	<i>Nm</i>		15000	13928	15000	10854	15000	15000	10678	15000	15000	15000	
		<i>in.lb</i>		132762	123274	132762	96063	132762	132762	94513	132762	132762	132762	
Permitted average input speed (at <i>T</i> <sub>2a</sub> and 20 °C ambient temperature) <sup>d)</sup>	<i>n</i> <sub>1N</sub>	<i>rpm</i>		1500	1500	1500	1500	1500	2000	2100	2100	2200	2200	
Max. input speed	<i>n</i> <sub>1Max</sub>	<i>rpm</i>		4375	4375	4375	4375	4375	4375	4375	4375	4375	4375	
Mean no load running torque <sup>b)</sup> (at <i>n</i> <sub>i</sub> = 2000 rpm and 20 °C gearbox temperature)	<i>T</i> <sub>012</sub>	<i>Nm</i>		10	9.6	9.2	7.0	7.0	5.8	3.4	4.5	3.5	3.6	
		<i>in.lb</i>		92	85	81	62	62	51	30	40	31	32	
Max. backlash	<i>j</i> <sub>t</sub>	<i>arcmin</i>		Standard ≤ 3 / Reduced ≤ 2										
Torsional rigidity <sup>b)</sup>	<i>C</i> <sub>t21</sub>	<i>Nm/arcmin</i>		1400	1200	1450	1200	1400	1300	1100	1250	950	1050	
		<i>in.lb/arcmin</i>		12391	10621	12834	10621	12391	11506	9736	11064	8408	9293	
Tilting rigidity	<i>C</i> <sub>2K</sub>	<i>Nm/arcmin</i>		9480										
		<i>in.lb/arcmin</i>		83906										
Max. axial force <sup>c)</sup>	<i>F</i> <sub>2AMax</sub>	<i>N</i>		50000										
		<i>lb<sub>f</sub></i>		11250										
Max. tilting moment	<i>M</i> <sub>2KMax</sub>	<i>Nm</i>		8800										
		<i>in.lb</i>		77887										
Efficiency at full load	<i>η</i>	%		94										
Service life <sup>f)</sup>	<i>L</i> <sub>h</sub>	<i>h</i>		> 20000										
Weight (incl. standard adapter plate)	<i>m</i>	<i>kg</i>		77.5										
		<i>lb<sub>m</sub></i>		171.3										
Operating noise (at reference ratio and reference speed – ratio-specific values available in cymex®)	<i>L</i> <sub>PA</sub>	<i>dB(A)</i>		≤ 60										
Max. permitted housing temperature		°C		+90										
		<i>F</i>		194										
Ambient temperature		°C		–15 to +40										
		<i>F</i>		5 to 104										
Lubrication				Lubricated for life										
Direction of rotation				In- and output same direction										
Protection class				IP 65										
Metal bellows coupling (recommended product type – validate sizing with cymex®)				–										
Bore diameter of coupling on the application side		<i>mm</i>		–										
Mass moment of inertia (relates to the drive) Clamping hub diameter [mm] Optimized mass inertia version available on request	M	48	<i>J</i> <sub>i</sub>	<i>kgcm²</i>	24.8	35.9	40.2	33.7	27.4	27.4	25.4	31.0	25.0	25.2
				<i>10<sup>-3</sup> in.lb.s²</i>	21.9	31.8	35.6	29.8	24.2	24.2	22.5	27.4	22.1	22.3

Please use our sizing software cymex<sup>®</sup> for a detailed sizing – [www.wittenstein-cymex.com](http://www.wittenstein-cymex.com)

- <sup>a)</sup> At max. 10 %  $M_{2KMax}$
- <sup>b)</sup> Valid for standard clamping hub diameter
- <sup>c)</sup> Refers to center of the output shaft or flange
- <sup>d)</sup> Please reduce input speed at higher ambient temperatures
- <sup>f)</sup> Please contact us to discuss application-specific service lifetimes

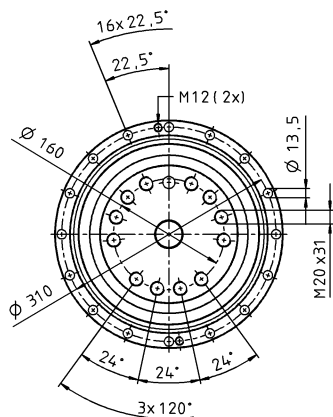


View A

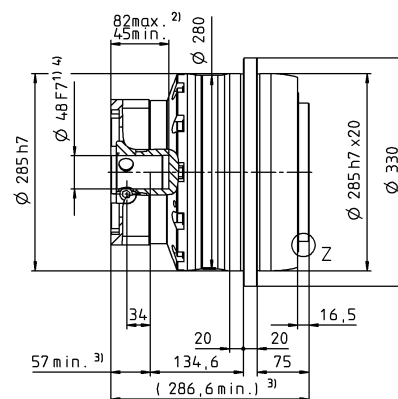
View B

Motor shaft diameter [mm]

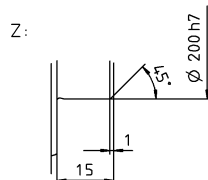
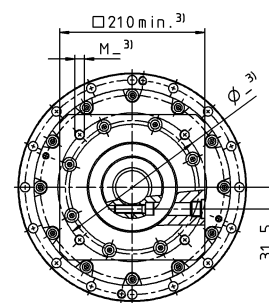
2-stage

up to 48 <sup>4)</sup> (M) <sup>5)</sup>  
clamping hub  
diameter


B →



← A



Non-tolerated dimensions are nominal dimensions

<sup>1)</sup> Check motor shaft fit

<sup>2)</sup> Min./Max. permissible motor shaft length. Longer motor shafts are possible, please contact alpha.

<sup>3)</sup> The dimensions depend on the motor

<sup>4)</sup> Smaller motor shaft diameter is compensated by a bushing with a minimum wall thickness of 1 mm

<sup>5)</sup> Standard clamping hub diameter

# TP+ 010 MA 2-/3-stage

				2-stage				3-stage							
Ratio			<i>i</i>		22	27.5	38.5	55	88	110	154	220			
Max. torque <sup>a) b)</sup>			<i>T</i> <sub>2a</sub>	<i>Nm</i>	315	315	315	315	315	315	315	315			
				<i>in.lb</i>	2788	2788	2788	2788	2788	2788	2788	2788	2788		
Max. acceleration torque <sup>b)</sup> (max. 1000 cycles per hour)			<i>T</i> <sub>2B</sub>	<i>Nm</i>	230	230	230	230	230	230	230	230			
				<i>in.lb</i>	2036	2036	2036	2036	2036	2036	2036	2036	2036		
Nominal torque (at <i>n</i> <sub>n</sub> )			<i>T</i> <sub>2N</sub>	<i>Nm</i>	140	137	139	147	184	184	181	184			
				<i>in.lb</i>	1242	1213	1230	1303	1629	1629	1599	1629	1629		
Emergency stop torque <sup>a) b)</sup> (permitted 1000 times during the service life of the gearbox)			<i>T</i> <sub>2Not</sub>	<i>Nm</i>	525	525	525	525	525	525	525	525			
				<i>in.lb</i>	4647	4647	4647	4647	4647	4647	4647	4647	4647		
Permitted average input speed (at <i>T</i> <sub>2N</sub> and 20 °C ambient temperature) <sup>d)</sup>			<i>n</i> <sub>1N</sub>	<i>rpm</i>	4000	4000	4000	4000	4500	4500	4500	4500			
Max. input speed			<i>n</i> <sub>1Max</sub>	<i>rpm</i>	7500	7500	7500	7500	7500	7500	7500	7500			
Mean no load running torque <sup>b)</sup> (at <i>n</i> <sub>i</sub> = 3000 rpm and 20 °C gearbox temperature)			<i>T</i> <sub>012</sub>	<i>Nm</i>	0.52	0.47	0.41	0.38	0.28	0.26	0.22	0.18			
				<i>in.lb</i>	4.6	4.2	4.0	3.4	2.5	2.3	1.9	1.6	1.6		
Max. backlash			<i>j</i> <sub>t</sub>	<i>arcmin</i>	≤ 1										
Torsional rigidity <sup>b)</sup>			<i>C</i> <sub>t21</sub>	<i>Nm/arcmin</i>	43	43	43	42	42	42	42	42			
				<i>in.lb/arcmin</i>	381	381	381	372	372	372	372	372	372		
Tilting rigidity			<i>C</i> <sub>2K</sub>	<i>Nm/arcmin</i>	225										
				<i>in.lb/arcmin</i>	1991										
Max. axial force <sup>c)</sup>			<i>F</i> <sub>2AMax</sub>	<i>N</i>	2795										
				<i>lb<sub>f</sub></i>	629										
Max. tilting moment			<i>M</i> <sub>2KMax</sub>	<i>Nm</i>	400										
				<i>in.lb</i>	3540										
Efficiency at full load			<i>η</i>	%	94										
Service life <sup>f)</sup>			<i>L</i> <sub>h</sub>	<i>h</i>	> 20000										
Weight (incl. standard adapter plate)			<i>m</i>	<i>kg</i>	3.2				3.6						
				<i>lb<sub>m</sub></i>	7.1				8.0						
Operating noise (at reference ratio and reference speed – ratio-specific values available in cymex®)			<i>L</i> <sub>PA</sub>	<i>dB(A)</i>	≤ 56										
Max. permitted housing temperature				°C	+90										
				<i>F</i>	194										
Ambient temperature				°C	–15 to +40										
				<i>F</i>	5 to 104										
Lubrication					Lubricated for life										
Direction of rotation					In- and output same direction										
Protection class					IP 65										
Metal bellows coupling (recommended product type – validate sizing with cymex®)					BCT-00150AAX-050.00										
Bore diameter of coupling on the application side				<i>mm</i>	X = 016.000 - 038.000										
Mass moment of inertia (relates to the drive)  Clamping hub diameter [mm]  Optimized mass inertia version available on request			C	14	<i>J</i> <sub>i</sub>	<i>kgcm<sup>2</sup></i>	0.21	0.18	0.16	0.14	0.16	0.15	0.14	0.13	
						<i>10<sup>-3</sup> in.lb.s<sup>2</sup></i>	0.19	0.16	0.14	0.12	0.14	0.13	0.12	0.12	0.12
			E	19	<i>J</i> <sub>i</sub>	<i>kgcm<sup>2</sup></i>	0.52	0.50	0.47	0.46	-	-	-	-	-
						<i>10<sup>-3</sup> in.lb.s<sup>2</sup></i>	0.46	0.44	0.42	0.41	-	-	-	-	-

Please use our sizing software cymex<sup>®</sup> for a detailed sizing – [www.wittenstein-cymex.com](http://www.wittenstein-cymex.com)

<sup>a)</sup> At max. 10 %  $M_{2KMax}$

<sup>b)</sup> Valid for standard clamping hub diameter

<sup>c)</sup> Refers to center of the output shaft or flange

<sup>d)</sup> Please reduce input speed at higher ambient temperatures

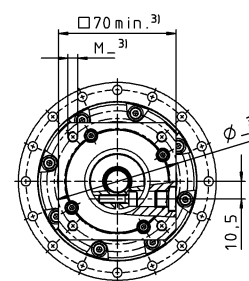
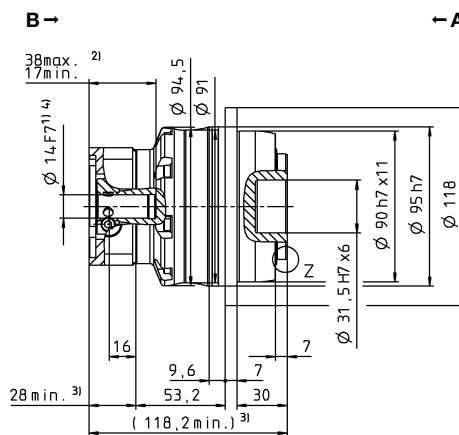
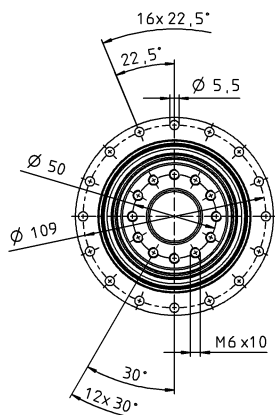
<sup>f)</sup> Please contact us to discuss  
application-specific service lifetimes

View A

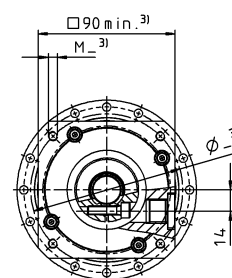
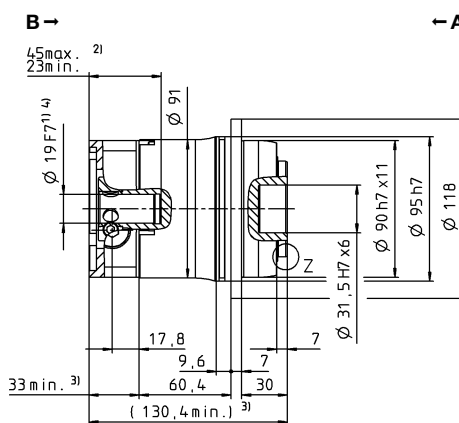
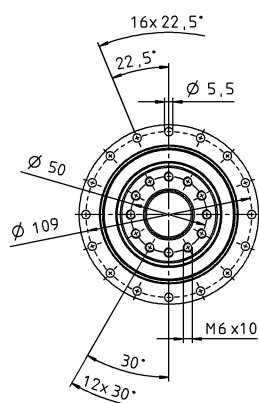
View B

# 2-stage

up to 14<sup>4)</sup> (C)<sup>5)</sup>  
clamping hub  
diameter



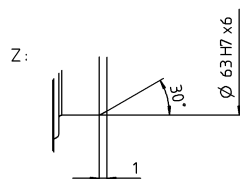
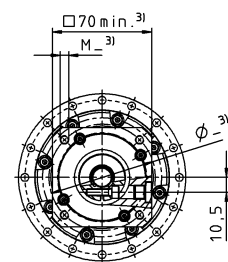
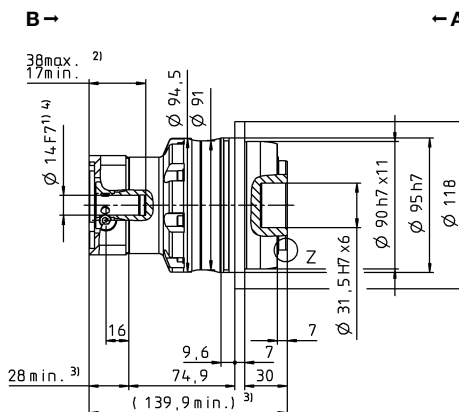
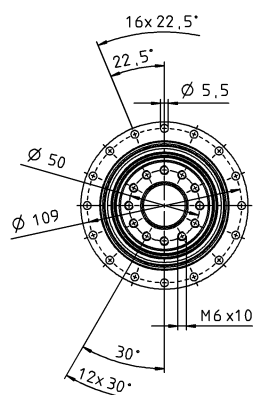
up to 19<sup>4)</sup> (E)  
clamping hub  
diameter



Motor shaft diameter [mm]

# 3-stage

up to 14<sup>4)</sup> (C)<sup>5)</sup>  
clamping hub  
diameter



Non-tolerated dimensions are nominal dimensions

<sup>1)</sup> Check motor shaft fit

<sup>2)</sup> Min./Max. permissible motor shaft length. Longer motor shafts are possible, please contact alpha.

<sup>3)</sup> The dimensions depend on the motor

<sup>4)</sup> Smaller motor shaft diameter is compensated by a bushing with a minimum wall thickness of 1 mm

<sup>5)</sup> Standard clamping hub diameter

# TP+ 025 MA 2-/3-stage

				2-stage				3-stage					
Ratio			<i>i</i>		22	27.5	38.5	55	66	88	110	154	220
Max. torque <sup>a) b)</sup>			<i>T</i> <sub>2a</sub>	<i>Nm</i>	583	583	583	583	525	525	525	525	525
				<i>in.lb</i>	5160	5160	5160	5160	4645	4645	4645	4645	4645
Max. acceleration torque <sup>b)</sup> (max. 1000 cycles per hour)			<i>T</i> <sub>2B</sub>	<i>Nm</i>	530	530	530	530	480	480	480	480	480
				<i>in.lb</i>	4691	4691	4691	4691	4248	4248	4248	4248	4248
Nominal torque (at <i>n</i> <sub>n</sub> )			<i>T</i> <sub>2N</sub>	<i>Nm</i>	312	314	371	413	260	276	296	330	364
				<i>in.lb</i>	2762	2775	3286	3652	2304	2447	2617	2920	3222
Emergency stop torque <sup>a) b)</sup> (permitted 1000 times during the service life of the gearbox)			<i>T</i> <sub>2Not</sub>	<i>Nm</i>	1200	1200	1200	1200	1200	1200	1200	1200	1200
				<i>in.lb</i>	10621	10621	10621	10621	10621	10621	10621	10621	10621
Permitted average input speed (at <i>T</i> <sub>2N</sub> and 20 °C ambient temperature) <sup>d)</sup>			<i>n</i> <sub>1N</sub>	<i>rpm</i>	3500	3500	3500	3500	4000	4000	4000	4000	4000
Max. input speed			<i>n</i> <sub>1Max</sub>	<i>rpm</i>	7500	7500	7500	7500	7500	7500	7500	7500	7500
Mean no load running torque <sup>b)</sup> (at <i>n</i> <sub>i</sub> = 3000 rpm and 20 °C gearbox temperature)			<i>T</i> <sub>012</sub>	<i>Nm</i>	1.0	0.87	0.78	0.70	0.62	0.52	0.44	0.35	0.27
				<i>in.lb</i>	9.2	7.7	6.9	6.2	5.5	4.6	3.9	3.1	2.4
Max. backlash			<i>j</i> <sub>t</sub>	<i>arcmin</i>	≤ 1								
Torsional rigidity <sup>b)</sup>			<i>C</i> <sub>t21</sub>	<i>Nm/arcmin</i>	105	105	105	100	95	95	95	95	95
				<i>in.lb/arcmin</i>	929	929	929	885	841	841	841	841	841
Tilting rigidity			<i>C</i> <sub>2K</sub>	<i>Nm/arcmin</i>	550								
				<i>in.lb/arcmin</i>	4868								
Max. axial force <sup>c)</sup>			<i>F</i> <sub>2AMax</sub>	<i>N</i>	4800								
				<i>lb<sub>f</sub></i>	1080								
Max. tilting moment			<i>M</i> <sub>2KMax</sub>	<i>Nm</i>	550								
				<i>in.lb</i>	4868								
Efficiency at full load			<i>η</i>	%	94								
Service life <sup>f)</sup>			<i>L</i> <sub>h</sub>	<i>h</i>	> 20000								
Weight (incl. standard adapter plate)			<i>m</i>	<i>kg</i>	5.6				6.1				
				<i>lb<sub>m</sub></i>	12.4				13.5				
Operating noise (at reference ratio and reference speed – ratio-specific values available in cymex®)			<i>L</i> <sub>PA</sub>	<i>dB(A)</i>	≤ 58				≤ 56				
Max. permitted housing temperature				°C	+90								
				<i>F</i>	194								
Ambient temperature				°C	–15 to +40								
				<i>F</i>	5 to 104								
Lubrication					Lubricated for life								
Direction of rotation					In- and output same direction								
Protection class					IP 65								
Metal bellows coupling (recommended product type – validate sizing with cymex®)					BCT-00300AAX-063.00								
Bore diameter of coupling on the application side				<i>mm</i>	X = 030.000 - 056.000								
Mass moment of inertia (relates to the drive)		E 19	<i>J</i> <sub>i</sub>	<i>kgcm<sup>2</sup></i>	0.87	0.7	0.6	0.55	0.63	0.56	0.53	0.51	0.50
				<i>10<sup>-3</sup> in.lb.s<sup>2</sup></i>	0.77	0.62	0.53	0.49	0.56	0.50	0.47	0.45	0.44
Clamping hub diameter [mm] Optimized mass inertia version available on request		G 24	<i>J</i> <sub>i</sub>	<i>kgcm<sup>2</sup></i>	2.39	2.22	2.12	2.07	-	-	-	-	-
				<i>10<sup>-3</sup> in.lb.s<sup>2</sup></i>	2.12	1.96	1.88	1.83	-	-	-	-	-

Please use our sizing software cymex<sup>®</sup> for a detailed sizing – [www.wittenstein-cymex.com](http://www.wittenstein-cymex.com)

<sup>a)</sup> At max. 10 %  $M_{2KMax}$

<sup>b)</sup> Valid for standard clamping hub diameter

<sup>c)</sup> Refers to center of the output shaft or flange

<sup>d)</sup> Please reduce input speed at higher ambient temperatures

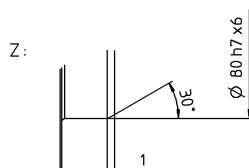
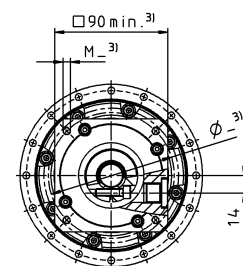
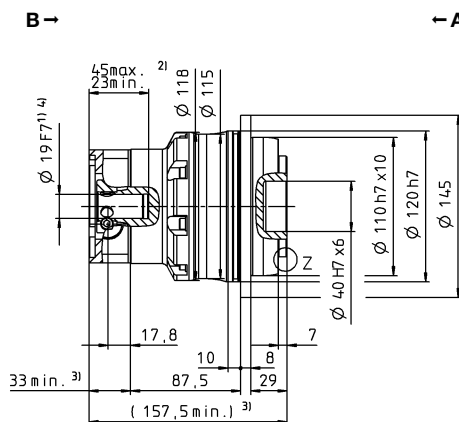
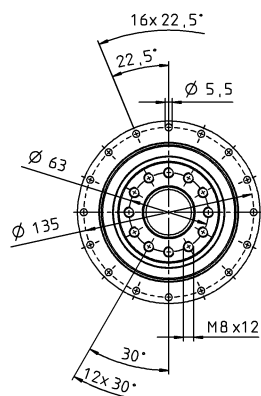
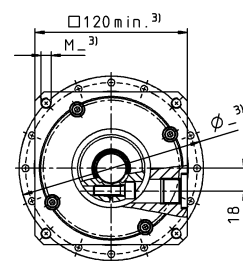
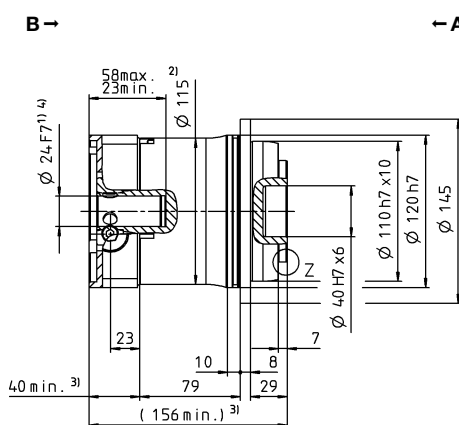
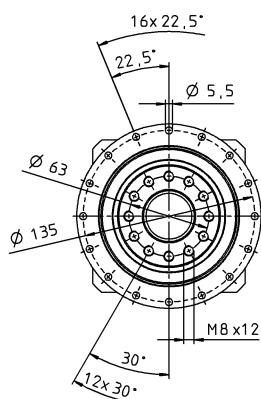
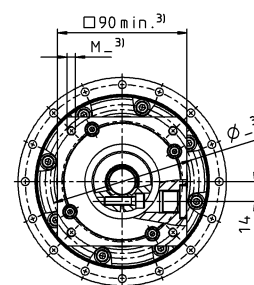
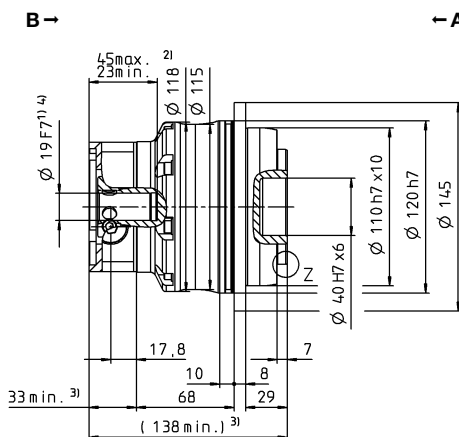
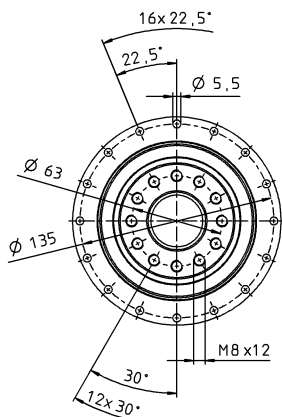
<sup>f)</sup> Please contact us to discuss  
application-specific service lifetimes

View A

View B

# 2-stage

up to 19<sup>4)</sup> (E)<sup>5)</sup>  
clamping hub  
diameter



Motor shaft diameter [mm]

# 3-stage

up to 19<sup>4)</sup> (E)<sup>5)</sup>  
clamping hub  
diameter

Planetary gearboxes

TP+

MA

Non-tolerated dimensions are nominal dimensions

<sup>1)</sup> Check motor shaft fit

<sup>2)</sup> Min./Max. permissible motor shaft length. Longer motor shafts are possible, please contact alpha.

<sup>3)</sup> The dimensions depend on the motor

<sup>4)</sup> Smaller motor shaft diameter is compensated by a bushing with a minimum wall thickness of 1 mm

<sup>5)</sup> Standard clamping hub diameter

# TP+ 050 MA 2-/3-stage

				2-stage				3-stage						
Ratio			<i>i</i>		22	27.5	38.5	55	66	88	110	154	220	
Max. torque <sup>a) b)</sup>			<i>T</i> <sub>2a</sub>	<i>Nm</i>	1402	1402	1402	1402	1402	1402	1402	1402	1402	
				<i>in.lb</i>	12406	12406	12406	12406	12406	12406	12406	12406	12406	12406
Max. acceleration torque <sup>b)</sup> (max. 1000 cycles per hour)			<i>T</i> <sub>2B</sub>	<i>Nm</i>	992	992	992	992	992	992	992	992	992	
				<i>in.lb</i>	8780	8780	8780	8780	8780	8780	8780	8780	8780	8780
Nominal torque (at <i>n</i> <sub>n</sub> )			<i>T</i> <sub>2N</sub>	<i>Nm</i>	523	566	638	717	723	794	794	794	794	
				<i>in.lb</i>	4632	5005	5649	6348	6400	7024	7024	7024	7024	7024
Emergency stop torque <sup>a) b)</sup> (permitted 1000 times during the service life of the gearbox)			<i>T</i> <sub>2Not</sub>	<i>Nm</i>	2375	2375	2375	2375	2375	2375	2375	2375	2375	
				<i>in.lb</i>	21021	21021	21021	21021	21021	21021	21021	21021	21021	21021
Permitted average input speed (at <i>T</i> <sub>2N</sub> and 20 °C ambient temperature) <sup>d)</sup>			<i>n</i> <sub>1N</sub>	<i>rpm</i>	3000	3000	3000	3000	3500	3500	3500	3500	3500	
Max. input speed			<i>n</i> <sub>1Max</sub>	<i>rpm</i>	6250	6250	6250	6250	6250	6250	6250	6250	6250	
Mean no load running torque <sup>b)</sup> (at <i>n</i> <sub>i</sub> = 3000 rpm and 20 °C gearbox temperature)			<i>T</i> <sub>012</sub>	<i>Nm</i>	2.7	2.4	2.1	1.7	1.8	1.3	1.1	0.9	0.72	
				<i>in.lb</i>	23.9	21.2	18.9	15.0	15.9	11.5	10.1	8.0	6.4	
Max. backlash			<i>j</i> <sub>t</sub>	<i>arcmin</i>	≤ 1									
Torsional rigidity <sup>b)</sup>			<i>C</i> <sub>t21</sub>	<i>Nm/arcmin</i>	220	220	220	220	205	205	205	205	205	
				<i>in.lb/arcmin</i>	1947	1947	1947	1947	1814	1814	1814	1814	1814	1814
Tilting rigidity			<i>C</i> <sub>2K</sub>	<i>Nm/arcmin</i>	560									
				<i>in.lb/arcmin</i>	4956									
Max. axial force <sup>c)</sup>			<i>F</i> <sub>2AMax</sub>	<i>N</i>	6130									
				<i>lb<sub>f</sub></i>	1379									
Max. tilting moment			<i>M</i> <sub>2KMax</sub>	<i>Nm</i>	1335									
				<i>in.lb</i>	11816									
Efficiency at full load			<i>η</i>	%	94				92					
Service life <sup>f)</sup>			<i>L</i> <sub>h</sub>	<i>h</i>	> 20000									
Weight (incl. standard adapter plate)			<i>m</i>	<i>kg</i>	12.5				13.4					
				<i>lb<sub>m</sub></i>	27.6				29.6					
Operating noise (at reference ratio and reference speed – ratio-specific values available in cymex®)			<i>L</i> <sub>PA</sub>	<i>dB(A)</i>	≤ 60				≤ 57					
Max. permitted housing temperature				°C	+90									
				<i>F</i>	194									
Ambient temperature				°C	–15 to +40									
				<i>F</i>	5 to 104									
Lubrication					Lubricated for life									
Direction of rotation					In- and output same direction									
Protection class					IP 65									
Metal bellows coupling (recommended product type – validate sizing with cymex®)					BCT-00300AAX-080.00									
Bore diameter of coupling on the application side				<i>mm</i>	X = 045.000 - 056.000									
Mass moment of inertia (relates to the drive)  Clamping hub diameter [mm]  Optimized mass inertia version available on request		G	24	<i>J</i> <sub>i</sub>	<i>kgcm<sup>2</sup></i>	3.80	3.33	3.00	2.80	2.60	2.40	2.20	2.10	2.10
					<i>10<sup>-3</sup> in.lb.s<sup>2</sup></i>	3.36	2.95	2.66	2.48	2.30	2.10	1.90	1.90	1.90
		K	38	<i>J</i> <sub>i</sub>	<i>kgcm<sup>2</sup></i>	10.7	10.3	9.90	9.70	-	-	-	-	-
					<i>10<sup>-3</sup> in.lb.s<sup>2</sup></i>	9.47	9.12	8.76	8.58	-	-	-	-	-

Please use our sizing software cymex<sup>®</sup> for a detailed sizing – [www.wittenstein-cymex.com](http://www.wittenstein-cymex.com)

<sup>a)</sup> At max. 10 %  $M_{2KMax}$

<sup>b)</sup> Valid for standard clamping hub diameter

<sup>c)</sup> Refers to center of the output shaft or flange

<sup>d)</sup> Please reduce input speed at higher ambient temperatures

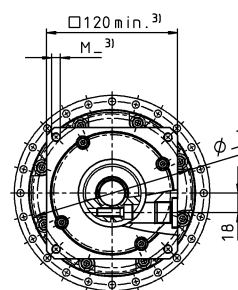
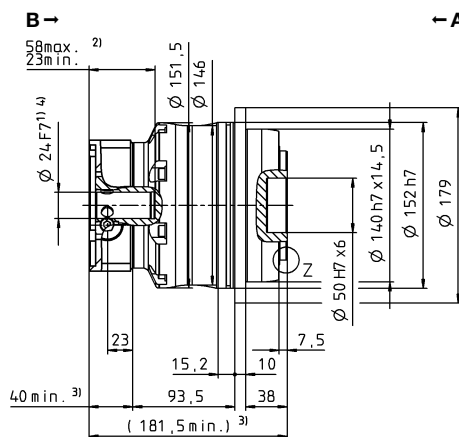
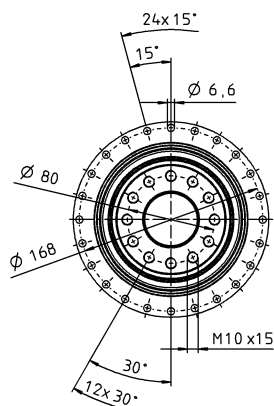
<sup>f)</sup> Please contact us to discuss  
application-specific service lifetimes

View A

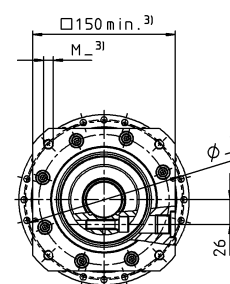
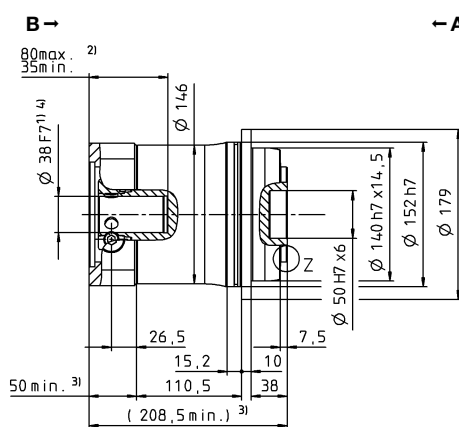
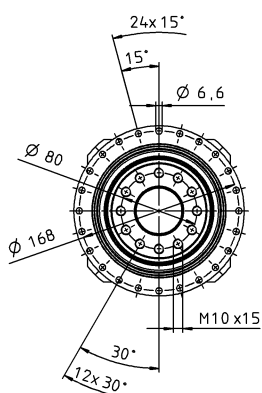
View B

# 2-stage

up to 24 <sup>4)</sup> (G) <sup>5)</sup>  
clamping hub  
diameter



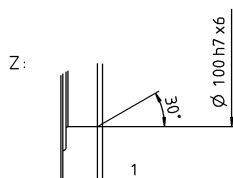
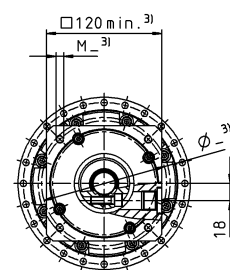
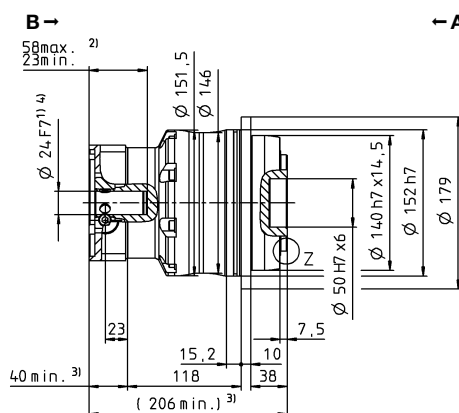
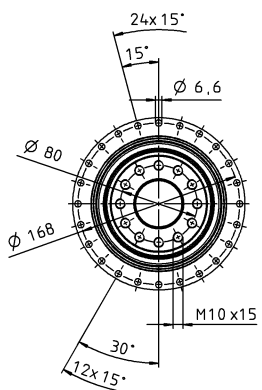
up to 38 <sup>4)</sup> (K)  
clamping hub  
diameter



Motor shaft diameter [mm]

# 3-stage

up to 24 <sup>4)</sup> (G) <sup>5)</sup>  
clamping hub  
diameter



Non-tolerated dimensions are nominal dimensions

<sup>1)</sup> Check motor shaft fit

<sup>2)</sup> Min./Max. permissible motor shaft length. Longer motor shafts are possible, please contact alpha.

<sup>3)</sup> The dimensions depend on the motor

<sup>4)</sup> Smaller motor shaft diameter is compensated by a bushing with a minimum wall thickness of 1 mm

<sup>5)</sup> Standard clamping hub diameter



# TP+ 110 MA 2-/3-stage

				2-stage				3-stage					
Ratio			<i>i</i>		22	27.5	38.5	55	66	88	110	154	220
Max. torque <sup>a) b)</sup>			<i>T</i> <sub>2a</sub>	<i>Nm</i>	3822	3822	3822	3200	3023	3023	3023	3023	3023
				<i>in.lb</i>	33826	33826	33826	28323	26757	26757	26757	26757	26757
Max. acceleration torque <sup>b)</sup> (max. 1000 cycles per hour)			<i>T</i> <sub>2B</sub>	<i>Nm</i>	3100	3100	3100	2400	2600	2600	2600	2600	2600
				<i>in.lb</i>	27437	27437	27437	21242	23012	23012	23012	23012	23012
Nominal torque (at <i>n</i> <sub>n</sub> )			<i>T</i> <sub>2N</sub>	<i>Nm</i>	1546	1662	2149	1827	1649	1797	1924	2080	2080
				<i>in.lb</i>	13687	14708	19022	16169	14593	15909	17033	18410	18410
Emergency stop torque <sup>a) b)</sup> (permitted 1000 times during the service life of the gearbox)			<i>T</i> <sub>2Not</sub>	<i>Nm</i>	6500	6500	6500	6500	6500	6500	6500	6500	6500
				<i>in.lb</i>	57530	57530	57530	57530	57530	57530	57530	57530	57530
Permitted average input speed (at <i>T</i> <sub>2n</sub> and 20 °C ambient temperature) <sup>d)</sup>			<i>n</i> <sub>1N</sub>	<i>rpm</i>	2500	2500	2500	2500	3000	3000	3000	3000	3000
Max. input speed			<i>n</i> <sub>1Max</sub>	<i>rpm</i>	5625	5625	5625	5625	5625	5625	5625	5625	5625
Mean no load running torque <sup>b)</sup> (at <i>n</i> <sub>i</sub> = 3000 rpm and 20 °C gearbox temperature)			<i>T</i> <sub>012</sub>	<i>Nm</i>	6.2	5.5	4.8	4.3	3.8	3.0	2.6	1.8	1.6
				<i>in.lb</i>	55.0	48.7	42.5	38.1	33.6	26.9	23	15.6	14.2
Max. backlash			<i>j</i> <sub>t</sub>	<i>arcmin</i>	≤ 1								
Torsional rigidity <sup>b)</sup>			<i>C</i> <sub>t21</sub>	<i>Nm/arcmin</i>	730	725	715	670	650	650	650	650	650
				<i>in.lb/arcmin</i>	6461	6417	6328	5930	5753	5753	5753	5753	5753
Tilting rigidity			<i>C</i> <sub>2K</sub>	<i>Nm/arcmin</i>	1452								
				<i>in.lb/arcmin</i>	12851								
Max. axial force <sup>c)</sup>			<i>F</i> <sub>2AMax</sub>	<i>N</i>	10050								
				<i>lb<sub>f</sub></i>	2261								
Max. tilting moment			<i>M</i> <sub>2KMax</sub>	<i>Nm</i>	3280								
				<i>in.lb</i>	29031								
Efficiency at full load			<i>η</i>	%	94								
Service life <sup>f)</sup>			<i>L</i> <sub>h</sub>	<i>h</i>	> 20000								
Weight (incl. standard adapter plate)			<i>m</i>	<i>kg</i>	33.1				35.4				
				<i>lb<sub>m</sub></i>	73.2				78.2				
Operating noise (at reference ratio and reference speed – ratio-specific values available in cymex®)			<i>L</i> <sub>PA</sub>	<i>dB(A)</i>	≤ 61				≤ 59				
Max. permitted housing temperature				°C	+90								
				<i>F</i>	194								
Ambient temperature				°C	–15 to +40								
				<i>F</i>	5 to 104								
Lubrication					Lubricated for life								
Direction of rotation					In- and output same direction								
Protection class					IP 65								
Metal bellows coupling (recommended product type – validate sizing with cymex®)					BCT-01500AAX-125.00								
Bore diameter of coupling on the application side				<i>mm</i>	X = 055.000 - 070.000								
Mass moment of inertia (relates to the drive)		K 38	<i>J</i> <sub>i</sub>	<i>kgcm<sup>2</sup></i>	16.6	15.2	13.9	13.1	13.8	10.2	9.80	9.50	9.20
				<i>10<sup>-3</sup> in.lb.s<sup>2</sup></i>	14.7	13.5	12.3	11.6	12.2	9.00	8.70	8.40	8.10
Clamping hub diameter [mm] Optimized mass inertia version available on request		M 48	<i>J</i> <sub>i</sub>	<i>kgcm<sup>2</sup></i>	31.4	29.9	28.7	28.0	-	-	-	-	-
				<i>10<sup>-3</sup> in.lb.s<sup>2</sup></i>	27.8	26.5	25.4	24.8	-	-	-	-	-

Please use our sizing software cymex<sup>®</sup> for a detailed sizing – [www.wittenstein-cymex.com](http://www.wittenstein-cymex.com)

<sup>a)</sup> At max. 10 %  $M_{2KMax}$

<sup>b)</sup> Valid for standard clamping hub diameter

<sup>c)</sup> Refers to center of the output shaft or flange

<sup>d)</sup> Please reduce input speed at higher ambient temperatures

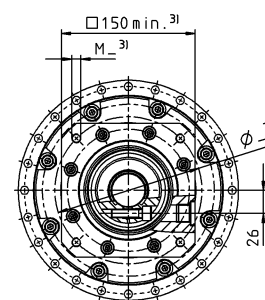
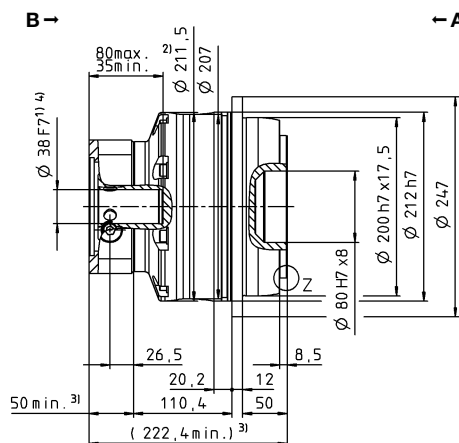
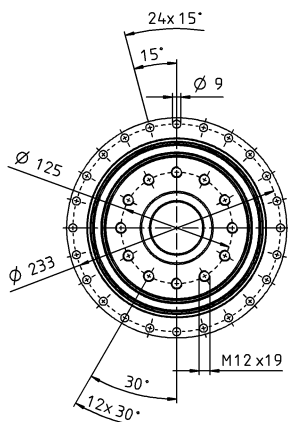
<sup>f)</sup> Please contact us to discuss  
application-specific service lifetimes

View A

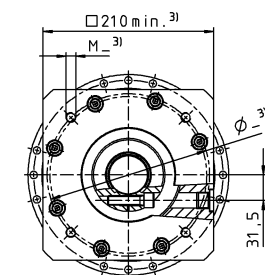
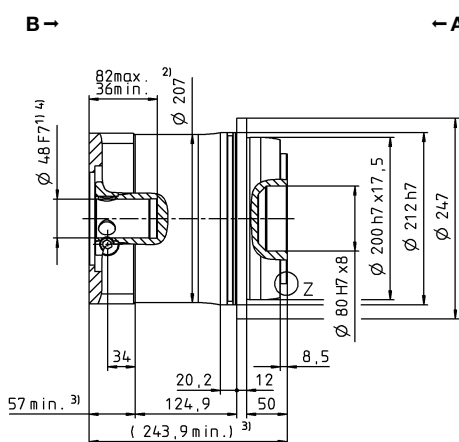
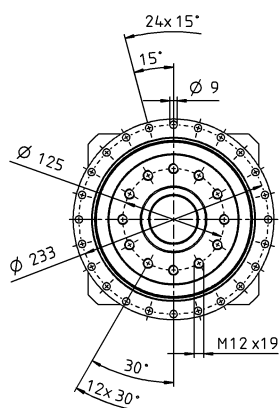
View B

# 2-stage

up to 38<sup>4)</sup> (K)<sup>5)</sup>  
clamping hub  
diameter



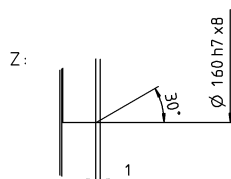
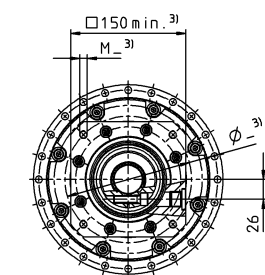
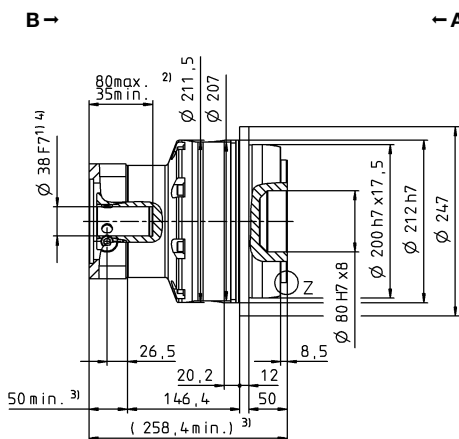
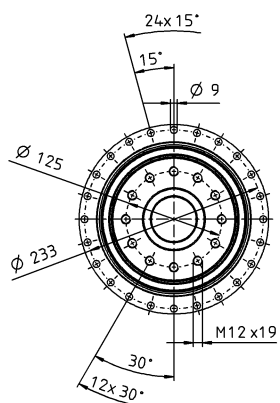
up to 48<sup>4)</sup> (M)  
clamping hub  
diameter



Motor shaft diameter [mm]

# 3-stage

up to 38<sup>4)</sup> (K)<sup>5)</sup>  
clamping hub  
diameter



Non-tolerated dimensions are nominal dimensions

<sup>1)</sup> Check motor shaft fit

<sup>2)</sup> Min./Max. permissible motor shaft length. Longer motor shafts are possible, please contact alpha.

<sup>3)</sup> The dimensions depend on the motor

<sup>4)</sup> Smaller motor shaft diameter is compensated by a bushing with a minimum wall thickness of 1 mm

<sup>5)</sup> Standard clamping hub diameter

# TP+ 300 MA 1-/2-/3-stage

				1-stage	2-stage				3-stage					
Ratio			<i>i</i>		5.5	22	27.5	38.5	55	66	88	110	154	220
Max. torque <sup>a) b)</sup>			<i>T</i> <sub>2a</sub>	<i>Nm</i>	7360	7535	7535	7535	5473	6987	6987	6987	6987	6987
				<i>in.lb</i>	65142	66691	66691	66691	48436	61838	61838	61838	61838	61838
Max. acceleration torque <sup>b)</sup> (max. 1000 cycles per hour)			<i>T</i> <sub>2B</sub>	<i>Nm</i>	5520	6600	6600	6600	4680	6600	6600	6600	6600	6600
				<i>in.lb</i>	48856	58415	58415	58415	41422	58415	58415	58415	58415	58415
Nominal torque (at <i>n</i> <sub>n</sub> )			<i>T</i> <sub>2N</sub>	<i>Nm</i>	2829	3566	3788	3884	3744	3216	3506	3750	4148	4617
				<i>in.lb</i>	25035	31563	33530	34378	33137	28465	31035	33186	36711	40863
Emergency stop torque <sup>a) b)</sup> (permitted 1000 times during the service life of the gearbox)			<i>T</i> <sub>2Not</sub>	<i>Nm</i>	10938	15333	15333	15296	15333	15333	15333	15333	15333	15333
				<i>in.lb</i>	96806	135709	135709	135377	135709	135709	135709	135709	135709	135709
Permitted average input speed (at <i>T</i> <sub>2N</sub> and 20 °C ambient temperature) <sup>d)</sup>			<i>n</i> <sub>1N</sub>	<i>rpm</i>	1000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Max. input speed			<i>n</i> <sub>1Max</sub>	<i>rpm</i>	3125	4375	4375	4375	4375	4375	4375	4375	4375	4375
Mean no load running torque <sup>b)</sup> (at <i>n</i> <sub>i</sub> = 2000 rpm and 20 °C gearbox temperature)			<i>T</i> <sub>012</sub>	<i>Nm</i>	19	8.8	7.8	6.8	5.9	5.2	3.6	3.1	2.1	1.5
				<i>in.lb</i>	170	78	69	60	52	46	32	27	19	13
Max. backlash			<i>j</i> <sub>t</sub>	<i>arcmin</i>	Standard ≤ 2 / Reduced ≤ 1		Standard ≤ 3 / Reduced ≤ 1.5							
Torsional rigidity <sup>b)</sup>			<i>C</i> <sub>121</sub>	<i>Nm/arcmin</i>	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200
				<i>in.lb/arcmin</i>	10621	10621	10621	10621	10621	10621	10621	10621	10621	10621
Tilting rigidity			<i>C</i> <sub>2K</sub>	<i>Nm/arcmin</i>	5560									
				<i>in.lb/arcmin</i>	49210									
Max. axial force <sup>c)</sup>			<i>F</i> <sub>2AMax</sub>	<i>N</i>	33000									
				<i>lb<sub>f</sub></i>	7425									
Max. tilting moment			<i>M</i> <sub>2KMax</sub>	<i>Nm</i>	3900	6500								
				<i>in.lb</i>	34518	57530								
Efficiency at full load			<i>η</i>	%	95	93								
Service life <sup>f)</sup>			<i>L</i> <sub>h</sub>	<i>h</i>	> 20000									
Weight (incl. standard adapter plate)			<i>m</i>	<i>kg</i>	55	64				67				
				<i>lb<sub>m</sub></i>	122	141				148				
Operating noise (at reference ratio and reference speed – ratio-specific values available in cymex <sup>®</sup> )			<i>L</i> <sub>PA</sub>	<i>dB(A)</i>	≤ 65	≤ 62				≤ 59				
Max. permitted housing temperature				°C	+90									
				<i>F</i>	194									
Ambient temperature				°C	–15 to +40									
				<i>F</i>	5 to 104									
Lubrication					Lubricated for life									
Direction of rotation					In- and output same direction									
Protection class					IP 65									
Metal bellows coupling (recommended product type – validate sizing with cymex <sup>®</sup> )					BCT-04000AAX-145.00									
Bore diameter of coupling on the application side				<i>mm</i>	X = 070.000 - 100.000									
Mass moment of inertia (relates to the drive)  Clamping hub diameter [mm] Optimized mass inertia version available on request	K	38	<i>J</i> <sub>1</sub>	<i>kgcm<sup>2</sup></i>	-	-	-	-	-	16.6	12.9	11.6	10.3	9.50
				<i>10<sup>-3</sup> in.lb.s<sup>2</sup></i>	-	-	-	-	-	14.7	11.4	10.3	9.10	8.40
	M	48	<i>J</i> <sub>1</sub>	<i>kgcm<sup>2</sup></i>	-	30.8	27.6	24.9	23.0	-	-	-	-	-
				<i>10<sup>-3</sup> in.lb.s<sup>2</sup></i>	-	27.3	24.4	22.0	20.4	-	-	-	-	-
	N	55	<i>J</i> <sub>1</sub>	<i>kgcm<sup>2</sup></i>	129	-	-	-	-	-	-	-	-	-
				<i>10<sup>-3</sup> in.lb.s<sup>2</sup></i>	114	-	-	-	-	-	-	-	-	-

Please use our sizing software cymex<sup>®</sup> for a detailed sizing – [www.wittenstein-cymex.com](http://www.wittenstein-cymex.com)

<sup>a)</sup> At max. 10 %  $M_{2KMax}$

<sup>b)</sup> Valid for standard clamping hub diameter

<sup>c)</sup> Refers to center of the output shaft or flange

<sup>d)</sup> Please reduce input speed at higher ambient temperatures

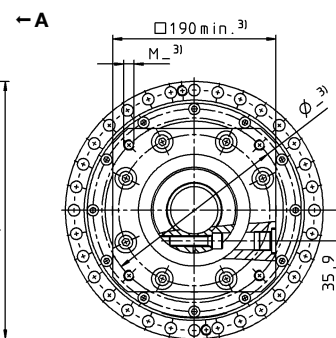
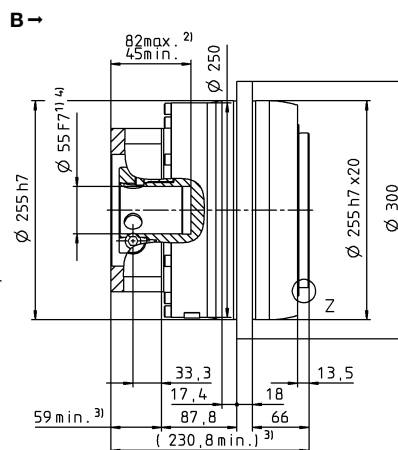
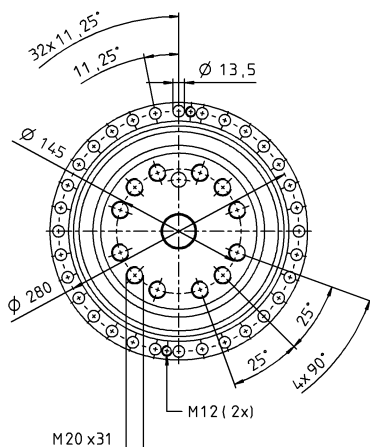
<sup>f)</sup> Please contact us to discuss  
application-specific service lifetimes

View A

View B

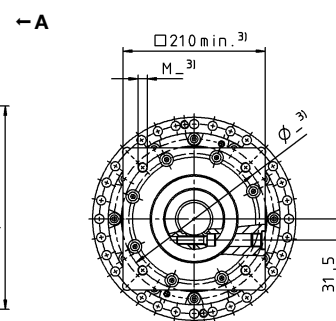
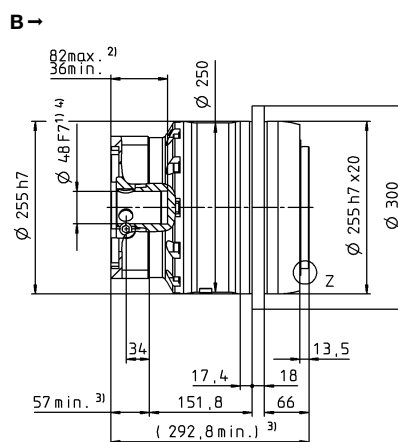
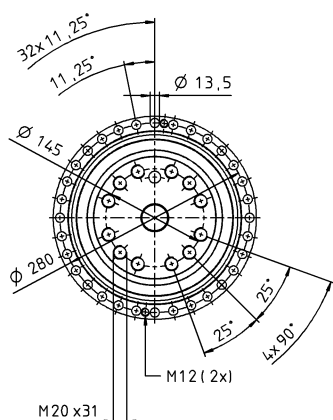
# 1-stage

up to 55<sup>4)</sup> (N)<sup>5)</sup>  
clamping hub  
diameter



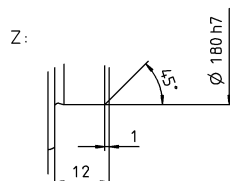
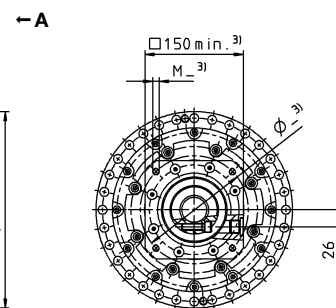
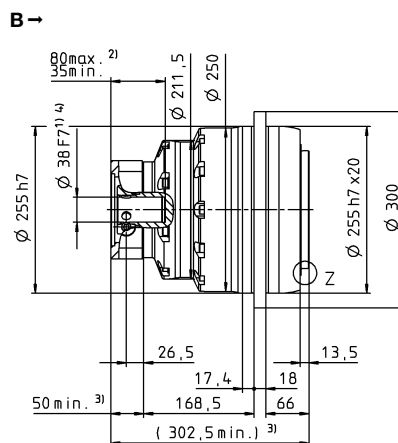
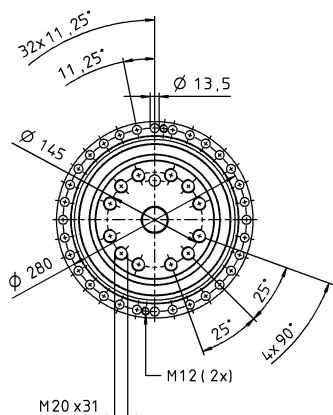
# 2-stage

up to 48<sup>4)</sup> (M)<sup>5)</sup>  
clamping hub  
diameter



# 3-stage

up to 38<sup>4)</sup> (K)<sup>5)</sup>  
clamping hub  
diameter



Non-tolerated dimensions are nominal dimensions

<sup>1)</sup> Check motor shaft fit

<sup>2)</sup> Min./Max. permissible motor shaft length. Longer motor shafts are possible, please contact alpha.

<sup>3)</sup> The dimensions depend on the motor

<sup>4)</sup> Smaller motor shaft diameter is compensated by a bushing with a minimum wall thickness of 1 mm

<sup>5)</sup> Standard clamping hub diameter

Motor shaft diameter [mm]

Planetary gearboxes

TP\*

MA

# TP+ 500 MA 1-/2-/3-stage

				1-stage	2-stage				3-stage					
Ratio			<i>i</i>		5.5	22	27.5	38.5	55	66	88	110	154	220
Max. torque <sup>a) b)</sup>			<i>T</i> <sub>2a</sub>	<i>Nm</i>	10450	10450	10450	10450	10450	10450	10450	10450	10450	10450
				<i>in.lb</i>	92491	92491	92491	92491	92491	92491	92491	92491	92491	92491
Max. acceleration torque <sup>b)</sup> (max. 1000 cycles per hour)			<i>T</i> <sub>2B</sub>	<i>Nm</i>	9600	10450	10450	10450	8640	10450	10450	10450	10450	
				<i>in.lb</i>	84968	92491	92491	92491	76471	92491	92491	92491	92491	92491
Nominal torque (at <i>n</i> <sub>n</sub> )			<i>T</i> <sub>2N</sub>	<i>Nm</i>	4313	5068	4980	5057	5325	4941	7464	7396	7546	7907
				<i>in.lb</i>	38174	44858	44075	44759	47129	43731	66060	65462	66792	69986
Emergency stop torque <sup>a) b)</sup> (permitted 1000 times during the service life of the gearbox)			<i>T</i> <sub>2Not</sub>	<i>Nm</i>	18750	25000	25000	25000	25000	25000	25000	25000	25000	
				<i>in.lb</i>	165953	221270	221270	221270	221270	221270	221270	221270	221270	221270
Permitted average input speed (at <i>T</i> <sub>2N</sub> and 20 °C ambient temperature) <sup>d)</sup>			<i>n</i> <sub>1N</sub>	<i>rpm</i>	900	1500	1500	1500	1500	1500	1500	1500	1500	
Max. input speed			<i>n</i> <sub>1Max</sub>	<i>rpm</i>	3125	4375	4375	4375	4375	4375	4375	4375	4375	
Mean no load running torque <sup>b)</sup> (at <i>n</i> <sub>i</sub> = 2000 rpm and 20 °C gearbox temperature)			<i>T</i> <sub>012</sub>	<i>Nm</i>	27	11	10	8.9	7.8	6.8	5.0	4.7	3.6	3.0
				<i>in.lb</i>	241	100	89	79	69	60	45	42	32	27
Max. backlash			<i>j</i> <sub>t</sub>	<i>arcmin</i>	Standard ≤ 2 / Reduced ≤ 1		Standard ≤ 3 / Reduced ≤ 1.5							
Torsional rigidity <sup>b)</sup>			<i>C</i> <sub>121</sub>	<i>Nm/arcmin</i>	2000	2000	2000	1950	1900	1800	1800	1800	1800	1800
				<i>in.lb/arcmin</i>	17702	17702	17702	17259	16817	15931	15931	15931	15931	15931
Tilting rigidity			<i>C</i> <sub>2K</sub>	<i>Nm/arcmin</i>	9480									
				<i>in.lb/arcmin</i>	83906									
Max. axial force <sup>c)</sup>			<i>F</i> <sub>2AMax</sub>	<i>N</i>	50000									
				<i>lb<sub>f</sub></i>	11250									
Max. tilting moment			<i>M</i> <sub>2KMax</sub>	<i>Nm</i>	6600	9500								
				<i>in.lb</i>	58415	84083								
Efficiency at full load			<i>η</i>	%	95	93								
Service life <sup>f)</sup>			<i>L</i> <sub>h</sub>	<i>h</i>	> 20000									
Weight (incl. standard adapter plate)			<i>m</i>	<i>kg</i>	80	80				89				
				<i>lb<sub>m</sub></i>	177	177				197				
Operating noise (at reference ratio and reference speed – ratio-specific values available in cymex <sup>®</sup> )			<i>L</i> <sub>PA</sub>	<i>dB(A)</i>	≤ 70	≤ 63				≤ 60				
Max. permitted housing temperature				°C	+90									
				<i>F</i>	194									
Ambient temperature				°C	–15 to +40									
				<i>F</i>	5 to 104									
Lubrication					Lubricated for life									
Direction of rotation					In- and output same direction									
Protection class					IP 65									
Metal bellows coupling (recommended product type – validate sizing with cymex <sup>®</sup> )					BCT-10000AAX-166.00									
Bore diameter of coupling on the application side				<i>mm</i>	X = 080.000 - 180.000									
Mass moment of inertia (relates to the drive)  Clamping hub diameter [mm]  Optimized mass inertia version available on request	K	38	<i>J</i> <sub>1</sub>	<i>kgcm<sup>2</sup></i>	-	-	-	-	-	17.9	13.5	11.9	10.5	9.70
				<i>10<sup>-3</sup> in.lb.s<sup>2</sup></i>	-	-	-	-	-	15.8	11.9	10.5	9.30	8.60
	M	48	<i>J</i> <sub>1</sub>	<i>kgcm<sup>2</sup></i>	-	43.8	36.9	30.5	27.0	32.7	28.3	26.7	25.2	24.4
				<i>10<sup>-3</sup> in.lb.s<sup>2</sup></i>	-	38.8	32.7	27.0	23.9	28.9	25.0	23.6	22.3	21.6
	O	60	<i>J</i> <sub>1</sub>	<i>kgcm<sup>2</sup></i>	175	-	-	-	-	-	-	-	-	-
				<i>10<sup>-3</sup> in.lb.s<sup>2</sup></i>	155	-	-	-	-	-	-	-	-	-

Please use our sizing software cymex<sup>®</sup> for a detailed sizing – [www.wittenstein-cymex.com](http://www.wittenstein-cymex.com)

<sup>a)</sup> At max. 10 %  $M_{2KMax}$

<sup>b)</sup> Valid for standard clamping hub diameter

<sup>c)</sup> Refers to center of the output shaft or flange

<sup>d)</sup> Please reduce input speed at higher ambient temperatures

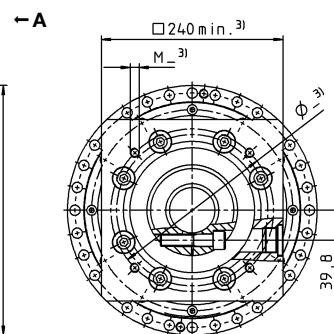
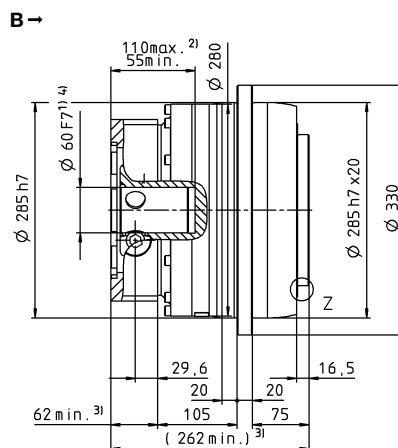
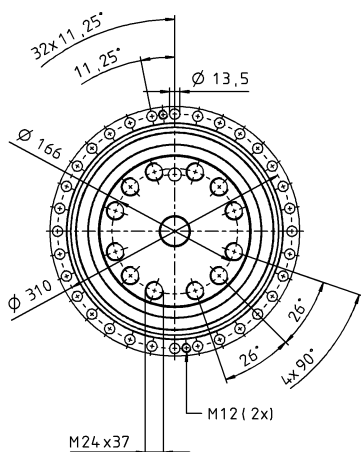
<sup>f)</sup> Please contact us to discuss  
application-specific service lifetimes

View A

View B

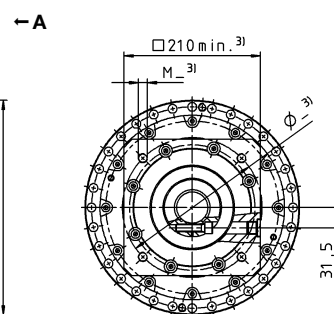
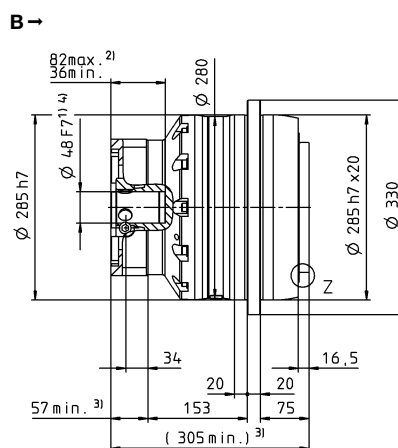
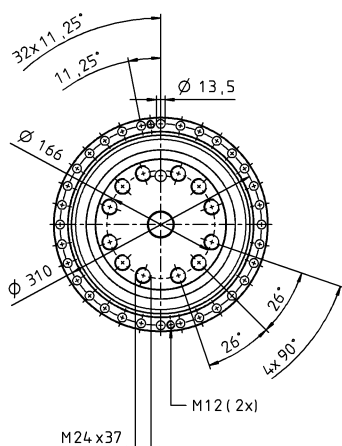
# 1-stage

up to 60<sup>4)</sup> (O)<sup>5)</sup>  
clamping hub  
diameter



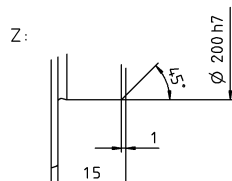
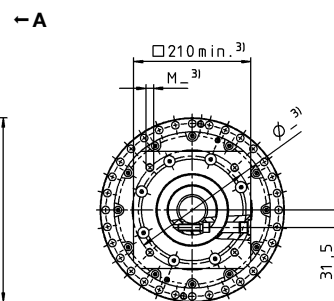
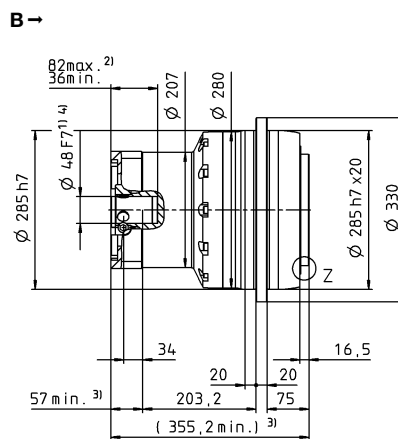
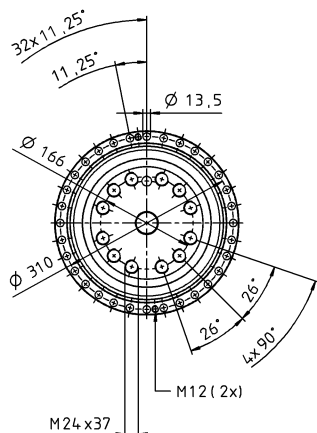
# 2-stage

up to 48<sup>4)</sup> (M)<sup>5)</sup>  
clamping hub  
diameter



# 3-stage

up to 38/48<sup>4)</sup>  
(K/M<sup>5)</sup>) clamping  
hub diameter



Non-tolerated dimensions are nominal dimensions

<sup>1)</sup> Check motor shaft fit

<sup>2)</sup> Min./Max. permissible motor shaft length. Longer motor shafts are possible, please contact alpha.

<sup>3)</sup> The dimensions depend on the motor

<sup>4)</sup> Smaller motor shaft diameter is compensated by a bushing with a minimum wall thickness of 1 mm

<sup>5)</sup> Standard clamping hub diameter

Motor shaft diameter [mm]

Planetary gearboxes

TP

MA

# TP+ 2000 MA 2-/3-stage

				2-stage		3-stage										
Ratio			<i>i</i>		22	30.25	66	88	110	121	154	220	302.5			
Max. torque <sup>a) b)</sup>			<i>T</i> <sub>2a</sub>	<i>Nm</i>	22000	22000	22000	22000	22000	22000	22000	15600	21500			
				<i>in.lb</i>	194718	194718	194718	194718	194718	194718	194718	138072	190292			
Max. acceleration torque <sup>b)</sup> (max. 1000 cycles per hour)			<i>T</i> <sub>2B</sub>	<i>Nm</i>	22000	22000	22000	22000	22000	22000	22000	15600	21500			
				<i>in.lb</i>	194718	194718	194718	194718	194718	194718	194718	138072	190292			
Nominal torque (at <i>n</i> <sub>n</sub> )			<i>T</i> <sub>2N</sub>	<i>Nm</i>	13500	13500	13500	13500	13500	13500	13500	10000	13500			
				<i>in.lb</i>	119486	119486	119486	119486	119486	119486	119486	88508	119486			
Emergency stop torque <sup>a) b)</sup> (permitted 1000 times during the service life of the gearbox)			<i>T</i> <sub>2Not</sub>	<i>Nm</i>	44000	44000	44000	44000	44000	44000	44000	44000	44000			
				<i>in.lb</i>	389435	389435	389435	389435	389435	389435	389435	389435	389435	389435		
Permitted average input speed (at <i>T</i> <sub>2n</sub> and 20 °C ambient temperature) <sup>d)</sup>			<i>n</i> <sub>1N</sub>	<i>rpm</i>	2000	2000	2500	2500	2500	2500	2500	2500	2500			
Max. input speed			<i>n</i> <sub>1Max</sub>	<i>rpm</i>	3000	3000	3500	3500	3500	3500	3500	3500	3500			
Mean no load running torque <sup>b) h)</sup> (at <i>n</i> <sub>i</sub> = 2000 rpm and 20 °C gearbox temperature)			<i>T</i> <sub>012</sub>	<i>Nm</i>	17	13	7.5	6.0	5.0	5.0	4.5	4.0	4.0			
				<i>in.lb</i>	151	115	66	53	44	44	40	35	35			
Max. backlash			<i>j</i> <sub>t</sub>	<i>arcmin</i>	≤ 3											
Torsional rigidity <sup>b)</sup>			<i>C</i> <sub>t21</sub>	<i>Nm/arcmin</i>	2900	2900	3000	3000	3000	3000	2950	2850	2850			
				<i>in.lb/arcmin</i>	25667	25667	26552	26552	26552	26552	26110	25225	25225			
Tilting rigidity			<i>C</i> <sub>2K</sub>	<i>Nm/arcmin</i>	13000											
				<i>in.lb/arcmin</i>	115060											
Max. axial force <sup>c)</sup>			<i>F</i> <sub>2AMax</sub>	<i>N</i>	100000											
				<i>lb<sub>f</sub></i>	22500											
Max. tilting moment			<i>M</i> <sub>2KMax</sub>	<i>Nm</i>	31600											
				<i>in.lb</i>	279685											
Efficiency at full load			<i>η</i>	%	95											
Service life <sup>f)</sup>			<i>L</i> <sub>h</sub>	<i>h</i>	> 20000											
Weight (incl. standard adapter plate)			<i>m</i>	<i>kg</i>	190			185								
				<i>lb<sub>m</sub></i>	420			409								
Operating noise (at reference ratio and reference speed – ratio-specific values available in cymex®)			<i>L</i> <sub>PA</sub>	<i>dB(A)</i>	≤ 68			≤ 66								
Max. permitted housing temperature				°C	+90											
				<i>F</i>	194											
Ambient temperature				°C	0 to +40											
				<i>F</i>	32 to 104											
Lubrication					Lubricated for life											
Direction of rotation					In- and output same direction											
Protection class					IP 65											
Metal bellows coupling (recommended product type – validate sizing with cymex®)					–											
Bore diameter of coupling on the application side				<i>mm</i>	–											
Mass moment of inertia (relates to the drive)  Clamping hub diameter [mm]  Optimized mass inertia version available on request			M	48	<i>J</i> <sub>i</sub>	<i>kgcm<sup>2</sup></i>	–	–	52	37	35	35	28	26	25	
						<i>10<sup>-3</sup> in.lb.s<sup>2</sup></i>	–	–	46	33	31	31	25	23	22	
			N	55	<i>J</i> <sub>i</sub>	<i>kgcm<sup>2</sup></i>	101	74	–	–	–	–	–	–	–	–
						<i>10<sup>-3</sup> in.lb.s<sup>2</sup></i>	89	65	–	–	–	–	–	–	–	–

Please use our sizing software cymex<sup>®</sup> for a detailed sizing – [www.wittenstein-cymex.com](http://www.wittenstein-cymex.com)

- <sup>a)</sup> At max. 10 %  $M_{2KMax}$   
<sup>b)</sup> Valid for standard clamping hub diameter  
<sup>c)</sup> Refers to center of the output shaft or flange  
<sup>d)</sup> Please reduce input speed at higher ambient temperatures  
<sup>f)</sup> Please contact us to discuss application-specific service lifetimes  
<sup>h)</sup> Depending on the mounting position.  
Please contact WITTENSTEIN alpha for details.

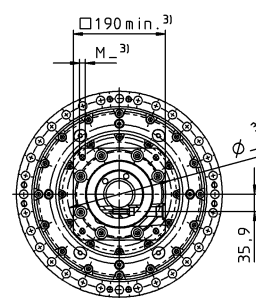
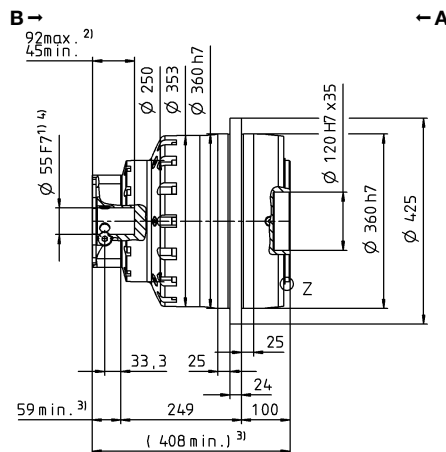
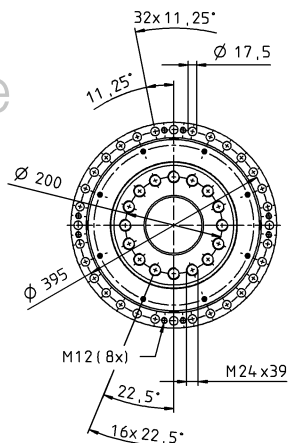


View A

View B

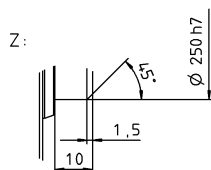
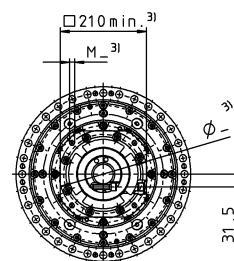
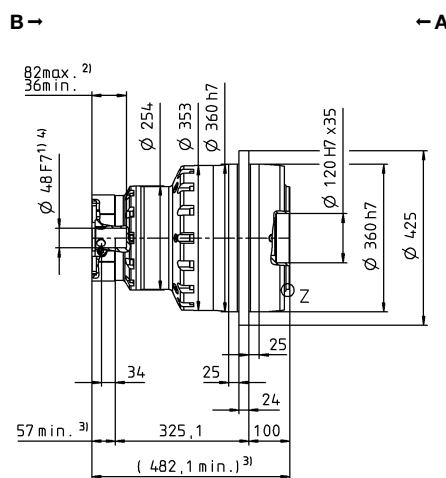
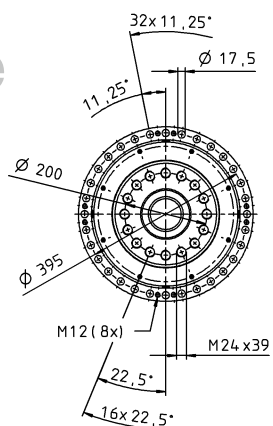
# 2-stage

up to 55<sup>4)</sup> (N)<sup>5)</sup>  
clamping hub  
diameter



# 3-stage

up to 48<sup>4)</sup> (M)<sup>5)</sup>  
clamping hub  
diameter



Non-tolerated dimensions are nominal dimensions

<sup>1)</sup> Check motor shaft fit

<sup>2)</sup> Min./Max. permissible motor shaft length. Longer motor shafts are possible, please contact alpha.

<sup>3)</sup> The dimensions depend on the motor

<sup>4)</sup> Smaller motor shaft diameter is compensated by a bushing with a minimum wall thickness of 1 mm

<sup>5)</sup> Standard clamping hub diameter

Motor shaft diameter [mm]

Planetary gearboxes

TP\*

MA



Hypoid gearboxes

HG<sup>+</sup> / SK<sup>+</sup> / SPK<sup>+</sup>

TK<sup>+</sup> / TPK<sup>+</sup> / TPK<sup>+</sup> HIGH TORQUE

Precise and highly dynamic



## HG<sup>+</sup> – Precise hollow shaft solution



HG<sup>+</sup>

### Product highlights

**Max. torsional backlash** [arcmin]  $\leq 4$

**Hollow shaft version**

**Available output types**

Hollow shaft interface, Output on both sides

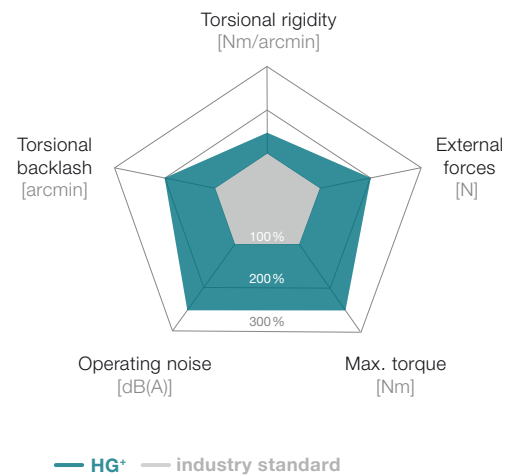
**Extremely smooth-running**

**Other gearbox models**

Corrosion resistant design, ATEX

The versatile hypoid gearboxes of the alpha Advanced Line are available with a hollow shaft on one or both sides. With the HG<sup>+</sup>, the low torsional backlash and high torsional rigidity assure maximum positioning accuracy of the drives and the high precision of machines – even during highly dynamic operation.

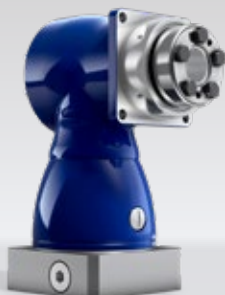
The HG<sup>+</sup> compared to the industry standard



HG<sup>+</sup> in corrosion-resistant design



HG<sup>+</sup> with hollow shaft on both sides



HG+ with shrink disk

# HG<sup>+</sup> 060 MF 1-/2-stage

			1-stage					2-stage										
Ratio	<i>i</i>		3	4	5	7	10	12	16	20	25	28	35	40	50	70	100	
Max. torque <sup>a) b)</sup>	<i>T</i> <sub>2a</sub>	<i>Nm</i>	36	36	36	25	20	36	36	36	36	36	36	36	36	25	20	
		<i>in.lb</i>	319	319	319	221	177	319	319	319	319	319	319	319	319	319	221	177
Max. acceleration torque <sup>b)</sup> (max. 1000 cycles per hour)	<i>T</i> <sub>2B</sub>	<i>Nm</i>	30	30	30	25	20	30	30	30	30	30	30	30	30	25	20	
		<i>in.lb</i>	266	266	266	221	177	266	266	266	266	266	266	266	266	266	221	177
Nominal torque (at <i>n</i> <sub>n</sub> )	<i>T</i> <sub>2N</sub>	<i>Nm</i>	22	22	22	20	15	22	22	22	22	22	22	22	22	20	15	
		<i>in.lb</i>	195	195	195	177	133	195	195	195	195	195	195	195	195	195	177	133
Emergency stop torque <sup>a) b)</sup> (permitted 1000 times during the service life of the gearbox)	<i>T</i> <sub>2Not</sub>	<i>Nm</i>	40	50	50	45	40	50	50	50	50	50	50	50	50	45	40	
		<i>in.lb</i>	354	443	443	398	354	443	443	443	443	443	443	443	443	443	398	354
Permitted average input speed (at <i>T</i> <sub>2N</sub> and 20 °C ambient temperature) <sup>d)</sup>	<i>n</i> <sub>1N</sub>	<i>n</i> <sub>1T</sub>	2500	2700	3000	3000	3000	4400	4400	4400	4400	4400	4400	4400	4800	5500	5500	
Max. input speed	<i>n</i> <sub>1Max</sub>	<i>rpm</i>	7500	7500	7500	7500	7500	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	
Mean no load running torque <sup>b)</sup> (at <i>n</i> <sub>i</sub> = 3000 rpm and 20 °C gearbox temperature)	<i>T</i> <sub>012</sub>	<i>Nm</i>	1.6	1.5	1.2	1.7	1.5	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	
		<i>in.lb</i>	14	13	11	15	13	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
Max. backlash	<i>j</i> <sub>t</sub>	<i>arcmin</i>	Standard ≤ 5															
Torsional rigidity <sup>b)</sup>	<i>C</i> <sub>121</sub>	<i>Nm/arcmin</i>	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	
		<i>in.lb/arcmin</i>	19	20	21	19	17	20	20	20	20	20	20	20	20	21	19	17
Max. axial force <sup>c)</sup>	<i>F</i> <sub>2AMax</sub>	<i>N</i>	2400															
		<i>lb<sub>f</sub></i>	540															
Max. lateral force <sup>c)</sup>	<i>F</i> <sub>2QMax</sub>	<i>N</i>	2700															
		<i>lb<sub>f</sub></i>	608															
Max. tilting moment	<i>M</i> <sub>2KMax</sub>	<i>Nm</i>	251															
		<i>in.lb</i>	2222															
Efficiency at full load	<i>η</i>	%	96					94										
Service life <sup>f)</sup>	<i>L</i> <sub>h</sub>	<i>h</i>	> 20000															
Weight (incl. standard adapter plate)	<i>m</i>	<i>kg</i>	2.9					3.2										
		<i>lb<sub>m</sub></i>	6					7										
Operating noise (at reference ratio and reference speed – ratio-specific values available in cymex <sup>®</sup> )	<i>L</i> <sub>PA</sub>	<i>dB(A)</i>	≤ 64															
Max. permitted housing temperature		°C	+90															
		<i>F</i>	194															
Ambient temperature		°C	0 to +40															
		<i>F</i>	32 to 104															
Lubrication			Lubricated for life															
Direction of rotation			In- and output opposite direction															
Protection class			IP 65															
Shrink disc (Standard version)			SD 018x044 S2															
Max. torque (without axial force)	<i>T</i> <sub>max</sub>	<i>Nm</i>	100															
Mass moment of inertia (relates to the drive) Clamping hub diameter [mm]	B	11	<i>J</i> <sub>i</sub>	<i>kgcm<sup>2</sup></i>	-	-	-	-	-	0.09	0.09	0.07	0.07	0.06	0.06	0.06	0.06	0.06
				<i>10<sup>-3</sup> in.lb.s<sup>2</sup></i>	-	-	-	-	-	0.08	0.08	0.06	0.06	0.05	0.05	0.05	0.05	0.05
	C	14	<i>J</i> <sub>i</sub>	<i>kgcm<sup>2</sup></i>	0.52	0.44	0.4	0.36	0.34	0.2	0.2	0.19	0.19	0.18	0.18	0.17	0.17	0.17
				<i>10<sup>-3</sup> in.lb.s<sup>2</sup></i>	0.46	0.39	0.35	0.32	0.3	0.18	0.18	0.17	0.17	0.16	0.16	0.15	0.15	0.15
	E	19	<i>J</i> <sub>i</sub>	<i>kgcm<sup>2</sup></i>	0.87	0.79	0.75	0.71	0.7	-	-	-	-	-	-	-	-	-
				<i>10<sup>-3</sup> in.lb.s<sup>2</sup></i>	0.77	0.7	0.66	0.63	0.62	-	-	-	-	-	-	-	-	-

Please use our sizing software cymex<sup>®</sup> for a detailed sizing – [www.wittenstein-cymex.com](http://www.wittenstein-cymex.com)  
Please contact us for optimum sizing at S1 conditions (Continuous operation).

<sup>a)</sup> At max. 10 %  $F_{2QMax}$

<sup>b)</sup> Valid for standard clamping hub diameter

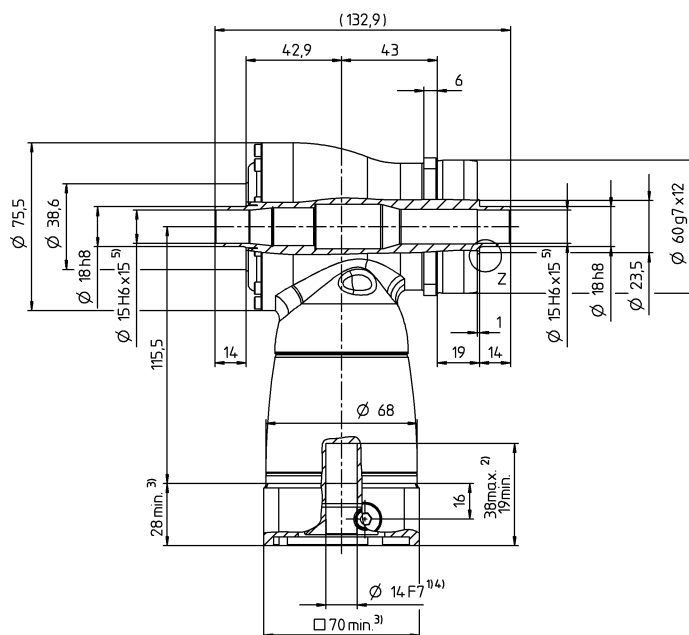
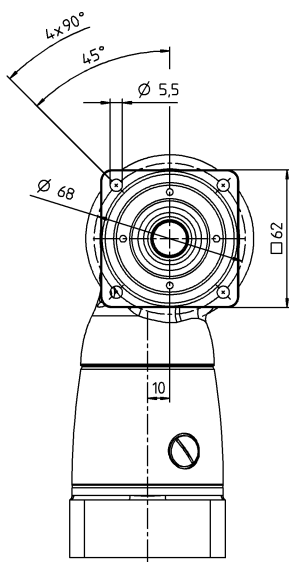
<sup>c)</sup> Refers to center of the output shaft or flange

<sup>d)</sup> Please reduce input speed at higher ambient temperatures

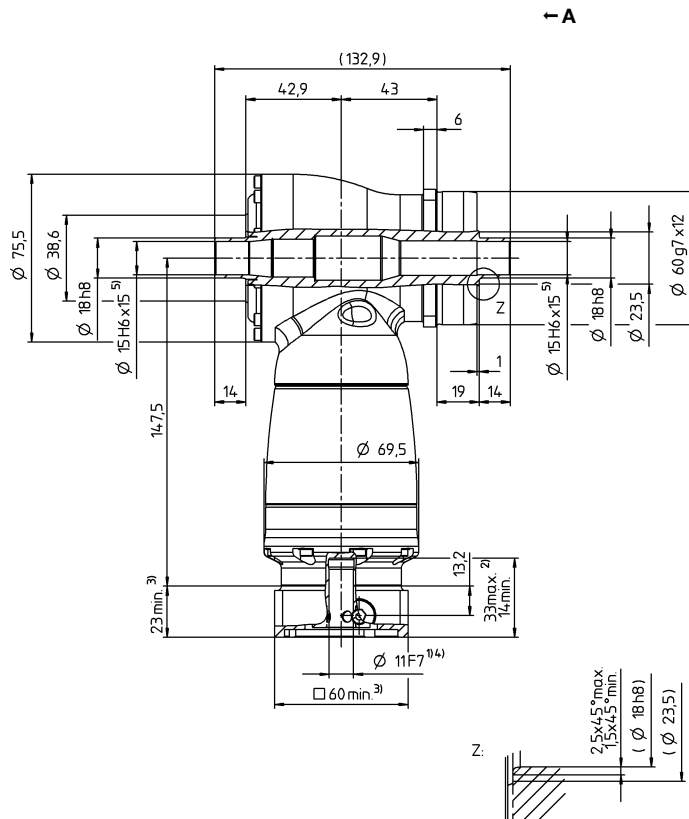
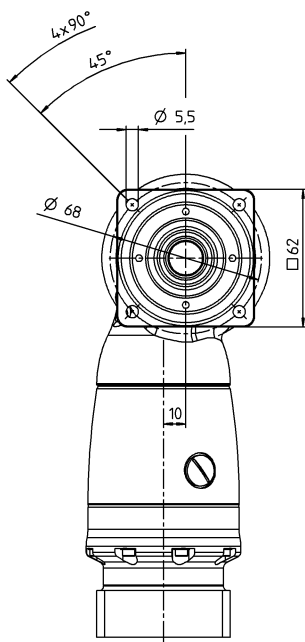
<sup>f)</sup> Please contact us to discuss  
application-specific service lifetimes



up to 14/19 <sup>4)</sup>  
(C <sup>6)</sup>/E) clamping  
hub diameter



up to 11/14 <sup>4)</sup>  
(B <sup>6)</sup>/C) clamping  
hub diameter



5) Tolerance h6 for mounted shaft.  
6) Standard clamping hub diameter



# HG<sup>+</sup> 075 MF 1-/2-stage

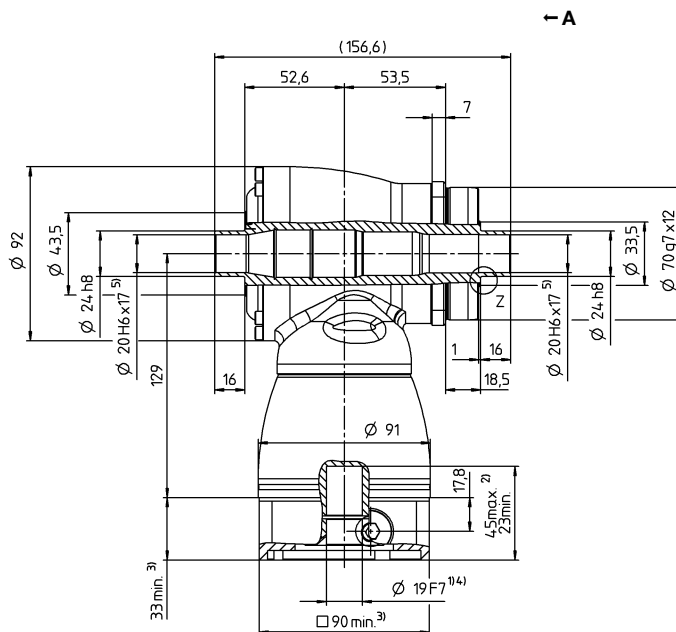
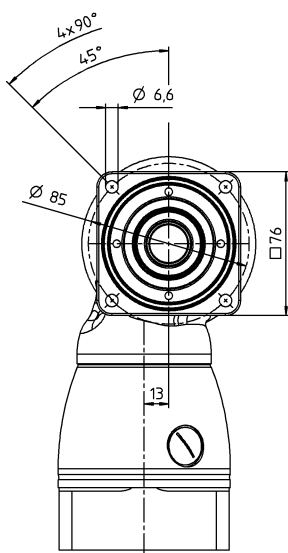
				1-stage					2-stage										
Ratio			<i>i</i>		3	4	5	7	10	12	16	20	25	28	35	40	50	70	100
Max. torque <sup>a) b)</sup>			<i>T</i> <sub>2a</sub>	<i>Nm</i>	84	84	84	60	50	84	84	84	84	84	84	84	84	60	50
				<i>in.lb</i>	743	743	743	531	443	743	743	743	743	743	743	743	743	743	531
Max. acceleration torque <sup>b)</sup> (max. 1000 cycles per hour)			<i>T</i> <sub>2B</sub>	<i>Nm</i>	70	70	70	60	50	70	70	70	70	70	70	70	70	60	50
				<i>in.lb</i>	620	620	620	531	443	620	620	620	620	620	620	620	620	620	531
Nominal torque (at <i>n</i> <sub>n</sub> )			<i>T</i> <sub>2N</sub>	<i>Nm</i>	50	50	50	45	40	50	50	50	50	50	50	50	50	45	40
				<i>in.lb</i>	443	443	443	398	354	443	443	443	443	443	443	443	443	443	398
Emergency stop torque <sup>a) b)</sup> (permitted 1000 times during the service life of the gearbox)			<i>T</i> <sub>2Not</sub>	<i>Nm</i>	95	115	115	110	100	115	115	115	115	115	115	115	115	110	100
				<i>in.lb</i>	841	1018	1018	974	885	1018	1018	1018	1018	1018	1018	1018	1018	1018	974
Permitted average input speed (at <i>T</i> <sub>2N</sub> and 20 °C ambient temperature) <sup>d)</sup>			<i>n</i> <sub>1N</sub>	<i>n</i> <sub>1T</sub>	2300	2500	2800	2800	2800	3500	3500	3500	3500	3500	3500	3500	3800	4500	4500
Max. input speed			<i>n</i> <sub>1Max</sub>	<i>rpm</i>	7500	7500	7500	7500	7500	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000
Mean no load running torque <sup>b)</sup> (at <i>n</i> <sub>i</sub> = 3000 rpm and 20 °C gearbox temperature)			<i>T</i> <sub>012</sub>	<i>Nm</i>	1.6	1.5	1.2	1.7	1.5	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
				<i>in.lb</i>	14	13	11	15	13	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
Max. backlash			<i>j</i> <sub>t</sub>	<i>arcmin</i>	Standard ≤ 4														
Torsional rigidity <sup>b)</sup>			<i>C</i> <sub>121</sub>	<i>Nm/arcmin</i>	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
				<i>in.lb/arcmin</i>	47	52	59	58	58	52	52	52	52	52	52	52	52	59	58
Max. axial force <sup>c)</sup>			<i>F</i> <sub>2AMax</sub>	<i>N</i>	3400														
				<i>lb<sub>f</sub></i>	765														
Max. lateral force <sup>c)</sup>			<i>F</i> <sub>2QMax</sub>	<i>N</i>	4000														
				<i>lb<sub>f</sub></i>	900														
Max. tilting moment			<i>M</i> <sub>2KMax</sub>	<i>Nm</i>	437														
				<i>in.lb</i>	3868														
Efficiency at full load			<i>η</i>	%	96					94									
Service life <sup>f)</sup>			<i>L</i> <sub>h</sub>	<i>h</i>	> 20000														
Weight (incl. standard adapter plate)			<i>m</i>	<i>kg</i>	4.8					5.1									
				<i>lb<sub>m</sub></i>	11					11									
Operating noise (at reference ratio and reference speed – ratio-specific values available in cymex <sup>®</sup> )			<i>L</i> <sub>PA</sub>	<i>dB(A)</i>	≤ 66														
Max. permitted housing temperature				°C	+90														
				<i>F</i>	194														
Ambient temperature				°C	0 to +40														
				<i>F</i>	32 to 104														
Lubrication					Lubricated for life														
Direction of rotation					In- and output opposite direction														
Protection class					IP 65														
Shrink disc (Standard version)					SD 024x050 S2														
Max. torque (without axial force)			<i>T</i> <sub>max</sub>	<i>Nm</i>	250														
Mass moment of inertia (relates to the drive) Clamping hub diameter [mm]	C	14	<i>J</i> <sub>i</sub>	<i>kgcm<sup>2</sup></i>	-	-	-	-	-	0.28	0.27	0.23	0.23	0.2	0.2	0.18	0.18	0.18	0.18
				<i>10<sup>-3</sup> in.lb.s<sup>2</sup></i>	-	-	-	-	-	0.25	0.24	0.2	0.2	0.18	0.18	0.16	0.16	0.16	0.16
	E	19	<i>J</i> <sub>i</sub>	<i>kgcm<sup>2</sup></i>	1.46	1.19	1.06	0.95	0.9	0.73	0.71	0.68	0.67	0.63	0.62	0.63	0.63	0.63	0.63
				<i>10<sup>-3</sup> in.lb.s<sup>2</sup></i>	1.29	1.05	0.94	0.84	0.8	0.65	0.63	0.6	0.59	0.56	0.55	0.56	0.56	0.56	0.56
	H	28	<i>J</i> <sub>i</sub>	<i>kgcm<sup>2</sup></i>	2.88	2.61	2.47	2.37	2.31	-	-	-	-	-	-	-	-	-	-
				<i>10<sup>-3</sup> in.lb.s<sup>2</sup></i>	2.55	2.31	2.19	2.1	2.04	-	-	-	-	-	-	-	-	-	-

Please use our sizing software cymex<sup>®</sup> for a detailed sizing – [www.wittenstein-cymex.com](http://www.wittenstein-cymex.com)  
Please contact us for optimum sizing at S1 conditions (Continuous operation).

- <sup>a)</sup> At max. 10 %  $F_{2QMax}$   
<sup>b)</sup> Valid for standard clamping hub diameter  
<sup>c)</sup> Refers to center of the output shaft or flange  
<sup>d)</sup> Please reduce input speed at higher ambient temperatures  
<sup>f)</sup> Please contact us to discuss application-specific service lifetimes

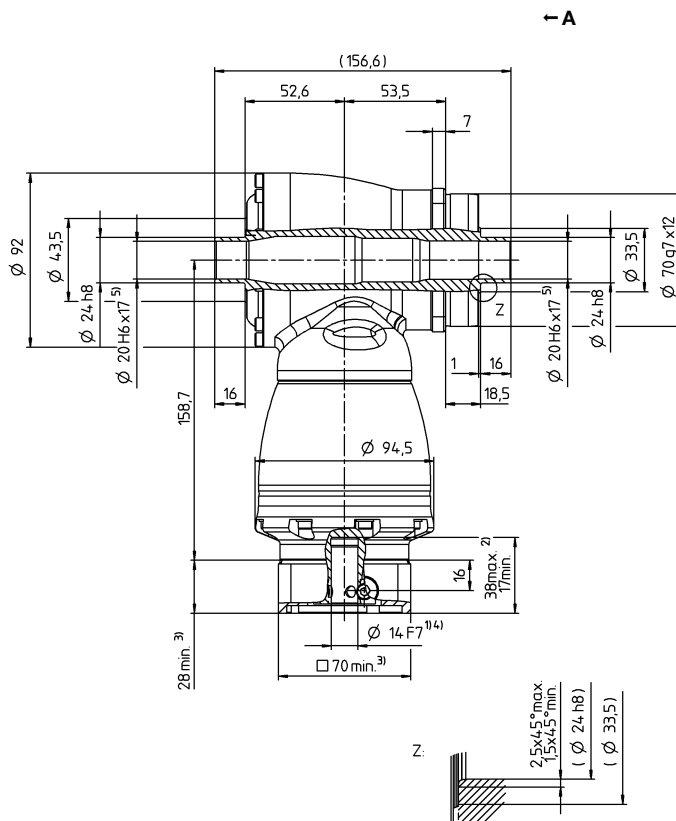
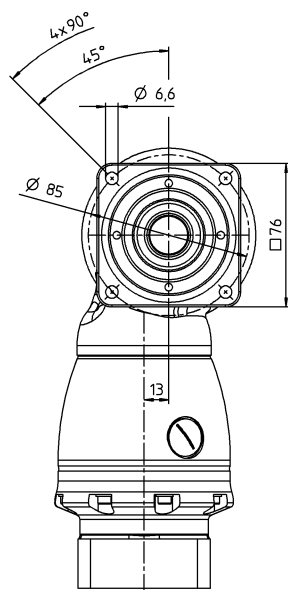
# 1-stage

up to 19/28 <sup>4)</sup>  
(E <sup>6)</sup>/H) clamping  
hub diameter



# 2-stage

up to 14/19 <sup>4)</sup>  
(C <sup>6)</sup>/E) clamping  
hub diameter



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

Non-tolerated dimensions are nominal dimensions

<sup>1)</sup> Check motor shaft fit

<sup>2)</sup> Min./Max. permissible motor shaft length. Longer motor shafts are possible, please contact alpha.

<sup>3)</sup> The dimensions depend on the motor

<sup>4)</sup> Smaller motor shaft diameter is compensated by a bushing with a minimum wall thickness of 1 mm

<sup>5)</sup> Tolerance h6 for mounted shaft.

<sup>6)</sup> Standard clamping hub diameter

# HG<sup>+</sup> 100 MF 1-/2-stage

				1-stage					2-stage											
Ratio			<i>i</i>		3	4	5	7	10	12	16	20	25	28	35	40	50	70	100	
Max. torque <sup>a) b)</sup>			<i>T</i> <sub>2a</sub>	<i>Nm</i>	204	204	204	145	125	204	204	204	204	204	204	204	204	145	125	
				<i>in.lb</i>	1806	1806	1806	1283	1106	1806	1806	1806	1806	1806	1806	1806	1806	1806	1283	1106
Max. acceleration torque <sup>b)</sup> (max. 1000 cycles per hour)			<i>T</i> <sub>2B</sub>	<i>Nm</i>	170	170	170	145	125	170	170	170	170	170	170	170	170	145	125	
				<i>in.lb</i>	1505	1505	1505	1283	1106	1505	1505	1505	1505	1505	1505	1505	1505	1505	1283	1106
Nominal torque (at <i>n</i> <sub>n</sub> )			<i>T</i> <sub>2N</sub>	<i>Nm</i>	100	100	100	90	80	100	100	100	100	100	100	100	100	90	80	
				<i>in.lb</i>	885	885	885	797	708	885	885	885	885	885	885	885	885	885	797	708
Emergency stop torque <sup>a) b)</sup> (permitted 1000 times during the service life of the gearbox)			<i>T</i> <sub>2Not</sub>	<i>Nm</i>	220	260	260	255	250	260	260	260	260	260	260	260	260	255	250	
				<i>in.lb</i>	1947	2301	2301	2257	2213	2301	2301	2301	2301	2301	2301	2301	2301	2301	2257	2213
Permitted average input speed (at <i>T</i> <sub>2N</sub> and 20 °C ambient temperature) <sup>d)</sup>			<i>n</i> <sub>1N</sub>	<i>n</i> <sub>1T</sub>	2200	2400	2700	2500	2500	3100	3100	3100	3100	3100	3100	3100	3500	4200	4200	
Max. input speed			<i>n</i> <sub>1Max</sub>	<i>rpm</i>	5500	5500	5500	5500	5500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	
Mean no load running torque <sup>b)</sup> (at <i>n</i> <sub>r</sub> = 3000 rpm and 20 °C gearbox temperature)			<i>T</i> <sub>012</sub>	<i>Nm</i>	4.3	3.4	3.2	4.6	3.7	0.7	0.7	0.6	0.4	0.4	0.3	0.2	0.2	0.2	0.2	
				<i>in.lb</i>	38	30	28	41	33	6.2	6.2	5.3	3.5	3.5	2.7	1.8	1.8	1.8	1.8	1.8
Max. backlash			<i>j</i> <sub>t</sub>	<i>arcmin</i>	Standard ≤ 4															
Torsional rigidity <sup>b)</sup>			<i>C</i> <sub>t21</sub>	<i>Nm/arcmin</i>	10.7	12.1	14	14.2	14.4	12.1	12.1	12.1	12.1	12.1	12.1	12.1	12.1	14	14.2	14.4
				<i>in.lb/arcmin</i>	95	107	124	126	127	107	107	107	107	107	107	107	107	107	124	126
Max. axial force <sup>c)</sup>			<i>F</i> <sub>2AMax</sub>	<i>N</i>	5700															
				<i>lb<sub>f</sub></i>	1283															
Max. lateral force <sup>c)</sup>			<i>F</i> <sub>2QMax</sub>	<i>N</i>	6300															
				<i>lb<sub>f</sub></i>	1418															
Max. tilting moment			<i>M</i> <sub>2KMax</sub>	<i>Nm</i>	833															
				<i>in.lb</i>	7373															
Efficiency at full load			<i>η</i>	%	96					94										
Service life <sup>f)</sup>			<i>L</i> <sub>h</sub>	<i>h</i>	> 20000															
Weight (incl. standard adapter plate)			<i>m</i>	<i>kg</i>	9.3					9.5										
				<i>lb<sub>m</sub></i>	21					21										
Operating noise (at reference ratio and reference speed – ratio-specific values available in cymex <sup>®</sup> )			<i>L</i> <sub>PA</sub>	<i>dB(A)</i>	≤ 66															
Max. permitted housing temperature				°C	+90															
				<i>F</i>	194															
Ambient temperature				°C	0 to +40															
				<i>F</i>	32 to 104															
Lubrication					Lubricated for life															
Direction of rotation					In- and output opposite direction															
Protection class					IP 65															
Shrink disc (Standard version)					SD 036x072 S2															
Max. torque (without axial force)			<i>T</i> <sub>max</sub>	<i>Nm</i>	650															
Mass moment of inertia (relates to the drive)  Clamping hub diameter [mm]	E	19	<i>J</i> <sub>i</sub>	<i>kgcm<sup>2</sup></i>	-	-	-	-	-	1.02	0.97	0.86	0.84	0.75	0.74	0.69	0.69	0.68	0.68	
				<i>10<sup>-3</sup> in.lb.s<sup>2</sup></i>	-	-	-	-	-	0.9	0.86	0.76	0.74	0.66	0.65	0.61	0.61	0.6	0.6	
	G	24	<i>J</i> <sub>i</sub>	<i>kgcm<sup>2</sup></i>	-	-	-	-	-	2.59	2.54	2.42	2.4	2.31	2.3	2.26	2.25	2.25	2.25	
				<i>10<sup>-3</sup> in.lb.s<sup>2</sup></i>	-	-	-	-	-	2.29	2.25	2.14	2.12	2.04	2.04	2	1.99	1.99	1.99	
	H	28	<i>J</i> <sub>i</sub>	<i>kgcm<sup>2</sup></i>	4.64	3.8	3.34	2.98	2.79	-	-	-	-	-	-	-	-	-	-	
				<i>10<sup>-3</sup> in.lb.s<sup>2</sup></i>	4.11	3.36	2.96	2.64	2.47	-	-	-	-	-	-	-	-	-	-	
	K	38	<i>J</i> <sub>i</sub>	<i>kgcm<sup>2</sup></i>	11.9	11	10.6	10.2	10	-	-	-	-	-	-	-	-	-	-	
				<i>10<sup>-3</sup> in.lb.s<sup>2</sup></i>	10.53	9.74	9.38	9.03	8.85	-	-	-	-	-	-	-	-	-	-	

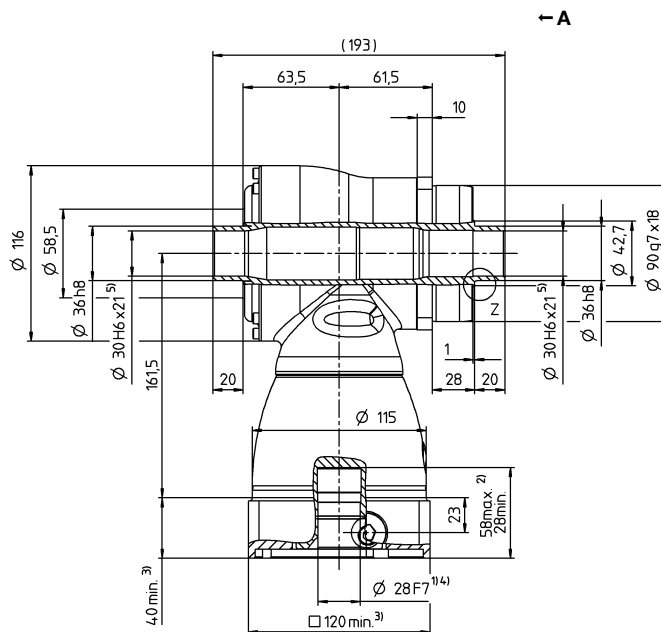
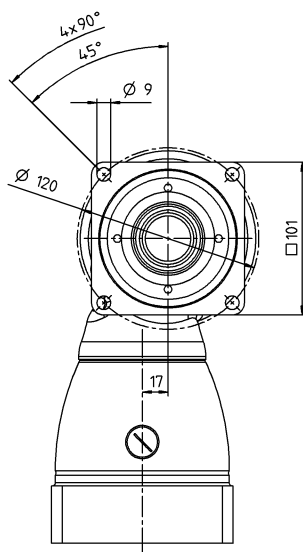
Please use our sizing software cymex<sup>®</sup> for a detailed sizing – [www.wittenstein-cymex.com](http://www.wittenstein-cymex.com)  
Please contact us for optimum sizing at S1 conditions (Continuous operation).

- <sup>a)</sup> At max. 10 %  $F_{2QMax}$   
<sup>b)</sup> Valid for standard clamping hub diameter  
<sup>c)</sup> Refers to center of the output shaft or flange  
<sup>d)</sup> Please reduce input speed at higher ambient temperatures  
<sup>f)</sup> Please contact us to discuss application-specific service lifetimes

View A

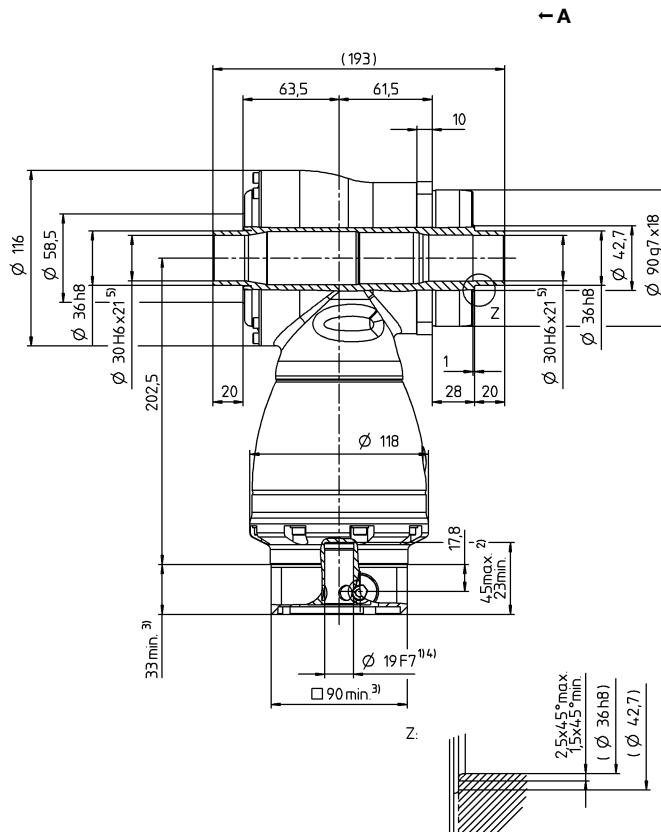
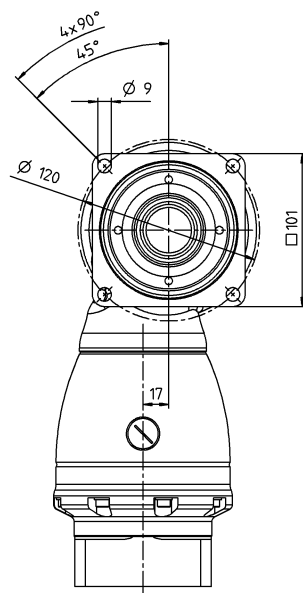
# 1-stage

up to 28/38<sup>4)</sup>  
(H<sup>6)</sup>/K) clamping  
hub diameter



# 2-stage

up to 19/24<sup>4)</sup>  
(E<sup>6)</sup>/G) clamping  
hub diameter



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

Non-tolerated dimensions are nominal dimensions

<sup>1)</sup> Check motor shaft fit

<sup>2)</sup> Min./Max. permissible motor shaft length. Longer motor shafts are possible, please contact alpha.

<sup>3)</sup> The dimensions depend on the motor

<sup>4)</sup> Smaller motor shaft diameter is compensated by a bushing with a minimum wall thickness of 1 mm

<sup>5)</sup> Tolerance h6 for mounted shaft.

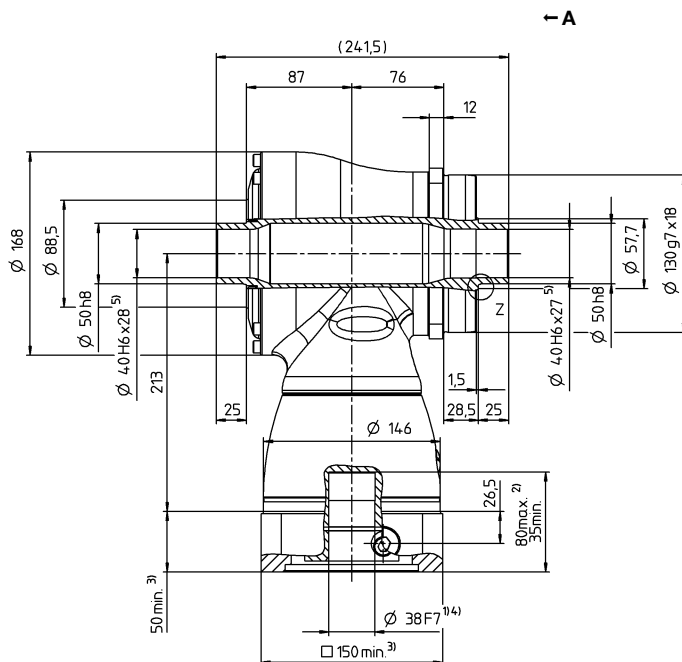
<sup>6)</sup> Standard clamping hub diameter

# HG<sup>+</sup> 140 MF 1-/2-stage

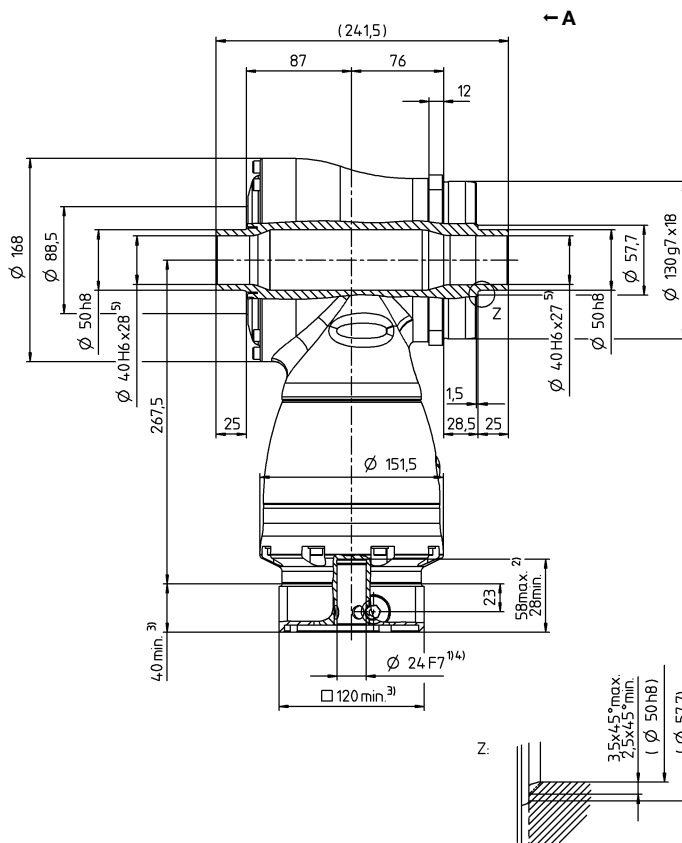
				1-stage					2-stage											
Ratio			<i>i</i>		3	4	5	7	10	12	16	20	25	28	35	40	50	70	100	
Max. torque <sup>a) b)</sup>			<i>T</i> <sub>2a</sub>	<i>Nm</i>	360	360	360	250	210	360	360	360	360	360	360	360	360	250	210	
				<i>in.lb</i>	3186	3186	3186	2213	1859	3186	3186	3186	3186	3186	3186	3186	3186	3186	2213	1859
Max. acceleration torque <sup>b)</sup> (max. 1000 cycles per hour)			<i>T</i> <sub>2B</sub>	<i>Nm</i>	300	300	300	250	210	300	300	300	300	300	300	300	300	250	210	
				<i>in.lb</i>	2655	2655	2655	2213	1859	2655	2655	2655	2655	2655	2655	2655	2655	2655	2213	1859
Nominal torque (at <i>n</i> <sub>n</sub> )			<i>T</i> <sub>2N</sub>	<i>Nm</i>	190	190	190	175	160	190	190	190	190	190	190	190	190	175	160	
				<i>in.lb</i>	1682	1682	1682	1549	1416	1682	1682	1682	1682	1682	1682	1682	1682	1682	1549	1416
Emergency stop torque <sup>a) b)</sup> (permitted 1000 times during the service life of the gearbox)			<i>T</i> <sub>2Not</sub>	<i>Nm</i>	400	500	500	450	400	500	500	500	500	500	500	500	500	450	400	
				<i>in.lb</i>	3540	4425	4425	3983	3540	4425	4425	4425	4425	4425	4425	4425	4425	4425	3983	3540
Permitted average input speed (at <i>T</i> <sub>2N</sub> and 20 °C ambient temperature) <sup>d)</sup>			<i>n</i> <sub>1N</sub>	<i>n</i> <sub>1T</sub>	1900	2000	2200	2000	2000	2900	2900	2900	2900	2900	2900	2900	3200	3200	3900	
Max. input speed			<i>n</i> <sub>1Max</sub>	<i>rpm</i>	5000	5000	5000	5000	5000	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	
Mean no load running torque <sup>b)</sup> (at <i>n</i> <sub>i</sub> = 3000 rpm and 20 °C gearbox temperature)			<i>T</i> <sub>012</sub>	<i>Nm</i>	10	7.6	7.9	11	7.9	1.5	1	0.8	0.6	0.6	0.4	0.4	0.3	0.3	0.3	
				<i>in.lb</i>	89	67	70	97	70	13	8.9	7.1	5.3	5.3	3.5	3.5	2.7	2.7	2.7	2.7
Max. backlash			<i>j</i> <sub>t</sub>	<i>arcmin</i>	Standard ≤ 4															
Torsional rigidity <sup>b)</sup>			<i>C</i> <sub>t21</sub>	<i>Nm/arcmin</i>	32	36	41	39	38	36	36	36	36	36	36	36	36	41	39	38
				<i>in.lb/arcmin</i>	283	319	363	345	336	319	319	319	319	319	319	319	319	319	363	345
Max. axial force <sup>c)</sup>			<i>F</i> <sub>2AMax</sub>	<i>N</i>	9900															
				<i>lb<sub>f</sub></i>	2228															
Max. lateral force <sup>c)</sup>			<i>F</i> <sub>2QMax</sub>	<i>N</i>	9500															
				<i>lb<sub>f</sub></i>	2138															
Max. tilting moment			<i>M</i> <sub>2KMax</sub>	<i>Nm</i>	1692															
				<i>in.lb</i>	14976															
Efficiency at full load			<i>η</i>	%	96					94										
Service life <sup>f)</sup>			<i>L</i> <sub>h</sub>	<i>h</i>	> 20000															
Weight (incl. standard adapter plate)			<i>m</i>	<i>kg</i>	22.6					24										
				<i>lb<sub>m</sub></i>	50					53										
Operating noise (at reference ratio and reference speed – ratio-specific values available in cymex <sup>®</sup> )			<i>L</i> <sub>PA</sub>	<i>dB(A)</i>	≤ 68															
Max. permitted housing temperature				°C	+90															
				<i>F</i>	194															
Ambient temperature				°C	0 to +40															
				<i>F</i>	32 to 104															
Lubrication					Lubricated for life															
Direction of rotation					In- and output opposite direction															
Protection class					IP 65															
Shrink disc (Standard version)					SD 050x090 S2															
Max. torque (without axial force)			<i>T</i> <sub>max</sub>	<i>Nm</i>	1320															
Mass moment of inertia (relates to the drive) Clamping hub diameter [mm]		G 24	<i>J</i> <sub>i</sub>	<i>kgcm<sup>2</sup></i>	-	-	-	-	-	4.2	3.84	3.27	3.16	2.78	2.73	2.48	2.46	2.43	2.42	
				<i>10<sup>-3</sup> in.lb.s<sup>2</sup></i>	-	-	-	-	-	3.72	3.4	2.89	2.8	2.46	2.42	2.19	2.18	2.15	2.14	
		K 38	<i>J</i> <sub>i</sub>	<i>kgcm<sup>2</sup></i>	25	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	
<i>10<sup>-3</sup> in.lb.s<sup>2</sup></i>	22.13			16.9	14.43	12.48	11.33	9.82	9.47	9.03	8.94	8.58	8.53	8.31	8.29	8.27	8.26			

Please use our sizing software cymex<sup>®</sup> for a detailed sizing – [www.wittenstein-cymex.com](http://www.wittenstein-cymex.com)  
Please contact us for optimum sizing at S1 conditions (Continuous operation).

- <sup>a)</sup> At max. 10 %  $F_{2QMax}$
- <sup>b)</sup> Valid for standard clamping hub diameter
- <sup>c)</sup> Refers to center of the output shaft or flange
- <sup>d)</sup> Please reduce input speed at higher ambient temperatures
- <sup>f)</sup> Please contact us to discuss application-specific service lifetimes



## 2-stage



133

# HG<sup>+</sup> 180 MF 1-/2-stage

				1-stage					2-stage											
Ratio			<i>i</i>		3	4	5	7	10	12	16	20	25	28	35	40	50	70	100	
Max. torque <sup>a) b)</sup>			<i>T</i> <sub>2a</sub>	<i>Nm</i>	768	768	768	550	470	768	768	768	768	768	768	768	768	550	470	
				<i>in.lb</i>	6797	6797	6797	4868	4160	6797	6797	6797	6797	6797	6797	6797	6797	6797	4868	4160
Max. acceleration torque <sup>b)</sup> (max. 1000 cycles per hour)			<i>T</i> <sub>2B</sub>	<i>Nm</i>	640	640	640	550	470	640	640	640	640	640	640	640	640	550	470	
				<i>in.lb</i>	5665	5665	5665	4868	4160	5665	5665	5665	5665	5665	5665	5665	5665	5665	4868	4160
Nominal torque (at <i>n</i> <sub>n</sub> )			<i>T</i> <sub>2N</sub>	<i>Nm</i>	400	400	400	380	360	400	400	400	400	400	400	400	400	380	360	
				<i>in.lb</i>	3540	3540	3540	3363	3186	3540	3540	3540	3540	3540	3540	3540	3540	3540	3363	3186
Emergency stop torque <sup>a) b)</sup> (permitted 1000 times during the service life of the gearbox)			<i>T</i> <sub>2Not</sub>	<i>Nm</i>	900	1050	1050	970	900	1050	1050	1050	1050	1050	1050	1050	1050	970	900	
				<i>in.lb</i>	7966	9293	9293	8585	7966	9293	9293	9293	9293	9293	9293	9293	9293	9293	8585	7966
Permitted average input speed (at <i>T</i> <sub>2a</sub> and 20 °C ambient temperature) <sup>d)</sup>			<i>n</i> <sub>1N</sub>	<i>n</i> <sub>1T</sub>	1600	1800	2000	1800	1800	2700	2700	2700	2700	2700	2700	2700	2900	3200	3400	
Max. input speed			<i>n</i> <sub>1Max</sub>	<i>rpm</i>	4500	4500	4500	4500	4500	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	
Mean no load running torque <sup>b)</sup> (at <i>n</i> <sub>i</sub> = 3000 rpm and 20 °C gearbox temperature)			<i>T</i> <sub>012</sub>	<i>Nm</i>	21	17	16	19	16	3.3	2.5	2	1.8	1.4	1.3	1	1	1	1	
				<i>in.lb</i>	186	150	142	168	142	29	22	18	16	12	12	8.9	8.9	8.9	8.9	
Max. backlash			<i>j</i> <sub>t</sub>	<i>arcmin</i>	Standard ≤ 4															
Torsional rigidity <sup>b)</sup>			<i>C</i> <sub>t21</sub>	<i>Nm/arcmin</i>	71	80	91	89	88	80	80	80	80	80	80	80	91	89	88	
				<i>in.lb/arcmin</i>	628	708	805	788	779	708	708	708	708	708	708	708	708	805	788	779
Max. axial force <sup>c)</sup>			<i>F</i> <sub>2AMax</sub>	<i>N</i>	14200															
				<i>lb<sub>f</sub></i>	3195															
Max. lateral force <sup>c)</sup>			<i>F</i> <sub>2QMax</sub>	<i>N</i>	14700															
				<i>lb<sub>f</sub></i>	3308															
Max. tilting moment			<i>M</i> <sub>2KMax</sub>	<i>Nm</i>	3213															
				<i>in.lb</i>	28438															
Efficiency at full load			<i>η</i>	%	96					94										
Service life <sup>f)</sup>			<i>L</i> <sub>h</sub>	<i>h</i>	> 20000															
Weight (incl. standard adapter plate)			<i>m</i>	<i>kg</i>	45.4					47										
				<i>lb<sub>m</sub></i>	100					104										
Operating noise (at reference ratio and reference speed – ratio-specific values available in cymex <sup>®</sup> )			<i>L</i> <sub>PA</sub>	<i>dB(A)</i>	≤ 68															
Max. permitted housing temperature				°C	+90															
				<i>F</i>	194															
Ambient temperature				°C	0 to +40															
				<i>F</i>	32 to 104															
Lubrication					Lubricated for life															
Direction of rotation					In- and output opposite direction															
Protection class					IP 65															
Shrink disc (Standard version)					SD 068x115 S2															
Max. torque (without axial force)			<i>T</i> <sub>max</sub>	<i>Nm</i>	2450															
Mass moment of inertia (relates to the drive) Clamping hub diameter [mm]			K 38	<i>J</i> <sub>i</sub>	<i>kgcm<sup>2</sup></i>	-	-	-	-	-	15.3	14	12.3	12	10.9	10.7	10.1	10	9.95	9.91
					<i>10<sup>-3</sup> in.lb.s<sup>2</sup></i>	-	-	-	-	-	13.54	12.39	10.89	10.62	9.65	9.47	8.94	8.85	8.81	8.77
			M 48	<i>J</i> <sub>i</sub>	<i>kgcm<sup>2</sup></i>	73.3	51.6	42.1	34	29.7	30	28.7	27.1	26.7	25.6	25.4	24.8	24.7	24.7	24.6
<i>10<sup>-3</sup> in.lb.s<sup>2</sup></i>	64.87	45.67			37.26	30.09	26.28	26.55	25.4	23.98	23.63	22.66	22.48	21.95	21.86	21.86	21.77			

Please use our sizing software cymex<sup>®</sup> for a detailed sizing – [www.wittenstein-cymex.com](http://www.wittenstein-cymex.com)  
Please contact us for optimum sizing at S1 conditions (Continuous operation).

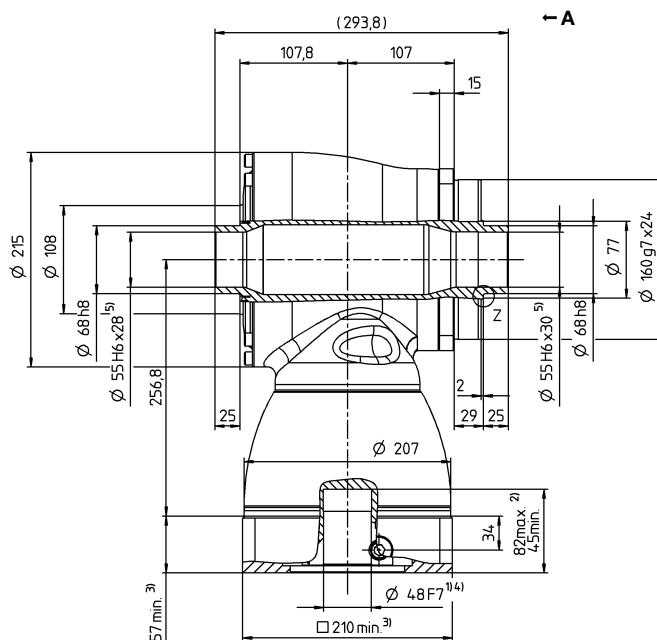
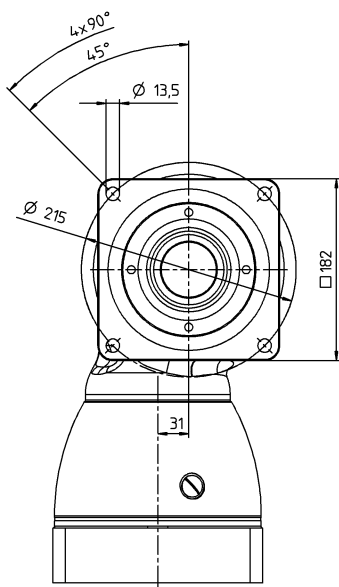
- <sup>a)</sup> At max. 10 %  $F_{2QMax}$
- <sup>b)</sup> Valid for standard clamping hub diameter
- <sup>c)</sup> Refers to center of the output shaft or flange
- <sup>d)</sup> Please reduce input speed at higher ambient temperatures
- <sup>f)</sup> Please contact us to discuss application-specific service lifetimes



View A

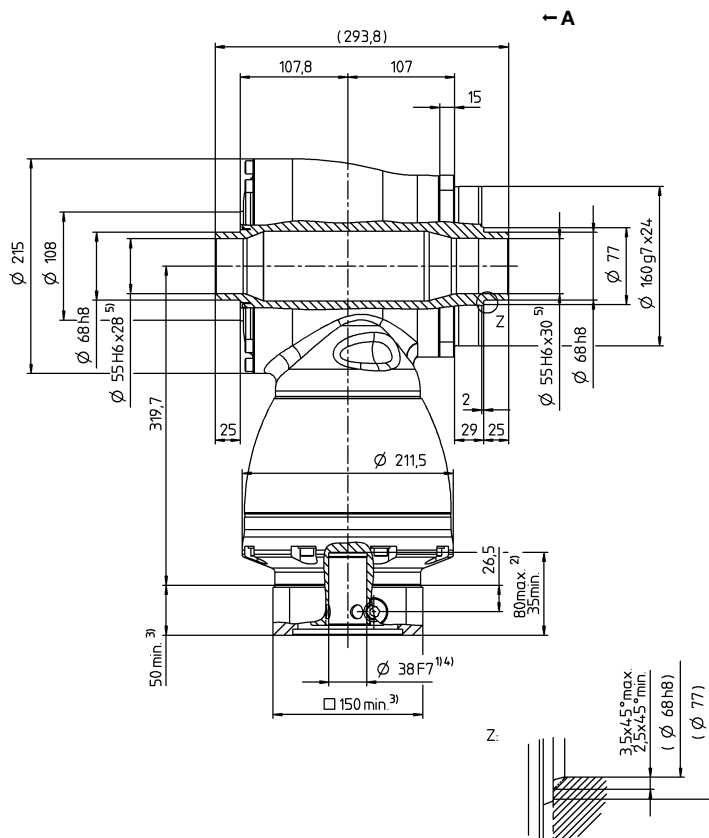
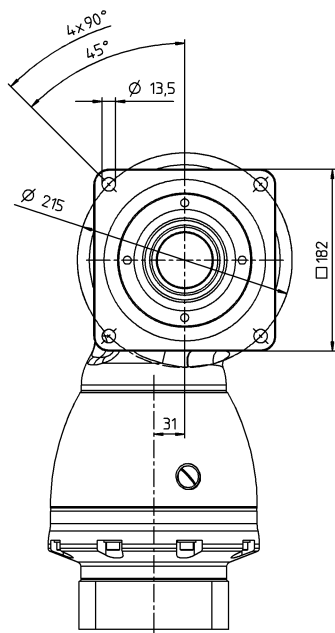
# 1-stage

up to 48<sup>4)</sup> (M)<sup>6)</sup>  
clamping hub  
diameter



# 2-stage

up to 38/48<sup>4)</sup>  
(K<sup>6)</sup>/M) clamping  
hub diameter



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

Non-tolerated dimensions are nominal dimensions

<sup>1)</sup> Check motor shaft fit

<sup>2)</sup> Min./Max. permissible motor shaft length. Longer motor shafts are possible, please contact alpha.

<sup>3)</sup> The dimensions depend on the motor

<sup>4)</sup> Smaller motor shaft diameter is compensated by a bushing with a minimum wall thickness of 1 mm

<sup>5)</sup> Tolerance h6 for mounted shaft.

<sup>6)</sup> Standard clamping hub diameter

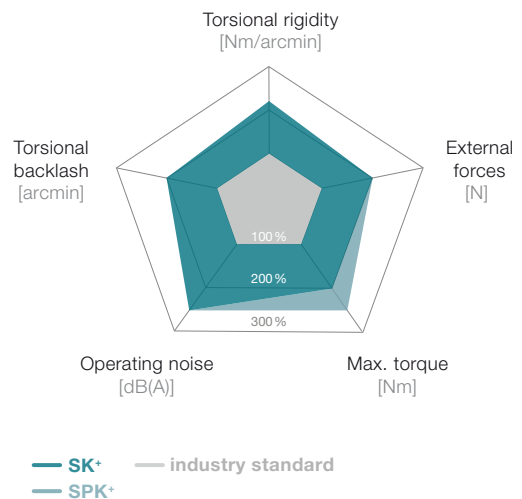
## SK<sup>+</sup> / SPK<sup>+</sup> – Space-saving right-angle precision with output shaft



SK<sup>+</sup>

The versatile hypoid gearbox with SP<sup>+</sup> compatible output shaft. SPK<sup>+</sup> gearboxes with planetary stage are especially suitable for high-precision applications requiring higher power and outstanding torsional rigidity.

The SK<sup>+</sup> / SPK<sup>+</sup> compared to the industry standard



### Product highlights

#### Max. torsional backlash

SK<sup>+</sup> ≤ 4 arcmin (Standard)

SPK<sup>+</sup> ≤ 4 arcmin (Standard)

≤ 2 arcmin (Reduced)

#### Diverse range of ratios $i = 3 - 1,000$

#### Multiple output configurations for greater flexibility

Smooth shaft, shaft with key, splined shaft (DIN 5480), blind hollow shaft, Output on both sides

#### Other gearbox models

Corrosional resistant design, ATEX (SK<sup>+</sup>)



SPK<sup>+</sup> in corrosion-resistant design



SK<sup>+</sup> with rearward shaft

Taper roller bearings for  
absorbing axial and radial forces

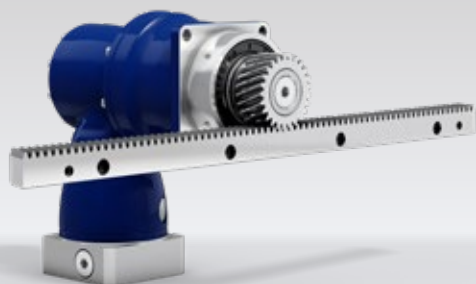
Output compatible  
with SP+ series

Variable output connection,  
also rearward

High-quality hypoid gearing  
for a higher torque  
and smoother operation

Metal bellows coupling at the  
input: length compensation to  
protect the motor bearing

SPK+



SPK+ with rack and pinion



SK+ with metal bellows coupling

# SK<sup>+</sup> 060 MF 1-/2-stage

			1-stage					2-stage											
Ratio			<i>i</i>		3	4	5	7	10	12	16	20	25	28	35	40	50	70	100
Max. torque <sup>a) b) e)</sup>			<i>T</i> <sub>2a</sub>	<i>Nm</i>	36	36	36	25	20	36	36	36	36	36	36	36	36	25	20
				<i>in.lb</i>	319	319	319	221	177	319	319	319	319	319	319	319	319	319	221
Max. acceleration torque <sup>b) e)</sup> (max. 1000 cycles per hour)			<i>T</i> <sub>2B</sub>	<i>Nm</i>	30	30	30	25	20	30	30	30	30	30	30	30	30	25	20
				<i>in.lb</i>	266	266	266	221	177	266	266	266	266	266	266	266	266	266	221
Nominal torque (at <i>n</i> <sub>1N</sub> )			<i>T</i> <sub>2N</sub>	<i>Nm</i>	22	22	22	20	15	22	22	22	22	22	22	22	22	20	15
				<i>in.lb</i>	195	195	195	177	133	195	195	195	195	195	195	195	195	195	177
Emergency stop torque <sup>a) b) e)</sup> (permitted 1000 times during the service life of the gearbox)			<i>T</i> <sub>2Not</sub>	<i>Nm</i>	40	50	50	45	40	50	50	50	50	50	50	50	50	45	40
				<i>in.lb</i>	354	443	443	398	354	443	443	443	443	443	443	443	443	443	398
Permitted average input speed (at <i>T</i> <sub>2N</sub> and 20 °C ambient temperature) <sup>d)</sup>			<i>n</i> <sub>1N</sub>	<i>n</i> <sub>1T</sub>	2500	2700	3000	3000	3000	4400	4400	4400	4400	4400	4400	4400	4800	5500	5500
Max. input speed			<i>n</i> <sub>1Max</sub>	<i>rpm</i>	7500	7500	7500	7500	7500	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000
Mean no load running torque <sup>b)</sup> (at <i>n</i> <sub>i</sub> = 3000 rpm and 20 °C gearbox temperature)			<i>T</i> <sub>012</sub>	<i>Nm</i>	1.5	1.4	1.1	1.5	1.4	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
				<i>in.lb</i>	13	12	9.7	13	12	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
Max. backlash			<i>j</i> <sub>t</sub>	<i>arcmin</i>	Standard ≤ 5														
Torsional rigidity <sup>b)</sup>			<i>C</i> <sub>121</sub>	<i>Nm/arcmin</i>	2	2.1	2.2	2	1.8	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2	1.8
				<i>in.lb/arcmin</i>	18	19	19	18	16	19	19	19	19	19	19	19	19	19	19
Max. axial force <sup>c)</sup>			<i>F</i> <sub>2AMax</sub>	<i>N</i>	2400														
				<i>lb<sub>f</sub></i>	540														
Max. lateral force <sup>c)</sup>			<i>F</i> <sub>2QMax</sub>	<i>N</i>	2700														
				<i>lb<sub>f</sub></i>	608														
Max. tilting moment			<i>M</i> <sub>2KMax</sub>	<i>Nm</i>	251														
				<i>in.lb</i>	2222														
Efficiency at full load			<i>η</i>	%	96					94									
Service life <sup>f)</sup>			<i>L</i> <sub>h</sub>	<i>h</i>	> 20000														
Weight (incl. standard adapter plate)			<i>m</i>	<i>kg</i>	2.9					3.2									
				<i>lb<sub>m</sub></i>	6					7									
Operating noise (at reference ratio and reference speed – ratio-specific values available in cymex®)			<i>L</i> <sub>PA</sub>	<i>dB(A)</i>	≤ 64														
Max. permitted housing temperature				°C	+90														
				<i>F</i>	194														
Ambient temperature				°C	0 to +40														
				<i>F</i>	32 to 104														
Lubrication					Lubricated for life														
Direction of rotation					In- and output opposite direction														
Protection class					IP 65														
Metal bellows coupling (recommended product type – validate sizing with cymex®)					BC2 - 00030AA - 016.000 - X														
Bore diameter of coupling on the application side				<i>mm</i>	X = 010.000 - 030.000														
Mass moment of inertia (relates to the drive) Clamping hub diameter [mm]	B	11	<i>J</i> <sub>i</sub>	<i>kgcm²</i>	-	-	-	-	-	0.09	0.09	0.07	0.07	0.06	0.06	0.06	0.06	0.06	0.06
				<i>10<sup>-3</sup> in.lb.s²</i>	-	-	-	-	-	0.08	0.08	0.06	0.06	0.05	0.05	0.05	0.05	0.05	0.05
	C	14	<i>J</i> <sub>i</sub>	<i>kgcm²</i>	0.52	0.44	0.4	0.36	0.34	0.2	0.2	0.19	0.19	0.18	0.18	0.17	0.17	0.17	0.17
				<i>10<sup>-3</sup> in.lb.s²</i>	0.46	0.39	0.35	0.32	0.3	0.18	0.18	0.17	0.17	0.16	0.16	0.15	0.15	0.15	0.15
	E	19	<i>J</i> <sub>i</sub>	<i>kgcm²</i>	0.87	0.79	0.75	0.71	0.7	-	-	-	-	-	-	-	-	-	-
				<i>10<sup>-3</sup> in.lb.s²</i>	0.77	0.7	0.66	0.63	0.62	-	-	-	-	-	-	-	-	-	-

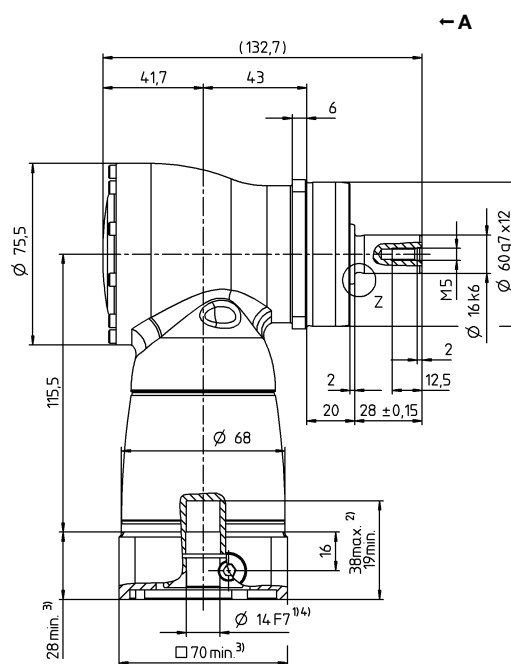
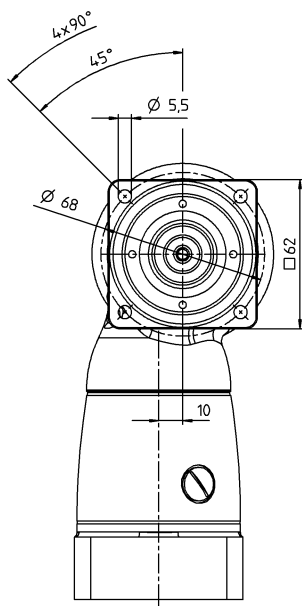
Please use our sizing software cymex<sup>®</sup> for a detailed sizing – [www.wittenstein-cymex.com](http://www.wittenstein-cymex.com)  
Please contact us for optimum sizing at S1 conditions (Continuous operation).

- <sup>a)</sup> At max. 10 %  $F_{2QMax}$
- <sup>b)</sup> Valid for standard clamping hub diameter
- <sup>c)</sup> Refers to center of the output shaft or flange
- <sup>d)</sup> Please reduce input speed at higher ambient temperatures
- <sup>e)</sup> Smooth shaft
- <sup>f)</sup> Please contact us to discuss application-specific service lifetimes

View A

# 1-stage

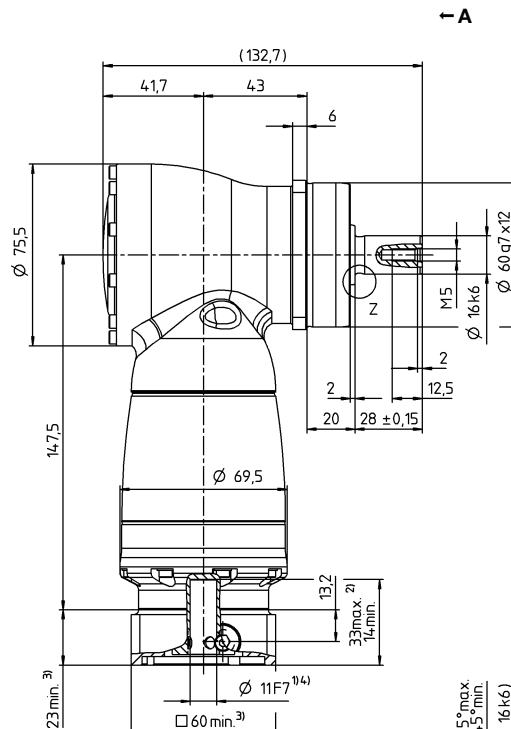
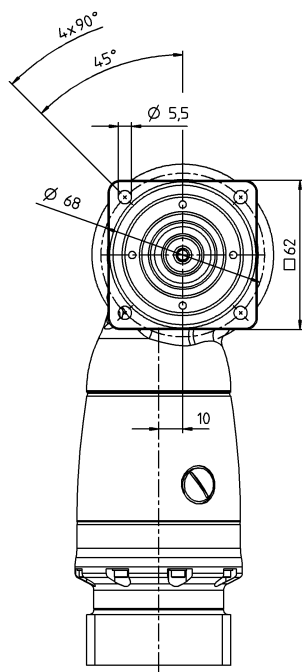
up to 14/19<sup>4)</sup>  
(C<sup>5)</sup>/E) clamping  
hub diameter



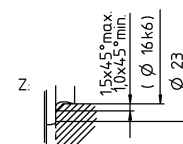
← A

# 2-stage

up to 11/14<sup>4)</sup>  
(B<sup>5)</sup>/C) clamping  
hub diameter



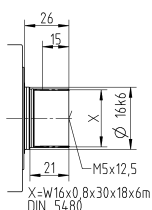
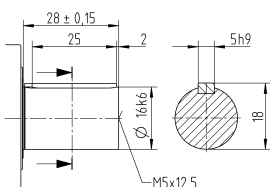
← A



## Other output variants

Shaft with key

Splined shaft (DIN 5480)



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

Non-tolerated dimensions are nominal dimensions

<sup>1)</sup> Check motor shaft fit

<sup>2)</sup> Min./Max. permissible motor shaft length. Longer motor shafts are possible, please contact alpha.

<sup>3)</sup> The dimensions depend on the motor

<sup>4)</sup> Smaller motor shaft diameter is compensated by a bushing with a minimum wall thickness of 1 mm

<sup>5)</sup> Standard clamping hub diameter

# SK<sup>+</sup> 075 MF 1-/2-stage

				1-stage					2-stage										
Ratio			<i>i</i>		3	4	5	7	10	12	16	20	25	28	35	40	50	70	100
Max. torque <sup>a) b) e)</sup>			<i>T</i> <sub>2a</sub>	<i>Nm</i>	84	84	84	60	50	84	84	84	84	84	84	84	84	60	50
				<i>in.lb</i>	743	743	743	531	443	743	743	743	743	743	743	743	743	743	531
Max. acceleration torque <sup>b) e)</sup> (max. 1000 cycles per hour)			<i>T</i> <sub>2B</sub>	<i>Nm</i>	70	70	70	60	50	70	70	70	70	70	70	70	70	60	50
				<i>in.lb</i>	620	620	620	531	443	620	620	620	620	620	620	620	620	620	531
Nominal torque (at <i>n</i> <sub>IN</sub> )			<i>T</i> <sub>2N</sub>	<i>Nm</i>	50	50	50	45	40	50	50	50	50	50	50	50	50	45	40
				<i>in.lb</i>	443	443	443	398	354	443	443	443	443	443	443	443	443	443	398
Emergency stop torque <sup>a) b) e)</sup> (permitted 1000 times during the service life of the gearbox)			<i>T</i> <sub>2Not</sub>	<i>Nm</i>	95	115	115	110	100	115	115	115	115	115	115	115	115	110	100
				<i>in.lb</i>	841	1018	1018	974	885	1018	1018	1018	1018	1018	1018	1018	1018	1018	974
Permitted average input speed (at <i>T</i> <sub>2N</sub> and 20 °C ambient temperature) <sup>d)</sup>			<i>n</i> <sub>1N</sub>	<i>n</i> <sub>1T</sub>	2300	2500	2800	2800	2800	3500	3500	3500	3500	3500	3500	3500	3800	4500	4500
Max. input speed			<i>n</i> <sub>1Max</sub>	<i>rpm</i>	7500	7500	7500	7500	7500	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000
Mean no load running torque <sup>b)</sup> (at <i>n</i> <sub>i</sub> = 3000 rpm and 20 °C gearbox temperature)			<i>T</i> <sub>012</sub>	<i>Nm</i>	2.4	2	1.8	2.2	2	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
				<i>in.lb</i>	21	18	16	19	18	2.7	2.7	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
Max. backlash			<i>j</i> <sub>t</sub>	<i>arcmin</i>	Standard ≤ 4														
Torsional rigidity <sup>b)</sup>			<i>C</i> <sub>121</sub>	<i>Nm/arcmin</i>	5	5.5	6	6	6	5.5	5.5	5.5	5.5	5.5	5.5	5.5	6	6	6
				<i>in.lb/arcmin</i>	44	49	53	53	53	49	49	49	49	49	49	49	49	53	53
Max. axial force <sup>c)</sup>			<i>F</i> <sub>2AMax</sub>	<i>N</i>	3400														
				<i>lb<sub>f</sub></i>	765														
Max. lateral force <sup>c)</sup>			<i>F</i> <sub>2QMax</sub>	<i>N</i>	4000														
				<i>lb<sub>f</sub></i>	900														
Max. tilting moment			<i>M</i> <sub>2KMax</sub>	<i>Nm</i>	437														
				<i>in.lb</i>	3868														
Efficiency at full load			<i>η</i>	%	96					94									
Service life <sup>f)</sup>			<i>L</i> <sub>h</sub>	<i>h</i>	> 20000														
Weight (incl. standard adapter plate)			<i>m</i>	<i>kg</i>	4.8					5.4									
				<i>lb<sub>m</sub></i>	11					12									
Operating noise (at reference ratio and reference speed – ratio-specific values available in cymex®)			<i>L</i> <sub>PA</sub>	<i>dB(A)</i>	≤ 66														
Max. permitted housing temperature				°C	+90														
				<i>F</i>	194														
Ambient temperature				°C	0 to +40														
				<i>F</i>	32 to 104														
Lubrication					Lubricated for life														
Direction of rotation					In- and output opposite direction														
Protection class					IP 65														
Metal bellows coupling (recommended product type – validate sizing with cymex®)					BC2 - 00080AA - 022.000 - X														
Bore diameter of coupling on the application side				<i>mm</i>	X = 014.000 - 042.000														
Mass moment of inertia (relates to the drive) Clamping hub diameter [mm]	C	14	<i>J</i> <sub>i</sub>	<i>kgcm²</i>	-	-	-	-	-	0.28	0.27	0.23	0.23	0.2	0.2	0.18	0.18	0.18	0.18
				<i>10<sup>-3</sup> in.lb.s²</i>	-	-	-	-	-	0.25	0.24	0.2	0.2	0.18	0.18	0.16	0.16	0.16	0.16
	E	19	<i>J</i> <sub>i</sub>	<i>kgcm²</i>	1.46	1.19	1.06	0.95	0.9	0.73	0.71	0.68	0.67	0.63	0.62	0.63	0.63	0.63	0.63
				<i>10<sup>-3</sup> in.lb.s²</i>	1.29	1.05	0.94	0.84	0.8	0.65	0.63	0.6	0.59	0.56	0.55	0.56	0.56	0.56	0.56
	H	28	<i>J</i> <sub>i</sub>	<i>kgcm²</i>	2.88	2.61	2.47	2.37	2.31	-	-	-	-	-	-	-	-	-	-
				<i>10<sup>-3</sup> in.lb.s²</i>	2.55	2.31	2.19	2.1	2.04	-	-	-	-	-	-	-	-	-	-

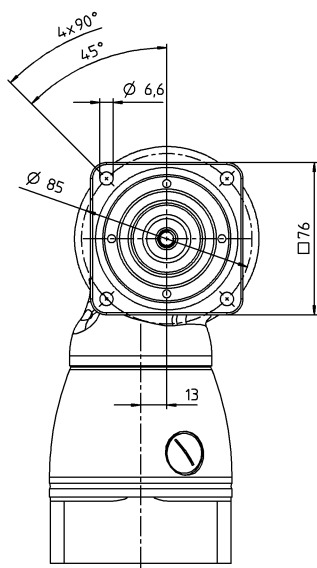
Please use our sizing software cymex<sup>®</sup> for a detailed sizing – [www.wittenstein-cymex.com](http://www.wittenstein-cymex.com)  
Please contact us for optimum sizing at S1 conditions (Continuous operation).

- <sup>a)</sup> At max. 10 %  $F_{2QMax}$
- <sup>b)</sup> Valid for standard clamping hub diameter
- <sup>c)</sup> Refers to center of the output shaft or flange
- <sup>d)</sup> Please reduce input speed at higher ambient temperatures
- <sup>e)</sup> Smooth shaft
- <sup>f)</sup> Please contact us to discuss application-specific service lifetimes

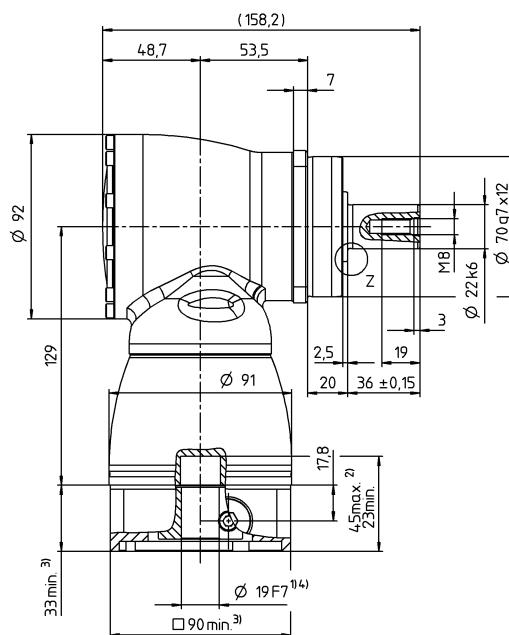
View A

# 1-stage

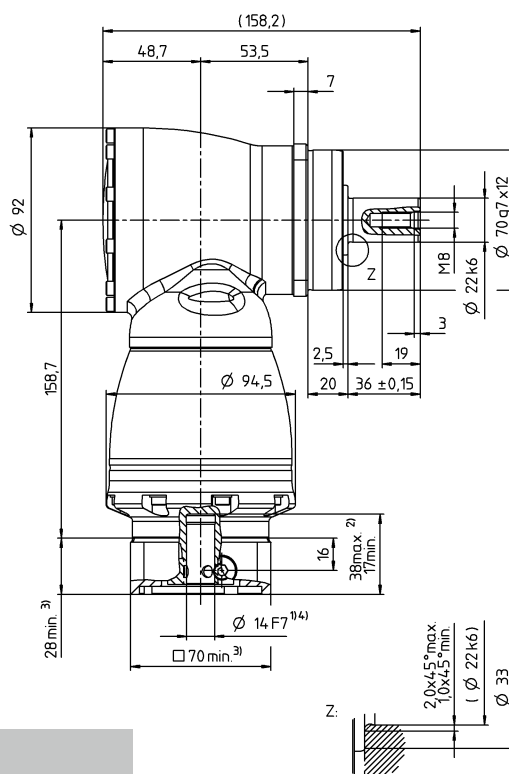
up to 19/28<sup>4)</sup>  
(E<sup>5)</sup>/H) clamping  
hub diameter



← A

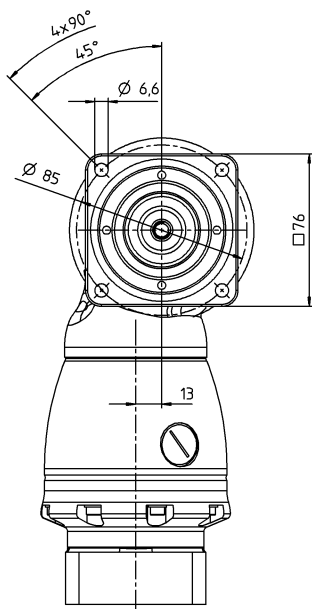


← A



# 2-stage

up to 14/19<sup>4)</sup>  
(C<sup>5)</sup>/E) clamping  
hub diameter

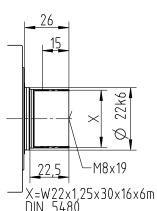
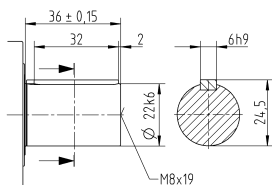


Motor shaft diameter [mm]

## Other output variants

Shaft with key

Splined shaft (DIN 5480)



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

Non-tolerated dimensions are nominal dimensions

<sup>1)</sup> Check motor shaft fit

<sup>2)</sup> Min./Max. permissible motor shaft length. Longer motor shafts are possible, please contact alpha.

<sup>3)</sup> The dimensions depend on the motor

<sup>4)</sup> Smaller motor shaft diameter is compensated by a bushing with a minimum wall thickness of 1 mm

<sup>5)</sup> Standard clamping hub diameter



# SK<sup>+</sup> 100 MF 1-/2-stage

				1-stage					2-stage													
Ratio			<i>i</i>		3	4	5	7	10	12	16	20	25	28	35	40	50	70	100			
Max. torque <sup>a) b) e)</sup>			<i>T</i> <sub>2a</sub>	<i>Nm</i>	204	204	204	145	125	204	204	204	204	204	204	204	204	145	125			
				<i>in.lb</i>	1806	1806	1806	1283	1106	1806	1806	1806	1806	1806	1806	1806	1806	1806	1283	1106		
Max. acceleration torque <sup>b) e)</sup> (max. 1000 cycles per hour)			<i>T</i> <sub>2B</sub>	<i>Nm</i>	170	170	170	145	125	170	170	170	170	170	170	170	170	145	125			
				<i>in.lb</i>	1505	1505	1505	1283	1106	1505	1505	1505	1505	1505	1505	1505	1505	1505	1283	1106		
Nominal torque (at <i>n</i> <sub>IN</sub> )			<i>T</i> <sub>2N</sub>	<i>Nm</i>	100	100	100	90	80	100	100	100	100	100	100	100	100	90	80			
				<i>in.lb</i>	885	885	885	797	708	885	885	885	885	885	885	885	885	885	797	708		
Emergency stop torque <sup>a) b) e)</sup> (permitted 1000 times during the service life of the gearbox)			<i>T</i> <sub>2Not</sub>	<i>Nm</i>	220	260	260	255	250	260	260	260	260	260	260	260	260	255	250			
				<i>in.lb</i>	1947	2301	2301	2257	2213	2301	2301	2301	2301	2301	2301	2301	2301	2301	2257	2213		
Permitted average input speed (at <i>T</i> <sub>2N</sub> and 20 °C ambient temperature) <sup>d)</sup>			<i>n</i> <sub>1N</sub>	<i>n</i> <sub>1T</sub>	2200	2400	2700	2500	2500	3100	3100	3100	3100	3100	3100	3100	3500	4200	4200			
Max. input speed			<i>n</i> <sub>1Max</sub>	<i>rpm</i>	5500	5500	5500	5500	5500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500			
Mean no load running torque <sup>b)</sup> (at <i>n</i> <sub>1</sub> = 3000 rpm and 20 °C gearbox temperature)			<i>T</i> <sub>012</sub>	<i>Nm</i>	3.9	3.1	2.9	4.1	3.3	0.6	0.6	0.5	0.4	0.4	0.3	0.2	0.2	0.2	0.2			
				<i>in.lb</i>	35	27	26	36	29	5.3	5.3	4.4	3.5	3.5	2.7	1.8	1.8	1.8	1.8	1.8		
Max. backlash			<i>j</i> <sub>t</sub>	<i>arcmin</i>	Standard ≤ 4																	
Torsional rigidity <sup>b)</sup>			<i>C</i> <sub>t21</sub>	<i>Nm/arcmin</i>	10	11	13	13	13	11	11	11	11	11	11	11	13	13	13			
				<i>in.lb/arcmin</i>	89	97	115	115	115	97	97	97	97	97	97	97	97	115	115	115		
Max. axial force <sup>c)</sup>			<i>F</i> <sub>2AMax</sub>	<i>N</i>	5700																	
				<i>lb<sub>f</sub></i>	1283																	
Max. lateral force <sup>c)</sup>			<i>F</i> <sub>2QMax</sub>	<i>N</i>	6300																	
				<i>lb<sub>f</sub></i>	1418																	
Max. tilting moment			<i>M</i> <sub>2KMax</sub>	<i>Nm</i>	833																	
				<i>in.lb</i>	7373																	
Efficiency at full load			<i>η</i>	%	96					94												
Service life <sup>f)</sup>			<i>L</i> <sub>h</sub>	<i>h</i>	> 20000																	
Weight (incl. standard adapter plate)			<i>m</i>	<i>kg</i>	9.3					10												
				<i>lb<sub>m</sub></i>	21					22												
Operating noise (at reference ratio and reference speed – ratio-specific values available in cymex®)			<i>L</i> <sub>PA</sub>	<i>dB(A)</i>	≤ 66																	
Max. permitted housing temperature				°C	+90																	
				<i>F</i>	194																	
Ambient temperature				°C	0 to +40																	
				<i>F</i>	32 to 104																	
Lubrication					Lubricated for life																	
Direction of rotation					In- and output opposite direction																	
Protection class					IP 65																	
Metal bellows coupling (recommended product type – validate sizing with cymex®)					BC2 - 00200AA - 032.000 - X																	
Bore diameter of coupling on the application side				<i>mm</i>	X = 022.000 - 045.000																	
Mass moment of inertia (relates to the drive)  Clamping hub diameter [mm]				E	19	<i>J</i> <sub>i</sub>	<i>kgcm²</i>	-	-	-	-	-	1.02	0.97	0.86	0.84	0.75	0.74	0.69	0.69	0.68	0.68
							<i>10<sup>-3</sup> in.lb.s²</i>	-	-	-	-	-	0.9	0.86	0.76	0.74	0.66	0.65	0.61	0.61	0.6	0.6
				G	24	<i>J</i> <sub>i</sub>	<i>kgcm²</i>	-	-	-	-	-	2.59	2.54	2.42	2.4	2.31	2.3	2.26	2.25	2.25	2.25
							<i>10<sup>-3</sup> in.lb.s²</i>	-	-	-	-	-	2.29	2.25	2.14	2.12	2.04	2.04	2	1.99	1.99	1.99
				H	28	<i>J</i> <sub>i</sub>	<i>kgcm²</i>	4.64	3.8	3.34	2.98	2.79	-	-	-	-	-	-	-	-	-	-
							<i>10<sup>-3</sup> in.lb.s²</i>	4.11	3.36	2.96	2.64	2.47	-	-	-	-	-	-	-	-	-	-
				K	38	<i>J</i> <sub>i</sub>	<i>kgcm²</i>	11.9	11	10.6	10.2	10	-	-	-	-	-	-	-	-	-	-
							<i>10<sup>-3</sup> in.lb.s²</i>	10.53	9.74	9.38	9.03	8.85	-	-	-	-	-	-	-	-	-	-

Please use our sizing software cymex<sup>®</sup> for a detailed sizing – [www.wittenstein-cymex.com](http://www.wittenstein-cymex.com)  
Please contact us for optimum sizing at S1 conditions (Continuous operation).

<sup>a)</sup> At max. 10 %  $F_{2QMax}$

<sup>b)</sup> Valid for standard clamping hub diameter

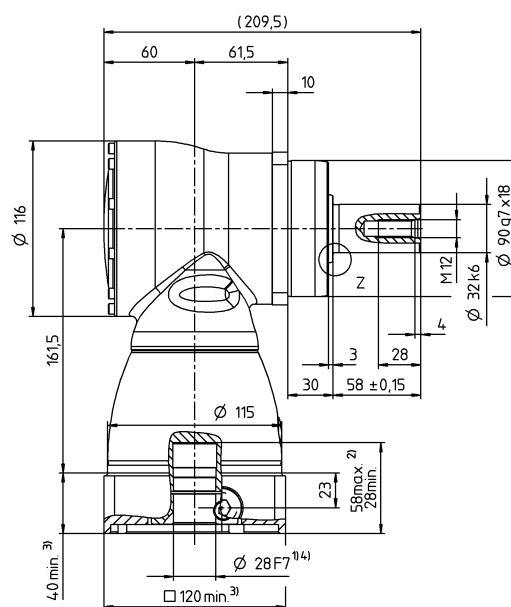
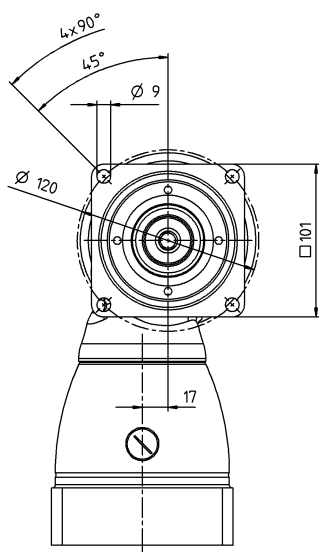
<sup>c)</sup> Refers to center of the output shaft or flange

<sup>d)</sup> Please reduce input speed at higher ambient temperatures

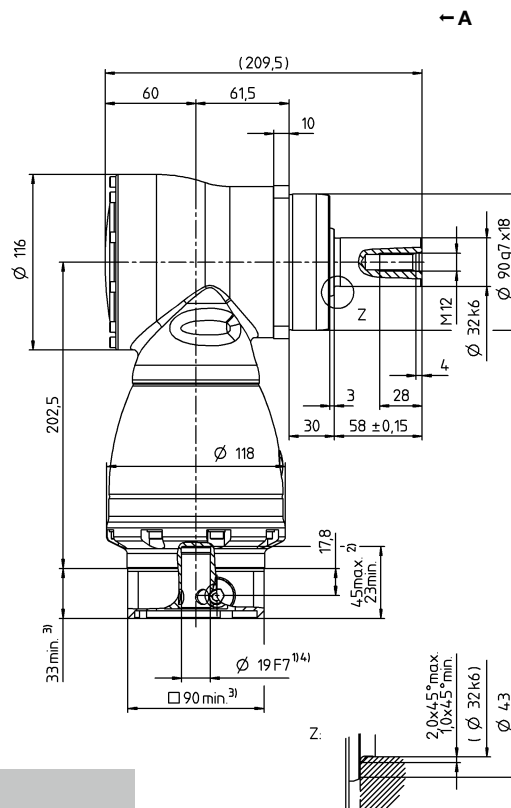
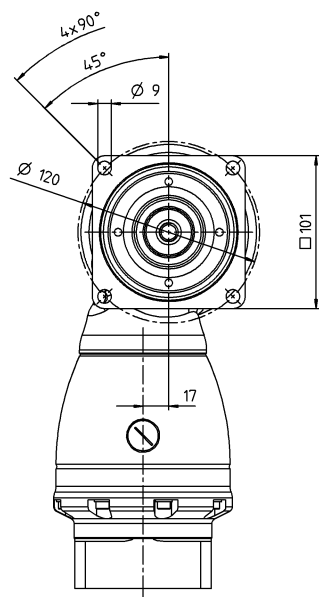
<sup>e)</sup> Smooth shaft

<sup>f)</sup> Please contact us to discuss application-specific service lifetimes

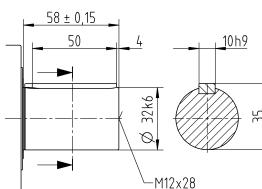
up to 28/38 <sup>4)</sup>  
(H<sup>5</sup>)/K) clamping  
hub diameter



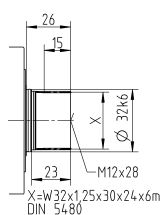
up to 19/24 <sup>4)</sup>  
(E<sup>5)</sup>/G) clamping  
hub diameter



Shaft with key



Splined shaft (DIN 5480)



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

Non-tolerated dimensions are nominal dimensions

- 1) Check motor shaft fit

2) Min./Max. permissible motor shaft length. Longer motor shafts are possible, please contact alpha.

3) The dimensions depend on the motor

4) Smaller motor shaft diameter is compensated by a bushing with a minimum wall thickness of 1 mm

5) Standard clamping hub diameter

SK<sup>+</sup>

# SK<sup>+</sup> 140 MF 1-/2-stage

				1-stage					2-stage											
Ratio			<i>i</i>		3	4	5	7	10	12	16	20	25	28	35	40	50	70	100	
Max. torque <sup>a) b) e)</sup>			<i>T</i> <sub>2a</sub>	<i>Nm</i>	360	360	360	250	210	360	360	360	360	360	360	360	360	250	210	
				<i>in.lb</i>	3186	3186	3186	2213	1859	3186	3186	3186	3186	3186	3186	3186	3186	3186	2213	1859
Max. acceleration torque <sup>b) e)</sup> (max. 1000 cycles per hour)			<i>T</i> <sub>2B</sub>	<i>Nm</i>	300	300	300	250	210	300	300	300	300	300	300	300	300	250	210	
				<i>in.lb</i>	2655	2655	2655	2213	1859	2655	2655	2655	2655	2655	2655	2655	2655	2655	2213	1859
Nominal torque (at <i>n</i> <sub>N</sub> )			<i>T</i> <sub>2N</sub>	<i>Nm</i>	190	190	190	175	160	190	190	190	190	190	190	190	190	175	160	
				<i>in.lb</i>	1682	1682	1682	1549	1416	1682	1682	1682	1682	1682	1682	1682	1682	1682	1549	1416
Emergency stop torque <sup>a) b) e)</sup> (permitted 1000 times during the service life of the gearbox)			<i>T</i> <sub>2Not</sub>	<i>Nm</i>	400	500	500	450	400	500	500	500	500	500	500	500	500	450	400	
				<i>in.lb</i>	3540	4425	4425	3983	3540	4425	4425	4425	4425	4425	4425	4425	4425	4425	3983	3540
Permitted average input speed (at <i>T</i> <sub>2N</sub> and 20 °C ambient temperature) <sup>d)</sup>			<i>n</i> <sub>1N</sub>	<i>n</i> <sub>1T</sub>	1900	2000	2200	2000	2000	2900	2900	2900	2900	2900	2900	2900	3200	3200	3900	
Max. input speed			<i>n</i> <sub>1Max</sub>	<i>rpm</i>	5000	5000	5000	5000	5000	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	
Mean no load running torque <sup>b)</sup> (at <i>n</i> <sub>i</sub> = 3000 rpm and 20 °C gearbox temperature)			<i>T</i> <sub>012</sub>	<i>Nm</i>	9.3	6.9	7.1	9.7	7.1	1.4	0.9	0.7	0.5	0.5	0.4	0.4	0.3	0.3	0.3	
				<i>in.lb</i>	82	61	63	86	63	12	8.0	6.2	4.4	4.4	3.5	3.5	2.7	2.7	2.7	2.7
Max. backlash			<i>j</i> <sub>t</sub>	<i>arcmin</i>	Standard ≤ 4															
Torsional rigidity <sup>b)</sup>			<i>C</i> <sub>t21</sub>	<i>Nm/arcmin</i>	27	30	32	32	32	29	29	29	29	29	29	29	29	31	31	31
				<i>in.lb/arcmin</i>	239	266	283	283	283	257	257	257	257	257	257	257	257	257	274	274
Max. axial force <sup>c)</sup>			<i>F</i> <sub>2AMax</sub>	<i>N</i>	9900															
				<i>lb<sub>f</sub></i>	2228															
Max. lateral force <sup>c)</sup>			<i>F</i> <sub>2QMax</sub>	<i>N</i>	9500															
				<i>lb<sub>f</sub></i>	2138															
Max. tilting moment			<i>M</i> <sub>2KMax</sub>	<i>Nm</i>	1692															
				<i>in.lb</i>	14976															
Efficiency at full load			<i>η</i>	%	96					94										
Service life <sup>f)</sup>			<i>L</i> <sub>h</sub>	<i>h</i>	> 20000															
Weight (incl. standard adapter plate)			<i>m</i>	<i>kg</i>	22.6					25										
				<i>lb<sub>m</sub></i>	50					55										
Operating noise (at reference ratio and reference speed – ratio-specific values available in cymex®)			<i>L</i> <sub>PA</sub>	<i>dB(A)</i>	≤ 68															
Max. permitted housing temperature				°C	+90															
				<i>F</i>	194															
Ambient temperature				°C	0 to +40															
				<i>F</i>	32 to 104															
Lubrication					Lubricated for life															
Direction of rotation					In- and output opposite direction															
Protection class					IP 65															
Metal bellows coupling (recommended product type – validate sizing with cymex®)					BC2 - 00300AA - 040.000 - X															
Bore diameter of coupling on the application side				<i>mm</i>	X = 024.000 - 060.000															
Mass moment of inertia (relates to the drive)  Clamping hub diameter [mm]		G	24	<i>J</i> <sub>i</sub>	<i>kgcm<sup>2</sup></i>	-	-	-	-	-	4.21	3.85	3.28	3.17	2.78	2.73	2.48	2.46	2.43	2.42
					<i>10<sup>-3</sup> in.lb.s<sup>2</sup></i>	-	-	-	-	-	3.73	3.41	2.9	2.81	2.46	2.42	2.19	2.18	2.15	2.14
		K	38	<i>J</i> <sub>i</sub>	<i>kgcm<sup>2</sup></i>	25	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
					<i>10<sup>-3</sup> in.lb.s<sup>2</sup></i>	22.13	16.9	14.43	12.48	11.33	9.82	9.47	9.03	8.94	8.58	8.53	8.31	8.29	8.27	8.26

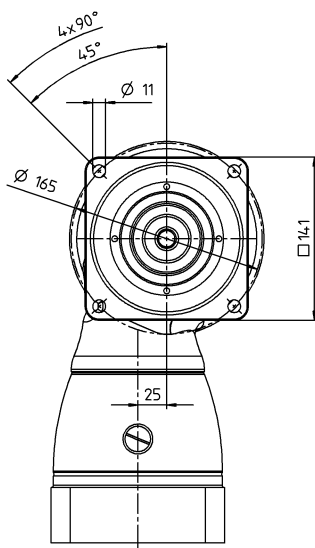
Please use our sizing software cymex<sup>®</sup> for a detailed sizing – [www.wittenstein-cymex.com](http://www.wittenstein-cymex.com)  
Please contact us for optimum sizing at S1 conditions (Continuous operation).

- <sup>a)</sup> At max. 10 %  $F_{2QMax}$
- <sup>b)</sup> Valid for standard clamping hub diameter
- <sup>c)</sup> Refers to center of the output shaft or flange
- <sup>d)</sup> Please reduce input speed at higher ambient temperatures
- <sup>e)</sup> Smooth shaft
- <sup>f)</sup> Please contact us to discuss application-specific service lifetimes

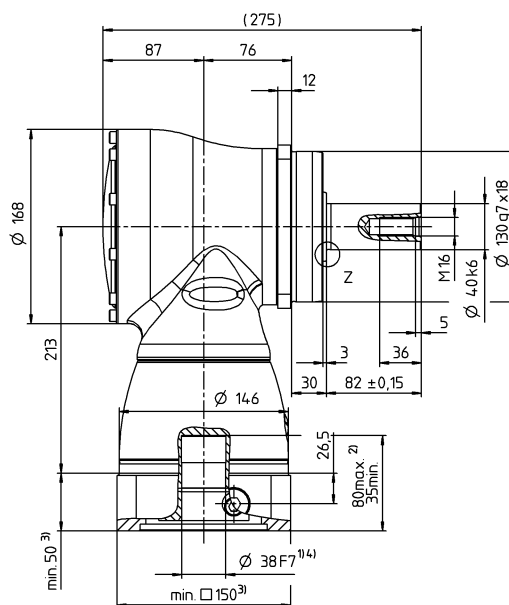
View A

# 1-stage

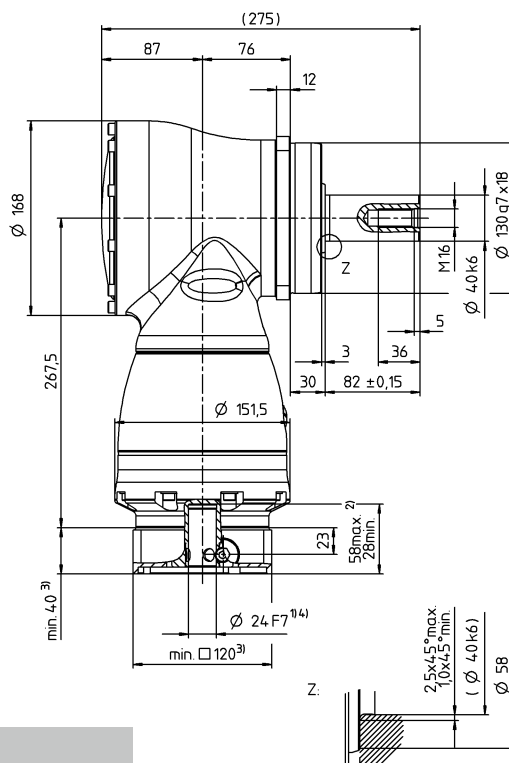
up to 38<sup>4)</sup> (K)<sup>5)</sup>  
clamping hub diameter



← A



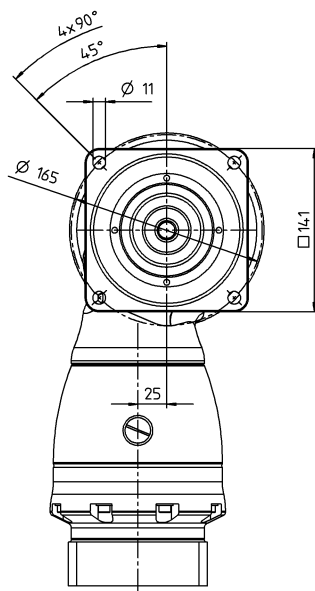
← A



Z:

# 2-stage

up to 24/38<sup>4)</sup>  
(G<sup>5)</sup>/K) clamping  
hub diameter

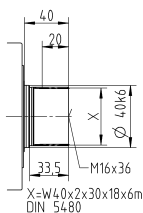
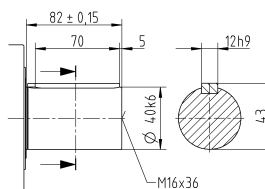


Motor shaft diameter [mm]

## Other output variants

Shaft with key

Splined shaft (DIN 5480)



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

Non-tolerated dimensions are nominal dimensions

<sup>1)</sup> Check motor shaft fit

<sup>2)</sup> Min./Max. permissible motor shaft length. Longer motor shafts are possible, please contact alpha.

<sup>3)</sup> The dimensions depend on the motor

<sup>4)</sup> Smaller motor shaft diameter is compensated by a bushing with a minimum wall thickness of 1 mm

<sup>5)</sup> Standard clamping hub diameter

# SK<sup>+</sup> 180 MF 1-/2-stage

				1-stage					2-stage											
Ratio			<i>i</i>		3	4	5	7	10	12	16	20	25	28	35	40	50	70	100	
Max. torque <sup>a) b) e)</sup>			<i>T</i> <sub>2a</sub>	<i>Nm</i>	768	768	768	550	470	768	768	768	768	768	768	768	768	550	470	
				<i>in.lb</i>	6797	6797	6797	4868	4160	6797	6797	6797	6797	6797	6797	6797	6797	6797	4868	4160
Max. acceleration torque <sup>b) e)</sup> (max. 1000 cycles per hour)			<i>T</i> <sub>2B</sub>	<i>Nm</i>	640	640	640	550	470	640	640	640	640	640	640	640	640	550	470	
				<i>in.lb</i>	5665	5665	5665	4868	4160	5665	5665	5665	5665	5665	5665	5665	5665	5665	4868	4160
Nominal torque (at <i>n</i> <sub>N</sub> )			<i>T</i> <sub>2N</sub>	<i>Nm</i>	400	400	400	380	360	400	400	400	400	400	400	400	400	380	360	
				<i>in.lb</i>	3540	3540	3540	3363	3186	3540	3540	3540	3540	3540	3540	3540	3540	3540	3363	3186
Emergency stop torque <sup>a) b) e)</sup> (permitted 1000 times during the service life of the gearbox)			<i>T</i> <sub>2Not</sub>	<i>Nm</i>	900	1050	1050	970	900	1050	1050	1050	1050	1050	1050	1050	1050	970	900	
				<i>in.lb</i>	7966	9293	9293	8585	7966	9293	9293	9293	9293	9293	9293	9293	9293	9293	8585	7966
Permitted average input speed (at <i>T</i> <sub>2N</sub> and 20 °C ambient temperature) <sup>d)</sup>			<i>n</i> <sub>1N</sub>	<i>n</i> <sub>1T</sub>	1600	1800	2000	1800	1800	2700	2700	2700	2700	2700	2700	2700	2900	3200	3400	
Max. input speed			<i>n</i> <sub>1Max</sub>	<i>rpm</i>	4500	4500	4500	4500	4500	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	
Mean no load running torque <sup>b)</sup> (at <i>n</i> <sub>i</sub> = 3000 rpm and 20 °C gearbox temperature)			<i>T</i> <sub>012</sub>	<i>Nm</i>	19	16	14	17	14	3	2.3	1.8	1.6	1.3	1.2	0.9	0.9	0.9	0.9	
				<i>in.lb</i>	168	142	124	150	124	27	20	16	14	12	11	8.0	8.0	8.0	8.0	
Max. backlash			<i>j</i> <sub>t</sub>	<i>arcmin</i>	Standard ≤ 4															
Torsional rigidity <sup>b)</sup>			<i>C</i> <sub>t21</sub>	<i>Nm/arcmin</i>	64	71	79	78	77	71	71	71	71	71	71	71	71	78	78	78
				<i>in.lb/arcmin</i>	566	628	699	690	682	628	628	628	628	628	628	628	628	628	690	690
Max. axial force <sup>c)</sup>			<i>F</i> <sub>2AMax</sub>	<i>N</i>	14200															
				<i>lb<sub>f</sub></i>	3195															
Max. lateral force <sup>c)</sup>			<i>F</i> <sub>2QMax</sub>	<i>N</i>	14700															
				<i>lb<sub>f</sub></i>	3308															
Max. tilting moment			<i>M</i> <sub>2KMax</sub>	<i>Nm</i>	3213															
				<i>in.lb</i>	28438															
Efficiency at full load			<i>η</i>	%	96					94										
Service life <sup>f)</sup>			<i>L</i> <sub>h</sub>	<i>h</i>	> 20000															
Weight (incl. standard adapter plate)			<i>m</i>	<i>kg</i>	45.4					48										
				<i>lb<sub>m</sub></i>	100					106										
Operating noise (at reference ratio and reference speed – ratio-specific values available in cymex®)			<i>L</i> <sub>PA</sub>	<i>dB(A)</i>	≤ 68															
Max. permitted housing temperature				°C	+90															
				<i>F</i>	194															
Ambient temperature				°C	0 to +40															
				<i>F</i>	32 to 104															
Lubrication					Lubricated for life															
Direction of rotation					In- and output opposite direction															
Protection class					IP 65															
Metal bellows coupling (recommended product type – validate sizing with cymex®)					BC2 - 00800AA - 055.000 - X															
				<i>mm</i>	X = 040.000 - 075.000															
Mass moment of inertia (relates to the drive)		K 38	<i>J</i> <sub>i</sub>	<i>kgcm<sup>2</sup></i>	-	-	-	-	-	15.3	14	12.3	12	10.9	10.7	10.1	10	9.95	9.91	
				<i>10<sup>-3</sup> in.lb.s<sup>2</sup></i>	-	-	-	-	-	13.54	12.39	10.89	10.62	9.65	9.47	8.94	8.85	8.81	8.77	
Clamping hub diameter [mm]		M 48	<i>J</i> <sub>i</sub>	<i>kgcm<sup>2</sup></i>	73.3	51.6	42.1	34	29.7	30	28.7	27.1	26.7	25.6	25.4	24.8	24.7	24.7	24.6	
				<i>10<sup>-3</sup> in.lb.s<sup>2</sup></i>	64.87	45.67	37.26	30.09	26.28	26.55	25.4	23.98	23.63	22.66	22.48	21.95	21.86	21.86	21.77	

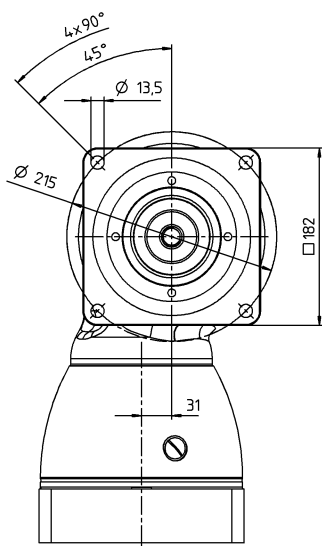
Please use our sizing software cymex<sup>®</sup> for a detailed sizing – [www.wittenstein-cymex.com](http://www.wittenstein-cymex.com)  
Please contact us for optimum sizing at S1 conditions (Continuous operation).

- <sup>a)</sup> At max. 10 %  $F_{2QMax}$
- <sup>b)</sup> Valid for standard clamping hub diameter
- <sup>c)</sup> Refers to center of the output shaft or flange
- <sup>d)</sup> Please reduce input speed at higher ambient temperatures
- <sup>e)</sup> Smooth shaft
- <sup>f)</sup> Please contact us to discuss application-specific service lifetimes

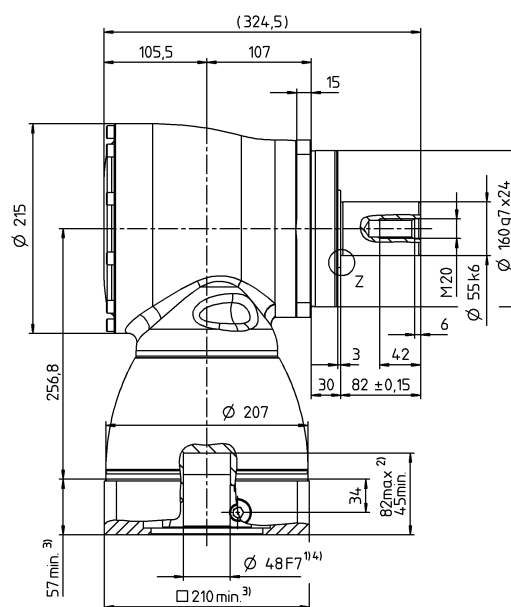
View A

# 1-stage

up to 48<sup>4)</sup> (M)<sup>5)</sup>  
clamping hub  
diameter

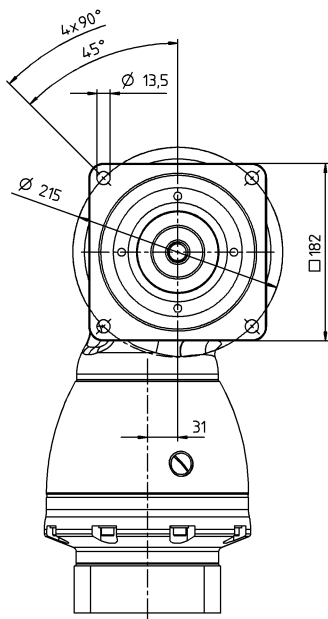


← A

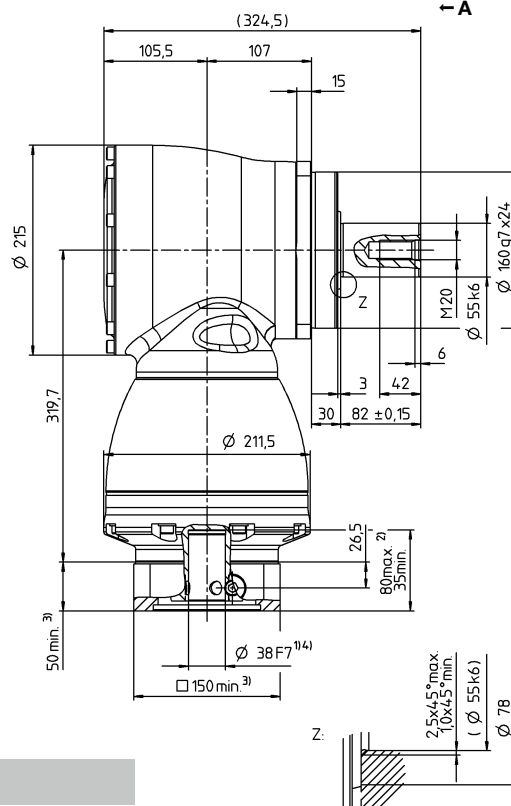


# 2-stage

up to 38/48<sup>4)</sup>  
(K<sup>5)</sup>/M) clamping  
hub diameter



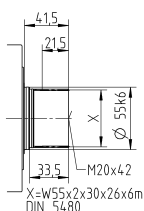
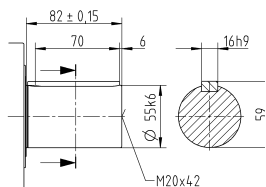
← A



## Other output variants

Shaft with key

Splined shaft (DIN 5480)



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

Non-tolerated dimensions are nominal dimensions

<sup>1)</sup> Check motor shaft fit

<sup>2)</sup> Min./Max. permissible motor shaft length. Longer motor shafts are possible, please contact alpha.

<sup>3)</sup> The dimensions depend on the motor

<sup>4)</sup> Smaller motor shaft diameter is compensated by a bushing with a minimum wall thickness of 1 mm

<sup>5)</sup> Standard clamping hub diameter

# SPK+ 075 MF 2-stage

				2-stage									
Ratio	<i>i</i>			12	16	20	25	28	35	40	50	70	100
Max. torque <sup>a) b) e)</sup>	$T_{2a}$	<i>Nm</i>		144	144	176	176	176	176	80	100	140	152
		<i>in.lb</i>		1275	1275	1558	1558	1558	1558	708	885	1239	1345
Max. acceleration torque <sup>b) e)</sup> (max. 1000 cycles per hour)	$T_{2B}$	<i>Nm</i>		120	120	132	132	132	132	80	100	132	114
		<i>in.lb</i>		1062	1062	1168	1168	1168	1168	708	885	1168	1009
Nominal torque (at $n_{IN}$ )	$T_{2N}$	<i>Nm</i>		75	75	75	75	75	75	60	75	75	52
		<i>in.lb</i>		664	664	664	664	664	664	531	664	664	460
Emergency stop torque <sup>a) b) e)</sup> (permitted 1000 times during the service life of the gearbox)	$T_{2Not}$	<i>Nm</i>		160	200	250	250	250	250	160	200	250	250
		<i>in.lb</i>		1416	1770	2213	2213	2213	2213	1416	1770	2213	2213
Permitted average input speed (at $T_{2N}$ and 20 °C ambient temperature) <sup>d)</sup>	$n_{1N}$	$n_{1T}$		2000	2400	2400	2700	2400	2500	2500	2500	2500	2500
Max. input speed	$n_{1Max}$	<i>rpm</i>		7500	7500	7500	7500	7500	7500	7500	7500	7500	7500
Mean no load running torque <sup>b)</sup> (at $n_i = 3000$ rpm and 20 °C gearbox temperature)	$T_{012}$	<i>Nm</i>		1.5	1.4	1.3	1.2	1.3	1.3	1.3	1.3	1.4	1.4
		<i>in.lb</i>		13	12	12	11	12	12	12	12	12	12
Max. backlash	$j_t$	<i>arcmin</i>		Standard ≤ 5 / Reduced ≤ 3									
Torsional rigidity <sup>b)</sup>	$C_{t21}$	<i>Nm/arcmin</i>		10	10	10	10	10	10	10	10	10	10
		<i>in.lb/arcmin</i>		89	89	89	89	89	89	89	89	89	89
Max. axial force <sup>c)</sup>	$F_{2AMax}$	<i>N</i>		3350									
		<i>lb<sub>f</sub></i>		754									
Max. lateral force <sup>c)</sup>	$F_{2QMax}$	<i>N</i>		4200									
		<i>lb<sub>f</sub></i>		945									
Max. tilting moment	$M_{2KMax}$	<i>Nm</i>		260									
		<i>in.lb</i>		2301									
Efficiency at full load	$\eta$	%		94									
Service life <sup>f)</sup>	$L_h$	<i>h</i>		> 20000									
Weight (incl. standard adapter plate)	<i>m</i>	<i>kg</i>		5.2									
		<i>lb<sub>m</sub></i>		11									
Operating noise (at reference ratio and reference speed – ratio-specific values available in cymex <sup>®</sup> )	$L_{PA}$	<i>dB(A)</i>		≤ 66									
Max. permitted housing temperature		°C		+90									
		<i>F</i>		194									
Ambient temperature		°C		0 to +40									
		<i>F</i>		32 to 104									
Lubrication				Lubricated for life									
Direction of rotation				In- and output opposite direction									
Protection class				IP 65									
Metal bellows coupling (recommended product type – validate sizing with cymex <sup>®</sup> )				BC2 - 00150AA - 022.000 - X									
Bore diameter of coupling on the application side		<i>mm</i>		X = 019.000 - 042.000									
Mass moment of inertia (relates to the drive) Clamping hub diameter [mm]	C	14	$J_1$	<i>kgcm<sup>2</sup></i>	0.54	0.45	0.44	0.4	0.44	0.36	0.35	0.34	0.34
				<i>10<sup>-3</sup> in.lb.s<sup>2</sup></i>	0.48	0.4	0.39	0.35	0.39	0.32	0.31	0.3	0.3
	E	19	$J_1$	<i>kgcm<sup>2</sup></i>	0.89	0.8	0.79	0.75	0.79	0.71	0.7	0.7	0.69
				<i>10<sup>-3</sup> in.lb.s<sup>2</sup></i>	0.79	0.71	0.7	0.66	0.7	0.63	0.62	0.62	0.61

Please use our sizing software cymex<sup>®</sup> for a detailed sizing – [www.wittenstein-cymex.com](http://www.wittenstein-cymex.com)  
Please contact us for optimum sizing at S1 conditions (Continuous operation).

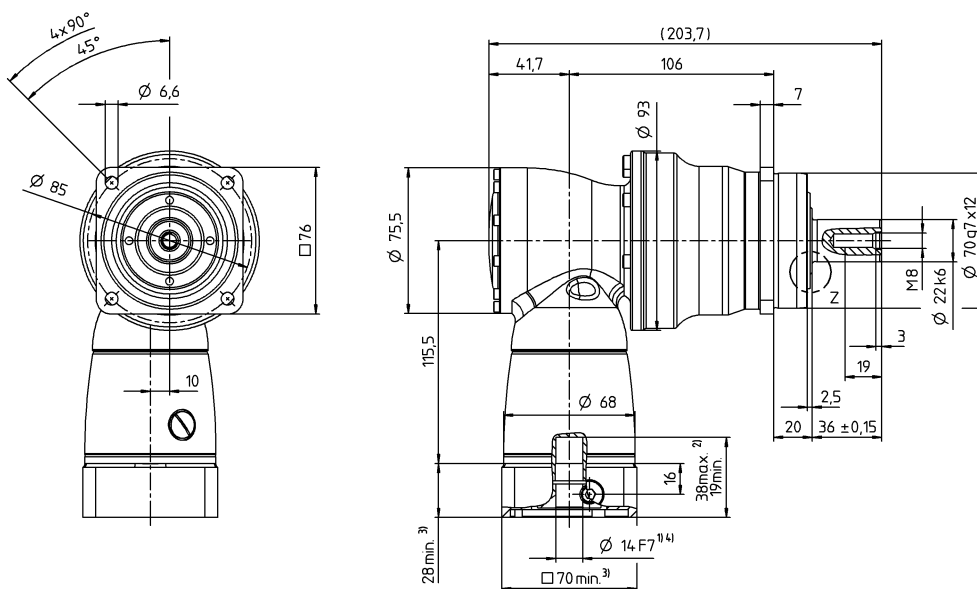
- <sup>a)</sup> At max. 10 %  $F_{2QMax}$
- <sup>b)</sup> Valid for standard clamping hub diameter
- <sup>c)</sup> Refers to center of the output shaft or flange
- <sup>d)</sup> Please reduce input speed at higher ambient temperatures
- <sup>e)</sup> Smooth shaft
- <sup>f)</sup> Please contact us to discuss application-specific service lifetimes



View A

Motor shaft diameter [mm]

2-stage

up to 14/19<sup>4)</sup>  
(C<sup>5)</sup>/E) clamping  
hub diameter


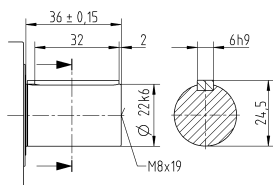
← A

Hypoid gearboxes

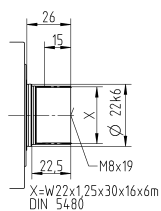
SPK

## Other output variants

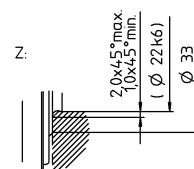
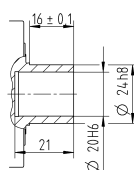
Shaft with key



Splined shaft (DIN 5480)



Shaft mounted



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

Non-tolerated dimensions are nominal dimensions

<sup>1)</sup> Check motor shaft fit

<sup>2)</sup> Min./Max. permissible motor shaft length. Longer motor shafts are possible, please contact alpha.

<sup>3)</sup> The dimensions depend on the motor

<sup>4)</sup> Smaller motor shaft diameter is compensated by a bushing with a minimum wall thickness of 1 mm

<sup>5)</sup> Standard clamping hub diameter

# SPK+ 075 MF 3-stage

				3-stage														
Ratio			<i>i</i>		64	84	100	125	140	175	200	250	280	350	400	500	700	1000
Max. torque <sup>a) b) e)</sup>			<i>T</i> <sub>2a</sub>	<i>Nm</i>	144	144	176	176	176	176	176	176	176	176	80	100	140	152
				<i>in.lb</i>	1275	1275	1558	1558	1558	1558	1558	1558	1558	1558	1558	708	885	1239
Max. acceleration torque <sup>b) e)</sup> (max. 1000 cycles per hour)			<i>T</i> <sub>2B</sub>	<i>Nm</i>	120	120	132	132	132	132	132	132	132	80	100	132	114	
				<i>in.lb</i>	1062	1062	1168	1168	1168	1168	1168	1168	1168	1168	1168	708	885	1168
Nominal torque (at <i>n</i> <sub>1N</sub> )			<i>T</i> <sub>2N</sub>	<i>Nm</i>	75	75	75	75	75	75	75	75	75	60	75	75	52	
				<i>in.lb</i>	664	664	664	664	664	664	664	664	664	664	664	531	664	664
Emergency stop torque <sup>a) b) e)</sup> (permitted 1000 times during the service life of the gearbox)			<i>T</i> <sub>2Not</sub>	<i>Nm</i>	200	160	250	250	250	250	250	250	250	160	200	250	250	
				<i>in.lb</i>	1770	1416	2213	2213	2213	2213	2213	2213	2213	2213	2213	1416	1770	2213
Permitted average input speed (at <i>T</i> <sub>2N</sub> and 20 °C ambient temperature) <sup>d)</sup>			<i>n</i> <sub>1N</sub>	<i>n</i> <sub>1T</sub>	4400	4400	4400	4400	4400	4400	4400	4800	4400	4800	5500	5500	5500	5500
Max. input speed			<i>n</i> <sub>1Max</sub>	<i>rpm</i>	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000
Mean no load running torque <sup>b)</sup> (at <i>n</i> <sub>1</sub> = 3000 rpm and 20 °C gearbox temperature)			<i>T</i> <sub>012</sub>	<i>Nm</i>	0.45	0.45	0.45	0.45	0.45	0.45	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
				<i>in.lb</i>	4.0	4.0	4.0	4.0	4.0	4.0	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7
Max. backlash			<i>j</i> <sub>t</sub>	<i>arcmin</i>	Standard ≤ 5 / Reduced ≤ 3													
Torsional rigidity <sup>b)</sup>			<i>C</i> <sub>t21</sub>	<i>Nm/arcmin</i>	10	10	10	10	10	10	10	10	10	10	10	10	10	10
				<i>in.lb/arcmin</i>	89	89	89	89	89	89	89	89	89	89	89	89	89	89
Max. axial force <sup>c)</sup>			<i>F</i> <sub>2AMax</sub>	<i>N</i>	3350													
				<i>lb<sub>f</sub></i>	754													
Max. lateral force <sup>c)</sup>			<i>F</i> <sub>2QMax</sub>	<i>N</i>	4200													
				<i>lb<sub>f</sub></i>	945													
Max. tilting moment			<i>M</i> <sub>2KMax</sub>	<i>Nm</i>	260													
				<i>in.lb</i>	2301													
Efficiency at full load			<i>η</i>	%	92													
Service life <sup>f)</sup>			<i>L</i> <sub>h</sub>	<i>h</i>	> 20000													
Weight (incl. standard adapter plate)			<i>m</i>	<i>kg</i>	5.5													
				<i>lb<sub>m</sub></i>	12													
Operating noise (at reference ratio and reference speed – ratio-specific values available in cymex®)			<i>L</i> <sub>PA</sub>	<i>dB(A)</i>	≤ 66													
Max. permitted housing temperature				°C	+90													
				<i>F</i>	194													
Ambient temperature				°C	0 to +40													
				<i>F</i>	32 to 104													
Lubrication					Lubricated for life													
Direction of rotation					In- and output opposite direction													
Protection class					IP 65													
Metal bellows coupling (recommended product type – validate sizing with cymex®)					BC2 - 00150AA - 022.000 - X													
Bore diameter of coupling on the application side				<i>mm</i>	X = 019.000 - 042.000													
Mass moment of inertia (relates to the drive) Clamping hub diameter [mm]	B	11	<i>J</i> <sub>1</sub>	<i>kgcm<sup>2</sup></i>	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
				<i>10<sup>-3</sup> in.lb.s<sup>2</sup></i>	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	<i>J</i> <sub>1</sub>	<i>kgcm<sup>2</sup></i>	0.2	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
<i>10<sup>-3</sup> in.lb.s<sup>2</sup></i>				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	

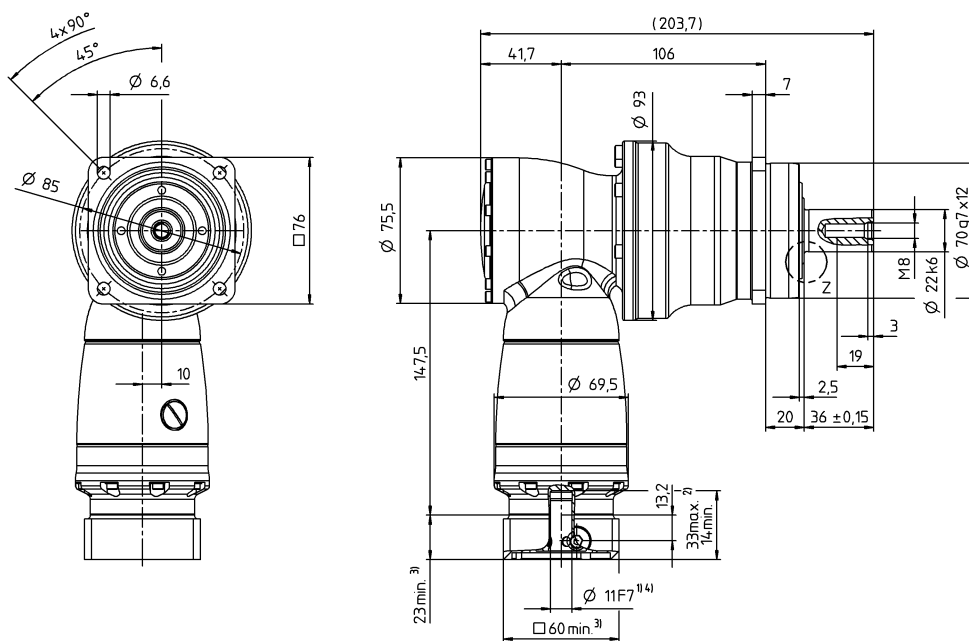
Please use our sizing software cymex<sup>®</sup> for a detailed sizing – [www.wittenstein-cymex.com](http://www.wittenstein-cymex.com)  
Please contact us for optimum sizing at S1 conditions (Continuous operation).

- <sup>a)</sup> At max. 10 %  $F_{2QMax}$
- <sup>b)</sup> Valid for standard clamping hub diameter
- <sup>c)</sup> Refers to center of the output shaft or flange
- <sup>d)</sup> Please reduce input speed at higher ambient temperatures
- <sup>e)</sup> Smooth shaft
- <sup>f)</sup> Please contact us to discuss application-specific service lifetimes

View A

Motor shaft diameter [mm]

3-stage

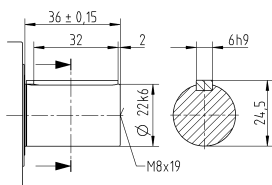
up to 11/14<sup>4)</sup>  
(B<sup>5)</sup>/C) clamping  
hub diameter


Hypoid gearboxes

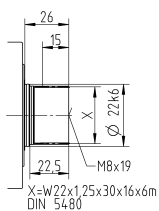
SPK

## Other output variants

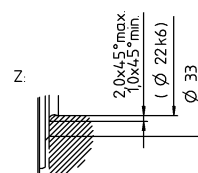
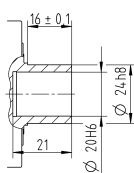
Shaft with key



Splined shaft (DIN 5480)



Shaft mounted



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

Non-tolerated dimensions are nominal dimensions  
<sup>1)</sup> Check motor shaft fit

<sup>2)</sup> Min./Max. permissible motor shaft length. Longer motor shafts are possible, please contact alpha.

<sup>3)</sup> The dimensions depend on the motor

<sup>4)</sup> Smaller motor shaft diameter is compensated by a bushing with a minimum wall thickness of 1 mm

<sup>5)</sup> Standard clamping hub diameter

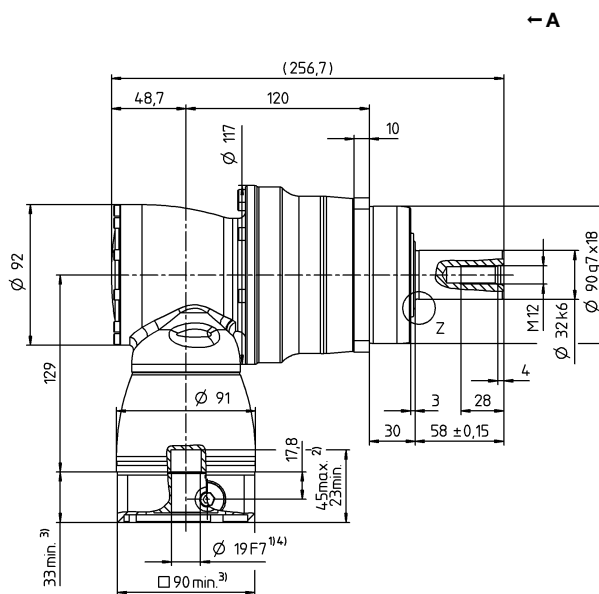
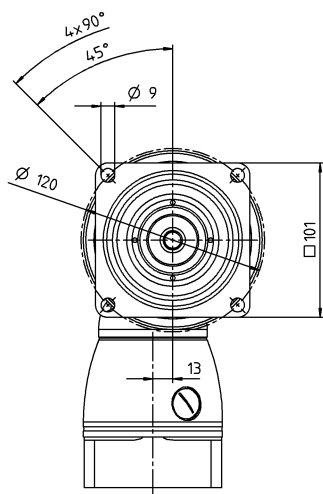
# SPK<sup>+</sup> 100 MF 2-stage

			2-stage									
Ratio	<i>i</i>		12	16	20	25	28	35	40	50	70	100
Max. torque <sup>a) b) e)</sup>	$T_{2a}$	Nm	336	336	420	420	428	428	200	250	350	376
		in.lb	2974	2974	3717	3717	3788	3788	1770	2213	3098	3328
Max. acceleration torque <sup>b) e)</sup> (max. 1000 cycles per hour)	$T_{2B}$	Nm	280	280	350	350	378	378	200	250	350	282
		in.lb	2478	2478	3098	3098	3346	3346	1770	2213	3098	2496
Nominal torque (at $n_n$ )	$T_{2N}$	Nm	180	180	175	175	170	170	160	175	170	120
		in.lb	1593	1593	1549	1549	1505	1505	1416	1549	1505	1062
Emergency stop torque <sup>a) b) e)</sup> (permitted 1000 times during the service life of the gearbox)	$T_{2Not}$	Nm	380	460	575	575	625	625	400	500	625	625
		in.lb	3363	4071	5089	5089	5532	5532	3540	4425	5532	5532
Permitted average input speed (at $T_{2N}$ and 20 °C ambient temperature) <sup>d)</sup>	$n_{1N}$	$n_{1T}$	2000	2400	2400	2700	2400	2500	2500	2500	2500	2500
Max. input speed	$n_{1Max}$	rpm	7500	7500	7500	7500	7500	7500	7500	7500	7500	7500
Mean no load running torque <sup>b)</sup> (at $n_i = 3000$ rpm and 20 °C gearbox temperature)	$T_{012}$	Nm	2	2.2	2.1	2.1	2.1	2.1	2	2	2	2
		in.lb	18	19	19	19	19	19	18	18	18	18
Max. backlash	$j_t$	arcmin	Standard ≤ 4 / Reduced ≤ 2									
Torsional rigidity <sup>b)</sup>	$C_{t21}$	Nm/arcmin	31	31	31	31	31	31	31	31	31	31
		in.lb/arcmin	274	274	274	274	274	274	274	274	274	274
Max. axial force <sup>c)</sup>	$F_{2AMax}$	N	5650									
		lb <sub>f</sub>	1271									
Max. lateral force <sup>c)</sup>	$F_{2QMax}$	N	6300									
		lb <sub>f</sub>	1418									
Max. tilting moment	$M_{2KMax}$	Nm	500									
		in.lb	4425									
Efficiency at full load	$\eta$	%	94									
Service life <sup>f)</sup>	$L_h$	h	> 20000									
Weight (incl. standard adapter plate)	$m$	kg	9.7									
		lb <sub>m</sub>	21									
Operating noise (at reference ratio and reference speed – ratio-specific values available in cymex <sup>®</sup> )	$L_{PA}$	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									
Direction of rotation			In- and output opposite direction									
Protection class			IP 65									
Metal bellows coupling (recommended product type – validate sizing with cymex <sup>®</sup> )			BC2 - 00300AA - 032.000 - X									
Bore diameter of coupling on the application side		mm	X = 024.000 - 060.000									
Mass moment of inertia (relates to the drive) Clamping hub diameter [mm]	E 19	$J_1$	kgcm <sup>2</sup>	1.48	1.2	1.17	1.05	1.15	0.95	0.9	0.89	0.89
			10 <sup>-3</sup> in.lb.s <sup>2</sup>	1.31	1.06	1.04	0.93	1.02	0.84	0.8	0.79	0.79
	H 28	$J_1$	kgcm <sup>2</sup>	2.89	2.62	2.59	2.46	2.56	2.36	2.31	2.31	2.3
			10 <sup>-3</sup> in.lb.s <sup>2</sup>	2.56	2.32	2.29	2.18	2.27	2.09	2.04	2.04	2.04

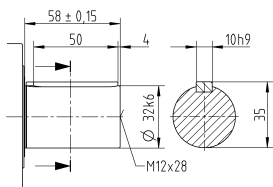
Please use our sizing software cymex<sup>®</sup> for a detailed sizing – [www.wittenstein-cymex.com](http://www.wittenstein-cymex.com)  
Please contact us for optimum sizing at S1 conditions (Continuous operation).

- <sup>a)</sup> At max. 10 %  $F_{2QMax}$
- <sup>b)</sup> Valid for standard clamping hub diameter
- <sup>c)</sup> Refers to center of the output shaft or flange
- <sup>d)</sup> Please reduce input speed at higher ambient temperatures
- <sup>e)</sup> Smooth shaft
- <sup>f)</sup> Please contact us to discuss application-specific service lifetimes

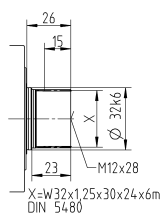
up to 19/28 <sup>4)</sup>  
(E<sup>5</sup>)/H) clamping  
hub diameter

SPK<sup>+</sup>

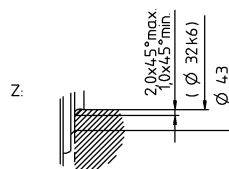
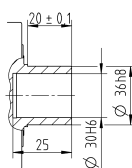
Shaft with key



Splined shaft (DIN 5480)



Shaft mounted



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

Non-tolerated dimensions are nominal dimensions  
<sup>1)</sup> Check motor shaft fit

2) Min./Max. permissible motor shaft length. Longer motor shafts are possible, please contact alpha.

3) The dimensions depend on the motor

- 4) Smaller motor shaft diameter is compensated by a bushing with a minimum wall thickness of 1 mm
- 5) Standard clamping hub diameter

# SPK<sup>+</sup> 100 MF 3-stage

				3-stage														
Ratio			<i>i</i>		64	84	100	125	140	175	200	250	280	350	400	500	700	1000
Max. torque <sup>a) b) e)</sup>			<i>T</i> <sub>2a</sub>	<i>Nm</i>	336	336	420	420	420	420	420	420	428	428	200	250	350	376
				<i>in.lb</i>	2974	2974	3717	3717	3717	3717	3717	3717	3788	3788	1770	2213	3098	3328
Max. acceleration torque <sup>b) e)</sup> (max. 1000 cycles per hour)			<i>T</i> <sub>2B</sub>	<i>Nm</i>	280	280	350	350	350	350	350	350	378	378	200	250	350	282
				<i>in.lb</i>	2478	2478	3098	3098	3098	3098	3098	3098	3346	3346	1770	2213	3098	2496
Nominal torque (at <i>n</i> <sub>N</sub> )			<i>T</i> <sub>2N</sub>	<i>Nm</i>	180	180	175	175	175	175	175	175	170	170	160	175	170	120
				<i>in.lb</i>	1593	1593	1549	1549	1549	1549	1549	1549	1505	1505	1416	1549	1505	1062
Emergency stop torque <sup>a) b) e)</sup> (permitted 1000 times during the service life of the gearbox)			<i>T</i> <sub>2Not</sub>	<i>Nm</i>	460	380	575	575	575	575	575	625	625	400	500	625	625	
				<i>in.lb</i>	4071	3363	5089	5089	5089	5089	5089	5089	5532	5532	3540	4425	5532	5532
Permitted average input speed (at <i>T</i> <sub>2N</sub> and 20 °C ambient temperature) <sup>d)</sup>			<i>n</i> <sub>1N</sub>	<i>n</i> <sub>1T</sub>	3500	3500	3500	3500	3500	3500	3500	3800	3500	3800	4500	4500	4500	4500
Max. input speed			<i>n</i> <sub>1Max</sub>	<i>rpm</i>	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000
Mean no load running torque <sup>b)</sup> (at <i>n</i> <sub>i</sub> = 3000 rpm and 20 °C gearbox temperature)			<i>T</i> <sub>012</sub>	<i>Nm</i>	0.6	0.45	0.45	0.45	0.45	0.45	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
				<i>in.lb</i>	5.3	4.0	4.0	4.0	4.0	4.0	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7
Max. backlash			<i>j</i> <sub>t</sub>	<i>arcmin</i>	Standard ≤ 4 / Reduced ≤ 2													
Torsional rigidity <sup>b)</sup>			<i>C</i> <sub>t21</sub>	<i>Nm/arcmin</i>	31	31	31	31	31	31	31	31	31	31	31	31	31	31
				<i>in.lb/arcmin</i>	274	274	274	274	274	274	274	274	274	274	274	274	274	274
Max. axial force <sup>c)</sup>			<i>F</i> <sub>2AMax</sub>	<i>N</i>	5650													
				<i>lb<sub>f</sub></i>	1271													
Max. lateral force <sup>c)</sup>			<i>F</i> <sub>2QMax</sub>	<i>N</i>	6300													
				<i>lb<sub>f</sub></i>	1418													
Max. tilting moment			<i>M</i> <sub>2KMax</sub>	<i>Nm</i>	500													
				<i>in.lb</i>	4425													
Efficiency at full load			<i>η</i>	%	92													
Service life <sup>f)</sup>			<i>L</i> <sub>h</sub>	<i>h</i>	> 20000													
Weight (incl. standard adapter plate)			<i>m</i>	<i>kg</i>	10.3													
				<i>lb<sub>m</sub></i>	23													
Operating noise (at reference ratio and reference speed – ratio-specific values available in cymex®)			<i>L</i> <sub>PA</sub>	<i>dB(A)</i>	≤ 68													
Max. permitted housing temperature				°C	+90													
				<i>F</i>	194													
Ambient temperature				°C	0 to +40													
				<i>F</i>	32 to 104													
Lubrication					Lubricated for life													
Direction of rotation					In- and output opposite direction													
Protection class					IP 65													
Metal bellows coupling (recommended product type – validate sizing with cymex®)					BC2 - 00300AA - 032.000 - X													
Bore diameter of coupling on the application side				<i>mm</i>	X = 024.000 - 060.000													
Mass moment of inertia (relates to the drive) Clamping hub diameter [mm]	C	14	<i>J</i> <sub>i</sub>	<i>kgcm²</i>	0.28	0.23	0.24	0.23	0.21	0.2	0.19	0.18	0.19	0.18	0.18	0.18	0.18	0.18
				<i>10<sup>-3</sup> in.lb.s²</i>	0.25	0.2	0.21	0.2	0.19	0.18	0.17	0.16	0.17	0.16	0.16	0.16	0.16	0.16
	E	19	<i>J</i> <sub>i</sub>	<i>kgcm²</i>	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
<i>10<sup>-3</sup> in.lb.s²</i>				0.64	0.56	0.6	0.6	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56

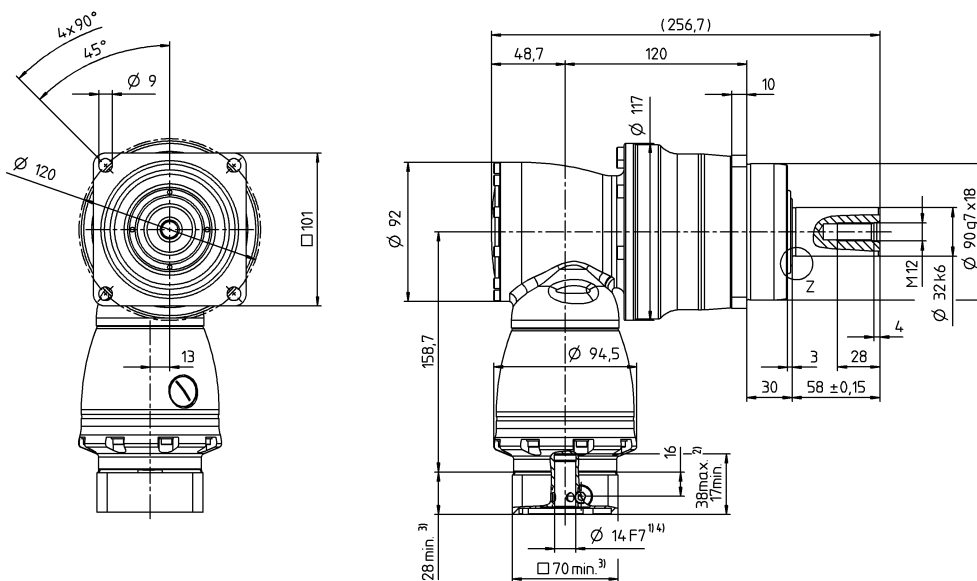
Please use our sizing software cymex<sup>®</sup> for a detailed sizing – [www.wittenstein-cymex.com](http://www.wittenstein-cymex.com)  
Please contact us for optimum sizing at S1 conditions (Continuous operation).

- <sup>a)</sup> At max. 10 %  $F_{2QMax}$
- <sup>b)</sup> Valid for standard clamping hub diameter
- <sup>c)</sup> Refers to center of the output shaft or flange
- <sup>d)</sup> Please reduce input speed at higher ambient temperatures
- <sup>e)</sup> Smooth shaft
- <sup>f)</sup> Please contact us to discuss application-specific service lifetimes

View A

Motor shaft diameter [mm]

3-stage

up to 14/19<sup>4)</sup>  
(C<sup>5)</sup>/E) clamping  
hub diameter


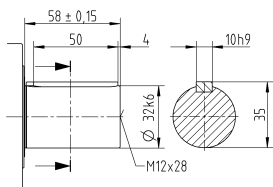
← A

Hypoid gearboxes

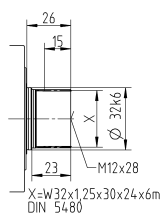
SPK

## Other output variants

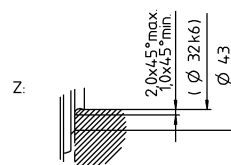
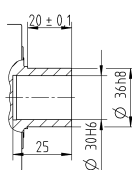
Shaft with key



Splined shaft (DIN 5480)



Shaft mounted



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

Non-tolerated dimensions are nominal dimensions

<sup>1)</sup> Check motor shaft fit

<sup>2)</sup> Min./Max. permissible motor shaft length. Longer motor shafts are possible, please contact alpha.

<sup>3)</sup> The dimensions depend on the motor

<sup>4)</sup> Smaller motor shaft diameter is compensated by a bushing with a minimum wall thickness of 1 mm

<sup>5)</sup> Standard clamping hub diameter



# SPK<sup>+</sup> 140 MF 2-stage

				2-stage										
Ratio			<i>i</i>		12	16	20	25	28	35	40	50	70	100
Max. torque <sup>a) b) e)</sup>			<i>T</i> <sub>2a</sub>	<i>Nm</i>	816	816	1020	1020	825	825	500	625	625	720
				<i>in.lb</i>	7222	7222	9028	9028	7302	7302	4425	5532	5532	6373
Max. acceleration torque <sup>b) e)</sup> (max. 1000 cycles per hour)			<i>T</i> <sub>2B</sub>	<i>Nm</i>	680	680	792	792	792	792	500	625	792	636
				<i>in.lb</i>	6019	6019	7010	7010	7010	7010	4425	5532	7010	5629
Nominal torque (at <i>n</i> <sub>N</sub> )			<i>T</i> <sub>2N</sub>	<i>Nm</i>	360	360	360	360	360	360	320	360	360	220
				<i>in.lb</i>	3186	3186	3186	3186	3186	3186	2832	3186	3186	1947
Emergency stop torque <sup>a) b) e)</sup> (permitted 1000 times during the service life of the gearbox)			<i>T</i> <sub>2Not</sub>	<i>Nm</i>	880	1040	1300	1300	1350	1350	1000	1250	1350	1250
				<i>in.lb</i>	7789	9205	11506	11506	11949	11949	8851	11064	11949	11064
Permitted average input speed (at <i>T</i> <sub>2N</sub> and 20 °C ambient temperature) <sup>d)</sup>			<i>n</i> <sub>1N</sub>	<i>n</i> <sub>1T</sub>	1900	2300	2300	2600	2300	2300	2300	2300	2300	2300
Max. input speed			<i>n</i> <sub>1Max</sub>	<i>rpm</i>	5500	5500	5500	5500	5500	5500	5500	5500	5500	5500
Mean no load running torque <sup>b)</sup> (at <i>n</i> <sub>i</sub> = 3000 rpm and 20 °C gearbox temperature)			<i>T</i> <sub>012</sub>	<i>Nm</i>	5.5	3.7	3.6	3.4	3.5	4.7	3.3	3.3	3.6	3.6
				<i>in.lb</i>	49	33	32	30	31	42	29	29	32	32
Max. backlash			<i>j</i> <sub>t</sub>	<i>arcmin</i>	Standard ≤ 4 / Reduced ≤ 2									
Torsional rigidity <sup>b)</sup>			<i>C</i> <sub>t21</sub>	<i>Nm/arcmin</i>	53	53	53	53	53	53	53	53	53	53
				<i>in.lb/arcmin</i>	469	469	469	469	469	469	469	469	469	469
Max. axial force <sup>c)</sup>			<i>F</i> <sub>2AMax</sub>	<i>N</i>	9870									
				<i>lb<sub>f</sub></i>	2221									
Max. lateral force <sup>c)</sup>			<i>F</i> <sub>2QMax</sub>	<i>N</i>	9600									
				<i>lb<sub>f</sub></i>	2160									
Max. tilting moment			<i>M</i> <sub>2KMax</sub>	<i>Nm</i>	1000									
				<i>in.lb</i>	8851									
Efficiency at full load			<i>η</i>	%	94									
Service life <sup>f)</sup>			<i>L</i> <sub>h</sub>	<i>h</i>	> 20000									
Weight (incl. standard adapter plate)			<i>m</i>	<i>kg</i>	20									
				<i>lb<sub>m</sub></i>	44									
Operating noise (at reference ratio and reference speed – ratio-specific values available in cymex®)			<i>L</i> <sub>PA</sub>	<i>dB(A)</i>	≤ 68									
Max. permitted housing temperature				°C	+90									
				<i>F</i>	194									
Ambient temperature				°C	0 to +40									
				<i>F</i>	32 to 104									
Lubrication					Lubricated for life									
Direction of rotation					In- and output opposite direction									
Protection class					IP 65									
Metal bellows coupling (recommended product type – validate sizing with cymex®)					BC2 - 00800AA - 040.000 - X									
				<i>mm</i>	X = 040.000 - 075.000									
Mass moment of inertia (relates to the drive) Clamping hub diameter [mm]	H	28	<i>J</i> <sub>i</sub>	<i>kgcm<sup>2</sup></i>	4.68	3.82	3.75	3.31	3.68	2.97	2.8	2.79	2.78	2.77
				<i>10<sup>-3</sup> in.lb.s<sup>2</sup></i>	4.14	3.38	3.32	2.93	3.26	2.63	2.48	2.47	2.46	2.45
	K	38	<i>J</i> <sub>i</sub>	<i>kgcm<sup>2</sup></i>	11.8	11	10.9	10.5	10.9	10.1	9.96	9.95	9.94	9.94
<i>10<sup>-3</sup> in.lb.s<sup>2</sup></i>				10.44	9.74	9.65	9.29	9.65	8.94	8.81	8.81	8.8	8.8	

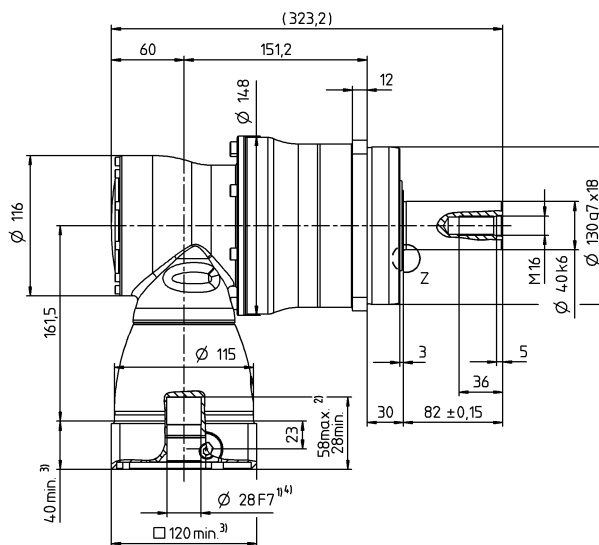
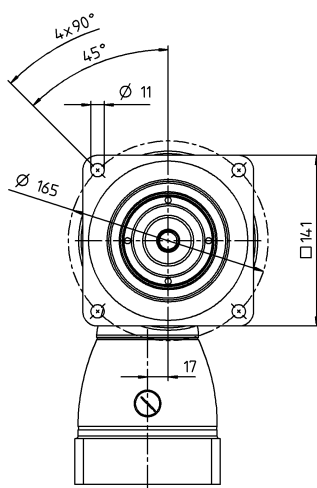
Please use our sizing software cymex<sup>®</sup> for a detailed sizing – [www.wittenstein-cymex.com](http://www.wittenstein-cymex.com)  
Please contact us for optimum sizing at S1 conditions (Continuous operation).

- <sup>a)</sup> At max. 10 %  $F_{2QMax}$
- <sup>b)</sup> Valid for standard clamping hub diameter
- <sup>c)</sup> Refers to center of the output shaft or flange
- <sup>d)</sup> Please reduce input speed at higher ambient temperatures
- <sup>e)</sup> Smooth shaft
- <sup>f)</sup> Please contact us to discuss application-specific service lifetimes

View A

Motor shaft diameter [mm]

2-stage

up to 28/38<sup>4)</sup>  
(H<sup>5)</sup>/K) clamping  
hub diameter


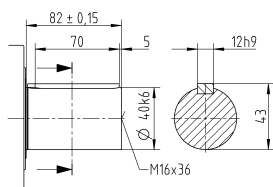
← A

Hypoid gearboxes

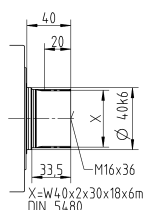
SPK

## Other output variants

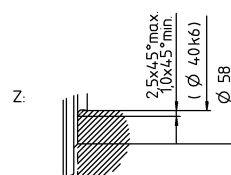
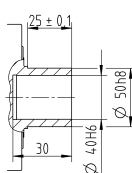
Shaft with key



Splined shaft (DIN 5480)



Shaft mounted



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

Non-tolerated dimensions are nominal dimensions

<sup>1)</sup> Check motor shaft fit

<sup>2)</sup> Min./Max. permissible motor shaft length. Longer motor shafts are possible, please contact alpha.

<sup>3)</sup> The dimensions depend on the motor

<sup>4)</sup> Smaller motor shaft diameter is compensated by a bushing with a minimum wall thickness of 1 mm

<sup>5)</sup> Standard clamping hub diameter

# SPK<sup>+</sup> 140 MF 3-stage

			3-stage													
Ratio	<i>i</i>		64	84	100	125	140	175	200	250	280	350	400	500	700	1000
Max. torque <sup>a) b) e)</sup>	$T_{2a}$	Nm	816	816	1020	1020	1020	1020	1020	1020	825	825	500	625	825	720
		in.lb	7222	7222	9028	9028	9028	9028	9028	9028	7302	7302	4425	5532	7302	6373
Max. acceleration torque <sup>b) e)</sup> (max. 1000 cycles per hour)	$T_{2B}$	Nm	680	680	792	792	792	792	792	792	792	792	500	625	792	636
		in.lb	6019	6019	7010	7010	7010	7010	7010	7010	7010	7010	4425	5532	7010	5629
Nominal torque (at $n_{IN}$ )	$T_{2N}$	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 <sup>a) b) e)</sup> (permitted 1000 times during the service life of the gearbox)	$T_{2Not}$	Nm	1040	880	1300	1300	1300	1300	1300	1300	1350	1350	1000	1250	1350	1250
		in.lb	9205	7789	11506	11506	11506	11506	11506	11506	11949	11949	8851	11064	11949	11064
Permitted average input speed (at $T_{2N}$ and 20 °C ambient temperature) <sup>d)</sup>	$n_{1N}$	$n_{1T}$	3100	3100	3100	3100	3100	3100	3100	3500	3100	3500	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 <sup>b)</sup> (at $n_i = 3000$ rpm and 20 °C gearbox temperature)	$T_{012}$	Nm	1.1	0.9	0.9	0.75	0.75	0.6	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45
		in.lb	9.7	8.0	8.0	6.6	6.6	5.3	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max. backlash	$j_t$	arcmin	Standard ≤ 4 / Reduced ≤ 2													
Torsional rigidity <sup>b)</sup>	$C_{t21}$	Nm/arcmin	53	53	53	53	53	53	53	53	53	53	53	53	53	53
		in.lb/arcmin	469	469	469	469	469	469	469	469	469	469	469	469	469	469
Max. axial force <sup>c)</sup>	$F_{2AMax}$	N	9870													
		lb <sub>f</sub>	2221													
Max. lateral force <sup>c)</sup>	$F_{2QMax}$	N	9600													
		lb <sub>f</sub>	2160													
Max. tilting moment	$M_{2KMax}$	Nm	1000													
		in.lb	8851													
Efficiency at full load	$\eta$	%	92													
Service life <sup>f)</sup>	$L_h$	h	> 20000													
Weight (incl. standard adapter plate)	$m$	kg	20.7													
		lb <sub>m</sub>	46													
Operating noise (at reference ratio and reference speed – ratio-specific values available in cymex <sup>®</sup> )	$L_{PA}$	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													
Direction of rotation			In- and output opposite direction													
Protection class			IP 65													
Metal bellows coupling (recommended product type – validate sizing with cymex <sup>®</sup> )			BC2 - 00800AA - 040.000 - X													
Bore diameter of coupling on the application side		mm	X = 040.000 - 075.000													
Mass moment of inertia (relates to the drive) Clamping hub diameter [mm]	E 19	$J_1$	kgcm <sup>2</sup>	1.01	0.76	0.88	0.85	0.76	0.75	0.7	0.69	0.7	0.69	0.69	0.69	0.69
			10 <sup>-3</sup> in.lb.s <sup>2</sup>	0.89	0.67	0.78	0.75	0.67	0.66	0.62	0.61	0.62	0.61	0.61	0.61	0.61
	G 24	$J_1$	kgcm <sup>2</sup>	2.57	2.32	2.44	2.42	2.32	2.31	2.26	2.25	2.26	2.25	2.25	2.25	2.25
			10 <sup>-3</sup> in.lb.s <sup>2</sup>	2.27	2.05	2.16	2.14	2.05	2.04	2	1.99	2	1.99	1.99	1.99	1.99

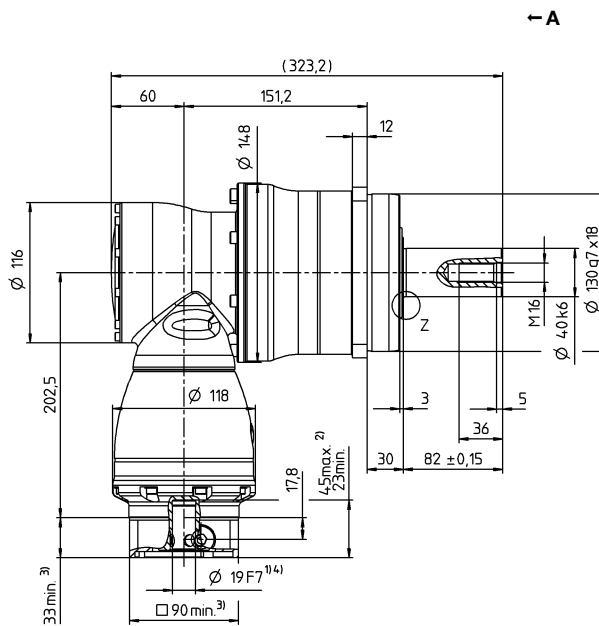
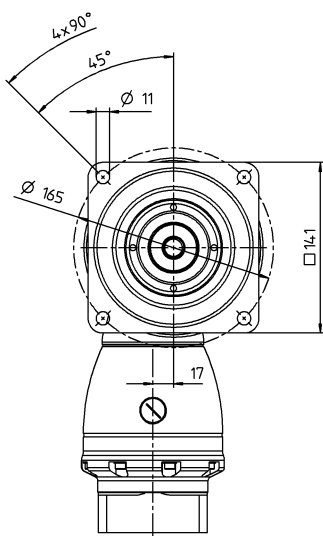
Please use our sizing software cymex<sup>®</sup> for a detailed sizing – [www.wittenstein-cymex.com](http://www.wittenstein-cymex.com)  
Please contact us for optimum sizing at S1 conditions (Continuous operation).

- <sup>a)</sup> At max. 10 %  $F_{2QMax}$
- <sup>b)</sup> Valid for standard clamping hub diameter
- <sup>c)</sup> Refers to center of the output shaft or flange
- <sup>d)</sup> Please reduce input speed at higher ambient temperatures
- <sup>e)</sup> Smooth shaft
- <sup>f)</sup> Please contact us to discuss application-specific service lifetimes

View A

Motor shaft diameter [mm]

3-stage

up to 19/24<sup>4)</sup>  
(E<sup>5)</sup>/G) clamping  
hub diameter


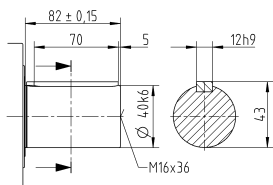
← A

Hypoid gearboxes

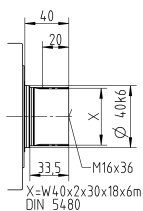
SPK

## Other output variants

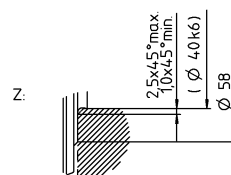
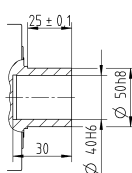
Shaft with key



Splined shaft (DIN 5480)



Shaft mounted



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

Non-tolerated dimensions are nominal dimensions

<sup>1)</sup> Check motor shaft fit

<sup>2)</sup> Min./Max. permissible motor shaft length. Longer motor shafts are possible, please contact alpha.

<sup>3)</sup> The dimensions depend on the motor

<sup>4)</sup> Smaller motor shaft diameter is compensated by a bushing with a minimum wall thickness of 1 mm

<sup>5)</sup> Standard clamping hub diameter

# SPK<sup>+</sup> 180 MF 2-stage

				2-stage									
Ratio	<i>i</i>			12	16	20	25	28	35	40	50	70	100
Max. torque <sup>a) b) e)</sup>	$T_{2a}$	Nm		1440	1440	1800	1800	1936	1936	840	1050	1470	1552
		in.lb		12745	12745	15931	15931	17135	17135	7435	9293	13011	13736
Max. acceleration torque <sup>b) e)</sup> (max. 1000 cycles per hour)	$T_{2B}$	Nm		1200	1200	1452	1452	1452	1452	840	1050	1452	1164
		in.lb		10621	10621	12851	12851	12851	12851	7435	9293	12851	10302
Nominal torque (at $n_n$ )	$T_{2N}$	Nm		750	750	750	750	750	750	640	750	750	750
		in.lb		6638	6638	6638	6638	6638	6638	5665	6638	6638	6638
Emergency stop torque <sup>a) b) e)</sup> (permitted 1000 times during the service life of the gearbox)	$T_{2Not}$	Nm		1600	2000	2500	2500	2750	2750	1600	2000	2750	2750
		in.lb		14161	17702	22127	22127	24340	24340	14161	17702	24340	24340
Permitted average input speed (at $T_{2N}$ and 20 °C ambient temperature) <sup>d)</sup>	$n_{1N}$	$n_{1T}$		1600	1900	1900	2100	1900	2100	2100	2100	2100	2100
Max. input speed	$n_{1Max}$	rpm		5000	5000	5000	5000	5000	5000	5000	5000	5000	5000
Mean no load running torque <sup>b)</sup> (at $n_i = 3000$ rpm and 20 °C gearbox temperature)	$T_{012}$	Nm		11	9.2	9.2	7	8.5	10	7.5	7.5	7	7
		in.lb		97	81	81	62	75	89	66	66	62	62
Max. backlash	$j_t$	arcmin		Standard ≤ 4 / Reduced ≤ 2									
Torsional rigidity <sup>b)</sup>	$C_{t21}$	Nm/arcmin		175	175	175	175	175	175	175	175	175	175
		in.lb/arcmin		1549	1549	1549	1549	1549	1549	1549	1549	1549	1549
Max. axial force <sup>c)</sup>	$F_{2AMax}$	N		15570									
		lb <sub>f</sub>		3503									
Max. lateral force <sup>c)</sup>	$F_{2QMax}$	N		15000									
		lb <sub>f</sub>		3375									
Max. tilting moment	$M_{2KMax}$	Nm		1800									
		in.lb		15931									
Efficiency at full load	$\eta$	%		94									
Service life <sup>f)</sup>	$L_h$	h		> 20000									
Weight (incl. standard adapter plate)	$m$	kg		45									
		lb <sub>m</sub>		99									
Operating noise (at reference ratio and reference speed – ratio-specific values available in cymex <sup>®</sup> )	$L_{PA}$	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									
Direction of rotation				In- and output opposite direction									
Protection class				IP 65									
Metal bellows coupling (recommended product type – validate sizing with cymex <sup>®</sup> )				BC2 - 01500AA - 055.000 - X									
Bore diameter of coupling on the application side		mm		X = 050.000 - 080.000									
Mass moment of inertia (relates to the drive) Clamping hub diameter [mm]	K 38	$J_i$	kgcm <sup>2</sup>	24.7	19.5	19	16.3	18.6	14	12.9	12.8	12.7	12.7
			10 <sup>-3</sup> in.lb.s <sup>2</sup>	21.86	17.26	16.82	14.43	16.46	12.39	11.42	11.33	11.24	11.24

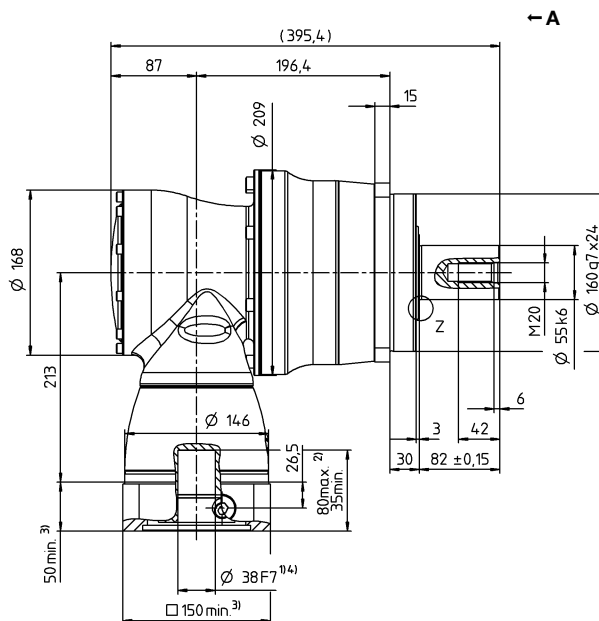
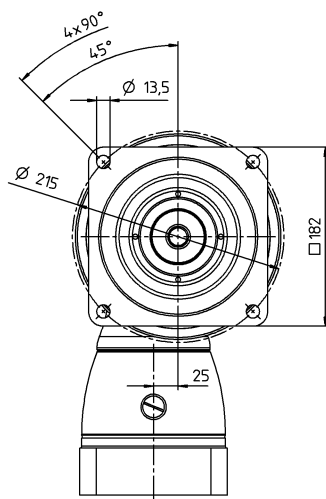
Please use our sizing software cymex<sup>®</sup> for a detailed sizing – [www.wittenstein-cymex.com](http://www.wittenstein-cymex.com)  
Please contact us for optimum sizing at S1 conditions (Continuous operation).

- <sup>a)</sup> At max. 10 %  $F_{2QMax}$
- <sup>b)</sup> Valid for standard clamping hub diameter
- <sup>c)</sup> Refers to center of the output shaft or flange
- <sup>d)</sup> Please reduce input speed at higher ambient temperatures
- <sup>e)</sup> Smooth shaft
- <sup>f)</sup> Please contact us to discuss application-specific service lifetimes

View A

Motor shaft diameter [mm]

2-stage

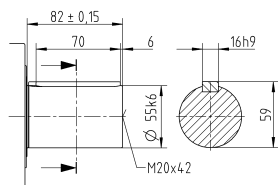
up to 38 <sup>4)</sup> (K) <sup>5)</sup>  
clamping hub  
diameter


Hypoid gearboxes

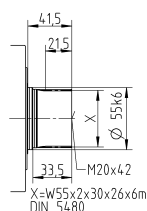
SPK

## Other output variants

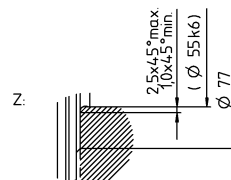
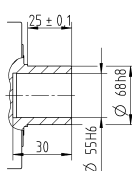
Shaft with key



Splined shaft (DIN 5480)



Shaft mounted



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

Non-tolerated dimensions are nominal dimensions

<sup>1)</sup> Check motor shaft fit

<sup>2)</sup> Min./Max. permissible motor shaft length. Longer motor shafts are possible, please contact alpha.

<sup>3)</sup> The dimensions depend on the motor

<sup>4)</sup> Smaller motor shaft diameter is compensated by a bushing with a minimum wall thickness of 1 mm

<sup>5)</sup> Standard clamping hub diameter

# SPK<sup>+</sup> 180 MF 3-stage

			3-stage													
Ratio	<i>i</i>		64	84	100	125	140	175	200	250	280	350	400	500	700	1000
Max. torque <sup>a) b) e)</sup>	$T_{2a}$	Nm	1440	1440	1800	1800	1800	1800	1800	1800	1936	1936	840	1050	1470	1552
		in.lb	12745	12745	15931	15931	15931	15931	15931	15931	17135	17135	7435	9293	13011	13736
Max. acceleration torque <sup>b) e)</sup> (max. 1000 cycles per hour)	$T_{2B}$	Nm	1200	1200	1452	1452	1452	1452	1452	1452	1452	1452	840	1050	1452	1164
		in.lb	10621	10621	12851	12851	12851	12851	12851	12851	12851	12851	7435	9293	12851	10302
Nominal torque (at $n_{IN}$ )	$T_{2N}$	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	5665	6638	6638	6638
Emergency stop torque <sup>a) b) e)</sup> (permitted 1000 times during the service life of the gearbox)	$T_{2Not}$	Nm	2000	1600	2500	2500	2500	2500	2500	2500	2750	2750	1600	2000	2750	2750
		in.lb	17702	14161	22127	22127	22127	22127	22127	22127	24340	24340	14161	17702	24340	24340
Permitted average input speed (at $T_{2N}$ and 20 °C ambient temperature) <sup>d)</sup>	$n_{1N}$	$n_{1T}$	2900	2900	2900	2900	2900	2900	2900	3200	2900	3200	3900	3900	3900	3900
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 <sup>b)</sup> (at $n_i = 3000$ rpm and 20 °C gearbox temperature)	$T_{012}$	Nm	2	1	1.6	1.2	1.2	1	1	0.8	1	0.8	0.8	0.8	0.8	0.8
		in.lb	18	8.9	14	11	11	8.9	8.9	7.1	8.9	7.1	7.1	7.1	7.1	7.1
Max. backlash	$j_t$	arcmin	Standard $\leq 4$ / Reduced $\leq 2$													
Torsional rigidity <sup>b)</sup>	$C_{t21}$	Nm/arcmin	175	175	175	175	175	175	175	175	175	175	175	175	175	175
		in.lb/arcmin	1549	1549	1549	1549	1549	1549	1549	1549	1549	1549	1549	1549	1549	1549
Max. axial force <sup>c)</sup>	$F_{2AMax}$	N	15570													
		lb <sub>f</sub>	3503													
Max. lateral force <sup>c)</sup>	$F_{2QMax}$	N	15000													
		lb <sub>f</sub>	3375													
Max. tilting moment	$M_{2KMax}$	Nm	1800													
		in.lb	15931													
Efficiency at full load	$\eta$	%	92													
Service life <sup>f)</sup>	$L_h$	h	> 20000													
Weight (incl. standard adapter plate)	$m$	kg	47.4													
		lb <sub>m</sub>	105													
Operating noise (at reference ratio and reference speed – ratio-specific values available in cymex <sup>®</sup> )	$L_{PA}$	dB(A)	$\leq 70$													
Max. permitted housing temperature		°C	+90													
		F	194													
Ambient temperature		°C	0 to +40													
		F	32 to 104													
Lubrication			Lubricated for life													
Direction of rotation			In- and output opposite direction													
Protection class			IP 65													
Metal bellows coupling (recommended product type – validate sizing with cymex <sup>®</sup> )			BC2 - 01500AA - 055.000 - X													
Bore diameter of coupling on the application side		mm	X = 050.000 - 080.000													
Mass moment of inertia (relates to the drive) Clamping hub diameter [mm]	G 24	$J_1$	kgcm <sup>2</sup>	3.97	2.82	3.36	3.22	2.82	2.75	2.5	2.47	2.5	2.44	2.42	2.42	2.42
			10 <sup>-3</sup> in.lb.s <sup>2</sup>	3.51	2.5	2.97	2.85	2.5	2.43	2.21	2.19	2.21	2.16	2.14	2.14	2.14
	K 38	$J_1$	kgcm <sup>2</sup>	10.9	9.74	10.3	10.1	9.74	9.66	9.41	9.38	9.41	9.38	9.33	9.33	9.33
			10 <sup>-3</sup> in.lb.s <sup>2</sup>	9.65	8.62	9.12	8.94	8.62	8.55	8.33	8.3	8.33	8.3	8.26	8.26	8.26

Please use our sizing software cymex<sup>®</sup> for a detailed sizing – [www.wittenstein-cymex.com](http://www.wittenstein-cymex.com)  
Please contact us for optimum sizing at S1 conditions (Continuous operation).

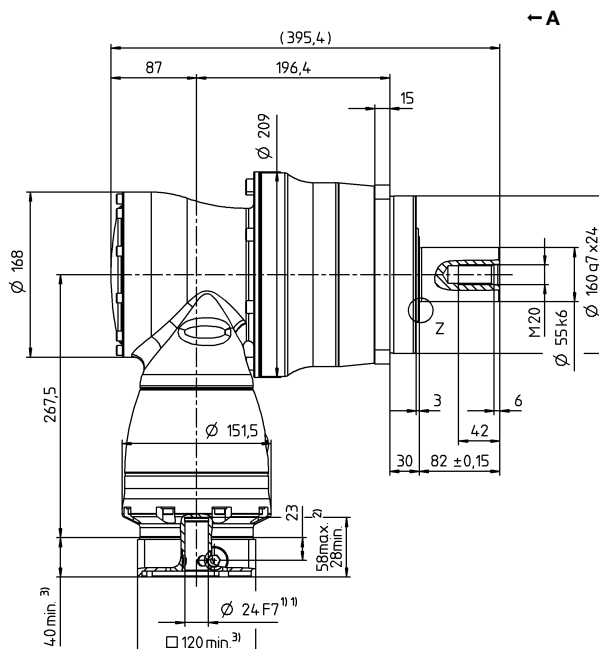
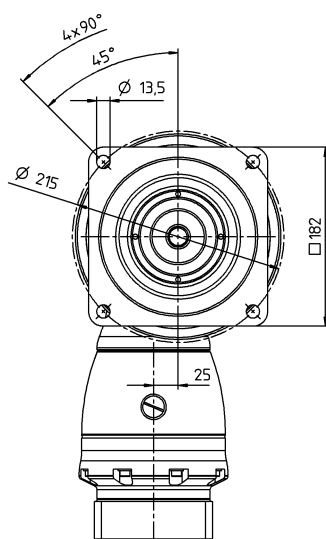
- <sup>a)</sup> At max. 10 %  $F_{2QMax}$
- <sup>b)</sup> Valid for standard clamping hub diameter
- <sup>c)</sup> Refers to center of the output shaft or flange
- <sup>d)</sup> Please reduce input speed at higher ambient temperatures
- <sup>e)</sup> Smooth shaft
- <sup>f)</sup> Please contact us to discuss application-specific service lifetimes



View A

Motor shaft diameter [mm]

3-stage

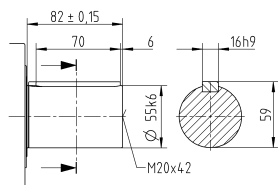
up to 24/38<sup>4)</sup>  
(G<sup>5)</sup>/K) clamping  
hub diameter


Hypoid gearboxes

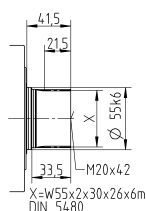
SPK

## Other output variants

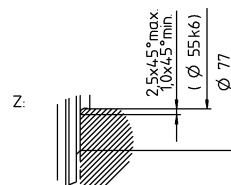
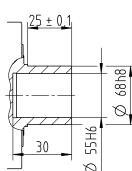
Shaft with key



Splined shaft (DIN 5480)



Shaft mounted



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

Non-tolerated dimensions are nominal dimensions

<sup>1)</sup> Check motor shaft fit

<sup>2)</sup> Min./Max. permissible motor shaft length. Longer motor shafts are possible, please contact alpha.

<sup>3)</sup> The dimensions depend on the motor

<sup>4)</sup> Smaller motor shaft diameter is compensated by a bushing with a minimum wall thickness of 1 mm

<sup>5)</sup> Standard clamping hub diameter

# SPK+ 210 MF 2-stage

				2-stage									
Ratio	<i>i</i>			12	16	20	25	28	35	40	50	70	100
Max. torque <sup>a) b) e)</sup>	$T_{2a}$	Nm		3072	3072	3840	3840	3840	3840	1880	2350	3290	2800
		in.lb		27190	27190	33987	33987	33987	33987	16640	20799	29119	24782
Max. acceleration torque <sup>b) e)</sup> (max. 1000 cycles per hour)	$T_{2B}$	Nm		2560	2560	3000	3000	2880	2880	1880	2350	2880	2280
		in.lb		22658	22658	26552	26552	25490	25490	16640	20799	25490	20180
Nominal torque (at $n_{1N}$ )	$T_{2N}$	Nm		1500	1500	1500	1500	1400	1500	1400	1500	1400	1000
		in.lb		13276	13276	13276	13276	12391	13276	12391	13276	12391	8851
Emergency stop torque <sup>a) b) e)</sup> (permitted 1000 times during the service life of the gearbox)	$T_{2Not}$	Nm		3600	4200	5250	5250	5900	5900	3600	4500	5900	5900
		in.lb		31863	37173	46467	46467	52220	52220	31863	39829	52220	52220
Permitted average input speed (at $T_{2N}$ and 20 °C ambient temperature) <sup>d)</sup>	$n_{1N}$	$n_{1T}$		1500	1700	1700	1900	1700	1900	1700	1700	1700	1700
Max. input speed	$n_{1Max}$	rpm		4500	4500	4500	4500	4500	4500	4500	4500	4500	4500
Mean no load running torque <sup>b)</sup> (at $n_1 = 3000$ rpm and 20 °C gearbox temperature)	$T_{012}$	Nm		21	19	17	16	15	15	16	16	15	14
		in.lb		186	168	150	142	133	133	142	142	133	124
Max. backlash	$j_t$	arcmin		Standard ≤ 4 / Reduced ≤ 2									
Torsional rigidity <sup>b)</sup>	$C_{t21}$	Nm/arcmin		300	300	300	300	300	300	300	300	300	300
		in.lb/arcmin		2655	2655	2655	2655	2655	2655	2655	2655	2655	2655
Max. axial force <sup>c)</sup>	$F_{2AMax}$	N		30000									
		lb <sub>f</sub>		6750									
Max. lateral force <sup>c)</sup>	$F_{2QMax}$	N		21000									
		lb <sub>f</sub>		4725									
Max. tilting moment	$M_{2KMax}$	Nm		3100									
		in.lb		27437									
Efficiency at full load	$\eta$	%		94									
Service life <sup>f)</sup>	$L_h$	h		> 20000									
Weight (incl. standard adapter plate)	$m$	kg		82									
		lb <sub>m</sub>		181									
Operating noise (at reference ratio and reference speed – ratio-specific values available in cymex <sup>®</sup> )	$L_{PA}$	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									
Direction of rotation				In- and output opposite direction									
Protection class				IP 65									
Metal bellows coupling (recommended product type – validate sizing with cymex <sup>®</sup> )				BC2 - 04000AA - 075.000 - X									
Bore diameter of coupling on the application side		mm		X = 050.000 - 090.000									
Mass moment of inertia (relates to the drive) Clamping hub diameter [mm]	M 48	$J_1$	kgcm <sup>2</sup>	78.8	54.6	53	43.4	51.5	42.2	30.2	30	29.8	29.8
			10 <sup>-3</sup> in.lb.s <sup>2</sup>	69.74	48.32	46.91	38.41	45.58	37.35	26.73	26.55	26.37	26.37

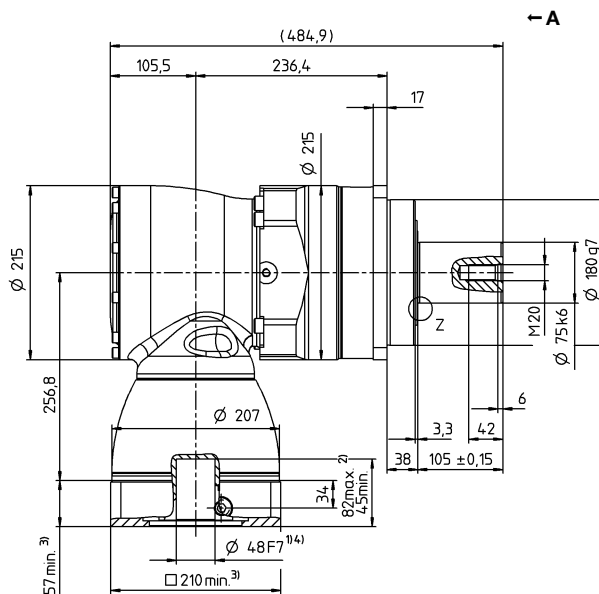
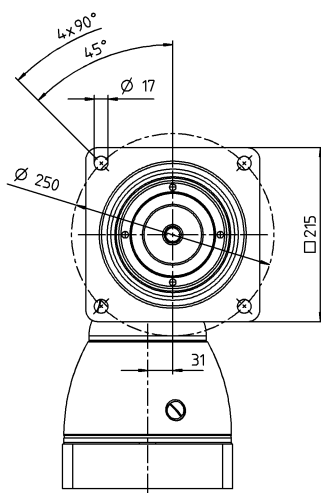
Please use our sizing software cymex<sup>®</sup> for a detailed sizing – [www.wittenstein-cymex.com](http://www.wittenstein-cymex.com)  
Please contact us for optimum sizing at S1 conditions (Continuous operation).

- <sup>a)</sup> At max. 10 %  $F_{2QMax}$
- <sup>b)</sup> Valid for standard clamping hub diameter
- <sup>c)</sup> Refers to center of the output shaft or flange
- <sup>d)</sup> Please reduce input speed at higher ambient temperatures
- <sup>e)</sup> Smooth shaft
- <sup>f)</sup> Please contact us to discuss application-specific service lifetimes

View A

Motor shaft diameter [mm]

2-stage

up to 48 <sup>4)</sup> (M) <sup>5)</sup>  
clamping hub  
diameter


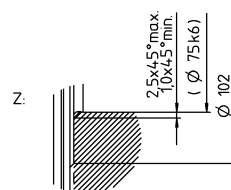
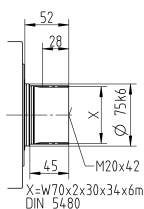
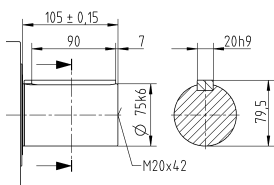
Hypoid gearboxes

SPK

## Other output variants

Shaft with key

Splined shaft (DIN 5480)



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

Non-tolerated dimensions are nominal dimensions

<sup>1)</sup> Check motor shaft fit

<sup>2)</sup> Min./Max. permissible motor shaft length. Longer motor shafts are possible, please contact alpha.

<sup>3)</sup> The dimensions depend on the motor

<sup>4)</sup> Smaller motor shaft diameter is compensated by a bushing with a minimum wall thickness of 1 mm

<sup>5)</sup> Standard clamping hub diameter

# SPK+ 210 MF 3-stage

				3-stage															
Ratio			<i>i</i>		64	84	100	125	140	175	200	250	280	350	400	500	700	1000	
Max. torque <sup>a) b) e)</sup>			<i>T</i> <sub>2a</sub>	<i>Nm</i>	3072	3072	3840	3840	3840	3840	3840	3840	3840	3840	1880	2350	3290	2800	
				<i>in.lb</i>	27190	27190	33987	33987	33987	33987	33987	33987	33987	33987	33987	16640	20799	29119	24782
Max. acceleration torque <sup>b) e)</sup> (max. 1000 cycles per hour)			<i>T</i> <sub>2B</sub>	<i>Nm</i>	2560	2560	3000	3000	3000	3000	3000	3000	2880	2880	1880	2350	2880	2280	
				<i>in.lb</i>	22658	22658	26552	26552	26552	26552	26552	26552	26552	25490	25490	16640	20799	25490	20180
Nominal torque (at <i>n</i> <sub>m</sub> )			<i>T</i> <sub>2N</sub>	<i>Nm</i>	1500	1500	1500	1500	1500	1500	1500	1500	1400	1400	1500	1500	1400	1000	
				<i>in.lb</i>	13276	13276	13276	13276	13276	13276	13276	13276	12391	12391	13276	13276	12391	8851	
Emergency stop torque <sup>a) b) e)</sup> (permitted 1000 times during the service life of the gearbox)			<i>T</i> <sub>2Not</sub>	<i>Nm</i>	4200	3600	5250	5250	5250	5250	5250	5250	5900	5900	3600	4500	5900	5900	
				<i>in.lb</i>	37173	31863	46467	46467	46467	46467	46467	46467	52220	52220	31863	39829	52220	52220	
Permitted average input speed (at <i>T</i> <sub>2N</sub> and 20 °C ambient temperature) <sup>d)</sup>			<i>n</i> <sub>1N</sub>	<i>n</i> <sub>1T</sub>	2700	2700	2700	2700	2700	2700	2700	2900	2700	2900	3400	3400	3400	3400	
Max. input speed			<i>n</i> <sub>1Max</sub>	<i>rpm</i>	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	
Mean no load running torque <sup>b)</sup> (at <i>n</i> <sub>i</sub> = 3000 rpm and 20 °C gearbox temperature)			<i>T</i> <sub>012</sub>	<i>Nm</i>	4.8	2.4	3.8	3.4	2.6	2.6	2	2	2	2	2	2	2	2	
				<i>in.lb</i>	42	21	34	30	23	23	18	18	18	18	18	18	18	18	18
Max. backlash			<i>j</i> <sub>t</sub>	<i>arcmin</i>	Standard ≤ 4 / Reduced ≤ 2														
Torsional rigidity <sup>b)</sup>			<i>C</i> <sub>t21</sub>	<i>Nm/arcmin</i>	300	300	300	300	300	300	300	300	300	300	300	300	300	300	
				<i>in.lb/arcmin</i>	2655	2655	2655	2655	2655	2655	2655	2655	2655	2655	2655	2655	2655	2655	2655
Max. axial force <sup>c)</sup>			<i>F</i> <sub>2AMax</sub>	<i>N</i>	30000														
				<i>lb<sub>f</sub></i>	6750														
Max. lateral force <sup>c)</sup>			<i>F</i> <sub>2QMax</sub>	<i>N</i>	21000														
				<i>lb<sub>f</sub></i>	4725														
Max. tilting moment			<i>M</i> <sub>2KMax</sub>	<i>Nm</i>	3100														
				<i>in.lb</i>	27437														
Efficiency at full load			<i>η</i>	%	92														
Service life <sup>f)</sup>			<i>L</i> <sub>h</sub>	<i>h</i>	> 20000														
Weight (incl. standard adapter plate)			<i>m</i>	<i>kg</i>	86														
				<i>lb<sub>m</sub></i>	190														
Operating noise (at reference ratio and reference speed – ratio-specific values available in cymex®)			<i>L</i> <sub>PA</sub>	<i>dB(A)</i>	≤ 71														
Max. permitted housing temperature				°C	+90														
				<i>F</i>	194														
Ambient temperature				°C	0 to +40														
				<i>F</i>	32 to 104														
Lubrication					Lubricated for life														
Direction of rotation					In- and output opposite direction														
Protection class					IP 65														
Metal bellows coupling (recommended product type – validate sizing with cymex®)					BC2 - 04000AA - 075.000 - X														
Bore diameter of coupling on the application side				<i>mm</i>	X = 050.000 - 090.000														
Mass moment of inertia (relates to the drive) Clamping hub diameter [mm]			K 38	<i>J</i> <sub>i</sub>	<i>kgcm<sup>2</sup></i>	14	10.9	12.3	12	10.9	10.7	10.1	10	10.1	10	9.9	9.9	9.9	9.9
					<i>10<sup>-3</sup> in.lb.s<sup>2</sup></i>	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	<i>J</i> <sub>i</sub>	<i>kgcm<sup>2</sup></i>	28.7	25.6	27.1	26.7	26.7	25.6	24.8	24.7	24.8	24.7	24.6	24.6	24.6	24.6
<i>10<sup>-3</sup> in.lb.s<sup>2</sup></i>	25.4	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			

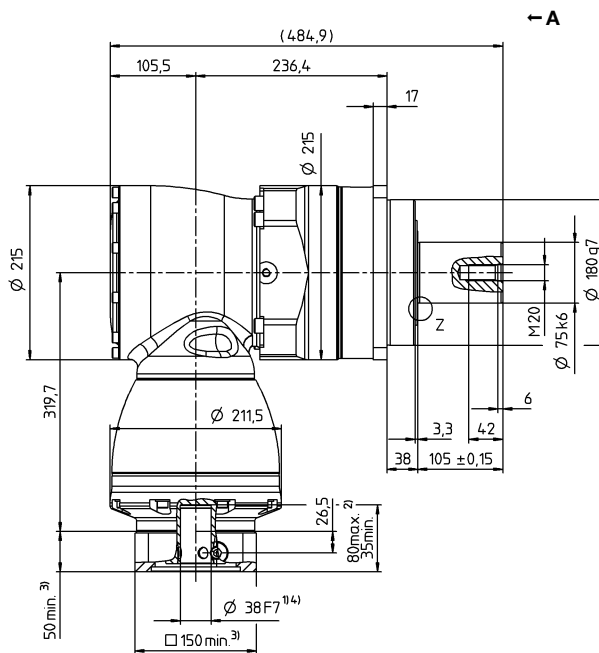
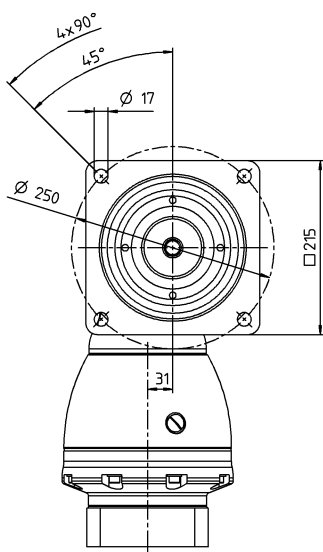
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Please contact us for optimum sizing at S1 conditions (Continuous operation).

- <sup>a)</sup> At max. 10 %  $F_{2QMax}$
- <sup>b)</sup> Valid for standard clamping hub diameter
- <sup>c)</sup> Refers to center of the output shaft or flange
- <sup>d)</sup> Please reduce input speed at higher ambient temperatures
- <sup>e)</sup> Smooth shaft
- <sup>f)</sup> Please contact us to discuss application-specific service lifetimes

View A

Motor shaft diameter [mm]

3-stage

up to 38/48<sup>4)</sup>  
(K<sup>5)</sup>/M) clamping  
hub diameter


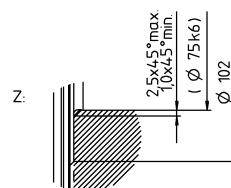
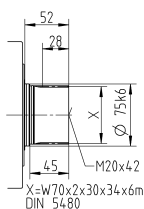
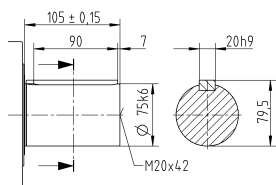
Hypoid gearboxes

SPK

## Other output variants

Shaft with key

Splined shaft (DIN 5480)



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

Non-tolerated dimensions are nominal dimensions

<sup>1)</sup> Check motor shaft fit

<sup>2)</sup> Min./Max. permissible motor shaft length. Longer motor shafts are possible, please contact alpha.

<sup>3)</sup> The dimensions depend on the motor

<sup>4)</sup> Smaller motor shaft diameter is compensated by a bushing with a minimum wall thickness of 1 mm

<sup>5)</sup> Standard clamping hub diameter

# SPK<sup>+</sup> 240 MF 3-stage

			3-stage					
Ratio	<i>i</i>		48	100	175	350	500	1000
Max. torque <sup>a) b) e)</sup>	$T_{2a}$	Nm	5446	5446	5700	5700	5700	3642
		in.lb	48201	48201	50450	50450	50450	32235
Max. acceleration torque <sup>b) e)</sup> (max. 1000 cycles per hour)	$T_{2B}$	Nm	4800	5400	5400	5400	5160	3642
		in.lb	42484	47794	47794	47794	45670	32235
Nominal torque (at $n_{1N}$ )	$T_{2N}$	Nm	2500	2500	2500	2500	2500	1700
		in.lb	22127	22127	22127	22127	22127	15046
Emergency stop torque <sup>a) b) e)</sup> (permitted 1000 times during the service life of the gearbox)	$T_{2Not}$	Nm	6400	8500	8500	8500	8500	6850
		in.lb	56645	75232	75232	75232	75232	60628
Permitted average input speed (at $T_{2N}$ and 20 °C ambient temperature) <sup>d)</sup>	$n_{1N}$	$n_{1T}$	1800	1900	2100	2100	2100	2100
Max. input speed	$n_{1Max}$	rpm	5000	5000	5000	5000	5000	5000
Mean no load running torque <sup>b)</sup> (at $n_1 = 3000$ rpm and 20 °C gearbox temperature)	$T_{012}$	Nm	13	8.4	9.6	7.2	6.9	6.9
		in.lb	115	74	85	64	61	61
Max. backlash	$j_t$	arcmin	Standard ≤ 5.5 / Reduced ≤ 3.5					
Torsional rigidity <sup>b)</sup>	$C_{t21}$	Nm/arcmin	510	510	510	510	510	510
		in.lb/arcmin	4514	4514	4514	4514	4514	4514
Max. axial force <sup>c)</sup>	$F_{2AMax}$	N	33000					
		lb <sub>f</sub>	7425					
Max. lateral force <sup>c)</sup>	$F_{2QMax}$	N	30000					
		lb <sub>f</sub>	6750					
Max. tilting moment	$M_{2KMax}$	Nm	5000					
		in.lb	44254					
Efficiency at full load	$\eta$	%	92					
Service life <sup>f)</sup>	$L_h$	h	> 20000					
Weight (incl. standard adapter plate)	$m$	kg	93					
		lb <sub>m</sub>	206					
Operating noise (at reference ratio and reference speed – ratio-specific values available in cymex <sup>®</sup> )	$L_{PA}$	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					
Direction of rotation			In- and output opposite direction					
Protection class			IP 65					
Metal bellows coupling (recommended product type – validate sizing with cymex <sup>®</sup> )			BC2 - 06000AA - 085.000 - X					
Bore diameter of coupling on the application side		mm	X = 060.000 - 140.000					
Mass moment of inertia (relates to the drive) Clamping hub diameter [mm]	K 38	$J_1$	kgcm <sup>2</sup>	26.5	17	15	13	13
			10 <sup>-3</sup> in.lb.s <sup>2</sup>	23.45	15.05	13.28	11.51	11.51

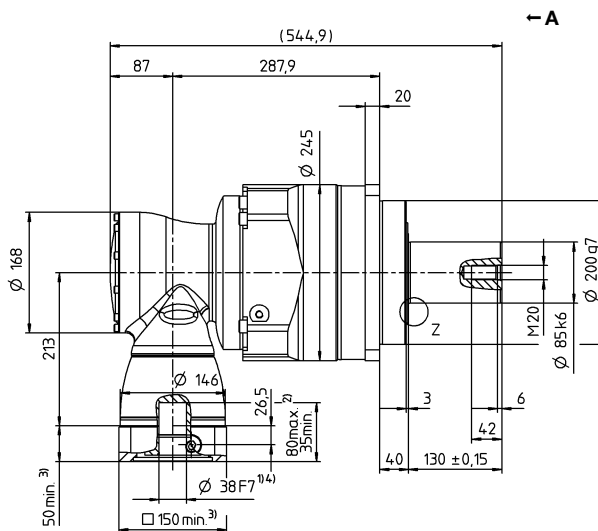
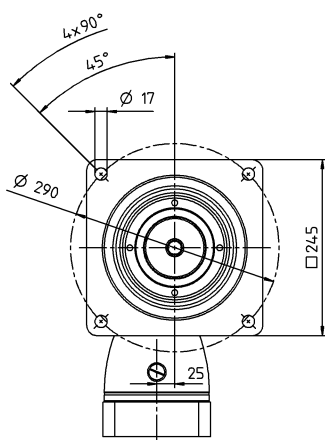
Please use our sizing software cymex<sup>®</sup> for a detailed sizing – [www.wittenstein-cymex.com](http://www.wittenstein-cymex.com)  
Please contact us for optimum sizing at S1 conditions (Continuous operation).

- <sup>a)</sup> At max. 10 %  $F_{2QMax}$
- <sup>b)</sup> Valid for standard clamping hub diameter
- <sup>c)</sup> Refers to center of the output shaft or flange
- <sup>d)</sup> Please reduce input speed at higher ambient temperatures
- <sup>e)</sup> Smooth shaft
- <sup>f)</sup> Please contact us to discuss application-specific service lifetimes

View A

Motor shaft diameter [mm]

3-stage

up to 38 <sup>4)</sup> (K) <sup>5)</sup>  
clamping hub  
diameter


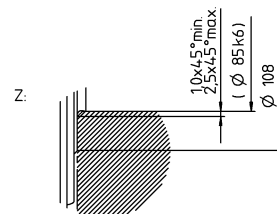
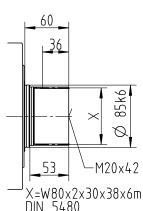
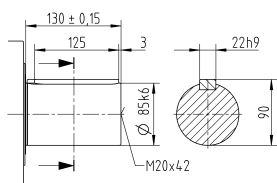
Hypoid gearboxes

SPK

## Other output variants

Shaft with key

Splined shaft (DIN 5480)



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

Non-tolerated dimensions are nominal dimensions  
<sup>1)</sup> Check motor shaft fit

<sup>2)</sup> Min./Max. permissible motor shaft length. Longer motor shafts are possible, please contact alpha.

<sup>3)</sup> The dimensions depend on the motor

<sup>4)</sup> Smaller motor shaft diameter is compensated by a bushing with a minimum wall thickness of 1 mm

<sup>5)</sup> Standard clamping hub diameter

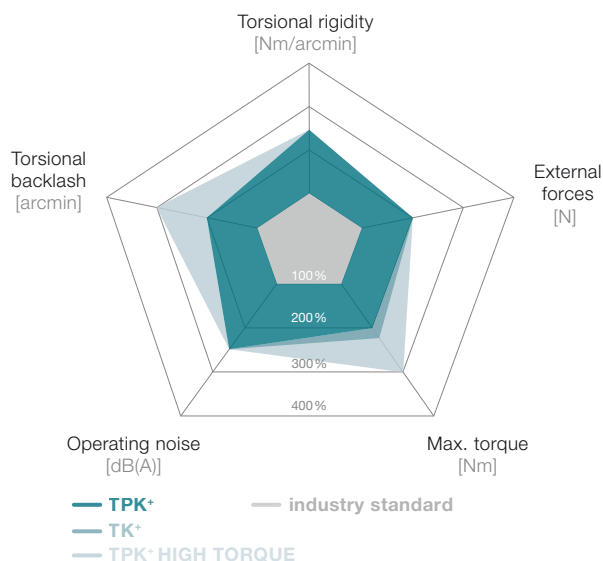


## TK<sup>+</sup> / TPK<sup>+</sup> / TPK<sup>+</sup> HIGH TORQUE – Space-saving right-angle precision with output flange



The versatile hypoid gearbox with TP<sup>+</sup> compatible output flange and hollow shaft. TPK<sup>+</sup> / TPK<sup>+</sup> HIGH TORQUE gearboxes with planetary stage are especially suitable for high-precision applications requiring higher power and torsional rigidity.

The TK<sup>+</sup> / TPK<sup>+</sup> / TK<sup>+</sup> HIGH TORQUE compared to the industry standard



### Product highlights

#### Max. torsional backlash

TK<sup>+</sup> ≤ 4 arcmin (Standard)

TPK<sup>+</sup> ≤ 3.3 arcmin (Standard)

≤ 2 arcmin (Reduced)

TPK<sup>+</sup> HIGH TORQUE ≤ 1.3 arcmin (Standard)

**Diverse range of ratios**  $i = 3 - 5,500$

**High torque capacity (MA)**

**Multiple output configurations for greater flexibility**

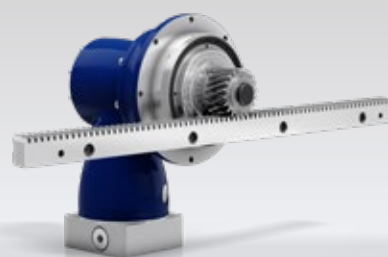
Flanged hollow shaft, Flange, System output, Output on both sides

#### Other gearbox models

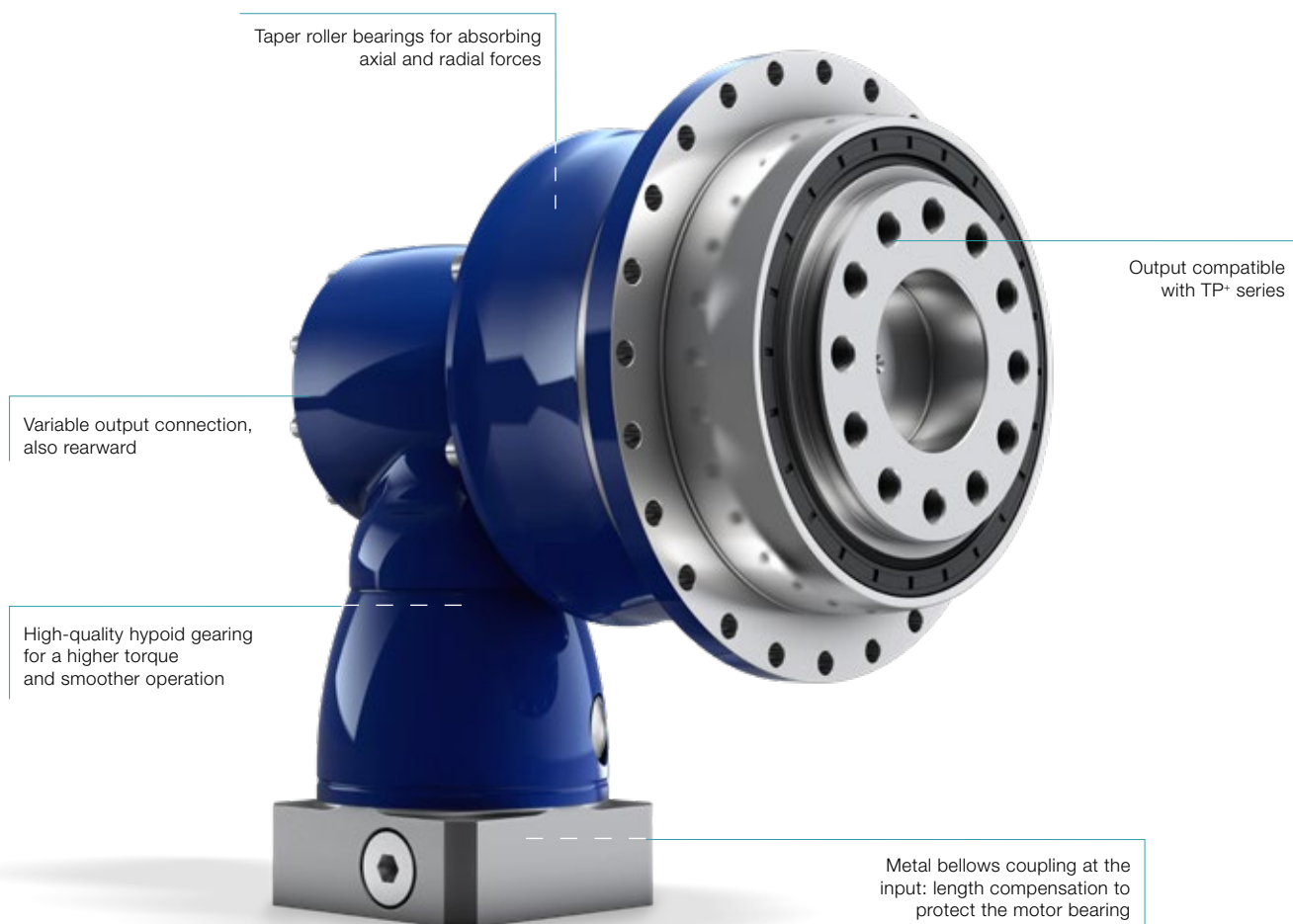
Corrosion resistant design, ATEX (TK<sup>+</sup>)



TK<sup>+</sup> in corrosion-resistant design



TPK<sup>+</sup> with rack and pinion



TPK+ HIGH TORQUE



TK+ with metal bellows coupling



TPK+ 2000 available on request

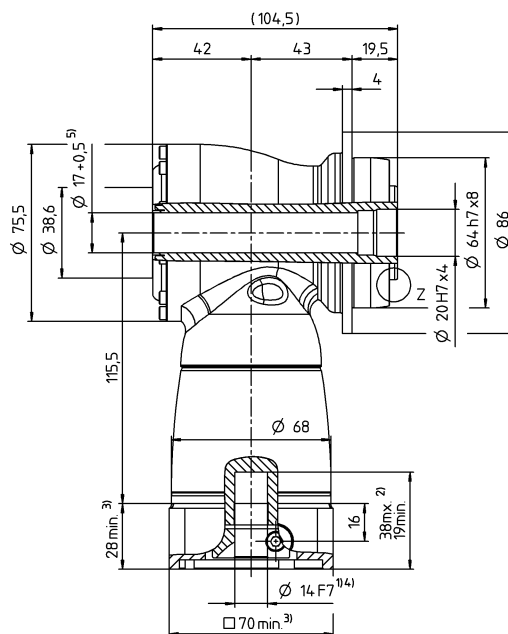
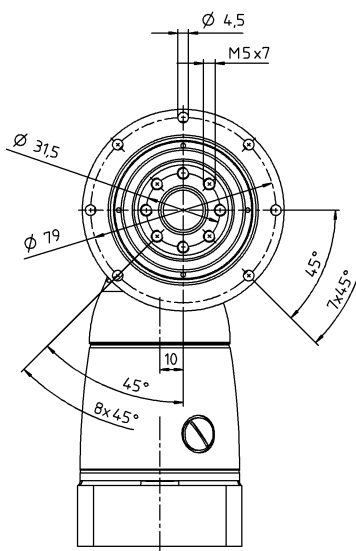
# TK<sup>+</sup> 004 MF 1-/2-stage

				1-stage					2-stage											
Ratio			<i>i</i>		3	4	5	7	10	12	16	20	25	28	35	40	50	70	100	
Max. torque <sup>a) b)</sup>			<i>T</i> <sub>2a</sub>	<i>Nm</i>	36	36	36	25	20	36	36	36	36	36	36	36	36	25	20	
				<i>in.lb</i>	319	319	319	221	177	319	319	319	319	319	319	319	319	319	221	177
Max. acceleration torque <sup>b)</sup> (max. 1000 cycles per hour)			<i>T</i> <sub>2B</sub>	<i>Nm</i>	30	30	30	25	20	30	30	30	30	30	30	30	30	25	20	
				<i>in.lb</i>	266	266	266	221	177	266	266	266	266	266	266	266	266	266	221	177
Nominal torque (at <i>n</i> <sub>n</sub> )			<i>T</i> <sub>2N</sub>	<i>Nm</i>	22	22	22	20	15	22	22	22	22	22	22	22	22	20	15	
				<i>in.lb</i>	195	195	195	177	133	195	195	195	195	195	195	195	195	195	177	133
Emergency stop torque <sup>a) b)</sup> (permitted 1000 times during the service life of the gearbox)			<i>T</i> <sub>2Not</sub>	<i>Nm</i>	40	50	50	45	40	50	50	50	50	50	50	50	50	45	40	
				<i>in.lb</i>	354	443	443	398	354	443	443	443	443	443	443	443	443	443	398	354
Permitted average input speed (at <i>T</i> <sub>2N</sub> and 20 °C ambient temperature) <sup>d)</sup>			<i>n</i> <sub>1N</sub>	<i>n</i> <sub>1T</sub>	2200	2400	2700	2700	2700	4400	4400	4400	4400	4400	4400	4400	4800	5500	5500	
Max. input speed			<i>n</i> <sub>1Max</sub>	<i>rpm</i>	7500	7500	7500	7500	7500	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	
Mean no load running torque <sup>b)</sup> (at <i>n</i> <sub>i</sub> = 3000 rpm and 20 °C gearbox temperature)			<i>T</i> <sub>012</sub>	<i>Nm</i>	1.9	1.8	1.4	1.5	1.4	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	
				<i>in.lb</i>	17	16	12	13	12	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
Max. backlash			<i>j</i> <sub>t</sub>	<i>arcmin</i>	Standard ≤ 5															
Torsional rigidity <sup>b)</sup>			<i>C</i> <sub>t21</sub>	<i>Nm/arcmin</i>	2.6	2.8	3	2.6	2.3	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	3	2.6	2.3
				<i>in.lb/arcmin</i>	23	25	27	23	20	25	25	25	25	25	25	25	25	25	27	23
Max. axial force <sup>c)</sup>			<i>F</i> <sub>2AMax</sub>	<i>N</i>	2400															
				<i>lb<sub>f</sub></i>	540															
Max. tilting moment			<i>M</i> <sub>2KMax</sub>	<i>Nm</i>	251															
				<i>in.lb</i>	2222															
Efficiency at full load			<i>η</i>	%	96					94										
Service life <sup>f)</sup>			<i>L</i> <sub>h</sub>	<i>h</i>	> 20000															
Weight (incl. standard adapter plate)			<i>m</i>	<i>kg</i>	2.9					3.2										
				<i>lb<sub>m</sub></i>	6					7										
Operating noise (at reference ratio and reference speed – ratio-specific values available in cymex®)			<i>L</i> <sub>PA</sub>	<i>dB(A)</i>	≤ 64															
Max. permitted housing temperature				°C	+90															
				<i>F</i>	194															
Ambient temperature				°C	0 to +40															
				<i>F</i>	32 to 104															
Lubrication					Lubricated for life															
Direction of rotation					In- and output opposite direction															
Protection class					IP 65															
Metal bellows coupling (recommended product type – validate sizing with cymex®)					BCT - 00015AAX - 031.500															
Bore diameter of coupling on the application side				<i>mm</i>	X = 012.000 - 028.000															
Mass moment of inertia (relates to the drive) Clamping hub diameter [mm]	B	11	<i>J</i> <sub>i</sub>	<i>kgcm²</i>	-	-	-	-	-	0.09	0.09	0.07	0.07	0.06	0.06	0.06	0.06	0.06	0.06	
				<i>10<sup>-3</sup> in.lb.s²</i>	-	-	-	-	-	0.08	0.08	0.06	0.06	0.05	0.05	0.05	0.05	0.05	0.05	
	C	14	<i>J</i> <sub>i</sub>	<i>kgcm²</i>	0.57	0.46	0.41	0.37	0.35	0.21	0.2	0.19	0.19	0.18	0.18	0.17	0.17	0.17	0.17	
				<i>10<sup>-3</sup> in.lb.s²</i>	0.5	0.41	0.36	0.33	0.31	0.19	0.18	0.17	0.17	0.16	0.16	0.15	0.15	0.15	0.15	
	E	19	<i>J</i> <sub>i</sub>	<i>kgcm²</i>	0.92	0.82	0.76	0.72	0.7	-	-	-	-	-	-	-	-	-	-	
				<i>10<sup>-3</sup> in.lb.s²</i>	0.81	0.73	0.67	0.64	0.62	-	-	-	-	-	-	-	-	-	-	

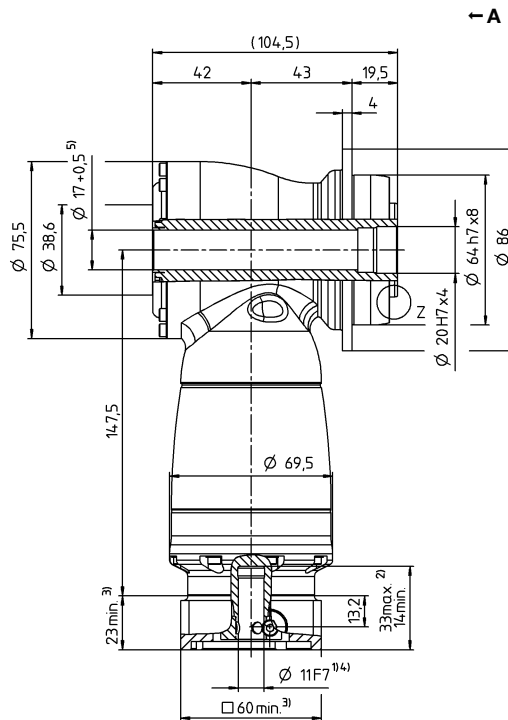
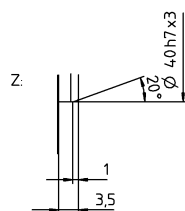
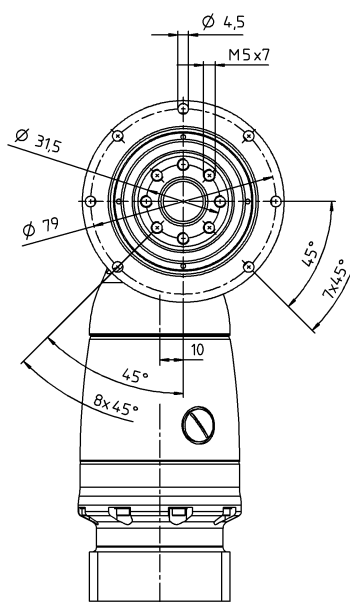
Please use our sizing software cymex<sup>®</sup> for a detailed sizing – [www.wittenstein-cymex.com](http://www.wittenstein-cymex.com)  
Please contact us for optimum sizing at S1 conditions (Continuous operation).

- <sup>a)</sup> At max. 10 %  $M_{2KMax}$
- <sup>b)</sup> Valid for standard clamping hub diameter
- <sup>c)</sup> Refers to center of the output shaft or flange
- <sup>d)</sup> Please reduce input speed at higher ambient temperatures
- <sup>f)</sup> Please contact us to discuss application-specific service lifetimes

up to 14/19 <sup>4)</sup>  
(C<sup>6</sup>)/E) clamping  
hub diameter



up to 11/14 <sup>4)</sup>  
(B<sup>6)</sup>/C) clamping  
hub diameter



6) Standard clamping hub diameter

# TK<sup>+</sup> 010 MF 1-/2-stage

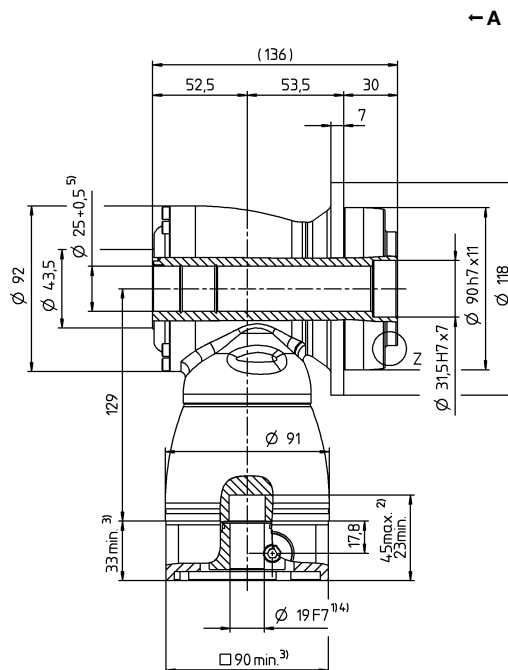
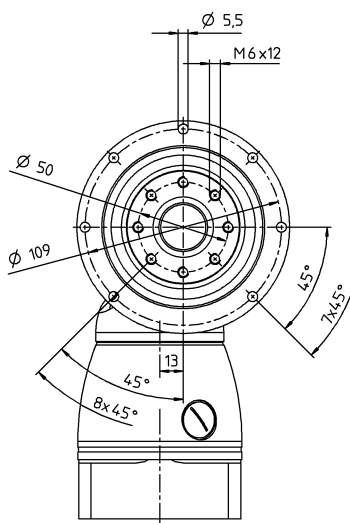
				1-stage					2-stage										
Ratio			<i>i</i>		3	4	5	7	10	12	16	20	25	28	35	40	50	70	100
Max. torque <sup>a) b)</sup>			<i>T</i> <sub>2a</sub>	<i>Nm</i>	84	84	84	60	50	84	84	84	84	84	84	84	84	60	50
				<i>in.lb</i>	743	743	743	531	443	743	743	743	743	743	743	743	743	743	531
Max. acceleration torque <sup>b)</sup> (max. 1000 cycles per hour)			<i>T</i> <sub>2B</sub>	<i>Nm</i>	70	70	70	60	50	70	70	70	70	70	70	70	70	60	50
				<i>in.lb</i>	620	620	620	531	443	620	620	620	620	620	620	620	620	620	531
Nominal torque (at <i>n</i> <sub>n</sub> )			<i>T</i> <sub>2N</sub>	<i>Nm</i>	50	50	50	45	40	50	50	50	50	50	50	50	50	45	40
				<i>in.lb</i>	443	443	443	398	354	443	443	443	443	443	443	443	443	443	398
Emergency stop torque <sup>a) b)</sup> (permitted 1000 times during the service life of the gearbox)			<i>T</i> <sub>2Not</sub>	<i>Nm</i>	95	115	115	110	100	115	115	115	115	115	115	115	115	110	100
				<i>in.lb</i>	841	1018	1018	974	885	1018	1018	1018	1018	1018	1018	1018	1018	1018	974
Permitted average input speed (at <i>T</i> <sub>2a</sub> and 20 °C ambient temperature) <sup>d)</sup>			<i>n</i> <sub>1N</sub>	<i>n</i> <sub>1T</sub>	2100	2200	2500	2500	2500	3500	3500	3500	3500	3500	3500	3500	3800	4500	4500
Max. input speed			<i>n</i> <sub>1Max</sub>	<i>rpm</i>	7500	7500	7500	7500	7500	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000
Mean no load running torque <sup>b)</sup> (at <i>n</i> <sub>i</sub> = 3000 rpm and 20 °C gearbox temperature)			<i>T</i> <sub>012</sub>	<i>Nm</i>	3.3	2.8	2.1	2.4	2.2	0.4	0.4	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2
				<i>in.lb</i>	29	25	19	21	19	3.5	3.5	2.7	2.7	2.7	2.7	2.7	1.8	1.8	1.8
Max. backlash			<i>j</i> <sub>t</sub>	<i>arcmin</i>	Standard ≤ 4														
Torsional rigidity <sup>b)</sup>			<i>C</i> <sub>t21</sub>	<i>Nm/arcmin</i>	6	7	8	8	8	7	7	7	7	7	7	7	8	8	8
				<i>in.lb/arcmin</i>	53	62	71	71	71	62	62	62	62	62	62	62	62	71	71
Max. axial force <sup>c)</sup>			<i>F</i> <sub>2AMax</sub>	<i>N</i>	3400														
				<i>lb<sub>f</sub></i>	765														
Max. tilting moment			<i>M</i> <sub>2KMax</sub>	<i>Nm</i>	437														
				<i>in.lb</i>	3868														
Efficiency at full load			<i>η</i>	%	96					94									
Service life <sup>f)</sup>			<i>L</i> <sub>h</sub>	<i>h</i>	> 20000														
Weight (incl. standard adapter plate)			<i>m</i>	<i>kg</i>	5.3					6.1									
				<i>lb<sub>m</sub></i>	12					13									
Operating noise (at reference ratio and reference speed – ratio-specific values available in cymex®)			<i>L</i> <sub>PA</sub>	<i>dB(A)</i>	≤ 66														
Max. permitted housing temperature				°C	+90														
				<i>F</i>	194														
Ambient temperature				°C	0 to +40														
				<i>F</i>	32 to 104														
Lubrication					Lubricated for life														
Direction of rotation					In- and output opposite direction														
Protection class					IP 65														
Metal bellows coupling (recommended product type – validate sizing with cymex®)					BCT - 00060AAX - 050.000														
Bore diameter of coupling on the application side				<i>mm</i>	X = 014.000 - 035.000														
Mass moment of inertia (relates to the drive) Clamping hub diameter [mm]	C	14	<i>J</i> <sub>i</sub>	<i>kgcm²</i>	-	-	-	-	-	0.31	0.28	0.24	0.23	0.21	0.2	0.19	0.18	0.18	0.18
				<i>10<sup>-3</sup> in.lb.s²</i>	-	-	-	-	-	0.27	0.25	0.21	0.2	0.19	0.18	0.17	0.16	0.16	0.16
	E	19	<i>J</i> <sub>i</sub>	<i>kgcm²</i>	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
				<i>10<sup>-3</sup> in.lb.s²</i>	1.6	1.23	1.04	0.9	0.82	0.66	0.64	0.6	0.6	0.56	0.56	0.56	0.56	0.56	0.56
	H	28	<i>J</i> <sub>i</sub>	<i>kgcm²</i>	3.22	2.8	2.6	2.43	2.34	-	-	-	-	-	-	-	-	-	-
				<i>10<sup>-3</sup> in.lb.s²</i>	2.85	2.48	2.3	2.15	2.07	-	-	-	-	-	-	-	-	-	-

Please use our sizing software cymex<sup>®</sup> for a detailed sizing – [www.wittenstein-cymex.com](http://www.wittenstein-cymex.com)  
Please contact us for optimum sizing at S1 conditions (Continuous operation).

- <sup>a)</sup> At max. 10 %  $M_{2KMax}$
- <sup>b)</sup> Valid for standard clamping hub diameter
- <sup>c)</sup> Refers to center of the output shaft or flange
- <sup>d)</sup> Please reduce input speed at higher ambient temperatures
- <sup>f)</sup> Please contact us to discuss application-specific service lifetimes

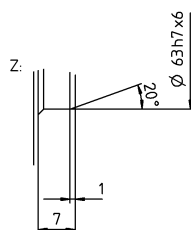
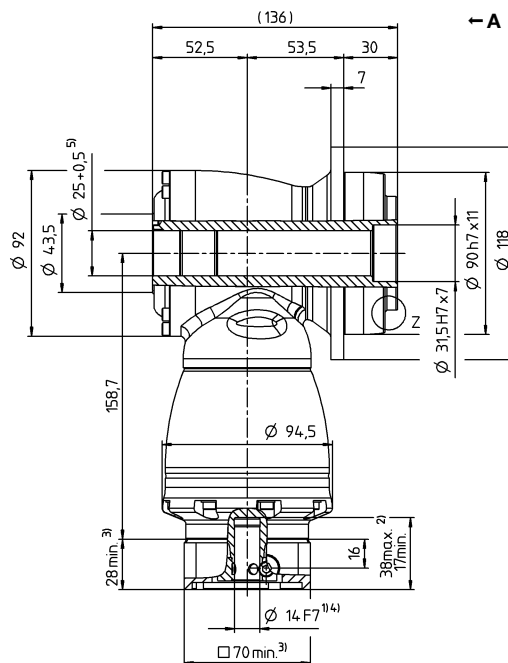
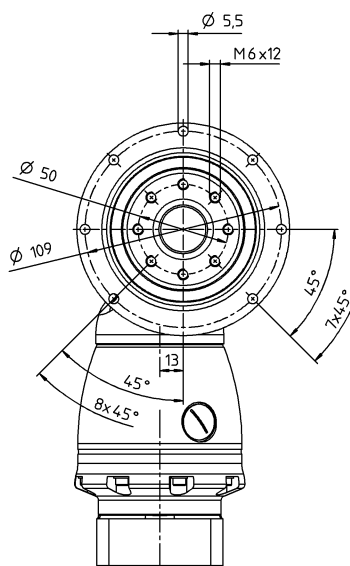
# 1-stage

up to 19/28 <sup>4)</sup>  
(E <sup>6)</sup>/H) clamping  
hub diameter



# 2-stage

up to 14/19 <sup>4)</sup>  
(C <sup>6)</sup>/E) clamping  
hub diameter



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

Non-tolerated dimensions are nominal dimensions

<sup>1)</sup> Check motor shaft fit

<sup>2)</sup> Min./Max. permissible motor shaft length. Longer motor shafts are possible, please contact alpha.

<sup>3)</sup> The dimensions depend on the motor

<sup>4)</sup> Smaller motor shaft diameter is compensated by a bushing with a minimum wall thickness of 1 mm

<sup>5)</sup> Led through element max. Ø 24.8 mm

<sup>6)</sup> Standard clamping hub diameter

# TK<sup>+</sup> 025 MF 1-/2-stage

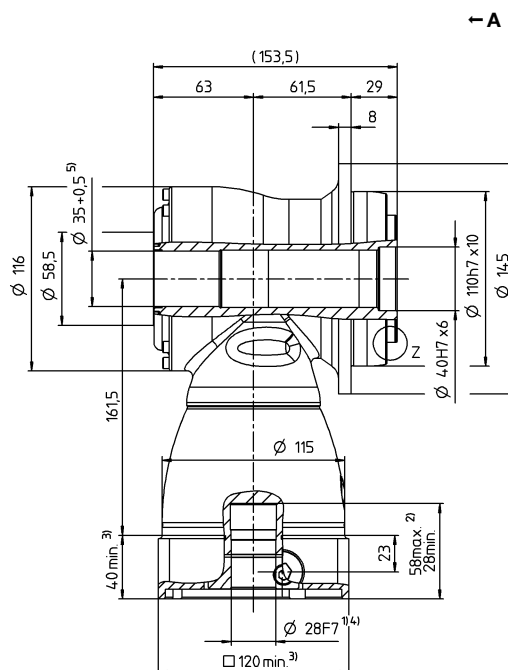
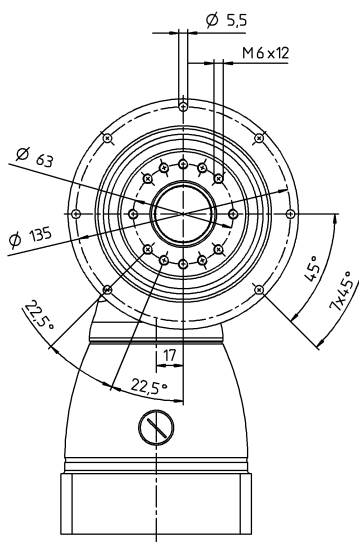
					1-stage					2-stage										
Ratio				i		3	4	5	7	10	12	16	20	25	28	35	40	50	70	100
Max. torque <sup>a) b)</sup>				T <sub>2a</sub>	Nm	204	204	204	145	125	204	204	204	204	204	204	204	204	145	125
					in.lb	1806	1806	1806	1283	1106	1806	1806	1806	1806	1806	1806	1806	1806	1806	1283
Max. acceleration torque <sup>b)</sup> (max. 1000 cycles per hour)				T <sub>2B</sub>	Nm	170	170	170	145	125	170	170	170	170	170	170	170	170	145	125
					in.lb	1505	1505	1505	1283	1106	1505	1505	1505	1505	1505	1505	1505	1505	1505	1283
Nominal torque (at n <sub>1n</sub> )				T <sub>2N</sub>	Nm	100	100	100	90	80	100	100	100	100	100	100	100	100	90	80
					in.lb	885	885	885	797	708	885	885	885	885	885	885	885	885	885	797
Emergency stop torque <sup>a) b)</sup> (permitted 1000 times during the service life of the gearbox)				T <sub>2Not</sub>	Nm	220	260	260	255	250	260	260	260	260	260	260	260	260	255	250
					in.lb	1947	2301	2301	2257	2213	2301	2301	2301	2301	2301	2301	2301	2301	2301	2301
Permitted average input speed (at T <sub>2N</sub> and 20 °C ambient temperature) <sup>d)</sup>				n <sub>1N</sub>	n <sub>1T</sub>	2000	2100	2400	2200	2200	3100	3100	3100	3100	3100	3100	3100	3500	4200	4200
Max. input speed				n <sub>1Max</sub>	rpm	5500	5500	5500	5500	5500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500
Mean no load running torque <sup>b)</sup> (at n <sub>i</sub> = 3000 rpm and 20 °C gearbox temperature)				T <sub>012</sub>	Nm	4.9	3.9	4	4.5	3.6	0.7	0.7	0.6	0.5	0.5	0.4	0.2	0.2	0.2	0.2
					in.lb	43	35	35	40	32	6.2	6.2	5.3	4.4	4.4	3.5	1.8	1.8	1.8	1.8
Max. backlash				j <sub>t</sub>	arcmin	Standard ≤ 4														
Torsional rigidity <sup>b)</sup>				C <sub>121</sub>	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	115	142	142
Max. axial force <sup>c)</sup>				F <sub>2AMax</sub>	N	5700														
					lb <sub>f</sub>	1283														
Max. tilting moment				M <sub>2KMax</sub>	Nm	833														
					in.lb	7373														
Efficiency at full load				η	%	96					94									
Service life <sup>f)</sup>				L <sub>h</sub>	h	> 20000														
Weight (incl. standard adapter plate)				m	kg	8.9					10.6									
					lb <sub>m</sub>	20					23									
Operating noise (at reference ratio and reference speed – ratio-specific values available in cymex <sup>®</sup> )				L <sub>PA</sub>	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															
Direction of rotation					In- and output opposite direction															
Protection class					IP 65															
Metal bellows coupling (recommended product type – validate sizing with cymex <sup>®</sup> )					BCT - 00150AAX - 063.000															
Bore diameter of coupling on the application side					mm	X = 019.000 - 042.000														
Mass moment of inertia (relates to the drive)  Clamping hub diameter [mm]	E	19	J <sub>i</sub>	kgcm <sup>2</sup>	-	-	-	-	-	1.08	1.01	0.88	0.85	0.76	0.75	0.7	0.69	0.68	0.68	
				10 <sup>-3</sup> in.lb.s <sup>2</sup>	-	-	-	-	-	0.96	0.89	0.78	0.75	0.67	0.66	0.62	0.61	0.6	0.6	
	G	24	J <sub>i</sub>	kgcm <sup>2</sup>	-	-	-	-	-	2.65	2.57	2.44	2.42	2.32	2.31	2.26	2.25	2.25		
				10 <sup>-3</sup> in.lb.s <sup>2</sup>	-	-	-	-	-	2.35	2.27	2.16	2.14	2.05	2.04	2	1.99	1.99		
	H	28	J <sub>i</sub>	kgcm <sup>2</sup>	5.5	4.3	3.6	3.1	2.9	-	-	-	-	-	-	-	-	-		
				10 <sup>-3</sup> in.lb.s <sup>2</sup>	4.87	3.81	3.19	2.74	2.57	-	-	-	-	-	-	-	-	-		
	K	38	J <sub>i</sub>	kgcm <sup>2</sup>	12.7	11.5	10.9	10.4	10.1	-	-	-	-	-	-	-	-	-	-	
				10 <sup>-3</sup> in.lb.s <sup>2</sup>	11.24	10.18	9.65	9.2	8.94	-	-	-	-	-	-	-	-	-	-	

Please use our sizing software cymex<sup>®</sup> for a detailed sizing – [www.wittenstein-cymex.com](http://www.wittenstein-cymex.com)  
Please contact us for optimum sizing at S1 conditions (Continuous operation).

- <sup>a)</sup> At max. 10 %  $M_{2KMax}$   
<sup>b)</sup> Valid for standard clamping hub diameter  
<sup>c)</sup> Refers to center of the output shaft or flange  
<sup>d)</sup> Please reduce input speed at higher ambient temperatures  
<sup>f)</sup> Please contact us to discuss application-specific service lifetimes

# 1-stage

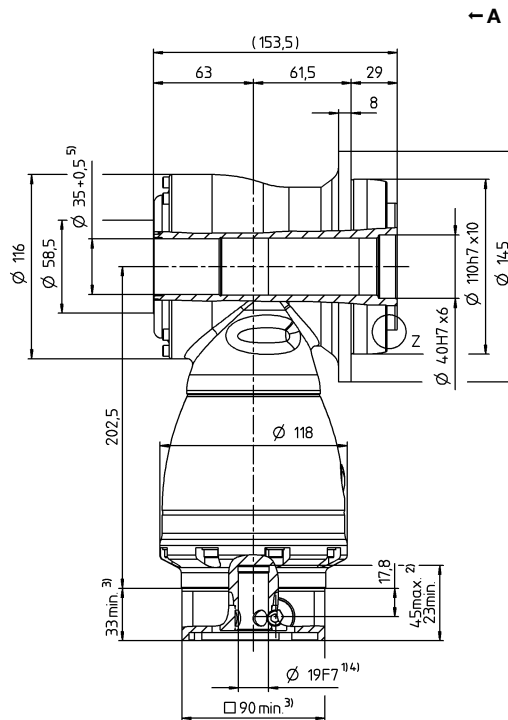
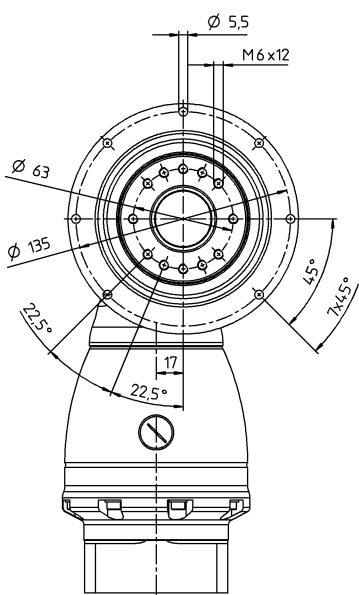
up to 28/38 <sup>4)</sup>  
(H<sup>6)</sup>/K) clamping  
hub diameter



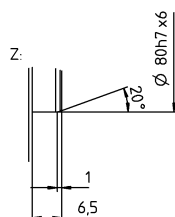
← A

# 2-stage

up to 19/24 <sup>4)</sup>  
(E<sup>6)</sup>/G) clamping  
hub diameter



← A



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

Non-tolerated dimensions are nominal dimensions

<sup>1)</sup> Check motor shaft fit

<sup>2)</sup> Min./Max. permissible motor shaft length. Longer motor shafts are possible, please contact alpha.

<sup>3)</sup> The dimensions depend on the motor

<sup>4)</sup> Smaller motor shaft diameter is compensated by a bushing with a minimum wall thickness of 1 mm

<sup>5)</sup> Led through element max. Ø 34.8 mm

<sup>6)</sup> Standard clamping hub diameter



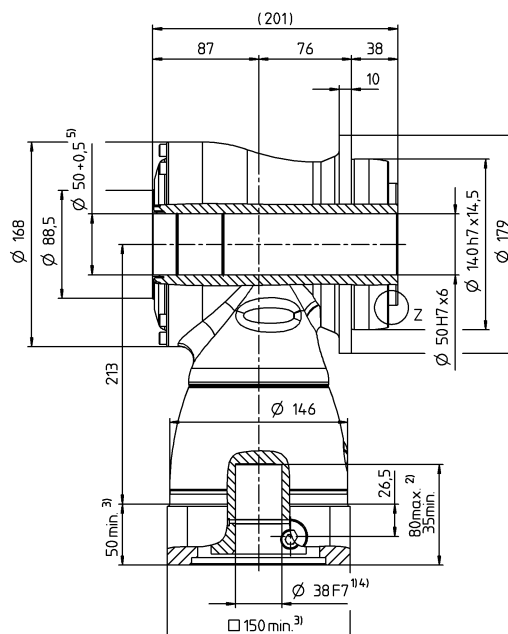
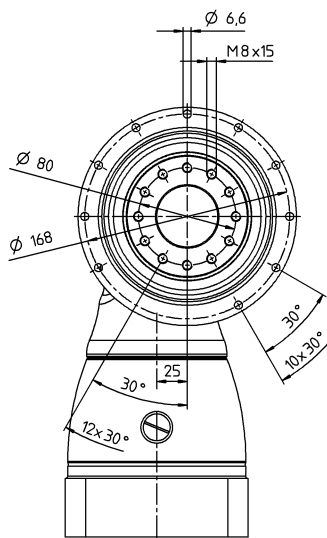
# TK<sup>+</sup> 050 MF 1-/2-stage

				1-stage					2-stage											
Ratio			<i>i</i>		3	4	5	7	10	12	16	20	25	28	35	40	50	70	100	
Max. torque <sup>a) b)</sup>			<i>T</i> <sub>2a</sub>	<i>Nm</i>	360	360	360	250	210	360	360	360	360	360	360	360	360	250	210	
				<i>in.lb</i>	3186	3186	3186	2213	1859	3186	3186	3186	3186	3186	3186	3186	3186	3186	2213	1859
Max. acceleration torque <sup>b)</sup> (max. 1000 cycles per hour)			<i>T</i> <sub>2B</sub>	<i>Nm</i>	300	300	300	250	210	300	300	300	300	300	300	300	300	250	210	
				<i>in.lb</i>	2655	2655	2655	2213	1859	2655	2655	2655	2655	2655	2655	2655	2655	2655	2213	1859
Nominal torque (at <i>n</i> <sub>n</sub> )			<i>T</i> <sub>2N</sub>	<i>Nm</i>	190	190	190	175	160	190	190	190	190	190	190	190	190	175	160	
				<i>in.lb</i>	1682	1682	1682	1549	1416	1682	1682	1682	1682	1682	1682	1682	1682	1682	1549	1416
Emergency stop torque <sup>a) b)</sup> (permitted 1000 times during the service life of the gearbox)			<i>T</i> <sub>2Not</sub>	<i>Nm</i>	400	500	500	450	400	500	500	500	500	500	500	500	500	450	400	
				<i>in.lb</i>	3540	4425	4425	3983	3540	4425	4425	4425	4425	4425	4425	4425	4425	4425	3983	3540
Permitted average input speed (at <i>T</i> <sub>2a</sub> and 20 °C ambient temperature) <sup>d)</sup>			<i>n</i> <sub>1N</sub>	<i>n</i> <sub>1T</sub>	1700	1800	2000	1800	1800	2900	2900	2900	2900	2900	2900	2900	3200	3200	3900	
Max. input speed			<i>n</i> <sub>1Max</sub>	<i>rpm</i>	5000	5000	5000	5000	5000	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	
Mean no load running torque <sup>b)</sup> (at <i>n</i> <sub>i</sub> = 3000 rpm and 20 °C gearbox temperature)			<i>T</i> <sub>012</sub>	<i>Nm</i>	9.6	7.1	8.4	9	6.6	1.7	1.1	0.8	0.6	0.6	0.5	0.5	0.4	0.4	0.4	
				<i>in.lb</i>	85	63	74	80	58	15	9.7	7.1	5.3	5.3	4.4	4.4	3.5	3.5	3.5	3.5
Max. backlash			<i>j</i> <sub>t</sub>	<i>arcmin</i>	Standard ≤ 4															
Torsional rigidity <sup>b)</sup>			<i>C</i> <sub>t21</sub>	<i>Nm/arcmin</i>	36	40	46	44	42	40	40	40	40	40	40	40	40	46	44	42
				<i>in.lb/arcmin</i>	319	354	407	389	372	354	354	354	354	354	354	354	354	354	407	389
Max. axial force <sup>c)</sup>			<i>F</i> <sub>2AMax</sub>	<i>N</i>	9900															
				<i>lb<sub>f</sub></i>	2228															
Max. tilting moment			<i>M</i> <sub>2KMax</sub>	<i>Nm</i>	1692															
				<i>in.lb</i>	14976															
Efficiency at full load			<i>η</i>	%	96					94										
Service life <sup>f)</sup>			<i>L</i> <sub>h</sub>	<i>h</i>	> 20000															
Weight (incl. standard adapter plate)			<i>m</i>	<i>kg</i>	22					26										
				<i>lb<sub>m</sub></i>	49					57										
Operating noise (at reference ratio and reference speed – ratio-specific values available in cymex®)			<i>L</i> <sub>PA</sub>	<i>dB(A)</i>	≤ 68															
Max. permitted housing temperature				°C	+90															
				<i>F</i>	194															
Ambient temperature				°C	0 to +40															
				<i>F</i>	32 to 104															
Lubrication					Lubricated for life															
Direction of rotation					In- and output opposite direction															
Protection class					IP 65															
Metal bellows coupling (recommended product type – validate sizing with cymex®)					BCT - 00300AAX - 080.000															
				<i>mm</i>	X = 024.000 - 060.000															
Mass moment of inertia (relates to the drive)		G	24	<i>J</i> <sub>i</sub>	<i>kgcm²</i>	-	-	-	-	-	4.43	3.97	3.36	3.22	2.82	2.75	2.5	2.47	2.44	2.42
					<i>10<sup>-3</sup> in.lb.s²</i>	-	-	-	-	-	3.92	3.51	2.97	2.85	2.5	2.43	2.21	2.19	2.16	2.14
		Clamping hub diameter [mm]	K	38	<i>J</i> <sub>i</sub>	<i>kgcm²</i>	28.4	21	17.6	14.7	13.1	11.3	10.9	10.3	10.1	9.74	9.66	9.41	9.38	9.35
<i>10<sup>-3</sup> in.lb.s²</i>	25.13					18.59	15.58	13.01	11.59	10	9.65	9.12	8.94	8.62	8.55	8.33	8.3	8.27	8.26	

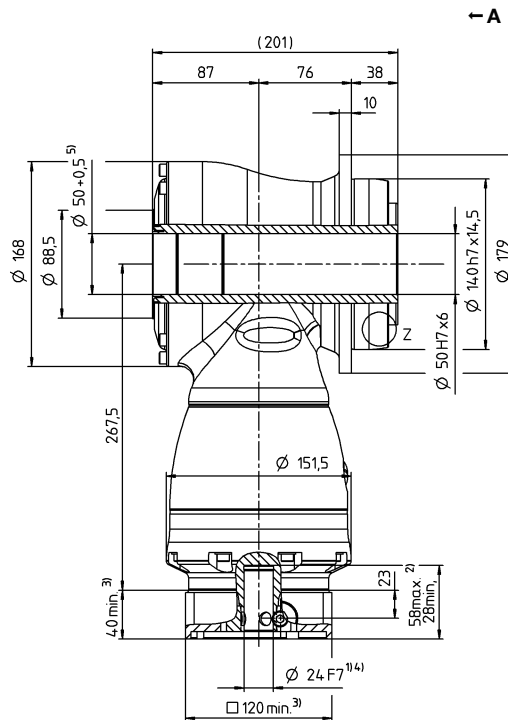
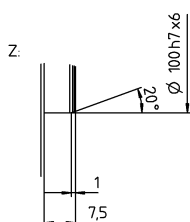
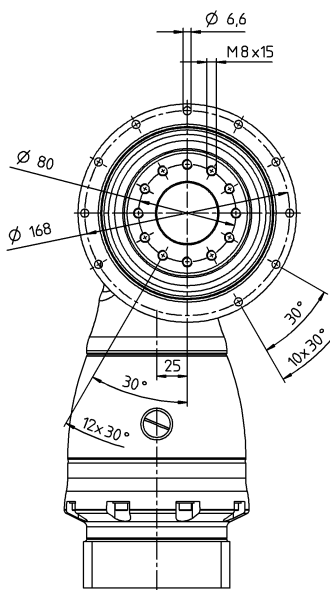
Please use our sizing software cymex<sup>®</sup> for a detailed sizing – [www.wittenstein-cymex.com](http://www.wittenstein-cymex.com)  
Please contact us for optimum sizing at S1 conditions (Continuous operation).

- <sup>a)</sup> At max. 10 %  $M_{2KMax}$
- <sup>b)</sup> Valid for standard clamping hub diameter
- <sup>c)</sup> Refers to center of the output shaft or flange
- <sup>d)</sup> Please reduce input speed at higher ambient temperatures
- <sup>f)</sup> Please contact us to discuss application-specific service lifetimes

up to 38<sup>4)</sup> (K)<sup>6)</sup>  
clamping hub  
diameter



up to 24/38 <sup>4)</sup>  
(G<sup>6</sup>/K) clamping  
hub diameter



6) Standard clamping hub diameter

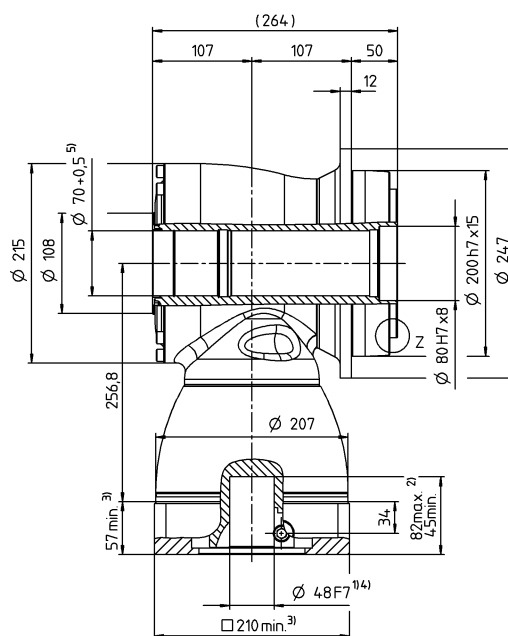
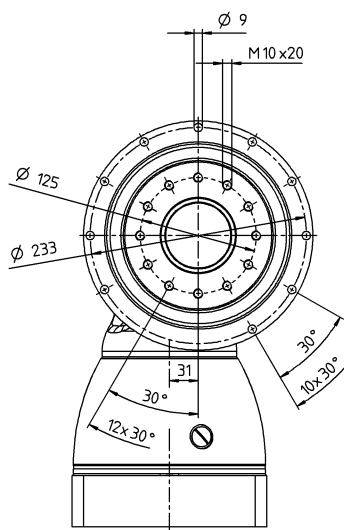
# TK<sup>+</sup> 110 MF 1- / 2-stage

				1-stage					2-stage											
Ratio			<i>i</i>		3	4	5	7	10	12	16	20	25	28	35	40	50	70	100	
Max. torque <sup>a) b)</sup>			<i>T</i> <sub>2a</sub>	<i>Nm</i>	768	768	768	550	470	768	768	768	768	768	768	768	768	550	470	
				<i>in.lb</i>	6797	6797	6797	4868	4160	6797	6797	6797	6797	6797	6797	6797	6797	6797	4868	4160
Max. acceleration torque <sup>b)</sup> (max. 1000 cycles per hour)			<i>T</i> <sub>2B</sub>	<i>Nm</i>	640	640	640	550	470	640	640	640	640	640	640	640	640	550	470	
				<i>in.lb</i>	5665	5665	5665	4868	4160	5665	5665	5665	5665	5665	5665	5665	5665	5665	4868	4160
Nominal torque (at <i>n</i> <sub>n</sub> )			<i>T</i> <sub>2N</sub>	<i>Nm</i>	400	400	400	380	360	400	400	400	400	400	400	400	400	380	360	
				<i>in.lb</i>	3540	3540	3540	3363	3186	3540	3540	3540	3540	3540	3540	3540	3540	3540	3363	3186
Emergency stop torque <sup>a) b)</sup> (permitted 1000 times during the service life of the gearbox)			<i>T</i> <sub>2Not</sub>	<i>Nm</i>	900	1050	1050	970	900	1050	1050	1050	1050	1050	1050	1050	1050	970	900	
				<i>in.lb</i>	7966	9293	9293	8585	7966	9293	9293	9293	9293	9293	9293	9293	9293	9293	8585	7966
Permitted average input speed (at <i>T</i> <sub>2a</sub> and 20 °C ambient temperature) <sup>d)</sup>			<i>n</i> <sub>1N</sub>	<i>n</i> <sub>1T</sub>	1400	1600	1800	1600	1600	2700	2700	2700	2700	2700	2700	2700	2900	3200	3400	
Max. input speed			<i>n</i> <sub>1Max</sub>	<i>rpm</i>	4500	4500	4500	4500	4500	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	
Mean no load running torque <sup>b)</sup> (at <i>n</i> <sub>i</sub> = 3000 rpm and 20 °C gearbox temperature)			<i>T</i> <sub>012</sub>	<i>Nm</i>	20	17	18	19	16	3.6	2.8	2.2	1.9	1.6	1.4	1.1	1.1	1.1	1.1	
				<i>in.lb</i>	177	150	159	168	142	32	25	19	17	14	12	9.7	9.7	9.7	9.7	9.7
Max. backlash			<i>j</i> <sub>t</sub>	<i>arcmin</i>	Standard ≤ 4															
Torsional rigidity <sup>b)</sup>			<i>C</i> <sub>t21</sub>	<i>Nm/arcmin</i>	76	87	99	97	96	87	87	87	87	87	87	87	87	99	97	96
				<i>in.lb/arcmin</i>	673	770	876	859	850	770	770	770	770	770	770	770	770	770	876	859
Max. axial force <sup>c)</sup>			<i>F</i> <sub>2AMax</sub>	<i>N</i>	14200															
				<i>lb<sub>f</sub></i>	3195															
Max. tilting moment			<i>M</i> <sub>2KMax</sub>	<i>Nm</i>	3213															
				<i>in.lb</i>	28438															
Efficiency at full load			<i>η</i>	%	96					94										
Service life <sup>f)</sup>			<i>L</i> <sub>h</sub>	<i>h</i>	> 20000															
Weight (incl. standard adapter plate)			<i>m</i>	<i>kg</i>	48					54										
				<i>lb<sub>m</sub></i>	106					119										
Operating noise (at reference ratio and reference speed – ratio-specific values available in cymex®)			<i>L</i> <sub>PA</sub>	<i>dB(A)</i>	≤ 68															
Max. permitted housing temperature				°C	+90															
				<i>F</i>	194															
Ambient temperature				°C	0 to +40															
				<i>F</i>	32 to 104															
Lubrication					Lubricated for life															
Direction of rotation					In- and output opposite direction															
Protection class					IP 65															
Metal bellows coupling (recommended product type – validate sizing with cymex®)					BCT - 01500AAX - 125.000															
				<i>mm</i>	X = 050.000 - 080.000															
Mass moment of inertia (relates to the drive)		K	38	<i>J</i> <sub>i</sub>	<i>kgcm²</i>	-	-	-	-	-	16.8	14.8	12.9	12.3	11.2	10.9	10.3	10.1	10	9.93
					<i>10<sup>-3</sup> in.lb.s²</i>	-	-	-	-	-	14.87	13.1	11.42	10.89	9.91	9.65	9.12	8.94	8.85	8.79
		M	48	<i>J</i> <sub>i</sub>	<i>kgcm²</i>	96.5	64.6	50.5	38.2	31.8	31.5	29.5	27.6	27	25.9	25.6	25	24.8	24.7	24.6
<i>10<sup>-3</sup> in.lb.s²</i>	85.4				57.17	44.69	33.81	28.14	27.88	26.11	24.43	23.9	22.92	22.66	22.13	21.95	21.86	21.77		

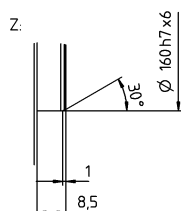
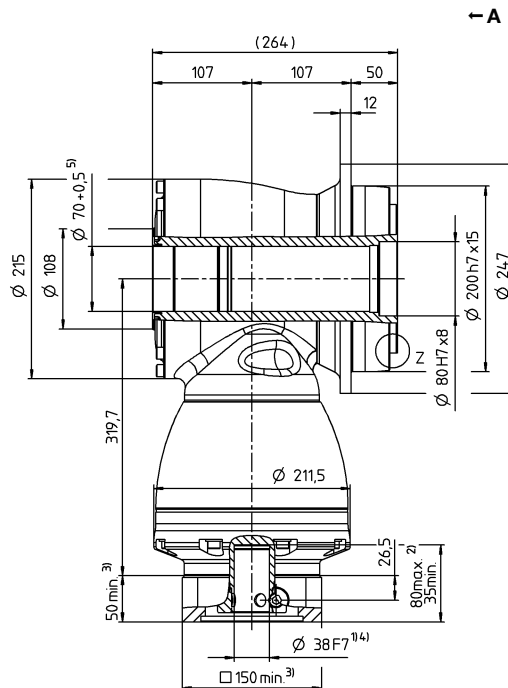
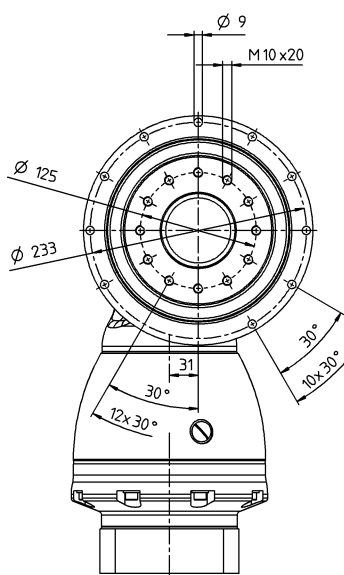
Please use our sizing software cymex<sup>®</sup> for a detailed sizing – [www.wittenstein-cymex.com](http://www.wittenstein-cymex.com)  
Please contact us for optimum sizing at S1 conditions (Continuous operation).

- <sup>a)</sup> At max. 10 %  $M_{2KMax}$
- <sup>b)</sup> Valid for standard clamping hub diameter
- <sup>c)</sup> Refers to center of the output shaft or flange
- <sup>d)</sup> Please reduce input speed at higher ambient temperatures
- <sup>f)</sup> Please contact us to discuss application-specific service lifetimes

up to 48 <sup>4)</sup> (M) <sup>6)</sup>  
clamping hub  
diameter



up to 38/48 <sup>4)</sup>  
(K<sup>6)</sup>/M) clamping  
hub diameter



6) Standard clamping hub diameter

# TPK+ 010 MF 2-stage

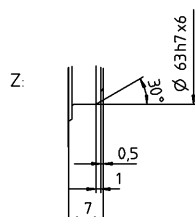
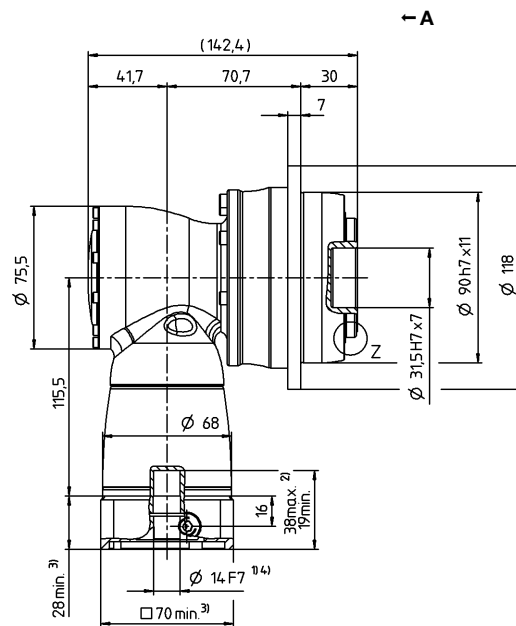
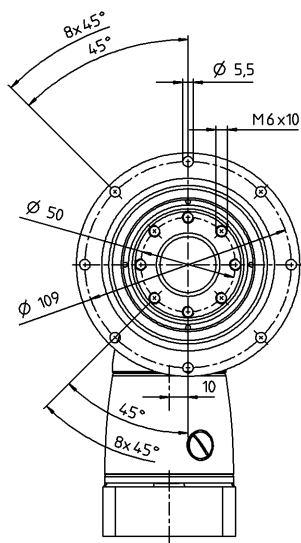
				2-stage											
Ratio			<i>i</i>		12	16	20	25	28	35	40	49	50	70	100
Max. torque <sup>a) b)</sup>			<i>T</i> <sub>2a</sub>	<i>Nm</i>	144	144	180	180	210	210	80	175	100	140	168
				<i>in.lb</i>	1275	1275	1593	1593	1859	1859	708	1549	885	1239	1487
Max. acceleration torque <sup>b)</sup> (max. 1000 cycles per hour)			<i>T</i> <sub>2B</sub>	<i>Nm</i>	120	120	150	150	172	172	80	172	100	140	126
				<i>in.lb</i>	1062	1062	1328	1328	1522	1522	708	1522	885	1239	1115
Nominal torque (at <i>n</i> <sub>n</sub> )			<i>T</i> <sub>2N</sub>	<i>Nm</i>	75	75	75	75	75	75	60	75	75	75	60
				<i>in.lb</i>	664	664	664	664	664	664	531	664	664	664	531
Emergency stop torque <sup>a) b)</sup> (permitted 1000 times during the service life of the gearbox)			<i>T</i> <sub>2Not</sub>	<i>Nm</i>	160	200	250	250	251	251	160	251	200	251	251
				<i>in.lb</i>	1416	1770	2213	2213	2222	2222	1416	2222	1770	2222	2222
Permitted average input speed (at <i>T</i> <sub>2n</sub> and 20 °C ambient temperature) <sup>d)</sup>			<i>n</i> <sub>1N</sub>	<i>n</i> <sub>1T</sub>	2000	2400	2400	2700	2400	2500	2500	2500	2500	2500	2500
Max. input speed			<i>n</i> <sub>1Max</sub>	<i>rpm</i>	7500	7500	7500	7500	7500	7500	7500	7500	7500	7500	7500
Mean no load running torque <sup>b)</sup> (at <i>n</i> <sub>i</sub> = 3000 rpm and 20 °C gearbox temperature)			<i>T</i> <sub>012</sub>	<i>Nm</i>	1.7	1.4	1.3	1.2	1.3	1.3	1.4	1.4	1.4	1.3	1.3
				<i>in.lb</i>	15	12	12	11	12	12	12	12	12	12	12
Max. backlash			<i>j</i> <sub>t</sub>	<i>arcmin</i>	Standard ≤ 5 / Reduced ≤ 3										
Torsional rigidity <sup>b)</sup>			<i>C</i> <sub>t21</sub>	<i>Nm/arcmin</i>	16	16	20	21	23	24	15	23	19	22	27
				<i>in.lb/arcmin</i>	142	142	177	186	204	212	133	204	168	195	239
Tilting rigidity			<i>C</i> <sub>2K</sub>	<i>Nm/arcmin</i>	225										
				<i>in.lb/arcmin</i>	1991										
Max. axial force <sup>c)</sup>			<i>F</i> <sub>2AMax</sub>	<i>N</i>	2795										
				<i>lb<sub>f</sub></i>	629										
Max. tilting moment			<i>M</i> <sub>2KMax</sub>	<i>Nm</i>	270										
				<i>in.lb</i>	2390										
Efficiency at full load			<i>η</i>	%	94										
Service life <sup>f)</sup>			<i>L</i> <sub>h</sub>	<i>h</i>	> 20000										
Weight (incl. standard adapter plate)			<i>m</i>	<i>kg</i>	5.2										
				<i>lb<sub>m</sub></i>	11										
Operating noise (at reference ratio and reference speed – ratio-specific values available in cymex <sup>®</sup> )			<i>L</i> <sub>PA</sub>	<i>dB(A)</i>	≤ 66										
Max. permitted housing temperature				°C	+90										
				<i>F</i>	194										
Ambient temperature				°C	0 to +40										
				<i>F</i>	32 to 104										
Lubrication					Lubricated for life										
Direction of rotation					In- and output opposite direction										
Protection class					IP 65										
Metal bellows coupling (recommended product type – validate sizing with cymex <sup>®</sup> )					BCT - 00060AAX - 050.000										
Bore diameter of coupling on the application side				<i>mm</i>	X = 014.000 - 035.000										
Mass moment of inertia (relates to the drive) Clamping hub diameter [mm]	C	14	<i>J</i> <sub>i</sub>	<i>kgcm<sup>2</sup></i>	0.55	0.46	0.44	0.39	0.43	0.36	0.34	0.37	0.34	0.34	0.34
				<i>10<sup>-3</sup> in.lb.s<sup>2</sup></i>	0.49	0.41	0.39	0.35	0.38	0.32	0.3	0.33	0.3	0.3	0.3
	E	19	<i>J</i> <sub>i</sub>	<i>kgcm<sup>2</sup></i>	0.9	0.81	0.79	0.75	0.78	0.71	0.7	0.72	0.7	0.69	0.69
<i>10<sup>-3</sup> in.lb.s<sup>2</sup></i>				0.8	0.72	0.7	0.66	0.69	0.63	0.62	0.64	0.62	0.61	0.61	

Please use our sizing software cymex<sup>®</sup> for a detailed sizing – [www.wittenstein-cymex.com](http://www.wittenstein-cymex.com)  
Please contact us for optimum sizing at S1 conditions (Continuous operation).

- <sup>a)</sup> At max. 10 %  $M_{2KMax}$
- <sup>b)</sup> Valid for standard clamping hub diameter
- <sup>c)</sup> Refers to center of the output shaft or flange
- <sup>d)</sup> Please reduce input speed at higher ambient temperatures
- <sup>f)</sup> Please contact us to discuss application-specific service lifetimes

Motor shaft diameter [mm]

2-stage

up to 14/19<sup>4)</sup>  
(C<sup>5)</sup> / E) clamping  
hub diameter


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

Non-tolerated dimensions are nominal dimensions

<sup>1)</sup> Check motor shaft fit

<sup>2)</sup> Min./Max. permissible motor shaft length. Longer motor shafts are possible, please contact alpha.

<sup>3)</sup> The dimensions depend on the motor

<sup>4)</sup> Smaller motor shaft diameter is compensated by a bushing with a minimum wall thickness of 1 mm

<sup>5)</sup> Standard clamping hub diameter

# TPK+ 010 MF 3-stage

			3-stage													
Ratio	<i>i</i>		64	84	100	125	140	175	200	250	280	350	400	500	700	1000
Max. torque <sup>a) b)</sup>	$T_{2a}$	Nm	144	144	180	180	180	180	180	180	210	210	96	120	168	168
		in.lb	1275	1275	1593	1593	1593	1593	1593	1593	1859	1859	850	1062	1487	1487
Max. acceleration torque <sup>b)</sup> (max. 1000 cycles per hour)	$T_{2B}$	Nm	120	120	150	150	150	150	150	150	172	172	80	100	140	126
		in.lb	1062	1062	1328	1328	1328	1328	1328	1328	1522	1522	708	885	1239	1115
Nominal torque (at $n_n$ )	$T_{2N}$	Nm	85	85	90	90	90	90	90	90	75	90	60	75	90	60
		in.lb	752	752	797	797	797	797	797	797	664	797	531	664	797	531
Emergency stop torque <sup>a) b)</sup> (permitted 1000 times during the service life of the gearbox)	$T_{2Not}$	Nm	200	160	250	250	250	250	250	250	251	251	160	200	251	251
		in.lb	1770	1416	2213	2213	2213	2213	2213	2213	2222	2222	1416	1770	2222	2222
Permitted average input speed (at $T_{2N}$ and 20 °C ambient temperature) <sup>d)</sup>	$n_{1N}$	$n_{1T}$	4400	4400	4400	4400	4400	4400	4400	4800	4400	4800	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 <sup>b)</sup> (at $n_i = 3000$ rpm and 20 °C gearbox temperature)	$T_{012}$	Nm	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
		in.lb	2.7	2.7	2.7	2.7	2.7	2.7	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
Max. backlash	$j_t$	arcmin	Standard $\leq 5$ / Reduced $\leq 3$													
Torsional rigidity <sup>b)</sup>	$C_{t21}$	Nm/arcmin	16	16	20	21	20	21	20	21	23	24	15	19	22	27
		in.lb/arcmin	142	142	177	186	177	186	177	186	204	212	133	168	195	239
Tilting rigidity	$C_{2K}$	Nm/arcmin	225													
		in.lb/arcmin	1991													
Max. axial force <sup>c)</sup>	$F_{2AMax}$	N	2795													
		lb <sub>f</sub>	629													
Max. tilting moment	$M_{2KMax}$	Nm	270													
		in.lb	2390													
Efficiency at full load	$\eta$	%	92													
Service life <sup>f)</sup>	$L_h$	h	> 20000													
Weight (incl. standard adapter plate)	$m$	kg	5.5													
		lb <sub>m</sub>	12													
Operating noise (at reference ratio and reference speed – ratio-specific values available in cymex <sup>®</sup> )	$L_{PA}$	dB(A)	$\leq 66$													
Max. permitted housing temperature		°C	+90													
		F	194													
Ambient temperature		°C	0 to +40													
		F	32 to 104													
Lubrication			Lubricated for life													
Direction of rotation			In- and output opposite direction													
Protection class			IP 65													
Metal bellows coupling (recommended product type – validate sizing with cymex <sup>®</sup> )			BCT - 00060AAX - 050.000													
Bore diameter of coupling on the application side		mm	X = 014.000 - 035.000													
Mass moment of inertia (relates to the drive) Clamping hub diameter [mm]	B	11	$J_1$	kgcm <sup>2</sup>	0.09	0.07	0.08	0.07	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
				10 <sup>-3</sup> in.lb.s <sup>2</sup>	0.08	0.06	0.07	0.06	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
	C	14	$J_1$	kgcm <sup>2</sup>	0.2	0.18	0.19	0.19	0.18	0.18	0.17	0.17	0.17	0.17	0.17	0.17
				10 <sup>-3</sup> in.lb.s <sup>2</sup>	0.18	0.16	0.17	0.17	0.16	0.16	0.15	0.15	0.15	0.15	0.15	0.15

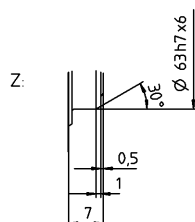
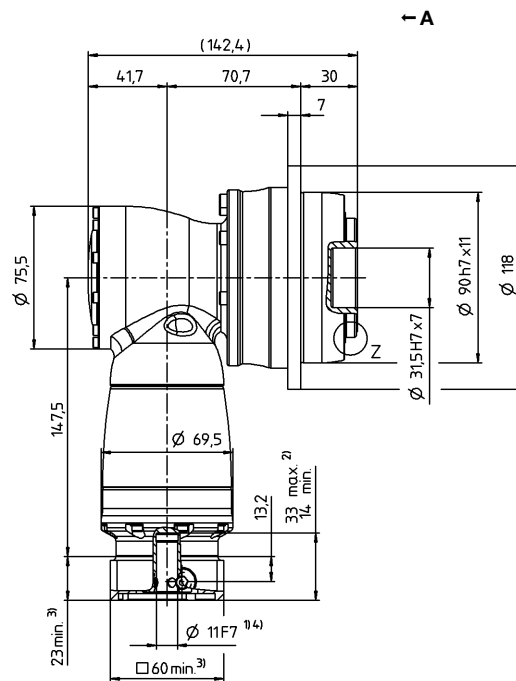
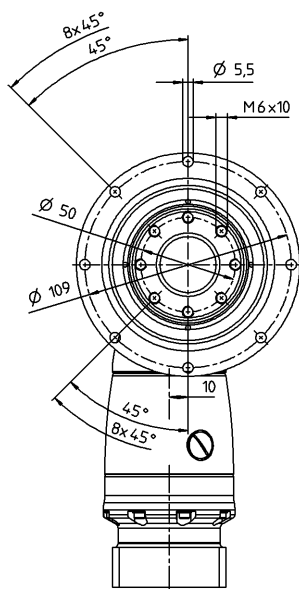
Please use our sizing software cymex<sup>®</sup> for a detailed sizing – [www.wittenstein-cymex.com](http://www.wittenstein-cymex.com)  
Please contact us for optimum sizing at S1 conditions (Continuous operation).

- <sup>a)</sup> At max. 10 %  $M_{2KMax}$
- <sup>b)</sup> Valid for standard clamping hub diameter
- <sup>c)</sup> Refers to center of the output shaft or flange
- <sup>d)</sup> Please reduce input speed at higher ambient temperatures
- <sup>f)</sup> Please contact us to discuss application-specific service lifetimes

View A

Motor shaft diameter [mm]

3-stage

up to 11/14<sup>4)</sup>  
(B<sup>5)</sup>/C) clamping  
hub diameter


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

Non-tolerated dimensions are nominal dimensions

<sup>1)</sup> Check motor shaft fit

<sup>2)</sup> Min./Max. permissible motor shaft length. Longer motor shafts are possible, please contact alpha.

<sup>3)</sup> The dimensions depend on the motor

<sup>4)</sup> Smaller motor shaft diameter is compensated by a bushing with a minimum wall thickness of 1 mm

<sup>5)</sup> Standard clamping hub diameter

TPK<sup>+</sup>

MF

Hypoid gearboxes



# TPK+ 025 MF 2-stage

			2-stage										
Ratio	<i>i</i>		12	16	20	25	28	35	40	49	50	70	100
Max. torque <sup>a) b)</sup>	$T_{2a}$	Nm	336	336	380	380	352	352	200	352	250	350	352
		in.lb	2974	2974	3363	3363	3115	3115	1770	3115	2213	3098	3115
Max. acceleration torque <sup>b)</sup> (max. 1000 cycles per hour)	$T_{2B}$	Nm	280	280	350	350	352	352	200	352	250	350	318
		in.lb	2478	2478	3098	3098	3115	3115	1770	3115	2213	3098	2815
Nominal torque (at $n_n$ )	$T_{2N}$	Nm	170	170	170	170	170	170	160	170	170	170	120
		in.lb	1505	1505	1505	1505	1505	1505	1416	1505	1505	1505	1062
Emergency stop torque <sup>a) b)</sup> (permitted 1000 times during the service life of the gearbox)	$T_{2Not}$	Nm	380	460	575	575	625	625	400	625	500	625	625
		in.lb	3363	4071	5089	5089	5532	5532	3540	5532	4425	5532	5532
Permitted average input speed (at $T_{2N}$ and 20 °C ambient temperature) <sup>d)</sup>	$n_{1N}$	$n_{1T}$	2000	2400	2400	2700	2400	2500	2500	2500	2500	2500	2500
Max. input speed	$n_{1Max}$	rpm	7500	7500	7500	7500	7500	7500	7500	7500	7500	7500	7500
Mean no load running torque <sup>b)</sup> (at $n_i = 3000$ rpm and 20 °C gearbox temperature)	$T_{012}$	Nm	2.5	2.1	2	1.8	2	2.2	2	2.2	2	2	2
		in.lb	22	19	18	16	18	19	18	19	18	18	18
Max. backlash	$j_t$	arcmin	Standard $\leq 4$ / Reduced $\leq 2$										
Torsional rigidity <sup>b)</sup>	$C_{t21}$	Nm/arcmin	40	42	53	55	59	60	44	60	55	60	56
		in.lb/arcmin	354	372	469	487	522	531	389	531	487	531	496
Tilting rigidity	$C_{2K}$	Nm/arcmin	550										
		in.lb/arcmin	4868										
Max. axial force <sup>c)</sup>	$F_{2AMax}$	N	4800										
		lb <sub>f</sub>	1080										
Max. tilting moment	$M_{2KMax}$	Nm	440										
		in.lb	3894										
Efficiency at full load	$\eta$	%	94										
Service life <sup>f)</sup>	$L_h$	h	> 20000										
Weight (incl. standard adapter plate)	$m$	kg	9										
		lb <sub>m</sub>	20										
Operating noise (at reference ratio and reference speed – ratio-specific values available in cymex <sup>®</sup> )	$L_{PA}$	dB(A)	$\leq 68$										
Max. permitted housing temperature		°C	+90										
		F	194										
Ambient temperature		°C	0 to +40										
		F	32 to 104										
Lubrication			Lubricated for life										
Direction of rotation			In- and output opposite direction										
Protection class			IP 65										
Metal bellows coupling (recommended product type – validate sizing with cymex <sup>®</sup> )			BCT - 00150AAX - 063.000										
Bore diameter of coupling on the application side		mm	X = 019.000 - 042.000										
Mass moment of inertia (relates to the drive) Clamping hub diameter [mm]	E 19	$J_1$	kgcm <sup>2</sup>	1.43	1.18	1.16	1.04	1.14	0.94	0.89	0.95	0.89	0.89
			10 <sup>-3</sup> in.lb.s <sup>2</sup>	1.27	1.04	1.03	0.92	1.01	0.83	0.79	0.84	0.79	0.79
	H 28	$J_1$	kgcm <sup>2</sup>	2.85	2.59	2.57	2.45	2.56	2.4	2.31	2.37	2.3	2.3
			10 <sup>-3</sup> in.lb.s <sup>2</sup>	2.52	2.29	2.27	2.17	2.27	2.12	2.04	2.1	2.04	2.04

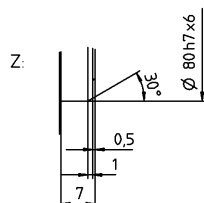
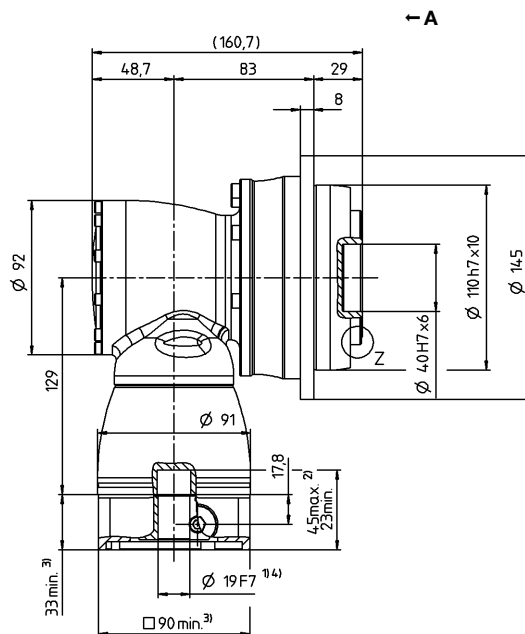
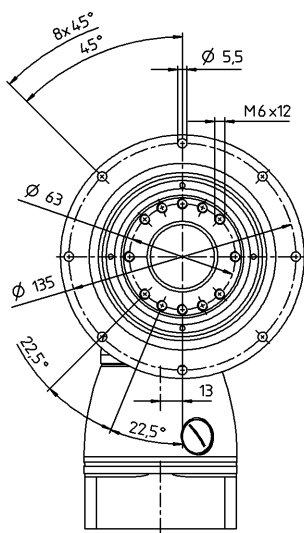
Please use our sizing software cymex<sup>®</sup> for a detailed sizing – [www.wittenstein-cymex.com](http://www.wittenstein-cymex.com)  
Please contact us for optimum sizing at S1 conditions (Continuous operation).

- <sup>a)</sup> At max. 10 %  $M_{2KMax}$
- <sup>b)</sup> Valid for standard clamping hub diameter
- <sup>c)</sup> Refers to center of the output shaft or flange
- <sup>d)</sup> Please reduce input speed at higher ambient temperatures
- <sup>f)</sup> Please contact us to discuss application-specific service lifetimes

View A

Motor shaft diameter [mm]

2-stage

up to 19/28 <sup>4)</sup>  
(E <sup>5)</sup>/H) clamping  
hub diameter


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

Non-tolerated dimensions are nominal dimensions

<sup>1)</sup> Check motor shaft fit

<sup>2)</sup> Min./Max. permissible motor shaft length. Longer motor shafts are possible, please contact alpha.

<sup>3)</sup> The dimensions depend on the motor

<sup>4)</sup> Smaller motor shaft diameter is compensated by a bushing with a minimum wall thickness of 1 mm

<sup>5)</sup> Standard clamping hub diameter

Hypoid gearboxes

TPK+

MF

# TPK+ 025 MF 3-stage

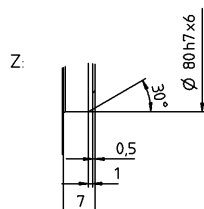
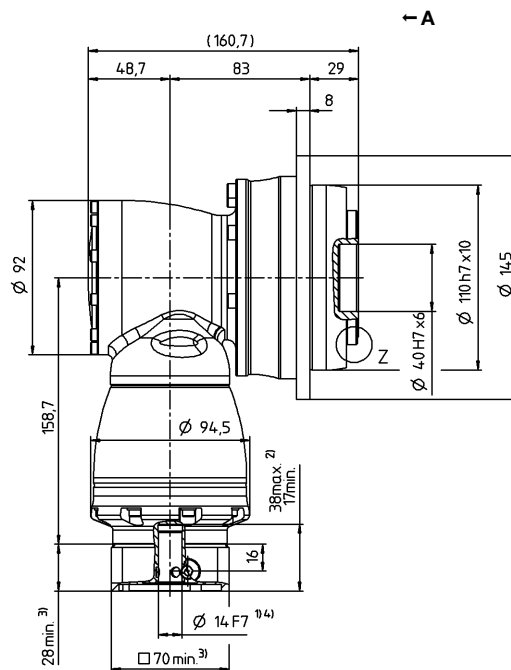
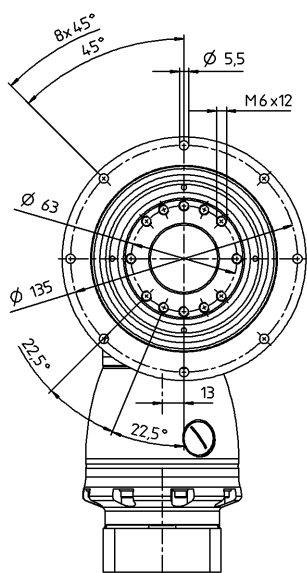
			3-stage													
Ratio	<i>i</i>		64	84	100	125	140	175	200	250	280	350	400	500	700	1000
Max. torque <sup>a) b)</sup>	$T_{2a}$	Nm	336	336	380	380	380	380	380	380	352	352	240	300	352	352
		in.lb	2974	2974	3363	3363	3363	3363	3363	3363	3115	3115	2124	2655	3115	3115
Max. acceleration torque <sup>b)</sup> (max. 1000 cycles per hour)	$T_{2B}$	Nm	280	280	350	350	350	350	350	350	352	352	200	250	350	318
		in.lb	2478	2478	3098	3098	3098	3098	3098	3098	3115	3115	1770	2213	3098	2815
Nominal torque (at $n_n$ )	$T_{2N}$	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 <sup>a) b)</sup> (permitted 1000 times during the service life of the gearbox)	$T_{2Not}$	Nm	460	380	575	575	575	575	575	575	625	625	400	500	625	625
		in.lb	4071	3363	5089	5089	5089	5089	5089	5089	5532	5532	3540	4425	5532	5532
Permitted average input speed (at $T_{2N}$ and 20 °C ambient temperature) <sup>d)</sup>	$n_{1N}$	$n_{1T}$	3500	3500	3500	3500	3500	3500	3500	3800	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	6000
Mean no load running torque <sup>b)</sup> (at $n_i$ = 3000 rpm and 20 °C gearbox temperature)	$T_{012}$	Nm	0.6	0.45	0.45	0.45	0.45	0.45	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
		in.lb	5.3	4.0	4.0	4.0	4.0	4.0	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7
Max. backlash	$j_t$	arcmin	Standard ≤ 4 / Reduced ≤ 2													
Torsional rigidity <sup>b)</sup>	$C_{t21}$	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 <sup>c)</sup>	$F_{2AMax}$	N	4800													
		lb <sub>f</sub>	1080													
Max. tilting moment	$M_{2KMax}$	Nm	440													
		in.lb	3894													
Efficiency at full load	$\eta$	%	92													
Service life <sup>f)</sup>	$L_h$	h	> 20000													
Weight (incl. standard adapter plate)	$m$	kg	9.8													
		lb <sub>m</sub>	22													
Operating noise (at reference ratio and reference speed – ratio-specific values available in cymex <sup>®</sup> )	$L_{PA}$	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													
Direction of rotation			In- and output opposite direction													
Protection class			IP 65													
Metal bellows coupling (recommended product type – validate sizing with cymex <sup>®</sup> )			BCT - 00150AAX - 063.000													
Bore diameter of coupling on the application side		mm	X = 019.000 - 042.000													
Mass moment of inertia (relates to the drive) Clamping hub diameter [mm]	C	14	$J_1$	kgcm <sup>2</sup>	0.28	0.23	0.24	0.23	0.21	0.2	0.19	0.18	0.19	0.18	0.18	0.18
				10 <sup>-3</sup> in.lb.s <sup>2</sup>	0.25	0.2	0.21	0.2	0.19	0.18	0.17	0.16	0.17	0.16	0.16	0.16
	E	19	$J_1$	kgcm <sup>2</sup>	0.72	0.63	0.68	0.68	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63
				10 <sup>-3</sup> in.lb.s <sup>2</sup>	0.64	0.56	0.6	0.6	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56

Please use our sizing software cymex<sup>®</sup> for a detailed sizing – [www.wittenstein-cymex.com](http://www.wittenstein-cymex.com)  
Please contact us for optimum sizing at S1 conditions (Continuous operation).

- <sup>a)</sup> At max. 10 %  $M_{2KMax}$
- <sup>b)</sup> Valid for standard clamping hub diameter
- <sup>c)</sup> Refers to center of the output shaft or flange
- <sup>d)</sup> Please reduce input speed at higher ambient temperatures
- <sup>f)</sup> Please contact us to discuss application-specific service lifetimes

Motor shaft diameter [mm]

3-stage

up to 14/19<sup>4)</sup>  
(C<sup>5)</sup>/E) clamping  
hub diameter


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

Non-tolerated dimensions are nominal dimensions

<sup>1)</sup> Check motor shaft fit

<sup>2)</sup> Min./Max. permissible motor shaft length. Longer motor shafts are possible, please contact alpha.

<sup>3)</sup> The dimensions depend on the motor

<sup>4)</sup> Smaller motor shaft diameter is compensated by a bushing with a minimum wall thickness of 1 mm

<sup>5)</sup> Standard clamping hub diameter

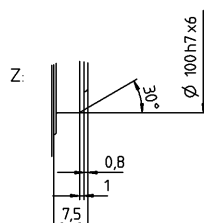
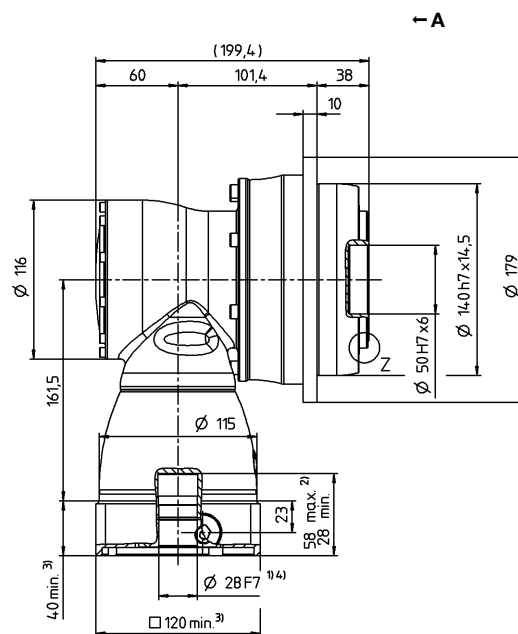
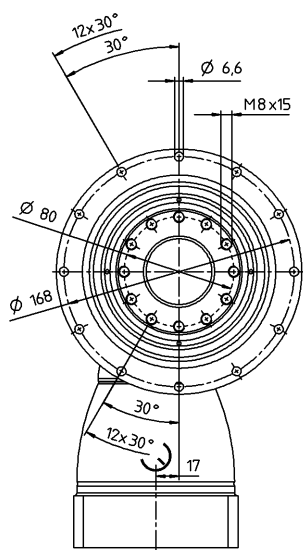
# TPK+ 050 MF 2-stage

				2-stage												
Ratio			<i>i</i>		12	16	20	25	28	35	40	49	50	70	100	
Max. torque <sup>a) b)</sup>			<i>T</i> <sub>2a</sub>	<i>Nm</i>	816	816	992	992	868	868	500	868	625	868	720	
				<i>in.lb</i>	7222	7222	8780	8780	7682	7682	4425	7682	5532	7682	6373	
Max. acceleration torque <sup>b)</sup> (max. 1000 cycles per hour)			<i>T</i> <sub>2B</sub>	<i>Nm</i>	680	680	840	840	840	840	500	840	625	840	648	
				<i>in.lb</i>	6019	6019	7435	7435	7435	7435	4425	7435	5532	7435	5735	
Nominal torque (at <i>n</i> <sub>n</sub> )			<i>T</i> <sub>2N</sub>	<i>Nm</i>	370	370	370	370	370	370	320	370	370	370	240	
				<i>in.lb</i>	3275	3275	3275	3275	3275	3275	2832	3275	3275	3275	2124	
Emergency stop torque <sup>a) b)</sup> (permitted 1000 times during the service life of the gearbox)			<i>T</i> <sub>2Not</sub>	<i>Nm</i>	880	1040	1250	1250	1250	1250	1000	1250	1250	1250	1250	
				<i>in.lb</i>	7789	9205	11064	11064	11064	11064	8851	11064	11064	11064	11064	
Permitted average input speed (at <i>T</i> <sub>2n</sub> and 20 °C ambient temperature) <sup>d)</sup>			<i>n</i> <sub>1N</sub>	<i>n</i> <sub>1T</sub>	1900	2300	2300	2600	2300	2300	2300	2300	2300	2300	2300	
Max. input speed			<i>n</i> <sub>1Max</sub>	<i>rpm</i>	5500	5500	5500	5500	5500	5500	5500	5500	5500	5500	5500	
Mean no load running torque <sup>b)</sup> (at <i>n</i> <sub>i</sub> = 3000 rpm and 20 °C gearbox temperature)			<i>T</i> <sub>012</sub>	<i>Nm</i>	5.6	4.3	4.2	3.4	4.1	4.7	3.3	4.1	3.3	3.3	3.3	
				<i>in.lb</i>	50	38	37	30	36	42	29	36	29	29	29	
Max. backlash			<i>j</i> <sub>t</sub>	<i>arcmin</i>	Standard ≤ 4 / Reduced ≤ 2											
Torsional rigidity <sup>b)</sup>			<i>C</i> <sub>t21</sub>	<i>Nm/arcmin</i>	87	91	111	119	123	127	96	127	115	125	112	
				<i>in.lb/arcmin</i>	770	805	982	1053	1089	1124	850	1124	1018	1106	991	
Tilting rigidity			<i>C</i> <sub>2K</sub>	<i>Nm/arcmin</i>	560											
				<i>in.lb/arcmin</i>	4956											
Max. axial force <sup>c)</sup>			<i>F</i> <sub>2AMax</sub>	<i>N</i>	6130											
				<i>lb<sub>f</sub></i>	1379											
Max. tilting moment			<i>M</i> <sub>2KMax</sub>	<i>Nm</i>	1335											
				<i>in.lb</i>	11816											
Efficiency at full load			<i>η</i>	%	94											
Service life <sup>f)</sup>			<i>L</i> <sub>h</sub>	<i>h</i>	> 20000											
Weight (incl. standard adapter plate)			<i>m</i>	<i>kg</i>	17											
				<i>lb<sub>m</sub></i>	38											
Operating noise (at reference ratio and reference speed – ratio-specific values available in cymex®)			<i>L</i> <sub>PA</sub>	<i>dB(A)</i>	≤ 68											
Max. permitted housing temperature				°C	+90											
				<i>F</i>	194											
Ambient temperature				°C	0 to +40											
				<i>F</i>	32 to 104											
Lubrication					Lubricated for life											
Direction of rotation					In- and output opposite direction											
Protection class					IP 65											
Metal bellows coupling (recommended product type – validate sizing with cymex®)					BCT - 00300AAX - 080.000											
Bore diameter of coupling on the application side				<i>mm</i>	X = 024.000 - 060.000											
Mass moment of inertia (relates to the drive) Clamping hub diameter [mm]		H	28	<i>J</i> <sub>i</sub>	<i>kgcm<sup>2</sup></i>	4.56	3.76	3.71	3.28	3.66	3	2.79	3.1	2.78	2.77	2.77
					<i>10<sup>-3</sup> in.lb.s<sup>2</sup></i>	4.04	3.33	3.28	2.9	3.24	2.66	2.47	2.74	2.46	2.45	2.45
		K	38	<i>J</i> <sub>i</sub>	<i>kgcm<sup>2</sup></i>	11.7	10.9	10.9	10.4	10.8	10.3	9.95	10.4	9.94	9.94	9.94
<i>10<sup>-3</sup> in.lb.s<sup>2</sup></i>	10.35				9.65	9.65	9.2	9.56	9.12	8.81	9.2	8.8	8.8	8.8		

Please use our sizing software cymex<sup>®</sup> for a detailed sizing – [www.wittenstein-cymex.com](http://www.wittenstein-cymex.com)  
Please contact us for optimum sizing at S1 conditions (Continuous operation).

- <sup>a)</sup> At max. 10 %  $M_{2KMax}$
- <sup>b)</sup> Valid for standard clamping hub diameter
- <sup>c)</sup> Refers to center of the output shaft or flange
- <sup>d)</sup> Please reduce input speed at higher ambient temperatures
- <sup>f)</sup> Please contact us to discuss application-specific service lifetimes

up to 28/38 <sup>4)</sup>  
(H<sup>5</sup>/K) clamping  
hub diameter

TPK<sup>+</sup>

MF

5) Standard clamping hub diameter

# TPK+ 050 MF 3-stage

			3-stage													
Ratio	<i>i</i>		64	84	100	125	140	175	200	250	280	350	400	500	700	1000
Max. torque <sup>a) b)</sup>	$T_{2a}$	Nm	816	816	992	992	992	992	992	992	868	868	600	750	868	720
		in.lb	7222	7222	8780	8780	8780	8780	8780	8780	7682	7682	5310	6638	7682	6373
Max. acceleration torque <sup>b)</sup> (max. 1000 cycles per hour)	$T_{2B}$	Nm	680	680	840	840	840	840	840	840	840	840	500	625	840	648
		in.lb	6019	6019	7435	7435	7435	7435	7435	7435	7435	7435	4425	5532	7435	5735
Nominal torque (at $n_{IN}$ )	$T_{2N}$	Nm	400	400	400	400	400	400	400	400	400	400	320	370	400	240
		in.lb	3540	3540	3540	3540	3540	3540	3540	3540	3540	3540	2832	3275	3540	2124
Emergency stop torque <sup>a) b)</sup> (permitted 1000 times during the service life of the gearbox)	$T_{2Not}$	Nm	1040	880	1250	1250	1250	1250	1250	1250	1250	1250	1000	1250	1250	1250
		in.lb	9205	7789	11064	11064	11064	11064	11064	11064	11064	11064	8851	11064	11064	11064
Permitted average input speed (at $T_{2N}$ and 20 °C ambient temperature) <sup>d)</sup>	$n_{1N}$	$n_{1T}$	3100	3100	3100	3100	3100	3100	3100	3500	3100	3500	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 <sup>b)</sup> (at $n_i$ = 3000 rpm and 20 °C gearbox temperature)	$T_{012}$	Nm	1.1	0.9	0.9	0.75	0.75	0.6	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45
		in.lb	9.7	8.0	8.0	6.6	6.6	5.3	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max. backlash	$j_t$	arcmin	Standard ≤ 4 / Reduced ≤ 2													
Torsional rigidity <sup>b)</sup>	$C_{t21}$	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 <sup>c)</sup>	$F_{2AMax}$	N	6130													
		lb <sub>f</sub>	1379													
Max. tilting moment	$M_{2KMax}$	Nm	1335													
		in.lb	11816													
Efficiency at full load	$\eta$	%	92													
Service life <sup>f)</sup>	$L_h$	h	> 20000													
Weight (incl. standard adapter plate)	$m$	kg	18.7													
		lb <sub>m</sub>	41													
Operating noise (at reference ratio and reference speed – ratio-specific values available in cymex <sup>®</sup> )	$L_{PA}$	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													
Direction of rotation			In- and output opposite direction													
Protection class			IP 65													
Metal bellows coupling (recommended product type – validate sizing with cymex <sup>®</sup> )			BCT - 00300AAX - 080.000													
Bore diameter of coupling on the application side		mm	X = 024.000 - 060.000													
Mass moment of inertia (relates to the drive) Clamping hub diameter [mm]	E 19	$J_1$	kgcm <sup>2</sup>	1.01	0.76	0.88	0.85	0.76	0.75	0.7	0.69	0.7	0.69	0.69	0.69	0.69
			10 <sup>-3</sup> in.lb.s <sup>2</sup>	0.89	0.67	0.78	0.75	0.67	0.66	0.62	0.61	0.62	0.61	0.61	0.61	0.61
	G 24	$J_1$	kgcm <sup>2</sup>	2.57	2.32	2.44	2.42	2.32	2.31	2.26	2.25	2.26	2.25	2.25	2.25	2.25
			10 <sup>-3</sup> in.lb.s <sup>2</sup>	2.27	2.05	2.16	2.14	2.05	2.04	2	1.99	2	1.99	1.99	1.99	1.99

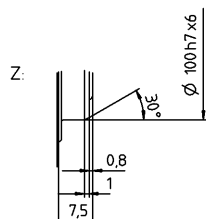
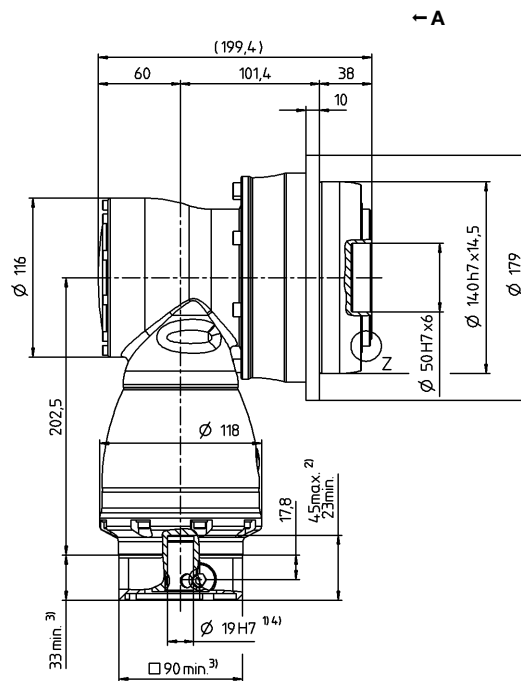
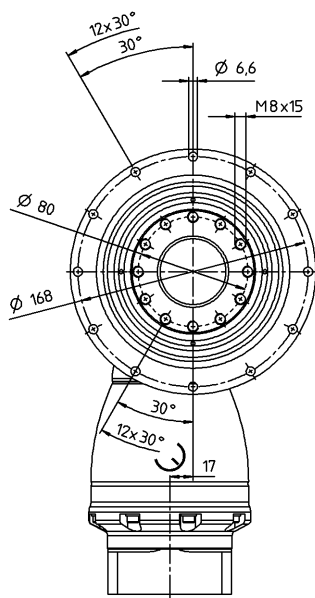
Please use our sizing software cymex<sup>®</sup> for a detailed sizing – [www.wittenstein-cymex.com](http://www.wittenstein-cymex.com)  
Please contact us for optimum sizing at S1 conditions (Continuous operation).

- <sup>a)</sup> At max. 10 %  $M_{2KMax}$
- <sup>b)</sup> Valid for standard clamping hub diameter
- <sup>c)</sup> Refers to center of the output shaft or flange
- <sup>d)</sup> Please reduce input speed at higher ambient temperatures
- <sup>f)</sup> Please contact us to discuss application-specific service lifetimes

View A

Motor shaft diameter [mm]

3-stage

up to 19/24<sup>4)</sup>  
(E<sup>5)</sup>/G) clamping  
hub diameter


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

Non-tolerated dimensions are nominal dimensions

<sup>1)</sup> Check motor shaft fit

<sup>2)</sup> Min./Max. permissible motor shaft length. Longer motor shafts are possible, please contact alpha.

<sup>3)</sup> The dimensions depend on the motor

<sup>4)</sup> Smaller motor shaft diameter is compensated by a bushing with a minimum wall thickness of 1 mm

<sup>5)</sup> Standard clamping hub diameter

Hypoid gearboxes

TPK+

MF



# TPK<sup>+</sup> 110 MF 2-stage

				2-stage										
Ratio	<i>i</i>			12	16	20	25	28	35	40	49	50	70	100
Max. torque <sup>a) b)</sup>	<i>T</i> <sub>2a</sub>	<i>Nm</i>		1440	1440	1800	1800	2520	2520	840	1750	1050	1470	2100
		<i>in.lb</i>		12745	12745	15931	15931	22304	22304	7435	15489	9293	13011	18587
Max. acceleration torque <sup>b)</sup> (max. 1000 cycles per hour)	<i>T</i> <sub>2B</sub>	<i>Nm</i>		1200	1200	1500	1500	1920	1920	840	1750	1050	1470	1680
		<i>in.lb</i>		10621	10621	13276	13276	16994	16994	7435	15489	9293	13011	14869
Nominal torque (at <i>n</i> <sub>IN</sub> )	<i>T</i> <sub>2N</sub>	<i>Nm</i>		700	700	750	750	750	750	640	750	750	750	750
		<i>in.lb</i>		6196	6196	6638	6638	6638	6638	5665	6638	6638	6638	6638
Emergency stop torque <sup>a) b)</sup> (permitted 1000 times during the service life of the gearbox)	<i>T</i> <sub>2Not</sub>	<i>Nm</i>		1600	2000	2500	2500	3075	3075	1600	3075	2000	2800	3075
		<i>in.lb</i>		14161	17702	22127	22127	27216	27216	14161	27216	17702	24782	27216
Permitted average input speed (at <i>T</i> <sub>2a</sub> and 20 °C ambient temperature) <sup>d)</sup>	<i>n</i> <sub>1N</sub>	<i>n</i> <sub>1T</sub>		1600	1900	1900	2100	1900	2100	2100	2100	2100	2100	2100
Max. input speed	<i>n</i> <sub>1Max</sub>	<i>rpm</i>		5000	5000	5000	5000	5000	5000	5000	5000	5000	5000	5000
Mean no load running torque <sup>b)</sup> (at <i>n</i> <sub>1</sub> = 3000 rpm and 20 °C gearbox temperature)	<i>T</i> <sub>012</sub>	<i>Nm</i>		12	8.9	8.9	5.5	8.2	8	7.5	10	7.5	7.4	7.4
		<i>in.lb</i>		106	79	79	49	73	71	66	89	66	65	65
Max. backlash	<i>j</i> <sub>t</sub>	<i>arcmin</i>		Standard ≤ 4 / Reduced ≤ 2										
Torsional rigidity <sup>b)</sup>	<i>C</i> <sub>121</sub>	<i>Nm/arcmin</i>		253	269	336	346	400	407	274	410	341	404	389
		<i>in.lb/arcmin</i>		2239	2381	2974	3062	3540	3602	2425	3629	3018	3576	3443
Tilting rigidity	<i>C</i> <sub>2K</sub>	<i>Nm/arcmin</i>		1452										
		<i>in.lb/arcmin</i>		12851										
Max. axial force <sup>c)</sup>	<i>F</i> <sub>2AMax</sub>	<i>N</i>		10050										
		<i>lb<sub>f</sub></i>		2261										
Max. tilting moment	<i>M</i> <sub>2KMax</sub>	<i>Nm</i>		3280										
		<i>in.lb</i>		29030										
Efficiency at full load	<i>η</i>	%		94										
Service life <sup>f)</sup>	<i>L</i> <sub>h</sub>	<i>h</i>		> 20000										
Weight (incl. standard adapter plate)	<i>m</i>	<i>kg</i>		41										
		<i>lb<sub>m</sub></i>		91										
Operating noise (at reference ratio and reference speed – ratio-specific values available in cymex®)	<i>L</i> <sub>PA</sub>	<i>dB(A)</i>		≤ 70										
Max. permitted housing temperature		°C		+90										
		<i>F</i>		194										
Ambient temperature		°C		0 to +40										
		<i>F</i>		32 to 104										
Lubrication				Lubricated for life										
Direction of rotation				In- and output opposite direction										
Protection class				IP 65										
Metal bellows coupling (recommended product type – validate sizing with cymex®)				BCT - 01500AAX - 125.000										
Bore diameter of coupling on the application side		<i>mm</i>		X = 050.000 - 080.000										
Mass moment of inertia (relates to the drive) Clamping hub diameter [mm]	K 38	<i>J</i> <sub>i</sub>	<i>kgcm²</i>	24.3	19	18.7	16.1	18.5	15.7	12.8	17.5	12.7	12.7	12.7
			<i>10<sup>-3</sup> in.lb.s²</i>	21.51	16.82	16.55	14.25	16.37	13.89	11.33	15.49	11.24	11.24	11.24

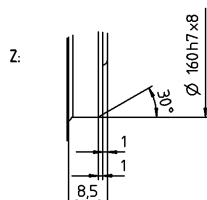
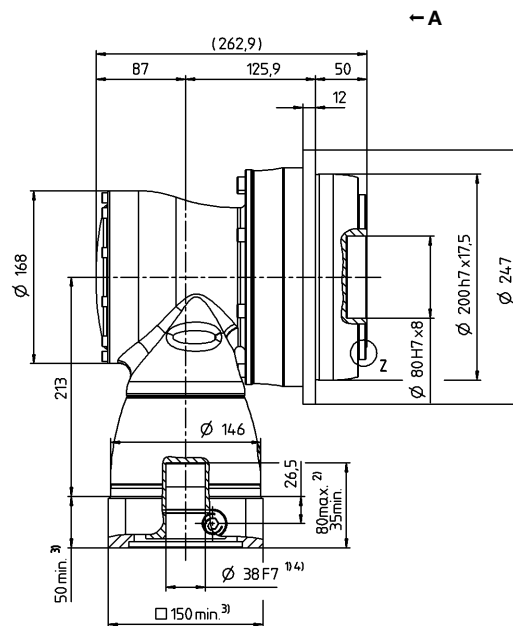
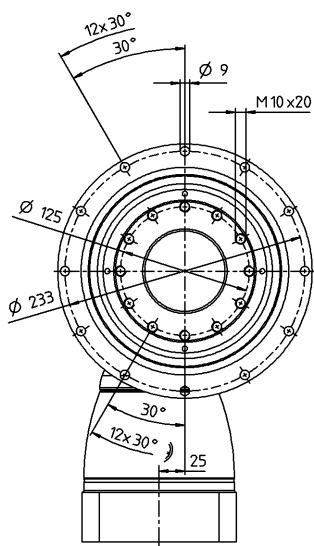
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Please contact us for optimum sizing at S1 conditions (Continuous operation).

- <sup>a)</sup> At max. 10 %  $M_{2KMax}$
- <sup>b)</sup> Valid for standard clamping hub diameter
- <sup>c)</sup> Refers to center of the output shaft or flange
- <sup>d)</sup> Please reduce input speed at higher ambient temperatures
- <sup>f)</sup> Please contact us to discuss application-specific service lifetimes

View A

Motor shaft diameter [mm]

2-stage

up to 38 <sup>4)</sup> (K) <sup>5)</sup>  
clamping hub  
diameter


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

Non-tolerated dimensions are nominal dimensions

<sup>1)</sup> Check motor shaft fit

<sup>2)</sup> Min./Max. permissible motor shaft length. Longer motor shafts are possible, please contact alpha.

<sup>3)</sup> The dimensions depend on the motor

<sup>4)</sup> Smaller motor shaft diameter is compensated by a bushing with a minimum wall thickness of 1 mm

<sup>5)</sup> Standard clamping hub diameter

# TPK+ 110 MF 3-stage

			3-stage													
Ratio	<i>i</i>		64	84	100	125	140	175	200	250	280	350	400	500	700	1000
Max. torque <sup>a) b)</sup>	$T_{2a}$	Nm	1440	1440	1800	1800	1800	1800	1800	1800	2520	2520	1008	1260	1764	2240
		in.lb	12745	12745	15931	15931	15931	15931	15931	15931	22304	22304	8922	11152	15613	19826
Max. acceleration torque <sup>b)</sup> (max. 1000 cycles per hour)	$T_{2B}$	Nm	1200	1200	1500	1500	1500	1500	1500	1500	1920	1920	840	1050	1470	1680
		in.lb	10621	10621	13276	13276	13276	13276	13276	13276	16994	16994	7435	9293	13011	14869
Nominal torque (at $n_n$ )	$T_{2N}$	Nm	700	700	950	950	950	950	950	950	1120	1250	640	750	1120	800
		in.lb	6196	6196	8408	8408	8408	8408	8408	8408	9913	11064	5665	6638	9913	7081
Emergency stop torque <sup>a) b)</sup> (permitted 1000 times during the service life of the gearbox)	$T_{2Not}$	Nm	2000	1600	2500	2500	2500	2500	2500	2500	3075	3075	1600	2000	2800	3075
		in.lb	17702	14161	22127	22127	22127	22127	22127	22127	27216	27216	14161	17702	24782	27216
Permitted average input speed (at $T_{2N}$ and 20 °C ambient temperature) <sup>d)</sup>	$n_{1N}$	$n_{1T}$	2900	2900	2900	2900	2900	2900	2900	3200	2900	3200	3900	3900	3900	3900
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 <sup>b)</sup> (at $n_i = 3000$ rpm and 20 °C gearbox temperature)	$T_{012}$	Nm	3	1.5	2.4	1.8	1.8	1.5	1.5	1.2	1.5	1.2	1.2	1.2	1.2	1.2
		in.lb	27	13	21	16	16	13	13	11	13	11	11	11	11	11
Max. backlash	$j_t$	arcmin	Standard $\leq 4$ / Reduced $\leq 2$													
Torsional rigidity <sup>b)</sup>	$C_{t21}$	Nm/arcmin	269	252	336	346	336	346	336	346	400	407	274	341	404	389
		in.lb/arcmin	2381	2230	2974	3062	2974	3062	2974	3062	3540	3602	2425	3018	3576	3443
Tilting rigidity	$C_{2K}$	Nm/arcmin	1452													
		in.lb/arcmin	12851													
Max. axial force <sup>c)</sup>	$F_{2AMax}$	N	10050													
		lb <sub>f</sub>	2261													
Max. tilting moment	$M_{2KMax}$	Nm	3280													
		in.lb	29030													
Efficiency at full load	$\eta$	%	92													
Service life <sup>f)</sup>	$L_h$	h	> 20000													
Weight (incl. standard adapter plate)	$m$	kg	45.4													
		lb <sub>m</sub>	100													
Operating noise (at reference ratio and reference speed – ratio-specific values available in cymex <sup>®</sup> )	$L_{PA}$	dB(A)	$\leq 70$													
Max. permitted housing temperature		°C	+90													
		F	194													
Ambient temperature		°C	0 to +40													
		F	32 to 104													
Lubrication			Lubricated for life													
Direction of rotation			In- and output opposite direction													
Protection class			IP 65													
Metal bellows coupling (recommended product type – validate sizing with cymex <sup>®</sup> )			BCT - 01500AAX - 125.000													
Bore diameter of coupling on the application side		mm	X = 050.000 - 080.000													
Mass moment of inertia (relates to the drive) Clamping hub diameter [mm]	G	24	$J_1$	kgcm <sup>2</sup>	3.97	2.82	3.36	3.22	2.82	2.75	2.5	2.47	2.5	2.44	2.42	2.42
				10 <sup>-3</sup> in.lb.s <sup>2</sup>	3.51	2.5	2.97	2.85	2.5	2.43	2.21	2.19	2.21	2.16	2.14	2.14
	K	38	$J_1$	kgcm <sup>2</sup>	10.9	9.74	10.3	10.1	9.74	9.66	9.41	9.38	9.41	9.38	9.33	9.33
				10 <sup>-3</sup> in.lb.s <sup>2</sup>	9.65	8.62	9.12	8.94	8.62	8.55	8.33	8.3	8.33	8.3	8.26	8.26

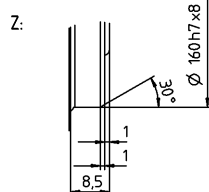
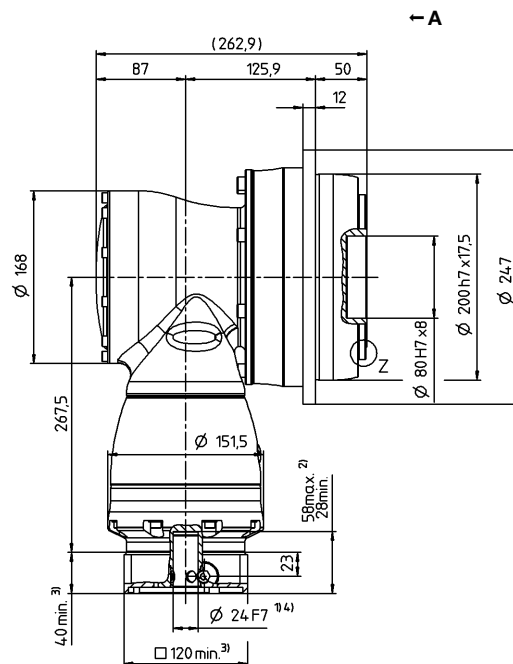
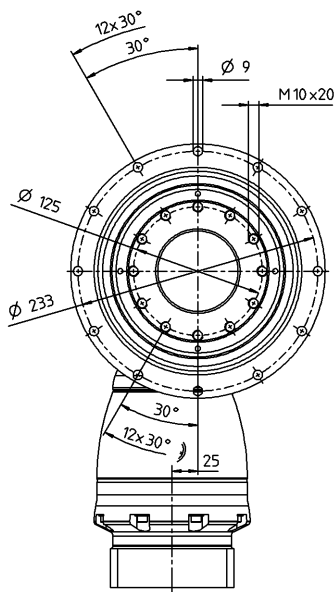
Please use our sizing software cymex<sup>®</sup> for a detailed sizing – [www.wittenstein-cymex.com](http://www.wittenstein-cymex.com)  
Please contact us for optimum sizing at S1 conditions (Continuous operation).

- <sup>a)</sup> At max. 10 %  $M_{2KMax}$
- <sup>b)</sup> Valid for standard clamping hub diameter
- <sup>c)</sup> Refers to center of the output shaft or flange
- <sup>d)</sup> Please reduce input speed at higher ambient temperatures
- <sup>f)</sup> Please contact us to discuss application-specific service lifetimes

View A

Motor shaft diameter [mm]

3-stage

up to 24/38<sup>4)</sup>  
(G<sup>5)</sup>/K) clamping  
hub diameter


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

Non-tolerated dimensions are nominal dimensions

<sup>1)</sup> Check motor shaft fit

<sup>2)</sup> Min./Max. permissible motor shaft length. Longer motor shafts are possible, please contact alpha.

<sup>3)</sup> The dimensions depend on the motor

<sup>4)</sup> Smaller motor shaft diameter is compensated by a bushing with a minimum wall thickness of 1 mm

<sup>5)</sup> Standard clamping hub diameter

Hypoid gearboxes

TPK+

MF

# TPK+ 300 MF 2-stage

			2-stage							
Ratio	<i>i</i>		15	20	25	35	49	50	70	100
Max. torque <sup>a) b)</sup>	$T_{2a}$	Nm	3840	3840	3840	5250	3840	2350	3290	2800
		in.lb	33987	33987	33987	46467	33987	20799	29119	24782
Max. acceleration torque <sup>b)</sup> (max. 1000 cycles per hour)	$T_{2B}$	Nm	3200	3200	3200	3960	3850	2350	3290	2280
		in.lb	28323	28323	28323	35049	34076	20799	29119	20180
Nominal torque (at $n_n$ )	$T_{2N}$	Nm	2000	2000	2000	1800	1800	1800	1800	1600
		in.lb	17702	17702	17702	15931	15931	15931	15931	14161
Emergency stop torque <sup>a) b)</sup> (permitted 1000 times during the service life of the gearbox)	$T_{2Not}$	Nm	4500	5250	5250	7350	6790	4500	6300	8750
		in.lb	39829	46467	46467	65053	60097	39829	55760	77445
Permitted average input speed (at $T_{2N}$ and 20 °C ambient temperature) <sup>d)</sup>	$n_{1N}$	$n_{1T}$	1500	1700	1900	1900	1700	1700	1700	1700
Max. input speed	$n_{1Max}$	rpm	4500	4500	4500	4500	4500	4500	4500	4500
Mean no load running torque <sup>b)</sup> (at $n_i = 3000$ rpm and 20 °C gearbox temperature)	$T_{012}$	Nm	24	19	15	14	17	21	17	16
		in.lb	212	168	133	124	150	186	150	142
Max. backlash	$j_t$	arcmin	Standard ≤ 4 / Reduced ≤ 2							
Torsional rigidity <sup>b)</sup>	$C_{t21}$	Nm/arcmin	615	640	664	730	728	658	727	642
		in.lb/arcmin	5443	5665	5877	6461	6443	5824	6435	5682
Tilting rigidity	$C_{2K}$	Nm/arcmin	5560							
		in.lb/arcmin	49210							
Max. axial force <sup>c)</sup>	$F_{2AMax}$	N	33000							
		lb <sub>f</sub>	7425							
Max. tilting moment	$M_{2KMax}$	Nm	5900							
		in.lb	52220							
Efficiency at full load	$\eta$	%	94							
Service life <sup>f)</sup>	$L_h$	h	> 20000							
Weight (incl. standard adapter plate)	$m$	kg	83							
		lb <sub>m</sub>	183							
Operating noise (at reference ratio and reference speed – ratio-specific values available in cymex <sup>®</sup> )	$L_{PA}$	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							
Direction of rotation			In- and output opposite direction							
Protection class			IP 65							
Metal bellows coupling (recommended product type – validate sizing with cymex <sup>®</sup> )			-							
Bore diameter of coupling on the application side		mm	-							
Mass moment of inertia (relates to the drive) Clamping hub diameter [mm]	M 48	$J_1$	kgcm <sup>2</sup>	74	52	43	43	35	30	30
			10 <sup>-3</sup> in.lb.s <sup>2</sup>	65.49	46.02	38.06	38.06	30.98	26.55	26.55

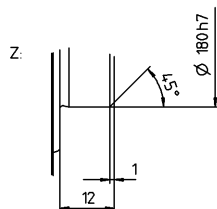
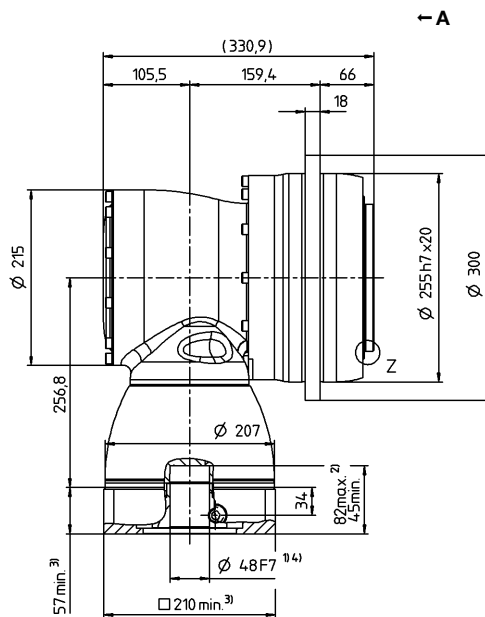
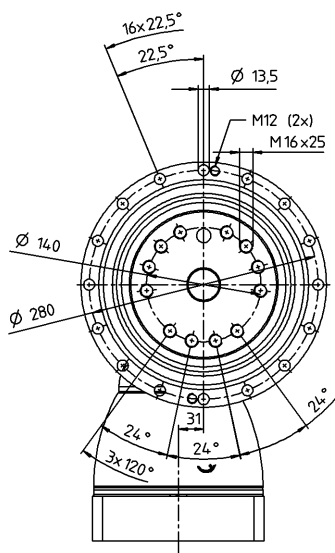
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Please contact us for optimum sizing at S1 conditions (Continuous operation).

- <sup>a)</sup> At max. 10 %  $M_{2KMax}$   
<sup>b)</sup> Valid for standard clamping hub diameter  
<sup>c)</sup> Refers to center of the output shaft or flange  
<sup>d)</sup> Please reduce input speed at higher ambient temperatures  
<sup>f)</sup> Please contact us to discuss application-specific service lifetimes

View A

Motor shaft diameter [mm]

2-stage

up to 48 <sup>4)</sup> (M) <sup>5)</sup>  
clamping hub  
diameter


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

Non-tolerated dimensions are nominal dimensions

<sup>1)</sup> Check motor shaft fit

<sup>2)</sup> Min./Max. permissible motor shaft length. Longer motor shafts are possible, please contact alpha.

<sup>3)</sup> The dimensions depend on the motor

<sup>4)</sup> Smaller motor shaft diameter is compensated by a bushing with a minimum wall thickness of 1 mm

<sup>5)</sup> Standard clamping hub diameter

Hypoid gearboxes

TPK<sup>+</sup>

MF

# TPK+ 300 MF 3-stage

				3-stage														
Ratio			<i>i</i>		63	100	125	140	175	200	250	280	350	500	700	1000		
Max. torque <sup>a) b)</sup>			<i>T</i> <sub>2a</sub>	<i>Nm</i>	5250	3840	3840	3840	3840	3840	3840	5250	5250	2820	3948	2800		
				<i>in.lb</i>	46467	33987	33987	33987	33987	33987	33987	46467	46467	24959	34943	24782		
Max. acceleration torque <sup>b)</sup> (max. 1000 cycles per hour)			<i>T</i> <sub>2B</sub>	<i>Nm</i>	3960	3200	3200	3200	3200	3200	3200	3960	3960	2350	3290	2280		
				<i>in.lb</i>	35049	28323	28323	28323	28323	28323	28323	35049	35049	20799	29119	20180		
Nominal torque (at <i>n</i> <sub>n</sub> )			<i>T</i> <sub>2N</sub>	<i>Nm</i>	1800	2000	2000	2000	2000	2000	2000	1800	1800	1800	1800	1600		
				<i>in.lb</i>	15931	17702	17702	17702	17702	17702	17702	15931	15931	15931	15931	14161		
Emergency stop torque <sup>a) b)</sup> (permitted 1000 times during the service life of the gearbox)			<i>T</i> <sub>2Not</sub>	<i>Nm</i>	6300	5250	5250	5250	5250	5250	5250	7350	7350	4500	6300	8750		
				<i>in.lb</i>	55760	46467	46467	46467	46467	46467	46467	65053	65053	39829	55760	77445		
Permitted average input speed (at <i>T</i> <sub>2n</sub> and 20 °C ambient temperature) <sup>d)</sup>			<i>n</i> <sub>1N</sub>	<i>n</i> <sub>1T</sub>	2700	2700	2700	2700	2700	2700	2900	2700	2900	3400	3400	3400		
Max. input speed			<i>n</i> <sub>1Max</sub>	<i>rpm</i>	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000		
Mean no load running torque <sup>b)</sup> (at <i>n</i> <sub>i</sub> = 3000 rpm and 20 °C gearbox temperature)			<i>T</i> <sub>012</sub>	<i>Nm</i>	11	6	5	4.2	3.8	3	2.8	2.6	2.4	2.2	2.2	2		
				<i>in.lb</i>	97	53	44	37	34	27	25	23	21	19	19	18		
Max. backlash			<i>j</i> <sub>t</sub>	<i>arcmin</i>	Standard ≤ 4 / Reduced ≤ 2													
Torsional rigidity <sup>b)</sup>			<i>C</i> <sub>121</sub>	<i>Nm/arcmin</i>	699	640	664	640	664	640	664	715	730	658	727	642		
				<i>in.lb/arcmin</i>	6187	5665	5877	5665	5877	5665	5877	6328	6461	5824	6435	5682		
Tilting rigidity			<i>C</i> <sub>2K</sub>	<i>Nm/arcmin</i>	5560													
				<i>in.lb/arcmin</i>	49210													
Max. axial force <sup>c)</sup>			<i>F</i> <sub>2AMax</sub>	<i>N</i>	33000													
				<i>lb<sub>f</sub></i>	7425													
Max. tilting moment			<i>M</i> <sub>2KMax</sub>	<i>Nm</i>	5900													
				<i>in.lb</i>	52220													
Efficiency at full load			<i>η</i>	%	92													
Service life <sup>f)</sup>			<i>L</i> <sub>h</sub>	<i>h</i>	> 20000													
Weight (incl. standard adapter plate)			<i>m</i>	<i>kg</i>	87													
				<i>lb<sub>m</sub></i>	192													
Operating noise (at reference ratio and reference speed – ratio-specific values available in cymex <sup>®</sup> )			<i>L</i> <sub>PA</sub>	<i>dB(A)</i>	≤ 71													
Max. permitted housing temperature				°C	+90													
				<i>F</i>	194													
Ambient temperature				°C	0 to +40													
				<i>F</i>	32 to 104													
Lubrication					Lubricated for life													
Direction of rotation					In- and output opposite direction													
Protection class					IP 65													
Metal bellows coupling (recommended product type – validate sizing with cymex <sup>®</sup> )					-													
Bore diameter of coupling on the application side				<i>mm</i>	-													
Mass moment of inertia (relates to the drive) Clamping hub diameter [mm]			K	38	<i>J</i> <sub>i</sub>	<i>kgcm<sup>2</sup></i>	17.8	14.1	12.1	11	10.8	10.2	10.1	10.1	10	9.9	9.9	9.9
						<i>10<sup>-3</sup> in.lb.s<sup>2</sup></i>	15.75	12.48	10.71	9.74	9.56	9.03	8.94	8.94	8.85	8.76	8.76	8.76
			M	48	<i>J</i> <sub>i</sub>	<i>kgcm<sup>2</sup></i>	32.5	28.8	26.8	25.7	25.5	24.9	24.8	24.9	24.8	24.6	24.6	24.6
<i>10<sup>-3</sup> in.lb.s<sup>2</sup></i>	28.76	25.49				23.72	22.74	22.57	22.04	21.95	22.04	21.95	21.77	21.77	21.77			

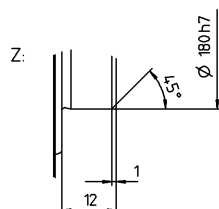
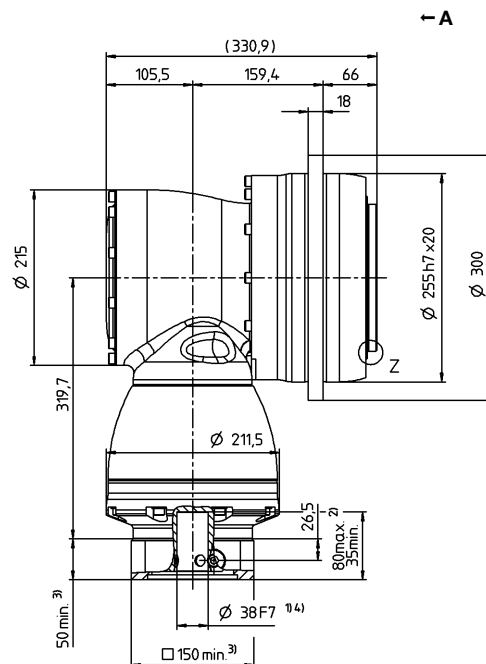
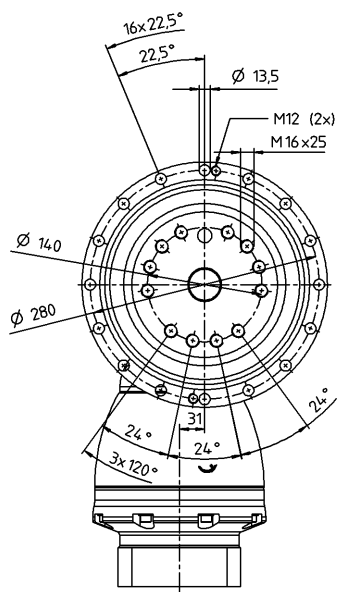
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Please contact us for optimum sizing at S1 conditions (Continuous operation).

- <sup>a)</sup> At max. 10 %  $M_{2KMax}$
- <sup>b)</sup> Valid for standard clamping hub diameter
- <sup>c)</sup> Refers to center of the output shaft or flange
- <sup>d)</sup> Please reduce input speed at higher ambient temperatures
- <sup>f)</sup> Please contact us to discuss application-specific service lifetimes

View A

Motor shaft diameter [mm]

3-stage

up to 38/48<sup>4)</sup>  
(K<sup>5)</sup>/M) clamping  
hub diameter


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

Non-tolerated dimensions are nominal dimensions

<sup>1)</sup> Check motor shaft fit

<sup>2)</sup> Min./Max. permissible motor shaft length. Longer motor shafts are possible, please contact alpha.

<sup>3)</sup> The dimensions depend on the motor

<sup>4)</sup> Smaller motor shaft diameter is compensated by a bushing with a minimum wall thickness of 1 mm

<sup>5)</sup> Standard clamping hub diameter



# TPK<sup>+</sup> 500 MF 3-stage

			3-stage				
Ratio	<i>i</i>		100	175	350	500	1000
Max. torque <sup>a) b)</sup>	$T_{2a}$	Nm	5446	6250	6808	4975	4800
		in.lb	48201	55318	60256	44033	42484
Max. acceleration torque <sup>b)</sup> (max. 1000 cycles per hour)	$T_{2B}$	Nm	5446	6250	6808	4975	4800
		in.lb	48201	55318	60256	44033	42484
Nominal torque (at $n_n$ )	$T_{2N}$	Nm	3350	3800	3800	2900	2900
		in.lb	29650	33633	33633	25667	25667
Emergency stop torque <sup>a) b)</sup> (permitted 1000 times during the service life of the gearbox)	$T_{2Not}$	Nm	10000	11250	14000	15000	15000
		in.lb	88508	99572	123911	132762	132762
Permitted average input speed (at $T_{2a}$ and 20 °C ambient temperature) <sup>d)</sup>	$n_{1N}$	$n_{1T}$	2100	1900	1900	1900	1900
Max. input speed	$n_{1Max}$	rpm	5000	5000	5000	5000	5000
Mean no load running torque <sup>b)</sup> (at $n_i = 3000$ rpm and 20 °C gearbox temperature)	$T_{012}$	Nm	7.2	11	7.8	7.8	7.8
		in.lb	64	97	69	69	69
Max. backlash	$j_t$	arcmin	Standard ≤ 3.3 / Reduced ≤ 2.3				
Torsional rigidity <sup>b)</sup>	$C_{t21}$	Nm/arcmin	1250	1350	1350	1280	1050
		in.lb/arcmin	11064	11949	11949	11329	9293
Tilting rigidity	$C_{2K}$	Nm/arcmin	9480				
		in.lb/arcmin	83906				
Max. axial force <sup>c)</sup>	$F_{2AMax}$	N	50000				
		lb <sub>f</sub>	11250				
Max. tilting moment	$M_{2KMax}$	Nm	8800				
		in.lb	77887				
Efficiency at full load	$\eta$	%	92				
Service life <sup>f)</sup>	$L_h$	h	> 20000				
Weight (incl. standard adapter plate)	$m$	kg	96				
		lb <sub>m</sub>	212				
Operating noise (at reference ratio and reference speed – ratio-specific values available in cymex <sup>®</sup> )	$L_{PA}$	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				
Direction of rotation			In- and output opposite direction				
Protection class			IP 65				
Metal bellows coupling (recommended product type – validate sizing with cymex <sup>®</sup> )			-				
Bore diameter of coupling on the application side		mm	-				
Mass moment of inertia (relates to the drive) Clamping hub diameter [mm]	K 38	$J_1$	kgcm <sup>2</sup>	16.7	16.5	16.4	16.4
			10 <sup>-3</sup> in.lb.s <sup>2</sup>	14.78	14.6	14.51	14.51

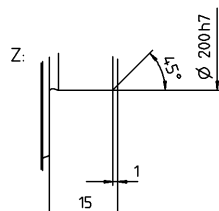
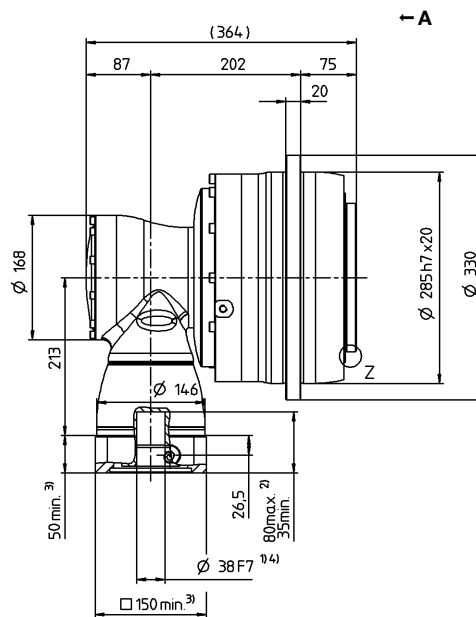
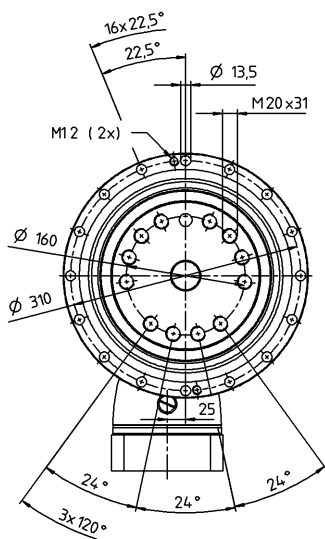
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Please contact us for optimum sizing at S1 conditions (Continuous operation).

- <sup>a)</sup> At max. 10 %  $M_{2KMax}$   
<sup>b)</sup> Valid for standard clamping hub diameter  
<sup>c)</sup> Refers to center of the output shaft or flange  
<sup>d)</sup> Please reduce input speed at higher ambient temperatures  
<sup>f)</sup> Please contact us to discuss application-specific service lifetimes

View A

Motor shaft diameter [mm]

3-stage

up to 38 <sup>4)</sup> (K) <sup>5)</sup>  
clamping hub  
diameter


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

Non-tolerated dimensions are nominal dimensions

<sup>1)</sup> Check motor shaft fit

<sup>2)</sup> Min./Max. permissible motor shaft length. Longer motor shafts are possible, please contact alpha.

<sup>3)</sup> The dimensions depend on the motor

<sup>4)</sup> Smaller motor shaft diameter is compensated by a bushing with a minimum wall thickness of 1 mm

<sup>5)</sup> Standard clamping hub diameter

Hypoid gearboxes

TPK<sup>+</sup>

MF

# TPK+ 025 MA 3-/4-stage

			3-stage								4-stage										
Ratio			<i>i</i>		66	88	110	137.5	154	220	385	330	462	577.5	770	1078	1540	2695	3850	5500	
Max. torque <sup>a) b)</sup>			<i>T</i> <sub>2a</sub>	<i>Nm</i>	583	583	583	583	550	440	583	583	583	583	583	583	583	583	583	583	583
				<i>in.lb</i>	5160	5160	5160	5160	4868	3894	5160	5160	5160	5160	5160	5160	5160	5160	5160	5160	5160
Max. acceleration torque <sup>b)</sup> (max. 1000 cycles per hour)			<i>T</i> <sub>2B</sub>	<i>Nm</i>	530	530	530	530	530	440	530	530	530	530	530	530	530	530	530	530	530
				<i>in.lb</i>	4691	4691	4691	4691	4691	3894	4691	4691	4691	4691	4691	4691	4691	4691	4691	4691	4691
Nominal torque (at <i>n</i> <sub>n</sub> )			<i>T</i> <sub>2N</sub>	<i>Nm</i>	375	375	375	375	375	330	375	375	375	375	375	375	375	375	375	375	375
				<i>in.lb</i>	3319	3319	3319	3319	3319	2921	3319	3319	3319	3319	3319	3319	3319	3319	3319	3319	3319
Emergency stop torque <sup>a) b)</sup> (permitted 1000 times during the service life of the gearbox)			<i>T</i> <sub>2Not</sub>	<i>Nm</i>	880	1100	1100	1200	990	880	1200	880	1200	1200	1200	1200	1200	1200	1200	1200	1200
				<i>in.lb</i>	7789	9736	9736	10621	8762	7789	10621	7789	10621	10621	10621	10621	10621	10621	10621	10621	10621
Permitted average input speed (at <i>T</i> <sub>2N</sub> and 20 °C ambient temperature) <sup>d)</sup>			<i>n</i> <sub>1N</sub>	<i>n</i> <sub>1T</sub>	2400	2600	2900	2900	2900	2900	2900	4300	4300	4300	4300	4300	4300	5400	5400	5400	
Max. input speed			<i>n</i> <sub>1Max</sub>	<i>rpm</i>	7500	7500	7500	7500	7500	7500	7500	6000	6000	6000	6000	6000	6000	6000	6000	6000	
Mean no load running torque <sup>b)</sup> (at <i>n</i> <sub>i</sub> = 3000 rpm and 20 °C gearbox temperature)			<i>T</i> <sub>012</sub>	<i>Nm</i>	1.4	1.2	1.2	1.4	1.6	1.6	1.2	0.45	0.45	0.3	0.3	0.3	0.2	0.2	0.2	0.2	
				<i>in.lb</i>	12	11	11	12	14	14	11	4.0	4.0	2.7	2.7	2.7	1.8	1.8	1.8	1.8	
Max. backlash			<i>j</i> <sub>t</sub>	<i>arcmin</i>	Standard ≤ 1.3																
Torsional rigidity <sup>b)</sup>			<i>C</i> <sub>121</sub>	<i>Nm/arcmin</i>	95	95	96	99	95	94	101	95	101	98	98	102	102	101	101	98	
				<i>in.lb/arcmin</i>	841	841	850	876	841	832	894	841	894	867	867	903	903	894	894	867	
Tilting rigidity			<i>C</i> <sub>2K</sub>	<i>Nm/arcmin</i>	550																
				<i>in.lb/arcmin</i>	4868																
Max. axial force <sup>c)</sup>			<i>F</i> <sub>2AMax</sub>	<i>N</i>	4800																
				<i>lb<sub>f</sub></i>	1080																
Max. tilting moment			<i>M</i> <sub>2KMax</sub>	<i>Nm</i>	550																
				<i>in.lb</i>	4868																
Efficiency at full load			<i>η</i>	%	92								90								
Service life <sup>f)</sup>			<i>L</i> <sub>h</sub>	<i>h</i>	> 20000																
Weight (incl. standard adapter plate)			<i>m</i>	<i>kg</i>	8.4								8.7								
				<i>lb<sub>m</sub></i>	19								19								
Operating noise (at reference ratio and reference speed – ratio-specific values available in cymex <sup>®</sup> )			<i>L</i> <sub>PA</sub>	<i>dB(A)</i>	≤ 66																
Max. permitted housing temperature				°C	+90																
				<i>F</i>	194																
Ambient temperature				°C	0 to +40																
				<i>F</i>	32 to 104																
Lubrication					Lubricated for life																
Direction of rotation					In- and output opposite direction																
Protection class					IP 65																
Metal bellows coupling (recommended product type – validate sizing with cymex <sup>®</sup> )					BCT - 00300AAX - 063.000																
Bore diameter of coupling on the application side				<i>mm</i>	X = 030.000 - 056.000																
Mass moment of inertia (relates to the drive) Clamping hub diameter [mm]	B	11	<i>J</i> <sub>i</sub>	<i>kgcm<sup>2</sup></i>	-	-	-	-	-	-	-	0.08	0.09	0.06	0.06	0.06	0.06	0.06	0.06	0.06	
				<i>10<sup>-3</sup> in.lb.s<sup>2</sup></i>	-	-	-	-	-	-	-	0.07	0.08	0.05	0.05	0.05	0.05	0.05	0.05	0.05	
	C	14	<i>J</i> <sub>i</sub>	<i>kgcm<sup>2</sup></i>	0.56	0.46	0.41	0.4	0.37	0.35	0.34	0.19	0.2	0.18	0.18	0.18	0.17	0.17	0.17	0.17	
				<i>10<sup>-3</sup> in.lb.s<sup>2</sup></i>	0.5	0.41	0.36	0.35	0.33	0.31	0.3	0.17	0.18	0.16	0.16	0.16	0.15	0.15	0.15	0.15	
	E	19	<i>J</i> <sub>i</sub>	<i>kgcm<sup>2</sup></i>	0.91	0.81	0.76	0.76	0.72	0.7	0.7	-	-	-	-	-	-	-	-	-	
				<i>10<sup>-3</sup> in.lb.s<sup>2</sup></i>	0.81	0.72	0.67	0.67	0.64	0.62	0.62	-	-	-	-	-	-	-	-	-	

Please use our sizing software cymex<sup>®</sup> for a detailed sizing – [www.wittenstein-cymex.com](http://www.wittenstein-cymex.com)  
Please contact us for optimum sizing at S1 conditions (Continuous operation).

<sup>a)</sup> At max. 10 %  $M_{2KMax}$

<sup>b)</sup> Valid for standard clamping hub diameter

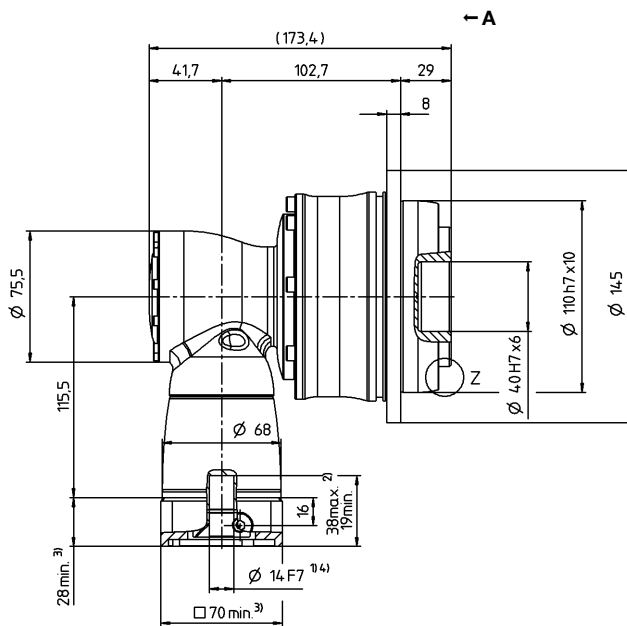
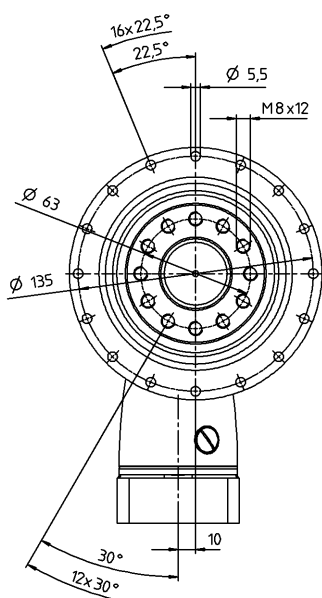
<sup>c)</sup> Refers to center of the output shaft or flange

<sup>d)</sup> Please reduce input speed at higher ambient temperatures

<sup>f)</sup> Please contact us to discuss  
application-specific service lifetimes

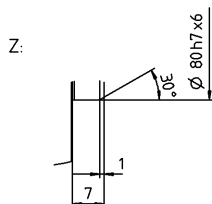
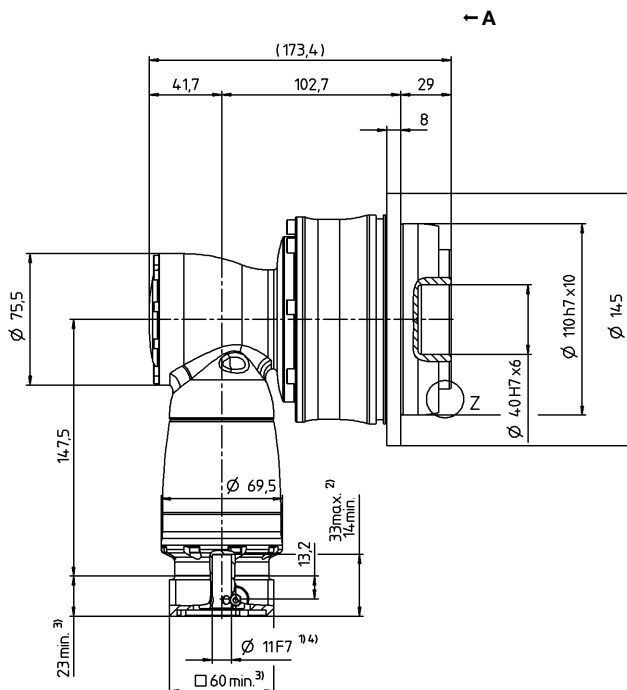
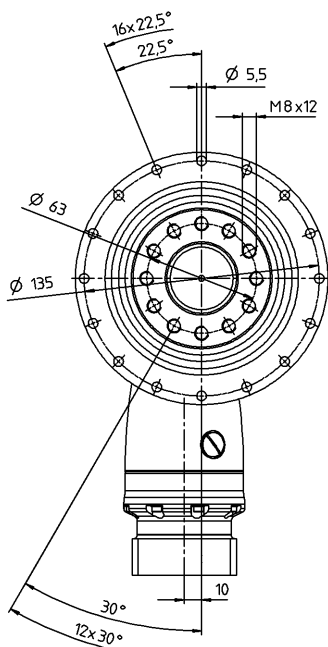
## 3-stage

up to 14/19 <sup>4)</sup>  
(C<sup>5</sup>)/E) clamping  
hub diameter



4-stage

up to 11/14 <sup>4)</sup>  
(B<sup>5</sup>/C) clamping  
hub diameter



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

Non-tolerated dimensions are nominal dimensions  
 1) Check motor shaft fit

2) Min./Max. permissible motor shaft length. Longer motor shafts are possible, please contact alpha.

3) The dimensions depend on the motor

4) Smaller motor shaft diameter is compensated by a bushing with a minimum wall thickness of 1 mm

5) Standard clamping hub diameter

# TPK<sup>+</sup> 050 MA 3-/4-stage

			3-stage								4-stage												
Ratio			<i>i</i>			66	88	110	137.5	154	220	385	330	462	577.5	770	1078	1540	2695	3850	5500		
Max. torque <sup>a) b)</sup>			<i>T</i> <sub>2a</sub>	<i>Nm</i>	1402	1402	1402	1402	1320	1100	1402	1402	1402	1402	1402	1402	1402	1402	1402	1402	1402		
				<i>in.lb</i>	12409	12409	12409	12409	11683	9736	12409	12409	12409	12409	12409	12409	12409	12409	12409	12409	12409	12409	
Max. acceleration torque <sup>b)</sup> (max. 1000 cycles per hour)			<i>T</i> <sub>2B</sub>	<i>Nm</i>	992	992	992	992	992	992	992	992	992	992	992	992	992	992	992	992	992		
				<i>in.lb</i>	8780	8780	8780	8780	8780	8780	8780	8780	8780	8780	8780	8780	8780	8780	8780	8780	8780	8780	
Nominal torque (at <i>n</i> <sub>IN</sub> )			<i>T</i> <sub>2N</sub>	<i>Nm</i>	675	675	675	675	675	675	675	675	675	675	675	675	675	675	675	675	675		
				<i>in.lb</i>	5974	5974	5974	5974	5974	5974	5974	5974	5974	5974	5974	5974	5974	5974	5974	5974	5974	5974	
Emergency stop torque <sup>a) b)</sup> (permitted 1000 times during the service life of the gearbox)			<i>T</i> <sub>2Not</sub>	<i>Nm</i>	2090	2375	2375	2375	2375	2375	2375	2090	2375	2375	2375	2375	2375	2375	2375	2375	2375		
				<i>in.lb</i>	18498	21021	21021	21021	21021	21021	21021	18498	21021	21021	21021	21021	21021	21021	21021	21021	21021	21021	
Permitted average input speed (at <i>T</i> <sub>2N</sub> and 20 °C ambient temperature) <sup>d)</sup>	<i>n</i> <sub>1N</sub>	<i>n</i> <sub>1T</sub>		2200	2400	2700	2700	2700	2700	2700	2700	3400	3400	3400	3400	3400	3400	4400	4400	4400			
Max. input speed	<i>n</i> <sub>1Max</sub>	<i>rpm</i>		7500	7500	7500	7500	7500	7500	7500	7500	6000	6000	6000	6000	6000	6000	6000	6000	6000			
Mean no load running torque <sup>b)</sup> (at <i>n</i> <sub>i</sub> = 3000 rpm and 20 °C gearbox temperature)			<i>T</i> <sub>012</sub>	<i>Nm</i>	2.9	2.4	2	2.1	2.4	2.1	2	0.6	0.75	0.45	0.45	0.45	0.45	0.3	0.15	0.15	0.15		
				<i>in.lb</i>	26	21	18	19	21	19	18	5.3	6.6	4.0	4.0	4.0	4.0	2.7	1.3	1.3	1.3		
Max. backlash	<i>j</i> <sub>t</sub>	<i>arcmin</i>	Standard ≤ 1.3																				
Torsional rigidity <sup>b)</sup>			<i>C</i> <sub>121</sub>	<i>Nm/arcmin</i>	202	203	205	210	205	205	215	202	214	208	209	214	214	215	215	217			
				<i>in.lb/arcmin</i>	1788	1797	1814	1859	1814	1814	1903	1788	1894	1841	1850	1894	1894	1903	1903	1921			
Tilting rigidity			<i>C</i> <sub>2K</sub>	<i>Nm/arcmin</i>	560																		
				<i>in.lb/arcmin</i>	4956																		
Max. axial force <sup>c)</sup>			<i>F</i> <sub>2AMax</sub>	<i>N</i>	6130																		
				<i>lb<sub>f</sub></i>	1379																		
Max. tilting moment			<i>M</i> <sub>2KMax</sub>	<i>Nm</i>	1335																		
				<i>in.lb</i>	11816																		
Efficiency at full load	<i>η</i>	%	92									90											
Service life <sup>f)</sup>	<i>L</i> <sub>h</sub>	<i>h</i>	> 20000																				
Weight (incl. standard adapter plate)			<i>m</i>	<i>kg</i>	16.9									17.5									
				<i>lb<sub>m</sub></i>	37									39									
Operating noise (at reference ratio and reference speed – ratio-specific values available in cymex <sup>®</sup> )			<i>L</i> <sub>PA</sub>	<i>dB(A)</i>	≤ 68																		
Max. permitted housing temperature				°C	+90																		
				<i>F</i>	194																		
Ambient temperature				°C	0 to +40																		
				<i>F</i>	32 to 104																		
Lubrication				Lubricated for life																			
Direction of rotation				In- and output opposite direction																			
Protection class				IP 65																			
Metal bellows coupling (recommended product type – validate sizing with cymex <sup>®</sup> )				BCT - 00300AAX - 080.000																			
Bore diameter of coupling on the application side				<i>mm</i>	X = 045.000 - 056.000																		
Mass moment of inertia (relates to the drive) Clamping hub diameter [mm]	C	14	<i>J</i> <sub>1</sub>	<i>kgcm<sup>2</sup></i>	-	-	-	-	-	-	-	0.24	0.29	0.2	0.2	0.2	0.19	0.18	0.18	0.18			
				<i>10<sup>-3</sup> in.lb.s<sup>2</sup></i>	-	-	-	-	-	-	-	0.21	0.26	0.18	0.18	0.18	0.17	0.16	0.16	0.16			
	E	19	<i>J</i> <sub>1</sub>	<i>kgcm<sup>2</sup></i>	1.65	1.3	1.13	1.11	0.99	0.91	0.9	0.68	0.73	0.63	0.63	0.63	0.63	0.63	0.63	0.63			
				<i>10<sup>-3</sup> in.lb.s<sup>2</sup></i>	1.46	1.15	1	0.98	0.88	0.81	0.8	0.6	0.65	0.56	0.56	0.56	0.56	0.56	0.56	0.56			
	H	28	<i>J</i> <sub>1</sub>	<i>kgcm<sup>2</sup></i>	3.07	2.71	2.54	2.53	2.4	2.53	2.32	-	-	-	-	-	-	-	-	-			
				<i>10<sup>-3</sup> in.lb.s<sup>2</sup></i>	2.72	2.4	2.25	2.24	2.12	2.24	2.05	-	-	-	-	-	-	-	-	-			

Please use our sizing software cymex<sup>®</sup> for a detailed sizing – [www.wittenstein-cymex.com](http://www.wittenstein-cymex.com)  
Please contact us for optimum sizing at S1 conditions (Continuous operation).

<sup>a)</sup> At max. 10 %  $M_{2KMax}$

<sup>b)</sup> Valid for standard clamping hub diameter

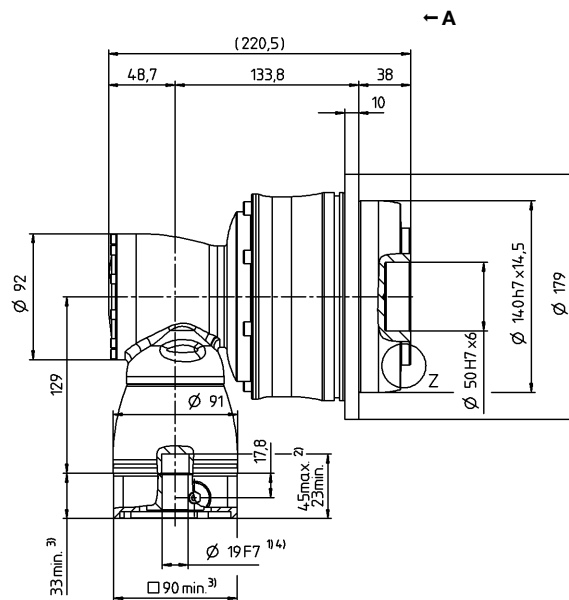
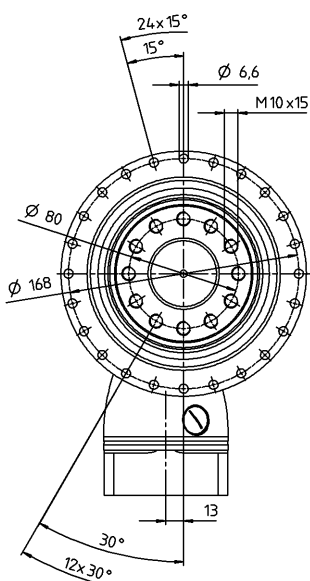
<sup>c)</sup> Refers to center of the output shaft or flange

<sup>d)</sup> Please reduce input speed at higher ambient temperatures

<sup>f)</sup> Please contact us to discuss  
application-specific service lifetimes

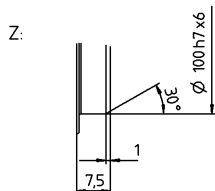
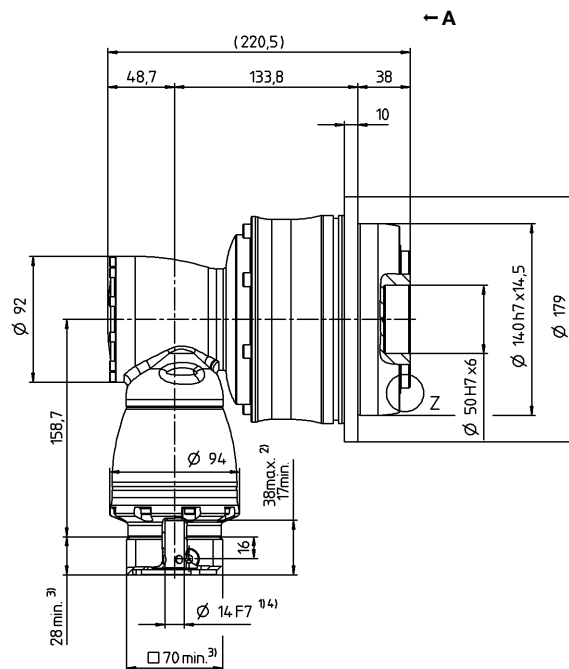
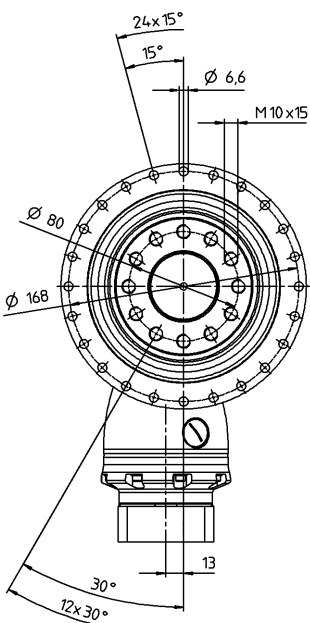
## 3-stage

up to 19/28<sup>4)</sup>  
(E<sup>5)</sup>/H) clamping  
hub diameter



## 4-stage

up to 14/19<sup>4)</sup>  
(C<sup>5)</sup>/E) clamping  
hub diameter



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

Non-tolerated dimensions are nominal dimensions

<sup>1)</sup> Check motor shaft fit

<sup>2)</sup> Min./Max. permissible motor shaft length. Longer motor shafts are possible, please contact alpha.

<sup>3)</sup> The dimensions depend on the motor

<sup>4)</sup> Smaller motor shaft diameter is compensated by a bushing with a minimum wall thickness of 1 mm

<sup>5)</sup> Standard clamping hub diameter

# TPK<sup>+</sup> 110 MA 3-/4-stage

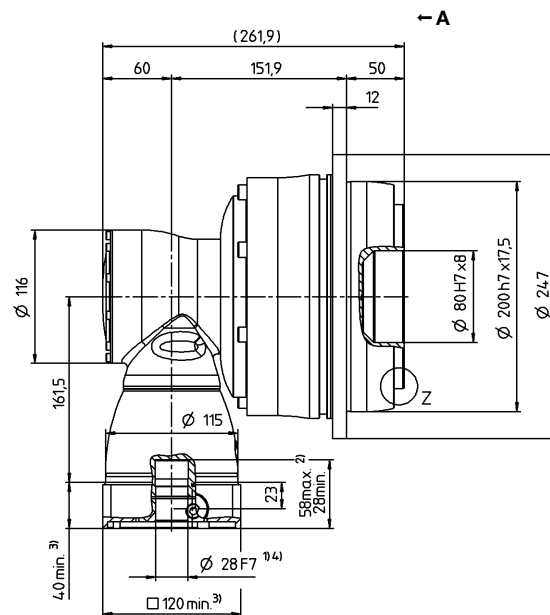
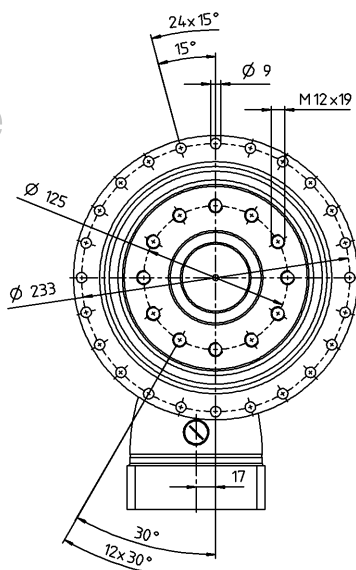
				3-stage								4-stage									
Ratio			<i>i</i>		66	88	110	137.5	154	220	385	330	462	577.5	770	1078	1540	2695	3850	5500	
Max. torque <sup>a) b)</sup>			<i>T</i> <sub>2a</sub>	<i>Nm</i>	3822	3822	3822	3822	3190	2750	3822	3822	3822	3822	3822	3822	3822	3822	3822	3822	3200
				<i>in.lb</i>	33828	33828	33828	33828	28234	24340	33828	33828	33828	33828	33828	33828	33828	33828	33828	33828	33828
Max. acceleration torque <sup>b)</sup> (max. 1000 cycles per hour)			<i>T</i> <sub>2B</sub>	<i>Nm</i>	3100	3100	3100	3100	3100	2750	3100	3100	3100	3100	3100	3100	3100	3100	3100	3100	2400
				<i>in.lb</i>	27437	27437	27437	27437	27437	24340	27437	27437	27437	27437	27437	27437	27437	27437	27437	27437	27437
Nominal torque (at <i>n</i> <sub>IN</sub> )			<i>T</i> <sub>2N</sub>	<i>Nm</i>	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650	1400
				<i>in.lb</i>	14604	14604	14604	14604	14604	14604	14604	14604	14604	14604	14604	14604	14604	14604	14604	14604	14604
Emergency stop torque <sup>a) b)</sup> (permitted 1000 times during the service life of the gearbox)			<i>T</i> <sub>2Not</sub>	<i>Nm</i>	4840	5720	5720	6500	5610	5500	6500	4840	6500	6050	6500	6500	6500	6500	6500	6500	6500
				<i>in.lb</i>	42838	50627	50627	57530	49653	48679	57530	42838	57530	53547	57530	57530	57530	57530	57530	57530	57530
Permitted average input speed (at <i>T</i> <sub>2N</sub> and 20 °C ambient temperature) <sup>d)</sup>			<i>n</i> <sub>1N</sub>	<i>n</i> <sub>1T</sub>	2100	2300	2600	2600	2400	2400	2400	3000	3000	3000	3000	3000	3000	4100	4100	4100	
Max. input speed			<i>n</i> <sub>1Max</sub>	<i>rpm</i>	5500	5500	5500	5500	5500	5500	5500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500
Mean no load running torque <sup>b)</sup> (at <i>n</i> <sub>1</sub> = 3000 rpm and 20 °C gearbox temperature)			<i>T</i> <sub>012</sub>	<i>Nm</i>	6	4.6	3.6	3.4	4.4	3.5	3.3	1.4	1.5	1.1	0.9	0.9	0.45	0.45	0.3	0.3	
				<i>in.lb</i>	53	41	32	30	39	31	29	12	13	9.7	8.0	8.0	4.0	4.0	2.7	2.7	
Max. backlash			<i>j</i> <sub>t</sub>	<i>arcmin</i>	Standard ≤ 1.3																
Torsional rigidity <sup>b)</sup>			<i>C</i> <sub>121</sub>	<i>Nm/arcmin</i>	634	642	654	675	654	648	687	634	682	662	667	685	685	689	687	658	
				<i>in.lb/arcmin</i>	5611	5682	5788	5974	5788	5735	6080	5611	6036	5859	5903	6063	6063	6098	6080	5824	
Tilting rigidity			<i>C</i> <sub>2K</sub>	<i>Nm/arcmin</i>	1452																
				<i>in.lb/arcmin</i>	12851																
Max. axial force <sup>c)</sup>			<i>F</i> <sub>2AMax</sub>	<i>N</i>	10050																
				<i>lb<sub>f</sub></i>	2261																
Max. tilting moment			<i>M</i> <sub>2KMax</sub>	<i>Nm</i>	3280																
				<i>in.lb</i>	29031																
Efficiency at full load			<i>η</i>	%	92								90								
Service life <sup>f)</sup>			<i>L</i> <sub>h</sub>	<i>h</i>	> 20000																
Weight (incl. standard adapter plate)			<i>m</i>	<i>kg</i>	39.9								40.6								
				<i>lb<sub>m</sub></i>	88								90								
Operating noise (at reference ratio and reference speed – ratio-specific values available in cymex®)			<i>L</i> <sub>PA</sub>	<i>dB(A)</i>	≤ 70																
Max. permitted housing temperature				°C	+90																
				<i>F</i>	194																
Ambient temperature				°C	0 to +40																
				<i>F</i>	32 to 104																
Lubrication					Lubricated for life																
Direction of rotation					In- and output opposite direction																
Protection class					IP 65																
Metal bellows coupling (recommended product type – validate sizing with cymex®)					BCT - 01500AAX - 125.000																
Bore diameter of coupling on the application side				<i>mm</i>	X = 055.000 - 070.000																
Mass moment of inertia (relates to the drive)  Clamping hub diameter [mm]	E	19	<i>J</i> <sub>1</sub>	<i>kgcm²</i>	-	-	-	-	-	-	-	0.89	1.06	0.76	0.76	0.76	0.69	0.68	0.68	0.68	
				<i>10<sup>-3</sup> in.lb.s²</i>	-	-	-	-	-	-	-	0.79	0.94	0.67	0.67	0.67	0.61	0.6	0.6	0.6	
	G	24	<i>J</i> <sub>1</sub>	<i>kgcm²</i>	-	-	-	-	-	-	-	2.46	2.63	2.33	2.32	2.32	2.26	2.25	2.25	2.25	
				<i>10<sup>-3</sup> in.lb.s²</i>	-	-	-	-	-	-	-	2.18	2.33	2.06	2.05	2.05	2	1.99	1.99	1.99	
	H	28	<i>J</i> <sub>1</sub>	<i>kgcm²</i>	5.48	4.27	3.64	3.58	3.14	2.87	2.84	-	-	-	-	-	-	-	-	-	
				<i>10<sup>-3</sup> in.lb.s²</i>	4.85	3.78	3.22	3.17	2.78	2.54	2.51	-	-	-	-	-	-	-	-	-	
	K	38	<i>J</i> <sub>1</sub>	<i>kgcm²</i>	12.72	11.52	10.89	10.83	10.39	10.12	10.09	-	-	-	-	-	-	-	-	-	
				<i>10<sup>-3</sup> in.lb.s²</i>	11.26	10.2	9.64	9.58	9.2	8.96	8.93	-	-	-	-	-	-	-	-	-	

Please use our sizing software cymex<sup>®</sup> for a detailed sizing – [www.wittenstein-cymex.com](http://www.wittenstein-cymex.com)  
Please contact us for optimum sizing at S1 conditions (Continuous operation).

- <sup>a)</sup> At max. 10 %  $M_{2KMax}$   
<sup>b)</sup> Valid for standard clamping hub diameter  
<sup>c)</sup> Refers to center of the output shaft or flange  
<sup>d)</sup> Please reduce input speed at higher ambient temperatures  
<sup>f)</sup> Please contact us to discuss application-specific service lifetimes

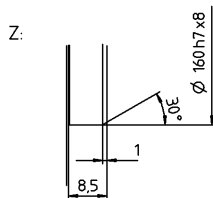
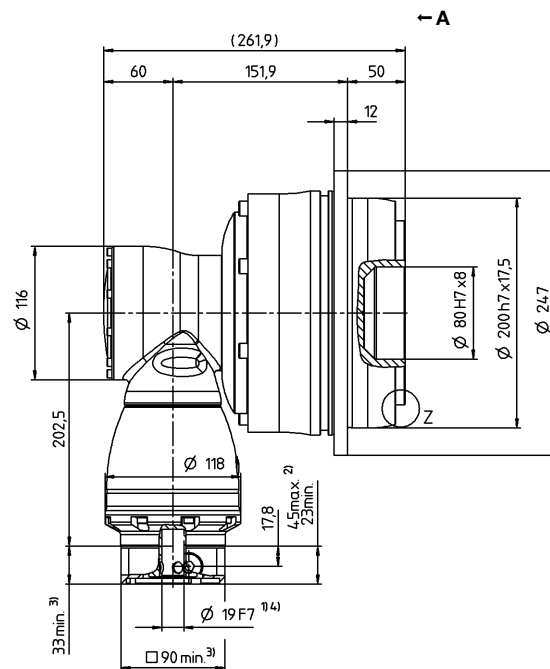
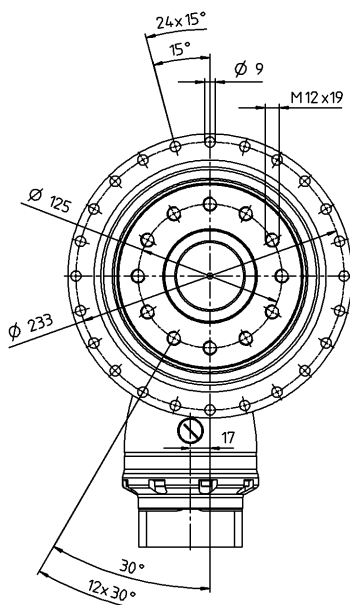
# 3-stage

up to 28/38<sup>4)</sup>  
(H<sup>5)</sup>/K) clamping  
hub diameter



# 4-stage

up to 19/24<sup>4)</sup>  
(E<sup>5)</sup>/G) clamping  
hub diameter



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

Non-tolerated dimensions are nominal dimensions

<sup>1)</sup> Check motor shaft fit

<sup>2)</sup> Min./Max. permissible motor shaft length. Longer motor shafts are possible, please contact alpha.

<sup>3)</sup> The dimensions depend on the motor

<sup>4)</sup> Smaller motor shaft diameter is compensated by a bushing with a minimum wall thickness of 1 mm

<sup>5)</sup> Standard clamping hub diameter



# TPK<sup>+</sup> 300 MA 3- / 4-stage

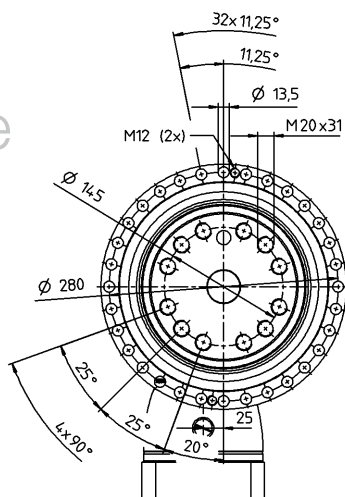
				3-stage								4-stage									
Ratio			i		66	88	110	137.5	154	220	385	330	462	577.5	770	1078	1540	2695	3850	5500	
Max. torque <sup>a) b)</sup>			T <sub>2a</sub>	Nm	7535	7535	7535	7535	5500	4620	7535	7535	7535	7535	7535	7535	7535	7535	7535	5473	
				in.lb	66691	66691	66691	66691	48679	40891	66691	66691	66691	66691	66691	66691	66691	66691	66691	66691	66691
Max. acceleration torque <sup>b)</sup> (max. 1000 cycles per hour)			T <sub>2B</sub>	Nm	6600	6600	6600	6600	5500	4620	6600	6600	6600	6600	6600	6600	6600	6600	6600	4680	
				in.lb	58415	58415	58415	58415	48679	40891	58415	58415	58415	58415	58415	58415	58415	58415	58415	58415	58415
Nominal torque (at n <sub>n</sub> )			T <sub>2N</sub>	Nm	3500	3500	3500	3500	3500	3500	3500	3500	3500	3500	3500	3500	3500	3500	3500	3500	
				in.lb	30978	30978	30978	30978	30978	30978	30978	30978	30978	30978	30978	30978	30978	30978	30978	30978	30978
Emergency stop torque <sup>a) b)</sup> (permitted 1000 times during the service life of the gearbox)			T <sub>2Not</sub>	Nm	8800	11000	11000	13750	9900	8800	15296	8800	15296	11000	13750	15296	15296	15296	15296	15333	
				in.lb	77887	97359	97359	121699	87623	77887	135382	77887	135382	97359	121699	135382	135382	135382	135382	135382	135709
Permitted average input speed (at T <sub>2n</sub> and 20 °C ambient temperature) <sup>d)</sup>			n <sub>1N</sub>	n <sub>1T</sub>	1800	1900	2100	2100	1900	1900	1900	2800	2800	2800	2800	2800	2800	3100	3800	3800	
Max. input speed			n <sub>1Max</sub>	rpm	5000	5000	5000	5000	5000	5000	5000	4500	4500	4500	4500	4500	4500	4500	4500	4500	
Mean no load running torque <sup>b)</sup> (at n <sub>i</sub> = 3000 rpm and 20 °C gearbox temperature)			T <sub>012</sub>	Nm	11	8.2	6.9	6.5	9.2	7.8	7.5	2.3	3.3	1.5	1.4	1.2	0.9	0.6	0.6	0.6	
				in.lb	97	73	61	58	81	69	66	20	29	13	12	11	8.0	5.3	5.3	5.3	
Max. backlash			j <sub>t</sub>	arcmin	Standard ≤ 3.3 / Reduced ≤ 1.8																
Torsional rigidity <sup>b)</sup>			C <sub>t21</sub>	Nm/arcmin	1099	1108	1114	960	1114	1111	979	1099	976	953	958	978	978	979	979	989	
				in.lb/arcmin	9727	9807	9860	8497	9860	9833	8665	9727	8638	8435	8479	8656	8656	8665	8665	8753	
Tilting rigidity			C <sub>2K</sub>	Nm/arcmin	5560																
				in.lb/arcmin	49210																
Max. axial force <sup>c)</sup>			F <sub>2AMax</sub>	N	33000																
				lb <sub>f</sub>	7425																
Max. tilting moment			M <sub>2KMax</sub>	Nm	6500																
				in.lb	57530																
Efficiency at full load			η	%	92								90								
Service life <sup>f)</sup>			L <sub>h</sub>	h	> 20000																
Weight (incl. standard adapter plate)			m	kg	83								87								
				lb <sub>m</sub>	183								192								
Operating noise (at reference ratio and reference speed – ratio-specific values available in cymex®)			L <sub>PA</sub>	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																
Direction of rotation					In- and output opposite direction																
Protection class					IP 65																
Metal bellows coupling (recommended product type – validate sizing with cymex®)					BCT - 04000AAX - 145.000																
Bore diameter of coupling on the application side				mm	X = 070.000 - 100.000																
Mass moment of inertia (relates to the drive)  Clamping hub diameter [mm]			G	24	J <sub>i</sub>	kgcm <sup>2</sup>	-	-	-	-	-	-	3.32	4.24	2.8	2.79	2.79	2.49	2.43	2.42	2.42
						10 <sup>-3</sup> in.lb.s <sup>2</sup>	-	-	-	-	-	-	2.94	3.75	2.48	2.47	2.47	2.2	2.15	2.14	2.14
			K	38	J <sub>i</sub>	kgcm <sup>2</sup>	26.04	19.71	16.71	16.58	14.26	12.89	12.83	10.23	11.15	9.71	9.7	9.7	9.4	9.34	9.33
10 <sup>-3</sup> in.lb.s <sup>2</sup>	23.05	17.44				14.79	14.67	12.62	11.41	11.35	9.05	9.87	8.59	8.58	8.58	8.32	8.27	8.26	8.26		

Please use our sizing software cymex<sup>®</sup> for a detailed sizing – [www.wittenstein-cymex.com](http://www.wittenstein-cymex.com)  
Please contact us for optimum sizing at S1 conditions (Continuous operation).

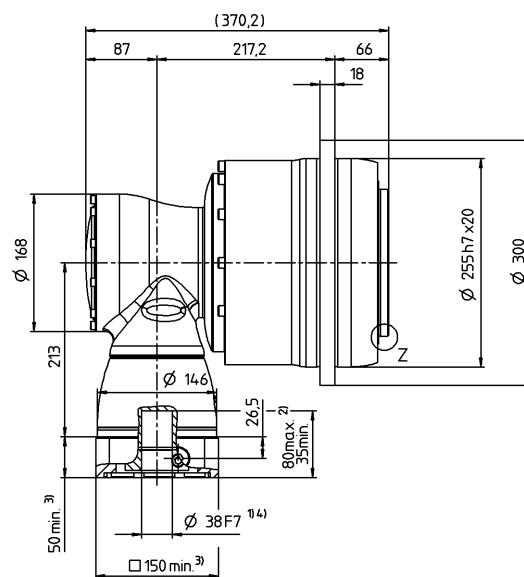
- <sup>a)</sup> At max. 10 %  $M_{2KMax}$
- <sup>b)</sup> Valid for standard clamping hub diameter
- <sup>c)</sup> Refers to center of the output shaft or flange
- <sup>d)</sup> Please reduce input speed at higher ambient temperatures
- <sup>f)</sup> Please contact us to discuss application-specific service lifetimes

# 3-stage

up to 38<sup>4)</sup> (K)<sup>5)</sup>  
clamping hub diameter

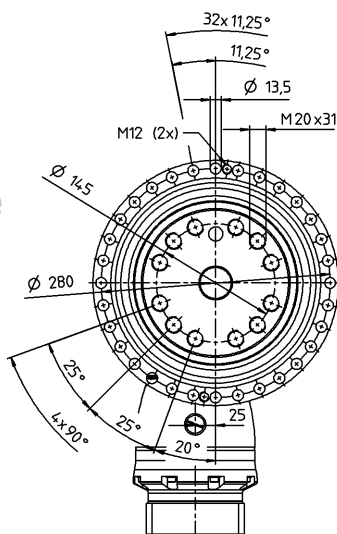


← A

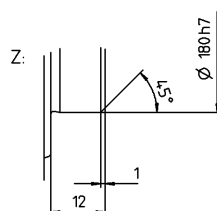
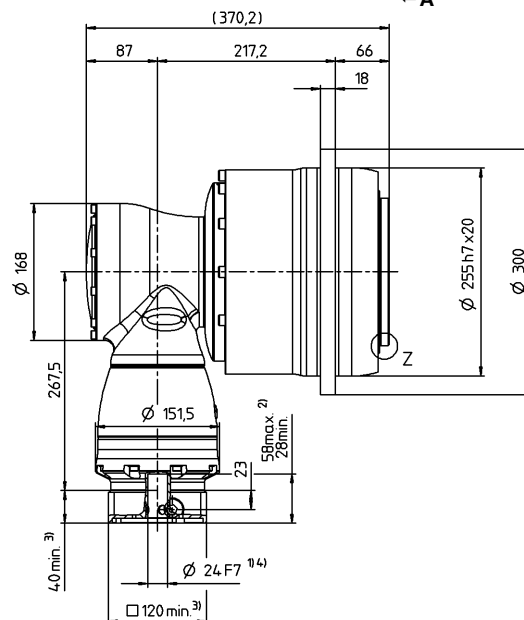


# 4-stage

up to 24/38<sup>4)</sup>  
(G<sup>5)</sup>/K) clamping hub diameter



← A



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

Non-tolerated dimensions are nominal dimensions

<sup>1)</sup> Check motor shaft fit

<sup>2)</sup> Min./Max. permissible motor shaft length. Longer motor shafts are possible, please contact alpha.

<sup>3)</sup> The dimensions depend on the motor

<sup>4)</sup> Smaller motor shaft diameter is compensated by a bushing with a minimum wall thickness of 1 mm

<sup>5)</sup> Standard clamping hub diameter

# TPK<sup>+</sup> 500 MA 3- / 4-stage

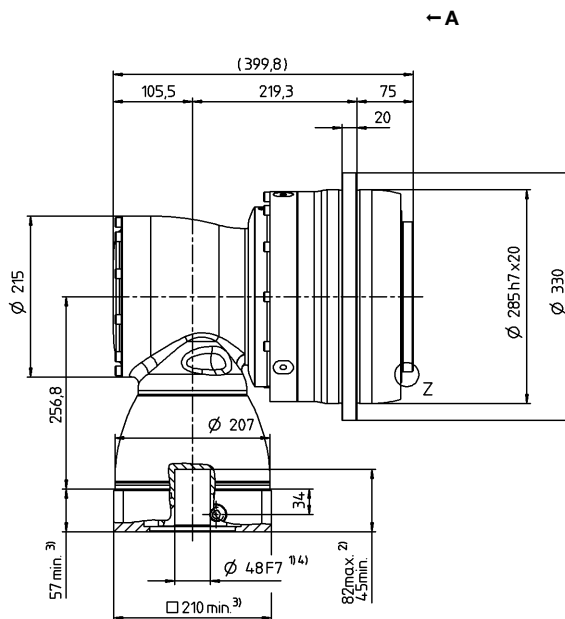
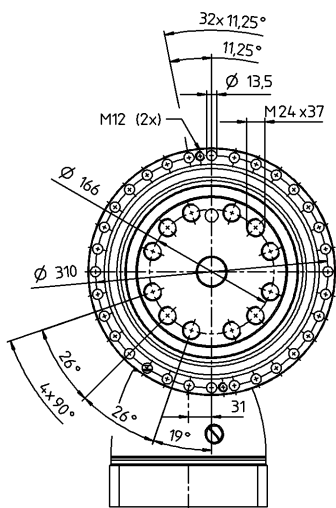
				3-stage								4-stage									
Ratio			i		66	88	110	137.5	154	220	385	330	462	577.5	770	1078	1540	2695	3850	5500	
Max. torque <sup>a) b)</sup>			T <sub>2a</sub>	Nm	10450	10450	10450	10450	10450	10340	10450	10450	10450	10450	10450	10450	10450	10450	10450	10450	10450
				in.lb	92491	92491	92491	92491	92491	91517	92491	92491	92491	92491	92491	92491	92491	92491	92491	92491	92491
Max. acceleration torque <sup>b)</sup> (max. 1000 cycles per hour)			T <sub>2B</sub>	Nm	10450	10450	10450	10450	10450	10340	10450	10450	10450	10450	10450	10450	10450	10450	10450	10450	8640
				in.lb	92491	92491	92491	92491	92491	91517	92491	92491	92491	92491	92491	92491	92491	92491	92491	92491	92491
Nominal torque (at n <sub>n</sub> )			T <sub>2N</sub>	Nm	5400	5400	5400	5400	5400	5400	5400	5400	5400	5400	5400	5400	5400	5400	5400	5400	5400
				in.lb	47794	47794	47794	47794	47794	47794	47794	47794	47794	47794	47794	47794	47794	47794	47794	47794	47794
Emergency stop torque <sup>a) b)</sup> (permitted 1000 times during the service life of the gearbox)			T <sub>2Not</sub>	Nm	19800	23100	23100	25000	21340	19800	25000	19800	25000	24750	25000	25000	25000	25000	25000	25000	25000
				in.lb	175246	204453	204453	221270	188876	175246	221270	175246	221270	219057	221270	221270	221270	221270	221270	221270	221270
Permitted average input speed (at T <sub>2N</sub> and 20 °C ambient temperature) <sup>d)</sup>			n <sub>1N</sub>	n <sub>1T</sub>	1500	1700	1900	1900	1700	1700	1700	2600	2600	2600	2600	2600	2600	3100	3300	3300	
Max. input speed			n <sub>1Max</sub>	rpm	4500	4500	4500	4500	4500	4500	4500	4000	4000	4000	4000	4000	4000	4000	4000	4000	
Mean no load running torque <sup>b)</sup> (at n <sub>i</sub> = 3000 rpm and 20 °C gearbox temperature)			T <sub>012</sub>	Nm	19	15	13	13	17	15	15	4.1	6	3	2.7	2.6	1.8	1.7	1.5	1.5	
				in.lb	168	133	115	115	150	133	133	36	53	27	24	23	16	15	13	13	
Max. backlash			j <sub>t</sub>	arcmin	Standard ≤ 3.3 / Reduced ≤ 1.8																
Torsional rigidity <sup>b)</sup>			C <sub>t21</sub>	Nm/arcmin	1879	1890	1901	1747	1899	1898	1772	1879	1766	1735	1742	1770	1770	1772	1772	1786	
				in.lb/arcmin	16631	16728	16825	15462	16808	16799	15684	16631	15631	15356	15418	15666	15666	15684	15684	15808	
Tilting rigidity			C <sub>2K</sub>	Nm/arcmin	9480																
				in.lb/arcmin	83906																
Max. axial force <sup>c)</sup>			F <sub>2AMax</sub>	N	50000																
				lb <sub>f</sub>	11250																
Max. tilting moment			M <sub>2KMax</sub>	Nm	9500																
				in.lb	84083																
Efficiency at full load			η	%	92								90								
Service life <sup>f)</sup>			L <sub>h</sub>	h	> 20000																
Weight (incl. standard adapter plate)			m	kg	120								124								
				lb <sub>m</sub>	265								274								
Operating noise (at reference ratio and reference speed – ratio-specific values available in cymex <sup>®</sup> )			L <sub>PA</sub>	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																
Direction of rotation					In- and output opposite direction																
Protection class					IP 65																
Metal bellows coupling (recommended product type – validate sizing with cymex <sup>®</sup> )					BCT - 10000AAX - 166.000																
Bore diameter of coupling on the application side				mm	X = 080.000 - 180.000																
Mass moment of inertia (relates to the drive) Clamping hub diameter [mm]			K 38	J <sub>i</sub>	kgcm <sup>2</sup>	-	-	-	-	-	-	12.43	15.36	10.93	10.92	10.91	10.13	9.95	9.91	9.91	
					10 <sup>-3</sup> in.lb.s <sup>2</sup>	-	-	-	-	-	-	11	13.59	9.67	9.66	9.66	8.97	8.81	8.77	8.77	
			M 48	J <sub>i</sub>	kgcm <sup>2</sup>	75.54	52.83	42.94	42.67	34.37	29.87	29.73	27.14	30.07	25.64	25.63	25.62	24.84	24.66	24.62	24.62
	10 <sup>-3</sup> in.lb.s <sup>2</sup>	66.85		46.75	38	37.76	30.42	26.43	26.31	24.02	26.61	22.69	22.68	22.67	21.98	21.82	21.79	21.79			

Please use our sizing software cymex<sup>®</sup> for a detailed sizing – [www.wittenstein-cymex.com](http://www.wittenstein-cymex.com)  
Please contact us for optimum sizing at S1 conditions (Continuous operation).

- <sup>a)</sup> At max. 10 %  $M_{2KMax}$
- <sup>b)</sup> Valid for standard clamping hub diameter
- <sup>c)</sup> Refers to center of the output shaft or flange
- <sup>d)</sup> Please reduce input speed at higher ambient temperatures
- <sup>f)</sup> Please contact us to discuss application-specific service lifetimes

# 3-stage

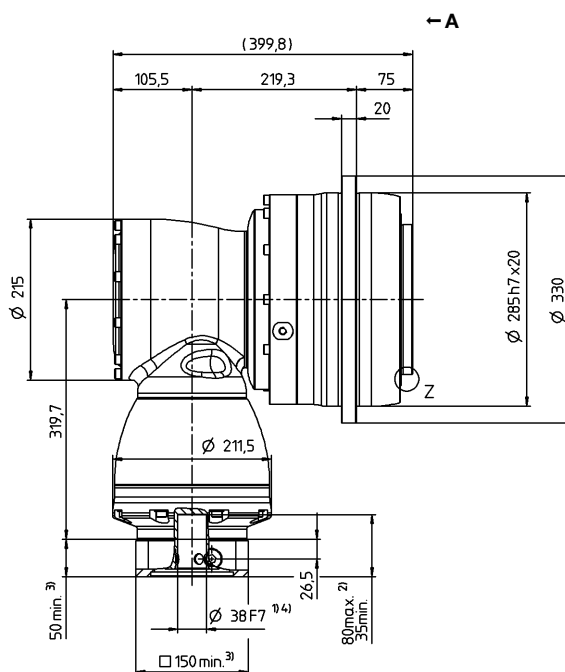
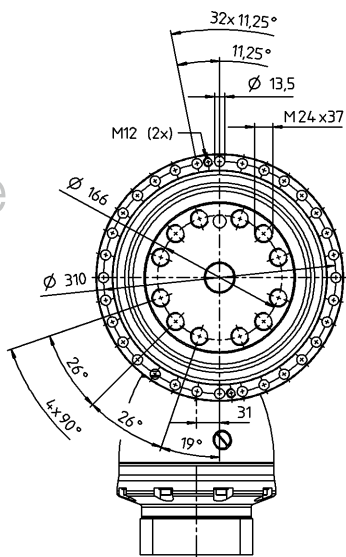
up to 48<sup>4)</sup> (M)<sup>5)</sup>  
clamping hub diameter



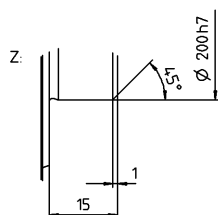
← A

# 4-stage

up to 38/48<sup>4)</sup>  
(K<sup>5)</sup> / M) clamping hub diameter



← A



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

Non-tolerated dimensions are nominal dimensions

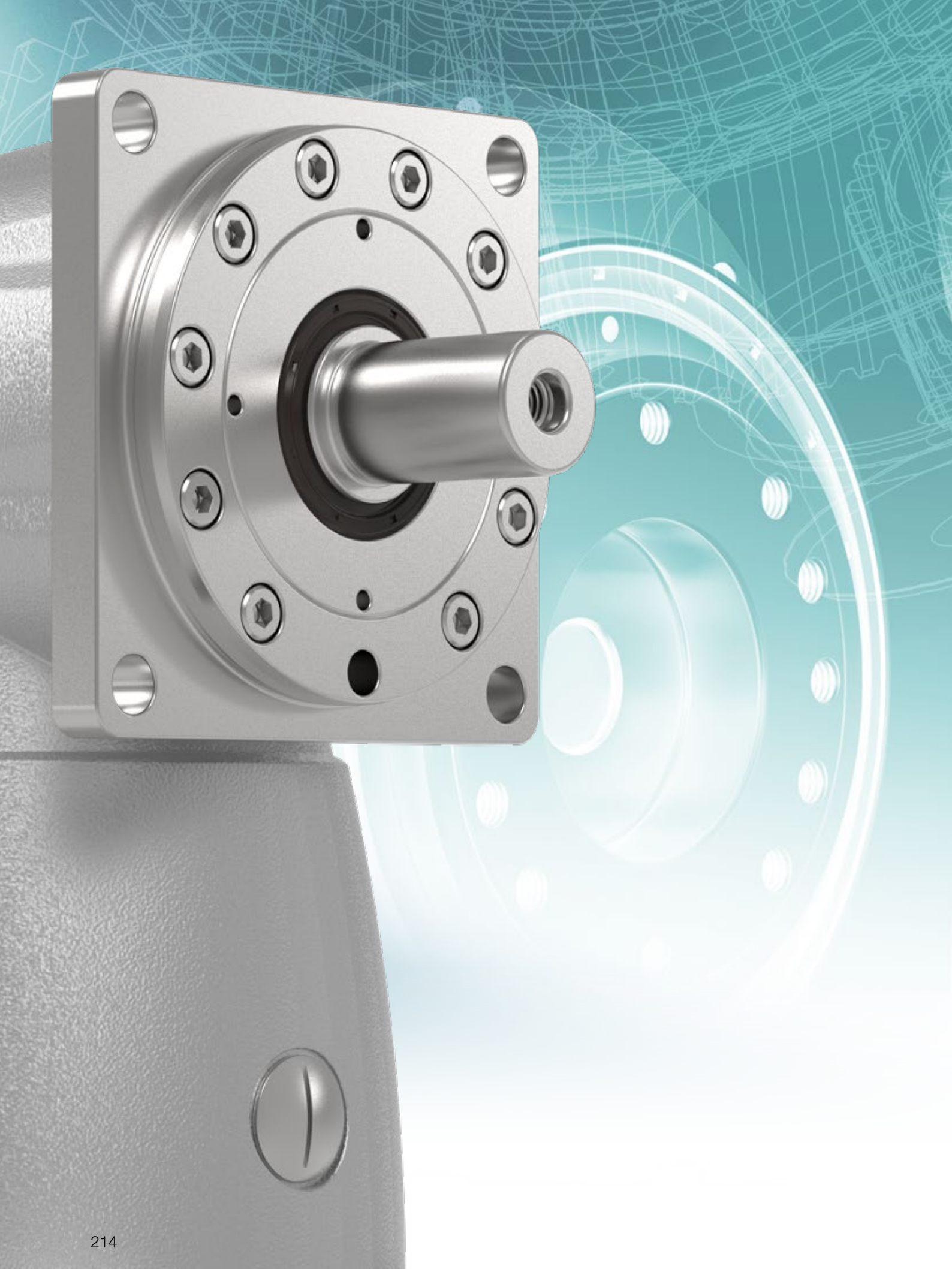
<sup>1)</sup> Check motor shaft fit

<sup>2)</sup> Min./Max. permissible motor shaft length. Longer motor shafts are possible, please contact alpha.

<sup>3)</sup> The dimensions depend on the motor

<sup>4)</sup> Smaller motor shaft diameter is compensated by a bushing with a minimum wall thickness of 1 mm

<sup>5)</sup> Standard clamping hub diameter







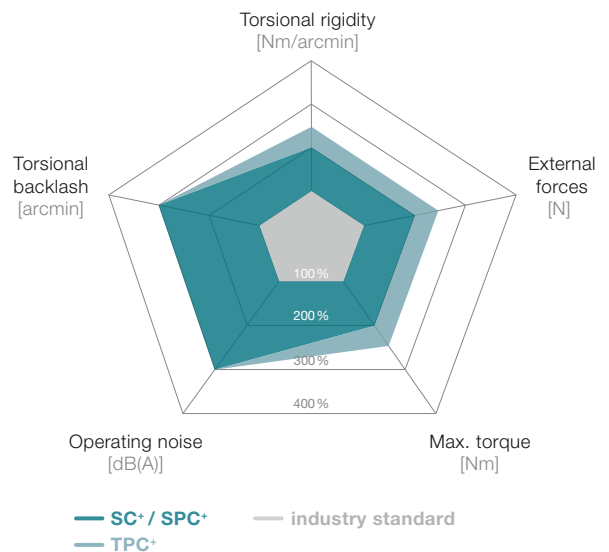
Bevel gearboxes  
SC<sup>+</sup> / SPC<sup>+</sup> / TPC<sup>+</sup>  
High performance  
guaranteed

## SC<sup>+</sup> / SPC<sup>+</sup> / TPC<sup>+</sup> – High performance at low ratios



If the application requires above-average performance at lower ratios: The innovative design of the alpha Advanced Line bevel gearbox SC<sup>+</sup> / SPC<sup>+</sup> / TPC<sup>+</sup> is not only space-saving, elegant and energy-efficient, it also delivers an impressive performance and guarantees smooth operation.

SC<sup>+</sup> / SPC<sup>+</sup> / TPC<sup>+</sup> compared to the industry standard



### Product highlights

#### Max. torsional backlash

SC <sup>+</sup>	≤ 4 arcmin (Standard)
SPC <sup>+</sup> / TPC <sup>+</sup>	≤ 4 arcmin (Standard)
	≤ 2 arcmin (Reduced)

#### High power density and dynamics

##### High output speeds

due to gear ratios  
1:1 and 2:1 (single-stage)

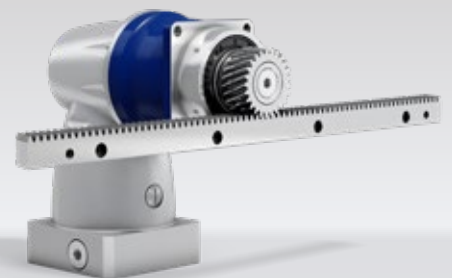
#### Multiple output configurations for greater flexibility

Smooth shaft, shaft with key, splined shaft (DIN 5480), blind hollow shaft, Flange, System output

Efficiency of 97%



TPC<sup>+</sup> with pinions



SPC<sup>+</sup> with rack and pinion



SPC+ with metal bellows coupling



# SC+ 060 MF 1-stage

				1-stage	
Ratio	<i>i</i>			1	2
Max. torque <sup>a) b) e)</sup>	$T_{2a}$	<i>Nm</i>		12	12
		<i>in.lb</i>		106	106
Max. acceleration torque <sup>b) e)</sup> (max. 1000 cycles per hour)	$T_{2B}$	<i>Nm</i>		10	10
		<i>in.lb</i>		89	89
Nominal torque (at $n_{IN}$ )	$T_{2N}$	<i>Nm</i>		7	7
		<i>in.lb</i>		62	62
Emergency stop torque <sup>a) b) e)</sup> (permitted 1000 times during the service life of the gearbox)	$T_{2Not}$	<i>Nm</i>		25	25
		<i>in.lb</i>		221	221
Permitted average input speed (at $T_{2a}$ and 20 °C ambient temperature) <sup>d)</sup>	$n_{1N}$	$n_{1T}$		5000	5500
Max. input speed	$n_{1Max}$	<i>rpm</i>		6000	6000
Mean no load running torque <sup>b)</sup> (at $n_1 = 3000$ rpm and 20 °C gearbox temperature)	$T_{012}$	<i>Nm</i>		0.7	0.5
		<i>in.lb</i>		6.2	4.4
Max. backlash	$j_t$	<i>arcmin</i>		Standard $\leq 5$	
Torsional rigidity <sup>b)</sup>	$C_{t21}$	<i>Nm/arcmin</i>		0.4	0.6
		<i>in.lb/arcmin</i>		4	5
Max. axial force <sup>c)</sup>	$F_{2AMax}$	<i>N</i>		500	
		<i>lb<sub>f</sub></i>		113	
Max. lateral force <sup>c)</sup>	$F_{2QMax}$	<i>N</i>		950	
		<i>lb<sub>f</sub></i>		214	
Max. tilting moment	$M_{2KMax}$	<i>Nm</i>		71	
		<i>in.lb</i>		628	
Efficiency at full load	$\eta$	%		97	
Service life <sup>f)</sup>	$L_h$	<i>h</i>		> 20000	
Weight (incl. standard adapter plate)	<i>m</i>	<i>kg</i>		1.9	
		<i>lb<sub>m</sub></i>		4	
Operating noise (at reference ratio and reference speed – ratio-specific values available in cymex <sup>®</sup> )	$L_{PA}$	<i>dB(A)</i>		≤ 66	
Max. permitted housing temperature		°C		+90	
		<i>F</i>		194	
Ambient temperature		°C		0 to +40	
		<i>F</i>		32 to 104	
Lubrication				Lubricated for life	
Direction of rotation				In- and output same direction	
Protection class				IP 65	
Metal bellows coupling (recommended product type – validate sizing with cymex <sup>®</sup> )  Bore diameter of coupling on the application side				BC2 - 00015AA - 012.000 - X	
		<i>mm</i>		X = 008.000 - 028.000	
Mass moment of inertia (relates to the drive)  Clamping hub diameter [mm]	C	14	$J_1$	<i>kgcm<sup>2</sup></i>	0.66
				<i>10<sup>-3</sup> in.lb.s<sup>2</sup></i>	0.58
	E	19	$J_1$	<i>kgcm<sup>2</sup></i>	0.99
				<i>10<sup>-3</sup> in.lb.s<sup>2</sup></i>	0.88
					0.42
					0.37
					0.75
					0.66

Please use our sizing software cymex<sup>®</sup> for a detailed sizing – [www.wittenstein-cymex.com](http://www.wittenstein-cymex.com)  
Please contact us for optimum sizing at S1 conditions (Continuous operation).

<sup>a)</sup> At max. 10 %  $F_{2QMax}$

<sup>b)</sup> Valid for standard clamping hub diameter

<sup>c)</sup> Refers to center of the output shaft or flange

<sup>d)</sup> Please reduce input speed at higher ambient temperatures

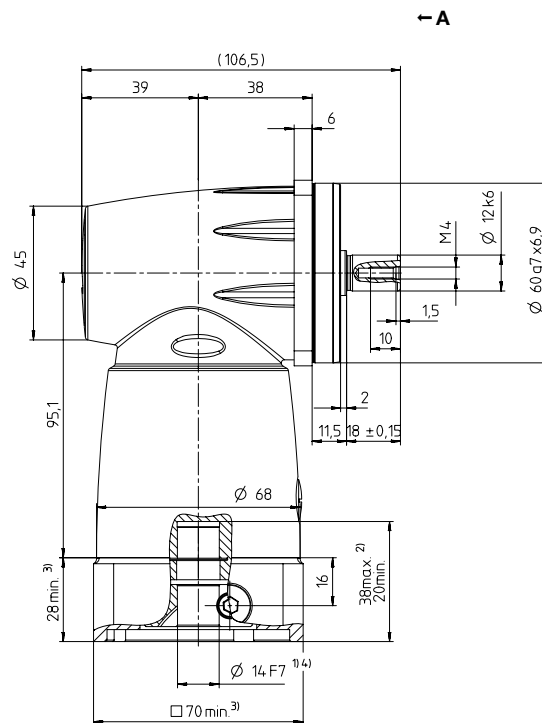
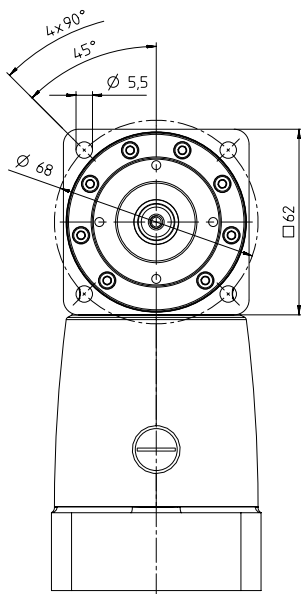
<sup>e)</sup> Smooth shaft

<sup>f)</sup> Please contact us to discuss  
application-specific service lifetimes

View A

Motor shaft diameter [mm]

1-stage

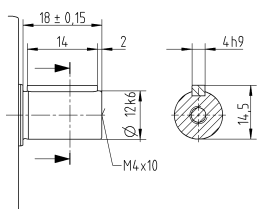
up to 14/19<sup>4)</sup>  
(C<sup>5)</sup>/E) clamping  
hub diameter


Bevel gearboxes

SC<sup>+</sup>

## Other output variants

Shaft with key



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

Non-tolerated dimensions are nominal dimensions

<sup>1)</sup> Check motor shaft fit

<sup>2)</sup> Min./Max. permissible motor shaft length. Longer motor shafts are possible, please contact alpha.

<sup>3)</sup> The dimensions depend on the motor

<sup>4)</sup> Smaller motor shaft diameter is compensated by a bushing with a minimum wall thickness of 1 mm

<sup>5)</sup> Standard clamping hub diameter

# SC+ 075 MF 1-stage

				1-stage	
Ratio	<i>i</i>			1	2
Max. torque <sup>a) b) e)</sup>	$T_{2a}$	<i>Nm</i>		36	36
		<i>in.lb</i>		319	319
Max. acceleration torque <sup>b) e)</sup> (max. 1000 cycles per hour)	$T_{2B}$	<i>Nm</i>		30	30
		<i>in.lb</i>		266	266
Nominal torque (at $n_{IN}$ )	$T_{2N}$	<i>Nm</i>		20	20
		<i>in.lb</i>		177	177
Emergency stop torque <sup>a) b) e)</sup> (permitted 1000 times during the service life of the gearbox)	$T_{2Not}$	<i>Nm</i>		48	62
		<i>in.lb</i>		425	549
Permitted average input speed (at $T_{2a}$ and 20 °C ambient temperature) <sup>d)</sup>	$n_{1N}$	$n_{1T}$		2600	4000
Max. input speed	$n_{1Max}$	<i>rpm</i>		6000	6000
Mean no load running torque <sup>b)</sup> (at $n_1 = 3000$ rpm and 20 °C gearbox temperature)	$T_{012}$	<i>Nm</i>		1.5	0.8
		<i>in.lb</i>		13	7.1
Max. backlash	$j_t$	<i>arcmin</i>		Standard $\leq 4$	
Torsional rigidity <sup>b)</sup>	$C_{t21}$	<i>Nm/arcmin</i>		1	1.5
		<i>in.lb/arcmin</i>		9	13
Max. axial force <sup>c)</sup>	$F_{2AMax}$	<i>N</i>		700	
		<i>lb<sub>f</sub></i>		158	
Max. lateral force <sup>c)</sup>	$F_{2QMax}$	<i>N</i>		1300	
		<i>lb<sub>f</sub></i>		293	
Max. tilting moment	$M_{2KMax}$	<i>Nm</i>		131	
		<i>in.lb</i>		1159	
Efficiency at full load	$\eta$	%		97	
Service life <sup>f)</sup>	$L_h$	<i>h</i>		> 20000	
Weight (incl. standard adapter plate)	<i>m</i>	<i>kg</i>		3.6	
		<i>lb<sub>m</sub></i>		8	
Operating noise (at reference ratio and reference speed – ratio-specific values available in cymex <sup>®</sup> )	$L_{PA}$	<i>dB(A)</i>		$\leq 68$	
Max. permitted housing temperature		°C		+90	
		<i>F</i>		194	
Ambient temperature		°C		0 to +40	
		<i>F</i>		32 to 104	
Lubrication				Lubricated for life	
Direction of rotation				In- and output same direction	
Protection class				IP 65	
Metal bellows coupling (recommended product type – validate sizing with cymex <sup>®</sup> )				BC2 - 00030AA - 016.000 - X	
Bore diameter of coupling on the application side		<i>mm</i>		X = 010.000 - 030.000	
Mass moment of inertia (relates to the drive) Clamping hub diameter [mm]	E 19	$J_1$	<i>kgcm<sup>2</sup></i>	1.99	1.19
			<i>10<sup>-3</sup> in.lb.s<sup>2</sup></i>	1.76	1.05
	H 28	$J_1$	<i>kgcm<sup>2</sup></i>	3.43	2.63
			<i>10<sup>-3</sup> in.lb.s<sup>2</sup></i>	3.04	2.33

Please use our sizing software cymex<sup>®</sup> for a detailed sizing – [www.wittenstein-cymex.com](http://www.wittenstein-cymex.com)  
Please contact us for optimum sizing at S1 conditions (Continuous operation).

<sup>a)</sup> At max. 10 %  $F_{2QMax}$

<sup>b)</sup> Valid for standard clamping hub diameter

<sup>c)</sup> Refers to center of the output shaft or flange

<sup>d)</sup> Please reduce input speed at higher ambient temperatures

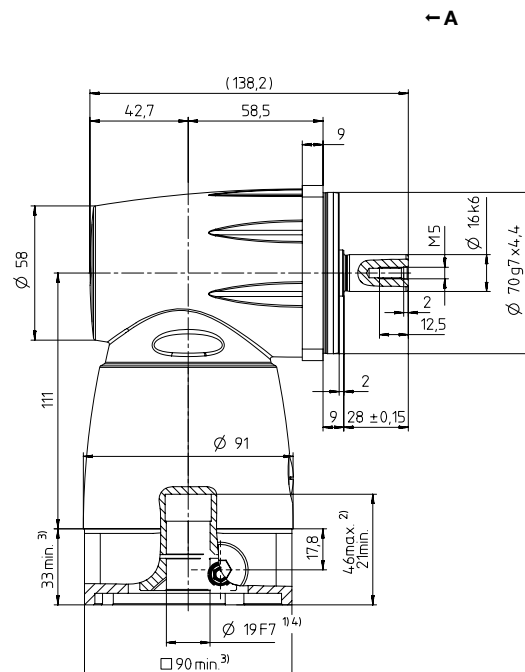
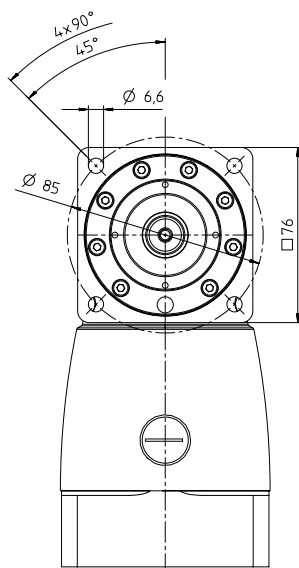
<sup>e)</sup> Smooth shaft

<sup>f)</sup> Please contact us to discuss  
application-specific service lifetimes

View A

Motor shaft diameter [mm]

1-stage

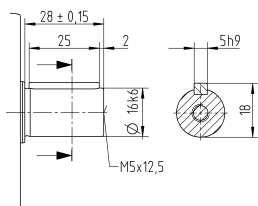
up to 19/28 <sup>4)</sup>  
(E <sup>5)</sup>/H) clamping  
hub diameter


Bevel gearboxes

SC<sup>+</sup>

## Other output variants

Shaft with key



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

Non-tolerated dimensions are nominal dimensions

<sup>1)</sup> Check motor shaft fit

<sup>2)</sup> Min./Max. permissible motor shaft length. Longer motor shafts are possible, please contact alpha.

<sup>3)</sup> The dimensions depend on the motor

<sup>4)</sup> Smaller motor shaft diameter is compensated by a bushing with a minimum wall thickness of 1 mm

<sup>5)</sup> Standard clamping hub diameter

# SC+ 100 MF 1-stage

				1-stage		
Ratio		<i>i</i>		1	2	
Max. torque <sup>a) b) e)</sup>		<i>T</i> <sub>2a</sub>	<i>Nm</i>	97	97	
			<i>in.lb</i>	859	859	
Max. acceleration torque <sup>b) e)</sup> (max. 1000 cycles per hour)		<i>T</i> <sub>2B</sub>	<i>Nm</i>	81	81	
			<i>in.lb</i>	717	717	
Nominal torque (at <i>n</i> <sub>IN</sub> )		<i>T</i> <sub>2N</sub>	<i>Nm</i>	50	50	
			<i>in.lb</i>	443	443	
Emergency stop torque <sup>a) b) e)</sup> (permitted 1000 times during the service life of the gearbox)		<i>T</i> <sub>2Not</sub>	<i>Nm</i>	135	160	
			<i>in.lb</i>	1195	1416	
Permitted average input speed (at <i>T</i> <sub>2a</sub> and 20 °C ambient temperature) <sup>d)</sup>		<i>n</i> <sub>1N</sub>	<i>n</i> <sub>1T</sub>	2500	2800	
Max. input speed		<i>n</i> <sub>1Max</sub>	<i>rpm</i>	4500	4500	
Mean no load running torque <sup>b)</sup> (at <i>n</i> <sub>1</sub> = 3000 rpm and 20 °C gearbox temperature)		<i>T</i> <sub>012</sub>	<i>Nm</i>	3.4	2.2	
			<i>in.lb</i>	30	19	
Max. backlash		<i>j</i> <sub>t</sub>	<i>arcmin</i>	Standard ≤ 4		
Torsional rigidity <sup>b)</sup>		<i>C</i> <sub>t21</sub>	<i>Nm/arcmin</i>	2.9	4.6	
			<i>in.lb/arcmin</i>	26	41	
Max. axial force <sup>c)</sup>		<i>F</i> <sub>2AMax</sub>	<i>N</i>	1900		
			<i>lb<sub>f</sub></i>	428		
Max. lateral force <sup>c)</sup>		<i>F</i> <sub>2QMax</sub>	<i>N</i>	3800		
			<i>lb<sub>f</sub></i>	855		
Max. tilting moment		<i>M</i> <sub>2KMax</sub>	<i>Nm</i>	439		
			<i>in.lb</i>	3886		
Efficiency at full load		<i>η</i>	%	97		
Service life <sup>f)</sup>		<i>L</i> <sub>h</sub>	<i>h</i>	> 20000		
Weight (incl. standard adapter plate)		<i>m</i>	<i>kg</i>	7		
			<i>lb<sub>m</sub></i>	15		
Operating noise (at reference ratio and reference speed – ratio-specific values available in cymex®)		<i>L</i> <sub>PA</sub>	<i>dB(A)</i>	≤ 68		
Max. permitted housing temperature			°C	+90		
			<i>F</i>	194		
Ambient temperature			°C	0 to +40		
			<i>F</i>	32 to 104		
Lubrication				Lubricated for life		
Direction of rotation				In- and output same direction		
Protection class				IP 65		
Metal bellows coupling (recommended product type – validate sizing with cymex®)				BC2 - 00080AA - 022.000 - X		
Bore diameter of coupling on the application side			<i>mm</i>	X = 014.000 - 042.000		
Mass moment of inertia (relates to the drive) Clamping hub diameter [mm]	H	28	<i>J</i> <sub>1</sub>	<i>kgcm</i> <sup>2</sup>	7.1	4.8
				<i>10<sup>-3</sup> in.lb.s</i> <sup>2</sup>	6.28	4.25
	K	38	<i>J</i> <sub>1</sub>	<i>kgcm</i> <sup>2</sup>	14.2	11.9
				<i>10<sup>-3</sup> in.lb.s</i> <sup>2</sup>	12.57	10.53

Please use our sizing software cymex<sup>®</sup> for a detailed sizing – [www.wittenstein-cymex.com](http://www.wittenstein-cymex.com)  
Please contact us for optimum sizing at S1 conditions (Continuous operation).

<sup>a)</sup> At max. 10 %  $F_{2QMax}$

<sup>b)</sup> Valid for standard clamping hub diameter

<sup>c)</sup> Refers to center of the output shaft or flange

<sup>d)</sup> Please reduce input speed at higher ambient temperatures

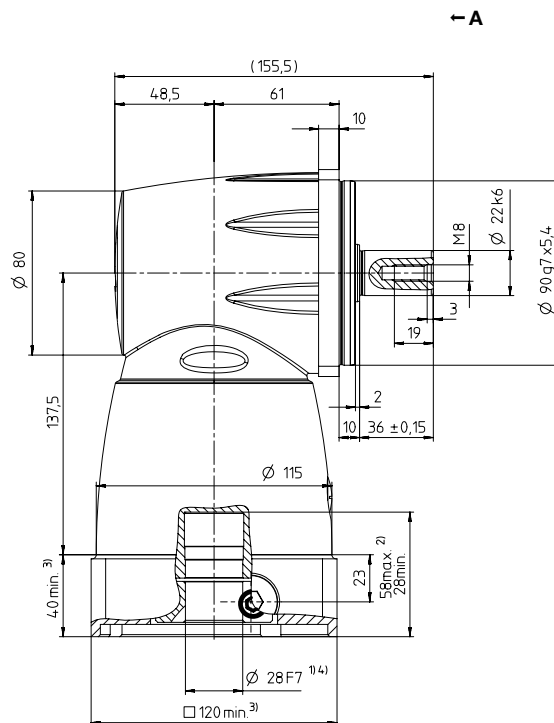
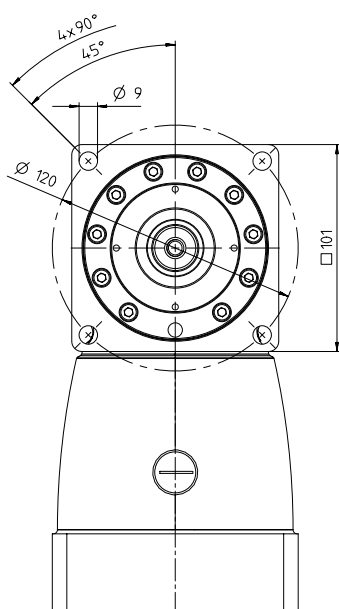
<sup>e)</sup> Smooth shaft

<sup>f)</sup> Please contact us to discuss  
application-specific service lifetimes

View A

Motor shaft diameter [mm]

1-stage

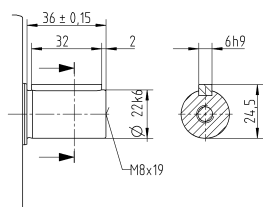
up to 28/38<sup>4)</sup>  
(H<sup>5)</sup>/K) clamping  
hub diameter


Bevel gearboxes

SC<sup>+</sup>

## Other output variants

Shaft with key



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

Non-tolerated dimensions are nominal dimensions  
<sup>1)</sup> Check motor shaft fit

<sup>2)</sup> Min./Max. permissible motor shaft length. Longer motor shafts are possible, please contact alpha.

<sup>3)</sup> The dimensions depend on the motor

<sup>4)</sup> Smaller motor shaft diameter is compensated by a bushing with a minimum wall thickness of 1 mm

<sup>5)</sup> Standard clamping hub diameter

# SC<sup>+</sup> 140 MF 1-stage

				1-stage	
Ratio	<i>i</i>			1	2
Max. torque <sup>a) b) e)</sup>	$T_{2a}$	<i>Nm</i>		210	210
		<i>in.lb</i>		1859	1859
Max. acceleration torque <sup>b) e)</sup> (max. 1000 cycles per hour)	$T_{2B}$	<i>Nm</i>		175	175
		<i>in.lb</i>		1549	1549
Nominal torque (at $n_{IN}$ )	$T_{2N}$	<i>Nm</i>		110	110
		<i>in.lb</i>		974	974
Emergency stop torque <sup>a) b) e)</sup> (permitted 1000 times during the service life of the gearbox)	$T_{2Not}$	<i>Nm</i>		240	310
		<i>in.lb</i>		2124	2744
Permitted average input speed (at $T_{2a}$ and 20 °C ambient temperature) <sup>d)</sup>	$n_{1N}$	$n_{1T}$		1600	2100
Max. input speed	$n_{1Max}$	<i>rpm</i>		4500	4500
Mean no load running torque <sup>b)</sup> (at $n_1 = 3000$ rpm and 20 °C gearbox temperature)	$T_{012}$	<i>Nm</i>		6.2	3.9
		<i>in.lb</i>		55	35
Max. backlash	$j_t$	<i>arcmin</i>		Standard $\leq 4$	
Torsional rigidity <sup>b)</sup>	$C_{t21}$	<i>Nm/arcmin</i>		6.4	9.1
		<i>in.lb/arcmin</i>		57	81
Max. axial force <sup>c)</sup>	$F_{2AMax}$	<i>N</i>		3000	
		<i>lb<sub>f</sub></i>		675	
Max. lateral force <sup>c)</sup>	$F_{2QMax}$	<i>N</i>		6000	
		<i>lb<sub>f</sub></i>		1350	
Max. tilting moment	$M_{2KMax}$	<i>Nm</i>		957	
		<i>in.lb</i>		8470	
Efficiency at full load	$\eta$	%		97	
Service life <sup>f)</sup>	$L_h$	<i>h</i>		> 20000	
Weight (incl. standard adapter plate)	<i>m</i>	<i>kg</i>		14.7	
		<i>lb<sub>m</sub></i>		32	
Operating noise (at reference ratio and reference speed – ratio-specific values available in cymex <sup>®</sup> )	$L_{PA}$	<i>dB(A)</i>		$\leq 70$	
Max. permitted housing temperature		°C		+90	
		<i>F</i>		194	
Ambient temperature		°C		0 to +40	
		<i>F</i>		32 to 104	
Lubrication				Lubricated for life	
Direction of rotation				In- and output same direction	
Protection class				IP 65	
Metal bellows coupling (recommended product type – validate sizing with cymex <sup>®</sup> )  Bore diameter of coupling on the application side				BC2 - 00200AA - 032.000 - X	
		<i>mm</i>		X = 022.000 - 045.000	
Mass moment of inertia (relates to the drive) Clamping hub diameter [mm]	K 38	$J_1$	<i>kgcm<sup>2</sup></i>	41.3	21.3
			<i>10<sup>-3</sup> in.lb.s<sup>2</sup></i>	36.55	18.85

Please use our sizing software cymex<sup>®</sup> for a detailed sizing – [www.wittenstein-cymex.com](http://www.wittenstein-cymex.com)  
Please contact us for optimum sizing at S1 conditions (Continuous operation).

<sup>a)</sup> At max. 10 %  $F_{2QMax}$

<sup>b)</sup> Valid for standard clamping hub diameter

<sup>c)</sup> Refers to center of the output shaft or flange

<sup>d)</sup> Please reduce input speed at higher ambient temperatures

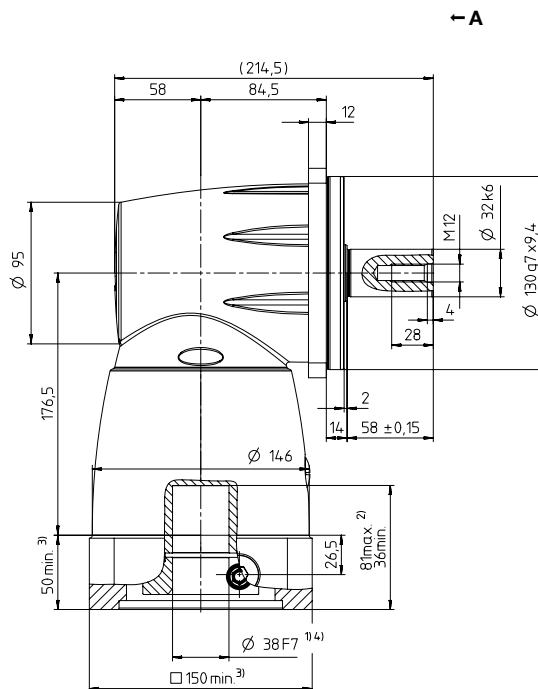
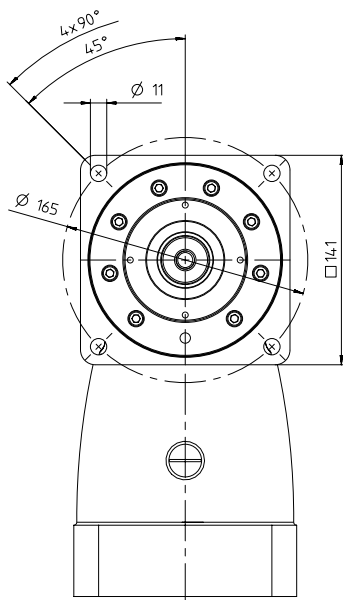
<sup>e)</sup> Smooth shaft

<sup>f)</sup> Please contact us to discuss  
application-specific service lifetimes

View A

Motor shaft diameter [mm]

1-stage

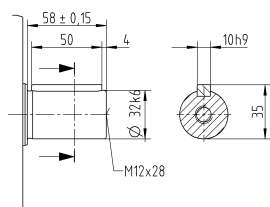
up to 38<sup>4)</sup> (K)<sup>5)</sup>  
clamping hub diameter


Bevel gearboxes

SC<sup>+</sup>

## Other output variants

Shaft with key



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

Non-tolerated dimensions are nominal dimensions

<sup>1)</sup> Check motor shaft fit

<sup>2)</sup> Min./Max. permissible motor shaft length. Longer motor shafts are possible, please contact alpha.

<sup>3)</sup> The dimensions depend on the motor

<sup>4)</sup> Smaller motor shaft diameter is compensated by a bushing with a minimum wall thickness of 1 mm

<sup>5)</sup> Standard clamping hub diameter



# SC<sup>+</sup> 180 MF 1-stage

				1-stage	
Ratio	<i>i</i>			1	2
Max. torque <sup>a) b) e)</sup>	$T_{2a}$	Nm		378	378
		in.lb		3346	3346
Max. acceleration torque <sup>b) e)</sup> (max. 1000 cycles per hour)	$T_{2B}$	Nm		315	315
		in.lb		2788	2788
Nominal torque (at $n_{IN}$ )	$T_{2N}$	Nm		200	200
		in.lb		1770	1770
Emergency stop torque <sup>a) b) e)</sup> (permitted 1000 times during the service life of the gearbox)	$T_{2Not}$	Nm		390	685
		in.lb		3452	6063
Permitted average input speed (at $T_{2N}$ and 20 °C ambient temperature) <sup>d)</sup>	$n_{1N}$	$n_{1T}$		1200	1500
Max. input speed	$n_{1Max}$	rpm		4000	4000
Mean no load running torque <sup>b)</sup> (at $n_1 = 3000$ rpm and 20 °C gearbox temperature)	$T_{012}$	Nm		14	8
		in.lb		124	71
Max. backlash	$j_t$	arcmin		Standard $\leq 3$	
Torsional rigidity <sup>b)</sup>	$C_{t21}$	Nm/arcmin		13	22
		in.lb/arcmin		115	195
Max. axial force <sup>c)</sup>	$F_{2AMax}$	N		4500	
		lb <sub>f</sub>		1013	
Max. lateral force <sup>c)</sup>	$F_{2QMax}$	N		9000	
		lb <sub>f</sub>		2025	
Max. tilting moment	$M_{2KMax}$	Nm		1910	
		in.lb		16905	
Efficiency at full load	$\eta$	%		97	
Service life <sup>f)</sup>	$L_h$	h		> 20000	
Weight (incl. standard adapter plate)	$m$	kg		31.4	
		lb <sub>m</sub>		69	
Operating noise (at reference ratio and reference speed – ratio-specific values available in cymex <sup>®</sup> )	$L_{PA}$	dB(A)		$\leq 70$	
Max. permitted housing temperature		°C		+90	
		F		194	
Ambient temperature		°C		0 to +40	
		F		32 to 104	
Lubrication				Lubricated for life	
Direction of rotation				In- and output same direction	
Protection class				IP 65	
Metal bellows coupling (recommended product type – validate sizing with cymex <sup>®</sup> )				BC2 - 00300AA - 040.000 - X	
Bore diameter of coupling on the application side		mm		X = 024.000 - 060.000	
Mass moment of inertia (relates to the drive) Clamping hub diameter [mm]	M	48	$J_1$	99.5	46.7
			$10^{-3}$ in.lb.s <sup>2</sup>	88.06	41.33

Please use our sizing software cymex<sup>®</sup> for a detailed sizing – [www.wittenstein-cymex.com](http://www.wittenstein-cymex.com)  
Please contact us for optimum sizing at S1 conditions (Continuous operation).

<sup>a)</sup> At max. 10 %  $F_{2QMax}$

<sup>b)</sup> Valid for standard clamping hub diameter

<sup>c)</sup> Refers to center of the output shaft or flange

<sup>d)</sup> Please reduce input speed at higher ambient temperatures

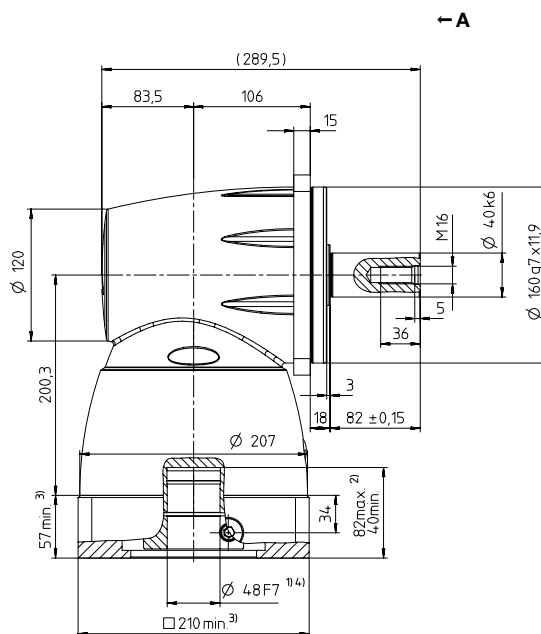
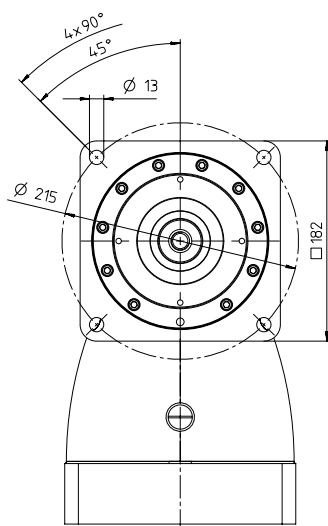
<sup>e)</sup> Smooth shaft

<sup>f)</sup> Please contact us to discuss  
application-specific service lifetimes

View A

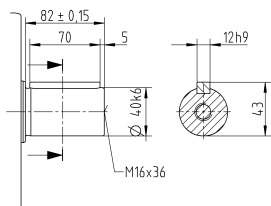
Motor shaft diameter [mm]

1-stage

up to 48 <sup>4)</sup> (M) <sup>5)</sup>  
clamping hub diameter


## Other output variants

Shaft with key



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

Non-tolerated dimensions are nominal dimensions

<sup>1)</sup> Check motor shaft fit

<sup>2)</sup> Min./Max. permissible motor shaft length. Longer motor shafts are possible, please contact alpha.

<sup>3)</sup> The dimensions depend on the motor

<sup>4)</sup> Smaller motor shaft diameter is compensated by a bushing with a minimum wall thickness of 1 mm

<sup>5)</sup> Standard clamping hub diameter

# SPC<sup>+</sup> 060 MF 2-stage

				2-stage						
Ratio	<i>i</i>			4	5	7	8	10	14	20
Max. torque <sup>a) b) e)</sup>	$T_{2a}$	Nm		48	60	67	48	60	67	51
		in.lb		425	531	593	425	531	593	451
Max. acceleration torque <sup>b) e)</sup> (max. 1000 cycles per hour)	$T_{2B}$	Nm		40	50	50	40	50	50	38
		in.lb		354	443	443	354	443	443	336
Nominal torque (at $n_{IN}$ )	$T_{2N}$	Nm		26	26	26	26	26	26	17
		in.lb		230	230	230	230	230	230	150
Emergency stop torque <sup>a) b) e)</sup> (permitted 1000 times during the service life of the gearbox)	$T_{2Not}$	Nm		100	109	109	100	109	109	100
		in.lb		885	965	965	885	965	965	885
Permitted average input speed (at $T_{2a}$ and 20 °C ambient temperature) <sup>d)</sup>	$n_{1N}$	$n_{1T}$		3000	3000	3200	3400	3400	3600	3600
Max. input speed	$n_{1Max}$	rpm		6000	6000	6000	6000	6000	6000	6000
Mean no load running torque <sup>b)</sup> (at $n_1 = 3000$ rpm and 20 °C gearbox temperature)	$T_{012}$	Nm		1.7	1.5	1.3	1	1	0.84	0.67
		in.lb		15	13	12	8.9	8.9	7.4	5.9
Max. backlash	$j_t$	arcmin		Standard $\leq 5$ / Reduced $\leq 3$						
Torsional rigidity <sup>b)</sup>	$C_{t21}$	Nm/arcmin		2.4	2.7	3.1	2.7	3	3.2	3.3
		in.lb/arcmin		21	24	27	24	27	28	29
Max. axial force <sup>c)</sup>	$F_{2AMax}$	N		2400						
		lb <sub>f</sub>		540						
Max. lateral force <sup>c)</sup>	$F_{2OMax}$	N		2800						
		lb <sub>f</sub>		630						
Max. tilting moment	$M_{2KMax}$	Nm		160						
		in.lb		1416						
Efficiency at full load	$\eta$	%		95						
Service life <sup>f)</sup>	$L_h$	h		> 20000						
Weight (incl. standard adapter plate)	$m$	kg		3.1						
		lb <sub>m</sub>		7						
Operating noise (at reference ratio and reference speed – ratio-specific values available in cymex <sup>®</sup> )	$L_{PA}$	dB(A)		$\leq 68$						
Max. permitted housing temperature		°C		+90						
		F		194						
Ambient temperature		°C		0 to +40						
		F		32 to 104						
Lubrication				Lubricated for life						
Direction of rotation				In- and output same direction						
Protection class				IP 65						
Metal bellows coupling (recommended product type – validate sizing with cymex <sup>®</sup> )				BC2 - 00060AA - 016.000 - X						
Bore diameter of coupling on the application side		mm		X = 012.000 - 035.000						
Mass moment of inertia (relates to the drive) Clamping hub diameter [mm]	C	14	$J_1$	kgcm <sup>2</sup>	0.72	0.7	0.66	0.44	0.43	0.43
				10 <sup>-3</sup> in.lb.s <sup>2</sup>	0.64	0.62	0.58	0.39	0.38	0.38
	E	19	$J_1$	kgcm <sup>2</sup>	1.05	1.03	0.99	0.77	0.76	0.75
				10 <sup>-3</sup> in.lb.s <sup>2</sup>	1	1	1	1	1	1

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Please contact us for optimum sizing at S1 conditions (Continuous operation).

<sup>a)</sup> At max. 10 %  $F_{2OMax}$

<sup>b)</sup> Valid for standard clamping hub diameter

<sup>c)</sup> Refers to center of the output shaft or flange

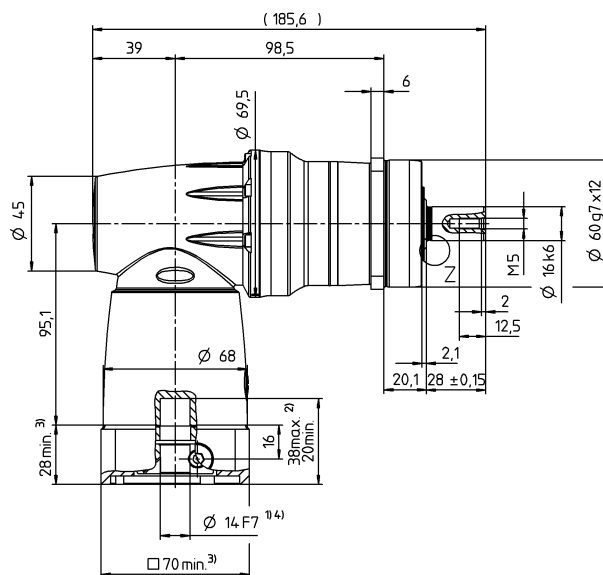
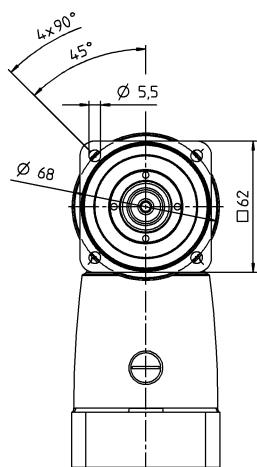
<sup>d)</sup> Please reduce input speed at higher ambient temperatures

<sup>e)</sup> Smooth shaft

<sup>f)</sup> Please contact us to discuss  
application-specific service lifetimes

Motor shaft diameter [mm]

2-stage

up to 14/19<sup>4)</sup>  
(C<sup>5)</sup>/E) clamping  
hub diameter


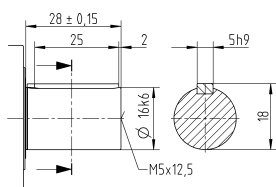
← A

Bevel gearboxes

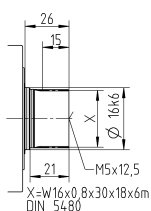
SPC

## Other output variants

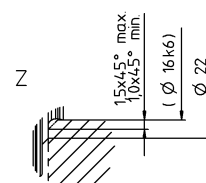
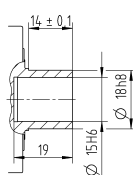
Shaft with key



Splined shaft (DIN 5480)



Shaft mounted



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

Non-tolerated dimensions are nominal dimensions

<sup>1)</sup> Check motor shaft fit

<sup>2)</sup> Min./Max. permissible motor shaft length. Longer motor shafts are possible, please contact alpha.

<sup>3)</sup> The dimensions depend on the motor

<sup>4)</sup> Smaller motor shaft diameter is compensated by a bushing with a minimum wall thickness of 1 mm

<sup>5)</sup> Standard clamping hub diameter

# SPC+ 075 MF 2-stage

				2-stage						
Ratio	<i>i</i>			4	5	7	8	10	14	20
Max. torque <sup>a) b) e)</sup>	$T_{2a}$	<i>Nm</i>		144	176	176	144	176	176	152
		<i>in.lb</i>		1275	1558	1558	1275	1558	1558	1345
Max. acceleration torque <sup>b) e)</sup> (max. 1000 cycles per hour)	$T_{2B}$	<i>Nm</i>		120	132	132	120	132	132	114
		<i>in.lb</i>		1062	1168	1168	1062	1168	1168	1009
Nominal torque (at $n_{IN}$ )	$T_{2N}$	<i>Nm</i>		75	75	75	75	75	75	52
		<i>in.lb</i>		664	664	664	664	664	664	460
Emergency stop torque <sup>a) b) e)</sup> (permitted 1000 times during the service life of the gearbox)	$T_{2Not}$	<i>Nm</i>		192	240	250	248	250	250	250
		<i>in.lb</i>		1699	2124	2213	2195	2213	2213	2213
Permitted average input speed (at $T_{2a}$ and 20 °C ambient temperature) <sup>d)</sup>	$n_{1N}$	$n_{1T}$		2200	2200	2400	2650	2650	2800	2800
Max. input speed	$n_{1Max}$	<i>rpm</i>		6000	6000	6000	6000	6000	6000	6000
Mean no load running torque <sup>b)</sup> (at $n_1 = 3000$ rpm and 20 °C gearbox temperature)	$T_{012}$	<i>Nm</i>		3.8	3.3	2.8	2.7	2.4	1.9	1.6
		<i>in.lb</i>		34	29	25	24	21	17	14
Max. backlash	$j_t$	<i>arcmin</i>		Standard $\leq 4$ / Reduced $\leq 2$						
Torsional rigidity <sup>b)</sup>	$C_{t21}$	<i>Nm/arcmin</i>		6.6	7.5	8.6	7.6	8.3	9.1	9.5
		<i>in.lb/arcmin</i>		58	66	76	67	73	81	84
Max. axial force <sup>c)</sup>	$F_{2AMax}$	<i>N</i>		3350						
		<i>lb<sub>f</sub></i>		754						
Max. lateral force <sup>c)</sup>	$F_{2OMax}$	<i>N</i>		4200						
		<i>lb<sub>f</sub></i>		945						
Max. tilting moment	$M_{2KMax}$	<i>Nm</i>		260						
		<i>in.lb</i>		2301						
Efficiency at full load	$\eta$	%		95						
Service life <sup>f)</sup>	$L_h$	<i>h</i>		> 20000						
Weight (incl. standard adapter plate)	<i>m</i>	<i>kg</i>		5.9						
		<i>lb<sub>m</sub></i>		13						
Operating noise (at reference ratio and reference speed – ratio-specific values available in cymex <sup>®</sup> )	$L_{PA}$	<i>dB(A)</i>		$\leq 68$						
Max. permitted housing temperature		°C		+90						
		<i>F</i>		194						
Ambient temperature		°C		0 to +40						
		<i>F</i>		32 to 104						
Lubrication				Lubricated for life						
Direction of rotation				In- and output same direction						
Protection class				IP 65						
Metal bellows coupling (recommended product type – validate sizing with cymex <sup>®</sup> )  Bore diameter of coupling on the application side				BC2 - 00150AA - 022.000 - X						
		<i>mm</i>		X = 019.000 - 042.000						
Mass moment of inertia (relates to the drive)  Clamping hub diameter [mm]	E 19	$J_1$	<i>kgcm<sup>2</sup></i>	2.33	2.15	1.99	1.25	1.23	1.21	1.2
			<i>10<sup>-3</sup> in.lb.s<sup>2</sup></i>	2.06	1.9	1.76	1.11	1.09	1.07	1.06
	H 28	$J_1$	<i>kgcm<sup>2</sup></i>	3.66	3.59	3.43	2.68	2.67	2.65	2.64
			<i>10<sup>-3</sup> in.lb.s<sup>2</sup></i>	3.24	3.18	3.04	2.37	2.36	2.35	2.34

Please use our sizing software cymex<sup>®</sup> for a detailed sizing – [www.wittenstein-cymex.com](http://www.wittenstein-cymex.com)  
Please contact us for optimum sizing at S1 conditions (Continuous operation).

<sup>a)</sup> At max. 10 %  $F_{2OMax}$

<sup>b)</sup> Valid for standard clamping hub diameter

<sup>c)</sup> Refers to center of the output shaft or flange

<sup>d)</sup> Please reduce input speed at higher ambient temperatures

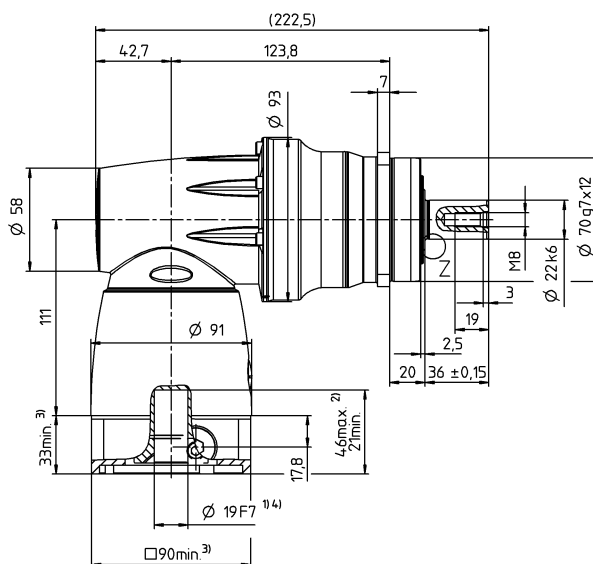
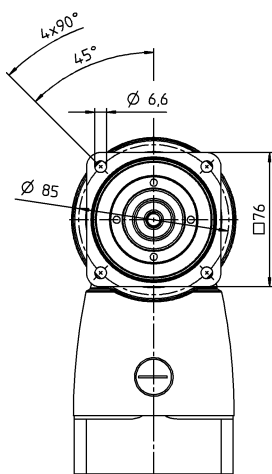
<sup>e)</sup> Smooth shaft

<sup>f)</sup> Please contact us to discuss  
application-specific service lifetimes

View A

Motor shaft diameter [mm]

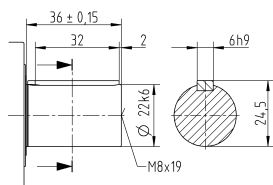
2-stage

up to 19/28<sup>4)</sup>  
(E<sup>5)</sup>/H) clamping  
hub diameter


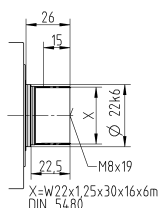
← A

## Other output variants

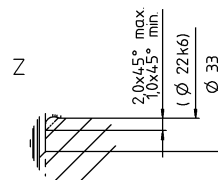
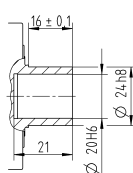
Shaft with key



Splined shaft (DIN 5480)



Shaft mounted



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

Non-tolerated dimensions are nominal dimensions

<sup>1)</sup> Check motor shaft fit

<sup>2)</sup> Min./Max. permissible motor shaft length. Longer motor shafts are possible, please contact alpha.

<sup>3)</sup> The dimensions depend on the motor

<sup>4)</sup> Smaller motor shaft diameter is compensated by a bushing with a minimum wall thickness of 1 mm

<sup>5)</sup> Standard clamping hub diameter

# SPC<sup>+</sup> 100 MF 2-stage

				2-stage						
Ratio	<i>i</i>			4	5	7	8	10	14	20
Max. torque <sup>a) b) e)</sup>	$T_{2a}$	Nm		389	486	428	389	486	428	376
		in.lb		3443	4301	3788	3443	4301	3788	3328
Max. acceleration torque <sup>b) e)</sup> (max. 1000 cycles per hour)	$T_{2B}$	Nm		324	378	378	324	378	378	282
		in.lb		2868	3346	3346	2868	3346	3346	2496
Nominal torque (at $n_{IN}$ )	$T_{2N}$	Nm		180	175	170	180	175	170	120
		in.lb		1593	1549	1505	1593	1549	1505	1062
Emergency stop torque <sup>a) b) e)</sup> (permitted 1000 times during the service life of the gearbox)	$T_{2Not}$	Nm		540	625	625	625	625	625	625
		in.lb		4779	5532	5532	5532	5532	5532	5532
Permitted average input speed (at $T_{2a}$ and 20 °C ambient temperature) <sup>d)</sup>	$n_{1N}$	$n_{1T}$		2000	2000	2200	2300	2300	2400	2400
Max. input speed	$n_{1Max}$	rpm		4500	4500	4500	4500	4500	4500	4500
Mean no load running torque <sup>b)</sup> (at $n_1 = 3000$ rpm and 20 °C gearbox temperature)	$T_{012}$	Nm		7.1	6.7	5.6	4.3	4	3.4	3.2
		in.lb		63	59	50	38	35	30	28
Max. backlash	$j_t$	arcmin		Standard $\leq 4$ / Reduced $\leq 2$						
Torsional rigidity <sup>b)</sup>	$C_{t21}$	Nm/arcmin		20	23	26	24	26	28	30
		in.lb/arcmin		177	204	230	212	230	248	266
Max. axial force <sup>c)</sup>	$F_{2AMax}$	N		5650						
		lb <sub>f</sub>		1271						
Max. lateral force <sup>c)</sup>	$F_{2OMax}$	N		6300						
		lb <sub>f</sub>		1418						
Max. tilting moment	$M_{2KMax}$	Nm		500						
		in.lb		4425						
Efficiency at full load	$\eta$	%		95						
Service life <sup>f)</sup>	$L_h$	h		> 20000						
Weight (incl. standard adapter plate)	$m$	kg		11.7						
		lb <sub>m</sub>		26						
Operating noise (at reference ratio and reference speed – ratio-specific values available in cymex <sup>®</sup> )	$L_{PA}$	dB(A)		$\leq 68$						
Max. permitted housing temperature		°C		+90						
		F		194						
Ambient temperature		°C		0 to +40						
		F		32 to 104						
Lubrication				Lubricated for life						
Direction of rotation				In- and output same direction						
Protection class				IP 65						
Metal bellows coupling (recommended product type – validate sizing with cymex <sup>®</sup> )				BC2 - 00300AA - 032.000 - X						
Bore diameter of coupling on the application side		mm		X = 024.000 - 060.000						
Mass moment of inertia (relates to the drive) Clamping hub diameter [mm]	H	28	$J_1$	kgcm <sup>2</sup>	8	7.6	7	5	4.9	4.8
				10 <sup>-3</sup> in.lb.s <sup>2</sup>	7	7	6	4	4	4
	K	38	$J_1$	kgcm <sup>2</sup>	15	14.7	14.1	12.1	12	11.9
				10 <sup>-3</sup> in.lb.s <sup>2</sup>	13	13	12	11	11	11

Please use our sizing software cymex<sup>®</sup> for a detailed sizing – [www.wittenstein-cymex.com](http://www.wittenstein-cymex.com)  
Please contact us for optimum sizing at S1 conditions (Continuous operation).

<sup>a)</sup> At max. 10 %  $F_{2OMax}$

<sup>b)</sup> Valid for standard clamping hub diameter

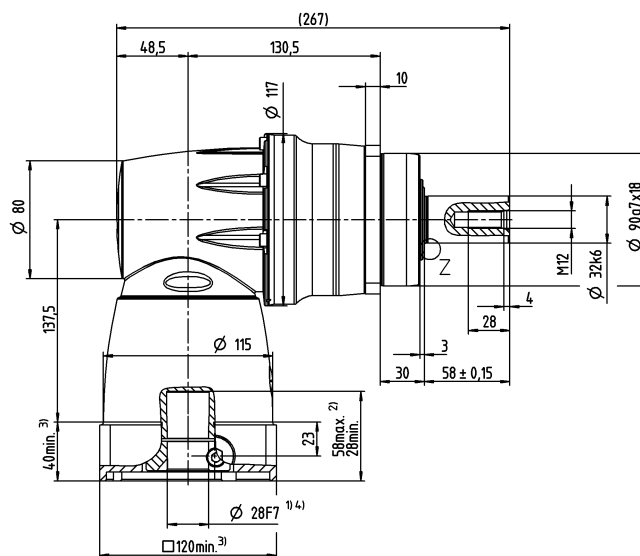
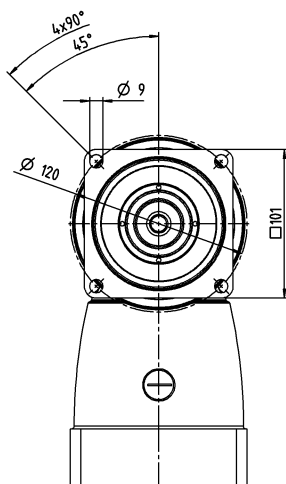
<sup>c)</sup> Refers to center of the output shaft or flange

<sup>d)</sup> Please reduce input speed at higher ambient temperatures

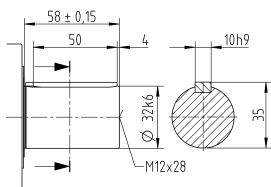
<sup>e)</sup> Smooth shaft

<sup>f)</sup> Please contact us to discuss  
application-specific service lifetimes

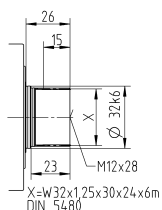
up to 28/38 <sup>4)</sup>  
(H<sup>5</sup>)/K) clamping  
hub diameter



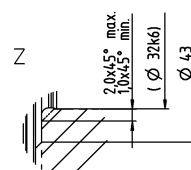
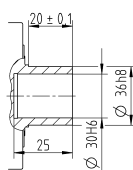
Shaft with key



Splined shaft (DIN 5480)



Shaft mounted



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

Non-tolerated dimensions are nominal dimensions  
<sup>1)</sup> Check motor shaft fit

2) Min. / Max. permissible motor shaft length. Longer motor shafts are possible, please contact alpha.

3) The dimensions depend on the motor

4) Smaller motor shaft diameter is compensated by a bushing with a minimum wall thickness of 1 mm

5) Standard clamping hub diameter

SPC<sup>+</sup>



# SPC<sup>+</sup> 140 MF 2-stage

				2-stage							
Ratio		<i>i</i>		4	5	7	8	10	14	20	
Max. torque <sup>a) b) e)</sup>		$T_{2a}$	<i>Nm</i>	840	1050	825	840	1050	825	720	
			<i>in.lb</i>	7435	9293	7302	7435	9293	7302	6373	
Max. acceleration torque <sup>b) e)</sup> (max. 1000 cycles per hour)		$T_{2B}$	<i>Nm</i>	700	792	792	700	792	792	636	
			<i>in.lb</i>	6196	7010	7010	6196	7010	7010	5629	
Nominal torque (at $n_{1N}$ )		$T_{2N}$	<i>Nm</i>	360	360	360	360	360	360	220	
			<i>in.lb</i>	3186	3186	3186	3186	3186	3186	1947	
Emergency stop torque <sup>a) b) e)</sup> (permitted 1000 times during the service life of the gearbox)		$T_{2Not}$	<i>Nm</i>	960	1200	1350	1240	1350	1350	1250	
			<i>in.lb</i>	8497	10621	11949	10975	11949	11949	11064	
Permitted average input speed (at $T_{2a}$ and 20 °C ambient temperature) <sup>d)</sup>		$n_{1N}$	$n_{1T}$	1300	1300	1400	1500	1500	1600	1600	
Max. input speed		$n_{1Max}$	<i>rpm</i>	4500	4500	4500	4500	4500	4500	4500	
Mean no load running torque <sup>b)</sup> (at $n_1$ = 3000 rpm and 20 °C gearbox temperature)		$T_{012}$	<i>Nm</i>	15	13	11	11	9.2	7.8	6.6	
			<i>in.lb</i>	133	115	97	97	81	69	58	
Max. backlash		$j_t$	<i>arcmin</i>	Standard ≤ 4 / Reduced ≤ 2							
Torsional rigidity <sup>b)</sup>		$C_{t21}$	<i>Nm/arcmin</i>	37	41	46	41	45	48	51	
			<i>in.lb/arcmin</i>	327	363	407	363	398	425	451	
Max. axial force <sup>c)</sup>		$F_{2AMax}$	<i>N</i>	9870							
			<i>lb<sub>f</sub></i>	2221							
Max. lateral force <sup>c)</sup>		$F_{2OMax}$	<i>N</i>	9600							
			<i>lb<sub>f</sub></i>	2160							
Max. tilting moment		$M_{2KMax}$	<i>Nm</i>	1000							
			<i>in.lb</i>	8851							
Efficiency at full load		$\eta$	%	95							
Service life <sup>f)</sup>		$L_h$	<i>h</i>	> 20000							
Weight (incl. standard adapter plate)		$m$	<i>kg</i>	24.7							
			<i>lb<sub>m</sub></i>	55							
Operating noise (at reference ratio and reference speed – ratio-specific values available in cymex®)		$L_{PA}$	<i>dB(A)</i>	≤ 70							
Max. permitted housing temperature			°C	+90							
			<i>F</i>	194							
Ambient temperature			°C	0 to +40							
			<i>F</i>	32 to 104							
Lubrication				Lubricated for life							
Direction of rotation				In- and output same direction							
Protection class				IP 65							
Metal bellows coupling (recommended product type – validate sizing with cymex®)				BC2 - 00800AA - 040.000 - X							
Bore diameter of coupling on the application side			<i>mm</i>	X = 040.000 - 075.000							
Mass moment of inertia (relates to the drive) Clamping hub diameter [mm]	K	38	$J_1$	<i>kgcm²</i>	30.6	29.7	27.9	18.9	18.7	18.5	18.4
				<i>10<sup>-3</sup> in.lb.s²</i>	27	26	25	17	17	16	16

Please use our sizing software cymex<sup>®</sup> for a detailed sizing – [www.wittenstein-cymex.com](http://www.wittenstein-cymex.com)  
Please contact us for optimum sizing at S1 conditions (Continuous operation).

<sup>a)</sup> At max. 10 %  $F_{2OMax}$

<sup>b)</sup> Valid for standard clamping hub diameter

<sup>c)</sup> Refers to center of the output shaft or flange

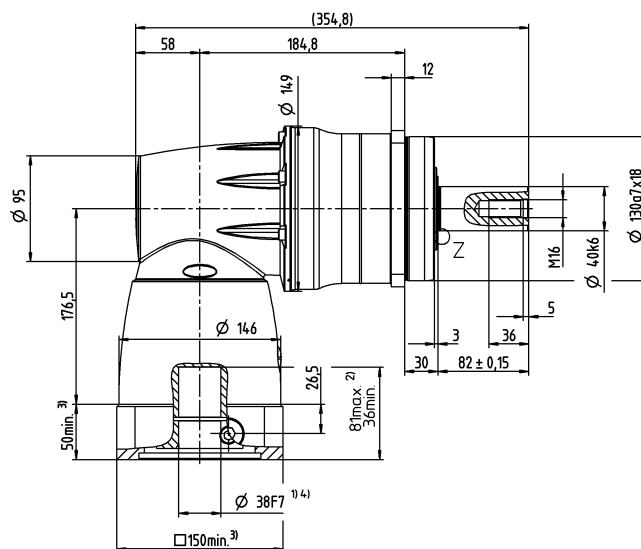
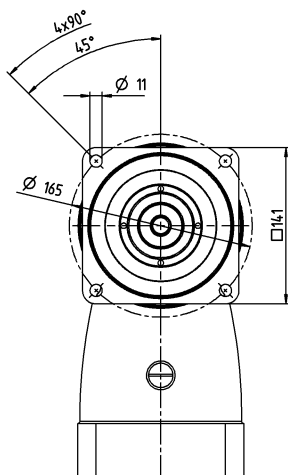
<sup>d)</sup> Please reduce input speed at higher ambient temperatures

<sup>e)</sup> Smooth shaft

<sup>f)</sup> Please contact us to discuss  
application-specific service lifetimes

Motor shaft diameter [mm]

2-stage

up to 38 <sup>4)</sup> (K) <sup>5)</sup>  
clamping hub  
diameter


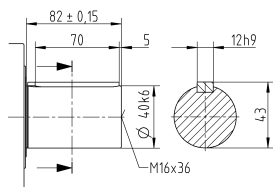
← A

Bevel gearboxes

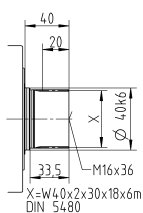
SPC

## Other output variants

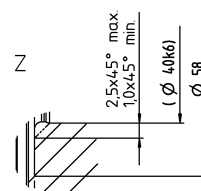
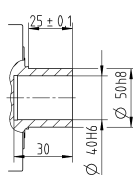
Shaft with key



Splined shaft (DIN 5480)



Shaft mounted



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

Non-tolerated dimensions are nominal dimensions

<sup>1)</sup> Check motor shaft fit

<sup>2)</sup> Min./Max. permissible motor shaft length. Longer motor shafts are possible, please contact alpha.

<sup>3)</sup> The dimensions depend on the motor

<sup>4)</sup> Smaller motor shaft diameter is compensated by a bushing with a minimum wall thickness of 1 mm

<sup>5)</sup> Standard clamping hub diameter

# SPC<sup>+</sup> 180 MF 2-stage

				2-stage						
Ratio	<i>i</i>			4	5	7	8	10	14	20
Max. torque <sup>a) b) e)</sup>	$T_{2a}$	<i>Nm</i>		1512	1890	1936	1512	1890	1936	1552
		<i>in.lb</i>		13382	16728	17135	13382	16728	17135	13736
Max. acceleration torque <sup>b) e)</sup> (max. 1000 cycles per hour)	$T_{2B}$	<i>Nm</i>		1260	1452	1452	1260	1452	1452	1164
		<i>in.lb</i>		11152	12851	12851	11152	12851	12851	10302
Nominal torque (at $n_{IN}$ )	$T_{2N}$	<i>Nm</i>		750	750	750	750	750	750	750
		<i>in.lb</i>		6638	6638	6638	6638	6638	6638	6638
Emergency stop torque <sup>a) b) e)</sup> (permitted 1000 times during the service life of the gearbox)	$T_{2Not}$	<i>Nm</i>		1560	1950	2730	2740	2750	2750	2750
		<i>in.lb</i>		13807	17259	24163	24251	24340	24340	24340
Permitted average input speed (at $T_{2a}$ and 20 °C ambient temperature) <sup>d)</sup>	$n_{1N}$	$n_{1T}$		1000	1000	1100	1200	1200	1300	1300
Max. input speed	$n_{1Max}$	<i>rpm</i>		4000	4000	4000	4000	4000	4000	4000
Mean no load running torque <sup>b)</sup> (at $n_1 = 3000$ rpm and 20 °C gearbox temperature)	$T_{012}$	<i>Nm</i>		30	27	24	16	15	13	12
		<i>in.lb</i>		266	239	212	142	133	115	106
Max. backlash	$j_t$	<i>arcmin</i>		Standard $\leq 4$ / Reduced $\leq 2$						
Torsional rigidity <sup>b)</sup>	$C_{t21}$	<i>Nm/arcmin</i>		104	122	143	130	144	157	166
		<i>in.lb/arcmin</i>		920	1080	1266	1151	1275	1390	1469
Max. axial force <sup>c)</sup>	$F_{2AMax}$	<i>N</i>		15570						
		<i>lb<sub>f</sub></i>		3503						
Max. lateral force <sup>c)</sup>	$F_{2OMax}$	<i>N</i>		15000						
		<i>lb<sub>f</sub></i>		3375						
Max. tilting moment	$M_{2KMax}$	<i>Nm</i>		1800						
		<i>in.lb</i>		15931						
Efficiency at full load	$\eta$	%		95						
Service life <sup>f)</sup>	$L_h$	<i>h</i>		> 20000						
Weight (incl. standard adapter plate)	<i>m</i>	<i>kg</i>		54.7						
		<i>lb<sub>m</sub></i>		121						
Operating noise (at reference ratio and reference speed – ratio-specific values available in cymex <sup>®</sup> )	$L_{PA}$	<i>dB(A)</i>		$\leq 70$						
Max. permitted housing temperature		°C		+90						
		<i>F</i>		194						
Ambient temperature		°C		0 to +40						
		<i>F</i>		32 to 104						
Lubrication				Lubricated for life						
Direction of rotation				In- and output same direction						
Protection class				IP 65						
Metal bellows coupling (recommended product type – validate sizing with cymex <sup>®</sup> )  Bore diameter of coupling on the application side				BC2 - 01500AA - 055.000 - X						
		<i>mm</i>		X = 050.000 - 080.000						
Mass moment of inertia (relates to the drive) Clamping hub diameter [mm]	<i>M</i> 48 $J_1$	<i>kgcm<sup>2</sup></i>		109.5	105	94.7	49.2	48.1	46.9	46.2
		<i>10<sup>-3</sup> in.lb.s<sup>2</sup></i>		97	93	84	44	43	42	41

Please use our sizing software cymex<sup>®</sup> for a detailed sizing – [www.wittenstein-cymex.com](http://www.wittenstein-cymex.com)  
Please contact us for optimum sizing at S1 conditions (Continuous operation).

<sup>a)</sup> At max. 10 %  $F_{2OMax}$

<sup>b)</sup> Valid for standard clamping hub diameter

<sup>c)</sup> Refers to center of the output shaft or flange

<sup>d)</sup> Please reduce input speed at higher ambient temperatures

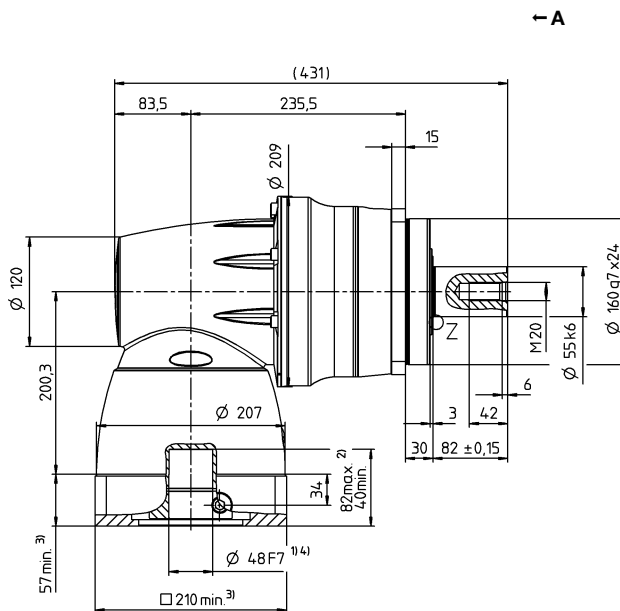
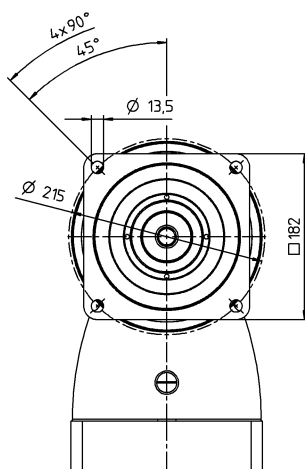
<sup>e)</sup> Smooth shaft

<sup>f)</sup> Please contact us to discuss  
application-specific service lifetimes

View A

Motor shaft diameter [mm]

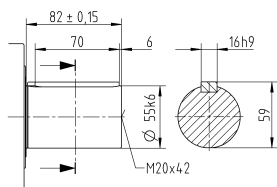
2-stage

up to 48 <sup>4)</sup> (M) <sup>5)</sup>  
clamping hub  
diameter


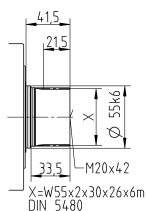
← A

## Other output variants

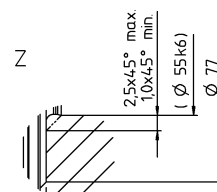
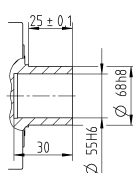
Shaft with key



Splined shaft (DIN 5480)



Shaft mounted



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

Non-tolerated dimensions are nominal dimensions  
<sup>1)</sup> Check motor shaft fit

<sup>2)</sup> Min./Max. permissible motor shaft length. Longer motor shafts are possible, please contact alpha.

<sup>3)</sup> The dimensions depend on the motor

<sup>4)</sup> Smaller motor shaft diameter is compensated by a bushing with a minimum wall thickness of 1 mm

<sup>5)</sup> Standard clamping hub diameter

# TPC+ 004 MF 2-stage

				2-stage						
Ratio	<i>i</i>			4	5	7	8	10	14	20
Max. torque <sup>a) b)</sup>	$T_{2a}$	Nm		48	60	83	48	60	83	56
		in.lb		425	531	735	425	531	735	496
Max. acceleration torque <sup>b)</sup> (max. 1000 cycles per hour)	$T_{2B}$	Nm		40	50	66	40	50	66	42
		in.lb		354	443	584	354	443	584	372
Nominal torque (at $n_{IN}$ )	$T_{2N}$	Nm		28	28	28	28	28	28	18
		in.lb		248	248	248	248	248	248	159
Emergency stop torque <sup>a) b)</sup> (permitted 1000 times during the service life of the gearbox)	$T_{2Not}$	Nm		100	100	100	100	100	100	100
		in.lb		885	885	885	885	885	885	885
Permitted average input speed (at $T_{2a}$ and 20 °C ambient temperature) <sup>d)</sup>	$n_{1N}$	$n_{1T}$		2900	2900	3100	3400	3400	3600	3600
Max. input speed	$n_{1Max}$	rpm		6000	6000	6000	6000	6000	6000	6000
Mean no load running torque <sup>b)</sup> (at $n_1 = 3000$ rpm and 20 °C gearbox temperature)	$T_{012}$	Nm		2.1	1.8	1.5	1.3	1.2	1	0.84
		in.lb		19	16	13	12	11	8.9	7.4
Max. backlash	$j_t$	arcmin		Standard $\leq 5$ / Reduced $\leq 3$						
Torsional rigidity <sup>b)</sup>	$C_{t21}$	Nm/arcmin		4.8	6.2	7.6	6.1	7.4	8.5	7.3
		in.lb/arcmin		42	55	67	54	65	75	65
Tilting rigidity	$C_{2K}$	Nm/arcmin		85						
		in.lb/arcmin		752						
Max. axial force <sup>c)</sup>	$F_{2AMax}$	N		2119						
		lb <sub>f</sub>		477						
Max. tilting moment	$M_{2KMax}$	Nm		110						
		in.lb		974						
Efficiency at full load	$\eta$	%		95						
Service life <sup>f)</sup>	$L_h$	h		> 20000						
Weight (incl. standard adapter plate)	$m$	kg		2.6						
		lb <sub>m</sub>		6						
Operating noise (at reference ratio and reference speed – ratio-specific values available in cymex <sup>®</sup> )	$L_{PA}$	dB(A)		$\leq 68$						
Max. permitted housing temperature		°C		+90						
		F		194						
Ambient temperature		°C		0 to +40						
		F		32 to 104						
Lubrication				Lubricated for life						
Direction of rotation				In- and output same direction						
Protection class				IP 65						
Metal bellows coupling (recommended product type – validate sizing with cymex <sup>®</sup> )				BCT - 00015AAX - 031.500						
Bore diameter of coupling on the application side		mm		X = 012.000 - 028.000						
Mass moment of inertia (relates to the drive) Clamping hub diameter [mm]	C	14	$J_1$	kgcm <sup>2</sup>	0.72	0.7	0.66	0.44	0.43	0.43
				10 <sup>-3</sup> in.lb.s <sup>2</sup>	0.64	0.62	0.58	0.39	0.38	0.38
	E	19	$J_1$	kgcm <sup>2</sup>	1.05	1.03	0.99	0.77	0.76	0.75
				10 <sup>-3</sup> in.lb.s <sup>2</sup>	1	1	1	1	1	1

Please use our sizing software cymex<sup>®</sup> for a detailed sizing – [www.wittenstein-cymex.com](http://www.wittenstein-cymex.com)  
Please contact us for optimum sizing at S1 conditions (Continuous operation).

<sup>a)</sup> At max. 10 %  $M_{2KMax}$

<sup>b)</sup> Valid for standard clamping hub diameter

<sup>c)</sup> Refers to center of the output shaft or flange

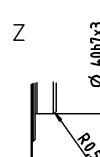
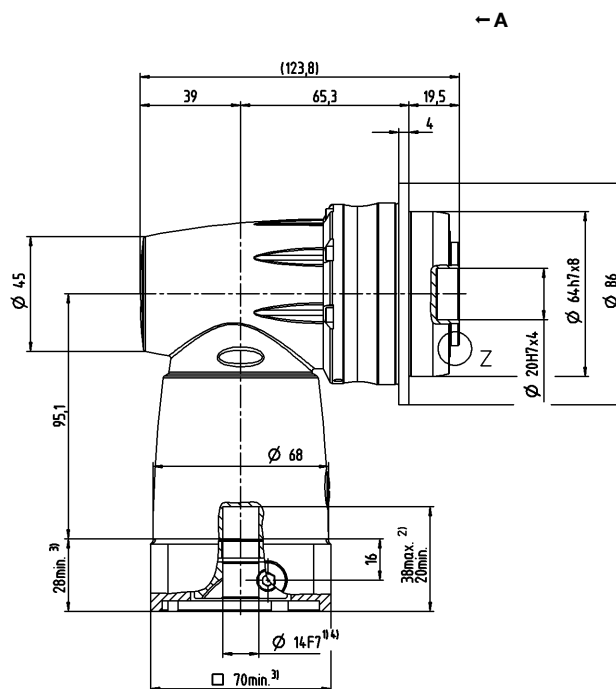
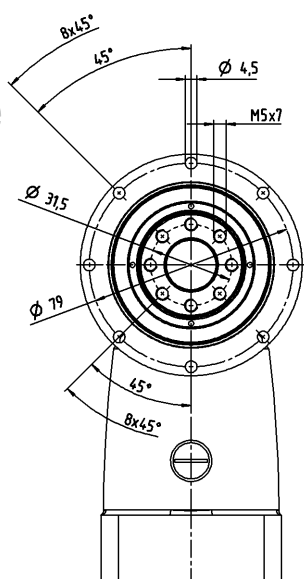
<sup>d)</sup> Please reduce input speed at higher ambient temperatures

<sup>f)</sup> Please contact us to discuss  
application-specific service lifetimes

View A

Motor shaft diameter [mm]

2-stage

up to 14/19<sup>4)</sup>  
(C<sup>5)</sup>/E) clamping  
hub diameter


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

Non-tolerated dimensions are nominal dimensions

<sup>1)</sup> Check motor shaft fit

<sup>2)</sup> Min./Max. permissible motor shaft length. Longer motor shafts are possible, please contact alpha.

<sup>3)</sup> The dimensions depend on the motor

<sup>4)</sup> Smaller motor shaft diameter is compensated by a bushing with a minimum wall thickness of 1 mm

<sup>5)</sup> Standard clamping hub diameter

# TPC+ 010 MF 2-stage

				2-stage						
Ratio	<i>i</i>			4	5	7	8	10	14	20
Max. torque <sup>a) b)</sup>	$T_{2a}$	Nm		144	180	210	144	180	210	168
		in.lb		1275	1593	1859	1275	1593	1859	1487
Max. acceleration torque <sup>b)</sup> (max. 1000 cycles per hour)	$T_{2B}$	Nm		120	150	172	120	150	172	126
		in.lb		1062	1328	1522	1062	1328	1522	1115
Nominal torque (at $n_{IN}$ )	$T_{2N}$	Nm		75	75	75	75	75	75	60
		in.lb		664	664	664	664	664	664	531
Emergency stop torque <sup>a) b)</sup> (permitted 1000 times during the service life of the gearbox)	$T_{2Not}$	Nm		192	240	251	248	251	251	251
		in.lb		1699	2124	2222	2195	2222	2222	2222
Permitted average input speed (at $T_{2a}$ and 20 °C ambient temperature) <sup>d)</sup>	$n_{1N}$	$n_{1T}$		2100	2100	2300	2650	2650	2800	2800
Max. input speed	$n_{1Max}$	rpm		6000	6000	6000	6000	6000	6000	6000
Mean no load running torque <sup>b)</sup> (at $n_1 = 3000$ rpm and 20 °C gearbox temperature)	$T_{012}$	Nm		4.2	3.7	3.2	2.9	2.7	2.1	1.9
		in.lb		37	33	28	26	24	19	17
Max. backlash	$j_t$	arcmin		Standard $\leq 4$ / Reduced $\leq 2$						
Torsional rigidity <sup>b)</sup>	$C_{t21}$	Nm/arcmin		12	16	20	16	20	23	21
		in.lb/arcmin		106	142	177	142	177	204	186
Tilting rigidity	$C_{2K}$	Nm/arcmin		225						
		in.lb/arcmin		1991						
Max. axial force <sup>c)</sup>	$F_{2AMax}$	N		2795						
		lb <sub>f</sub>		629						
Max. tilting moment	$M_{2KMax}$	Nm		270						
		in.lb		2390						
Efficiency at full load	$\eta$	%		95						
Service life <sup>f)</sup>	$L_h$	h		> 20000						
Weight (incl. standard adapter plate)	$m$	kg		5.8						
		lb <sub>m</sub>		13						
Operating noise (at reference ratio and reference speed – ratio-specific values available in cymex <sup>®</sup> )	$L_{PA}$	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						
Direction of rotation				In- and output same direction						
Protection class				IP 65						
Metal bellows coupling (recommended product type – validate sizing with cymex <sup>®</sup> )				BCT - 00060AAX - 050.000						
Bore diameter of coupling on the application side		mm		X = 014.000 - 035.000						
Mass moment of inertia (relates to the drive) Clamping hub diameter [mm]	E 19	$J_1$	kgcm <sup>2</sup>	2.41	2.27	1.99	1.29	1.26	1.22	1.21
			10 <sup>-3</sup> in.lb.s <sup>2</sup>	2.13	2.01	1.76	1.14	1.12	1.08	1.07
	H 28	$J_1$	kgcm <sup>2</sup>	3.85	3.71	3.43	2.73	2.7	2.66	2.64
			10 <sup>-3</sup> in.lb.s <sup>2</sup>	3.41	3.28	3.04	2.42	2.39	2.35	2.34

Please use our sizing software cymex<sup>®</sup> for a detailed sizing – [www.wittenstein-cymex.com](http://www.wittenstein-cymex.com)  
Please contact us for optimum sizing at S1 conditions (Continuous operation).

<sup>a)</sup> At max. 10 %  $M_{2KMax}$

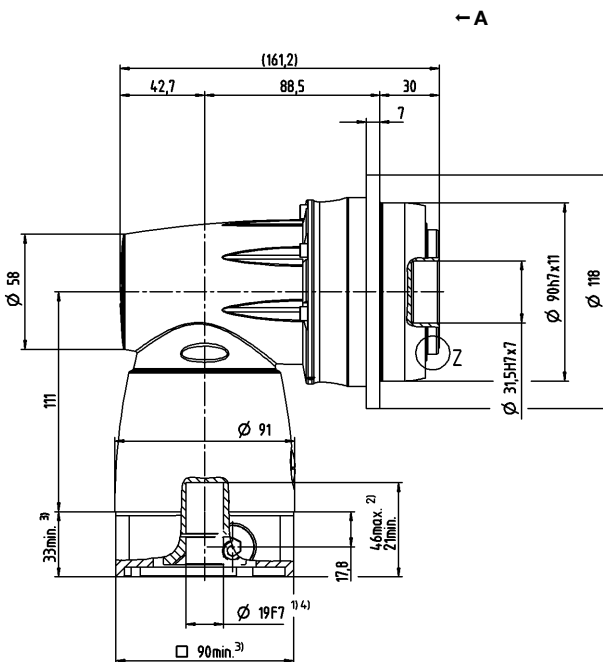
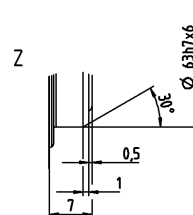
<sup>b)</sup> Valid for standard clamping hub diameter

<sup>c)</sup> Refers to center of the output shaft or flange

<sup>d)</sup> Please reduce input speed at higher ambient temperatures

<sup>f)</sup> Please contact us to discuss  
application-specific service lifetimes

## 2-stage

TPC<sup>+</sup>

Non-tolerated dimensions are nominal dimensions

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



# TPC+ 025 MF 2-stage

				2-stage							
Ratio		<i>i</i>		4	5	7	8	10	14	20	
Max. torque <sup>a) b)</sup>		$T_{2a}$	<i>Nm</i>	352	380	352	352	380	352	352	
			<i>in.lb</i>	3115	3363	3115	3115	3363	3115	3115	
Max. acceleration torque <sup>b)</sup> (max. 1000 cycles per hour)		$T_{2B}$	<i>Nm</i>	324	380	352	324	380	352	318	
			<i>in.lb</i>	2868	3363	3115	2868	3363	3115	2815	
Nominal torque (at $n_{IN}$ )		$T_{2N}$	<i>Nm</i>	170	170	170	180	175	170	120	
			<i>in.lb</i>	1505	1505	1505	1593	1549	1505	1062	
Emergency stop torque <sup>a) b)</sup> (permitted 1000 times during the service life of the gearbox)		$T_{2Not}$	<i>Nm</i>	540	625	625	625	625	625	625	
			<i>in.lb</i>	4779	5532	5532	5532	5532	5532	5532	
Permitted average input speed (at $T_{2a}$ and 20 °C ambient temperature) <sup>d)</sup>		$n_{1N}$	$n_{1T}$	1900	1900	2100	2300	2300	2400	2400	
Max. input speed		$n_{1Max}$	<i>rpm</i>	4500	4500	4500	4500	4500	4500	4500	
Mean no load running torque <sup>b)</sup> (at $n_1$ = 3000 rpm and 20 °C gearbox temperature)		$T_{012}$	<i>Nm</i>	7.9	7.1	6.1	4.7	4.3	3.7	3.2	
			<i>in.lb</i>	70	63	54	42	38	33	28	
Max. backlash		$j_t$	<i>arcmin</i>	Standard ≤ 4 / Reduced ≤ 2							
Torsional rigidity <sup>b)</sup>		$C_{t21}$	<i>Nm/arcmin</i>	33	43	53	45	56	61	57	
			<i>in.lb/arcmin</i>	292	381	469	398	496	540	504	
Tilting rigidity		$C_{2K}$	<i>Nm/arcmin</i>	550							
			<i>in.lb/arcmin</i>	4868							
Max. axial force <sup>c)</sup>		$F_{2AMax}$	<i>N</i>	4800							
			<i>lb<sub>f</sub></i>	1080							
Max. tilting moment		$M_{2KMax}$	<i>Nm</i>	440							
			<i>in.lb</i>	3894							
Efficiency at full load		$\eta$	%	95							
Service life <sup>f)</sup>		$L_h$	<i>h</i>	> 20000							
Weight (incl. standard adapter plate)		$m$	<i>kg</i>	10.5							
			<i>lb<sub>m</sub></i>	23							
Operating noise (at reference ratio and reference speed – ratio-specific values available in cymex®)		$L_{PA}$	<i>dB(A)</i>	≤ 68							
Max. permitted housing temperature			°C	+90							
			<i>F</i>	194							
Ambient temperature			°C	0 to +40							
			<i>F</i>	32 to 104							
Lubrication				Lubricated for life							
Direction of rotation				In- and output same direction							
Protection class				IP 65							
Metal bellows coupling (recommended product type – validate sizing with cymex®)				BCT - 00150AAX - 063.000							
			<i>mm</i>	X = 019.000 - 042.000							
Mass moment of inertia (relates to the drive) Clamping hub diameter [mm]	H	28	$J_1$	<i>kgcm<sup>2</sup></i>	8.3	7.9	7	5.1	5	4.9	4.8
				<i>10<sup>-3</sup> in.lb.s<sup>2</sup></i>	7	7	6	5	4	4	4
	K	38	$J_1$	<i>kgcm<sup>2</sup></i>	15.4	14.9	14.1	12.2	12.1	12	11.9
				<i>10<sup>-3</sup> in.lb.s<sup>2</sup></i>	14	13	12	11	11	11	11

Please use our sizing software cymex<sup>®</sup> for a detailed sizing – [www.wittenstein-cymex.com](http://www.wittenstein-cymex.com)  
Please contact us for optimum sizing at S1 conditions (Continuous operation).

<sup>a)</sup> At max. 10 %  $M_{2KMax}$

<sup>b)</sup> Valid for standard clamping hub diameter

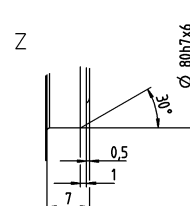
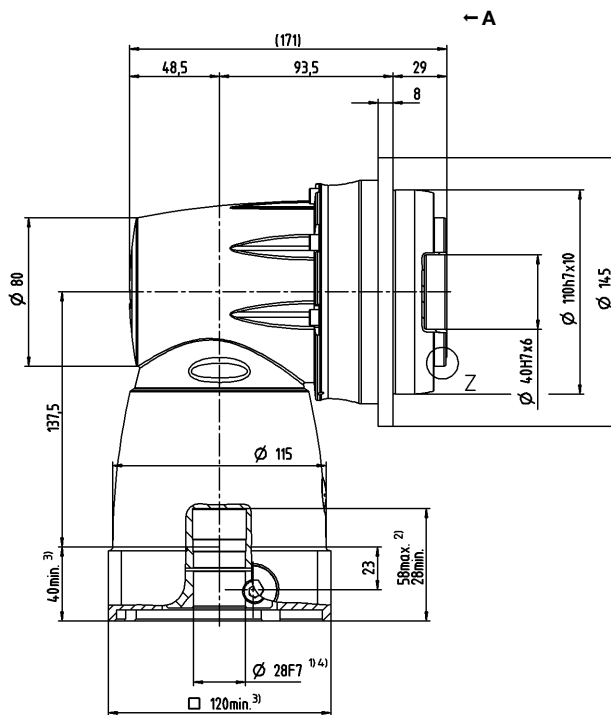
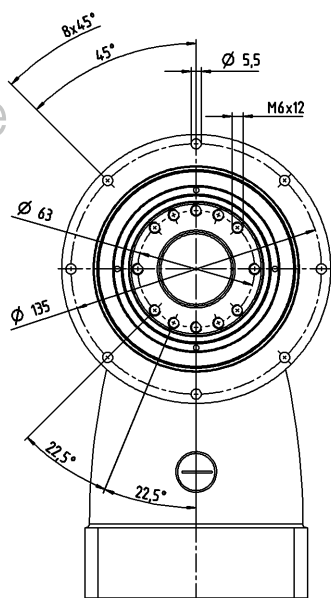
<sup>c)</sup> Refers to center of the output shaft or flange

<sup>d)</sup> Please reduce input speed at higher ambient temperatures

<sup>f)</sup> Please contact us to discuss  
application-specific service lifetimes

Motor shaft diameter [mm]

2-stage

up to 28/38<sup>4)</sup>  
(H<sup>5)</sup>/K) clamping  
hub diameter


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

Non-tolerated dimensions are nominal dimensions

<sup>1)</sup> Check motor shaft fit

<sup>2)</sup> Min./Max. permissible motor shaft length. Longer motor shafts are possible, please contact alpha.

<sup>3)</sup> The dimensions depend on the motor

<sup>4)</sup> Smaller motor shaft diameter is compensated by a bushing with a minimum wall thickness of 1 mm

<sup>5)</sup> Standard clamping hub diameter

# TPC+ 050 MF 2-stage

				2-stage						
Ratio	<i>i</i>			4	5	7	8	10	14	20
Max. torque <sup>a) b)</sup>	$T_{2a}$	Nm		840	992	868	840	992	868	720
		in.lb		7435	8780	7682	7435	8780	7682	6373
Max. acceleration torque <sup>b)</sup> (max. 1000 cycles per hour)	$T_{2B}$	Nm		700	840	840	700	840	840	648
		in.lb		6196	7435	7435	6196	7435	7435	5735
Nominal torque (at $n_{IN}$ )	$T_{2N}$	Nm		370	370	370	370	370	370	240
		in.lb		3275	3275	3275	3275	3275	3275	2124
Emergency stop torque <sup>a) b)</sup> (permitted 1000 times during the service life of the gearbox)	$T_{2Not}$	Nm		960	1200	1250	1240	1250	1250	1250
		in.lb		8497	10621	11064	10975	11064	11064	11064
Permitted average input speed (at $T_{2a}$ and 20 °C ambient temperature) <sup>d)</sup>	$n_{1N}$	$n_{1T}$		1200	1200	1300	1500	1500	1600	1600
Max. input speed	$n_{1Max}$	rpm		4500	4500	4500	4500	4500	4500	4500
Mean no load running torque <sup>b)</sup> (at $n_1 = 3000$ rpm and 20 °C gearbox temperature)	$T_{012}$	Nm		19	16	14	13	11	9.4	7.8
		in.lb		168	142	124	115	97	83	69
Max. backlash	$j_t$	arcmin		Standard $\leq 4$ / Reduced $\leq 2$						
Torsional rigidity <sup>b)</sup>	$C_{t21}$	Nm/arcmin		73	93	111	93	113	124	111
		in.lb/arcmin		646	823	982	823	1000	1097	982
Tilting rigidity	$C_{2K}$	Nm/arcmin		560						
		in.lb/arcmin		4956						
Max. axial force <sup>c)</sup>	$F_{2AMax}$	N		6130						
		lb <sub>f</sub>		1379						
Max. tilting moment	$M_{2KMax}$	Nm		1379						
		in.lb		12205						
Efficiency at full load	$\eta$	%		95						
Service life <sup>f)</sup>	$L_h$	h		> 20000						
Weight (incl. standard adapter plate)	$m$	kg		21.5						
		lb <sub>m</sub>		48						
Operating noise (at reference ratio and reference speed – ratio-specific values available in cymex <sup>®</sup> )	$L_{PA}$	dB(A)		$\leq 70$						
Max. permitted housing temperature		°C		+90						
		F		194						
Ambient temperature		°C		0 to +40						
		F		32 to 104						
Lubrication				Lubricated for life						
Direction of rotation				In- and output same direction						
Protection class				IP 65						
Metal bellows coupling (recommended product type – validate sizing with cymex <sup>®</sup> )				BCT - 00300AAX - 080.000						
Bore diameter of coupling on the application side		mm		X = 024.000 - 060.000						
Mass moment of inertia (relates to the drive) Clamping hub diameter [mm]	K 38	$J_1$	kgcm <sup>2</sup>	32.3	30.8	27.9	19.4	19	18.7	18.5
			10 <sup>-3</sup> in.lb.s <sup>2</sup>	29	27	25	17	17	17	16

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Please contact us for optimum sizing at S1 conditions (Continuous operation).

<sup>a)</sup> At max. 10 %  $M_{2KMax}$

<sup>b)</sup> Valid for standard clamping hub diameter

<sup>c)</sup> Refers to center of the output shaft or flange

<sup>d)</sup> Please reduce input speed at higher ambient temperatures

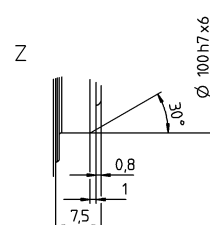
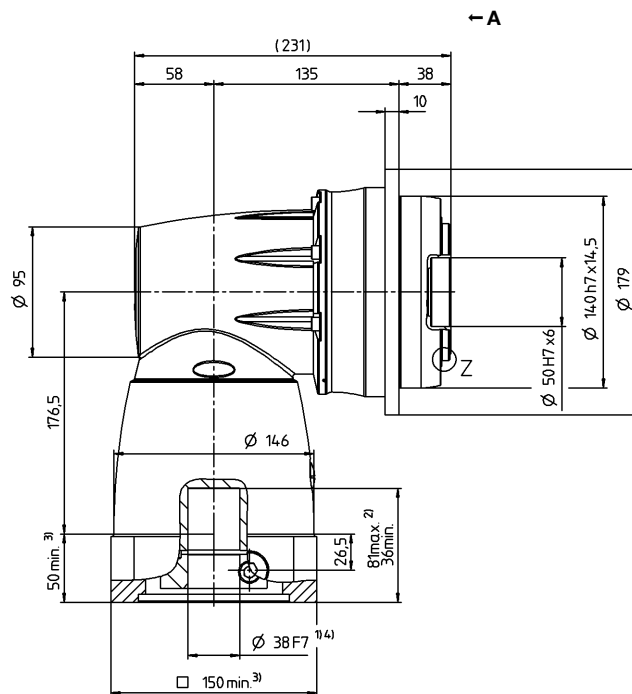
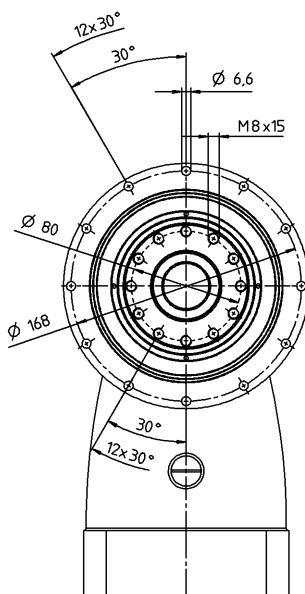
<sup>f)</sup> Please contact us to discuss

application-specific service lifetimes

View A

Motor shaft diameter [mm]

2-stage

up to 38 <sup>4)</sup> (K) <sup>5)</sup>  
clamping hub  
diameter


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

Non-tolerated dimensions are nominal dimensions

<sup>1)</sup> Check motor shaft fit

<sup>2)</sup> Min./Max. permissible motor shaft length. Longer motor shafts are possible, please contact alpha.

<sup>3)</sup> The dimensions depend on the motor

<sup>4)</sup> Smaller motor shaft diameter is compensated by a bushing with a minimum wall thickness of 1 mm

<sup>5)</sup> Standard clamping hub diameter

# TPC+ 110 MF 2-stage

				2-stage						
Ratio	<i>i</i>			4	5	7	8	10	14	20
Max. torque <sup>a) b)</sup>	$T_{2a}$	Nm		1512	1890	2560	1512	1890	2560	2240
		in.lb		13382	16728	22658	13382	16728	22658	19826
Max. acceleration torque <sup>b)</sup> (max. 1000 cycles per hour)	$T_{2B}$	Nm		1260	1575	1920	1260	1575	1920	1680
		in.lb		11152	13940	16994	11152	13940	16994	14869
Nominal torque (at $n_n$ )	$T_{2N}$	Nm		700	750	750	700	750	750	750
		in.lb		6196	6638	6638	6196	6638	6638	6638
Emergency stop torque <sup>a) b)</sup> (permitted 1000 times during the service life of the gearbox)	$T_{2Not}$	Nm		1560	1950	2730	2740	3075	3075	3075
		in.lb		13807	17259	24163	24251	27216	27216	27216
Permitted average input speed (at $T_{2a}$ and 20 °C ambient temperature) <sup>d)</sup>	$n_{1N}$	$n_{1T}$		900	900	1000	1200	1200	1300	1300
Max. input speed	$n_{1Max}$	rpm		4000	4000	4000	4000	4000	4000	4000
Mean no load running torque <sup>b)</sup> (at $n_i = 3000$ rpm and 20 °C gearbox temperature)	$T_{012}$	Nm		37	32	28	20	17	15	13
		in.lb		327	283	248	177	150	133	115
Max. backlash	$j_t$	arcmin		Standard $\leq 4$ / Reduced $\leq 2$						
Torsional rigidity <sup>b)</sup>	$C_{t21}$	Nm/arcmin		181	242	324	278	345	407	390
		in.lb/arcmin		1602	2142	2868	2461	3054	3602	3452
Tilting rigidity	$C_{2K}$	Nm/arcmin		1452						
		in.lb/arcmin		12851						
Max. axial force <sup>c)</sup>	$F_{2AMax}$	N		10050						
		lb <sub>f</sub>		2261						
Max. tilting moment	$M_{2KMax}$	Nm		3280						
		in.lb		29031						
Efficiency at full load	$\eta$	%		95						
Service life <sup>f)</sup>	$L_h$	h		> 20000						
Weight (incl. standard adapter plate)	$m$	kg		50.7						
		lb <sub>m</sub>		112						
Operating noise (at reference ratio and reference speed – ratio-specific values available in cymex <sup>®</sup> )	$L_{PA}$	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						
Direction of rotation				In- and output same direction						
Protection class				IP 65						
Metal bellows coupling (recommended product type – validate sizing with cymex <sup>®</sup> )				BCT - 01500AAX - 125.000						
Bore diameter of coupling on the application side		mm		X = 050.000 - 080.000						
Mass moment of inertia (relates to the drive) Clamping hub diameter [mm]	M 48	$J_1$	kgcm <sup>2</sup>	121.2	112.6	94.7	52.1	50	47.9	46.7
			10 <sup>-3</sup> in.lb.s <sup>2</sup>	107	100	84	46	44	42	41

Please use our sizing software cymex<sup>®</sup> for a detailed sizing – [www.wittenstein-cymex.com](http://www.wittenstein-cymex.com)  
Please contact us for optimum sizing at S1 conditions (Continuous operation).

<sup>a)</sup> At max. 10 %  $M_{2KMax}$

<sup>b)</sup> Valid for standard clamping hub diameter

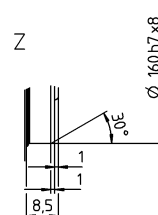
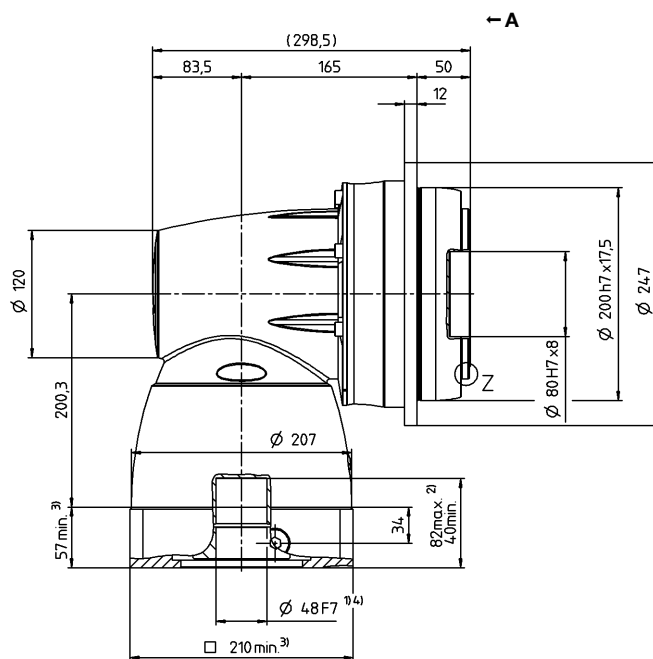
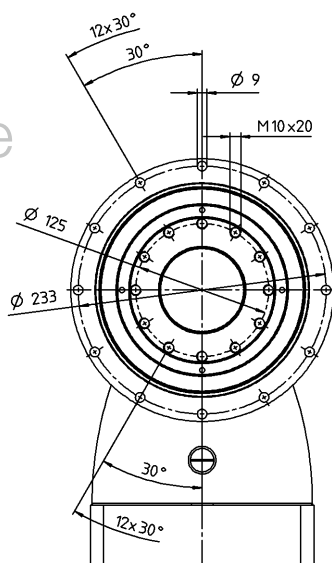
<sup>c)</sup> Refers to center of the output shaft or flange

<sup>d)</sup> Please reduce input speed at higher ambient temperatures

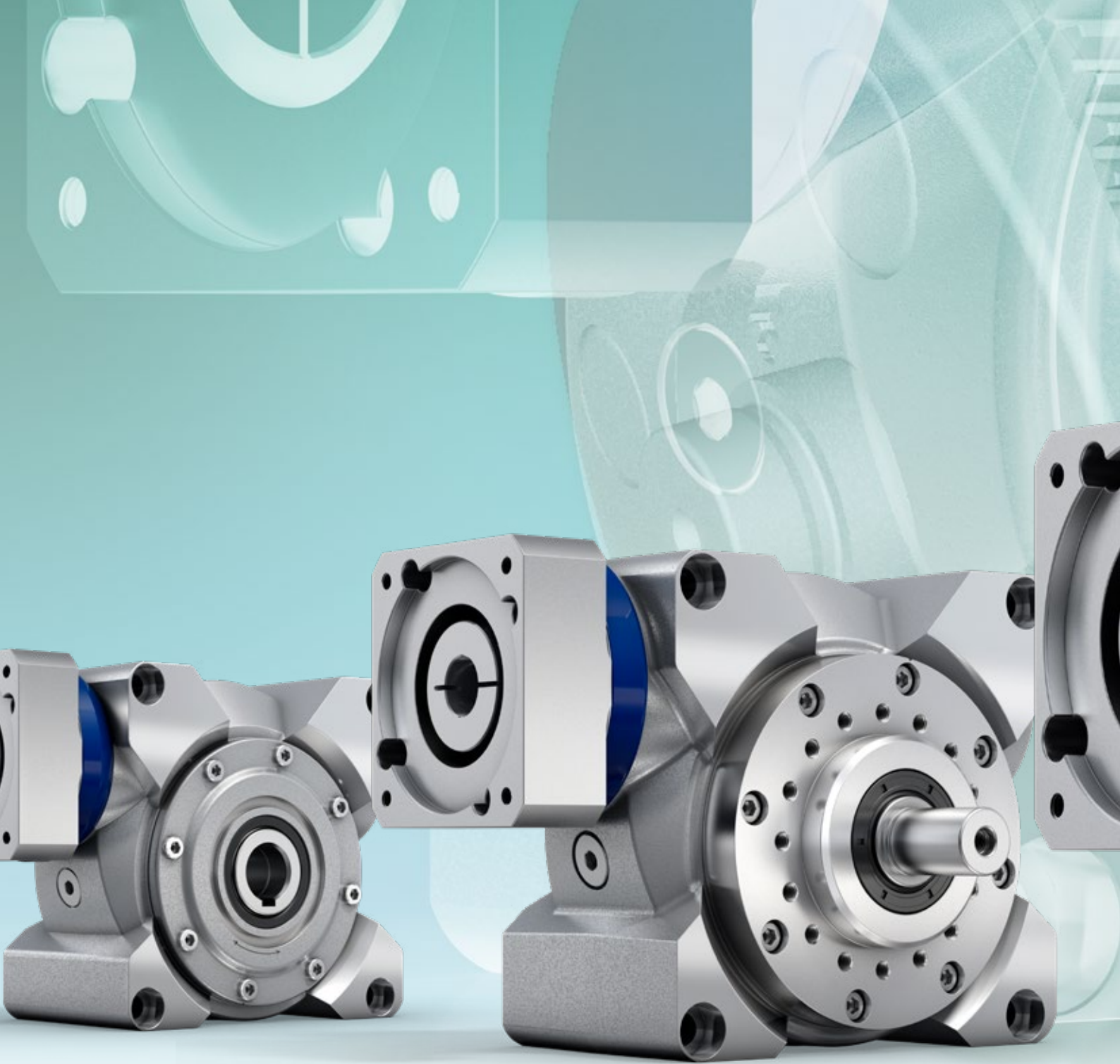
<sup>f)</sup> Please contact us to discuss

application-specific service lifetimes

up to 48 <sup>4)</sup> (M) <sup>5)</sup>  
clamping hub  
diameter

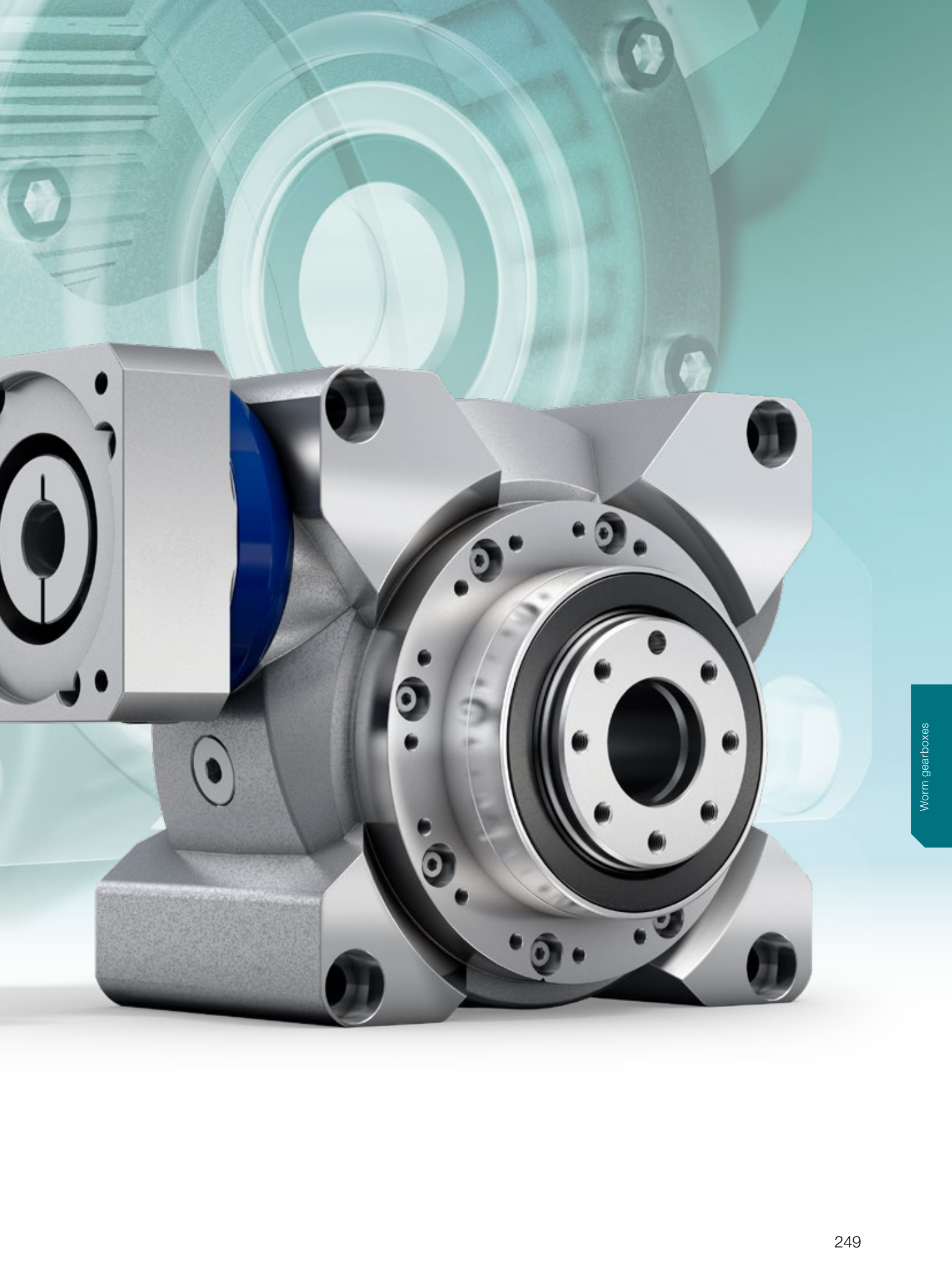


5) Standard clamping hub diameter



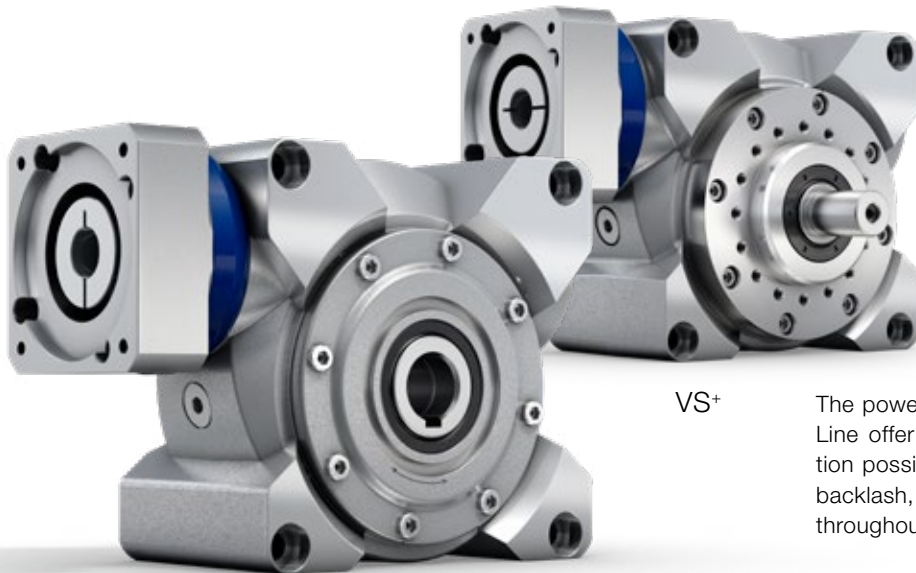
## Worm gearboxes VH<sup>+</sup> / VS<sup>+</sup> / VT<sup>+</sup> Flexible powerhouses







# VH<sup>+</sup> / VS<sup>+</sup> / VT<sup>+</sup> – Precision worm gearboxes



VS<sup>+</sup>

The powerful V-Drive worm gears of the alpha Advanced Line offer flexible output shapes and countless application possibilities. With high-quality toothing and constant backlash, the gearboxes remain exceptionally efficient throughout their entire service life.

VH<sup>+</sup>

V-Drive Advanced compared to the industry standard

## Product highlights

**Max. torsional backlash** [arcmin] ≤ 3 (Standard)  
≤ 2 (Reduced)

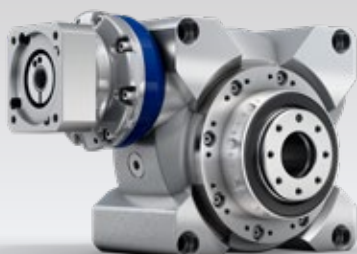
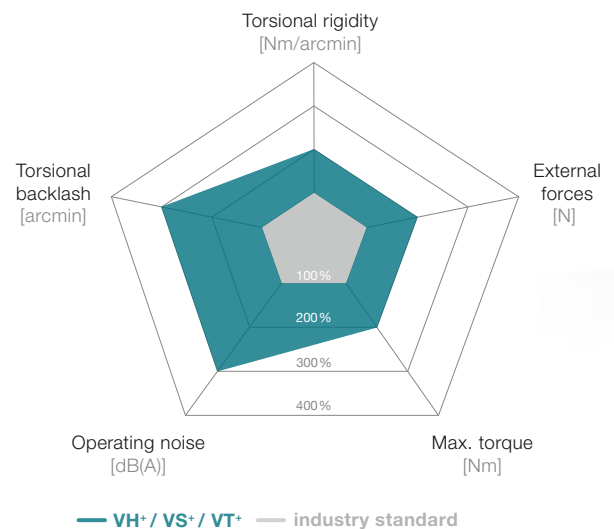
**Constant, low torsional backlash**  
consistently high quality and high positioning accuracy guaranteed throughout its lifespan

**No stick-slip effect**  
owing to the enhanced hollow-flank teeth

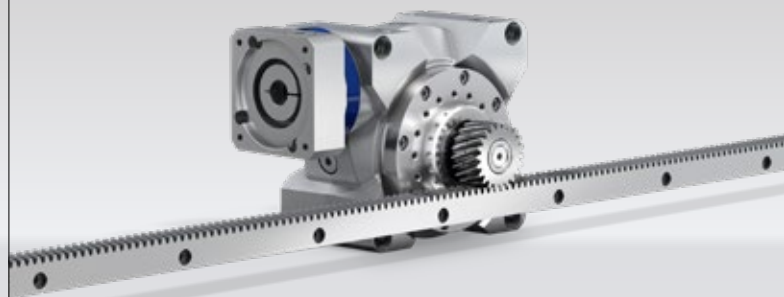
**Optimally sized output bearing** for absorbing high axial and radial forces in cyclic or continuous operation

**Hollow-flank teeth** with high overload capacity owing to the low specific tooth pressure

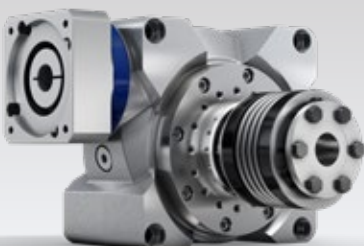
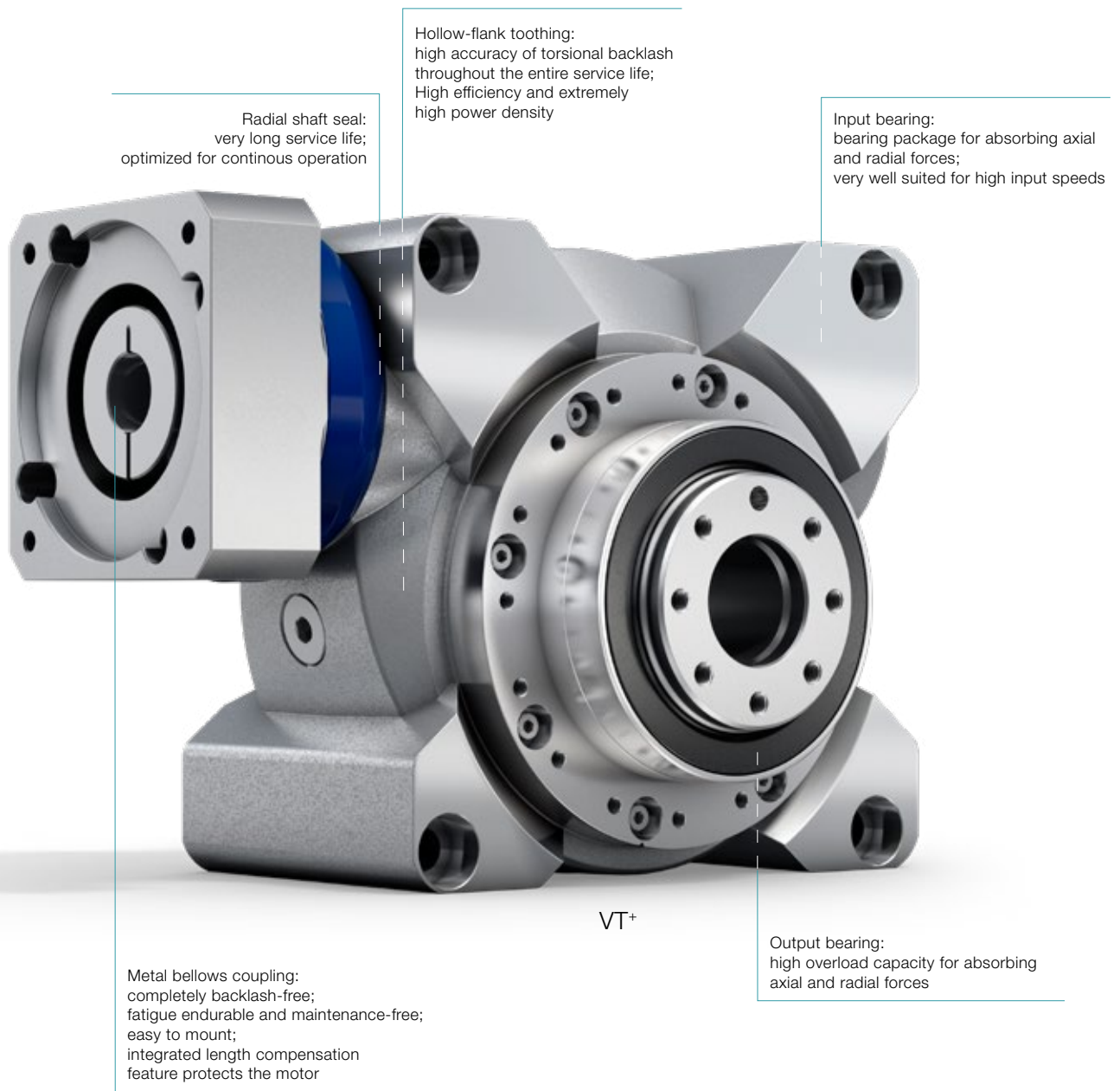
**Multiple output configurations for greater flexibility**  
Smooth shaft, shaft with key, splined shaft (DIN 5480), Hollow shaft interface, Keyed hollow shaft, Flanged hollow shaft, Flange, System output, Output on both sides



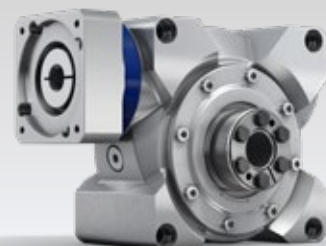
VT<sup>+</sup> with integrated planetary input stage for higher ratios



VS<sup>+</sup> in linear system



VS+ with metal bellows coupling BC3



VH+ with shrink disk

# VH<sup>+</sup> 040 MF 1-/2-stage

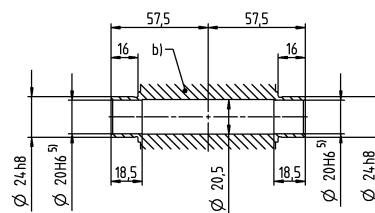
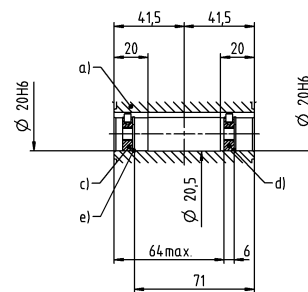
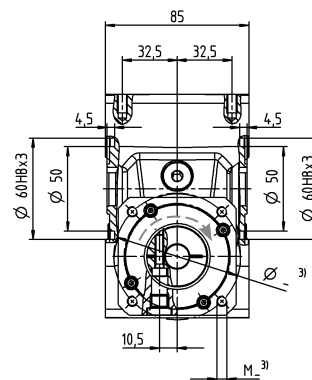
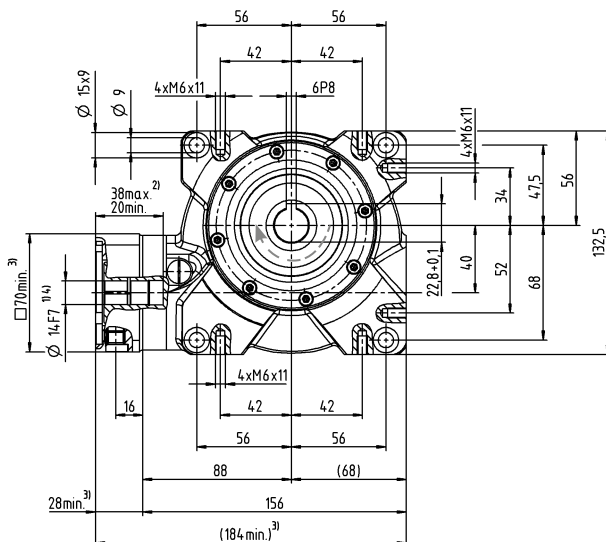
				1-stage							2-stage								
Ratio			<i>i</i>		4	7	10	16	28	40	50	70	100	140	200	280	400		
Max. torque <sup>a) b)</sup> (at <i>n</i> <sub>1</sub> = 500 rpm)			<i>T</i> <sub>2a</sub>	<i>Nm</i>	74	82	98	101	106	98	98	82	98	106	98	106	98		
				<i>in.lb</i>	655	726	867	894	938	867	867	726	867	938	867	938	867		
Torque for constant backlash (over the lifetime)			<i>T</i> <sub>2Servo</sub>	<i>Nm</i>	17	24	25	26	29	25	25	24	25	29	25	29	25		
				<i>in.lb</i>	150	212	221	230	257	221	221	212	221	257	221	257	221		
Emergency stop torque <sup>a) b)</sup> (permitted 1000 times during the service life of the gearbox)			<i>T</i> <sub>2Not</sub>	<i>Nm</i>	118	126	125	129	134	122	125	126	125	134	122	134	122		
				<i>in.lb</i>	1044	1115	1106	1142	1186	1080	1106	1115	1106	1186	1080	1186	1080		
Permitted average input speed (at 20 °C ambient temperature) <sup>d)</sup>			<i>n</i> <sub>1N</sub>	<i>rpm</i>	4000							4400							
Max. input speed			<i>n</i> <sub>1Max</sub>	<i>rpm</i>	6000														
Mean no load running torque <sup>b)</sup> (at <i>n</i> <sub>1</sub> = 3000 rpm and 20 °C gearbox temperature)			<i>T</i> <sub>012</sub>	<i>Nm</i>	0.8	0.7	0.6	0.5	0.4	0.4	0.4	0.2	0.2	0.4	0.4	0.3	0.2		
				<i>in.lb</i>	7.1	6.2	5.3	4.4	3.5	3.5	3.5	1.8	1.8	3.5	3.5	2.7	1.8		
Max. backlash			<i>j</i> <sub>t</sub>	<i>arcmin</i>	≤ 3	Standard ≤ 3 / Reduced ≤ 2							Standard ≤ 4 / Reduced ≤ 3						
Torsional rigidity <sup>b)</sup>			<i>C</i> <sub>t21</sub>	<i>Nm/arcmin</i>	4.5							5							
				<i>in.lb/arcmin</i>	40							40							
Max. axial force <sup>c)</sup>			<i>F</i> <sub>2AMax</sub>	<i>N</i>	3000														
				<i>lb<sub>f</sub></i>	675														
Max. lateral force <sup>c)</sup>			<i>F</i> <sub>2QMax</sub>	<i>N</i>	2400														
				<i>lb<sub>f</sub></i>	540														
Max. tilting moment			<i>M</i> <sub>2KMax</sub>	<i>Nm</i>	205														
				<i>in.lb</i>	1814														
Efficiency at full load (at <i>n</i> <sub>1</sub> = 500 rpm)			<i>η</i>	%	93	90	88	82	73	67	86	88	86	71	65	71	65		
Service life <sup>1)</sup>			<i>L</i> <sub>h</sub>	<i>h</i>	> 20000														
Weight (incl. standard adapter plate)			<i>m</i>	<i>kg</i>	5.0							5.6							
				<i>lb<sub>m</sub></i>	11.1							12.0							
Operating noise (at reference ratio and reference speed – ratio-specific values available in cymex <sup>®</sup> )			<i>L</i> <sub>PA</sub>	<i>dB(A)</i>	≤ 54							≤ 58							
Max. permitted housing temperature				°C	+90														
				<i>F</i>	194														
Ambient temperature				°C	-15 to +40														
				<i>F</i>	5 to 104														
Lubrication					Lubricated for life														
Direction of rotation					In- and output same direction														
Protection class					IP 65														
Shrink disc (Standard version)					SD 024x050 S2														
Max. torque (without axial force)			<i>T</i> <sub>max</sub>	<i>Nm</i>	250														
Mass moment of inertia (relates to the drive)  Clamping hub diameter [mm]			C	14	<i>J</i> <sub>1</sub>	<i>kgcm<sup>2</sup></i>	0.56	0.42	0.39	0.37	0.36	0.35	0.16	0.15	0.15	0.16	0.16	0.15	0.15
						<i>10<sup>-3</sup> in.lb.s<sup>2</sup></i>	0.5	0.37	0.35	0.33	0.32	0.31	0.14	0.13	0.13	0.14	0.14	0.13	0.13
			E	19	<i>J</i> <sub>1</sub>	<i>kgcm<sup>2</sup></i>	0.88	0.74	0.7	0.68	0.68	0.67	0.53	0.52	0.52	0.53	0.53	0.52	0.52
<i>10<sup>-3</sup> in.lb.s<sup>2</sup></i>	0.78	0.65				0.62	0.6	0.6	0.59	0.47	0.46	0.46	0.47	0.47	0.46	0.46			

Please use our sizing software cymex<sup>®</sup> for a detailed sizing – [www.wittenstein-cymex.com](http://www.wittenstein-cymex.com)  
Please contact us for optimum sizing at S1 conditions (Continuous operation).

- <sup>a)</sup> At max. 10 % *F*<sub>20Max</sub>  
<sup>b)</sup> Valid for standard clamping hub diameter  
<sup>c)</sup> Refers to center of the output shaft or flange  
<sup>d)</sup> Please reduce input speed at higher ambient temperatures  
<sup>1)</sup> Please contact us to discuss application-specific service lifetimes

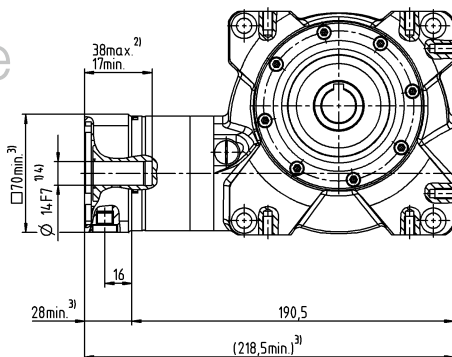
# 1-stage

up to 14/19<sup>4)</sup>  
(C<sup>6)</sup>/E) clamping  
hub diameter



# 2-stage

up to 14/19<sup>4)</sup>  
(C<sup>6)</sup>/E) clamping  
hub diameter



- 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

c) - e): Already included in the scope of delivery of the gearbox

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

Non-tolerated dimensions are nominal dimensions

<sup>1)</sup> Check motor shaft fit.

<sup>2)</sup> Min. / Max. permissible motor shaft length.

Longer motor shafts are adaptable, please contact us.

<sup>3)</sup> The dimensions depend on the motor.

<sup>4)</sup> Smaller motor shaft diameter is compensated by a bushing with a minimum wall thickness of 1 mm.

<sup>5)</sup> Tolerance h6 for mounted shaft.

<sup>6)</sup> Standard clamping hub diameter

# VH+ 050 MF 1-/2-stage

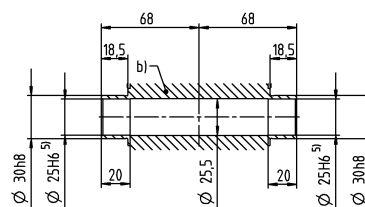
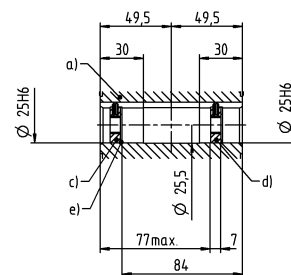
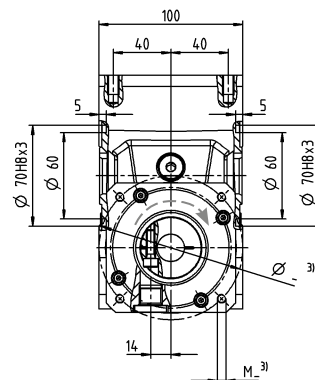
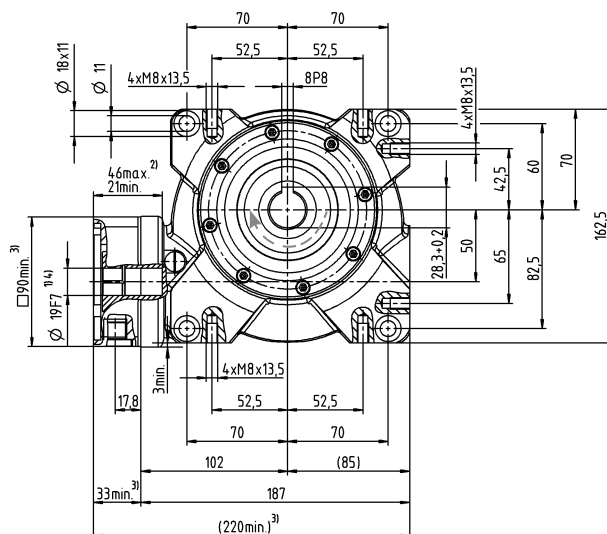
			1-stage							2-stage							
Ratio	<i>i</i>			4	7	10	16	28	40	50	70	100	140	200	280	400	
Max. torque <sup>a) b)</sup> (at <i>n</i> <sub>1</sub> = 500 rpm)	<i>T</i> <sub>2a</sub>		<i>Nm</i>	165	180	182	193	204	183	182	180	182	204	183	204	183	
			<i>in.lb</i>	1460	1593	1611	1708	1805	1620	1611	1593	1611	1805	1620	1805	1620	
Torque for constant backlash (over the lifetime)	<i>T</i> <sub>2Servo</sub>		<i>Nm</i>	54	71	74	81	90	74	74	71	74	90	74	90	74	
			<i>in.lb</i>	478	628	655	717	797	655	655	628	655	797	655	797	655	
Emergency stop torque <sup>a) b)</sup> (permitted 1000 times during the service life of the gearbox)	<i>T</i> <sub>2Not</sub>		<i>Nm</i>	230	242	242	250	262	236	242	242	242	262	236	262	236	
			<i>in.lb</i>	2036	2142	2142	2213	2319	2089	2142	2142	2142	2319	2089	2319	2089	
Permitted average input speed (at 20 °C ambient temperature) <sup>d)</sup>	<i>n</i> <sub>1N</sub>		<i>rpm</i>	4000							3500						
Max. input speed	<i>n</i> <sub>1Max</sub>		<i>rpm</i>	6000													
Mean no load running torque <sup>b)</sup> (at <i>n</i> <sub>1</sub> = 3000 rpm and 20 °C gearbox temperature)	<i>T</i> <sub>012</sub>		<i>Nm</i>	2.3	2.2	1.6	1.5	1.2	1.1	0.7	0.5	0.4	0.6	0.6	0.4	0.4	
			<i>in.lb</i>	20.4	19.5	14.2	13.3	10.6	9.7	6.2	4.4	3.5	5.3	5.3	3.5	3.5	
Max. backlash	<i>j</i> <sub>t</sub>		<i>arcmin</i>	≤ 3	Standard ≤ 3 / Reduced ≤ 2					Standard ≤ 4 / Reduced ≤ 3							
Torsional rigidity <sup>b)</sup>	<i>C</i> <sub>t21</sub>		<i>Nm/arcmin</i>	8													
			<i>in.lb/arcmin</i>	71													
Max. axial force <sup>c)</sup>	<i>F</i> <sub>2AMax</sub>		<i>N</i>	5000													
			<i>lb<sub>f</sub></i>	1125													
Max. lateral force <sup>c)</sup>	<i>F</i> <sub>2QMax</sub>		<i>N</i>	3800													
			<i>lb<sub>f</sub></i>	855													
Max. tilting moment	<i>M</i> <sub>2KMax</sub>		<i>Nm</i>	409													
			<i>in.lb</i>	3620													
Efficiency at full load (at <i>n</i> <sub>1</sub> = 500 rpm)	<i>η</i>		%	92	89	86	82	72	64	84	87	84	70	62	70	62	
Service life <sup>1)</sup>	<i>L</i> <sub>h</sub>		<i>h</i>	> 20000													
Weight (incl. standard adapter plate)	<i>m</i>		<i>kg</i>	8.0							8.7						
			<i>lb<sub>m</sub></i>	17.7							19.0						
Operating noise (at reference ratio and reference speed – ratio-specific values available in cymex <sup>®</sup> )	<i>L</i> <sub>PA</sub>		<i>dB(A)</i>	≤ 62													
Max. permitted housing temperature			°C	+90													
			<i>F</i>	194													
Ambient temperature			°C	-15 to +40													
			<i>F</i>	5 to 104													
Lubrication				Lubricated for life													
Direction of rotation				In- and output same direction													
Protection class				IP 65													
Shrink disc (Standard version)				SD 030x060 S2V													
Max. torque (without axial force)	<i>T</i> <sub>max</sub>		<i>Nm</i>	550													
Mass moment of inertia (relates to the drive) Clamping hub diameter [mm]	C	14	<i>J</i> <sub>1</sub>	<i>kgcm</i> <sup>2</sup>	-	-	-	-	-	-	0.21	0.16	0.16	0.2	0.21	0.16	0.16
				<i>10<sup>-3</sup> in.lb.s</i> <sup>2</sup>	-	-	-	-	-	-	0.19	0.14	0.14	0.18	0.19	0.14	0.14
	E	19	<i>J</i> <sub>1</sub>	<i>kgcm</i> <sup>2</sup>	1.5	1.2	1.1	1.0	0.97	1.0	0.57	0.53	0.53	0.57	0.57	0.53	0.53
				<i>10<sup>-3</sup> in.lb.s</i> <sup>2</sup>	1.0	1.0	0.97	0.89	0.86	0.89	0.5	0.47	0.47	0.5	0.5	0.47	0.47
	G	24	<i>J</i> <sub>1</sub>	<i>kgcm</i> <sup>2</sup>	1.6	1.3	1.2	1.1	1.1	1.2	-	-	-	-	-	-	-
				<i>10<sup>-3</sup> in.lb.s</i> <sup>2</sup>	1.0	1.0	1.0	0.97	0.97	1.0	-	-	-	-	-	-	-

Please use our sizing software cymex<sup>®</sup> for a detailed sizing – [www.wittenstein-cymex.com](http://www.wittenstein-cymex.com)  
Please contact us for optimum sizing at S1 conditions (Continuous operation).

- <sup>a)</sup> At max. 10 %  $F_{2QMax}$
- <sup>b)</sup> Valid for standard clamping hub diameter
- <sup>c)</sup> Refers to center of the output shaft or flange
- <sup>d)</sup> Please reduce input speed at higher ambient temperatures
- <sup>1)</sup> Please contact us to discuss application-specific service lifetimes

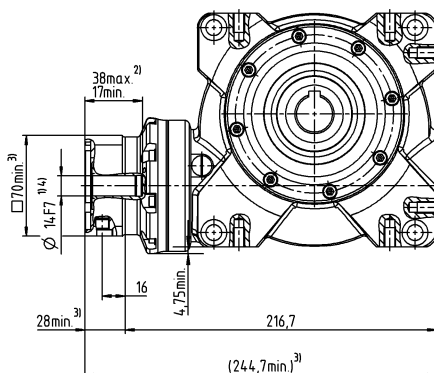
# 1-stage

up to 19/24<sup>4)</sup>  
(E<sup>6)</sup>/G) clamping  
hub diameter



# 2-stage

up to 14/19<sup>4)</sup>  
(C<sup>6)</sup>/E) clamping  
hub diameter



- 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

c) - e): Already included in the scope of delivery of the gearbox

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

Non-tolerated dimensions are nominal dimensions

<sup>1)</sup> Check motor shaft fit.

<sup>2)</sup> Min./Max. permissible motor shaft length.

Longer motor shafts are adaptable, please contact us.

<sup>3)</sup> The dimensions depend on the motor.

<sup>4)</sup> Smaller motor shaft diameter is compensated by a bushing with a minimum wall thickness of 1 mm.

<sup>5)</sup> Tolerance h6 for mounted shaft.

<sup>6)</sup> Standard clamping hub diameter

Motor shaft diameter [mm]

Worm gearboxes

VH+

# VH<sup>+</sup> 063 MF 1-/2-stage

			1-stage							2-stage								
Ratio			i		4	7	10	16	28	40	50	70	100	140	200	280	400	
Max. torque <sup>a) b)</sup> (at n <sub>1</sub> = 500 rpm)			T <sub>2a</sub>	Nm	319	353	364	372	392	363	364	353	364	392	363	392	363	
				in.lb	2823	3124	3221	3292	3469	3213	3221	3124	3221	3469	3213	3469	3213	
Torque for constant backlash (over the lifetime)			T <sub>2Servo</sub>	Nm	198	210	225	221	229	226	225	210	225	229	226	229	226	
				in.lb	1752	1859	1991	1956	2027	2000	1991	1859	1991	2027	2000	2027	2000	
Emergency stop torque <sup>a) b)</sup> (permitted 1000 times during the service life of the gearbox)			T <sub>2Not</sub>	Nm	460	484	491	494	518	447	491	484	494	518	447	518	447	
				in.lb	4071	4283	4345	4372	4584	3956	4345	4283	4372	4584	3956	4584	3956	
Permitted average input speed (at 20 °C ambient temperature) <sup>d)</sup>			n <sub>1N</sub>	rpm	4000							3100						
Max. input speed			n <sub>1Max</sub>	rpm	4500													
Mean no load running torque <sup>b)</sup> (at n <sub>1</sub> = 3000 rpm and 20 °C gearbox temperature)			T <sub>012</sub>	Nm	4.2	3.1	3	2.4	2.3	2.2	1.2	0.7	0.7	1.1	1.1	0.8	0.6	
				in.lb	37.2	27.4	26.6	21.2	20.4	19.5	10.6	6.2	6.2	9.7	9.7	7.1	5.3	
Max. backlash			j <sub>t</sub>	arcmin	≤ 3	Standard ≤ 3 / Reduced ≤ 2					Standard ≤ 4 / Reduced ≤ 3							
Torsional rigidity <sup>b)</sup>			C <sub>t21</sub>	Nm/arcmin	28													
				in.lb/arcmin	248													
Max. axial force <sup>c)</sup>			F <sub>2AMax</sub>	N	8250													
				lb <sub>f</sub>	1856													
Max. lateral force <sup>c)</sup>			F <sub>2QMax</sub>	N	6000													
				lb <sub>f</sub>	1350													
Max. tilting moment			M <sub>2KMax</sub>	Nm	843													
				in.lb	7461													
Efficiency at full load (at n <sub>1</sub> = 500 rpm)			η	%	93	91	88	83	74	68	86	89	86	72	66	72	66	
Service life <sup>1)</sup>			L <sub>h</sub>	h	> 20000													
Weight (incl. standard adapter plate)			m	kg	13.0							13.7						
				lb <sub>m</sub>	28.7							30.0						
Operating noise (at reference ratio and reference speed – ratio-specific values available in cymex <sup>®</sup> )			L <sub>PA</sub>	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													
Direction of rotation					In- and output same direction													
Protection class					IP 65													
Shrink disc (Standard version)					SD 036x072 S2V													
Max. torque (without axial force)			T <sub>max</sub>	Nm	640													
Mass moment of inertia (relates to the drive) Clamping hub diameter [mm]	E	19	J <sub>1</sub>	kgcm <sup>2</sup>	-	-	-	-	-	-	0.75	0.59	0.58	0.75	0.75	0.58	0.58	
				10 <sup>-3</sup> in.lb.s <sup>2</sup>	-	-	-	-	-	-	0.66	0.52	0.51	0.66	0.66	0.51	0.51	
	G	24	J <sub>1</sub>	kgcm <sup>2</sup>	-	-	-	-	-	-	2.3	2.2	2.2	2.3	2.3	2.2	2.2	
				10 <sup>-3</sup> in.lb.s <sup>2</sup>	-	-	-	-	-	-	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
	H	28	J <sub>1</sub>	kgcm <sup>2</sup>	4.9	4.0	3.8	3.7	3.6	3.6	-	-	-	-	-	-	-	
				10 <sup>-3</sup> in.lb.s <sup>2</sup>	4.3	3.5	3.4	3.3	3.2	3.2	-	-	-	-	-	-	-	

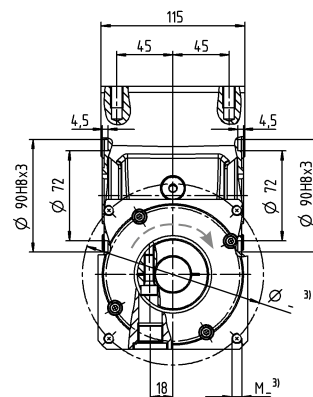
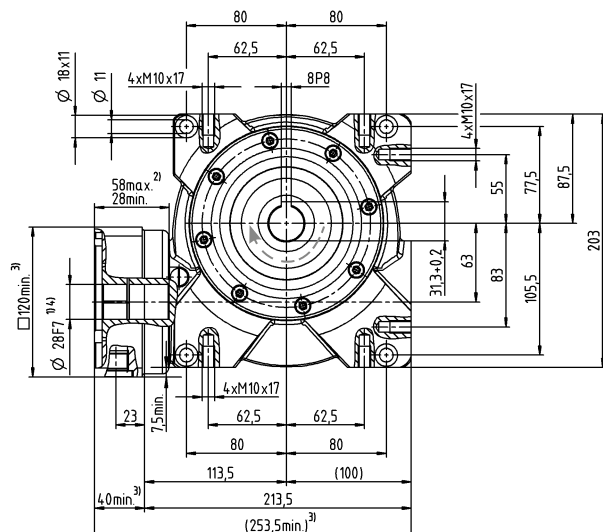
Please use our sizing software cymex<sup>®</sup> for a detailed sizing – [www.wittenstein-cymex.com](http://www.wittenstein-cymex.com)  
Please contact us for optimum sizing at S1 conditions (Continuous operation).

- <sup>a)</sup> At max. 10 %  $F_{2QMax}$
- <sup>b)</sup> Valid for standard clamping hub diameter
- <sup>c)</sup> Refers to center of the output shaft or flange
- <sup>d)</sup> Please reduce input speed at higher ambient temperatures
- <sup>1)</sup> Please contact us to discuss application-specific service lifetimes



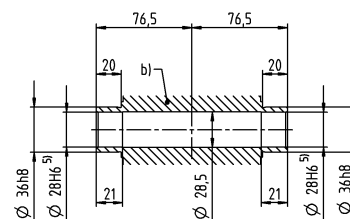
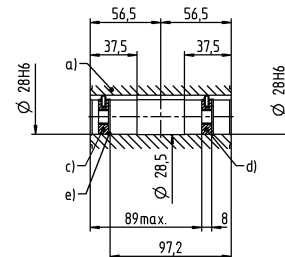
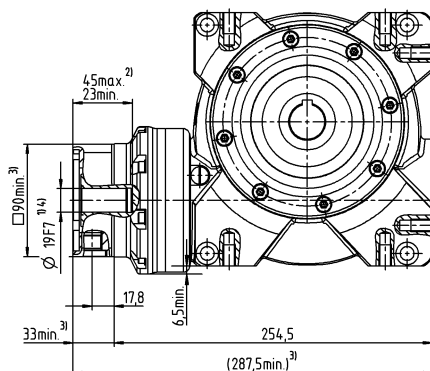
1-stage

up to 28<sup>4)</sup> (H)<sup>6)</sup>  
clamping hub  
diameter



## 2-stage

up to 19/24 <sup>4)</sup>  
(E<sup>6)</sup>/G) clamping  
hub diameter



- a) Hollow shaft, keyed
- b) Hollow shaft, smooth
- c) End disc for screw M10
- d) End disc as forcing washer for screw M12
- e) Locking ring – DIN 472

c) - e): Already included in the scope of delivery of the gearbox

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

Non-tolerated dimensions are nominal dimensions

- 1) Check motor shaft fit.

<sup>2)</sup> Min./Max. permissible motor shaft length.

Longer motor shafts are adaptable, please contact us.

<sup>3)</sup> The dimensions depend on the motor.

4) Smaller motor shaft diameter is compensated by a bushing with a minimum wall thickness of 1 mm.

5) Tolerance h6 for mounted shaft.

<sup>6)</sup> Standard clamping hub diameter



# VH<sup>+</sup> 080 MF 1-/2-stage

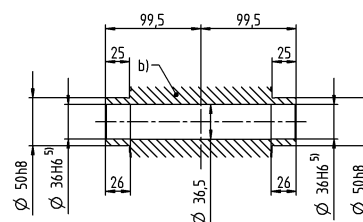
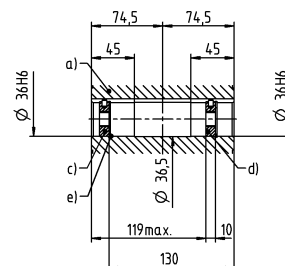
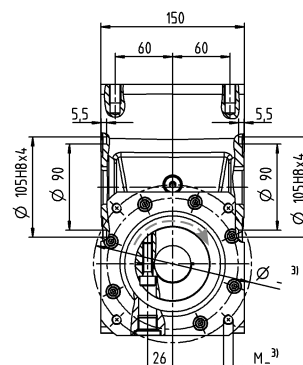
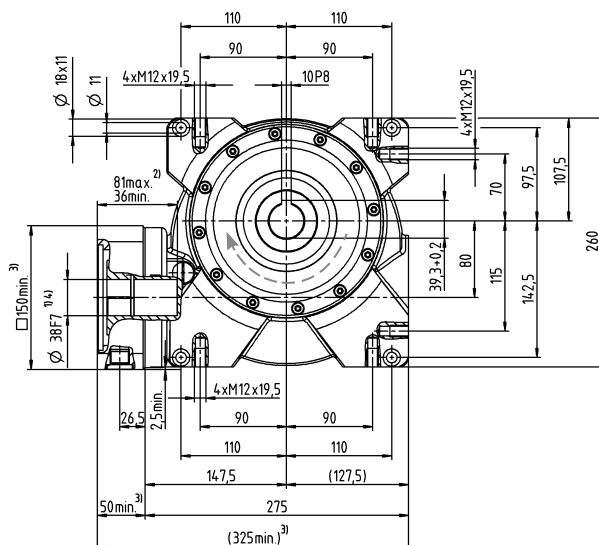
			1-stage							2-stage								
Ratio			<i>i</i>		4	7	10	16	28	40	50	70	100	140	200	280	400	
Max. torque <sup>a) b)</sup> (at <i>n</i> <sub>1</sub> = 500 rpm)			<i>T</i> <sub>2a</sub>	<i>Nm</i>	578	646	672	702	785	676	672	646	672	785	676	785	676	
				<i>in.lb</i>	5115	5717	5947	6213	6947	5983	5947	5717	5947	6947	5983	6947	5983	
Torque for constant backlash (over the lifetime)			<i>T</i> <sub>2Servo</sub>	<i>Nm</i>	469	601	613	677	764	631	613	601	613	764	631	764	631	
				<i>in.lb</i>	4151	5319	5425	5991	6761	5584	5425	5319	5425	6761	5584	6761	5584	
Emergency stop torque <sup>a) b)</sup> (permitted 1000 times during the service life of the gearbox)			<i>T</i> <sub>2Not</sub>	<i>Nm</i>	938	993	963	1005	1064	941	963	993	963	1064	941	1064	941	
				<i>in.lb</i>	8301	8788	8523	8894	9416	8328	8523	8788	8523	9416	8328	9416	8328	
Permitted average input speed (at 20 °C ambient temperature) <sup>d)</sup>			<i>n</i> <sub>1N</sub>	<i>rpm</i>	3500							2900						
Max. input speed			<i>n</i> <sub>1Max</sub>	<i>rpm</i>	4000							4500						
Mean no load running torque <sup>b)</sup> (at <i>n</i> <sub>1</sub> = 3000 rpm and 20 °C gearbox temperature)			<i>T</i> <sub>012</sub>	<i>Nm</i>	7.2	7.1	6.5	5	4.8	4.5	2.8	1.6	1.5	2.4	2.4	1.8	1.3	
				<i>in.lb</i>	63.7	62.8	57.5	44.3	42.5	39.8	24.8	14.2	13.3	21.2	21.2	15.9	11.5	
Max. backlash			<i>j</i> <sub>t</sub>	<i>arcmin</i>	≤ 3	Standard ≤ 3 / Reduced ≤ 2					Standard ≤ 4 / Reduced ≤ 3							
Torsional rigidity <sup>b)</sup>			<i>C</i> <sub>t21</sub>	<i>Nm/arcmin</i>	78													
				<i>in.lb/arcmin</i>	690													
Max. axial force <sup>c)</sup>			<i>F</i> <sub>2AMax</sub>	<i>N</i>	13900													
				<i>lb<sub>f</sub></i>	3128													
Max. lateral force <sup>c)</sup>			<i>F</i> <sub>2QMax</sub>	<i>N</i>	9000													
				<i>lb<sub>f</sub></i>	2025													
Max. tilting moment			<i>M</i> <sub>2KMax</sub>	<i>Nm</i>	1544													
				<i>in.lb</i>	13664													
Efficiency at full load (at <i>n</i> <sub>1</sub> = 500 rpm)			<i>η</i>	%	94	92	89	86	77	70	87	90	87	75	68	75	68	
Service life <sup>f)</sup>			<i>L</i> <sub>h</sub>	<i>h</i>	> 20000													
Weight (incl. standard adapter plate)			<i>m</i>	<i>kg</i>	27.0							29.5						
				<i>lb<sub>m</sub></i>	59.7							68.0						
Operating noise (at reference ratio and reference speed – ratio-specific values available in cymex®)			<i>L</i> <sub>PA</sub>	<i>dB(A)</i>	≤ 66							≤ 68						
Max. permitted housing temperature				°C	+90													
				<i>F</i>	194													
Ambient temperature				°C	-15 to +40													
				<i>F</i>	5 to 104													
Lubrication					Lubricated for life													
Direction of rotation					In- and output same direction													
Protection class					IP 65													
Shrink disc (Standard version)					SD 050x090 S2V													
Max. torque (without axial force)			<i>T</i> <sub>max</sub>	<i>Nm</i>	1400													
Mass moment of inertia (relates to the drive)	G	24	<i>J</i> <sub>1</sub>	<i>kgcm²</i>	-	-	-	-	-	-	3.0	2.4	2.4	3.0	3.0	2.4	2.4	
				<i>10<sup>-3</sup> in.lb.s²</i>	-	-	-	-	-	-	2.7	2.1	2.1	2.7	2.7	2.1	2.1	
	K	38	<i>J</i> <sub>1</sub>	<i>kgcm²</i>	19.8	16.3	16.3	14.9	14.8	15.4	10.2	9.5	9.5	10.1	10.2	9.5	9.5	
<i>10<sup>-3</sup> in.lb.s²</i>				17.5	14.4	14.4	13.2	13.1	13.6	9.0	8.4	8.4	8.9	9.0	8.4	8.4		

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Please contact us for optimum sizing at S1 conditions (Continuous operation).

- <sup>a)</sup> At max. 10 %  $F_{2QMax}$
- <sup>b)</sup> Valid for standard clamping hub diameter
- <sup>c)</sup> Refers to center of the output shaft or flange
- <sup>d)</sup> Please reduce input speed at higher ambient temperatures
- <sup>f)</sup> Please contact us to discuss application-specific service lifetimes

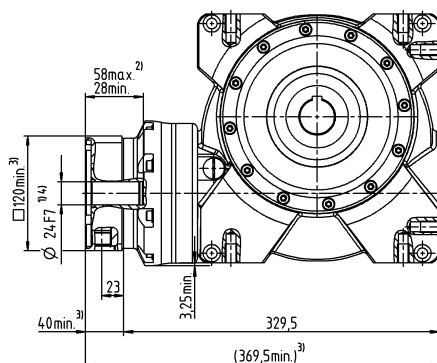
# 1-stage

up to 38<sup>4)</sup> (K)<sup>6)</sup>  
clamping hub  
diameter



# 2-stage

up to 24/38<sup>4)</sup>  
(G<sup>6)</sup>/K) clamping  
hub diameter



- 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

c) - e): Already included in the scope of delivery of the gearbox

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

Non-tolerated dimensions are nominal dimensions

<sup>1)</sup> Check motor shaft fit.

<sup>2)</sup> Min. / Max. permissible motor shaft length.

Longer motor shafts are adaptable, please contact us.

<sup>3)</sup> The dimensions depend on the motor.

<sup>4)</sup> Smaller motor shaft diameter is compensated by a bushing with a minimum wall thickness of 1 mm.

<sup>5)</sup> Tolerance h6 for mounted shaft.

<sup>6)</sup> Standard clamping hub diameter

Motor shaft diameter [mm]

Worm gearboxes

VH+

# VH<sup>+</sup> 100 MF 1-/2-stage

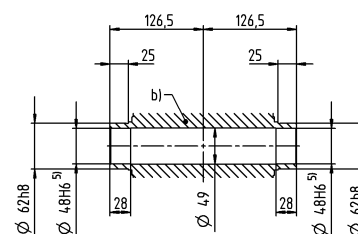
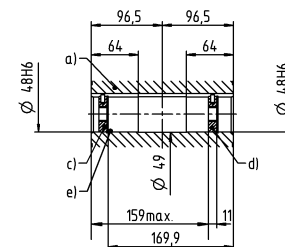
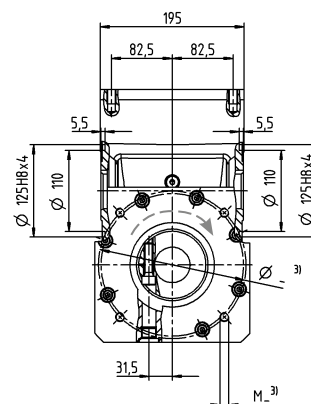
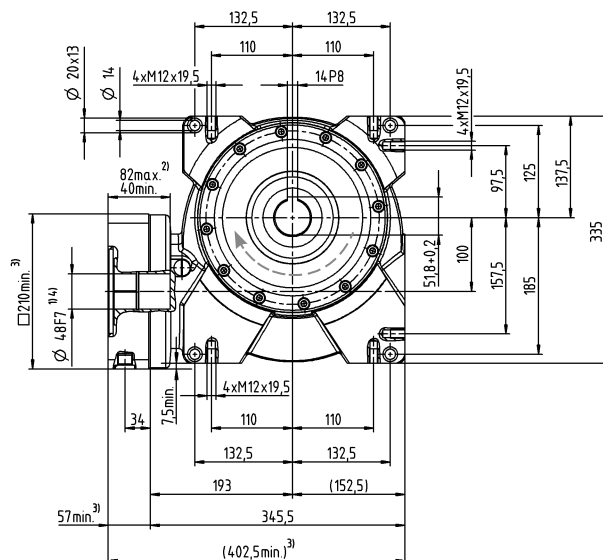
			1-stage							2-stage									
Ratio			<i>i</i>		4	7	10	16	28	40	50	70	100	140	200	280	400		
Max. torque <sup>a) b)</sup> (at <i>n</i> <sub>1</sub> = 500 rpm)			<i>T</i> <sub>2a</sub>	<i>Nm</i>	1184	1336	1377	1392	1505	1376	1377	1336	1377	1505	1376	1505	1376		
				<i>in.lb</i>	10478	11824	12186	12319	13319	12178	12186	11825	12186	13319	12178	13319	12178		
Torque for constant backlash (over the lifetime)			<i>T</i> <sub>2Servo</sub>	<i>Nm</i>	1155	1304	1343	1359	1469	1343	1343	1304	1343	1469	1343	1469	1343		
				<i>in.lb</i>	10222	11540	11886	12027	13001	11886	11886	11541	11886	13001	11886	13001	11886		
Emergency stop torque <sup>a) b)</sup> (permitted 1000 times during the service life of the gearbox)			<i>T</i> <sub>2Not</sub>	<i>Nm</i>	1819	1932	1940	1955	2073	1856	1940	1940	1940	2073	1856	2073	1856		
				<i>in.lb</i>	16098	17098	17169	17302	18346	16426	17169	17169	17169	18346	16426	18346	16426		
Permitted average input speed (at 20 °C ambient temperature) <sup>d)</sup>			<i>n</i> <sub>1N</sub>	<i>rpm</i>	3000							2700							
Max. input speed			<i>n</i> <sub>1Max</sub>	<i>rpm</i>	3500							4000							
Mean no load running torque <sup>b)</sup> (at <i>n</i> <sub>1</sub> = 3000 rpm and 20 °C gearbox temperature)			<i>T</i> <sub>012</sub>	<i>Nm</i>	12.2	10.5	9.8	9.1	8.2	7.2	4.1	2.3	2.2	3.8	3.6	2.6	2		
				<i>in.lb</i>	108.0	92.9	86.7	80.5	72.6	63.7	36.3	20.4	19.5	33.6	31.9	23.0	17.7		
Max. backlash			<i>j</i> <sub>t</sub>	<i>arcmin</i>	≤ 3	Standard ≤ 3 / Reduced ≤ 2					Standard ≤ 4 / Reduced ≤ 3								
Torsional rigidity <sup>b)</sup>			<i>C</i> <sub>t21</sub>	<i>Nm/arcmin</i>	153														
				<i>in.lb/arcmin</i>	1354														
Max. axial force <sup>c)</sup>			<i>F</i> <sub>2AMax</sub>	<i>N</i>	19500														
				<i>lb<sub>f</sub></i>	4388														
Max. lateral force <sup>c)</sup>			<i>F</i> <sub>2QMax</sub>	<i>N</i>	14000														
				<i>lb<sub>f</sub></i>	3150														
Max. tilting moment			<i>M</i> <sub>2KMax</sub>	<i>Nm</i>	3059														
				<i>in.lb</i>	27072														
Efficiency at full load (at <i>n</i> <sub>1</sub> = 500 rpm)			<i>η</i>	%	95	93	91	87	80	76	89	89	89	78	74	78	74		
Service life <sup>f)</sup>			<i>L</i> <sub>h</sub>	<i>h</i>	> 20000														
Weight (incl. standard adapter plate)			<i>m</i>	<i>kg</i>	51.0							53.6							
				<i>lb<sub>m</sub></i>	112.7							118.0							
Operating noise (at reference ratio and reference speed – ratio-specific values available in cymex®)			<i>L</i> <sub>PA</sub>	<i>dB(A)</i>	≤ 70														
Max. permitted housing temperature				°C	+90														
				<i>F</i>	194														
Ambient temperature				°C	-15 to +40														
				<i>F</i>	5 to 104														
Lubrication					Lubricated for life														
Direction of rotation					In- and output same direction														
Protection class					IP 65														
Shrink disc (Standard version)					SD 062x110 S2V														
Max. torque (without axial force)			<i>T</i> <sub>max</sub>	<i>Nm</i>	2300														
Mass moment of inertia (relates to the drive)  Clamping hub diameter [mm]			K	38	<i>J</i> <sub>1</sub>	<i>kgcm<sup>2</sup></i>	-	-	-	-	-	-	11.9	10.0	10.0	11.8	11.8	10.0	10.0
						<i>10<sup>-3</sup> in.lb.s<sup>2</sup></i>	-	-	-	-	-	-	10.5	8.9	8.9	10.4	10.4	8.9	8.9
			M	48	<i>J</i> <sub>1</sub>	<i>kgcm<sup>2</sup></i>	53.4	43.8	41.9	42.7	40.3	40.6	26.9	25.1	25.0	26.8	26.9	25.0	25.0
<i>10<sup>-3</sup> in.lb.s<sup>2</sup></i>	47.3	38.8				27.1	37.8	35.7	35.9	23.8	22.2	22.1	23.7	23.8	22.1	22.1			

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Please contact us for optimum sizing at S1 conditions (Continuous operation).

- <sup>a)</sup> At max. 10 % *F*<sub>2QMax</sub>
- <sup>b)</sup> Valid for standard clamping hub diameter
- <sup>c)</sup> Refers to center of the output shaft or flange
- <sup>d)</sup> Please reduce input speed at higher ambient temperatures
- <sup>f)</sup> Please contact us to discuss application-specific service lifetimes

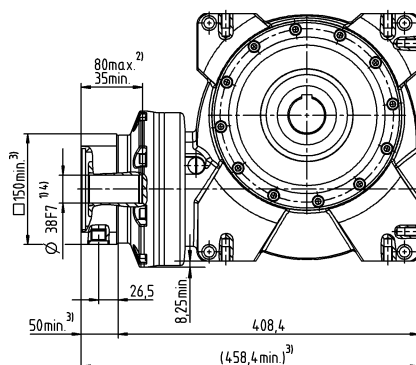
# 1-stage

up to 48<sup>4)</sup> (M)<sup>6)</sup>  
clamping hub  
diameter



# 2-stage

up to 38/48<sup>4)</sup>  
(K<sup>6)</sup>/M) clamping  
hub diameter



- 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

c) - e): Already included in the scope of delivery of the gearbox

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

Non-tolerated dimensions are nominal dimensions

<sup>1)</sup> Check motor shaft fit.

<sup>2)</sup> Min./Max. permissible motor shaft length.

Longer motor shafts are adaptable, please contact us.

<sup>3)</sup> The dimensions depend on the motor.

<sup>4)</sup> Smaller motor shaft diameter is compensated by a bushing with a minimum wall thickness of 1 mm.

<sup>5)</sup> Tolerance h6 for mounted shaft.

<sup>6)</sup> Standard clamping hub diameter

# VS+ 050 MF 1-/2-stage

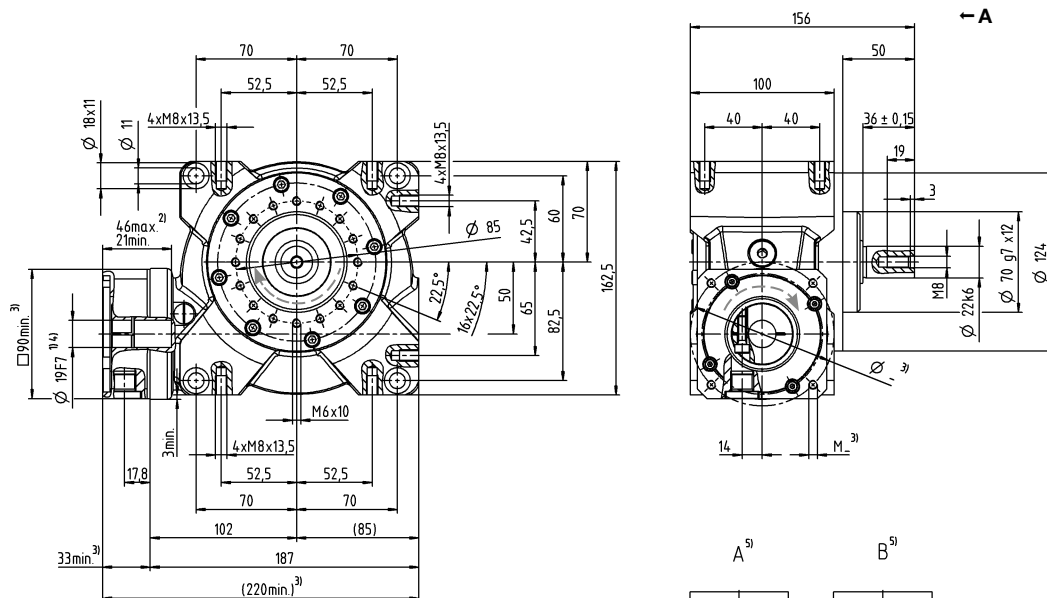
			1-stage							2-stage								
Ratio			i		4	7	10	16	28	40	50	70	100	140	200	280	400	
Max. torque <sup>a) b) e)</sup> (at n <sub>1</sub> = 500 rpm)			T <sub>2a</sub>	Nm	165	180	182	193	204	183	182	180	182	204	183	204	183	
				in.lb	1460	1593	1611	1708	1805	1620	1611	1593	1611	1805	1620	1805	1620	
Torque for constant backlash (over the lifetime)			T <sub>2Servo</sub>	Nm	54	71	74	81	90	74	74	71	74	90	74	90	74	
				in.lb	478	628	655	717	797	655	655	628	655	797	655	797	655	
Emergency stop torque <sup>a) b) e)</sup> (permitted 1000 times during the service life of the gearbox)			T <sub>2Not</sub>	Nm	230	242	242	250	262	236	242	242	242	262	236	262	236	
				in.lb	2036	2142	2142	2213	2319	2089	2142	2142	2142	2319	2089	2319	2089	
Permitted average input speed (at 20 °C ambient temperature) <sup>d)</sup>			n <sub>1N</sub>	rpm	4000							3500						
Max. input speed			n <sub>1Max</sub>	rpm	6000													
Mean no load running torque <sup>b)</sup> (at n <sub>1</sub> = 3000 rpm and 20 °C gearbox temperature)			T <sub>012</sub>	Nm	2.3	2.2	1.6	1.5	1.2	1.1	0.7	0.5	0.4	0.6	0.6	0.4	0.4	
				in.lb	20.4	19.5	14.2	13.3	10.6	9.7	6.2	4.4	3.5	5.3	5.3	3.5	3.5	
Max. backlash			j <sub>t</sub>	arcmin	≤ 3	Standard ≤ 3 / Reduced ≤ 2					Standard ≤ 4 / Reduced ≤ 3							
Torsional rigidity <sup>b)</sup>			C <sub>t21</sub>	Nm/arcmin	8													
				in.lb/arcmin	71													
Max. axial force <sup>c)</sup>			F <sub>2AMax</sub>	N	5000													
				lb <sub>f</sub>	1125													
Max. lateral force <sup>c)</sup>			F <sub>2QMax</sub>	N	3800													
				lb <sub>f</sub>	855													
Max. tilting moment			M <sub>2KMax</sub>	Nm	409													
				in.lb	3620													
Efficiency at full load (at n <sub>1</sub> = 500 rpm)			η	%	92	89	86	82	72	64	84	87	84	70	62	70	62	
Service life <sup>f)</sup>			L <sub>h</sub>	h	> 20000													
Weight (incl. standard adapter plate)			m	kg	9.0							9.7						
				lb <sub>m</sub>	19.9							21.0						
Operating noise (at reference ratio and reference speed – ratio-specific values available in cymex®)			L <sub>PA</sub>	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													
Direction of rotation					In- and output same direction													
Protection class					IP 65													
Metal bellows coupling (recommended product type – validate sizing with cymex®)					BC3 - 00200A - 022.000 - X													
Bore diameter of coupling on the application side				mm	X = 015.000 - 044.000													
Mass moment of inertia (relates to the drive) Clamping hub diameter [mm]	C	14	J <sub>1</sub>	kgcm <sup>2</sup>	-	-	-	-	-	-	0.21	0.16	0.16	0.2	0.21	0.16	0.16	
				10 <sup>-3</sup> in.lb.s <sup>2</sup>	-	-	-	-	-	-	0.19	0.14	0.14	0.18	0.19	0.14	0.14	
	E	19	J <sub>1</sub>	kgcm <sup>2</sup>	1.5	1.2	1.1	1.0	0.97	1.0	0.57	0.53	0.53	0.57	0.57	0.53	0.53	
				10 <sup>-3</sup> in.lb.s <sup>2</sup>	1.3	1.1	0.97	0.89	0.86	0.89	0.5	0.47	0.47	0.5	0.5	0.47	0.47	
	G	24	J <sub>1</sub>	kgcm <sup>2</sup>	1.6	1.3	1.2	1.1	1.1	1.2	-	-	-	-	-	-	-	
				10 <sup>-3</sup> in.lb.s <sup>2</sup>	1.4	1.2	1.1	0.97	0.97	1.1	-	-	-	-	-	-	-	

Please use our sizing software cymex® for a detailed sizing – [www.wittenstein-cymex.com](http://www.wittenstein-cymex.com)  
Please contact us for optimum sizing at S1 conditions (Continuous operation).

- <sup>a)</sup> At max. 10 %  $F_{2QMax}$
- <sup>b)</sup> Valid for standard clamping hub diameter
- <sup>c)</sup> Refers to center of the output shaft or flange
- <sup>d)</sup> Please reduce input speed at higher ambient temperatures
- <sup>e)</sup> Smooth shaft
- <sup>f)</sup> Please contact us to discuss application-specific service lifetimes

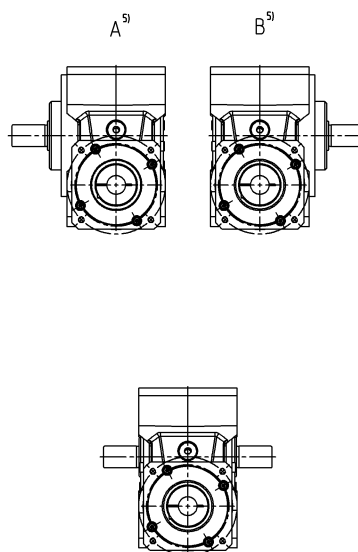
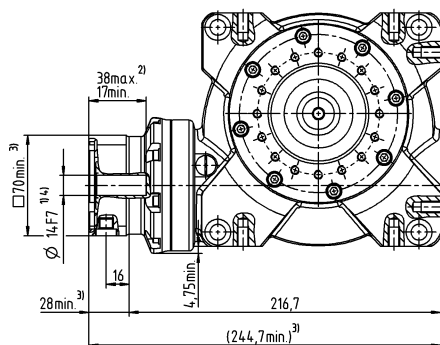
# 1-stage

up to 19/24<sup>4)</sup>  
(E<sup>6)</sup>/G) clamping  
hub diameter



# 2-stage

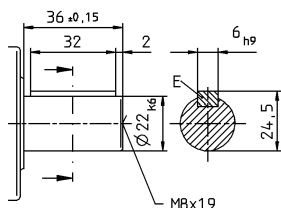
up to 14/19<sup>4)</sup>  
(C<sup>6)</sup>/E) clamping  
hub diameter



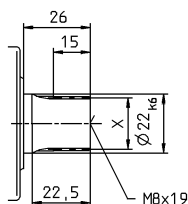
Optional dual-shaft output. Drawings available upon request.  
Involute gearing is not possible.

## Other output variants

### Shaft with key



### Splined shaft (DIN 5480)



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

Non-tolerated dimensions are nominal dimensions

<sup>1)</sup> Check motor shaft fit.

<sup>2)</sup> Min./Max. permissible motor shaft length.

Longer motor shafts are adaptable, please contact us.

<sup>3)</sup> The dimensions depend on the motor.

<sup>4)</sup> Smaller motor shaft diameter is compensated by a  
bushing with a minimum wall thickness of 1 mm.

<sup>5)</sup> Output side

<sup>6)</sup> Standard clamping hub diameter

# VS+ 063 MF 1-/2-stage

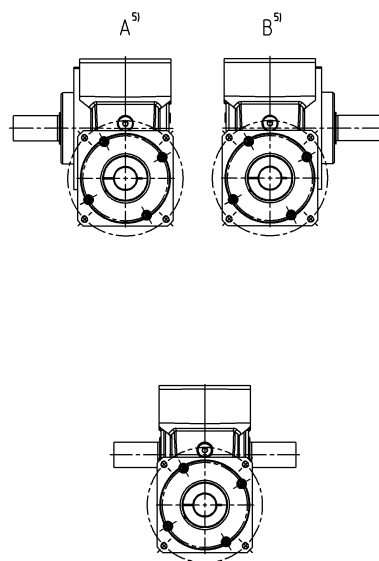
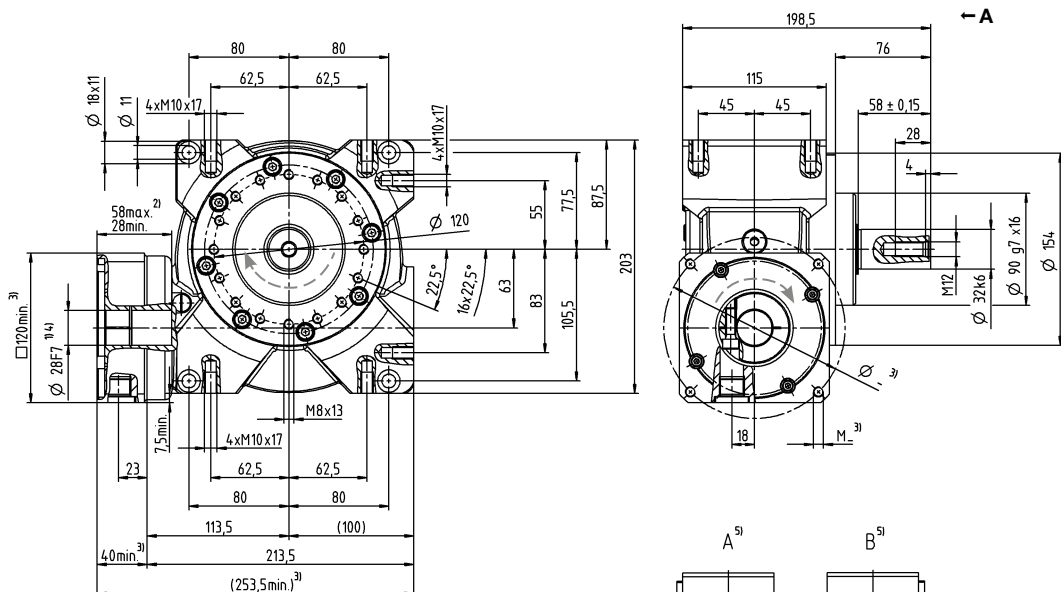
			1-stage							2-stage								
Ratio			i		4	7	10	16	28	40	50	70	100	140	200	280	400	
Max. torque <sup>a) b) e)</sup> (at n <sub>1</sub> = 500 rpm)			T <sub>2a</sub>	Nm	319	353	364	372	392	363	364	353	364	392	363	392	363	
				in.lb	2823	3124	3221	3292	3469	3213	3221	3124	3221	3469	3213	3469	3213	
Torque for constant backlash (over the lifetime)			T <sub>2Servo</sub>	Nm	198	210	225	221	229	226	225	210	225	229	226	229	226	
				in.lb	1752	1859	1991	1956	2027	2000	1991	1859	1991	2027	2000	2027	2000	
Emergency stop torque <sup>a) b) e)</sup> (permitted 1000 times during the service life of the gearbox)			T <sub>2Not</sub>	Nm	460	484	491	494	518	447	491	484	494	518	447	518	447	
				in.lb	4071	4283	4345	4372	4584	3956	4345	4283	4372	4584	3956	4584	3956	
Permitted average input speed (at 20 °C ambient temperature) <sup>d)</sup>			n <sub>1N</sub>	rpm	4000							3100						
Max. input speed			n <sub>1Max</sub>	rpm	4500													
Mean no load running torque <sup>b)</sup> (at n <sub>1</sub> = 3000 rpm and 20 °C gearbox temperature)			T <sub>012</sub>	Nm	4.2	3.1	3	2.4	2.3	2.2	1.2	0.7	0.7	1.1	1.1	0.8	0.6	
				in.lb	37.2	27.4	26.6	21.2	20.4	19.5	10.6	6.2	6.2	9.7	9.7	7.1	5.3	
Max. backlash			j <sub>t</sub>	arcmin	≤ 3	Standard ≤ 3 / Reduced ≤ 2					Standard ≤ 4 / Reduced ≤ 3							
Torsional rigidity <sup>b)</sup>			C <sub>t21</sub>	Nm/arcmin	28													
				in.lb/arcmin	248													
Max. axial force <sup>c)</sup>			F <sub>2AMax</sub>	N	8250													
				lb <sub>f</sub>	1856													
Max. lateral force <sup>c)</sup>			F <sub>2QMax</sub>	N	6000													
				lb <sub>f</sub>	1350													
Max. tilting moment			M <sub>2KMax</sub>	Nm	843													
				in.lb	7461													
Efficiency at full load (at n <sub>1</sub> = 500 rpm)			η	%	93	91	88	83	74	68	86	89	86	72	66	72	66	
Service life <sup>f)</sup>			L <sub>h</sub>	h	> 20000													
Weight (incl. standard adapter plate)			m	kg	16.0							16.7						
				lb <sub>m</sub>	35.4							37.0						
Operating noise (at reference ratio and reference speed – ratio-specific values available in cymex®)			L <sub>PA</sub>	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													
Direction of rotation					In- and output same direction													
Protection class					IP 65													
Metal bellows coupling (recommended product type – validate sizing with cymex®)					BC3 - 00500A - 032.000 - X													
Bore diameter of coupling on the application side				mm	X = 024.000 - 056.000													
Mass moment of inertia (relates to the drive) Clamping hub diameter [mm]	E	19	J <sub>1</sub>	kgcm <sup>2</sup>	-	-	-	-	-	-	0.75	0.59	0.58	0.75	0.75	0.58	0.58	
				10 <sup>-3</sup> in.lb.s <sup>2</sup>	-	-	-	-	-	-	0.66	0.52	0.51	0.66	0.66	0.51	0.51	
	G	24	J <sub>1</sub>	kgcm <sup>2</sup>	-	-	-	-	-	-	2.3	2.2	2.2	2.3	2.3	2.2	2.2	
				10 <sup>-3</sup> in.lb.s <sup>2</sup>	-	-	-	-	-	-	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
	H	28	J <sub>1</sub>	kgcm <sup>2</sup>	4.9	4.0	3.8	3.7	3.6	3.6	-	-	-	-	-	-	-	
				10 <sup>-3</sup> in.lb.s <sup>2</sup>	4.3	3.5	3.4	3.3	3.2	3.2	-	-	-	-	-	-	-	

Please use our sizing software cymex® for a detailed sizing – [www.wittenstein-cymex.com](http://www.wittenstein-cymex.com)  
Please contact us for optimum sizing at S1 conditions (Continuous operation).

- <sup>a)</sup> At max. 10 %  $F_{2QMax}$
- <sup>b)</sup> Valid for standard clamping hub diameter
- <sup>c)</sup> Refers to center of the output shaft or flange
- <sup>d)</sup> Please reduce input speed at higher ambient temperatures
- <sup>e)</sup> Smooth shaft
- <sup>f)</sup> Please contact us to discuss application-specific service lifetimes

1-stage

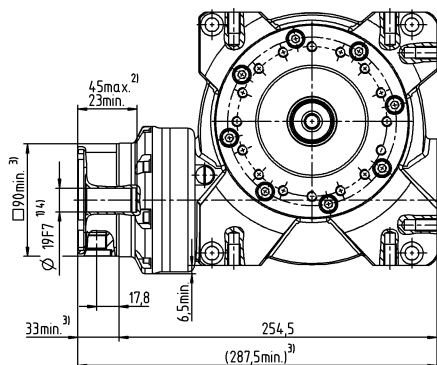
up to 28<sup>4)</sup> (H)<sup>6)</sup>  
clamping hub  
diameter



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

## 2-stage

up to 19/24 <sup>4)</sup>  
(E<sup>6</sup>)/G) clamping  
hub diameter

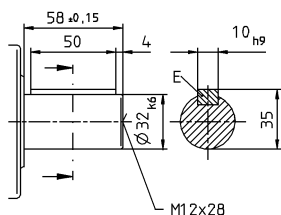


Motor shaft diameter [mm]

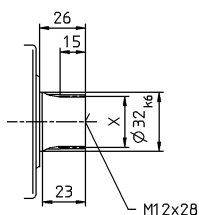
VS<sup>+</sup>

## Other output variants

Shaft with key



Splined shaft (DIN 5480)



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

Non-tolerated dimensions are nominal dimensions

- 1) Check motor shaft fit.

<sup>2)</sup> Min. / Max. permissible motor shaft length.

Longer 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 wall thickness of 1 mm.

5) Output side

<sup>6)</sup> Standard clamping hub diameter



# VS<sup>+</sup> 080 MF 1-/2-stage

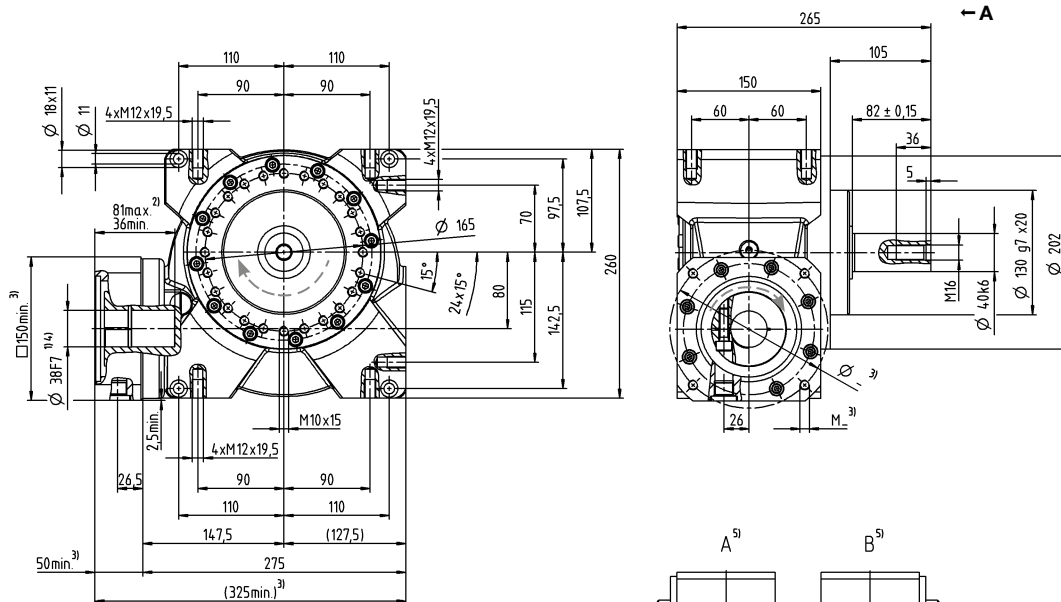
				1-stage							2-stage								
Ratio			<i>i</i>		4	7	10	16	28	40	50	70	100	140	200	280	400		
Max. torque <sup>a) b) e)</sup> (at <i>n</i> <sub>1</sub> = 500 rpm)			<i>T</i> <sub>2a</sub>	<i>Nm</i>	578	646	672	702	785	676	672	646	672	785	676	785	676		
				<i>in.lb</i>	5115	5717	5947	6213	6947	5983	5947	5717	5947	6947	5983	6947	5983		
Torque for constant backlash (over the lifetime)			<i>T</i> <sub>2Servo</sub>	<i>Nm</i>	469	601	613	677	764	631	613	601	613	764	631	764	631		
				<i>in.lb</i>	4151	5319	5425	5991	6761	5584	5425	5319	5425	6761	5584	6761	5584		
Emergency stop torque <sup>a) b) e)</sup> (permitted 1000 times during the service life of the gearbox)			<i>T</i> <sub>2Not</sub>	<i>Nm</i>	938	993	963	1005	1064	941	963	993	963	1064	941	1064	941		
				<i>in.lb</i>	8301	8788	8523	8894	9416	8328	8523	8788	8523	9416	8328	9416	8328		
Permitted average input speed (at 20 °C ambient temperature) <sup>d)</sup>			<i>n</i> <sub>1N</sub>	<i>rpm</i>	3500							2900							
Max. input speed			<i>n</i> <sub>1Max</sub>	<i>rpm</i>	4000							4500							
Mean no load running torque <sup>b)</sup> (at <i>n</i> <sub>1</sub> = 3000 rpm and 20 °C gearbox temperature)			<i>T</i> <sub>012</sub>	<i>Nm</i>	7.2	7.1	6.5	5	4.8	4.5	2.8	1.6	1.5	2.4	2.4	1.8	1.3		
				<i>in.lb</i>	63.7	62.8	57.5	44.3	42.5	39.8	24.8	14.2	13.3	21.2	21.2	15.9	11.5		
Max. backlash			<i>j</i> <sub>t</sub>	<i>arcmin</i>	≤ 3	Standard ≤ 3 / Reduced ≤ 2					Standard ≤ 4 / Reduced ≤ 3								
Torsional rigidity <sup>b)</sup>			<i>C</i> <sub>t21</sub>	<i>Nm/arcmin</i>	78														
				<i>in.lb/arcmin</i>	690														
Max. axial force <sup>c)</sup>			<i>F</i> <sub>2AMax</sub>	<i>N</i>	13900														
				<i>lb<sub>f</sub></i>	3128														
Max. lateral force <sup>c)</sup>			<i>F</i> <sub>2QMax</sub>	<i>N</i>	9000														
				<i>lb<sub>f</sub></i>	2025														
Max. tilting moment			<i>M</i> <sub>2KMax</sub>	<i>Nm</i>	1544														
				<i>in.lb</i>	13664														
Efficiency at full load (at <i>n</i> <sub>1</sub> = 500 rpm)			<i>η</i>	%	94	92	89	86	77	70	87	90	87	75	68	75	68		
Service life <sup>f)</sup>			<i>L</i> <sub>h</sub>	<i>h</i>	> 20000														
Weight (incl. standard adapter plate)			<i>m</i>	<i>kg</i>	33.0							35.5							
				<i>lb<sub>m</sub></i>	72.9							78.0							
Operating noise (at reference ratio and reference speed – ratio-specific values available in cymex®)			<i>L</i> <sub>PA</sub>	<i>dB(A)</i>	≤ 66							≤ 68							
Max. permitted housing temperature				°C	+90														
				<i>F</i>	194														
Ambient temperature				°C	-15 to +40														
				<i>F</i>	5 to 104														
Lubrication					Lubricated for life														
Direction of rotation					In- and output same direction														
Protection class					IP 65														
Metal bellows coupling (recommended product type – validate sizing with cymex®)					BC3 - 00800A - 040.000 - X														
Bore diameter of coupling on the application side				<i>mm</i>	X = 030.000 - 060.000														
Mass moment of inertia (relates to the drive)  Clamping hub diameter [mm]			G	24	<i>J</i> <sub>1</sub>	<i>kgcm</i> <sup>2</sup>	-	-	-	-	-	-	3.0	2.4	2.4	3.0	3.0	2.4	2.4
						<i>10<sup>-3</sup> in.lb.s</i> <sup>2</sup>	-	-	-	-	-	-	2.0	2.1	2.1	2.7	2.7	2.1	2.1
			K	38	<i>J</i> <sub>1</sub>	<i>kgcm</i> <sup>2</sup>	19.8	16.3	16.3	14.9	14.8	15.4	10.2	9.5	9.5	10.1	10.2	9.5	9.5
<i>10<sup>-3</sup> in.lb.s</i> <sup>2</sup>	17.5	14.4				14.4	13.2	13.1	13.6	9.0	8.4	8.4	8.9	9.0	8.4	8.4			

Please use our sizing software cymex<sup>®</sup> for a detailed sizing – [www.wittenstein-cymex.com](http://www.wittenstein-cymex.com)  
Please contact us for optimum sizing at S1 conditions (Continuous operation).

- <sup>a)</sup> At max. 10 %  $F_{2QMax}$
- <sup>b)</sup> Valid for standard clamping hub diameter
- <sup>c)</sup> Refers to center of the output shaft or flange
- <sup>d)</sup> Please reduce input speed at higher ambient temperatures
- <sup>e)</sup> Smooth shaft
- <sup>f)</sup> Please contact us to discuss application-specific service lifetimes

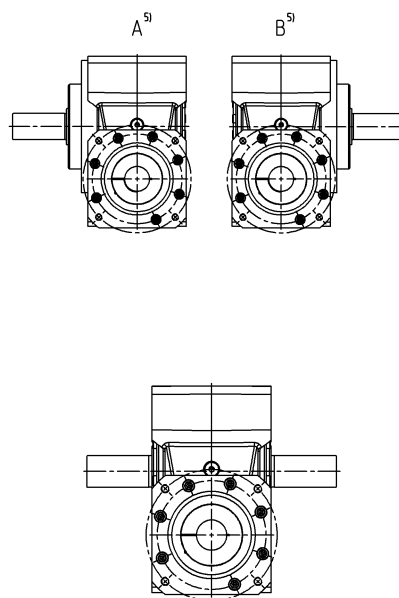
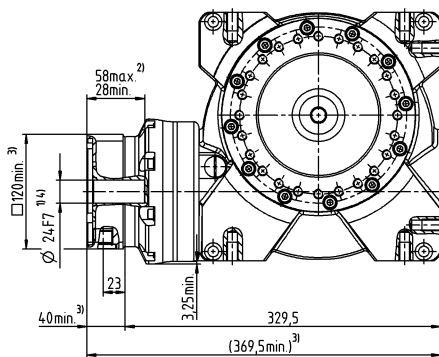
# 1-stage

up to 38<sup>4)</sup> (K)<sup>6)</sup>  
clamping hub diameter



# 2-stage

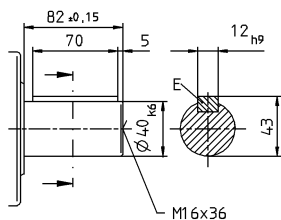
up to 24/38<sup>4)</sup>  
(G<sup>6)</sup>/K) clamping hub diameter



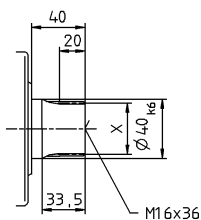
Optional dual-shaft output. Drawings available upon request.  
Involute gearing is not possible.

## Other output variants

### Shaft with key



### Splined shaft (DIN 5480)



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

Non-tolerated dimensions are nominal dimensions

<sup>1)</sup> Check motor shaft fit.

<sup>2)</sup> Min./Max. permissible motor shaft length.

Longer motor shafts are adaptable, please contact us.

<sup>3)</sup> The dimensions depend on the motor.

<sup>4)</sup> Smaller motor shaft diameter is compensated by a  
bushing with a minimum wall thickness of 1 mm.

<sup>5)</sup> Output side

<sup>6)</sup> Standard clamping hub diameter

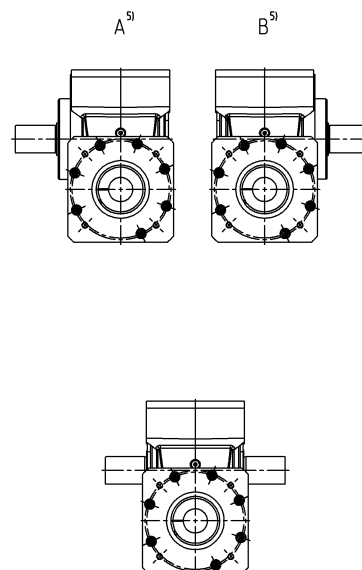
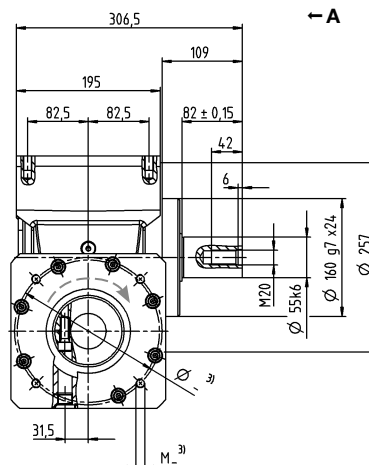
# VS+ 100 MF 1-/2-stage

			1-stage							2-stage							
Ratio	<i>i</i>			4	7	10	16	28	40	50	70	100	140	200	280	400	
Max. torque <sup>a) b) e)</sup> (at <i>n</i> <sub>1</sub> = 500 rpm)	<i>T</i> <sub>2a</sub>		<i>Nm</i>	1184	1336	1377	1392	1505	1376	1377	1336	1377	1505	1376	1505	1376	
			<i>in.lb</i>	10478	11824	12186	12319	13319	12178	12186	11825	12186	13319	12178	13319	12178	
Torque for constant backlash (over the lifetime)	<i>T</i> <sub>2Servo</sub>		<i>Nm</i>	1155	1304	1343	1359	1469	1343	1343	1304	1343	1469	1343	1469	1343	
			<i>in.lb</i>	10222	11540	11886	12027	13001	11886	11886	11541	11886	13001	11886	13001	11886	
Emergency stop torque <sup>a) b) e)</sup> (permitted 1000 times during the service life of the gearbox)	<i>T</i> <sub>2Not</sub>		<i>Nm</i>	1819	1932	1940	1955	2073	1856	1940	1940	1940	2073	1856	2073	1856	
			<i>in.lb</i>	16098	17098	17169	17302	18346	16426	17169	17169	17169	18346	16426	18346	16426	
Permitted average input speed (at 20 °C ambient temperature) <sup>d)</sup>	<i>n</i> <sub>1N</sub>		<i>rpm</i>	3000						2700							
Max. input speed	<i>n</i> <sub>1Max</sub>		<i>rpm</i>	3500						4000							
Mean no load running torque <sup>b)</sup> (at <i>n</i> <sub>1</sub> = 3000 rpm and 20 °C gearbox temperature)	<i>T</i> <sub>012</sub>		<i>Nm</i>	12.2	10.5	9.8	9.1	8.2	7.2	4.1	2.3	2.2	3.8	3.6	2.6	2	
			<i>in.lb</i>	108.0	92.9	86.7	80.5	72.6	63.7	36.3	20.4	19.5	33.6	31.9	23.0	17.7	
Max. backlash	<i>j</i> <sub>t</sub>		<i>arcmin</i>	≤ 3	Standard ≤ 3 / Reduced ≤ 2					Standard ≤ 4 / Reduced ≤ 3							
Torsional rigidity <sup>b)</sup>	<i>C</i> <sub>t21</sub>		<i>Nm/arcmin</i>	153													
			<i>in.lb/arcmin</i>	1354													
Max. axial force <sup>c)</sup>	<i>F</i> <sub>2AMax</sub>		<i>N</i>	19500													
			<i>lb<sub>f</sub></i>	4388													
Max. lateral force <sup>c)</sup>	<i>F</i> <sub>2QMax</sub>		<i>N</i>	14000													
			<i>lb<sub>f</sub></i>	3150													
Max. tilting moment	<i>M</i> <sub>2KMax</sub>		<i>Nm</i>	3059													
			<i>in.lb</i>	27072													
Efficiency at full load (at <i>n</i> <sub>1</sub> = 500 rpm)	<i>η</i>		%	95	93	91	87	80	76	89	89	89	78	74	78	74	
Service life <sup>f)</sup>	<i>L</i> <sub>h</sub>		<i>h</i>	> 20000													
Weight (incl. standard adapter plate)	<i>m</i>		<i>kg</i>	62.0						64.6							
			<i>lb<sub>m</sub></i>	137.0						143.0							
Operating noise (at reference ratio and reference speed – ratio-specific values available in cymex®)	<i>L</i> <sub>PA</sub>		<i>dB(A)</i>	≤ 70													
Max. permitted housing temperature			°C	+90													
			<i>F</i>	194													
Ambient temperature			°C	-15 to +40													
			<i>F</i>	5 to 104													
Lubrication				Lubricated for life													
Direction of rotation				In- and output same direction													
Protection class				IP 65													
Metal bellows coupling (recommended product type – validate sizing with cymex®)				BC3 - 01500A - 055.000 - X													
Bore diameter of coupling on the application side			<i>mm</i>	X = 035.000 - 070.000													
Mass moment of inertia (relates to the drive)  Clamping hub diameter [mm]	K	38	<i>J</i> <sub>t</sub>	<i>kgcm</i> <sup>2</sup>	-	-	-	-	-	-	11.9	10.0	10.0	11.8	11.8	10.0	10.0
				10 <sup>-3</sup> <i>in.lb.s</i> <sup>2</sup>	-	-	-	-	-	-	10.5	8.9	8.9	10.4	10.4	8.9	8.9
	M	48	<i>J</i> <sub>t</sub>	<i>kgcm</i> <sup>2</sup>	53.4	43.8	41.9	42.7	40.3	40.6	26.9	25.1	25.0	26.8	26.9	25.0	25.0
				10 <sup>-3</sup> <i>in.lb.s</i> <sup>2</sup>	47.3	38.8	37.1	37.8	35.7	35.9	23.8	22.2	22.1	23.7	23.8	22.1	22.1

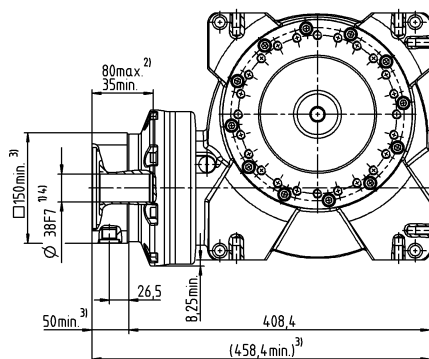
Please use our sizing software cymex® for a detailed sizing – [www.wittenstein-cymex.com](http://www.wittenstein-cymex.com)  
Please contact us for optimum sizing at S1 conditions (Continuous operation).

- <sup>a)</sup> At max. 10 %  $F_{2QMax}$
- <sup>b)</sup> Valid for standard clamping hub diameter
- <sup>c)</sup> Refers to center of the output shaft or flange
- <sup>d)</sup> Please reduce input speed at higher ambient temperatures
- <sup>e)</sup> Smooth shaft
- <sup>f)</sup> Please contact us to discuss application-specific service lifetimes

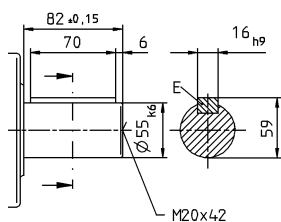
up to 48 <sup>4)</sup> (M) <sup>6)</sup>  
clamping hub  
diameter



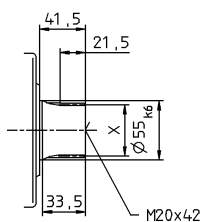
up to 38/48 <sup>4)</sup>  
(K<sup>6)</sup>/M) clamping  
hub diameter



Shaft with key



Splined shaft (DIN 5480)



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

Non-tolerated dimensions are nominal dimensions

- 1) Check motor shaft fit.

<sup>2)</sup> Min. / Max. permissible motor shaft length.

Longer 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 wall thickness of 1 mm.

5) Output side

<sup>6)</sup> Standard clamping hub diameter

# VT+ 050 MF 1-/2-stage

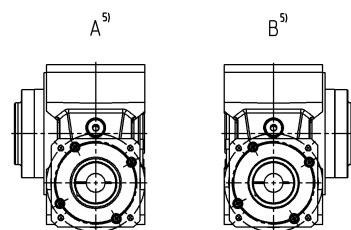
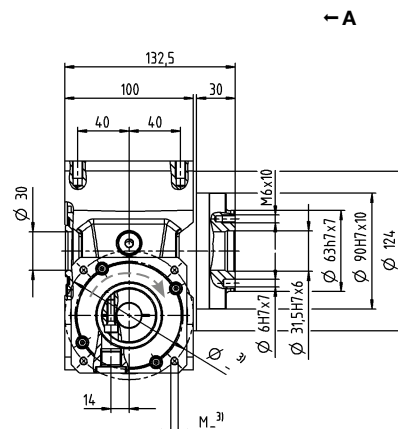
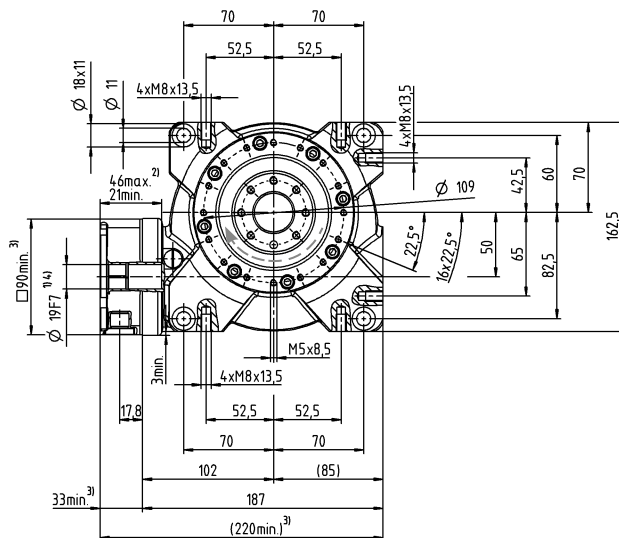
				1-stage						2-stage							
Ratio			<i>i</i>		4	7	10	16	28	40	50	70	100	140	200	280	400
Max. torque <sup>a) b)</sup> (at <i>n</i> <sub>1</sub> = 500 rpm)			<i>T</i> <sub>2a</sub>	<i>Nm</i>	165	180	182	193	204	183	182	180	182	204	183	204	183
				<i>in.lb</i>	1460	1593	1611	1708	1805	1620	1611	1593	1611	1805	1620	1805	1620
Torque for constant backlash (over the lifetime)			<i>T</i> <sub>2Servo</sub>	<i>Nm</i>	54	71	74	81	90	74	74	71	74	90	74	90	74
				<i>in.lb</i>	478	628	655	717	797	655	655	628	655	797	655	797	655
Emergency stop torque <sup>a) b)</sup> (permitted 1000 times during the service life of the gearbox)			<i>T</i> <sub>2Not</sub>	<i>Nm</i>	230	242	242	250	262	236	242	242	242	262	236	262	236
				<i>in.lb</i>	2036	2142	2142	2213	2319	2089	2142	2142	2142	2319	2089	2319	2089
Permitted average input speed (at 20 °C ambient temperature) <sup>a)</sup>			<i>n</i> <sub>1N</sub>	<i>rpm</i>	4000						3500						
Max. input speed			<i>n</i> <sub>1Max</sub>	<i>rpm</i>	6000												
Mean no load running torque <sup>b)</sup> (at <i>n</i> <sub>1</sub> = 3000 rpm and 20 °C gearbox temperature)			<i>T</i> <sub>012</sub>	<i>Nm</i>	2.3	2.2	1.6	1.5	1.2	1.1	0.7	0.5	0.4	0.6	0.6	0.4	0.4
				<i>in.lb</i>	20.4	19.5	14.2	13.3	10.6	9.7	6.2	4.4	3.5	5.3	5.3	3.5	3.5
Max. backlash			<i>j</i> <sub>t</sub>	<i>arcmin</i>	≤ 3	Standard ≤ 3 / Reduced ≤ 2					Standard ≤ 4 / Reduced ≤ 3						
Torsional rigidity <sup>b)</sup>			<i>C</i> <sub>t21</sub>	<i>Nm/arcmin</i>	17						17						
				<i>in.lb/arcmin</i>	150						150						
Max. axial force <sup>c)</sup>			<i>F</i> <sub>2AMax</sub>	<i>N</i>	5000												
				<i>lb<sub>f</sub></i>	1125												
Max. tilting moment			<i>M</i> <sub>2KMax</sub>	<i>Nm</i>	409												
				<i>in.lb</i>	3620												
Efficiency at full load (at <i>n</i> <sub>1</sub> = 500 rpm)			<i>η</i>	%	92	89	86	82	72	64	84	87	84	70	62	70	62
Tilting rigidity			<i>C</i> <sub>2K</sub>	<i>Nm/arcmin</i>	504												
				<i>in.lb/arcmin</i>	4460												
Service life <sup>f)</sup>			<i>L</i> <sub>h</sub>	<i>h</i>	> 20000												
Weight (incl. standard adapter plate)			<i>m</i>	<i>kg</i>	9.0						9.5						
				<i>lb<sub>m</sub></i>	19.9						21.0						
Operating noise (at reference ratio and reference speed – ratio-specific values available in cymex®)			<i>L</i> <sub>PA</sub>	<i>dB(A)</i>	≤ 62												
Max. permitted housing temperature				°C	+90												
				<i>F</i>	194												
Ambient temperature				°C	-15 to +40												
				<i>F</i>	5 to 104												
Lubrication					Lubricated for life												
Direction of rotation					In- and output same direction												
Protection class					IP 65												
Metal bellows coupling (recommended product type – validate sizing with cymex®)					BCT-00060AAX-050.000												
Bore diameter of coupling on the application side				<i>mm</i>	X = 014.000 - 035.000												
Mass moment of inertia (relates to the drive) Clamping hub diameter [mm]	C	14	<i>J</i> <sub>1</sub>	<i>kgcm<sup>2</sup></i>	-	-	-	-	-	-	0.21	0.16	0.29	0.2	0.21	0.16	0.16
				<i>10<sup>-3</sup> in.lb.s<sup>2</sup></i>	-	-	-	-	-	-	0.19	0.14	0.26	0.18	0.19	0.14	0.14
	E	19	<i>J</i> <sub>1</sub>	<i>kgcm<sup>2</sup></i>	1.8	1.3	1.1	1.0	1.0	1.0	0.58	0.53	0.53	0.57	0.57	0.53	0.53
				<i>10<sup>-3</sup> in.lb.s<sup>2</sup></i>	1.6	1.2	0.97	0.89	0.89	0.89	0.51	0.47	0.47	0.5	0.5	0.47	0.47
	G	24	<i>J</i> <sub>1</sub>	<i>kgcm<sup>2</sup></i>	1.9	1.4	1.3	1.1	1.1	1.1	-	-	-	-	-	-	-
				<i>10<sup>-3</sup> in.lb.s<sup>2</sup></i>	1.7	1.2	1.2	0.97	0.97	0.97	-	-	-	-	-	-	-

Please use our sizing software cymex® for a detailed sizing – [www.wittenstein-cymex.com](http://www.wittenstein-cymex.com)  
Please contact us for optimum sizing at S1 conditions (Continuous operation).

- <sup>a)</sup> At max. 10 %  $M_{2KMax}$
- <sup>b)</sup> Valid for standard clamping hub diameter
- <sup>c)</sup> Refers to center of the output shaft or flange
- <sup>d)</sup> Please reduce input speed at higher ambient temperatures
- <sup>f)</sup> Please contact us to discuss application-specific service lifetimes

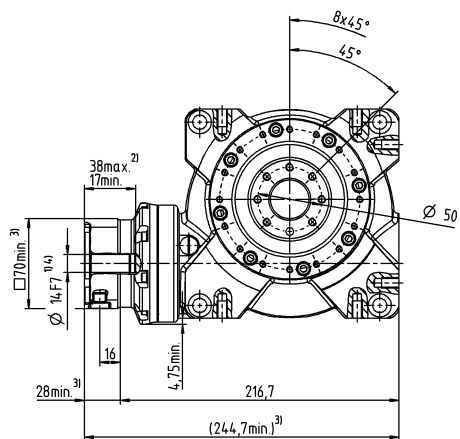
# 1-stage

up to 19/24<sup>4)</sup>  
(E<sup>6)</sup>/G) clamping  
hub diameter



# 2-stage

up to 14/19<sup>4)</sup>  
(C<sup>6)</sup>/E) clamping  
hub diameter



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

Non-tolerated dimensions are nominal dimensions

<sup>1)</sup> Check motor shaft fit.

<sup>2)</sup> Min./Max. permissible motor shaft length.

Longer motor shafts are adaptable, please contact us.

<sup>3)</sup> The dimensions depend on the motor.

<sup>4)</sup> Smaller motor shaft diameter is compensated by a bushing with a minimum wall thickness of 1 mm.

<sup>5)</sup> Output side

<sup>6)</sup> Standard clamping hub diameter

# VT+ 063 MF 1-/2-stage

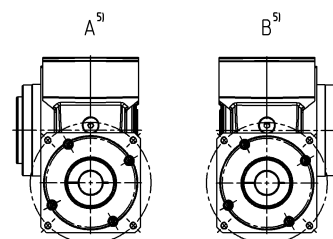
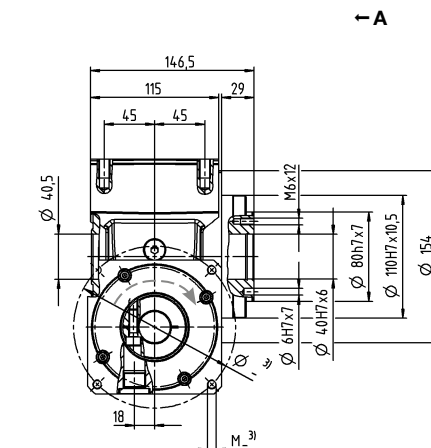
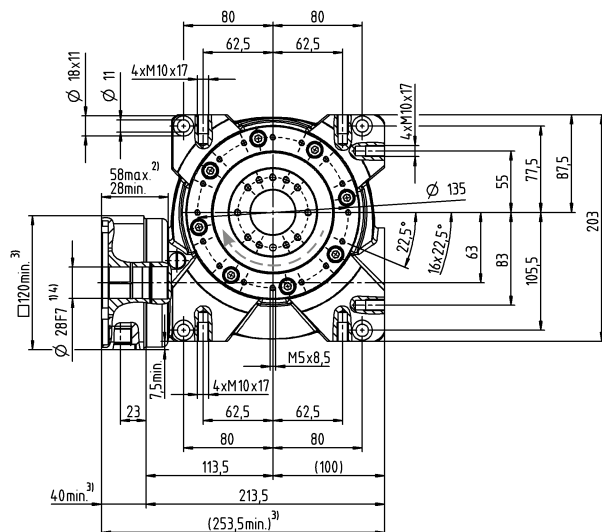
			1-stage							2-stage							
Ratio			<i>i</i>		4	7	10	16	28	40	50	70	100	140	200	280	400
Max. torque <sup>a) b)</sup> (at <i>n</i> <sub>1</sub> = 500 rpm)			<i>T</i> <sub>2a</sub>	<i>Nm</i>	319	353	364	372	392	363	364	353	364	392	363	392	363
				<i>in.lb</i>	2823	3124	3221	3292	3469	3213	3221	3124	3221	3469	3213	3469	3213
Torque for constant backlash (over the lifetime)			<i>T</i> <sub>2Servo</sub>	<i>Nm</i>	198	210	225	221	229	226	225	210	225	229	226	229	226
				<i>in.lb</i>	1752	1859	1991	1956	2027	2000	1991	1859	1991	2027	2000	2027	2000
Emergency stop torque <sup>a) b)</sup> (permitted 1000 times during the service life of the gearbox)			<i>T</i> <sub>2Not</sub>	<i>Nm</i>	460	484	491	494	518	447	491	484	494	518	447	518	447
				<i>in.lb</i>	4071	4283	4345	4372	4584	3956	4345	4283	4372	4584	3956	4584	3956
Permitted average input speed (at 20 °C ambient temperature) <sup>d)</sup>			<i>n</i> <sub>1N</sub>	<i>rpm</i>	4000							3100					
Max. input speed			<i>n</i> <sub>1Max</sub>	<i>rpm</i>	4500												
Mean no load running torque <sup>b)</sup> (at <i>n</i> <sub>1</sub> = 3000 rpm and 20 °C gearbox temperature)			<i>T</i> <sub>012</sub>	<i>Nm</i>	4.2	3.1	3	2.4	2.3	2.2	1.2	0.7	0.7	1.1	1.1	0.8	0.6
				<i>in.lb</i>	37.2	27.4	26.6	21.2	20.4	19.5	10.6	6.2	6.2	9.7	9.7	7.1	5.3
Max. backlash			<i>j</i> <sub>t</sub>	<i>arcmin</i>	≤ 3	Standard ≤ 3 / Reduced ≤ 2					Standard ≤ 4 / Reduced ≤ 3						
Torsional rigidity <sup>b)</sup>			<i>C</i> <sub>t21</sub>	<i>Nm/arcmin</i>	50						50						
				<i>in.lb/arcmin</i>	443						443						
Max. axial force <sup>c)</sup>			<i>F</i> <sub>2AMax</sub>	<i>N</i>	8250												
				<i>lb<sub>f</sub></i>	1856												
Max. tilting moment			<i>M</i> <sub>2KMax</sub>	<i>Nm</i>	843												
				<i>in.lb</i>	7461												
Efficiency at full load (at <i>n</i> <sub>1</sub> = 500 rpm)			<i>η</i>	%	93	91	88	83	74	68	86	89	86	72	66	72	66
Tilting rigidity			<i>C</i> <sub>2K</sub>	<i>Nm/arcmin</i>	603												
				<i>in.lb/arcmin</i>	5337												
Service life <sup>1)</sup>			<i>L</i> <sub>h</sub>	<i>h</i>	> 20000												
Weight (incl. standard adapter plate)			<i>m</i>	<i>kg</i>	15.0						15.2						
				<i>lb<sub>m</sub></i>	33						34.0						
Operating noise (at reference ratio and reference speed – ratio-specific values available in cymex®)			<i>L</i> <sub>PA</sub>	<i>dB(A)</i>	≤ 64												
Max. permitted housing temperature				°C	+90												
				<i>F</i>	194												
Ambient temperature				°C	-15 to +40												
				<i>F</i>	5 to 104												
Lubrication					Lubricated for life												
Direction of rotation					In- and output same direction												
Protection class					IP 65												
Metal bellows coupling (recommended product type – validate sizing with cymex®)					BCT-00150AAX-063.000												
Bore diameter of coupling on the application side				<i>mm</i>	X = 019.000 - 042.000												
Mass moment of inertia (relates to the drive) Clamping hub diameter [mm]	E	19	<i>J</i> <sub>1</sub>	<i>kgcm</i> <sup>2</sup>	-	-	-	-	-	-	0.76	0.59	0.59	0.75	0.75	0.58	0.58
				<i>10<sup>-3</sup> in.lb.s</i> <sup>2</sup>	-	-	-	-	-	-	0.67	0.52	0.52	0.66	0.66	0.51	0.51
	G	24	<i>J</i> <sub>1</sub>	<i>kgcm</i> <sup>2</sup>	-	-	-	-	-	-	2.3	2.2	2.2	2.3	2.3	2.2	2.2
				<i>10<sup>-3</sup> in.lb.s</i> <sup>2</sup>	-	-	-	-	-	-	2.0	2.0	2.0	2.0	2.0	2.0	2.0
	H	28	<i>J</i> <sub>1</sub>	<i>kgcm</i> <sup>2</sup>	5.7	4.2	3.9	3.7	3.6	3.6	-	-	-	-	-	-	-
				<i>10<sup>-3</sup> in.lb.s</i> <sup>2</sup>	5.0	3.7	3.5	3.3	3.2	3.2	-	-	-	-	-	-	-

Please use our sizing software cymex® for a detailed sizing – [www.wittenstein-cymex.com](http://www.wittenstein-cymex.com)  
Please contact us for optimum sizing at S1 conditions (Continuous operation).

- <sup>a)</sup> At max. 10 %  $M_{2KMax}$
- <sup>b)</sup> Valid for standard clamping hub diameter
- <sup>c)</sup> Refers to center of the output shaft or flange
- <sup>d)</sup> Please reduce input speed at higher ambient temperatures
- <sup>1)</sup> Please contact us to discuss application-specific service lifetimes

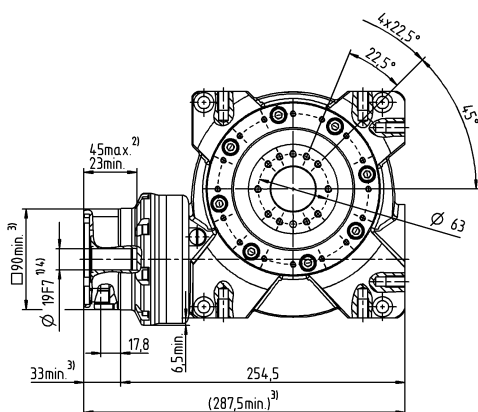
# 1-stage

up to 28<sup>4)</sup> (H)<sup>6)</sup>  
clamping hub  
diameter



# 2-stage

up to 19/24<sup>4)</sup>  
(E<sup>6)</sup>/G) clamping  
hub diameter



Motor shaft diameter [mm]

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

Non-tolerated dimensions are nominal dimensions

<sup>1)</sup> Check motor shaft fit.

<sup>2)</sup> Min./Max. permissible motor shaft length.

Longer motor shafts are adaptable, please contact us.

<sup>3)</sup> The dimensions depend on the motor.

<sup>4)</sup> Smaller motor shaft diameter is compensated by a bushing with a minimum wall thickness of 1 mm.

<sup>5)</sup> Output side

<sup>6)</sup> Standard clamping hub diameter



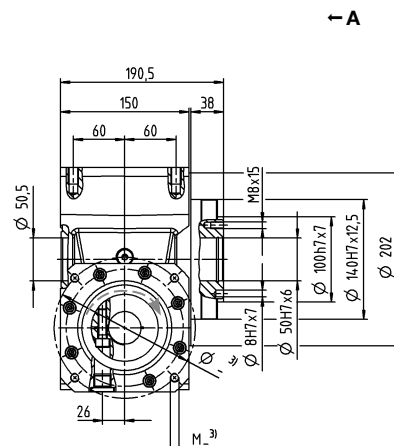
# VT+ 080 MF 1-/2-stage

			1-stage							2-stage									
Ratio			i		4	7	10	16	28	40	50	70	100	140	200	280	400		
Max. torque <sup>a) b)</sup> (at n <sub>1</sub> = 500 rpm)			T <sub>2a</sub>	Nm	578	646	672	702	785	676	672	646	672	785	676	785	676		
				in.lb	5115	5717	5947	6213	6947	5983	5947	5717	5947	6947	5983	6947	5983		
Torque for constant backlash (over the lifetime)			T <sub>2Servo</sub>	Nm	469	601	613	677	764	631	613	601	613	764	631	764	631		
				in.lb	4151	5319	5425	5991	6761	5584	5425	5319	5425	6761	5584	6761	5584		
Emergency stop torque <sup>a) b)</sup> (permitted 1000 times during the service life of the gearbox)			T <sub>2Not</sub>	Nm	938	993	963	1005	1064	941	963	993	963	1064	941	1064	941		
				in.lb	8301	8788	8523	8894	9416	8328	8523	8788	8523	9416	8328	9416	8328		
Permitted average input speed (at 20 °C ambient temperature) <sup>d)</sup>			n <sub>1N</sub>	rpm	3500							2900							
Max. input speed			n <sub>1Max</sub>	rpm	4000							4500							
Mean no load running torque <sup>b)</sup> (at n <sub>1</sub> = 3000 rpm and 20 °C gearbox temperature)			T <sub>012</sub>	Nm	7.2	7.1	6.5	5	4.8	4.5	2.8	1.6	1.5	2.4	2.4	1.8	1.3		
				in.lb	63.7	62.8	57.5	44.3	42.5	39.8	24.8	14.2	13.3	21.2	21.2	15.9	11.5		
Max. backlash			j <sub>t</sub>	arcmin	≤ 3	Standard ≤ 3 / Reduced ≤ 2					Standard ≤ 4 / Reduced ≤ 3								
Torsional rigidity <sup>b)</sup>			C <sub>t21</sub>	Nm/arcmin	113							113							
				in.lb/arcmin	1000							1000							
Max. axial force <sup>c)</sup>			F <sub>2AMax</sub>	N	13900														
				lb <sub>f</sub>	3128														
Max. tilting moment			M <sub>2KMax</sub>	Nm	1544														
				in.lb	13664														
Efficiency at full load (at n <sub>1</sub> = 500 rpm)			η	%	94	92	89	86	77	70	87	90	87	75	68	75	68		
Tilting rigidity			C <sub>2K</sub>	Nm/arcmin	1178														
				in.lb/arcmin	10425														
Service life <sup>f)</sup>			L <sub>h</sub>	h	> 20000														
Weight (incl. standard adapter plate)			m	kg	32.0							33.5							
				lb <sub>m</sub>	70.7							74.0							
Operating noise (at reference ratio and reference speed – ratio-specific values available in cymex®)			L <sub>PA</sub>	dB(A)	≤ 66							≤ 68							
Max. permitted housing temperature				°C	+90														
				F	194														
Ambient temperature				°C	-15 to +40														
				F	5 to 104														
Lubrication					Lubricated for life														
Direction of rotation					In- and output same direction														
Protection class					IP 65														
Metal bellows coupling (recommended product type – validate sizing with cymex®)					BCT-00300AAX-080.000														
Bore diameter of coupling on the application side				mm	X = 024.000 - 060.000														
Mass moment of inertia (relates to the drive)  Clamping hub diameter [mm]			G	24	J <sub>1</sub>	kgcm <sup>2</sup>	-	-	-	-	-	-	3.1	2.4	2.4	3.0	3.0	2.4	2.4
						10 <sup>-3</sup> in.lb.s <sup>2</sup>	-	-	-	-	-	-	2.7	2.1	2.1	2.7	2.7	2.1	2.1
			K	38	J <sub>1</sub>	kgcm <sup>2</sup>	22.5	17.1	16.7	15.1	14.8	15.5	10.2	9.5	9.5	10.2	10.2	9.5	9.5
10 <sup>-3</sup> in.lb.s <sup>2</sup>	19.9	15.1				14.8	13.4	13.1	13.7	9.0	8.4	8.4	9.0	9.0	8.4	8.4			

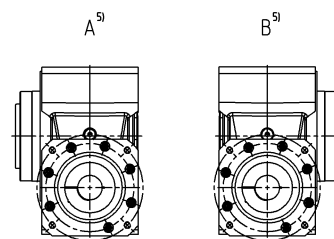
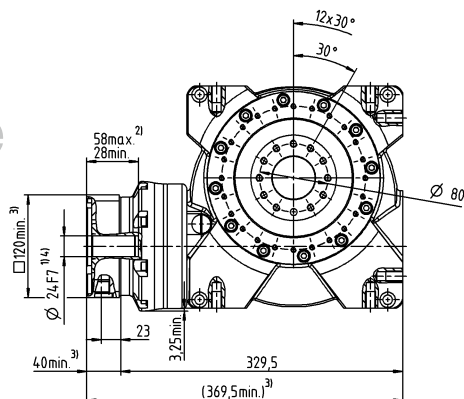
Please use our sizing software cymex® for a detailed sizing – [www.wittenstein-cymex.com](http://www.wittenstein-cymex.com)  
Please contact us for optimum sizing at S1 conditions (Continuous operation).

- <sup>a)</sup> At max. 10 %  $M_{2KMax}$   
<sup>b)</sup> Valid for standard clamping hub diameter  
<sup>c)</sup> Refers to center of the output shaft or flange  
<sup>d)</sup> Please reduce input speed at higher ambient temperatures  
<sup>1)</sup> Please contact us to discuss application-specific service lifetimes

up to 38<sup>4)</sup> (K)<sup>6)</sup>  
clamping hub  
diameter



up to 24/38 <sup>4)</sup>  
(G<sup>6</sup>/K) clamping  
hub diameter



Motor shaft diameter [mm]

6) Standard clamping hub diameter

# VT+ 100 MF 1-/2-stage

			1-stage							2-stage								
Ratio			i		4	7	10	16	28	40	50	70	100	140	200	280	400	
Max. torque <sup>a) b)</sup> (at n <sub>1</sub> = 500 rpm)			T <sub>2a</sub>	Nm	1184	1336	1377	1392	1505	1376	1377	1336	1377	1505	1376	1505	1376	
				in.lb	10478	11824	12186	12319	13319	12178	12186	11825	12186	13319	12178	13319	12178	
Torque for constant backlash (over the lifetime)			T <sub>2Servo</sub>	Nm	1155	1304	1343	1359	1469	1343	1343	1304	1343	1469	1343	1469	1343	
				in.lb	10222	11540	11886	12027	13001	11886	11886	11541	11886	13001	11886	13001	11886	
Emergency stop torque <sup>a) b)</sup> (permitted 1000 times during the service life of the gearbox)			T <sub>2Not</sub>	Nm	1819	1932	1940	1955	2073	1856	1940	1940	1940	2073	1856	2073	1856	
				in.lb	16098	17098	17169	17302	18346	16426	17169	17169	17169	18346	16426	18346	16426	
Permitted average input speed (at 20 °C ambient temperature) <sup>d)</sup>			n <sub>1N</sub>	rpm	3000							2700						
Max. input speed			n <sub>1Max</sub>	rpm	3500							4000						
Mean no load running torque <sup>b)</sup> (at n <sub>1</sub> = 3000 rpm and 20 °C gearbox temperature)			T <sub>012</sub>	Nm	12.2	10.5	9.8	9.1	8.2	7.2	4.1	2.3	2.2	3.8	3.6	2.6	2	
				in.lb	108.0	92.9	86.7	80.5	72.6	63.7	36.3	20.4	19.5	33.6	31.9	23.0	17.7	
Max. backlash			j <sub>t</sub>	arcmin	≤ 3	Standard ≤ 3 / Reduced ≤ 2					Standard ≤ 4 / Reduced ≤ 3							
Torsional rigidity <sup>b)</sup>			C <sub>t21</sub>	Nm/arcmin	213							213						
				in.lb/arcmin	1885							1885						
Max. axial force <sup>c)</sup>			F <sub>2AMax</sub>	N	19500													
				lb <sub>f</sub>	4388													
Max. tilting moment			M <sub>2KMax</sub>	Nm	3059													
				in.lb	27072													
Efficiency at full load (at n <sub>1</sub> = 500 rpm)			η	%	95	93	91	87	80	76	89	89	89	78	74	78	74	
Tilting rigidity			C <sub>2K</sub>	Nm/arcmin	2309													
				in.lb/arcmin	20435													
Service life <sup>f)</sup>			L <sub>h</sub>	h	> 20000													
Weight (incl. standard adapter plate)			m	kg	63.0							64.6						
				lb <sub>m</sub>	139.0							143.0						
Operating noise (at reference ratio and reference speed – ratio-specific values available in cymex®)			L <sub>PA</sub>	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													
Direction of rotation					In- and output same direction													
Protection class					IP 65													
Metal bellows coupling (recommended product type – validate sizing with cymex®)					BCT-01500AAX-125.000													
						X = 050.000 - 080.000												
Mass moment of inertia (relates to the drive)	K	38	J <sub>1</sub>	kgcm <sup>2</sup>	-	-	-	-	-	-	11,9	10,0	10,0	11,8	11,8	9,9	9,9	
				10 <sup>-3</sup> in.lb.s <sup>2</sup>	-	-	-	-	-	-	10,5	8,9	8,9	10,4	10,4	8,8	8,8	
	Clamping hub diameter [mm]	M	48	J <sub>1</sub>	kgcm <sup>2</sup>	67,6	48,5	44,2	43,6	40,6	40,7	27,0	25,1	25,1	26,8	26,9	25,0	25,0
10 <sup>-3</sup> in.lb.s <sup>2</sup>					59,8	42,9	31,1	38,6	35,9	36,0	23,9	22,2	22,2	23,7	23,8	22,1	22,1	

Please use our sizing software cymex® for a detailed sizing – [www.wittenstein-cymex.com](http://www.wittenstein-cymex.com)  
Please contact us for optimum sizing at S1 conditions (Continuous operation).

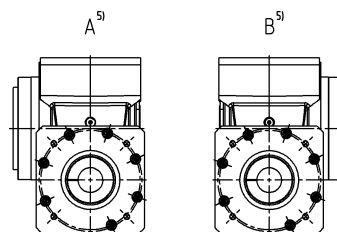
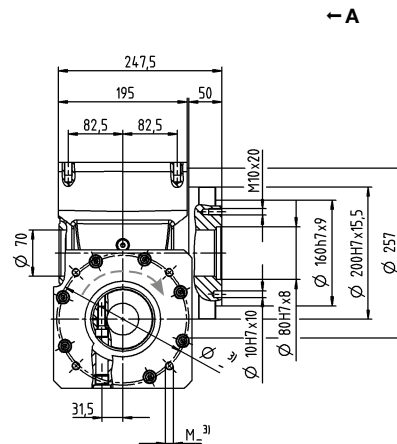
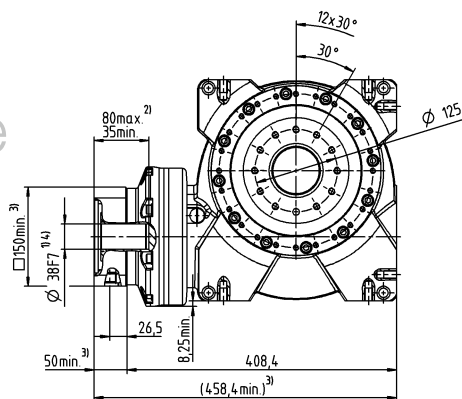
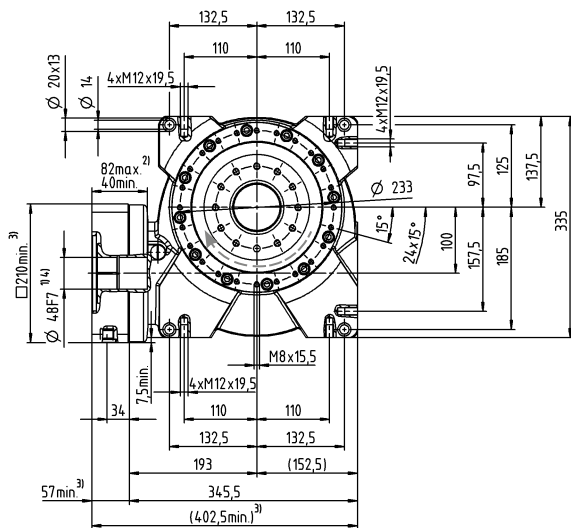
- <sup>a)</sup> At max. 10 %  $M_{2KMax}$   
<sup>b)</sup> Valid for standard clamping hub diameter  
<sup>c)</sup> Refers to center of the output shaft or flange  
<sup>d)</sup> Please reduce input speed at higher ambient temperatures  
<sup>f)</sup> Please contact us to discuss application-specific service lifetimes

up to 48 <sup>4)</sup> (M) <sup>6)</sup>  
clamping hub  
diameter

Motor shaft diameter [mm]

## 2-stage

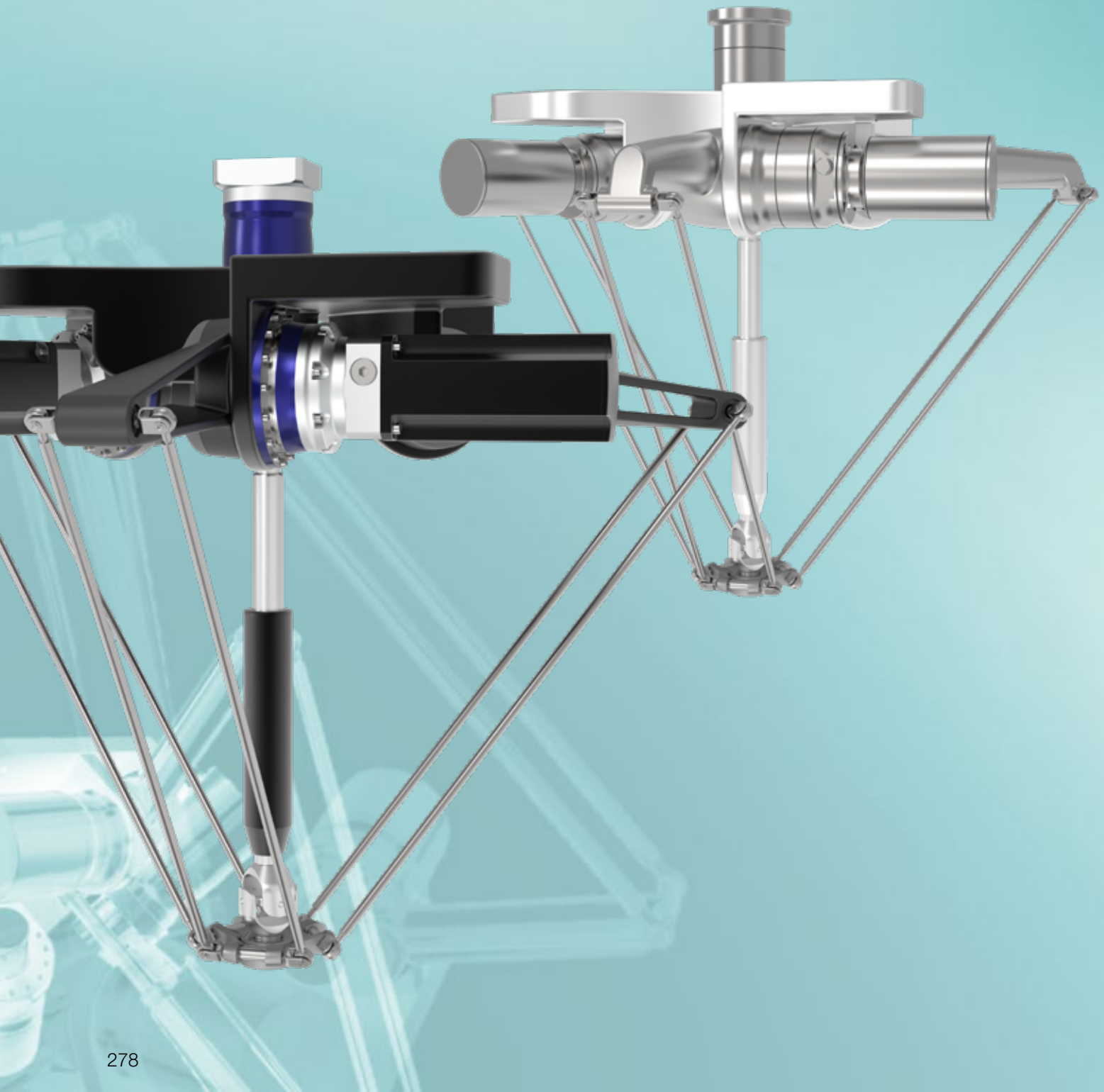
up to 38/48 <sup>4)</sup>  
(K<sup>6)</sup>/M) clamping  
hub diameter

<sup>6)</sup> Standard clamping hub diameter

## Application-specific solutions

### The right solution for all requirements

Varying customer requirements create major challenges for Delta robots and require continuous further development of the drives. For more than ten years, WITTENSTEIN has been developing and manufacturing gearbox and servo actuator solutions for Delta robots that are just as individual as the applications of our customers. With unique engineering experience, recognized methodological competencies and software expertise as well as a high-performance product portfolio, we offer our customers the security of a technically and economically refined drive design for highly dynamic, multidimensional movement profiles.







### Hygienically safe drive

Our products with hygienic design are specially developed for challenging food processing applications, made of highly resistant stainless steel and ideal for cleaning with aggressive cleaning agents and disinfectants.

Direct process integration allows new freedom in design and an open machine concept without encasings.

# DP+ – The right solution for all requirements

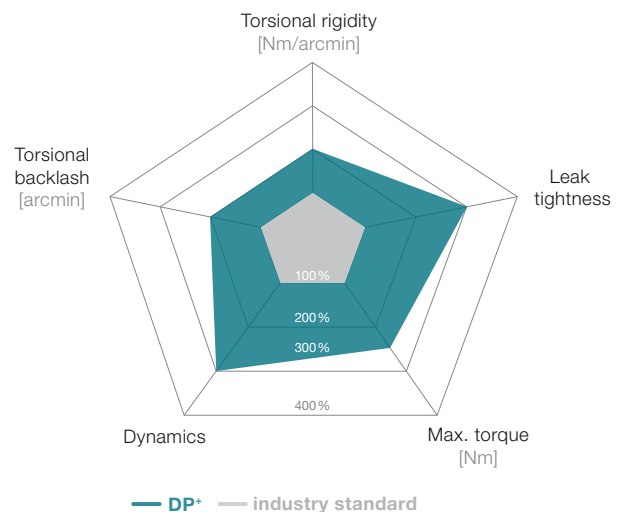


The DP+ planetary gearbox was specially developed for use in Delta robotics applications. Various characteristics allow use of the gearbox in dry, spray and wet areas (HDP+). In addition to an optimized sealing system, this drive solution includes advantages such as improved dynamics due to the optimized moment of inertia. The DP+ is available in four sizes and covers a ratio range of  $i = 16 - 55$ .

The DP+ compared to the industry standard

Product highlights

- Reliability** Extremely reliable gearboxes prevent cost-intensive machine breakdowns
- Positioning accuracy** Minimal backlash and extreme rigidity ensure maximum positioning accuracy at the tool center point
- Speed** Highest speeds increase machine output
- Maintenance** Highest quality standards guarantee a long service life and extend maintenance intervals
- Consistently high performance** Constant backlash throughout the service life of the gearbox ensures a consistently high performance
- Low inertia** Use of an servo actuator further reduces inertia



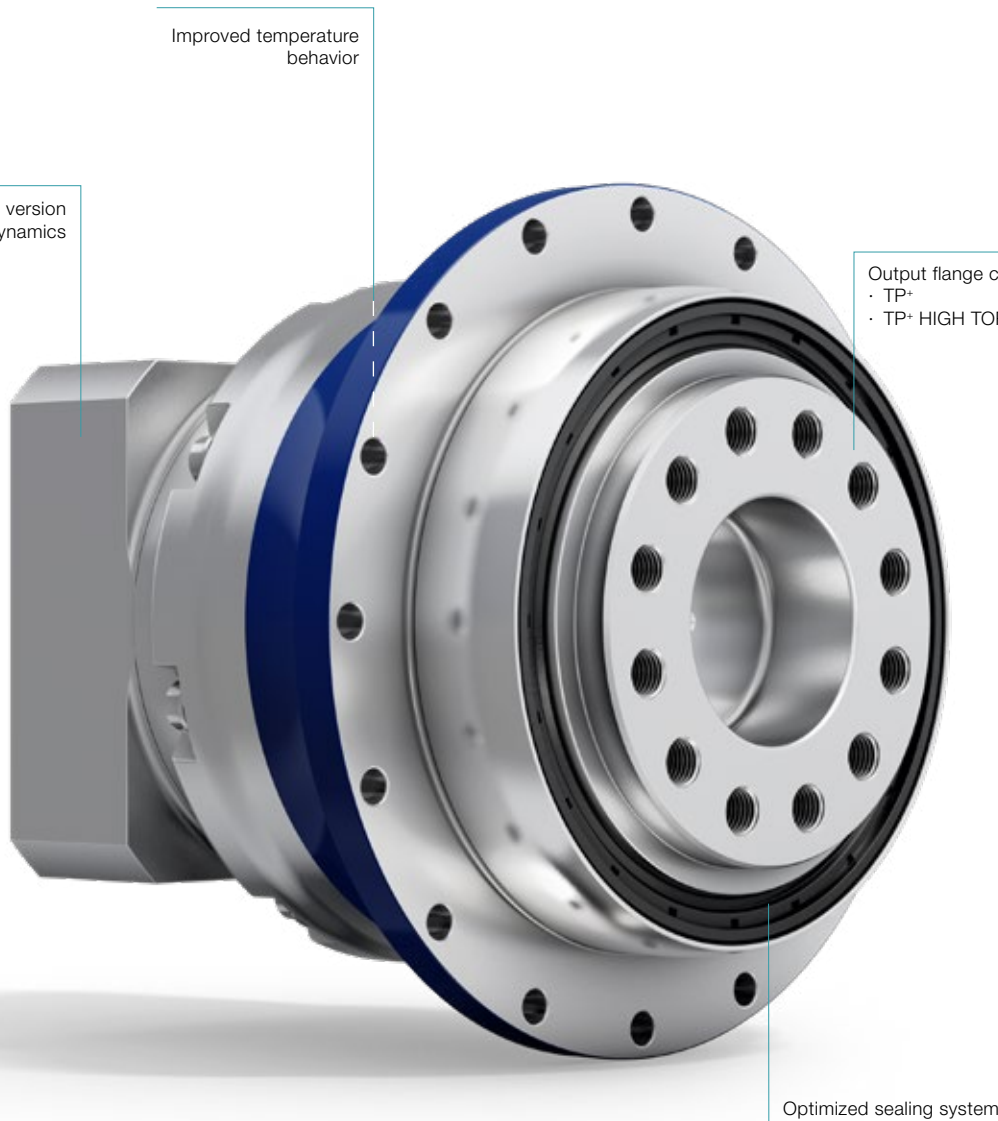
Fields of application: Secondary packaging, Handling, Mounting, Intralogistics ...



Fields of application: Pharmaceutical industry, Medical technology, Primary packaging without hygiene design requirements, Clean room...



More information on Delta robotics: simply scan the QR code with your smartphone.



## 💧 Wet area (integrated in the process)



Fields of application: Primary packaging with hygiene design requirements

We are happy to advise you on individual solutions for your project-specific requirements.



Custom solutions



# DP+ 004 MF 2-stage

			2-stage								
Ratio	<i>i</i>		16	20	21	25	28	31	35	40	50
Max. torque <sup>a) b)</sup>	$T_{2a}$	Nm	57	57	60	72	57	50	72	57	72
		in.lb	507	507	533	634	507	442	634	507	634
Max. acceleration torque <sup>b)</sup> (max. 1000 cycles per hour)	$T_{2B}$	Nm	57	57	48	66	57	48	66	57	66
		in.lb	507	507	425	584	507	425	584	507	584
Nominal torque (at $n_n$ )	$T_{2N}$	Nm	39	41	32	41	45	36	45	46	48
		in.lb	342	365	286	361	403	320	399	406	421
Emergency stop torque <sup>a) b)</sup> (permitted 1000 times during the service life of the gearbox)	$T_{2Not}$	Nm	100	100	100	100	100	100	100	100	100
		in.lb	885	885	885	885	885	885	885	885	885
Permitted average input speed (at $T_{2N}$ and 20 °C ambient temperature) <sup>d)</sup>	$n_{1N}$	rpm	4000	4000	4000	4000	4000	4000	4000	4000	4800
Max. input speed	$n_{1Max}$	rpm	7500	7500	7500	7500	7500	7500	7500	7500	7500
Mean no load running torque <sup>b)</sup> (at $n_i = 3000$ rpm and 20 °C gearbox temperature)	$T_{012}$	Nm	0.28	0.23	0.24	0.22	0.21	0.22	0.17	0.18	0.17
		in.lb	2.5	2.0	2.1	1.9	1.9	1.9	1.5	1.6	1.5
Max. backlash	$j_t$	arcmin	Standard ≤ 4 / Reduced ≤ 2								
Torsional rigidity <sup>b)</sup>	$C_{t21}$	Nm/arcmin	12	12	10	12	12	9	12	11	12
		in.lb/arcmin	106	106	89	106	106	80	106	97	106
Tilting rigidity	$C_{2K}$	Nm/arcmin	85								
		in.lb/arcmin	752								
Max. axial force <sup>c)</sup>	$F_{2AMax}$	N	2119								
		lb <sub>f</sub>	477								
Max. tilting moment	$M_{2KMax}$	Nm	110								
		in.lb	974								
Efficiency at full load	$\eta$	%	94								
Service life <sup>f)</sup>	$L_h$	h	> 20000								
Weight (incl. standard adapter plate)	$m$	kg	1.5								
		lb <sub>m</sub>	3.3								
Operating noise (at reference ratio and reference speed – ratio-specific values available in cymex <sup>®</sup> )	$L_{PA}$	dB(A)	≤ 54								
Max. permitted housing temperature		°C	+90								
		F	194								
Ambient temperature		°C	–15 to +40								
		F	5 to 104								
Lubrication			Lubricated for life								
Direction of rotation			In- and output same direction								
Protection class			IP 65								
Metal bellows coupling (recommended product type – validate sizing with cymex <sup>®</sup> )			-								
Bore diameter of coupling on the application side		mm	-								
Mass moment of inertia (relates to the drive) Clamping hub diameter [mm] Optimized mass inertia version available on request	B 11	$J_1$	kgcm <sup>2</sup>	0.078	0.070	0.074	0.068	0.062	0.072	0.061	0.057
			10 <sup>-3</sup> in.lb.s <sup>2</sup>	0.069	0.062	0.065	0.060	0.055	0.064	0.054	0.050
	C 14	$J_1$	kgcm <sup>2</sup>	0.17	0.17	0.17	0.16	0.16	0.17	0.16	0.15
			10 <sup>-3</sup> in.lb.s <sup>2</sup>	0.15	0.15	0.15	0.15	0.14	0.15	0.14	0.14

Please use our sizing software cymex<sup>®</sup> for a detailed sizing – [www.wittenstein-cymex.com](http://www.wittenstein-cymex.com)

<sup>a)</sup> At max. 10 %  $M_{2KMax}$

<sup>b)</sup> Valid for standard clamping hub diameter

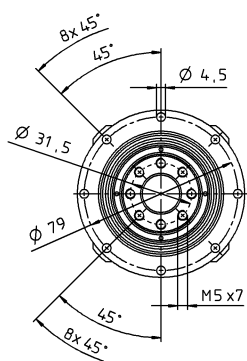
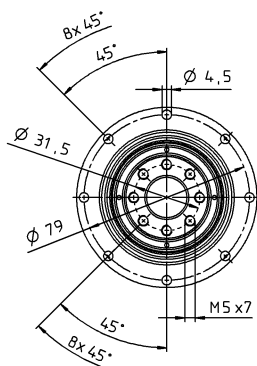
<sup>c)</sup> Refers to center of the output shaft or flange

<sup>d)</sup> Please reduce input speed at higher ambient temperatures

<sup>f)</sup> Please contact us to discuss  
application-specific service lifetimes

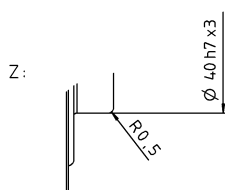
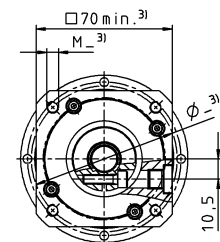
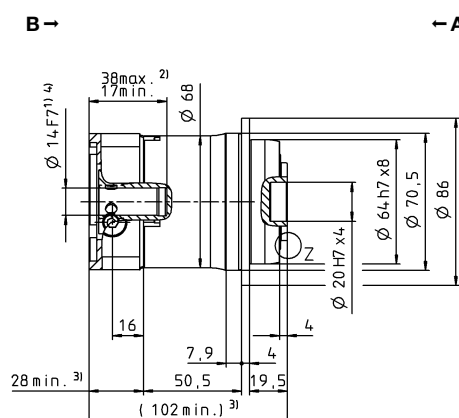
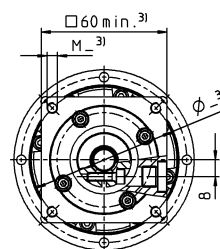
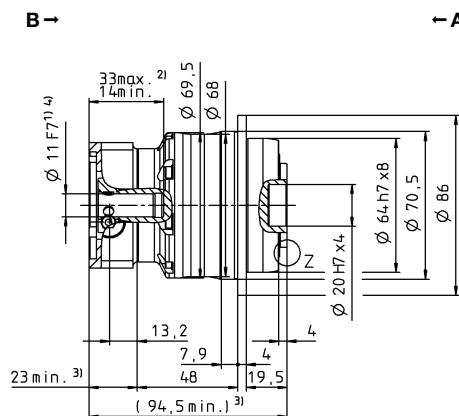
# 2-stage

up to 11 <sup>4)</sup> (B) <sup>5)</sup>  
clamping hub  
diameter



Motor shaft diameter [mm]

up to 14 <sup>4)</sup> (C)  
clamping hub  
diameter



Non-tolerated dimensions are nominal dimensions

<sup>1)</sup> Check motor shaft fit

<sup>2)</sup> Min./Max. permissible motor shaft length. Longer motor shafts are possible, please contact alpha.

<sup>3)</sup> The dimensions depend on the motor

<sup>4)</sup> Smaller motor shaft diameter is compensated by a bushing with a minimum wall thickness of 1 mm

<sup>5)</sup> Standard clamping hub diameter

# DP+ 010 MF 2-stage

				2-stage									
Ratio			<i>i</i>		16	20	21	25	28	31	35	40	50
Max. torque <sup>a) b)</sup>			<i>T</i> <sub>2a</sub>	<i>Nm</i>	157	126	133	158	157	121	158	154	158
				<i>in.lb</i>	1392	1118	1174	1398	1392	1071	1398	1363	1398
Max. acceleration torque <sup>b)</sup> (max. 1000 cycles per hour)			<i>T</i> <sub>2B</sub>	<i>Nm</i>	157	126	120	158	157	121	158	154	158
				<i>in.lb</i>	1392	1113	1062	1398	1392	1071	1398	1363	1398
Nominal torque (at <i>n</i> <sub>n</sub> )			<i>T</i> <sub>2N</sub>	<i>Nm</i>	106	101	96	124	107	87	126	112	126
				<i>in.lb</i>	935	895	850	1097	945	770	1118	987	1118
Emergency stop torque <sup>a) b)</sup> (permitted 1000 times during the service life of the gearbox)			<i>T</i> <sub>2Not</sub>	<i>Nm</i>	251	251	251	251	251	251	251	251	251
				<i>in.lb</i>	2222	2222	2222	2222	2222	2222	2222	2222	2222
Permitted average input speed (at <i>T</i> <sub>2N</sub> and 20 °C ambient temperature) <sup>d)</sup>			<i>n</i> <sub>1N</sub>	<i>rpm</i>	3500	3500	3500	3500	3500	3500	3500	3500	3800
Max. input speed			<i>n</i> <sub>1Max</sub>	<i>rpm</i>	7500	7500	7500	7500	7500	7500	7500	7500	7500
Mean no load running torque <sup>b)</sup> (at <i>n</i> <sub>i</sub> = 3000 rpm and 20 °C gearbox temperature)			<i>T</i> <sub>012</sub>	<i>Nm</i>	0.56	0.48	0.47	0.44	0.40	0.40	0.28	0.32	0.32
				<i>in.lb</i>	5.0	4.2	4.2	3.9	3.5	3.5	2.5	2.8	2.8
Max. backlash			<i>j</i> <sub>t</sub>	<i>arcmin</i>	Standard ≤ 3 / Reduced ≤ 1								
Torsional rigidity <sup>b)</sup>			<i>C</i> <sub>121</sub>	<i>Nm/arcmin</i>	32	32	26	32	31	24	32	30	30
				<i>in.lb/arcmin</i>	283	283	230	283	274	212	283	266	266
Tilting rigidity			<i>C</i> <sub>2K</sub>	<i>Nm/arcmin</i>	225								
				<i>in.lb/arcmin</i>	1991								
Max. axial force <sup>c)</sup>			<i>F</i> <sub>2AMax</sub>	<i>N</i>	2795								
				<i>lb<sub>f</sub></i>	629								
Max. tilting moment			<i>M</i> <sub>2KMax</sub>	<i>Nm</i>	270								
				<i>in.lb</i>	2390								
Efficiency at full load			<i>η</i>	%	94								
Service life <sup>f)</sup>			<i>L</i> <sub>h</sub>	<i>h</i>	> 20000								
Weight (incl. standard adapter plate)			<i>m</i>	<i>kg</i>	3.6								
				<i>lb<sub>m</sub></i>	8.0								
Operating noise (at reference ratio and reference speed – ratio-specific values available in cymex®)			<i>L</i> <sub>PA</sub>	<i>dB(A)</i>	≤ 55								
Max. permitted housing temperature				°C	+90								
				<i>F</i>	194								
Ambient temperature				°C	−15 to +40								
				<i>F</i>	5 to 104								
Lubrication					Lubricated for life								
Direction of rotation					In- and output same direction								
Protection class					IP 65								
Metal bellows coupling (recommended product type – validate sizing with cymex®)					-								
Bore diameter of coupling on the application side				<i>mm</i>	-								
Mass moment of inertia (relates to the drive)  Clamping hub diameter [mm] Optimized mass inertia version available on request	B	11	<i>J</i> <sub>i</sub>	<i>kgcm²</i>	0.17	0.14	0.15	0.13	0.11	0.14	0.10	0.09	0.09
				<i>10<sup>-3</sup> in.lb.s²</i>	0.15	0.12	0.13	0.12	0.10	0.12	0.09	0.08	0.08
	C	14	<i>J</i> <sub>i</sub>	<i>kgcm²</i>	0.24	0.21	0.22	0.20	0.18	0.21	0.18	0.17	0.17
				<i>10<sup>-3</sup> in.lb.s²</i>	0.21	0.19	0.20	0.18	0.16	0.18	0.16	0.15	0.15
	E	19	<i>J</i> <sub>i</sub>	<i>kgcm²</i>	0.56	0.53	0.55	0.53	0.51	0.53	0.50	0.49	0.49
				<i>10<sup>-3</sup> in.lb.s²</i>	0.50	0.47	0.48	0.47	0.45	0.47	0.44	0.43	0.43

Please use our sizing software cymex<sup>®</sup> for a detailed sizing – [www.wittenstein-cymex.com](http://www.wittenstein-cymex.com)

<sup>a)</sup> At max. 10 %  $M_{2KMax}$

<sup>b)</sup> Valid for standard clamping hub diameter

<sup>c)</sup> Refers to center of the output shaft or flange

<sup>d)</sup> Please reduce input speed at higher ambient temperatures

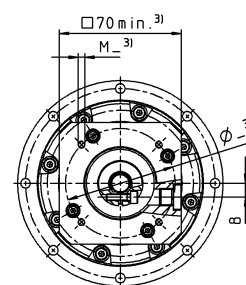
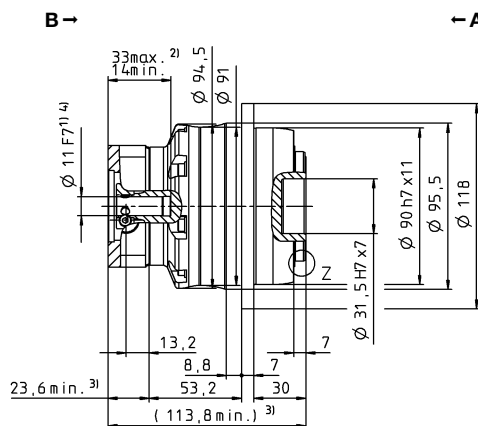
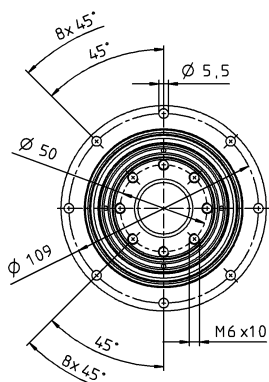
<sup>f)</sup> Please contact us to discuss  
application-specific service lifetimes

View A

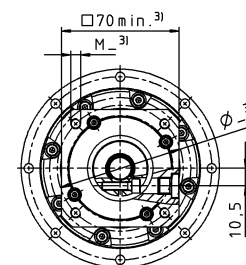
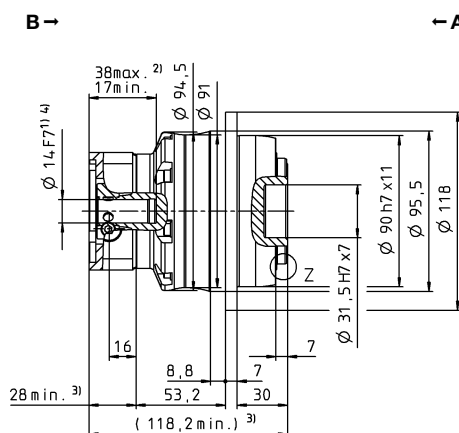
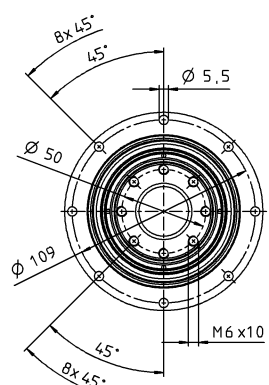
View B

# 2-stage

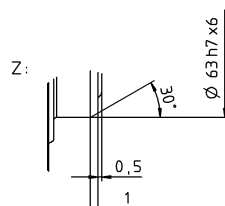
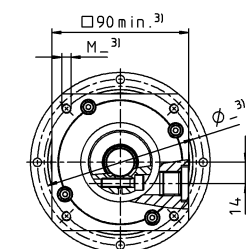
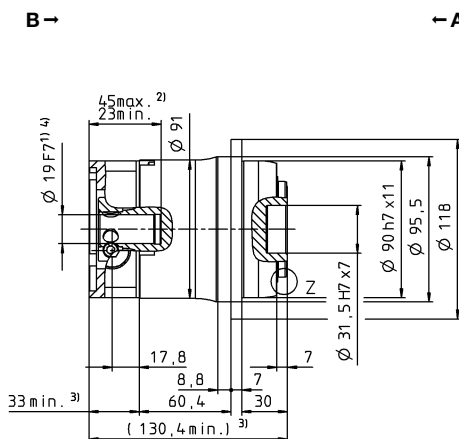
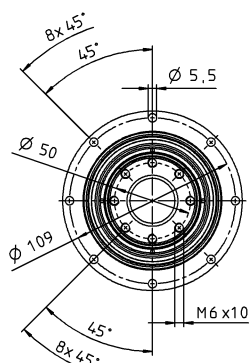
up to 11<sup>4)</sup> (B)  
clamping hub  
diameter



up to 14<sup>4)</sup> (C)<sup>5)</sup>  
clamping hub  
diameter



up to 19<sup>4)</sup> (E)  
clamping hub  
diameter



Non-tolerated dimensions are nominal dimensions

<sup>1)</sup> Check motor shaft fit

<sup>2)</sup> Min./Max. permissible motor shaft length. Longer motor shafts are possible, please contact alpha.

<sup>3)</sup> The dimensions depend on the motor

<sup>4)</sup> Smaller motor shaft diameter is compensated by a bushing with a minimum wall thickness of 1 mm

<sup>5)</sup> Standard clamping hub diameter

Motor shaft diameter [mm]

Application-spec.  
solutions

DP+

MF

# DP+ 025 MF 2-stage

				2-stage									
Ratio			<i>i</i>		16	20	21	25	28	31	35	40	50
Max. torque <sup>a) b)</sup>			<i>T</i> <sub>2a</sub>	<i>Nm</i>	352	352	352	380	352	352	380	352	380
				<i>in.lb</i>	3115	3115	3115	3363	3115	3115	3363	3115	3363
Max. acceleration torque <sup>b)</sup> (max. 1000 cycles per hour)			<i>T</i> <sub>2B</sub>	<i>Nm</i>	352	352	330	380	352	330	380	352	380
				<i>in.lb</i>	3115	3115	2921	3363	3115	2921	3363	3115	3363
Nominal torque (at <i>n</i> <sub>N</sub> )			<i>T</i> <sub>2N</sub>	<i>Nm</i>	250	267	211	265	282	231	294	282	304
				<i>in.lb</i>	2213	2366	1872	2348	2492	2047	2598	2492	2691
Emergency stop torque <sup>a) b)</sup> (permitted 1000 times during the service life of the gearbox)			<i>T</i> <sub>2Not</sub>	<i>Nm</i>	625	625	625	625	625	625	625	625	625
				<i>in.lb</i>	5532	5532	5532	5532	5532	5532	5532	5532	5532
Permitted average input speed (at <i>T</i> <sub>2N</sub> and 20 °C ambient temperature) <sup>d)</sup>			<i>n</i> <sub>1N</sub>	<i>rpm</i>	2800	2800	2800	2800	2800	2800	2800	2800	3100
Max. input speed			<i>n</i> <sub>1Max</sub>	<i>rpm</i>	7500	7500	7500	7500	7500	7500	7500	7500	7500
Mean no load running torque <sup>b)</sup> (at <i>n</i> <sub>i</sub> = 3000 rpm and 20 °C gearbox temperature)			<i>T</i> <sub>012</sub>	<i>Nm</i>	1.2	1.0	1.1	0.90	0.80	0.84	0.60	0.59	0.50
				<i>in.lb</i>	10	8.9	9.9	8.0	7.1	7.4	5.3	5.2	4.4
Max. backlash			<i>j</i> <sub>t</sub>	<i>arcmin</i>	Standard ≤ 3 / Reduced ≤ 1								
Torsional rigidity <sup>b)</sup>			<i>C</i> <sub>t21</sub>	<i>Nm/arcmin</i>	81	81	70	83	80	54	82	76	80
				<i>in.lb/arcmin</i>	717	717	620	735	708	478	726	673	708
Tilting rigidity			<i>C</i> <sub>2K</sub>	<i>Nm/arcmin</i>	550								
				<i>in.lb/arcmin</i>	4868								
Max. axial force <sup>c)</sup>			<i>F</i> <sub>2AMax</sub>	<i>N</i>	4800								
				<i>lb<sub>f</sub></i>	1080								
Max. tilting moment			<i>M</i> <sub>2KMax</sub>	<i>Nm</i>	440								
				<i>in.lb</i>	3894								
Efficiency at full load			<i>η</i>	%	94								
Service life <sup>f)</sup>			<i>L</i> <sub>h</sub>	<i>h</i>	> 20000								
Weight (incl. standard adapter plate)			<i>m</i>	<i>kg</i>	6.7								
				<i>lb<sub>m</sub></i>	14.8								
Operating noise (at reference ratio and reference speed – ratio-specific values available in cymex®)			<i>L</i> <sub>PA</sub>	<i>dB(A)</i>	≤ 58								
Max. permitted housing temperature				°C	+90								
				<i>F</i>	194								
Ambient temperature				°C	–15 to +40								
				<i>F</i>	5 to 104								
Lubrication					Lubricated for life								
Direction of rotation					In- and output same direction								
Protection class					IP 65								
Metal bellows coupling (recommended product type – validate sizing with cymex®)					-								
				<i>mm</i>	-								
Mass moment of inertia (relates to the drive) Clamping hub diameter [mm] Optimized mass inertia version available on request	C	14	<i>J</i> <sub>i</sub>	<i>kgcm<sup>2</sup></i>	0.66	0.55	0.60	0.53	0.44	0.55	0.43	0.38	0.38
				<i>10<sup>-3</sup> in.lb.s<sup>2</sup></i>	0.58	0.48	0.53	0.47	0.39	0.49	0.38	0.34	0.33
	E	19	<i>J</i> <sub>i</sub>	<i>kgcm<sup>2</sup></i>	0.83	0.71	0.77	0.70	0.61	0.72	0.60	0.55	0.55
				<i>10<sup>-3</sup> in.lb.s<sup>2</sup></i>	0.73	0.63	0.68	0.62	0.54	0.64	0.53	0.49	0.48
	G	24	<i>J</i> <sub>i</sub>	<i>kgcm<sup>2</sup></i>	2.20	2.08	2.14	2.07	1.98	2.09	1.97	1.92	1.92
				<i>10<sup>-3</sup> in.lb.s<sup>2</sup></i>	1.95	1.84	1.89	1.83	1.75	1.85	1.74	1.70	1.70
	H	28	<i>J</i> <sub>i</sub>	<i>kgcm<sup>2</sup></i>	2.00	1.91	1.96	1.89	1.82	1.85	1.81	1.76	1.76
				<i>10<sup>-3</sup> in.lb.s<sup>2</sup></i>	1.77	1.69	1.73	1.67	1.61	1.64	1.60	1.56	1.56

Please use our sizing software cymex<sup>®</sup> for a detailed sizing – [www.wittenstein-cymex.com](http://www.wittenstein-cymex.com)

<sup>a)</sup> At max. 10 %  $M_{2KMax}$

<sup>b)</sup> Valid for standard clamping hub diameter

<sup>c)</sup> Refers to center of the output shaft or flange

<sup>d)</sup> Please reduce input speed at higher ambient temperatures

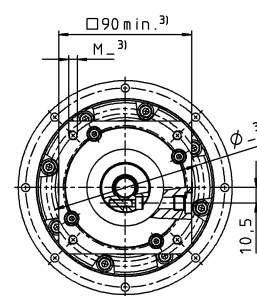
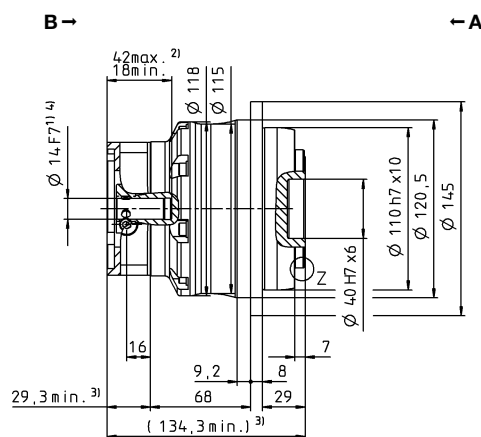
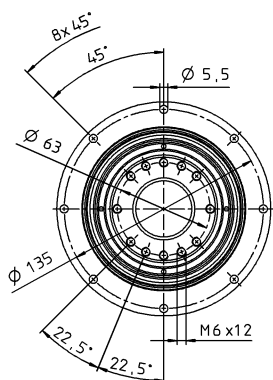
<sup>f)</sup> Please contact us to discuss  
application-specific service lifetimes

View A

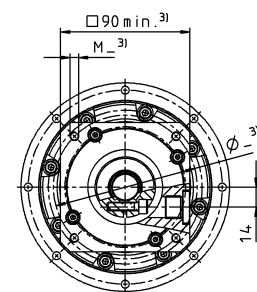
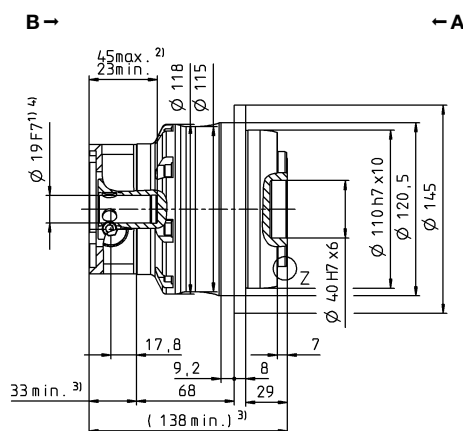
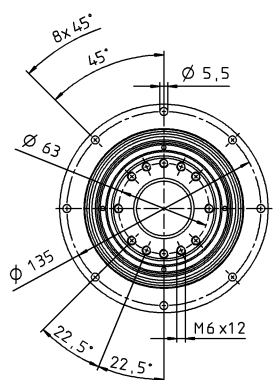
View B

# 2-stage

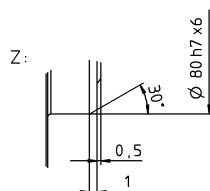
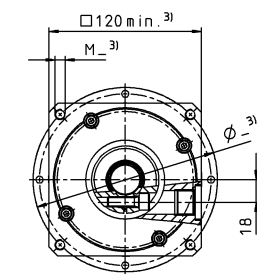
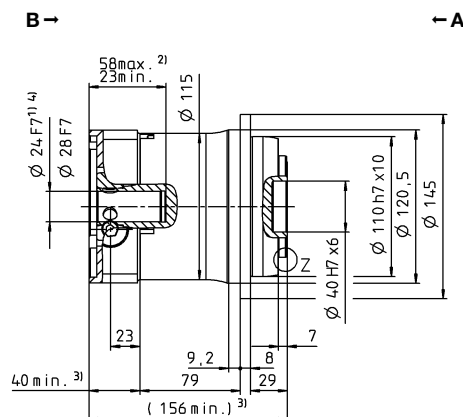
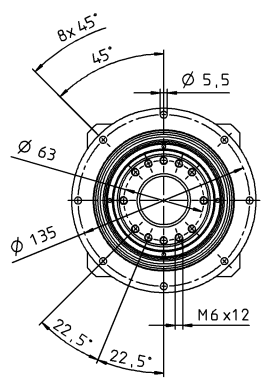
up to 14<sup>4)</sup> (C)  
clamping hub  
diameter



up to 19<sup>4)</sup> (E)<sup>5)</sup>  
clamping hub  
diameter



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



Non-tolerated dimensions are nominal dimensions

<sup>1)</sup> Check motor shaft fit

<sup>2)</sup> Min./Max. permissible motor shaft length. Longer motor shafts are possible, please contact alpha.

<sup>3)</sup> The dimensions depend on the motor

<sup>4)</sup> Smaller motor shaft diameter is compensated by a bushing with a minimum wall thickness of 1 mm

<sup>5)</sup> Standard clamping hub diameter

Motor shaft diameter [mm]

Application-spec.  
solutions

DP+

MF

# DP+ 050 MF 2-stage

				2-stage									
Ratio			<i>i</i>		16	20	21	25	28	31	35	40	50
Max. torque <sup>a) b)</sup>			<i>T</i> <sub>2a</sub>	<i>Nm</i>	825	825	660	825	825	682	825	825	825
				<i>in.lb</i>	7302	7302	5842	7302	7302	6036	7302	7302	7302
Max. acceleration torque <sup>b)</sup> (max. 1000 cycles per hour)			<i>T</i> <sub>2B</sub>	<i>Nm</i>	825	825	660	825	825	682	825	825	825
				<i>in.lb</i>	7302	7302	5842	7302	7302	6036	7302	7302	7302
Nominal torque (at <i>n</i> <sub>n</sub> )			<i>T</i> <sub>2N</sub>	<i>Nm</i>	461	493	393	489	545	431	541	607	585
				<i>in.lb</i>	4078	4361	2476	4332	4824	3812	4792	5370	5179
Emergency stop torque <sup>a) b)</sup> (permitted 1000 times during the service life of the gearbox)			<i>T</i> <sub>2Not</sub>	<i>Nm</i>	1250	1250	1250	1250	1250	1250	1250	1250	1250
				<i>in.lb</i>	11064	11064	11064	11064	11064	11064	11064	11064	11064
Permitted average input speed (at <i>T</i> <sub>2N</sub> and 20 °C ambient temperature) <sup>d)</sup>			<i>n</i> <sub>1N</sub>	<i>rpm</i>	2900	2900	2900	2900	2900	2900	2900	2900	3200
Max. input speed			<i>n</i> <sub>1Max</sub>	<i>rpm</i>	6250	6250	6250	6250	6250	6250	6250	6250	6250
Mean no load running torque <sup>b)</sup> (at <i>n</i> <sub>i</sub> = 3000 rpm and 20 °C gearbox temperature)			<i>T</i> <sub>012</sub>	<i>Nm</i>	2.8	2.4	2.2	2.6	2.0	1.9	1.5	1.5	1.2
				<i>in.lb</i>	25	22	20	23	17	17	14	13	11
Max. backlash			<i>j</i> <sub>t</sub>	<i>arcmin</i>	Standard ≤ 3 / Reduced ≤ 1								
Torsional rigidity <sup>b)</sup>			<i>C</i> <sub>121</sub>	<i>Nm/arcmin</i>	180	185	145	180	180	130	175	175	175
				<i>in.lb/arcmin</i>	1593	1637	1283	1593	1593	1151	1549	1549	1549
Tilting rigidity			<i>C</i> <sub>2K</sub>	<i>Nm/arcmin</i>	560								
				<i>in.lb/arcmin</i>	4956								
Max. axial force <sup>c)</sup>			<i>F</i> <sub>2AMax</sub>	<i>N</i>	6130								
				<i>lb<sub>f</sub></i>	1379								
Max. tilting moment			<i>M</i> <sub>2KMax</sub>	<i>Nm</i>	1379								
				<i>in.lb</i>	11816								
Efficiency at full load			<i>η</i>	%	94								
Service life <sup>f)</sup>			<i>L</i> <sub>h</sub>	<i>h</i>	> 20000								
Weight (incl. standard adapter plate)			<i>m</i>	<i>kg</i>	14.1								
				<i>lb<sub>m</sub></i>	31.2								
Operating noise (at reference ratio and reference speed – ratio-specific values available in cymex <sup>®</sup> )			<i>L</i> <sub>PA</sub>	<i>dB(A)</i>	≤ 60								
Max. permitted housing temperature				°C	+90								
				<i>F</i>	194								
Ambient temperature				°C	−15 to +40								
				<i>F</i>	5 to 104								
Lubrication					Lubricated for life								
Direction of rotation					In- and output same direction								
Protection class					IP 65								
Metal bellows coupling (recommended product type – validate sizing with cymex <sup>®</sup> )					-								
Bore diameter of coupling on the application side				<i>mm</i>	-								
Mass moment of inertia (relates to the drive)  Clamping hub diameter [mm] Optimized mass inertia version available on request	E	19	<i>J</i> <sub>i</sub>	<i>kgcm<sup>2</sup></i>	2.53	2.08	2.30	2.01	1.67	2.12	1.64	1.44	1.42
				<i>10<sup>-3</sup> in.lb.s<sup>2</sup></i>	2.24	1.84	2.04	1.78	1.48	1.88	1.45	1.27	1.26
	G	24	<i>J</i> <sub>i</sub>	<i>kgcm<sup>2</sup></i>	3.22	2.77	2.99	2.70	2.37	2.81	2.33	2.13	2.12
				<i>10<sup>-3</sup> in.lb.s<sup>2</sup></i>	2.85	2.45	2.65	2.39	2.10	2.49	2.06	1.89	1.88
	K	38	<i>J</i> <sub>i</sub>	<i>kgcm<sup>2</sup></i>	10.3	9.83	10.1	9.77	9.43	9.88	9.40	9.20	9.18
				<i>10<sup>-3</sup> in.lb.s<sup>2</sup></i>	9.12	8.70	8.94	8.65	8.35	8.74	8.32	8.14	8.12

Please use our sizing software cymex<sup>®</sup> for a detailed sizing – [www.wittenstein-cymex.com](http://www.wittenstein-cymex.com)

<sup>a)</sup> At max. 10 %  $M_{2KMax}$

<sup>b)</sup> Valid for standard clamping hub diameter

<sup>c)</sup> Refers to center of the output shaft or flange

<sup>d)</sup> Please reduce input speed at higher ambient temperatures

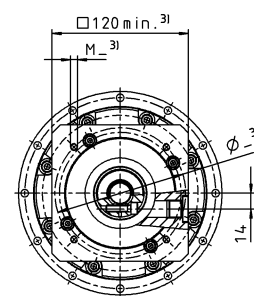
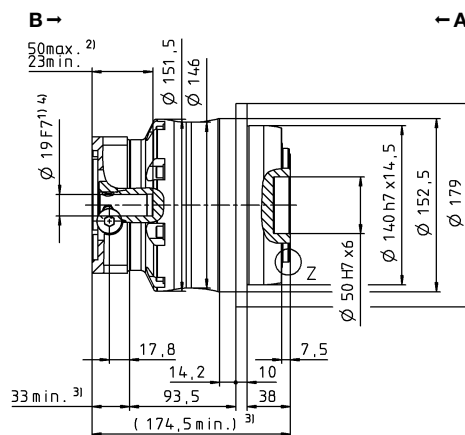
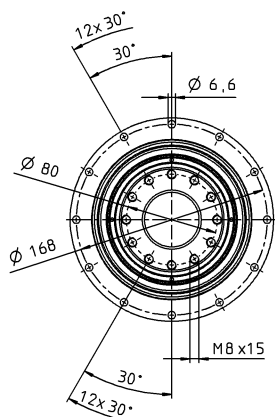
<sup>f)</sup> Please contact us to discuss  
application-specific service lifetimes

View A

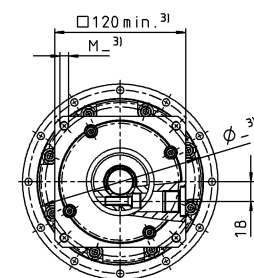
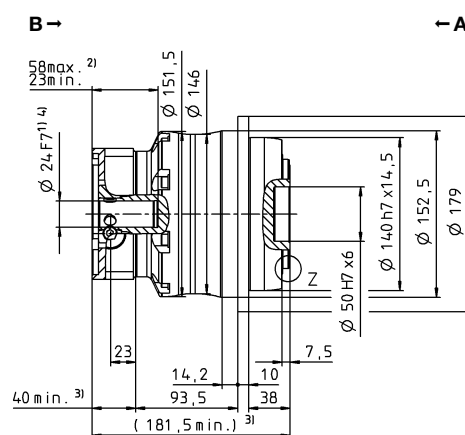
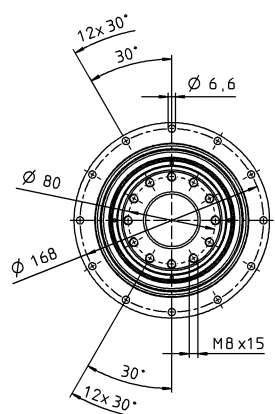
View B

# 2-stage

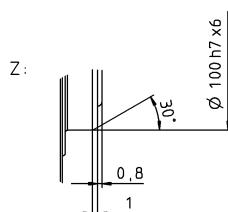
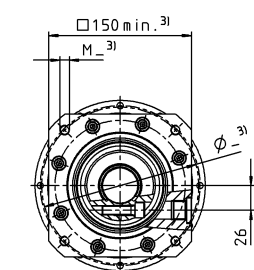
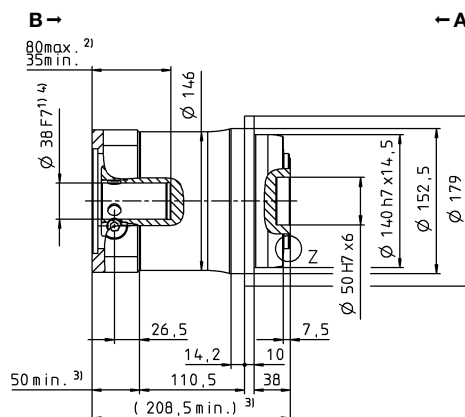
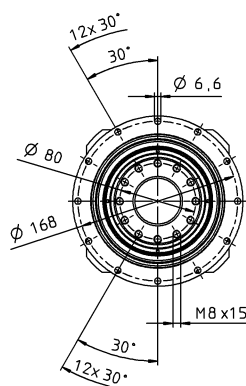
up to 19<sup>4)</sup> (E)  
clamping hub  
diameter



up to 24<sup>4)</sup> (G)<sup>5)</sup>  
clamping hub  
diameter



up to 38<sup>4)</sup> (K)  
clamping hub  
diameter



Non-tolerated dimensions are nominal dimensions

<sup>1)</sup> Check motor shaft fit

<sup>2)</sup> Min./Max. permissible motor shaft length. Longer motor shafts are possible, please contact alpha.

<sup>3)</sup> The dimensions depend on the motor

<sup>4)</sup> Smaller motor shaft diameter is compensated by a bushing with a minimum wall thickness of 1 mm

<sup>5)</sup> Standard clamping hub diameter

Motor shaft diameter [mm]

Application-spec.  
solutions

DP+

MF



# DP+ 010 MA 2-stage

				2-stage				
Ratio			<i>i</i>		22	27.5	38.5	55
Max. torque <sup>a) b)</sup>			<i>T</i> <sub>2a</sub>	<i>Nm</i>	315	315	315	315
				<i>in.lb</i>	2788	2788	2788	2788
Max. acceleration torque <sup>b)</sup> (max. 1000 cycles per hour)			<i>T</i> <sub>2B</sub>	<i>Nm</i>	230	230	230	230
				<i>in.lb</i>	2036	2036	2036	2036
Nominal torque (at <i>n</i> <sub>n</sub> )			<i>T</i> <sub>2N</sub>	<i>Nm</i>	140	137	139	147
				<i>in.lb</i>	1242	1213	1230	1303
Emergency stop torque <sup>a) b)</sup> (permitted 1000 times during the service life of the gearbox)			<i>T</i> <sub>2Not</sub>	<i>Nm</i>	525	525	525	525
				<i>in.lb</i>	4647	4647	4647	4647
Permitted average input speed (at <i>T</i> <sub>2N</sub> and 20 °C ambient temperature) <sup>d)</sup>			<i>n</i> <sub>1N</sub>	<i>rpm</i>	4000	4000	4000	4000
Max. input speed			<i>n</i> <sub>1Max</sub>	<i>rpm</i>	7500	7500	7500	7500
Mean no load running torque <sup>b)</sup> (at <i>n</i> <sub>i</sub> = 3000 rpm and 20 °C gearbox temperature)			<i>T</i> <sub>012</sub>	<i>Nm</i>	0.52	0.47	0.41	0.38
				<i>in.lb</i>	4.6	4.2	4.0	3.4
Max. backlash			<i>j</i> <sub>t</sub>	<i>arcmin</i>	≤ 1			
Torsional rigidity <sup>b)</sup>			<i>C</i> <sub>t21</sub>	<i>Nm/arcmin</i>	43	43	43	42
				<i>in.lb/arcmin</i>	381	381	381	372
Tilting rigidity			<i>C</i> <sub>2K</sub>	<i>Nm/arcmin</i>	225			
				<i>in.lb/arcmin</i>	1991			
Max. axial force <sup>c)</sup>			<i>F</i> <sub>2AMax</sub>	<i>N</i>	2795			
				<i>lb<sub>f</sub></i>	629			
Max. tilting moment			<i>M</i> <sub>2KMax</sub>	<i>Nm</i>	400			
				<i>in.lb</i>	3540			
Efficiency at full load			<i>η</i>	%	94			
Service life <sup>f)</sup>			<i>L</i> <sub>h</sub>	<i>h</i>	> 20000			
Weight (incl. standard adapter plate)			<i>m</i>	<i>kg</i>	3.2			
				<i>lb<sub>m</sub></i>	7.1			
Operating noise (at reference ratio and reference speed – ratio-specific values available in cymex®)			<i>L</i> <sub>PA</sub>	<i>dB(A)</i>	≤ 56			
Max. permitted housing temperature				°C	+90			
				<i>F</i>	194			
Ambient temperature				°C	–15 to +40			
				<i>F</i>	5 to 104			
Lubrication					Lubricated for life			
Direction of rotation					In- and output same direction			
Protection class					IP 65			
Metal bellows coupling (recommended product type – validate sizing with cymex®)					-			
Bore diameter of coupling on the application side				<i>mm</i>	-			
Mass moment of inertia (relates to the drive)  Clamping hub diameter [mm]  Optimized mass inertia version available on request	C	14	<i>J</i> <sub>i</sub>	<i>kgcm</i> <sup>2</sup>	0.21	0.18	0.16	0.14
				<i>10<sup>-3</sup> in.lb.s</i> <sup>2</sup>	0.19	0.16	0.14	0.12
	E	19	<i>J</i> <sub>i</sub>	<i>kgcm</i> <sup>2</sup>	0.52	0.50	0.47	0.46
				<i>10<sup>-3</sup> in.lb.s</i> <sup>2</sup>	0.46	0.44	0.42	0.41

Please use our sizing software cymex<sup>®</sup> for a detailed sizing – [www.wittenstein-cymex.com](http://www.wittenstein-cymex.com)

<sup>a)</sup> At max. 10 %  $M_{2KMax}$

<sup>b)</sup> Valid for standard clamping hub diameter

<sup>c)</sup> Refers to center of the output shaft or flange

<sup>d)</sup> Please reduce input speed at higher ambient temperatures

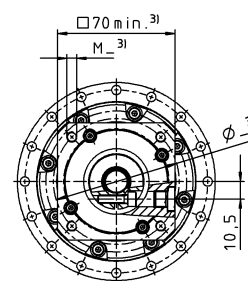
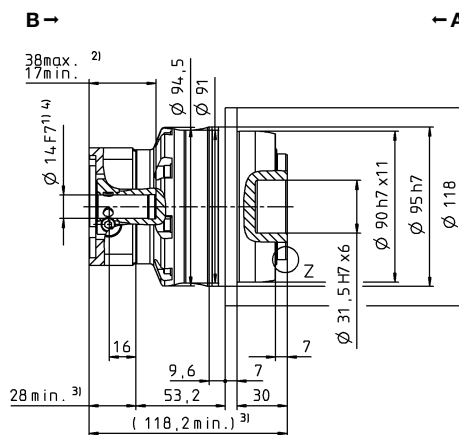
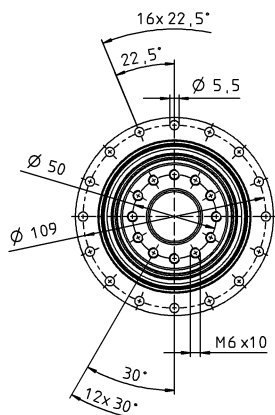
<sup>f)</sup> Please contact us to discuss  
application-specific service lifetimes

View A

View B

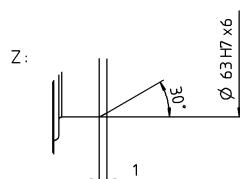
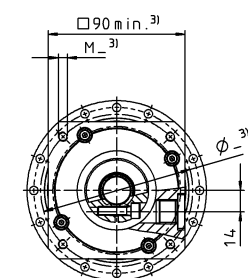
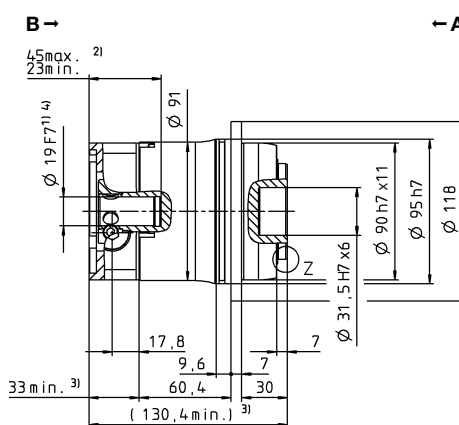
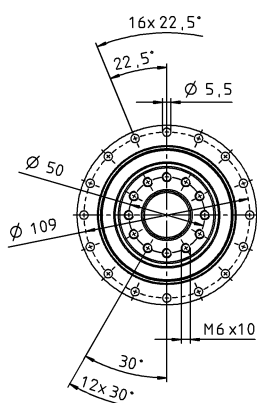
# 2-stage

up to 14<sup>4)</sup> (C)<sup>5)</sup>  
clamping hub  
diameter



Motor shaft diameter [mm]

up to 19<sup>4)</sup> (E)  
clamping hub  
diameter



Non-tolerated dimensions are nominal dimensions

<sup>1)</sup> Check motor shaft fit

<sup>2)</sup> Min./Max. permissible motor shaft length. Longer motor shafts are possible, please contact alpha.

<sup>3)</sup> The dimensions depend on the motor

<sup>4)</sup> Smaller motor shaft diameter is compensated by a bushing with a minimum wall thickness of 1 mm

<sup>5)</sup> Standard clamping hub diameter

# DP+ 025 MA 2-stage

				2-stage			
Ratio	<i>i</i>			22	27.5	38.5	55
Max. torque <sup>a) b)</sup>	$T_{2a}$	Nm		583	583	583	583
		in.lb		5160	5160	5160	5160
Max. acceleration torque <sup>b)</sup> (max. 1000 cycles per hour)	$T_{2B}$	Nm		530	530	530	530
		in.lb		4691	4691	4691	4691
Nominal torque (at $n_n$ )	$T_{2N}$	Nm		312	314	371	413
		in.lb		2762	2775	3286	3652
Emergency stop torque <sup>a) b)</sup> (permitted 1000 times during the service life of the gearbox)	$T_{2Not}$	Nm		1200	1200	1200	1200
		in.lb		10621	10621	10621	10621
Permitted average input speed (at $T_{2N}$ and 20 °C ambient temperature) <sup>d)</sup>	$n_{1N}$	rpm		3500	3500	3500	3500
Max. input speed	$n_{1Max}$	rpm		7500	7500	7500	7500
Mean no load running torque <sup>b)</sup> (at $n_i = 3000$ rpm and 20 °C gearbox temperature)	$T_{012}$	Nm		1.0	0.87	0.78	0.70
		in.lb		9.2	7.7	6.9	6.2
Max. backlash	$j_t$	arcmin		$\leq 1$			
Torsional rigidity <sup>b)</sup>	$C_{t21}$	Nm/arcmin		105	105	105	100
		in.lb/arcmin		929	929	929	885
Tilting rigidity	$C_{2K}$	Nm/arcmin		550			
		in.lb/arcmin		4868			
Max. axial force <sup>c)</sup>	$F_{2AMax}$	N		4800			
		lb <sub>f</sub>		1080			
Max. tilting moment	$M_{2KMax}$	Nm		550			
		in.lb		4868			
Efficiency at full load	$\eta$	%		94			
Service life <sup>f)</sup>	$L_h$	h		> 20000			
Weight (incl. standard adapter plate)	$m$	kg		5.6			
		lb <sub>m</sub>		12.4			
Operating noise (at reference ratio and reference speed – ratio-specific values available in cymex <sup>®</sup> )	$L_{PA}$	dB(A)		$\leq 58$			
Max. permitted housing temperature		°C		+90			
		F		194			
Ambient temperature		°C		-15 to +40			
		F		5 to 104			
Lubrication				Lubricated for life			
Direction of rotation				In- and output same direction			
Protection class				IP 65			
Metal bellows coupling (recommended product type – validate sizing with cymex <sup>®</sup> )				-			
Bore diameter of coupling on the application side		mm		-			
Mass moment of inertia (relates to the drive) Clamping hub diameter [mm] Optimized mass inertia version available on request	E 19	$J_1$	kgcm <sup>2</sup>	0.87	0.70	0.60	0.55
			10 <sup>-3</sup> in.lb.s <sup>2</sup>	0.77	0.62	0.53	0.49
	G 24	$J_1$	kgcm <sup>2</sup>	2.39	2.22	2.12	2.07
			10 <sup>-3</sup> in.lb.s <sup>2</sup>	2.12	1.96	1.88	1.83

Please use our sizing software cymex<sup>®</sup> for a detailed sizing – [www.wittenstein-cymex.com](http://www.wittenstein-cymex.com)

<sup>a)</sup> At max. 10 %  $M_{2KMax}$

<sup>b)</sup> Valid for standard clamping hub diameter

<sup>c)</sup> Refers to center of the output shaft or flange

<sup>d)</sup> Please reduce input speed at higher ambient temperatures

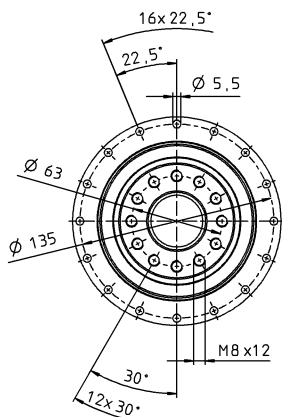
<sup>f)</sup> Please contact us to discuss  
application-specific service lifetimes

View A

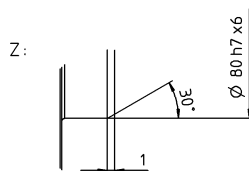
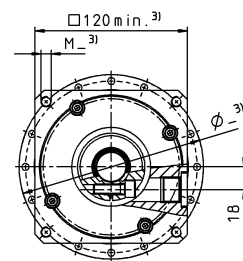
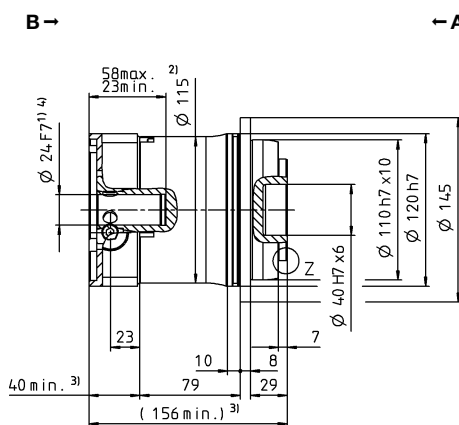
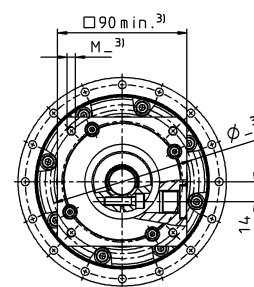
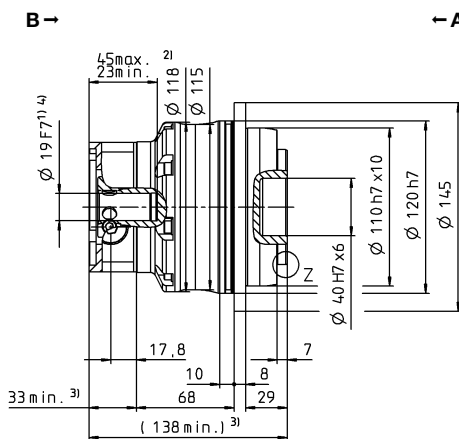
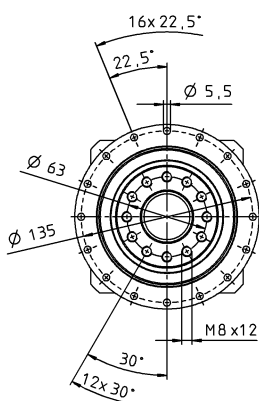
View B

# 2-stage

up to 19 <sup>4)</sup> (E) <sup>5)</sup>  
clamping hub  
diameter



up to 24 <sup>4)</sup> (G)  
clamping hub  
diameter



Non-tolerated dimensions are nominal dimensions

<sup>1)</sup> Check motor shaft fit

<sup>2)</sup> Min./Max. permissible motor shaft length. Longer motor shafts are possible, please contact alpha.

<sup>3)</sup> The dimensions depend on the motor

<sup>4)</sup> Smaller motor shaft diameter is compensated by a bushing with a minimum wall thickness of 1 mm

<sup>5)</sup> Standard clamping hub diameter

# DP+ 050 MA 2-stage

				2-stage				
Ratio			<i>i</i>		22	27.5	38.5	55
Max. torque <sup>a) b)</sup>			<i>T</i> <sub>2a</sub>	<i>Nm</i>	1402	1402	1402	1402
				<i>in.lb</i>	12406	12406	12406	12406
Max. acceleration torque <sup>b)</sup> (max. 1000 cycles per hour)			<i>T</i> <sub>2B</sub>	<i>Nm</i>	992	992	992	992
				<i>in.lb</i>	8780	8780	8780	8780
Nominal torque (at <i>n</i> <sub>n</sub> )			<i>T</i> <sub>2N</sub>	<i>Nm</i>	523	566	638	717
				<i>in.lb</i>	4632	5005	5649	6348
Emergency stop torque <sup>a) b)</sup> (permitted 1000 times during the service life of the gearbox)			<i>T</i> <sub>2Not</sub>	<i>Nm</i>	2375	2375	2375	2375
				<i>in.lb</i>	21021	21021	21021	21021
Permitted average input speed (at <i>T</i> <sub>2N</sub> and 20 °C ambient temperature) <sup>d)</sup>			<i>n</i> <sub>1N</sub>	<i>rpm</i>	3000	3000	3000	3000
Max. input speed			<i>n</i> <sub>1Max</sub>	<i>rpm</i>	6250	6250	6250	6250
Mean no load running torque <sup>b)</sup> (at <i>n</i> <sub>i</sub> = 3000 rpm and 20 °C gearbox temperature)			<i>T</i> <sub>012</sub>	<i>Nm</i>	2.7	2.4	2.1	1.7
				<i>in.lb</i>	23.9	21.2	18.9	15.0
Max. backlash			<i>j</i> <sub>t</sub>	<i>arcmin</i>	≤ 1			
Torsional rigidity <sup>b)</sup>			<i>C</i> <sub>t21</sub>	<i>Nm/arcmin</i>	220	220	220	220
				<i>in.lb/arcmin</i>	1947	1947	1947	1947
Tilting rigidity			<i>C</i> <sub>2K</sub>	<i>Nm/arcmin</i>	560			
				<i>in.lb/arcmin</i>	4956			
Max. axial force <sup>c)</sup>			<i>F</i> <sub>2AMax</sub>	<i>N</i>	6130			
				<i>lb<sub>f</sub></i>	1379			
Max. tilting moment			<i>M</i> <sub>2KMax</sub>	<i>Nm</i>	1335			
				<i>in.lb</i>	11816			
Efficiency at full load			<i>η</i>	%	94			
Service life <sup>f)</sup>			<i>L</i> <sub>h</sub>	<i>h</i>	> 20000			
Weight (incl. standard adapter plate)			<i>m</i>	<i>kg</i>	12.5			
				<i>lb<sub>m</sub></i>	27.6			
Operating noise (at reference ratio and reference speed – ratio-specific values available in cymex®)			<i>L</i> <sub>PA</sub>	<i>dB(A)</i>	≤ 60			
Max. permitted housing temperature				°C	+90			
				<i>F</i>	194			
Ambient temperature				°C	–15 to +40			
				<i>F</i>	5 to 104			
Lubrication					Lubricated for life			
Direction of rotation					In- and output same direction			
Protection class					IP 65			
Metal bellows coupling (recommended product type – validate sizing with cymex®)					-			
Bore diameter of coupling on the application side				<i>mm</i>	-			
Mass moment of inertia (relates to the drive)  Clamping hub diameter [mm]  Optimized mass inertia version available on request	G	24	<i>J</i> <sub>i</sub>	<i>kgcm</i> <sup>2</sup>	3.80	3.33	3.00	2.80
				<i>10<sup>-3</sup> in.lb.s</i> <sup>2</sup>	3.36	2.95	2.66	2.48
	K	38	<i>J</i> <sub>i</sub>	<i>kgcm</i> <sup>2</sup>	10.7	10.3	9.90	9.70
				<i>10<sup>-3</sup> in.lb.s</i> <sup>2</sup>	9.47	9.12	8.76	8.58

Please use our sizing software cymex<sup>®</sup> for a detailed sizing – [www.wittenstein-cymex.com](http://www.wittenstein-cymex.com)

<sup>a)</sup> At max. 10 %  $M_{2KMax}$

<sup>b)</sup> Valid for standard clamping hub diameter

<sup>c)</sup> Refers to center of the output shaft or flange

<sup>d)</sup> Please reduce input speed at higher ambient temperatures

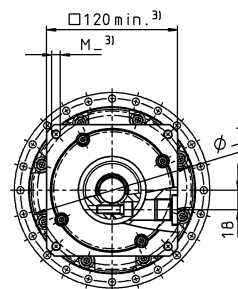
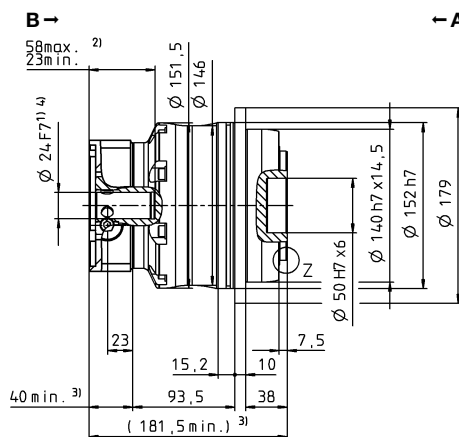
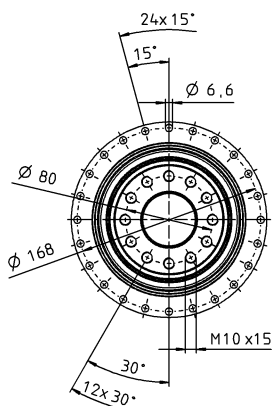
<sup>f)</sup> Please contact us to discuss  
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View A

View B

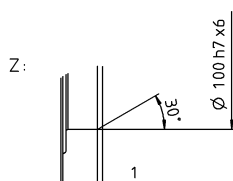
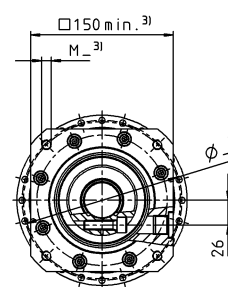
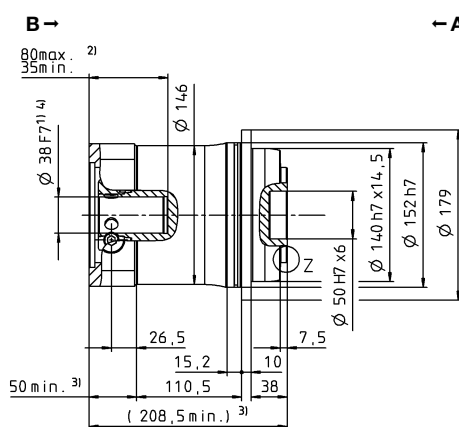
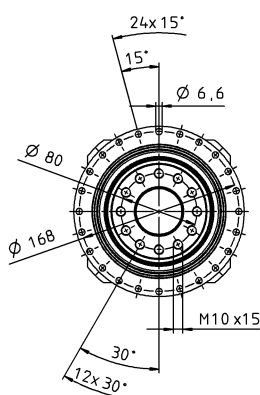
# 2-stage

up to 24 <sup>4)</sup> (G) <sup>5)</sup>  
clamping hub  
diameter



Motor shaft diameter [mm]

up to 38 <sup>4)</sup> (K)  
clamping hub  
diameter



Non-tolerated dimensions are nominal dimensions

<sup>1)</sup> Check motor shaft fit

<sup>2)</sup> Min./Max. permissible motor shaft length. Longer motor shafts are possible, please contact alpha.

<sup>3)</sup> The dimensions depend on the motor

<sup>4)</sup> Smaller motor shaft diameter is compensated by a bushing with a minimum wall thickness of 1 mm

<sup>5)</sup> Standard clamping hub diameter

## HDP+ – Cleanliness guaranteed



HDP+

### Product highlights

**Positioning accuracy:** Minimal backlash and extreme torsional rigidity ensure maximum positioning accuracy

**New freedom in design through direct process integration**

**Resistance:** Resistant against chemical cleaning agents and disinfectants

**Cleaning:** Fast, efficient and safe cleaning, also suitable for CIP processes

**Consistently high performance:** Constant backlash throughout the service life of the gearbox ensures a consistently high performance

**Max. achievable leak tightness:** IP69K (max. 30 bar)

Aseptic, highly dynamic and outstanding positioning accuracy – the HDP+ meets the strict hygiene requirements of production and packaging facilities. The gearbox in hygienic design not only offers you maximum safety against contamination-related product and process risks, but also guarantees maximum system availability and productivity.

HDP+ is setting new industrial standards in hygienic design

### Benefits for system manufacturers

- Integration in a system constructed according to Hygiene Design requirements (certification available)
- Meets legal obligations (machinery directive, food hygiene regulation)
- Reduction of individual parts simplifies production / assembly and allows a more compact machine design
- Greater overall system effectiveness
- Competitive advantage through innovation

### Benefits for operators

- Easier, faster cleaning: shorter CIP / SIP times
- Improved reliability and longer life
- Quick and easy disassembly
- Reduced consumption of cleaning materials
- Minimal costs for maintenance and repair
- Cost savings: competitive advantage and lower end user price
- Increased food safety



Used for fish processing



Used for filling and packing milk products



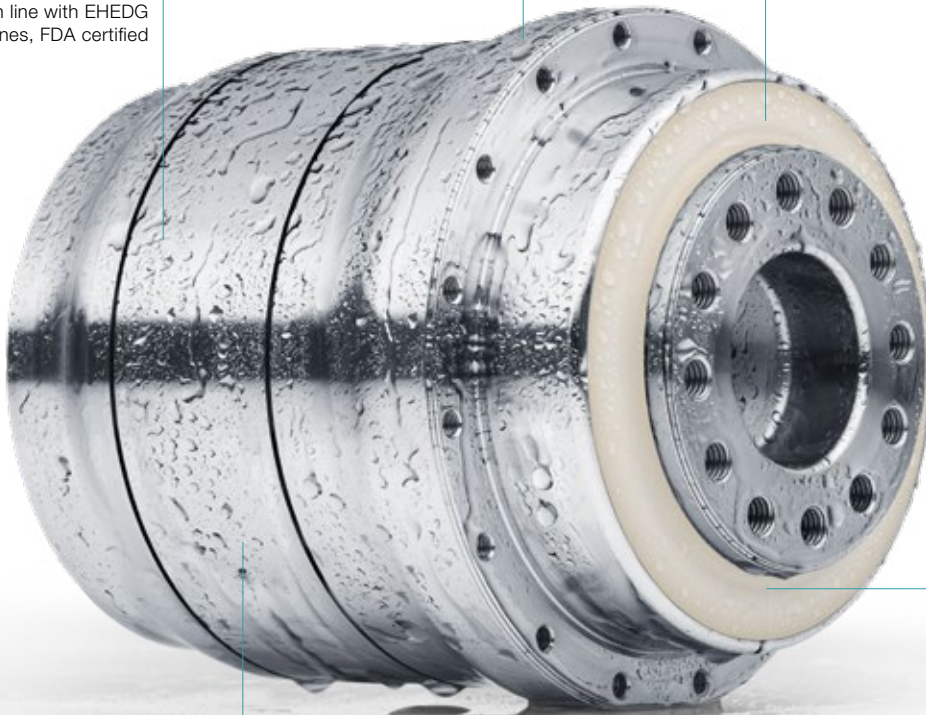


More information on hygienic design solutions: Simply scan the QR code with your smartphone.

Smooth rolled surface in hygienic steel 1.4404

Triple sealing concept guarantees optimal reliability

Designed in line with EHEDG guidelines, FDA certified



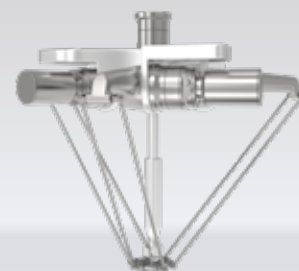
Seals resistant to cleaning materials have IP69K protection (max. 30 bar)

No dead spaces

Application-spec.  
solutions



Used for portioning meat products



The high-precision HDP+ is ideal for Delta robotics applications



# HDP<sup>+</sup> 010 MA 2-stage

				2-stage			
Ratio	<i>i</i>			22	27.5	38.5	55
Max. torque <sup>a) b)</sup>	$T_{2a}$	Nm		252	252	252	252
		in.lb		2230	2230	2230	2230
Max. acceleration torque <sup>b)</sup> (max. 1000 cycles per hour)	$T_{2B}$	Nm		185	185	185	185
		in.lb		1637	1637	1637	1637
Nominal torque (at $n_n$ )	$T_{2N}$	Nm		140	137	139	147
		in.lb		1242	1213	1230	1303
Emergency stop torque <sup>a) b)</sup> (permitted 1000 times during the service life of the gearbox)	$T_{2Not}$	Nm		525	525	525	525
		in.lb		4647	4647	4647	4647
Permitted average input speed (at $T_{2N}$ and 20 °C ambient temperature) <sup>d)</sup>	$n_{1N}$	rpm		4000	4000	4000	4000
Max. input speed	$n_{1Max}$	rpm		7500	7500	7500	7500
Mean no load running torque <sup>b)</sup> (at $n_i = 3000$ rpm and 20 °C gearbox temperature)	$T_{012}$	Nm		0.52	0.47	0.38	0.38
		in.lb		4.6	4.2	3.4	3.4
Max. backlash	$j_t$	arcmin		≤ 1			
Torsional rigidity <sup>b)</sup>	$C_{t21}$	Nm/arcmin		43	43	43	42
		in.lb/arcmin		381	381	381	372
Tilting rigidity	$C_{2K}$	Nm/arcmin		225			
		in.lb/arcmin		1991			
Max. axial force <sup>c)</sup>	$F_{2AMax}$	N		2795			
		lb <sub>f</sub>		629			
Max. tilting moment	$M_{2KMax}$	Nm		400			
		in.lb		3540			
Efficiency at full load	$\eta$	%		94			
Service life <sup>f)</sup>	$L_h$	h		> 20000			
Weight (incl. standard adapter plate)	$m$	kg		7.3			
		lb <sub>m</sub>		16.1			
Operating noise (at reference ratio and reference speed – ratio-specific values available in cymex <sup>®</sup> )	$L_{PA}$	dB(A)		≤ 56			
Max. permitted housing temperature		°C		+90			
		F		194			
Ambient temperature		°C		–15 to +40			
		F		5 to 104			
Lubrication				Lubricated for life			
Direction of rotation				In- and output same direction			
Protection class <sup>g)</sup>				IP69K (max. 30 bar)			
Metal bellows coupling (recommended product type – validate sizing with cymex <sup>®</sup> )				-			
Bore diameter of coupling on the application side		mm		-			
Mass moment of inertia (relates to the drive) Clamping hub diameter [mm] Optimized mass inertia version	C 14	$J_1$	kgcm <sup>2</sup>	0.16	0.14	0.11	0.10
			10 <sup>-3</sup> in.lb.s <sup>2</sup>	0.14	0.12	0.10	0.9
	E 19	$J_1$	kgcm <sup>2</sup>	0.39	0.36	0.34	0.33
			10 <sup>-3</sup> in.lb.s <sup>2</sup>	0.35	0.32	0.30	0.29

Please use our sizing software cymex<sup>®</sup> for a detailed sizing – [www.wittenstein-cymex.com](http://www.wittenstein-cymex.com)

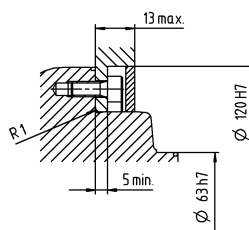
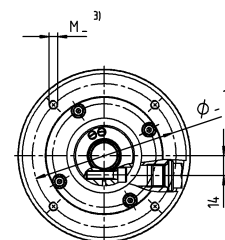
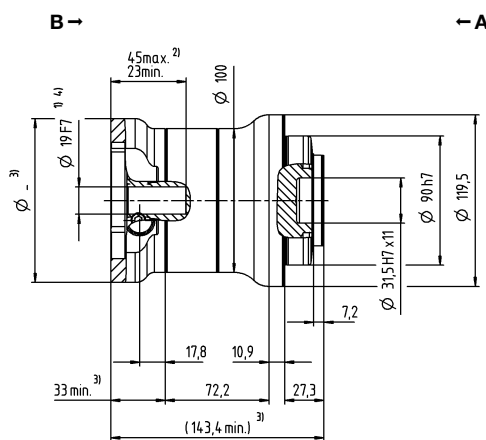
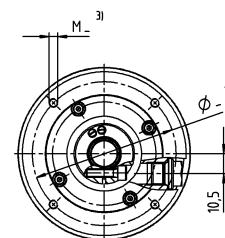
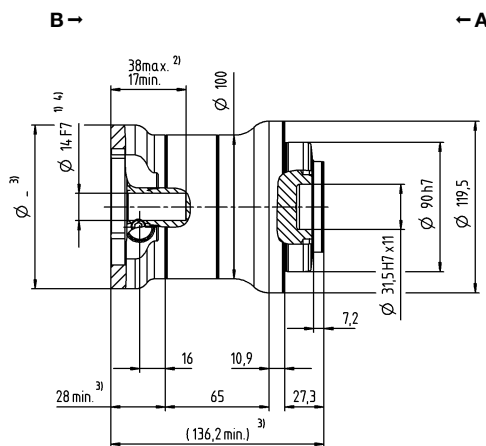
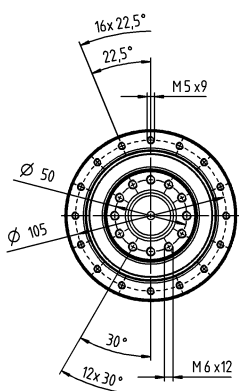
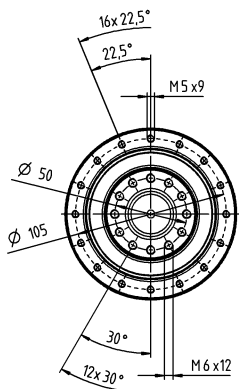
- <sup>a)</sup> At max. 10 %  $M_{2KMax}$
- <sup>b)</sup> Valid for standard clamping hub diameter
- <sup>c)</sup> Refers to center of the output shaft or flange
- <sup>d)</sup> Please reduce input speed at higher ambient temperatures
- <sup>f)</sup> Please contact us to discuss application-specific service lifetimes
- <sup>g)</sup> Applies at standstill, for details see operating instructions

View A

View B

# 2-stage

up to 14 <sup>4)</sup> (C) <sup>5)</sup>  
clamping hub  
diameter



Mounting accessories:  
Mounting kit comprising seals and  
O-rings available as an option.

Non-tolerated dimensions are nominal dimensions

<sup>1)</sup> Check motor shaft fit

<sup>2)</sup> Min./Max. permissible motor shaft length. Longer motor shafts are possible, please contact alpha.

<sup>3)</sup> The dimensions depend on the motor

<sup>4)</sup> Smaller motor shaft diameter is compensated by a bushing with a minimum wall thickness of 1 mm

<sup>5)</sup> Standard clamping hub diameter

Motor shaft diameter [mm]

up to 19 <sup>4)</sup> (E)  
clamping hub  
diameter

HDP

Application-spec.  
solutions

# HDP+ 025 MA 2-stage

				2-stage			
Ratio	<i>i</i>			22	27.5	38.5	55
Max. torque <sup>a) b)</sup>	$T_{2a}$	Nm		466	466	466	466
		in.lb		4128	4128	4128	4128
Max. acceleration torque <sup>b)</sup> (max. 1000 cycles per hour)	$T_{2B}$	Nm		425	425	425	425
		in.lb		3762	3762	3762	3762
Nominal torque (at $n_n$ )	$T_{2N}$	Nm		312	314	371	413
		in.lb		2762	2775	3286	3652
Emergency stop torque <sup>a) b)</sup> (permitted 1000 times during the service life of the gearbox)	$T_{2Not}$	Nm		1200	1200	1200	1200
		in.lb		10621	10621	10621	10621
Permitted average input speed (at $T_{2N}$ and 20 °C ambient temperature) <sup>d)</sup>	$n_{1N}$	rpm		3500	3500	3500	3500
Max. input speed	$n_{1Max}$	rpm		7500	7500	7500	7500
Mean no load running torque <sup>b)</sup> (at $n_i = 3000$ rpm and 20 °C gearbox temperature)	$T_{012}$	Nm		1.0	0.87	0.78	0.70
		in.lb		9.2	7.7	6.9	6.2
Max. backlash	$j_t$	arcmin		$\leq 1$			
Torsional rigidity <sup>b)</sup>	$C_{t21}$	Nm/arcmin		100	100	100	100
		in.lb/arcmin		885	885	885	885
Tilting rigidity	$C_{2K}$	Nm/arcmin		550			
		in.lb/arcmin		4868			
Max. axial force <sup>c)</sup>	$F_{2AMax}$	N		4800			
		lb <sub>f</sub>		1080			
Max. tilting moment	$M_{2KMax}$	Nm		550			
		in.lb		4868			
Efficiency at full load	$\eta$	%		94			
Service life <sup>f)</sup>	$L_h$	h		> 20000			
Weight (incl. standard adapter plate)	$m$	kg		11.1			
		lb <sub>m</sub>		24.5			
Operating noise (at reference ratio and reference speed – ratio-specific values available in cymex <sup>®</sup> )	$L_{PA}$	dB(A)		$\leq 58$			
Max. permitted housing temperature		°C		+90			
		F		194			
Ambient temperature		°C		-15 to +40			
		F		5 to 104			
Lubrication				Lubricated for life			
Direction of rotation				In- and output same direction			
Protection class <sup>g)</sup>				IP69K (max. 30 bar)			
Metal bellows coupling (recommended product type – validate sizing with cymex <sup>®</sup> )				-			
Bore diameter of coupling on the application side		mm		-			
Mass moment of inertia (relates to the drive) Clamping hub diameter [mm] Optimized mass inertia version	E 19	$J_1$	kgcm <sup>2</sup>	0.75	0.57	0.47	0.42
			10 <sup>-3</sup> in.lb.s <sup>2</sup>	0.67	0.52	0.42	0.37
	G 24	$J_1$	kgcm <sup>2</sup>	1.77	1.59	1.49	1.44
			10 <sup>-3</sup> in.lb.s <sup>2</sup>	1.57	1.41	1.32	1.28

Please use our sizing software cymex<sup>®</sup> for a detailed sizing – [www.wittenstein-cymex.com](http://www.wittenstein-cymex.com)

<sup>a)</sup> At max. 10 %  $M_{2KMax}$

<sup>b)</sup> Valid for standard clamping hub diameter

<sup>c)</sup> Refers to center of the output shaft or flange

<sup>d)</sup> Please reduce input speed at higher ambient temperatures

<sup>f)</sup> Please contact us to discuss  
application-specific service lifetimes

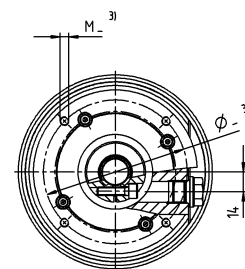
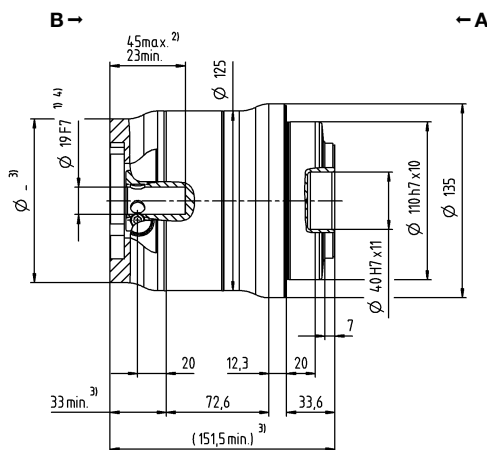
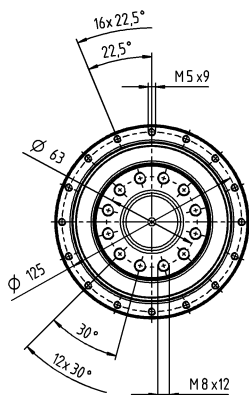
<sup>g)</sup> Applies at standstill, for details see operating instructions

View A

View B

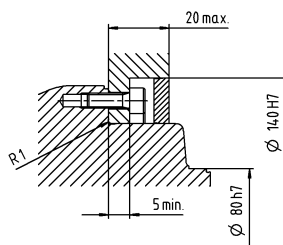
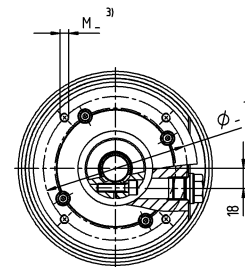
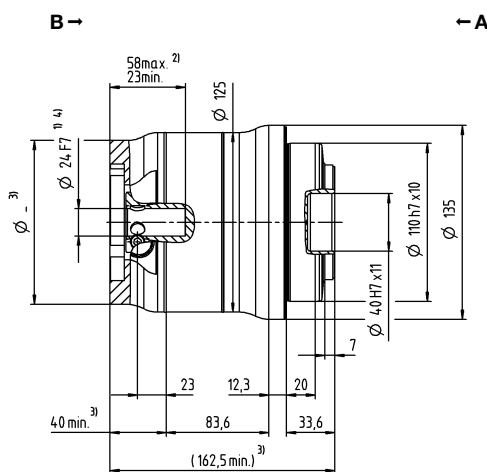
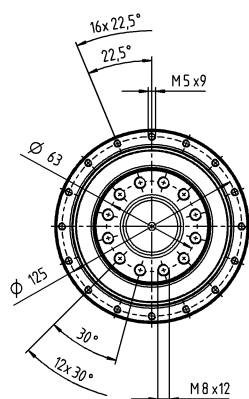
# 2-stage

up to 19 <sup>4)</sup> (E) <sup>5)</sup>  
clamping hub  
diameter



Motor shaft diameter [mm]

up to 24 <sup>4)</sup> (G)  
clamping hub  
diameter



Mounting accessories:  
Mounting kit comprising seals and  
O-rings available as an option.

Non-tolerated dimensions are nominal dimensions

<sup>1)</sup> Check motor shaft fit

<sup>2)</sup> Min./Max. permissible motor shaft length. Longer motor shafts are possible, please contact alpha.

<sup>3)</sup> The dimensions depend on the motor

<sup>4)</sup> Smaller motor shaft diameter is compensated by a bushing with a minimum wall thickness of 1 mm

<sup>5)</sup> Standard clamping hub diameter

# Basic Line gearbox overview



Product type		CP	CPS	CPK	CPSK	CVH	CVS
Version		MF	MF	MF	MF	MF / MT	MF / MT
Ratio <sup>c)</sup>	min. $i =$	3	3	3	3	7	7
	max. $i =$	100	100	100	100	40	40
Max. torsional backlash [arcmin] <sup>c)</sup>	Standard	≤ 12	≤ 12	≤ 15	≤ 15	≤ 15	≤ 15
	Reduced	–	–	–	–	–	–
<b>Output type</b>							
Smooth shaft		x	x	x	x	–	x
Shaft with key <sup>d)</sup>		x	x	x	x	–	x
Splined shaft (DIN 5480)		–	–	–	–	–	–
Blind hollow shaft		–	–	–	–	–	–
Hollow shaft interface		–	–	–	–	x	–
Keyed hollow shaft		–	–	–	–	x	–
Flanged hollow shaft		–	–	–	–	–	–
Flange		–	–	–	–	–	–
System output		–	–	–	–	–	–
Output on both sides		–	–	–	–	x	x
<b>Input type</b>							
Motor-mounted		x	x	x	x	x	x
Self-contained version <sup>b)</sup>		–	–	–	–	–	–
<b>Characteristic</b>							
Flange with slotted holes		–	–	–	–	–	–
ATEX <sup>a)</sup>		–	–	–	–	–	–
Food-grade lubrication <sup>a) b)</sup>		x	x	x	x	x	x
Corrosion resistant <sup>a) b)</sup>		–	–	–	–	–	–
Optimized mass inertia <sup>a)</sup>		–	–	–	–	–	–
<b>System solutions</b>							
Linear system (rack/pinion)		–	–	–	–	–	–
Servo actuator		–	–	–	–	–	–
<b>Accessories</b> (please refer to the product pages for further options)							
Coupling		x	x	x	x	–	x
Shrink disc		–	–	–	–	x	–

<sup>a)</sup> Power reduction: technical data available on request

<sup>b)</sup> Please contact WITTENSTEIN alpha

<sup>c)</sup> In relation to reference sizes

<sup>d)</sup> Power reduction: Please use our sizing software cymex® for a detailed sizing – [www.wittenstein-cymex.com](http://www.wittenstein-cymex.com)

# Value Line gearbox overview



Product type		NP	NPL	NPS	NPT	NPR	NTP	NPK	NPLK	NPSK	NPTK	NPRK	NVH	NVS	HDV
Version		MF/MA	MF/MA	MF/MA	MF/MA	MF/MA	MQ	MF	MF	MF	MF	MF	MF	MF	MF/MT
Ratio <sup>c)</sup>	min. $i =$	3	3	3	3	3	4	3	3	3	3	3	4	4	4
	max. $i =$	100	100	100	100	100	100	100	100	100	100	100	400	400	400
Max. torsional backlash [arcmin] <sup>c)</sup>	Standard	≤ 8	≤ 8	≤ 8	≤ 8	≤ 8	≤ 5	≤ 11	≤ 11	≤ 11	≤ 11	≤ 11	≤ 6	≤ 6	≤ 10
	Reduced	–	–	–	–	–	–	–	–	–	–	–	–	–	–
<b>Output type</b>															
Smooth shaft		x	x	x	–	x	–	x	x	x	–	x	–	x	x
Shaft with key <sup>d)</sup>		x	x	x	–	x	–	x	x	x	–	x	–	x	x
Splined shaft (DIN 5480)		–	x	x	–	x	–	–	x	x	–	x	–	–	–
Blind hollow shaft		–	–	–	–	–	–	–	–	–	–	–	–	–	–
Hollow shaft interface		–	–	–	–	–	–	–	–	–	–	–	x	–	–
Keyed hollow shaft		–	–	–	–	–	–	–	–	–	–	–	x	–	–
Flanged hollow shaft		–	–	–	–	–	–	–	–	–	–	–	–	–	–
Flange		–	–	–	x	–	x	–	–	–	x	–	–	–	–
System output		–	–	–	–	–	–	–	–	–	–	–	–	–	–
Output on both sides		–	–	–	–	–	–	–	–	–	–	–	x	x	–
<b>Input type</b>															
Motor-mounted		x	x	x	x	x	x	x	x	x	x	x	x	x	x
Self-contained version <sup>b)</sup>		–	–	–	–	–	–	–	–	–	–	–	–	–	–
<b>Characteristic</b>															
Flange with slotted holes		–	–	–	–	x	–	–	–	–	–	x	–	–	–
ATEX <sup>a)</sup>		–	–	–	–	–	–	–	–	–	–	–	–	–	–
Food-grade lubrication <sup>a) b)</sup>		x	x	x	x	x	x	x	x	x	x	x	x	x	x
Corrosion resistant <sup>a) b)</sup>		–	–	–	–	–	–	–	–	–	–	–	x	x	x
Optimized mass inertia <sup>a)</sup>		–	–	–	–	–	–	–	–	–	–	–	–	–	–
<b>System solutions</b>															
Linear system (rack/pinion)		x	x	x	–	x	–	x	x	x	–	x	–	x	–
Servo actuator		–	–	–	–	–	–	–	–	–	–	–	–	–	x
<b>Accessories</b> (please refer to the product pages for further options)															
Coupling		x	x	x	x	x	x	x	x	x	–	x	–	x	–
Shrink disc		–	–	–	–	–	–	–	–	–	–	–	x	–	–

<sup>a)</sup> Power reduction: technical data available on request

<sup>b)</sup> Please contact WITTENSTEIN alpha

<sup>c)</sup> In relation to reference sizes

<sup>d)</sup> Power reduction: Please use our sizing software cymex® for a detailed sizing – [www.wittenstein-cymex.com](http://www.wittenstein-cymex.com)

# Advanced Line gearbox overview



Product type		SP+	SP+ HIGH SPEED	SP+ HIGH SPEED friction optimized	TP+	TP+ HIGH TORQUE	HG+	SK+	SPK+
Version		MF	MC	MC-L	MF	MA	MF	MF	MF
Catalog page		26	26	26	80	80	126	138	148
Ratio <sup>c)</sup>	min. i =	3	3	3	4	22	3	3	12
	max. i =	100	100	10	100	302.5	100	100	1000
Max. torsional backlash [arcmin] <sup>c)</sup>	Standard	≤ 3	≤ 4	≤ 4	≤ 3	≤ 1	≤ 4	≤ 4	≤ 4
	Reduced	≤ 1	≤ 2	≤ 2	≤ 1	–	–	–	≤ 2

## Output shape

Smooth shaft	x	x	x	–	–	–	x	x
Shaft with key <sup>d)</sup>	x	x	x	–	–	–	x	x
Splined shaft (DIN 5480)	x	x	x	–	–	–	x	x
Blind hollow shaft	x	x	x	–	–	–	–	x
Hollow shaft interface	–	–	–	–	–	x	–	–
Keyed hollow shaft	–	–	–	–	–	–	–	–
Flanged hollow shaft	–	–	–	–	–	–	–	–
Flange	–	–	–	x	x	–	–	–
System output	–	–	–	x	x	–	–	–
Output on both sides	–	–	–	–	–	x	x	x

## Input type

Motor-mounted	x	x	x	x	x	x	x	x
Self-contained version <sup>b)</sup>	x	–	–	x	–	–	–	–

## Characteristic

Flange with slotted holes	x	–	–	–	–	–	–	–
ATEX <sup>a)</sup>	x	x	–	–	–	x	x	–
Food-grade lubrication <sup>a) b)</sup>	x	x	x	x	x	x	x	x
Corrosion resistant <sup>a) b)</sup>	x	x	x	x	x	x	x	x
Optimized mass inertia <sup>a)</sup>	x	x	x	x	x	–	–	–

## System solutions

Linear system (rack / pinion)	x	x	–	x	x	–	x	x
Servo actuator	x	–	–	x	x	–	–	–

## Accessories

(please refer to the product pages for further options)

Coupling	x	x	x	x	x	–	x	x
Shrink disc	x	x	x	–	–	x	–	x

<sup>a)</sup> Power reduction; technical data available on request

<sup>b)</sup> Please contact WITTENSTEIN alpha

<sup>c)</sup> In relation to reference sizes

<sup>d)</sup> Power reduction: Please use our sizing software cymex® for a detailed sizing – [www.wittenstein-cymex.com](http://www.wittenstein-cymex.com)



TK+	TPK+	TPK+ HIGH TORQUE	SC+	SPC+	TPC+	VH+	VS+	VT+	DP+	HDP+
MF	MF	MA	MF	MF	MF	MF	MF	MF	MF / MA	MA
172	182	182	218	228	238	252	262	270	285	298
3	12	66	1	4	4	4	4	4	16	22
100	5500	5500	2	20	20	400	400	400	55	55
≤ 4	≤ 4	≤ 1.3	≤ 4	≤ 4	≤ 4	≤ 3	≤ 3	≤ 3	≤ 3	≤ 1
–	≤ 2	–	–	≤ 2	≤ 2	≤ 2	≤ 2	≤ 2	≤ 1	–

–	–	–	x	x	–	–	x	–	–	–
–	–	–	x	x	–	–	x	–	–	–
–	–	–	–	x	–	–	x	–	–	–
–	–	–	–	x	–	–	–	–	–	–
–	–	–	–	–	–	x	–	–	–	–
–	–	–	–	–	–	x	–	–	–	–
x	–	–	–	–	–	–	–	x	–	–
–	x	x	–	–	x	–	–	–	x	x
–	x	x	–	–	x	–	–	–	–	–
x	x	x	–	–	–	x	x	–	–	–

x	x	x	x	x	x	x	x	x	x	x
–	–	–	–	–	–	–	–	–	–	–

–	–	–	–	–	–	–	–	–	–	–
x	–	–	–	–	–	–	–	–	–	–
x	x	x	x	x	x	x	x	x	x	x
x	x	x	–	–	–	x	x	x	x	x
–	–	–	–	–	–	–	–	–	x	x

x	x	x	x	x	x	–	x	x	–	–
–	–	–	–	–	–	–	–	–	–	–

x	x	x	x	x	x	–	x	x	–	–
–	–	–	–	x	–	x	–	–	–	–



# Premium Line gearbox overview



Product type		XP <sup>+</sup>	XP <sup>+</sup> HIGH SPEED	RP <sup>+</sup>	RP <sup>+</sup> HIGH TORQUE	XPK <sup>+</sup>	RPK <sup>+</sup>	XPC <sup>+</sup>	RPC <sup>+</sup>
Version		MF	MC	MF	MA	MF	MA	MF	MA
Ratio <sup>c)</sup>	min. $i =$	3	3	4	5.5	12	48	4	22
	max. $i =$	100	100	10	220	1000	5500	20	55
Max. torsional backlash [arcmin] <sup>c)</sup>	Standard	≤ 3	≤ 4	≤ 3	≤ 1	≤ 4	≤ 1.3	≤ 4	≤ 1.3
	Reduced	≤ 1	≤ 2	≤ 1	–	≤ 2	–	≤ 2	–
<b>Output shape</b>									
Smooth shaft		x	x	–	–	x	–	x	–
Shaft with key <sup>d)</sup>		x	x	–	–	x	–	x	–
Splined shaft (DIN 5480)		x	x	–	–	x	–	x	–
Blind hollow shaft		x	x	–	–	x	–	x	–
Hollow shaft interface		–	–	–	–	–	–	–	–
Keyed hollow shaft		–	–	–	–	–	–	–	–
Flanged hollow shaft		–	–	–	–	–	–	–	–
Flange		–	–	x	x	–	x	–	x
System output		x	x	x	x	x	x	x	x
Output on both sides		–	–	–	–	–	–	–	–
<b>Input type</b>									
Motor-mounted		x	x	x	x	x	x	x	x
Self-contained version <sup>b)</sup>		x	–	–	–	–	–	–	–
<b>Characteristic</b>									
Flange with slotted holes		x	x	x	x	x	x	x	x
ATEX <sup>a)</sup>		–	–	–	–	–	–	–	–
Food-grade lubrication <sup>a) b)</sup>		x	x	x	x	x	x	x	x
Corrosion resistant <sup>a) b)</sup>		–	–	–	–	–	–	–	–
Optimized mass inertia <sup>a)</sup>		x	x	x	x	–	–	–	–
<b>System solutions</b>									
Linear system (rack / pinion)		x	x	x	x	x	x	x	x
Servo actuator		x	–	x	x	–	–	–	–
<b>Accessories</b> (please refer to the product pages for further options)									
Coupling		x	x	–	–	x	–	x	–
Shrink disc		x	x	–	–	x	–	x	–

<sup>a)</sup> Power reduction: technical data available on request

<sup>b)</sup> Please contact WITTENSTEIN alpha

<sup>c)</sup> In relation to reference sizes

<sup>d)</sup> Power reduction: Please use our sizing software cymex® for a detailed sizing – [www.wittenstein-cymex.com](http://www.wittenstein-cymex.com)

# Servo actuator overview



Product type		PBG	PAG	PHG	RPM*	TPM* DYNAMIC	TPM* HIGH TORQUE	TPM* POWER	AVF
Version		Standard	Standard	Standard	Customer specific	Standard	Standard	Standard	Standard
Ratio <sup>c)</sup>	min. $i =$	16	16	16	22	16	22	4	10
	max. $i =$	100	100	100	220	91	220	100	25
Max. torsional backlash <sup>c)</sup> [arcmin]	Standard	≤ 5	≤ 3	≤ 4	≤ 1	≤ 3	≤ 1	≤ 3	≤ 10
	Reduced	≤ 3	≤ 1	≤ 2	–	≤ 1	≤ 1	≤ 1	–
<b>Output shape</b>									
Smooth shaft		x	–	x	–	–	–	–	x
Shaft with key <sup>d)</sup>		x	–	x	–	–	–	–	x
Splined shaft (DIN 5480)		x	–	x	–	–	–	–	–
Blind hollow shaft		–	–	–	–	–	–	–	–
Hollow shaft interface		–	–	–	–	–	–	–	–
Keyed hollow shaft		–	–	–	–	–	–	–	–
Flanged hollow shaft		–	–	–	–	–	–	–	–
Flange		–	x	–	x	x	x	x	–
System output		–	x	x	x	x	x	x	–
Output on both sides		–	–	–	–	–	–	–	–
<b>Input type</b>									
Motor-mounted		–	–	–	–	–	–	–	–
Self-contained version		–	–	–	–	–	–	–	–
<b>Characteristic</b>									
Flange with slotted holes		–	–	x	x	–	–	–	–
ATEX <sup>a)</sup>		–	–	–	–	–	–	–	–
Food-grade lubrication <sup>a) b)</sup>		x	x	x	x	x	x	x	x
Corrosion resistant <sup>a) b)</sup>		–	–	–	–	x	x	x	x
Optimized mass Inertia <sup>a)</sup>		–	–	–	–	–	–	–	–
<b>System solutions</b>									
Linear system (rack / pinion)		x	x	x	x	x	x	x	–
<b>Accessories</b> (please refer to the product pages for further options)									
Coupling		x	x	–	–	x	x	x	–
Shrink disc		x	–	x	–	–	–	–	–
Power cable, signal cable, hybrid cable		x	x	x	x	x	x	x	x

<sup>a)</sup> Power reduction: technical data available on request

<sup>b)</sup> Please contact WITTENSTEIN alpha

<sup>c)</sup> In relation to reference sizes

<sup>d)</sup> Power reduction: Please use our sizing software cymex® for a detailed sizing – [www.wittenstein-cymex.com](http://www.wittenstein-cymex.com)

# Overview of output interfaces

## Rotative output interfaces



### Smooth shaft

- Friction contact torque transmission via a clamp connection (e.g. in connection with a coupling)
- Simple connection of the gearbox to the application
- Consistently high transmittable torques even with highly cyclical changing loads
- Classic output interface for the shaft gears in the alpha Advanced Line and alpha Premium Line



### Shaft with key

- Form fit torque transmission via the key in the cylindrical gearbox output<sup>1</sup>
- Easy to assemble and disassemble
- Cost-efficient solution for connecting the gearbox to the application
- Form fit locking of the shaft against slipping
- Danger of deflection with highly cyclical changing loads
- Not suitable for applications with high requirements in terms of repeatability
- Common output interface for the shaft gears in the alpha Basic Line and alpha Value Line



### Splined shaft (DIN 5480)

- Form fit torque transmission via the tooth flanks of the output shaft
- Easy to assemble and disassemble
- Consistently high transmittable torques even with highly cyclical changing loads
- Requires little space
- Higher demands on design and production
- Used for connecting RMS pinions to the gearbox (see the alpha Linear Systems product catalog)



### Flange output

- Friction contact torque transmission by screwing the application to the face of the gearbox output<sup>2</sup>
- Maximum torsional rigidity and torque transmission even with highly cyclical changing loads
- Simple and space-saving mounting base



### Blind hollow shaft<sup>4</sup>

- Friction contact torque transmission via a hollow-shaft-like interface on the gearbox output for connecting the application to a shrink disc<sup>3</sup>
- Reduced space requirement due to elimination of connecting elements (e.g. couplings)



#### System output as the basis for RMW pinions (see alpha Linear Systems product catalog)

- Cohesive connection of the output flange with a pinion
- Highly flexible interface for connecting different pinion variants and geometries
- Maximum linear rigidity through the direct connection of pinions with a small reference pitch diameter
- Maximum safety and reliability
- Compact design



#### Flanged hollow shaft

- Friction contact torque transmission by screwing the application to the face of the gearbox output <sup>2</sup>
- Combination of flange output and hollow shaft for maximum use of space for feeding through e.g. cable harnesses or a shaft
- Maximum torsional rigidity and torque transmission even with highly cyclical changing loads
- Simple and space-saving mounting base



#### Hollow shaft interface <sup>4</sup>

- Friction contact torque transmission via cylindrical shoulder on the gearbox output for connecting the application to a shrink disc
- Hollow shaft for feeding through e.g. cable harnesses or a shaft
- Requires little space
- Complex mechanical calculation in the event of tilting moments or lateral forces



#### Keyed hollow shaft <sup>4</sup>

- Form fit torque transmission via the combination of the hollow shaft and a feather keyway <sup>1</sup>
- Hollow shaft for feeding through e.g. cable harnesses or a shaft
- Easy to assemble and disassemble
- Form fit safeguard of the shaft against slipping
- Requires little space
- Danger of deflection with highly cyclical changing loads
- Not suitable for applications with high requirements in terms of repeatability



#### Output on both sides

- Version of the gearbox with a second, rear output (depiction of possible constellations on p. 349)
- Use as input for an additional mounting base
- No reduction in the permitted speeds and torques on both output sides, except in gearboxes with additional planetary output stages (e.g. SPK<sup>+</sup>, TPK<sup>+</sup>); these gearboxes also have higher speeds at the rear output.
- Reduced absorption of axial and lateral forces on the rear output

<sup>1)</sup> The cymex® 5 sizing software performs standard calculations in this regard. Assistance from WITTENSTEIN is possible if required.

<sup>2)</sup> The reliability of the screws depends largely on the screws used, the screw tightening procedure, and the cleaning procedure for the screws during assembly. Recommendations in this regard are included in the operating manual.

<sup>3)</sup> For radial loads, a case-by-case check by WITTENSTEIN is recommended.

<sup>4)</sup> To prevent overdetermination of the system, a torque support is recommended.

# Overview of gearbox variants

**S P** **100** **S** - **M F 1** - **10** - **0 G 1** - **2 S**

## Characteristic:

B = Modular output combination  
 C = Reverse centering  
 E = ATEX  
 F = Food grade lubrication  
 G = Grease  
 H = Food-grade grease  
 L = Friction optimized  
 R = Flange with slotted holes  
 S = Standard  
 W = Corrosion resistant

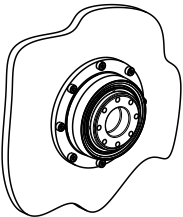
Explanation of variants  
 deviating from the standard:

### B = Modular output combination

An additional backward output type is available for hypoid gearboxes. See page 351 for details.

### C = Reverse centering

To save space, this variant offers greater flexibility in mounting the product on the machine.



### E = ATEX

Devices bearing the Ex symbol comply with EU Directive 2014/34/EN (ATEX) and are approved for use in defined explosion-prone zones. Performance data is limited and can be found in the operating instructions.

### F = Food grade lubrication

These products are available with food-grade lubrication and can therefore be used in the food industry. Please note that the torque ratings in the catalog are reduced by 20 % (excluding V-Drive).

### G = Grease

This variant allows you to lubricate selected products with grease instead of oil. Please note that the torque ratings in the catalog are reduced by 20 %.

### H = Food-grade grease

This variant allows you to lubricate selected products with food-safe grease instead of oil. Please note that the torque ratings in the catalog are reduced by 40%.

### L = Friction optimized

A friction-optimized variant is available for HIGH SPEED products.

Design changes allow the products to be used particularly in applications with high temperature sensitivity, high nominal speeds or long duty cycles.

### R = Flange with slotted holes

This output type is designed for linear applications with rack and pinion or belt pulley. Integrated slotted holes enable easy positioning of the pinion or simple tensioning of the belt.

### W = Corrosion resistant

These products can be used in corrosive environments, e.g. in the food industry, pharmaceutical industry or packaging industry. All external product areas have been designed to avoid corrosion. In addition the products are provided with food-grade grease lubrication. Please note that the torque ratings in the catalog are reduced by 20 % (excluding V-Drive).



# FAST LANE: proven products – available quickly

**With our FAST LANE product program, you are always one step ahead.**  
**With FAST LANE, we enable you to plan your projects optimally, even in volatile times, thanks to fast availability worldwide.**  
**Benefit from a comprehensive portfolio for your application areas with proven reliability and quality.**



## Three ways to your FAST LANE product:

- Use our configuration tools for product selection and requesting a quotation.
- Select from the product overview. Use the contact form to submit your quotation request.
- Contact your sales representative.

## Our promise:



### Constant and short delivery times

Greater responsiveness and efficiency thanks to fast order fulfillment on all sides. Reduction of delivery times for your customers too.



### Proven products

The FAST LANE product program consists of proven products of the highest quality. Quick and long-term availability.



### Reliable delivery times

Stable supply chain even in difficult market phases. Design efficient and lean storage levels.



### Broad portfolio

The FAST LANE product program is being successively expanded to include all product lines and thus covers the majority of your applications and axes.

## Your benefits at a glance

Reduce safety stocks and reconciliations to a minimum - thanks to short-term and predictable availability.

Efficient machine design planning thanks to the rapid availability of prototypes.



Consider fast series availability already in the development phase.

Reduce stock levels thanks to the rapid availability of our FAST LANE product program as a standard.



We will gladly help you to choose the right FAST LANE product.

# Our FAST LANE products

Product type	Size	Characteristic	Ratio	Output	Clamping hub	Backlash					
<b>CP</b> 	005	S Standard	$i=5$ $i=10$	1 Shaft with key	B (11 mm)	1 Standard					
	015				C (14 mm)						
	025				E (19 mm)						
<b>NP</b> 	005	S Standard	$i=5$ $i=10$	0 Smooth shaft  1 Shaft with key	A (9 mm) B (11 mm)	1 Standard					
	015				A (9 mm) B (11 mm) C (14 mm) D (16 mm) E (19 mm)						
					025		C (14 mm) D (16 mm) E (19 mm) G (24 mm)				
	<b>SP<sup>+</sup></b> 						075	S Standard	$i=5$ $i=7$ $i=10$	0 Smooth shaft  1 Shaft with key	E (19 mm) G (24 mm)
					100		G (24 mm) K (38 mm)				
					140		K (38 mm)				
	<b>TP<sup>+</sup></b> 				010		S Standard	$i=7$ $i=10$	0 Flange	E (19 mm) G (24 mm)	0 Reduced  1 Standard
025		G (24 mm) K (38 mm)									
		K (38 mm)									
050											

FAST LANE is only available for the following variants according to the ordering code:  
Gearbox variant: M = Motor-mounted  
Gearbox model: F = Standard  
Motor connection: S = Clamping hub socket





# alpha Advanced Linear Systems

## Strong performance in the advanced segment

Advanced Linear Systems are adapted to applications with average to high demands in terms of smooth running, positioning accuracy and feed force. Different gearbox versions and options such as HIGH TORQUE or HIGH SPEED can be selected to utilize the most appropriate system for the application. Typical fields of application include wood, plastic and composite machining, machining centers and automation.

## The alpha preferred linear system – The best of each segment

Our preferred linear systems in the Advanced Segment are always comprised of the perfect combination of gearbox, pinion, rack and lubrication system. The systems are optimized to achieve the required feed force, feed speed, rigidity and degree of utilization of the individual components.



**For further information, refer to our alpha Linear Systems catalog and our website:**  
**[www.wittenstein-alpha.com/linear-systems](http://www.wittenstein-alpha.com/linear-systems)**

## For a wide range of applications

Linear systems from WITTENSTEIN alpha are suitable for a wide range of applications and industries. New standards and advantages have been achieved in the following areas:

- Smooth operation
- Positioning accuracy
- Feed force
- Power density
- Rigidity
- Easy installation
- Design options
- Scalability

Together with a comprehensive range of services, we pledge to support you from the initial concept to the design, installation and commissioning phase. We will also ensure a consistent supply of spare parts.

### Your benefits at a glance

Perfectly adapted linear systems available with planetary, right-angle and worm gearboxes or as an actuator

Optionally with INIRA®

Large individual configuration range due to numerous pinion/gearbox combinations



# INIRA®: The revolution in rack assembly



Simply scan the QR code using your smartphone to see INIRA® in action.

**INIRA® combines our existing innovative concepts for the simple, safe and efficient installation of racks. INIRA® clamping, INIRA® adjusting and INIRA® pinning have already made the assembly process much faster, more accurate and more ergonomic. Available for the Advanced and Premium Linear Systems.**

**INIRA® clamping:** Simply faster and more ergonomic  
Previously, enormous effort was required to clamp racks to the machine bed using screw clamps. INIRA® clamping integrates the clamping device in the rack. The rack incorporates a mounting sleeve which is guided over the head of the fastening screw to ensure quick and ergonomic clamping.

**INIRA® pinning:** Simply better and more efficient  
The previous method used for pinning racks was extremely time-consuming. Precision bores have to be drilled and the chips generated must be carefully removed from the assembly. INIRA® pinning now offers a completely new solution for the chipless pinning of racks, which reduces installation times considerably (time spent on each rack ~ 1 min).

**INIRA® adjusting:** Simply safer and more precise  
In combination with INIRA® clamping, INIRA® adjusting is the ideal solution for perfectly adjusting the transition between two rack segments. The innovative setting tool can adjust the transition extremely reliably and precisely, accurate to the micrometer.



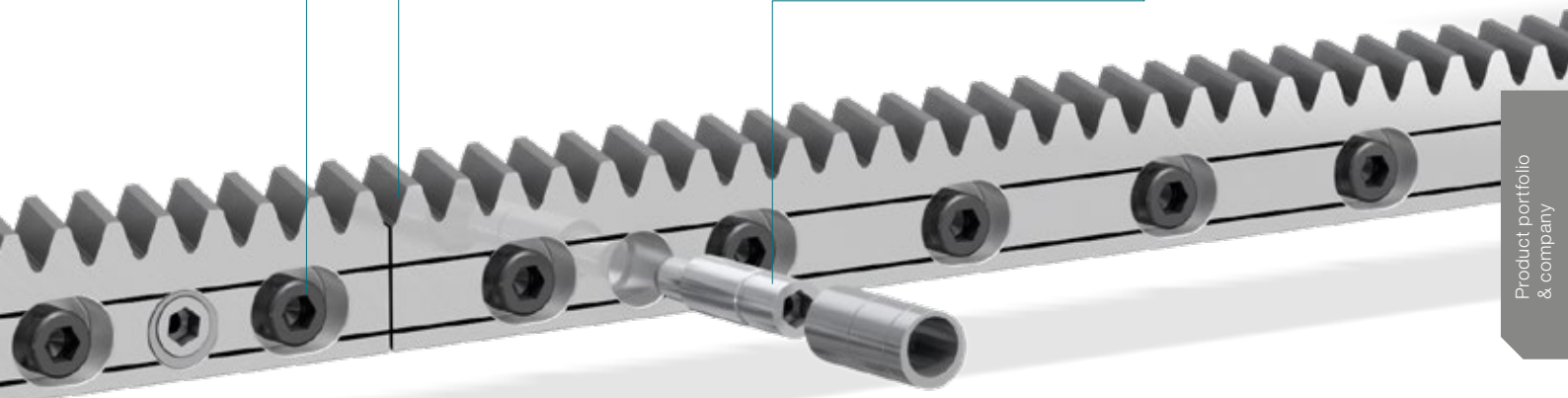
INIRA® clamping



INIRA® adjusting



INIRA® pinning



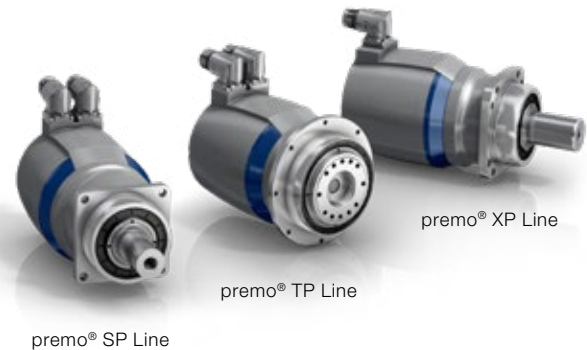
# Precision meets motion = premo® by WITTENSTEIN alpha

premo® is a new, powerful servo actuator platform that combines absolute precision with perfect movement. The central idea behind this first fully scalable servo actuator platform is uncompromising flexibility from the viewpoint of the user. Motors and gearboxes with application-related graduated performance characteristics can be configured modularly to individual servo actuators. The result is a

highly versatile modular system with customizable power, designed for a wide variety of applications. The core of the servo actuator is a torsionally rigid precision gearbox with low backlash and excellent torque density combined with the equally powerful, permanent magnet servo motor with a split winding that guarantees low cogging and minimal velocity ripple.

## premo® – clearly superior in performance

- Higher machine performance thanks to higher acceleration torque
- High torque density combined with a compact design allow for the realization of higher performance machines with significant space saving
- Improved connectivity to next generation controllers from leading system providers through the use of digital feedback (EnDat 2.2, DSL, HIPERFACE DSL®, DRIVE-CLiQ)
- Compatibility for high bus voltages up to 750 V DC
- Reduced wiring requirement through single-connector technology
- Improved reliability and safety through the use of more powerful brakes and SIL 2 encoders

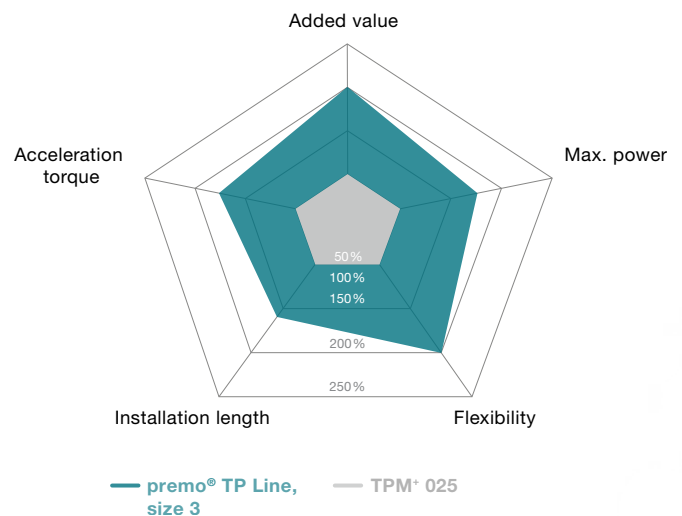


## Product highlights

Optimized power density for greater energy efficiency and productivity

Flexible mechanical and electrical interfaces for high scalability

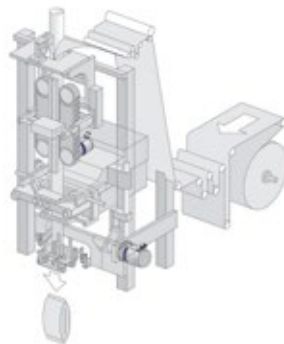
Variety of options for individually upgrading the basic configuration



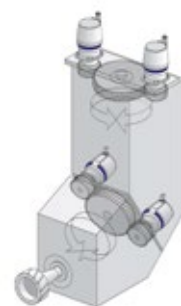
## premo® application examples



Handling portal  
premo® SP Line



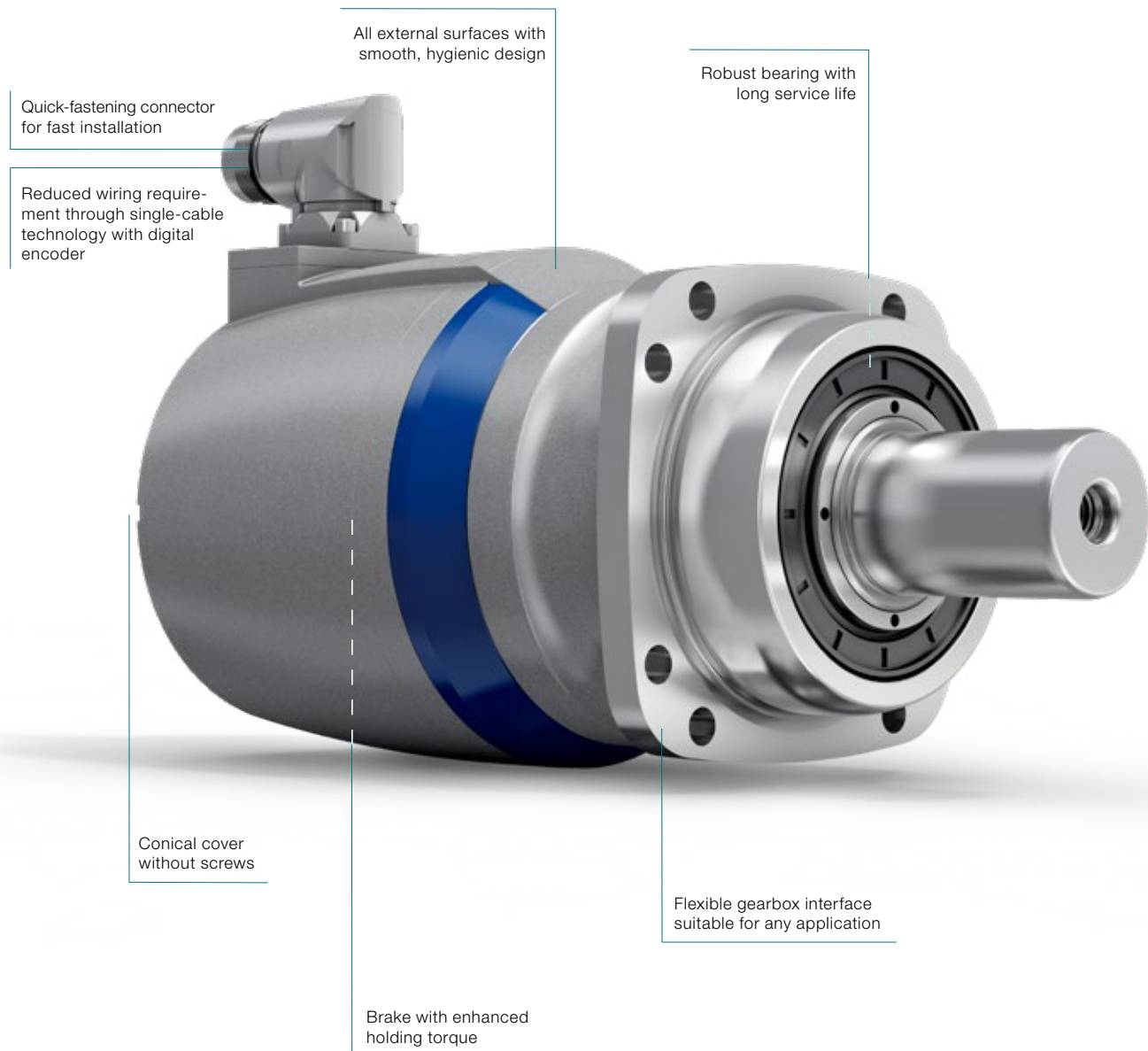
Fill and Seal machine  
premo® TP Line



Milling cutter for a machining center  
premo® XP Line

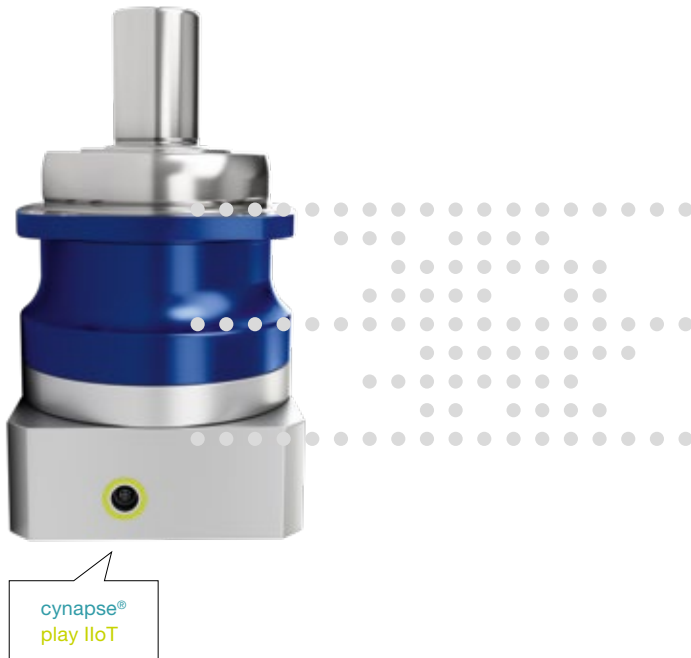
## Typical fields of application and industry solutions

- Delta robot (axes 1–3, swivel axis)
- Handling portal (Z-axis, swivel / rotating axis)
- Machine tool reaming (rotating axes A–C, tool changer)
- Fill and Seal Machine (incl. jaw stroke, sealing jaw, blade)
- Folding carton packaging (incl. assembly / folding, filling valve)
- Plastic thermoform (tool axis)



# cynapse® – It's new. It's connective. The smart feature.

Cybertronic drive systems that can independently acquire and communicate information are an essential prerequisite for IIoT. WITTENSTEIN alpha is the first component manufacturer to offer smart gearboxes as standard – gearboxes with cynapse®. They have an integrated sensor module that makes Industry 4.0 connectivity possible.

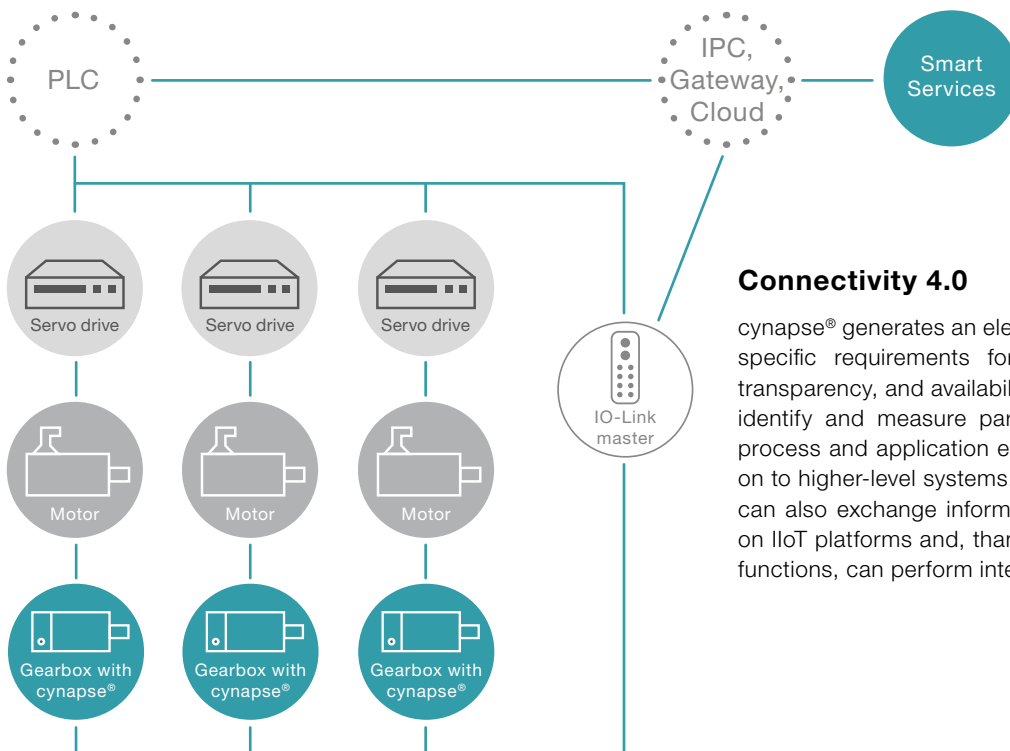


## cynapse® – how it works

cynapse® ensures the gearbox can be easily integrated into the digital world. The cynapse® feature is integrated into the existing installation space and is connected via an IO-Link interface. As a result, measured data such as the gearbox's **temperature, vibration, operating time, acceleration, and product-specific information** can be accessed.

## cynapse® wins customers over with:

- Sensor module integrated into the installation space
- Simple connection by IO-Link interface
- Gearbox threshold monitoring
- Quick product identification thanks to digital name plate



## Connectivity 4.0

cynapse® generates an electronic “fingerprint” of your specific requirements for performance, efficiency, transparency, and availability. The smart gearbox can identify and measure parameters directly from the process and application environment and pass them on to higher-level systems. Gearboxes with cynapse® can also exchange information with the applications on IIoT platforms and, thanks to their integrated logic functions, can perform intelligent monitoring tasks.

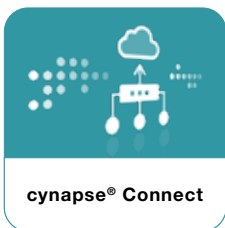
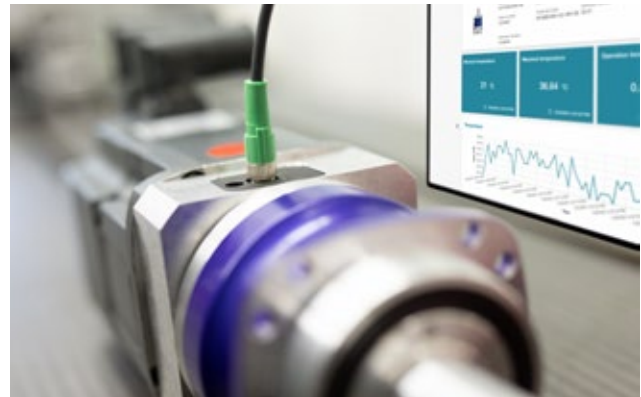


# Smart Services – the perfect complement

The Smart Services expand the functional scope of the cynapse® feature. The basic functions comprise data processing, visualization, and analysis. The specific expertise, which WITTENSTEIN has gathered over more than 40 years of developing low-backlash planetary gearboxes, is used in combination with the operating data to establish and display the status of the gearbox in the Smart Services.

## Your benefits at a glance

- Visualization of the operating data
- Simple and convenient integration
- Determination and monitoring of critical threshold values
- Early identification of problematic statuses
- Avoidance of machine downtimes and associated costs
- Transparency for drive axis



**cynapse® Connect** enables integration and routing of data, which is a fundamental prerequisite for condition monitoring. The Smart Service makes the recorded data available in a structured format. It can obtain this data from various source systems via IO-Link or OPC UA and utilizes it for digital services from WITTENSTEIN. cynapse® Connect thus greatly simplifies the integration of smart gearboxes into the relevant machine infrastructure.



**cynapse® Monitor** builds upon the Smart Service cynapse® Connect and enables straightforward evaluation and visualization of operating data. Since manufacturers and operators do not have to develop their own solutions, development requirements are massively reduced. In addition, the data of the cynapse® Monitor service can be used to monitor threshold values of selected parameters. Deviations and critical states in the behavior of gearboxes or in the relevant process can therefore be identified at an early stage.

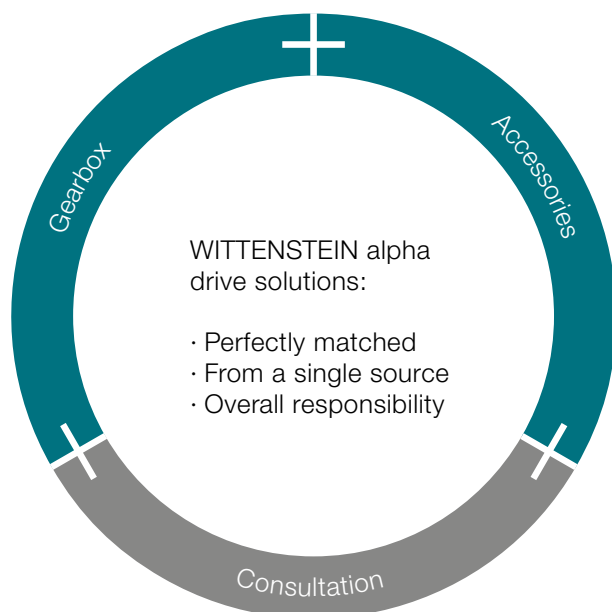


**cynapse® Analyze** is a constantly growing portfolio of smart analysis tools that enable real-time analysis of drive train data. The combination of intelligent algorithms with WITTENSTEIN alpha's core expertise in gearbox technology results in a wide range of synergy effects. The analysis tools can simultaneously monitor different points in the machine and be used for different machine applications. This enables recognition of more complex deviations in the machine process or component behavior at an early stage. Machine downtimes can be anticipated in good time, thus preventing high breakdown costs.



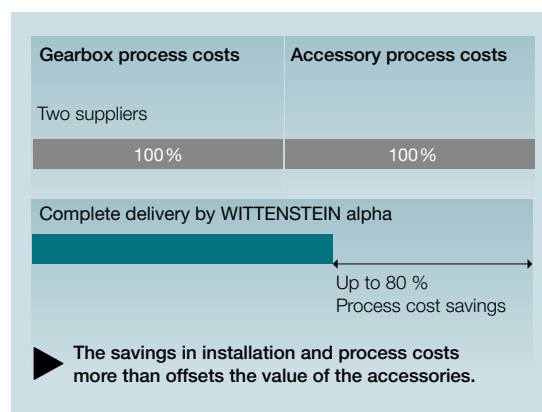
## Accessories – smart additions for intelligent performance

Gearboxes, accessories and consulting from a single source



Optimization of your added value chain

Use the combination of gearbox and accessories in a complete package to streamline your internal processes.



## Quick selection

PRODUCTS	COUPLING	SHRINK DISC
<b>Basic Line</b>		
CP / CPK	ELC	
CPS / CPSK	ELC	
CVH		SD
CVS	ELC	
<b>Value Line</b>		
NP / NPK	ELC	
NPL / NPLK	ELC	
NPS / NPSK	ELC	
NPT / NPTK / NTP	ELT	
NPR / NPRK	ELC	
NVH		SD
NVS	ELC	

PRODUCTS	COUPLING	SHRINK DISC
<b>Advanced Line</b>		
SP <sup>+</sup> / SPK <sup>+</sup> / SPC <sup>+</sup>	BC2	SD
TP <sup>+</sup> / TPK <sup>+</sup> / TPC <sup>+</sup>	BCT	
TP <sup>+</sup> / TPK <sup>+</sup> HIGH TORQUE	BCT	
HG <sup>+</sup>		SD
SK <sup>+</sup>	BC2	
TK <sup>+</sup>	BCT	SD
SC <sup>+</sup>	BC2	
VH <sup>+</sup>		SD
VS <sup>+</sup>	BC3	
VT <sup>+</sup>	BCT	
premo <sup>®</sup> SP Line	BC2	
premo <sup>®</sup> TP Line	BCT	
TPM <sup>+</sup> DYNAMIC		
TPM <sup>+</sup> HIGH TORQUE	BCT	
TPM <sup>+</sup> POWER		

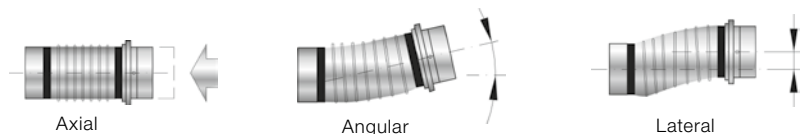
### Premium Line

XP <sup>+</sup> / XPK <sup>+</sup> / XPC <sup>+</sup>	BC3	
premo <sup>®</sup> XP Line	BC3	

# Couplings

Couplings are used for compensating misalignment during assembly and material-related heat expansion

## Compensation for shaft misalignment



### Metal bellows coupling

- Compensation for shaft misalignment
- Completely backlash free
- Corrosion resistant version available as an option (BC2, BC3, BCT)
- High torsional rigidity



### Elastomer coupling

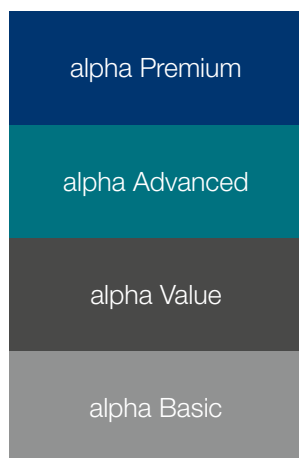
- Compensation for shaft misalignment
- Completely backlash free
- Selectable torsional rigidity/damping
- Compact design
- Extremely simple installation (plug-in)



### Torque limiter

- Compensation for shaft misalignment
- Completely backlash free
- Precise, preset overload protection (switch-off in 1 – 3 ms)
- Precise repeat accuracy
- Just one protection element per axis

## Preferred coupling series



Preferred series are defined for the relevant gearbox segments to make selection easier. Preferred couplings are defined based on the maximum torque that the gearbox can transmit. Standard industrial conditions for the number of cycles (1000/h) and ambient temperature were adopted.

Please note that the coupling load is based on the torque that the gearbox can transmit and not the torque in your application. We recommend using our cymex® 5 design software to create a more detailed design. ([www.wittenstein-cymex.com](http://www.wittenstein-cymex.com))

For more coupling types, please visit [www.wittenstein-alpha.com](http://www.wittenstein-alpha.com)



# Shrink disks

Shrink disks are frictional hub / shaft connections. Together with our hollow shaft or mounted shaft gearboxes for mounting directly on load shafts, machines can be designed to take up a minimal installation space.

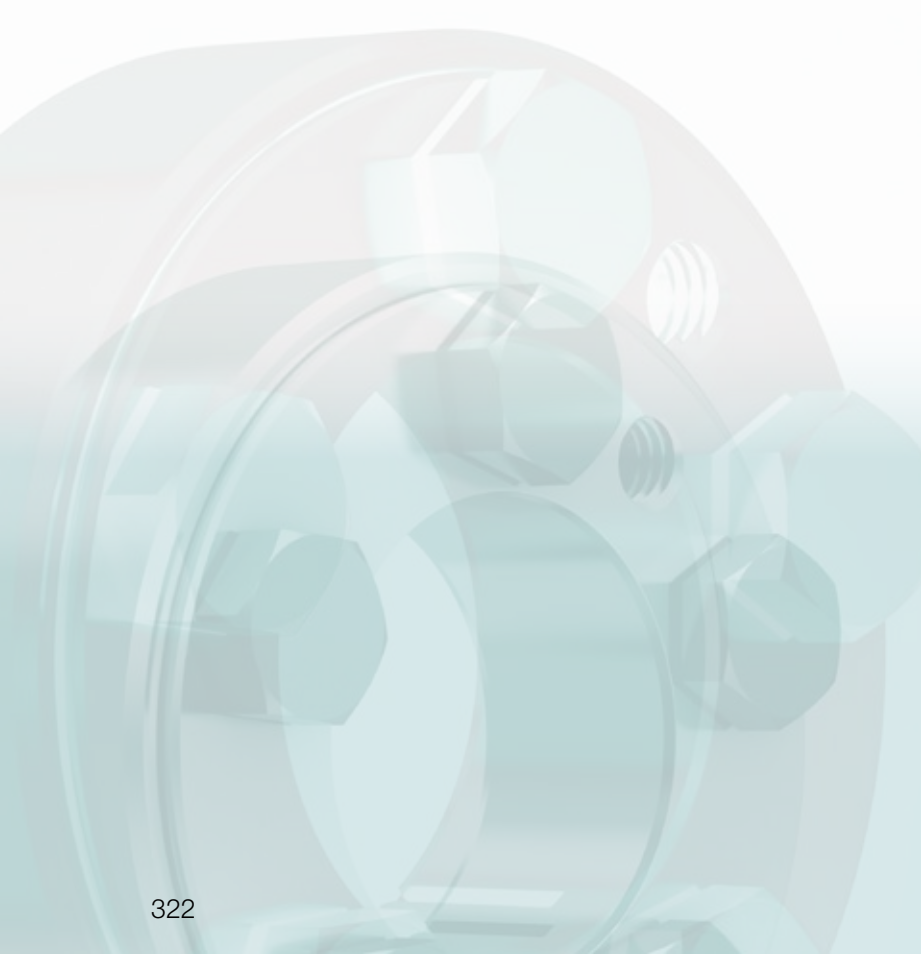
The benefits:

- Simple mounting and removal
- Quick selection, easy and convenient
- Optional: corrosion resistant version

## Preferred shrink disk series

To view a wide range of nickel-plated, stainless steel and other shrink disks as well as all the relevant technical data and dimensions, visit our homepage

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



# Quick shrink disc selection

Gearbox		Version			Geometry					
		Standard	Nickel-plated	Stainless steel	d	D	A	H*	H2*	J [kgcm <sup>2</sup> ]
HG <sup>+</sup> / SP <sup>+</sup> / SPC <sup>+</sup> 060	Ordering code	SD 018x044 S2	SD 018x044 N2	SD 018x044 E2	18	44	30	15	19	0.252
	Material number	20000744	20048496	20048491						
	T <sub>2Max</sub> [Nm]	100	51	51						
HG <sup>+</sup> / SP <sup>+</sup> / SPK <sup>+</sup> / SPC <sup>+</sup> 075	Ordering code	SD 024x050 S2	SD 024x050 N2	SD 024x050 E2	24	50	36	18	22	0.729
	Material number	20001389	20047957	20043198						
	T <sub>2Max</sub> [Nm]	250	136	136						
HG <sup>+</sup> / SP <sup>+</sup> / SPK <sup>+</sup> / SPC <sup>+</sup> 100	Ordering code	SD 036x072 S2	SD 036x072 N2	SD 036x072 E2	36	72	52	22	27.5	3.94
	Material number	20001391	20048497	20035055						
	T <sub>2Max</sub> [Nm]	650	575	450						
HG <sup>+</sup> / SP <sup>+</sup> / SPK <sup>+</sup> / SPC <sup>+</sup> 140	Ordering code	SD 050x090 S2	SD 050x090 N2	SD 050x090 E2	50	90	68	26	31.5	11.1
	Material number	20001394	20048498	20047937						
	T <sub>2Max</sub> [Nm]	1320	1015	770						
HG <sup>+</sup> / SP <sup>+</sup> / SPK <sup>+</sup> / SPC <sup>+</sup> 180	Ordering code	SD 068x115 S2	SD 068x115 N2	SD 068x115 E2	68	115	86	29	34.5	31.1
	Material number	20001396	20048499	20048492						
	T <sub>2Max</sub> [Nm]	2450	1820	1500						
VH <sup>+</sup> / NVH / CVH 040	Ordering code	SD 024x050 S2	SD 024x050 N2	SD 024x050 E2	24	50	36	18	22	0.729
	Material number	20001389	20047957	20043198						
	T <sub>2Max</sub> [Nm]	250	136	136						
VH <sup>+</sup> / NVH / CVH 050	Ordering code	SD 030x060 S2V	SD 030x060 N2	SD 030x060 E2	30	60	44	20	24	1.82
	Material number	20020687	20047934	20047885						
	T <sub>2Max</sub> [Nm]	550	375	230						
VH <sup>+</sup> / NVH / CVH 063	Ordering code	SD 036x072 S2V	SD 036x072 N2V	SD 036x072 E2	36	72	52	22	27.5	3.94
	Material number	20020688	20047530	20035055						
	T <sub>2Max</sub> [Nm]	640	560	450						
VH <sup>+</sup> 080	Ordering code	SD 050x090 S2V	SD 050x090 N2V	SD 050x090 E2	50	90	68	26	31.5	11.1
	Material number	20020689	20047935	20047937						
	T <sub>2Max</sub> [Nm]	1400	950	900						
VH <sup>+</sup> 100	Ordering code	SD 062x110 S2V	SD 062x110 N2	SD 062x110 E2	62	110	80	29	34.5	27
	Material number	20020690	20047927	20047860						
	T <sub>2Max</sub> [Nm]	2300	1540	1000						

\*Applicable to the unclamped condition. \*\* Maximum torque without axial forces. Shrink discs suitable for XP<sup>+</sup> gearboxes upon request

One shrink disk per gearhead is sufficient.

Refer to the operating manual for information on correct shrink disc installation and additional cleaning instructions, particularly for stainless steel shrink disks.

The instructions are enclosed with the order.

Mounting/operating manual at [www.wittenstein-alpha.de/en/](http://www.wittenstein-alpha.de/en/)

Recommendation for the load shaft:

Tolerance h6

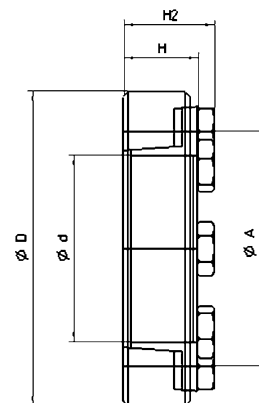
Surface roughness ≤ Rz 16

Minimum yield strength (standard) Rp 0.2 ≥ 385 N/mm<sup>2</sup>

Minimum yield strength (nickel-plated) Rp 0.2 ≥ 260 N/mm<sup>2</sup>

Minimum yield strength (stainless steel) Rp 0.2 ≥ 260 N/mm<sup>2</sup>

The shrink disc is not included in the scope of delivery of the gearhead. Therefore, it must be ordered separately.



# Support at each interaction stage

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

## Global presence

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

## Speed counts

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

## Personal consultation

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

## Design

Consultation  
CAD POINT  
cymex® select  
Sizing software cymex®  
Engineering

## Installation

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



We are happy to advise you:

24 h service hotline: +49 7931 493-12900

### No matter where you need us:

A comprehensive sales and service network provides quick availability and competent support worldwide.



# Support at each interaction stage

## Design

Whatever your requirements are: we offer the right design methodology. Use the CAD POINT to gain easy access to CAD files, cymex® select for creating simple designs,

cymex® 5 for precise dimensioning and our engineering service for individual solutions.

### Consultation

- Personal contact on-site
- Professional application calculations and drive design create the best solutions



### CAD POINT

- 3D data of selected solution
- Online comparison with motor geometry
- Transparent and simple selection of required components

### Engineering

#### Catalog gearboxes:

- Advanced software tools for accurate calculation, simulation and analysis of the drive train
- Optimization of your productivity and reduction in development costs



### cymex® select

- Efficient and customizable product selection in seconds
- Top three product recommendations for your requirements
- Automatic geometry adjustment

#### Special gearboxes:

- Gearing design and development
- Development and production of special gearboxes
- Send all inquiries to: [sondergetriebe@wittenstein.de](mailto:sondergetriebe@wittenstein.de)



### cymex® 5 sizing software

- Dimensioning, design and evaluation of the entire drive train
- Reliable, efficient design
- Optimization of drive system



## Installation

All delivered products are perfectly matched to your application environment and fully operational right away.

Our service experts support you in the installation and commissioning of complex mechatronic systems, guaranteeing maximum availability of your plant.

### speedline® delivery

**Tel. +49 7931 493-10444**

- Delivery of standard series in 24 or 48 hours ex works\*
- Outstanding flexibility for fast deliveries at short notice

### Operating and installation instructions

- Detailed explanations of how to use the product
- Motor installation videos
- Assembly videos on rack and pinion system

### Installation on-site

- Professional installation
- Optimal integration of the system in your application
- Explanation of the drive function

### Pick-up and return service

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



\* Non-binding delivery time depending on part availability.



# Support at each interaction stage

## Maintenance

WITTENSTEIN alpha guarantees fast repairs of the highest quality and precision – with short throughput times and intensive support. In addition, we will provide you with information about various measurements, material

analyses and condition monitoring inspections. You can rely on short response times, unbureaucratic processing and individual support.

### 24 h service hotline

**Tel. +49 7931 493-12900**

- Available round the clock
- Personal, prompt service for resolving time-critical maintenance issues

### cymex® statistics

- Systematic field data acquisition
- Reliability calculations (MTBF)
- Customized evaluations

### Maintenance and inspection

- Documentation regarding condition and expected service life
- Maintaining required state
- Customized maintenance schedules

### Modernization

- Professional retrofitting
- Reliable compatibility testing of existing solutions

### Repair

- Restoring to required state
- Short throughput times
- Immediate response in time-critical situations



## Training

Discover how our products function and how they can add value to your application. We offer you training courses at our premises or on-site at your plant. Benefit from

practice-oriented learning methods and a highly skilled team of trainers.

### Product training

Greater knowledge enables greater achievement. We will be pleased to share our expert knowledge with you: Profit from our many years of experience and learn more about the product portfolio of WITTENSTEIN alpha.

### Sizing training

Become a design expert! We will provide you with training courses on our design software, adapted to your requirements. Whether for beginners or experts, for occasional or regular users – we adapt our training course to your wishes and requirements.

### Installation training

We offer you individual training courses on-site for your system application of selected linear axes as well as professional installation.

### Service training

Participation in a service training course is a prerequisite for sourcing spare parts at the parts list level. We offer you training courses at our premises or on-site at your plant. Moreover, we regularly host maintenance workshops at which the participants are instructed in safe handling during mounting of the motor to the gearbox as well as the independent replacement of wearing parts and gearbox assemblies.





# The WITTENSTEIN group – The company and its fields of business



**WITTENSTEIN**

With approximately 2,800 employees worldwide, the WITTENSTEIN group stands for innovation, precision and excellence in the world of mechatronic drive technology, both nationally and internationally. The group is active in six innovative fields of business. Furthermore, WITTENSTEIN group is represented by some 60 subsidiaries in around 40 countries in all important technology and sales markets worldwide.



## Our fields of expertise

### We provide know-how for a host of different sectors:

- Machine and plant construction
- Software development
- Aerospace
- Automotive & E-mobility
- Energy
- Oil & Gas Exploration and Production
- Medical technology
- Measurement and testing technology
- Nanotechnology
- Simulation

# The WITTENSTEIN Group



WITTENSTEIN alpha GmbH  
High-precision servo drives and linear systems



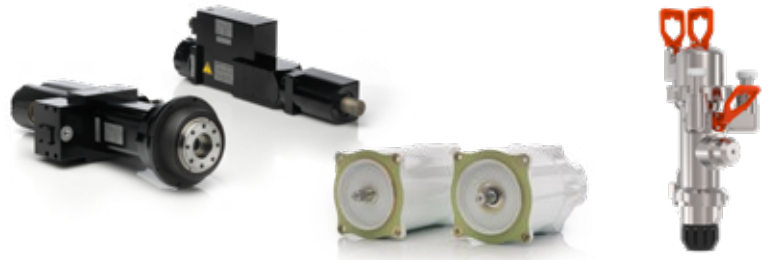
WITTENSTEIN cyber motor GmbH  
Highly dynamic servo motors and drive electronics



WITTENSTEIN galaxie GmbH  
Superior gearboxes and drive systems



WITTENSTEIN motion control GmbH  
Drive systems for the most extreme environmental requirements



attocube systems AG  
Nanoprecision drive and measurement technology solutions



baramundi software GmbH  
Secure management of the IT infrastructure in offices and production

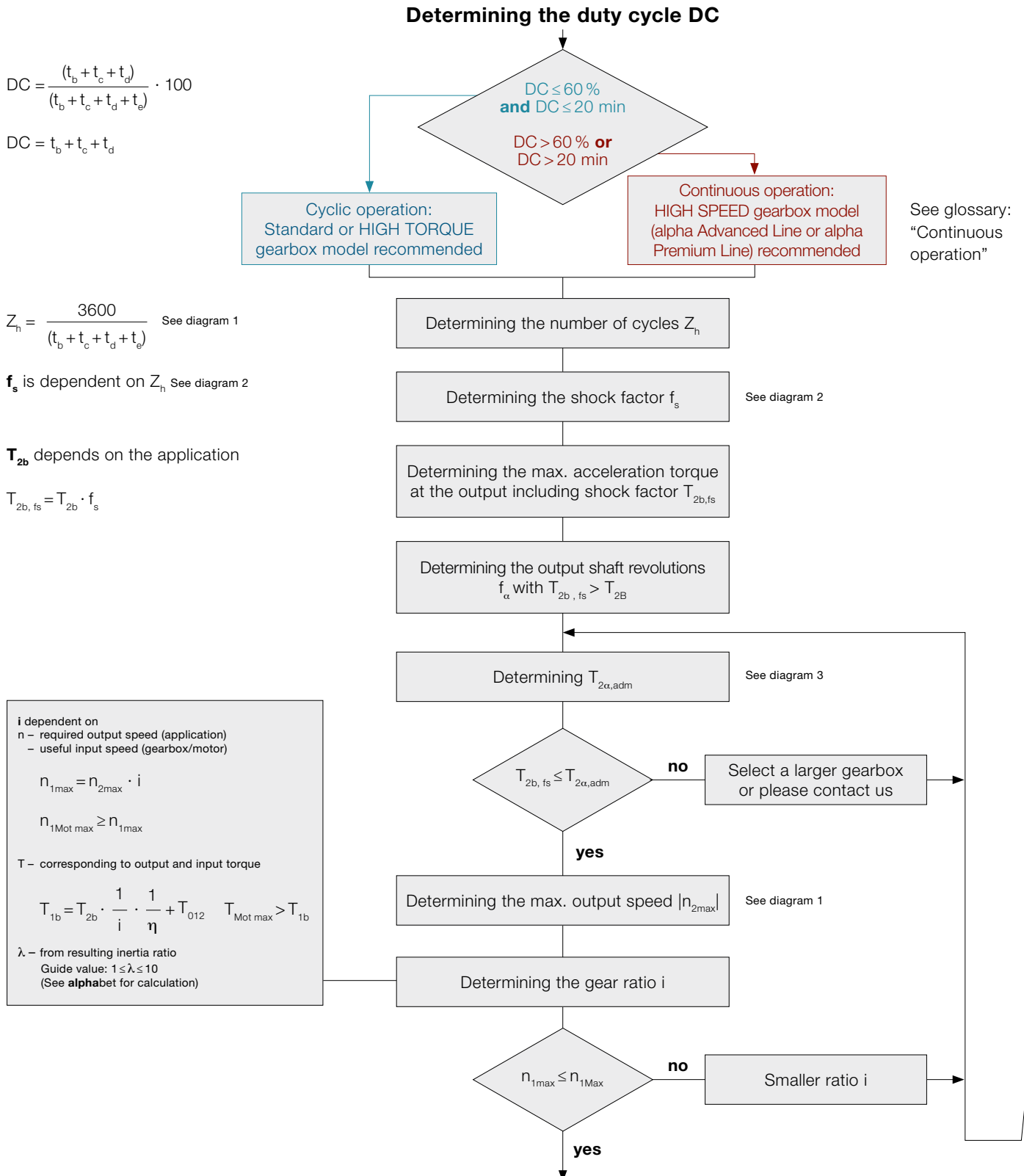


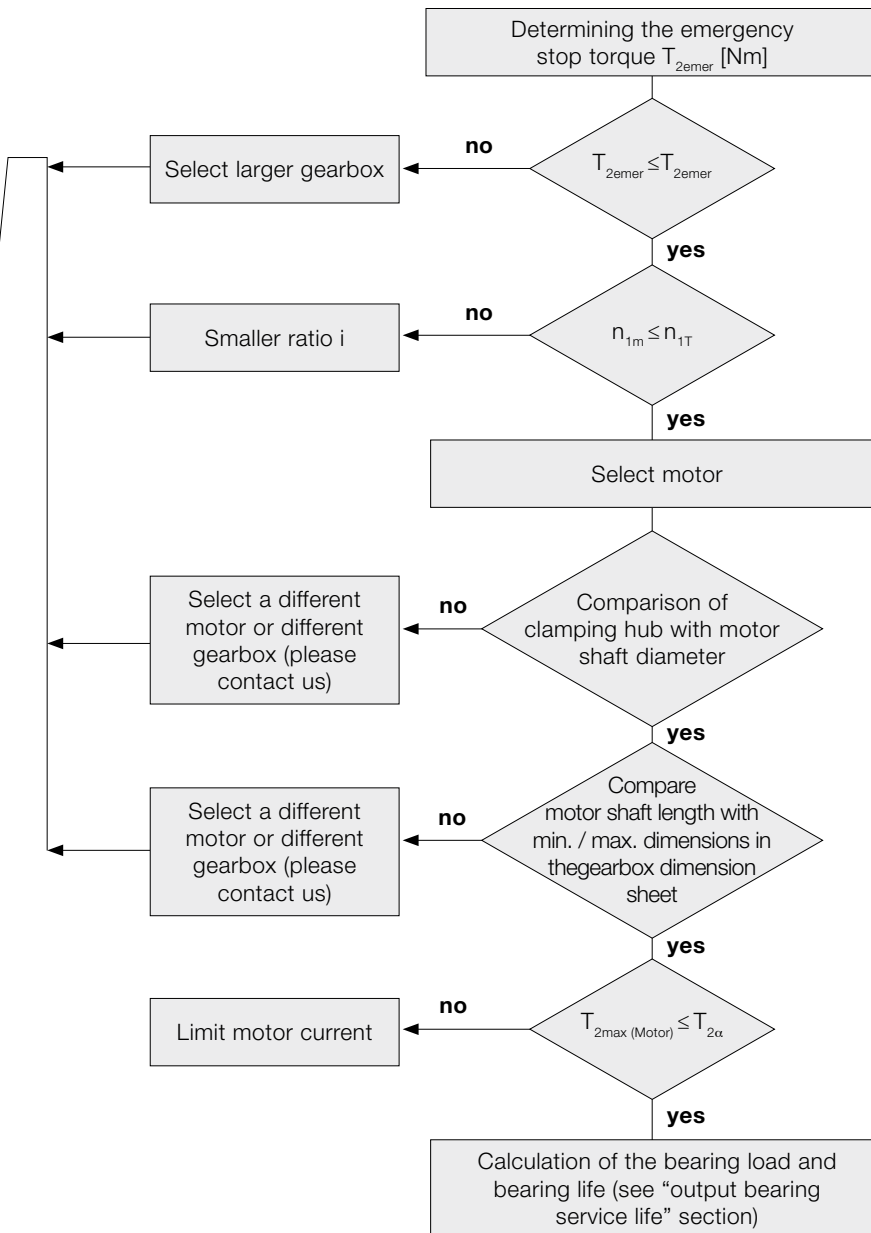
**WITTENSTEIN – one with the future**

# Planetary/bevel gearbox – detailed sizing

The following diagram describes the steps involved in sizing planetary and bevel gearboxes.  
Please use cymex® - [www.wittenstein-cymex.com](http://www.wittenstein-cymex.com) - for detailed sizing.

Diagram: cyclic operation **S5** and continuous operation **S1**





See glossary:  $T_{2emer}$

$$n_{1m} = \frac{|n_{1,0}| \cdot t_0 + \dots + |n_{1,n}| \cdot t_n}{t_0 + \dots + t_n}$$

with  $\sum_0^n t_n \leq 20$  min incl. pause time

Must be observed for any 20-minute period

$$\frac{D_{clamping\ hub}}{2} \leq D_{W, Mot} \leq D_{clamping\ hub}$$

It must be possible to insert the motor shaft into the clamping hub.

The motor shaft must protrude far enough into the clamping hub without hitting the backstop.

The gearbox must not be damaged when the motor is at full load; limit the motor current if necessary.

$$T_{2\ Mot\ max} = T_{1\ Mot\ max} \cdot i \cdot \frac{1}{\eta_{gearbox}} + T_{012}$$

Diagram 1

Usual load duty cycle at the output. At drive speeds up to the nominal speed  $n_{1n}$  or thermal speed limit  $n_{1T}$ , the gearbox does not get hotter than 90°C in average environmental conditions.

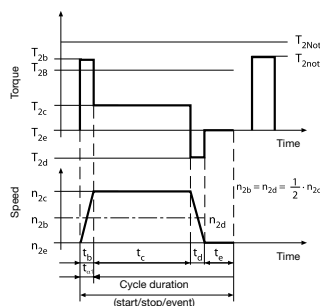


Diagram 2

High numbers of cycles in connection with shorter acceleration times can lead to oscillations in the drive train. The resulting excessive torque increases can be taken into consideration with the shock factor  $f_s$ .

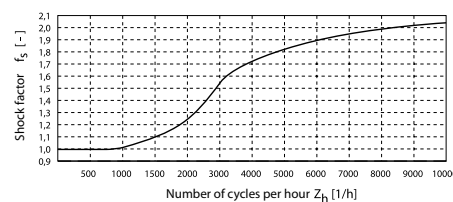
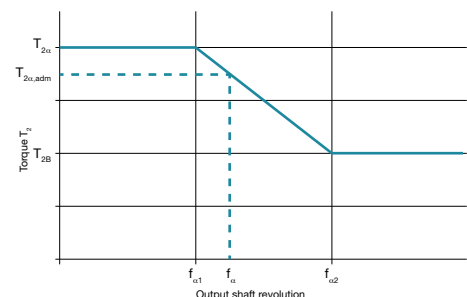


Diagram 3

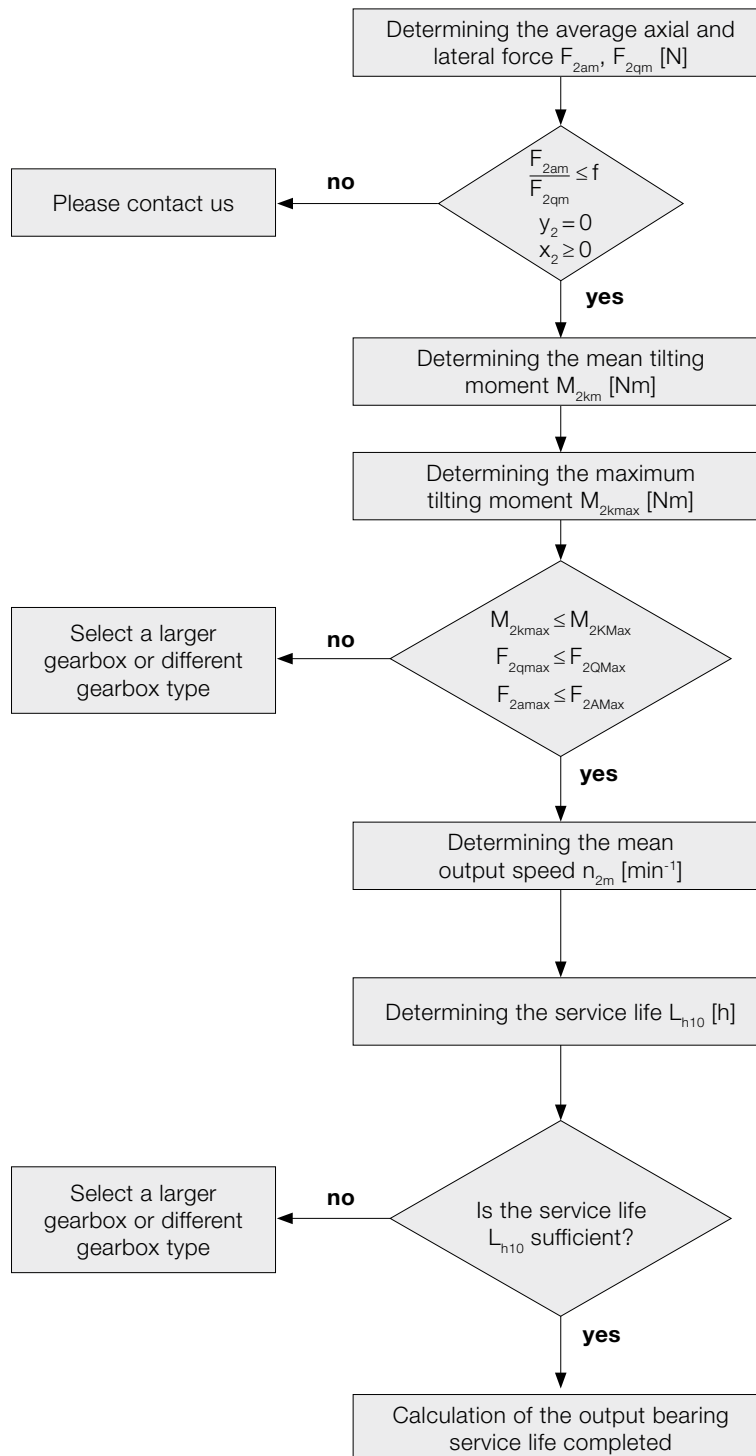
The transmittable torque  $T_{2u,adm}$  of the gearbox depends on the number of output shaft revolutions. In the range of low output shaft revolutions, the high cycle fatigue of the toothings can thus be utilized up to the maximum value  $T_{2u}$ .



# Planetary/bevel gearbox – detailed sizing

Please use cymex® - [www.wittenstein-cymex.com](http://www.wittenstein-cymex.com) - for detailed sizing.

Output bearing service life  $L_{h10}$



$$F_{2am} = \sqrt[3]{\frac{|n_{2b}| \cdot t_b \cdot |F_{2ab}|^3 + \dots + |n_{2n}| \cdot t_n \cdot |F_{2an}|^3}{|n_{2b}| \cdot t_b + \dots + |n_{2n}| \cdot t_n}}$$

$$F_{2qm} = \sqrt[3]{\frac{|n_{2b}| \cdot t_b \cdot |F_{2qb}|^3 + \dots + |n_{2n}| \cdot t_n \cdot |F_{2qn}|^3}{|n_{2b}| \cdot t_b + \dots + |n_{2n}| \cdot t_n}}$$

$$M_{2km} = \frac{F_{2am} \cdot y_2 + F_{2qm} \cdot (x_2 + z_2)}{W} \quad a)$$

$$M_{2kmax} = \frac{F_{2amax} \cdot y_2 + F_{2qmax} \cdot (x_2 + z_2)}{W} \quad a)$$

a) x, y, z in mm

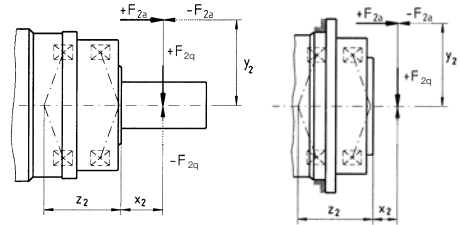
$$n_{2m} = \frac{n_{2b} \cdot t_b + \dots + n_{2n} \cdot t_n}{t_b + \dots + t_n}$$

$$L_{h10} = \frac{16666}{n_{2m}} \cdot \left[ \frac{K1_2}{M_{2km}} \right]^{p_2}$$

	metric	inch
W	1000	1

	TP <sup>+</sup> /TPK <sup>+</sup>	SP <sup>+</sup> /SPK <sup>+</sup>
f	0.37	0.40

Example with output shaft and flange:



SP <sup>+</sup> /SPK <sup>+</sup> /SPC <sup>+</sup>		060	075	100	140	180	210	240
z <sub>2</sub>	[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
K <sub>12</sub>	[Nm]	795	1109	1894	3854	9456	15554	19521
	[in.lb]	7036	9815	16762	34108	83686	137653	172761
p <sub>2</sub>		3.33	3.33	3.33	3.33	3.33	3.33	3.33

TP <sup>+</sup> /TPK <sup>+</sup> /TPC <sup>+</sup> /DP <sup>+</sup>		004	010	025	050	110	300	500	2000
z <sub>2</sub>	[mm]	57.6	82.7	94.5	81.2	106.8	140.6	157	216
	[in]	2.27	3.26	3.72	3.20	4.21	5.48	6.12	8.50
K <sub>12</sub>	[Nm]	536	1325	1896	4048	9839	18895	27251	96400
	[in.lb]	4744	11726	16780	35825	87075	167220	241171	853140
p <sub>2</sub>		3.33	3.33	3.33	3.33	3.33	3.33	3.33	3.33

HDP <sup>+</sup>		010	025
z <sub>2</sub>	[mm]	90.4	99.1
	[in]	3.56	3.90
K <sub>12</sub>	[Nm]	1325	1896
	[in.lb]	11726	16780
p <sub>2</sub>		3.33	3.33

TK<sup>+</sup>/SK<sup>+</sup>/HG<sup>+</sup>/SC<sup>+</sup>/VH<sup>+</sup>/VS<sup>+</sup>/VT<sup>+</sup>: Calculation using cymex®.  
Please contact us for further information.

# Hypoid gearboxes – Detailed sizing

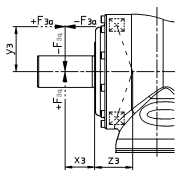
Gearbox types and sizes			TK* 004 SK* 060 HG* 060	SPK* 075 TPK* 010 TPK* 025 MA	TK* 010 SK* 075 HG* 075	SPK* 100 TPK* 025 TPK* 050 MA	
Dimensions of rearward drive							
Solid shaft:	diameter	øD <sub>k6</sub>	mm	16	16	22	22
	length	L	mm	28 ±0.15	28 ±0.15	36 ±0.15	36 ±0.15
Hollow shaft interface outer diameter		øD <sub>h8</sub>	mm	18	18	24	24
Hollow shaft interface inner diameter		ød <sub>h8</sub>	mm	15	15	20	20
Hollow shaft interface length		L <sub>hw</sub>	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 <sub>h9</sub>	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 <sup>c)</sup>	T <sub>3α,zul</sub>	Nm	= T <sub>2α,zul</sub> on the condition that T <sub>2b,fs</sub> + T <sub>3b,fs</sub> ≤ T <sub>2α,zul</sub>	Please contact us	= T <sub>2α,zul</sub> on the condition that T <sub>2b,fs</sub> + T <sub>3b,fs</sub> ≤ T <sub>2α,zul</sub>	Please contact us	
Nominal output torque <sup>c)</sup>	T <sub>3N</sub>	Nm	= T <sub>2N</sub> - T <sub>2n</sub>		= T <sub>2N</sub> - T <sub>2n</sub>		
EMERGENCY STOP torque <sup>c)</sup>	T <sub>3Not</sub>	Nm	= T <sub>2Not</sub> - T <sub>2not</sub>		= T <sub>2Not</sub> - T <sub>2not</sub>		
Output speed	n <sub>2</sub>	min <sup>-1</sup>	Same as output	Please contact us	Same as output	Please contact us	
Max. axial force <sup>b)</sup>	F <sub>3Amax</sub>	N	1500	1500	1800	1800	
Max. lateral force <sup>b)</sup>	F <sub>3Qmax</sub>	N	2300	2300	3000	3000	
Max. tilting torque	M <sub>3Kmax</sub>	Nm	60	60	100	100	
Calculation of average tilting torque at the rearward drive							
Factor for tilting torque calculation	z <sub>3</sub>	mm	11.9	11.9	15.6	15.6	
Distance between axial force and center of gearbox	y <sub>3</sub>	mm	Application-dependent				
Distance between lateral force and shaft collar	x <sub>3</sub>	mm	Application-dependent				

<sup>a)</sup> Connection via shrink discs

<sup>b)</sup> Refers to center of shaft

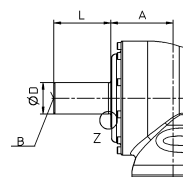
<sup>c)</sup> See also page 336, "Detailed dimensioning – Gearbox"

Rearward drive:

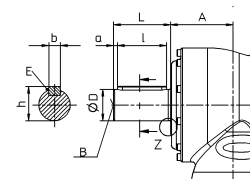


$$M_{3k} = F_{3a} \cdot y_3 + F_{3q} \cdot (x_3 + z_3)$$

Smooth shaft

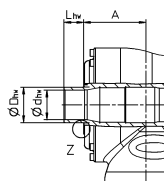


Shaft with key



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
$= T_{2\alpha,zul}$ on the condition that $T_{2b,fs} + T_{3b,fs} \leq T_{2\alpha,zul}$	Please contact us	$= T_{2\alpha,zul}$ on the condition that $T_{2b,fs} + T_{3b,fs} \leq T_{2\alpha,zul}$	Please contact us	$= T_{2\alpha,zul}$ on the condition that $T_{2b,fs} + T_{3b,fs} \leq T_{2\alpha,zul}$	Please contact us
$= T_{2N} - T_{2n}$		$= T_{2N} - T_{2n}$		$= T_{2N} - T_{2n}$	
$= T_{2Not} - T_{2not}$		$= T_{2Not} - T_{2not}$		$= T_{2Not} - T_{2not}$	
Same as output	Please contact us	Same as output	Please contact us	Same as output	Please contact us
2000	2000	9900	9900	12000	12000
3300	3300	9500	9500	11000	11000
150	150	580	580	710	710
16.5	16.5	20	20	23.75	23.75
Application-dependent					
Application-dependent					

Hollow shaft interface a)



Hollow shaft



No connection possible

Cover



No connection possible



# Worm gearboxes – Detailed sizing

**A:** Simplified sizing for servo motors based on the maximum motor torque:  $M_{\max} \cdot i \leq T_{2\alpha}$

**B:** Sizing based on the application

## Step 1:

Determine the application data

$T_{2b} = \text{_____ [Nm]}$   $n_{1n} = \text{_____ [rpm]}$

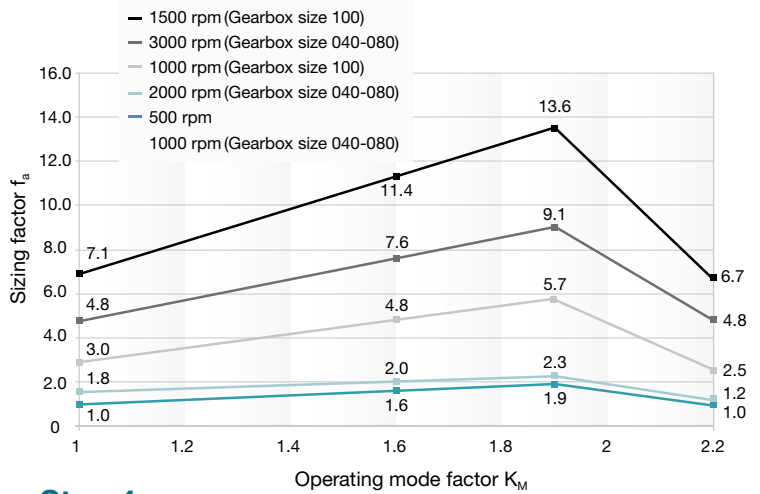
## Step 2:

Determine the operating mode factor  $K_M = \text{_____}$

Typical applications	Cycle	Torque characteristic	Operating mode factor $K_M$
Format changing, e.g. in packaging machines, drives for processing equipment, actuators etc.	<b>S5 operation:</b> Low duty cycle Small number of cycles Low dynamics		1.0
Tool changers with low dynamics, pick & place gantry axes, tire building machines etc.	<b>S5 operation:</b> Medium duty cycle Small number of cycles Medium dynamics		1.6
Linear axes in plasma, laser or water jet cutters, portals, tool changers with high dynamics	<b>S5 operation:</b> Medium duty cycle Medium number of cycles High dynamics		1.9
Roller drives in printing presses, star drives in rackers etc.	<b>S1 operation:</b> High duty cycle		2.2
cymex® 5 also allows sizing calculations for other applications / cycles!			

## Step 3:

Determine the sizing factor  $f_a$  with the operating mode factor  $K_M$   $f_a = \text{_____}$



## Step 4:

Compare the equivalent application torque with the maximum gearbox  $T_{2\alpha}$  (see table, Step 5)

$$T_{2eq} = f_a \cdot T_{2b} \leq T_{2\alpha}$$

$$T_{2eq} = \text{_____} \cdot \text{_____} \leq T_{2\alpha}$$

$$T_{2eq} = \text{_____ [Nm]} \leq \text{_____ [Nm]}$$

We recommend using a vent screw for duty cycles  $\geq 60\%$ , longer than 20 min (S1 operation) and  $n_{1N} \geq 3000$  rpm.

## Step 5: Quick selection of the technical data

			V-Drive Advanced				
			040	050	063	080	100
Ratio	$i$		4 - 400				
Maximum torque <sup>a)</sup> (at $n_1 = 500$ rpm)	$T_{2\alpha}$	Nm	74-106	165-204	319-372	578-785	1184-1505
		in.lb	655-938	1460-1805	2823-3292	5115-6947	10478-13319
Max. input speed	$n_{1max}$	rpm	6000	6000	4500	4000 / 4500 <sup>b)</sup>	3500 / 4000 <sup>b)</sup>
Max. lateral force	$F_{20Max}$	N	2400	3800	6000	9000	14000
		lb <sub>f</sub>	540	855	1350	2025	3150
Operating noise (with $n_1 = 3000$ rpm no load)	$L_{PA}$	dB(A)	$\leq 54$	$\leq 62$	$\leq 64$	$\leq 66$	$\leq 70$
Max. torsional backlash	$j_t$	arcmin	$\leq 3$	$\leq 3$	$\leq 3$	$\leq 3$	$\leq 3$
Service life (For calculation see "Information")	$L_h$	h	$> 20000$	$> 20000$	$> 20000$	$> 20000$	$> 20000$

<sup>a)</sup> The maximum torques depend on the ratio.

<sup>b)</sup> First value for single-stage version, second value for two-stage version.

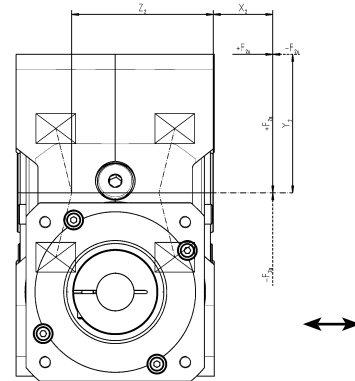
## Account must be taken of the lateral and axial forces at the output:

Please also carry out steps 6 and 7 if forces are present at the output (e.g. if timing belt pulleys, pinions or levers are mounted there).

### Step 6 (if external forces are present):

Determine the forces acting on the output and check the boundary conditions

Lateral force  $F_{2q} = \underline{\hspace{2cm}}$  [N]  
 Lateral force distance  $x_2 = \underline{\hspace{2cm}}$  [mm]  
 Axial force  $F_{2a} = \underline{\hspace{2cm}}$  [N]  
 Axial force distance  $y_2 = \underline{\hspace{2cm}}$  [mm]  
 (required if  $F_{2a}$  is present)



Conditions if axial force  $F_{2a}$  is present:

1.  $F_{2a} \leq 0.25 * F_{2q} \Rightarrow (\underline{\hspace{2cm}} \leq 0.25 * \underline{\hspace{2cm}})$  ☐ Met ☐ Not met: Sizing with cymex® 5
2.  $y_2 \leq x_2 \Rightarrow (\underline{\hspace{2cm}} \leq \underline{\hspace{2cm}})$  ☐ Met ☐ Not met: Sizing with cymex® 5

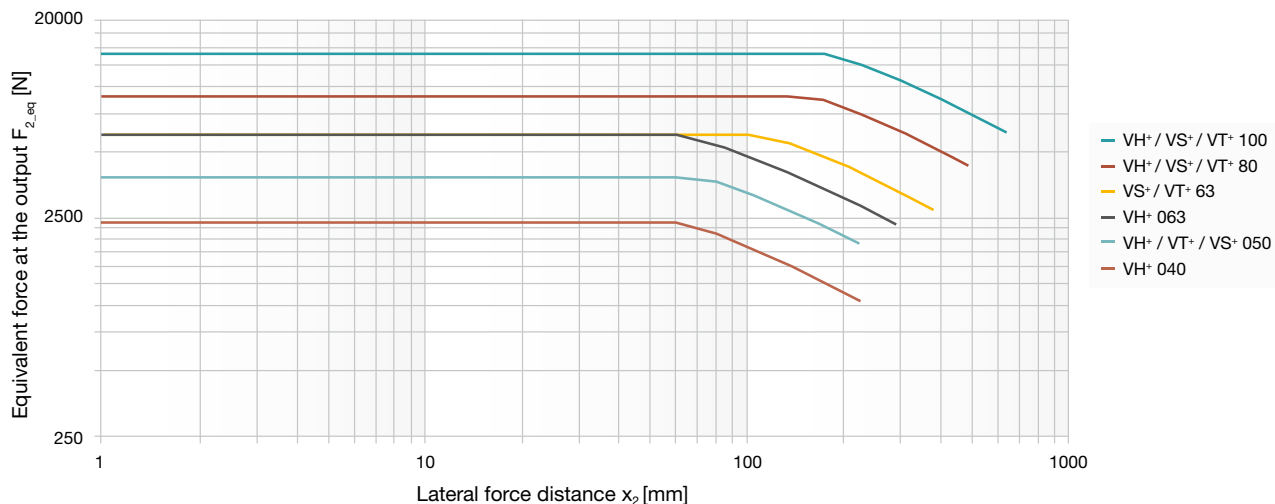
### Step 7:

Determine the maximum equivalent force acting on the output  $F_{2eq}$

$$F_{2eq} = F_{2q} + 0.25 * F_{2a} \leq F_{2QMax} \quad (F_{2QMax} \text{ can be determined from the diagram below})$$

$$F_{2eq} = \underline{\hspace{2cm}} + 0.25 * \underline{\hspace{2cm}} \leq \underline{\hspace{2cm}}$$

$$F_{2eq} = \underline{\hspace{2cm}} \text{ [N]} \leq \underline{\hspace{2cm}} \text{ [N]} \quad \text{ ☐ Met ☐ Not met: Sizing with cymex® 5 }$$



# Glossary – the alphabet

## Acceleration torque ( $T_{2B}$ )

The acceleration torque  $T_{2B}$  is the torque that the gearbox toothing can permanently transmit. To calculate the acceleration torque, a → **coefficient of impact** which is appropriate for the application must also be taken into account.

## Adapter plate

WITTENSTEIN alpha uses a system of standardized adapter plates for connecting the motor and gearbox. This makes it as simple as possible to attach motors from any manufacturer to WITTENSTEIN alpha gearboxes.

## Angle of rotation

Angle by which the connection element of the coupling rotates under the torque load. The admissible angle of rotation for torsionally rigid couplings is  $< 0.05^\circ$  and for vibration-damping couplings  $< 5^\circ$ .

## Angular minute

A degree is subdivided into 60 angular minutes ( $= 60 \text{ arcmin} = 60'$ ).

Example:

If the backlash is  $j_t = 1 \text{ arcmin}$ , the output may rotate by  $1/60^\circ$ . The impacts on the application are determined by the arc length:  $b = 2 \cdot \pi \cdot r \cdot \alpha^\circ / 360^\circ$ .

Example:

A pinion with a radius  $r = 50 \text{ mm}$  mounted on a gearbox with a backlash of  $j_t = 3 \text{ arcmin}$  can be rotated by  $b = 0.04 \text{ mm}$ .

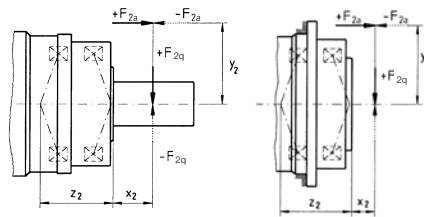
## Angular misalignment

Angular misalignment of drive and output shaft. In most cases due to assembly. Causes an increased strain on the coupling.

## Axial force ( $F_{2AMax}$ )

An axial force on a gearbox runs parallel to its output shaft or perpendicular to its output flange. Under certain circumstances, it acts offset from the axis with a lever arm  $y_2$ . In this case, it also creates a bending moment. If the axial force exceeds the permissible catalog values (max. axial force  $F_{2AMax}$ ), an additional component (e.g. axial bearing) must be provided to absorb these forces.

Example with output shaft and flange:



## Axial misalignment

Length variation along the longitudinal axes of the drive and output shaft. Generally caused by thermal expansion.

## Axial spring rigidity ( $C_a$ )

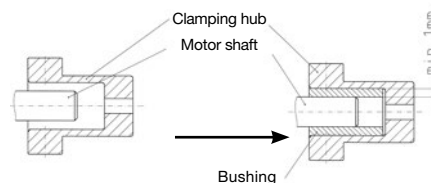
Counter-force of the coupling in the event of axial misalignment [N/mm]. This additional force should be taken into consideration in the sizing of the drive train and bearings.

## Backlash-free

Changes in the rotational speed, direction of rotation or torque do not cause any backlash and thus no shocks in the coupling. However, it should be noted that an → **angle of rotation** still occurs.

## Bushing

If the diameter of the motor shaft is smaller than the → **clamping hub**, a bushing is used to compensate for the difference in diameter. A minimum wall thickness of 1 mm and a motor shaft diameter of 2 mm difference are required.



## CAD POINT

Performance data, dimension sheets and CAD data for all gearboxes can be found online in our CAD POINT, including clear documentation of the selection. ([www.wittenstein-cad-point.com](http://www.wittenstein-cad-point.com))

## Clamping hub (couplings)

The clamping hub ensures a friction contact connection between the coupling and the gearbox shaft as well as with the application. Clamping hubs are available in all motor shaft diameters; therefore, a bushing as connection piece is not required and also not recommended. Optionally, a form fit connection via a key is also possible.

## Clamping hub (gearbox)

The clamping hub ensures a friction contact connection between the motor shaft and gearbox. If the diameter of the motor shaft is smaller than the diameter of the clamping hub, a → **bushing** is used as a connection piece.

For gearboxes in the alpha Advanced Line and the alpha Premium Line, a form fit connection via a key is also possible.

## Connection between the clamping hub and the metal bellows

For metal bellows couplings which transmit torques of up to 500 Nm, the stainless steel bellow is bonded onto the clamping hub. In the event of higher torques, the connection is welded.

## Continuous operation (S1)

In continuous operation, it is particularly important to ensure that the maximum gearbox temperature is maintained (see temperature behavior). For optimum drive behavior in continuous operation, we recommend our HIGH SPEED gearbox model.

## Cyclic operation (S5)

The cyclic operation is defined via the → **duty cycle**. If the duty cycle is less than 60% and shorter than 20 minutes, it qualifies as cyclic operation (→ **operating modes**).

## cymex®

cymex® is the calculation software developed by our company for dimensioning complete drive trains. The software enables the precise simulation of motion and load variables. The software is available to download from our website ([www.wittenstein-cymex.de](http://www.wittenstein-cymex.de)). We can also provide training to enable you to make full use of all the possibilities provided by the software.

## cymex® select

The cymex® select quick layout tool from WITTENSTEIN alpha allows for efficient and innovative product selection in seconds and is available online.

You get suitable recommendations for your application and your motor in no time based on technical and economic suitability. ([cymex-select.wittenstein-group.com](http://cymex-select.wittenstein-group.com))

## Degrees of protection (IP)

The various degrees of protection are defined in DIN EN 60529 "Degrees of protection offered by enclosures (IP code)". The IP degree of protection (International Protection) is represented by two digits. The first digit indicates the protection against the ingress of impurities and the second is the protection against the ingress of water.

Example:

**IP65**

Protection against the ingress of dust (dust-proofness)

Protection against water jets

## Disengagement torque ( $T_{Dis}$ )

Adjustable torque of torque limiters with which the coupling separates the drive and output side of the system.

## Duty cycle (DC)

The cycle determines the duty cycle (DC). 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 dwell time  $t_e$ .

$$DC [\%] = \frac{t_b + t_c + t_d}{t_b + t_c + t_d + t_e} \cdot 100 \quad \frac{\text{Motion duration}}{\text{Cycle time}}$$

$$DC [\text{min}] = t_b + t_c + t_d$$

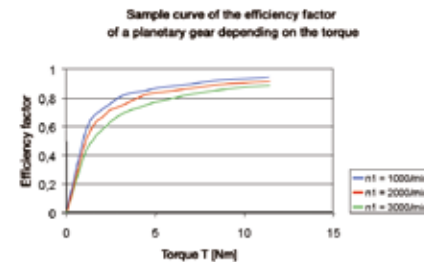
## Dynamic torsional rigidity ( $C_{Tdyn}$ )

Torsional rigidity with  $T_N$

## Efficiency ( $\eta$ )

The efficiency [%]  $\eta$  is the ratio of output power to input power. Power lost through friction reduces efficiency to less than 1 or 100%.

$$\eta = P_{\text{off}} / P_{\text{on}} = (P_{\text{on}} - P_{\text{loss}}) / P_{\text{on}}$$



WITTENSTEIN alpha always indicates the efficiency of a gearbox during operation at full load. If the input power or torque is lower, the efficiency rating is also lower due to the constant no-load torque. Power losses do not increase as a result. A lower efficiency is also to be expected at high speeds (see figure).

## Emergency stop torque ( $T_{2Emer}$ )

The emergency stop torque  $T_{2Emer}$  is the maximum permissible torque at the gearbox output. It must not be reached more than 1000 times during the service life of the gearbox. It must never be exceeded! The following cases in particular should be checked: controlled emergency stop, power failure, brake application, and crash.



## 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 the explosion group and category, as well as further information on the respective gearbox, is available upon request.

## Food-grade lubrication (F)

These products are designed with food-grade lubrication and can therefore be used in the food industry. It is important to note the reduction in torque compared to the standard. (V-Drive excluded). See cymex® 5 or the CAD POINT for the exact torques.

## HIGH SPEED (MC)

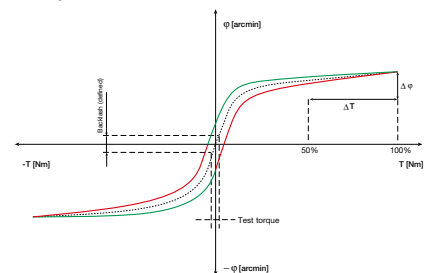
The HIGH SPEED version of our gearbox has been specifically developed for applications in continuous operation at high input speeds. It is used, for example, in the printing and the packaging industry.

## HIGH TORQUE (MA)

WITTENSTEIN alpha gearboxes are also available in a HIGH TORQUE version. These gearboxes are particularly suitable for applications requiring extremely high torques and maximum rigidity.

## Hysteresis curve

The hysteresis is measured to determine the torsional rigidity of a gearbox. The result of this measurement is known as the hysteresis curve.



If the input shaft is locked, the gearbox is continuously loaded and relieved at the output in both directions of rotation up to a defined torque. The angle of rotation is plotted against the torque. This yields a closed curve from which the → **backlash** and → **torsional rigidity** can be calculated.

## Jerk ( $j$ )

The jerk is the derivative of the acceleration with respect to time, that is, the change in acceleration in a unit of time. It is referred to as a shock if the acceleration curve shows a jump, i.e. the jerk is infinitely large.

## Lateral force ( $F_{2QMax}$ )

The maximum lateral force  $F_{2QMax}$  [N] is the force component that acts perpendicular to the output shaft or parallel to the output flange. It acts perpendicular to the → **axial force** and can have an axial distance  $x_2$  to the shaft shoulder or to the shaft flange that acts as a lever arm. The lateral force creates a side load (also see → **axial force**).

→ Refer to this term for further details.

# Glossary – the alphabet

## Lateral misalignment

Parallel misalignment of the drive and output shaft. Causes an additional strain on the bearings and other components of the drive train.

## Lateral spring rigidity (C<sub>l</sub>)

Counter-force of the coupling in the event of lateral misalignment [N/mm]. This additional force should be taken into consideration in the sizing of the drive train and bearings.

## Mass moment of inertia (J)

The mass moment of inertia J [kg/cm<sup>2</sup>] is a measurement of the effort applied by an object to maintain its momentary condition (at rest or moving).

## Maximum torque (T<sub>2α</sub>)

T<sub>2α</sub> represents the maximum torque that can be transmitted by the gearbox. Depending on application-specific boundary conditions and the precise evaluation of the motion profile, the gearbox may be operated with a maximum torque T<sub>2b,fs</sub> above the specified maximum acceleration torque T<sub>2B</sub> (See diagram 3.) For detailed sizing, please use cymex cymex®

$$T_{2\alpha} \geq T_{2b,fs} \geq T_{2B}$$

## No-load running torque (T<sub>012</sub>)

The no-load running torque T<sub>012</sub> is the torque which must be applied to a gearbox in order to overcome the internal friction; it is therefore considered lost torque. The WITTENSTEIN alpha catalog values are determined at a speed n<sub>1</sub> = 3.000 min<sup>-1</sup> and an ambient temperature of 20°C.

$$T_{012}: \quad 0 \quad \quad 1 \rightarrow 2$$

no load          from input side toward  
output side

No-load running torques decrease during operation.

## NSF

Lubricants certified as grade H1 by the NSF (National Sanitation Foundation) can be used in the food sector where occasional unavoidable contact with food cannot be excluded.

## Operating modes (continuous operation S1 and cyclic operation S5)

Gearboxes are selected depending on whether the motion profile is characterized by frequent acceleration and deceleration phases in → **cyclic operation** (S5) as well as dwell times, or whether it is designed for → **continuous operation** (S1), i.e. with long phases of constant motion.

## Operating noise (L<sub>PA</sub>)

The gear ratio and speed influence the operating noise. As a general rule, the higher the speed, the higher the operating noise and the higher the gear ratio, the lower the operating noise. Our catalog specifications refer to a reference gear ratio and speed. The reference speed is n<sub>1</sub> = 3000 rpm or n<sub>1</sub> = 2000 rpm, depending on the size of the gearbox. Ratio-specific values can be found in cymex® - [www.wittenstein-cymex.com](http://www.wittenstein-cymex.com)

## Output shaft revolution (f<sub>α</sub>)

The factor f<sub>α</sub> determines the number of service life cycles for the required service life of the gearbox. It describes the number of revolutions at the output to assess the permissible torque at the output.

## Positioning accuracy

The positioning accuracy is determined by the angular deviation from the setpoint and is the sum of the load-dependent → **(torsional rigidity and torsional backlash)** and kinematic → **(synchronization)** angles of rotation that occur simultaneously in practice.

## Quality control

All Premium and Advanced gearboxes at WITTENSTEIN alpha are subjected to an outgoing inspection before they leave the factory. This ensures that every gearbox is delivered within specification.

## Ratio (i)

The ratio i indicates the factor by which the gearbox transforms the three relevant parameters of motion (speed, torque and mass moment of inertia).

The factor is a result of the geometry of the toothing elements (example.: i = 10).

$$\begin{array}{ccc} n_1 = 3000 \text{ min}^{-1} & \xrightarrow{i} & T_2 = 200 \text{ Nm} \\ T_1 = 20 \text{ Nm} & \xrightarrow{i} & n_2 = 300 \text{ min}^{-1} \\ J_1 = 0,10 \text{ kgm}^2 & \xleftarrow{\quad} & J_2 = 10 \text{ kgm}^2 \\ & & \text{(Application)} \end{array}$$

## Ratio 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 gearbox side). It is an important parameter determining the controllability of an application. Accurate control of dynamic processes becomes more difficult with increased differing mass moments of inertia and as λ becomes greater. WITTENSTEIN alpha recommends that a guideline value of λ < 5 is maintained. A gearbox reduces the external mass moment of inertia by a factor of 1/i<sup>2</sup>.

$$\lambda = \frac{J_{\text{external}}}{J_{\text{internal}}}$$

J<sub>external</sub> reduced to input:

$$J'_{\text{external}} = J_{\text{external}} / i^2$$

Simple applications ≤ 10

Dynamic applications ≤ 5

Highly dynamic applications ≤ 1

## Safety instruction

For applications with special safety requirements (e.g. vertical axes, distorted gear inputs) we recommend exclusively employing our Premium and Advanced products (V-Drive excluded).

## Servo actuators

In addition to a high-precision planetary gearbox, the servo actuator is equipped with a powerful, permanent magnet synchronous servo motor, which ensures high power density and a high speed stability thanks to the distributed winding. This enables even more compact and powerful linear drives to be realized. The investment costs for the drive train and the ongoing operating costs can be positively influenced by downsizing. The goal is to achieve a smaller input and therefore a smaller servo controller and lower energy consumption with the same productivity. A low mass moment of inertia combined with higher rigidity is the way to achieve this.

## Shaft misalignment

One main function of the coupling is the compensation of the shaft misalignment which occurs in almost all applications between the drive and the output side. A distinction is made between →axial, →lateral- and →angular misalignment. When complying with the indicated maximum misalignment, the couplings are safe for the duration of their service life.

## Shock factor ( $f_s$ ) (gearbox)

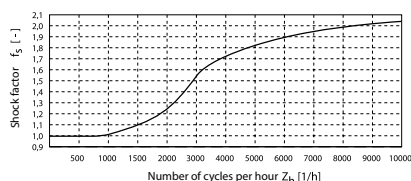
The maximum admissible acceleration torque ( $T_{2B}$ ) indicated in the catalog in cyclic operation applies to less than 1000 cycles/h. Greater numbers of cycles in connection with shorter acceleration times can lead to oscillations in the drive train. The resulting excessive torque increases are taken into consideration with the shock factor  $f_s$ .

WITTENSTEIN alpha suggests taking these unknown overloads into account using the following curve.

This determined value is multiplied by the actual acceleration torque  $T_{2b}$  before it is compared with the maximum permissible acceleration torque  $T_{2B}$ .

$$(T_{2b} \cdot f_s = T_{2B}, f_s < T_{2B})$$

The following applies to gearboxes:



The following applies to couplings:

Number of cycles $Z_h$ [1/h]	Metal bellow couplings and torque limiters	Elastomer couplings
< 1000	1.0	1.0
< 2000	1.1	1.2
< 3000	1.2	1.4
< 4000	1.8	1.8
> 4000	2.0	2.0

## Slipping torque

With a smaller clamping hub diameter, it is possible that the transmittable torque of the shaft-hub connection is lower than the maximum accelerating torque  $T_B$  of the coupling. In particular, this is applicable to the series BC3, BCT Standard, EL6 and ELC. More detailed information is available on request.

## Speed (n)

The permitted maximum speed  $n_{1Max}$  must be compared with the maximum speed  $n_{1max}$  during operation. The maximum permissible speed  $n_{1Max}$  must not be exceeded at any time.

The average speed  $n_{1m}$  is determined as the arithmetic mean of the speeds in the cycle or over a maximum of 20 minutes. It must be below the permitted nominal speed  $n_{1N}$  at all times. This applies to both cyclic and continuous operation.

$$n_{1m} = \frac{|n_{1,0}| \cdot t_0 + \dots + |n_{1,n}| \cdot t_n}{t_0 + \dots + t_n} \text{ incl. pause time} \quad \text{with } \sum_0^n t_n \leq 20 \text{ min}$$

WITTENSTEIN alpha determines the thermal speed limit or thermal limit of the nominal speed in the laboratory at an ambient temperature of 20°C while maintaining a gearbox temperature of 90°C.

## speedline® delivery

If required, standard series can be delivered within 24 or 48 hours ex works. Fast deliveries at short notice thanks to a high level of flexibility

## Spring rigidity (C)

Counter-force of the coupling in the event of axial or lateral misalignment [N/mm]. A distinction is made between →axial and →lateral spring rigidity.

## Static torsional rigidity ( $C_{Tstat}$ )

Torsional rigidity at 50 %  $T_N$

## Synchronous run

The synchronous run refers to the measurable variation in speed between the input and output during one revolution of the output shaft. It is caused by manufacturing tolerances and results in ratio fluctuations within one revolution.

## Technical data

Further technical data for our complete product portfolio is available to download from our website.

## Temperature factor ( $f_t$ )

With elastomer couplings, the ambient temperature impacts the maximum admissible accelerating torque of the coupling. This is taken into consideration in the coupling design by means of the temperature factor  $f_t$ . The temperature factor depending on the elastomer insert used can be determined by means of the table.

Temperature °C	Elastomer insert			Metal bellows
	A	B	C	
> -30 to -10	1.5	1.3	1.4	1.0
> -10 to +30	1.0	1.0	1.0	1.0
> +30 to +40	1.2	1.1	1.3	1.0
> +40 to +60	1.4	1.3	1.5	1.0
> +60 to +80	1.7	1.5	1.8	1.0
> +80 to +100	2.0	1.8	2.1	1.0
> +100 to +120	-	2.4	-	1.0



# Glossary – the alphabet

## Thermal behavior - temperature

It is necessary to measure the maximum temperature of the gearbox in the application.

The gearbox temperature is significantly influenced by the following application-specific factors:

- Load spectrum with nominal torque and nominal speed
- Motor temperature (e.g. heat input from the motor)
- Heat dissipation to the machine interface (e.g. mounting on a stainless steel structure or very thin mounting plates)
- Convection (e.g. convection prevented by installation location)
- Ambient temperature (e.g. excessively high ambient temperature of the air and the mechanical interface parts)

If the permissible gearbox temperature is exceeded, the service life of the gearbox is reduced considerably.

## Tilting moment ( $M_{2K}$ )

The tilting moment  $M_{2K}$  is a result of the **→ axial and lateral forces** applied and their respective force application points in relation to the inner radial bearing on the output side.

## Tilting rigidity

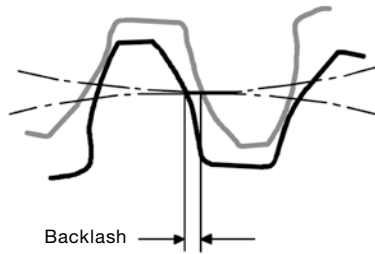
The tilting rigidity  $C_{2K}$  of the gearbox is made up of the bending rigidity of the output or pinion shaft and the bearing stiffness of the output bearing. It is defined as a quotient of the tilting moment  $M_{2K}$  [Nm] and tilting angle  $\Phi$  [arcmin] ( $C_{2K} = M_{2K}/\Phi$ ).

## Tooth engagement frequency ( $f_z$ )

In certain circumstances, the tooth engagement frequency can lead to vibration problems in the application, specifically if the excitation frequency corresponds to a natural frequency of the applications. For planetary gearboxes from WITTENSTEIN alpha (exception: gearboxes with ratio  $i = 8$ ) the tooth engagement frequency can be calculated using the formula  $f_z = 1,8 \cdot n_2$  [min<sup>-1</sup>]. It is independent of the ratio in planetary gearboxes from Wittenstein alpha. If it does prove problematic, either the natural frequency of the system can be changed or a different gearbox (e.g. hypoid gearbox) with a different tooth engagement frequency can be chosen.

## Torsional backlash ( $j_t$ )

Torsional backlash  $j_t$  [arcmin] describes the maximum angle of rotation of the output shaft in relation to the input. In simple terms, the torsional backlash describes the distance between two tooth flanks.

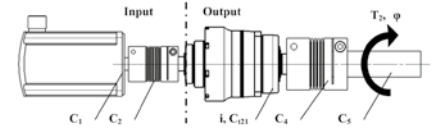


The measurement is taken with the input shaft blocked.

The output is then loaded with a defined test torque in order to overcome the internal gearbox friction. The main influence of the backlash is the flank backlash between the teeth. The low torsional backlash of the WITTENSTEIN alpha gearbox is achieved through high manufacturing precision and selective combination of the toothed wheels.

## Torsional rigidity ( $C_{t21}$ ) (gearbox)

The torsional rigidity [Nm/arcmin]  $C_{t21}$  is defined as the quotient of applied torque and resulting angle of rotation ( $C_{t21} = \Delta T / \Delta \Phi$ ). It indicates the torque required to turn the output shaft by one angular minute. The torsional rigidity can be determined using the **→ hysteresis curve** Torsional rigidity  $C$ , angle of rotation  $\Phi$



Reduce all torsional rigidity to the output:

$$C_{(n),ab} = C_{(n),an} \cdot i^2$$

with  $i$  = gearbox ratio [ - ]

$C_{(n)}$  = Individual rigidities [Nm/arcmin]

Note: The torsional rigidity  $C_{t21}$  for the gearbox always relates to the output.

Series connection of torsional rigidities

$$1/C_{ges} = 1/C_{1,ab} + 1/C_{2,ab} + \dots + 1/C_{(n)}$$

Angle of rotation  $\Phi$  [arcmin]

$$\Phi = T_2 \cdot 1/C_{ges}$$

with  $T_2$  = output torque [Nm]

## Torsional rigidity ( $C_t$ ) (couplings)

The torsional rigidity [Nm/arcmin]  $C_t$  is defined as the quotient of applied torque and resulting angle of rotation. It shows the torque required to turn the two clamping hubs against each other by one angular minute. If the maximum value is exceeded, the coupling can no longer transmit the applied torque since the **→ angle of rotation** of the coupling becomes too large. A distinction is made between **→ static** and **→ dynamic torsional rigidity**.

## Torque ( $T_{2\alpha}$ )

$T_{2\alpha}$  represents the maximum torque that can be transmitted by the gearbox. This value may be reduced depending on application-specific boundary conditions and the precise evaluation of the motion profile.





# Glossary – Formulae

## Formulae

<b>Torque [Nm]</b>	$T = J \cdot \alpha$	$J$ = Mass moment of inertia [kgm <sup>2</sup> ] $\alpha$ = Angular acceleration [1/s <sup>2</sup> ]
<b>Torque [Nm]</b>	$T = F \cdot l$	$F$ = Force [N] $l$ = Lever, length [m]
<b>Acceleration force [N]</b>	$F_b = m \cdot a$	$m$ = Mass [kg] $a$ = Linear acceleration [m/s <sup>2</sup> ]
<b>Frictional force [N]</b>	$F_{\text{Reib}} = m \cdot g \cdot \mu$	$g$ = Acceleration due to gravity 9.81 m/s <sup>2</sup> $\mu$ = Coefficient of friction
<b>Angular speed [1/s]</b>	$\omega = 2 \cdot \pi \cdot n / 60$	$n$ = Speed [rpm] $\pi$ = PI = 3.14...
<b>Linear speed [m/s]</b>	$v = \omega \cdot r$	$v$ = Linear speed [m/s] $r$ = Radius [m]
<b>Linear speed [m/s] (spindle)</b>	$v_{\text{sp}} = \omega \cdot h / (2 \cdot \pi)$	$h$ = Screw pitch [m]
<b>Linear acceleration [m/s<sup>2</sup>]</b>	$a = v / t_b$	$t_b$ = Acceleration time [s]
<b>Angular acceleration [1/s<sup>2</sup>]</b>	$\alpha = \omega / t_b$	
<b>Pinion path [mm]</b>	$s = m_n \cdot z \cdot \pi / \cos \beta$	$m_n$ = Normal module [mm] $z$ = Number of teeth [-] $\beta$ = Helix angle [°]

## Conversion table

<b>1 mm</b>	= 0.039 in
<b>1 Nm</b>	= 8.85 in.lb
<b>1 kgcm<sup>2</sup></b>	= 8.85 x 10 <sup>-4</sup> in.lb.s <sup>2</sup>
<b>1 N</b>	= 0.225 lb <sub>f</sub>
<b>1 kg</b>	= 2.21 lb <sub>m</sub>

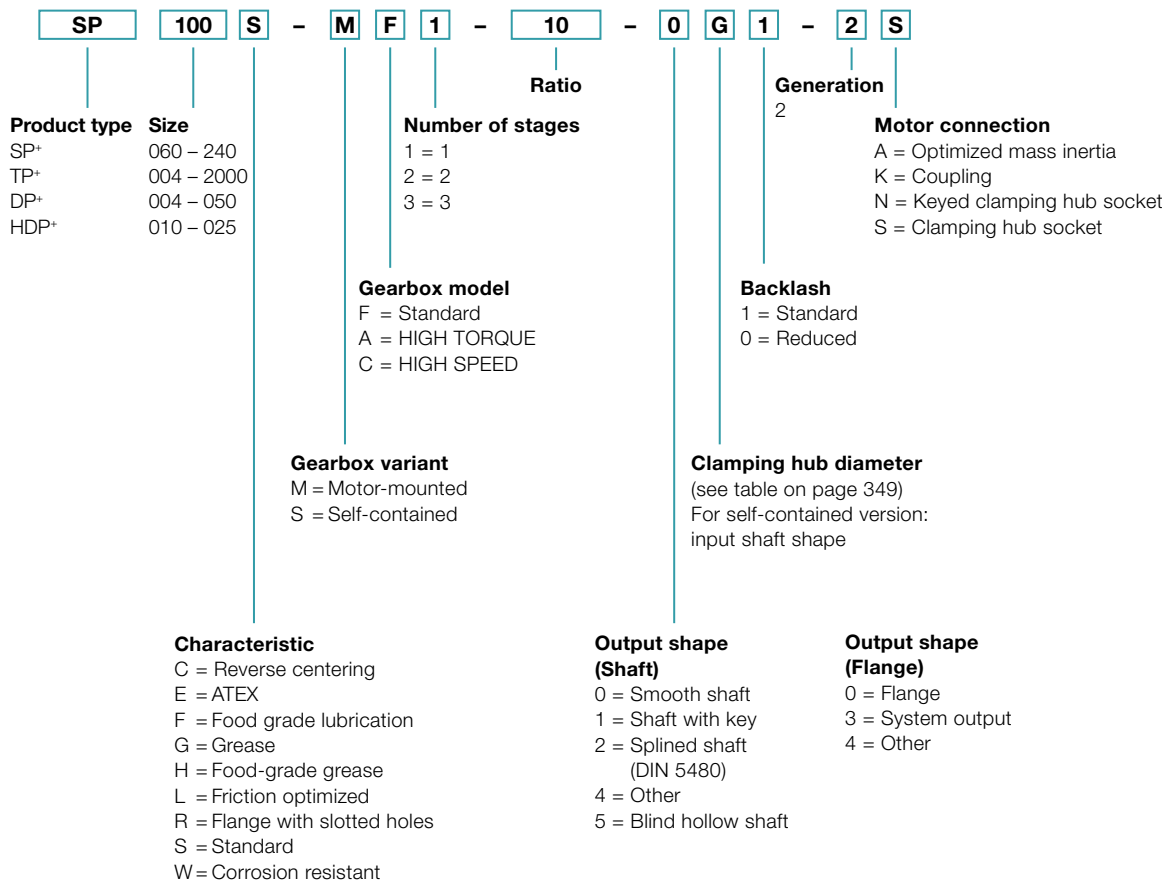
## Symbol

Symbol	Unit	Designation
$C$	Nm/arcmin	Stiffness
$ED$	%, min	Duty cycle
$F$	N	Force
$f_s$	–	Shock factor
$f_e$	–	Factor for duty cycle
$i$	–	Ratio
$j$	arcmin	Backlash
$J$	kgm <sup>2</sup>	Mass 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
$\eta$	%	Efficiency
$t$	s	Time
$T$	Nm	Torque
$v$	m/min	Linear speed
$z$	1/h	Number of cycles

## Index

Index	Designation
Capital letter	Permissible values
Small letter	Actual values
1	Input
2	Output
A/a	Axial
B/b	Acceleration
c	Constant
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
Q/q	Lateral
t	Torsional
T	Tangential

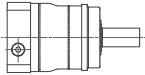
# Ordering code – Planetary gearbox



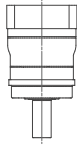
# Mounting positions and clamping hub diameters

Clamping hub diameter  
(see technical data sheet for possible diameters)

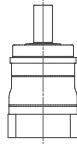
B5  
Horizontal



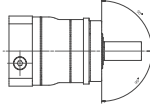
V1  
Output vertical  
downwards



V3  
Output vertical  
upwards



S  
Can be tilted  $\pm 90^\circ$   
from a horizontal  
position



Code letter	mm	Code letter	mm
B	11	I	32
C	14	K	38
E	19	M	48
G	24	N	55
H	28	O	60

Intermediate sizes possible using bushings with a minimum thickness of 1 mm.

**For information purposes only – not required when placing orders!**

## Exceptions:

- The mounting position of TP+ 2000 must be specified.
- DP+ / HDP+ products are designed for mounting position B5 as standard!

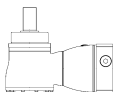
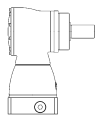
If the mounting position is different, contact WITTENSTEIN alpha without fail.

## Ordering code – Hypoid- / Bevel gearboxes

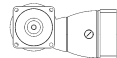
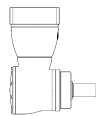
[illegible]

## Mounting positions

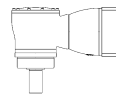
B5/V3  
Output horizontal/  
motor shaft vertical upwards



B5/V1  
Output horizontal/  
motor shaft vertical down-  
wards



V1 / B5  
Output vertical downwards /  
motor shaft horizontal



V3 / B5  
Output vertical upwards /  
motor shaft horizontal

B5 / B5  
Output horizontal /  
motor shaft horizontal

**Please note the orientation when placing your order.**

**Exceptions:**

- The mounting position of TPK+ 2000 must be specified.
- If the mounting position is different, contact WITTENSTEIN alpha without fail.

## Characteristic: Modular output combination (B)

HG <sup>+</sup> / SK <sup>+</sup> / SPK <sup>+</sup> / TK <sup>+</sup> / TPK <sup>+</sup>									
SK <sup>+</sup>	100	B	-	M	F	1	-	10	- G E 1 / motor
		Characteristic: B = Modular output combination S = Standard					Output shape		

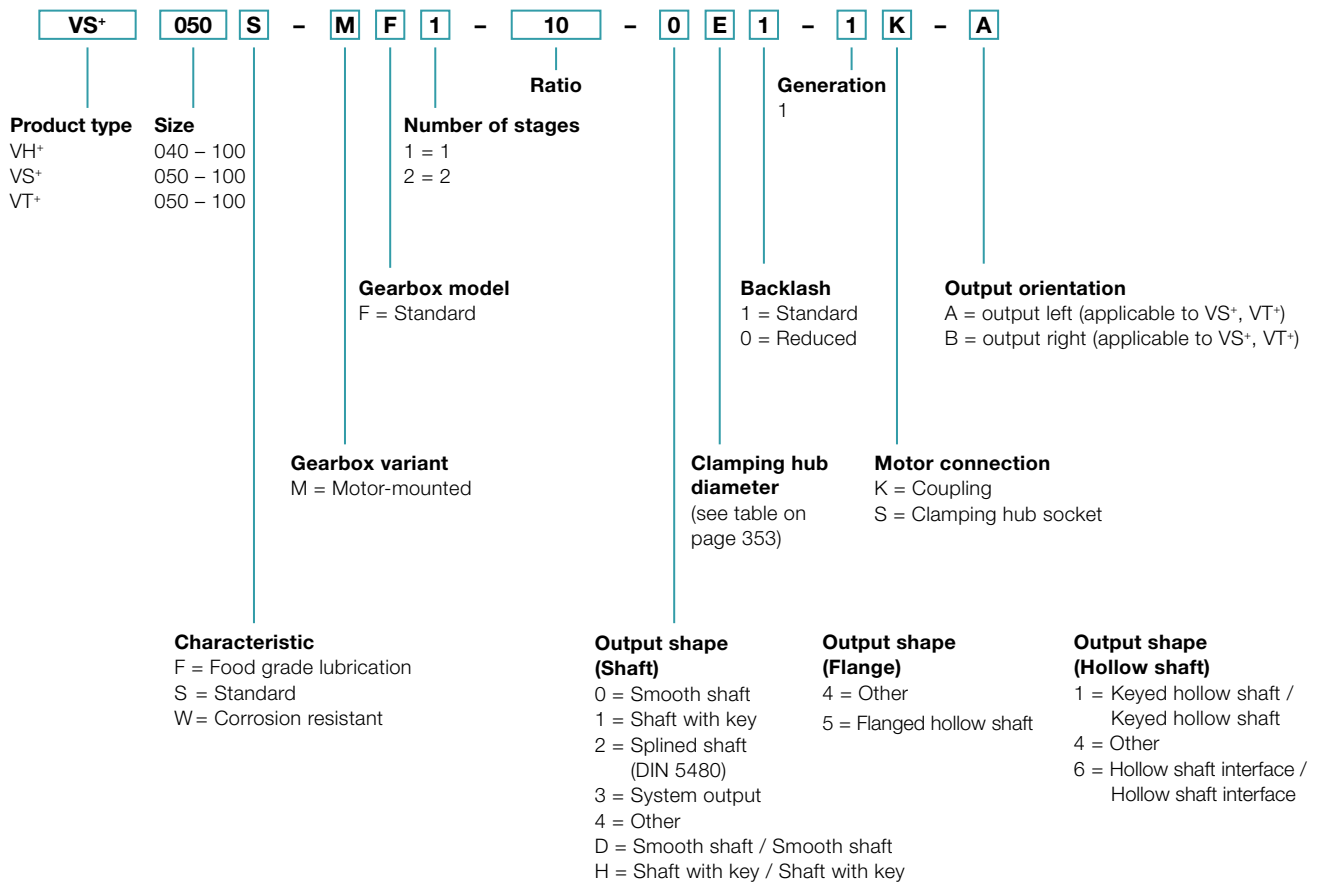
When selecting an output combination from the modular system, please select the letter „B“ as the characteristic in the ordering code. The digit for the required output shape is the modular matrix system.

Example: If you opt for an SK+ with a smooth shaft and require an additional output in the form of a shaft with key, then select the letter „G“ and enter in the order key under „Output shape“.

<div>Backward</div> <div>Output shape</div> <div>Front</div>						
		Smooth shaft	Shaft with key	Hollow shaft interface	Hollow shaft	Cover
SK <sup>+</sup> / SPK <sup>+</sup>	 Smooth shaft	D	G	A	-	0*
	 Shaft with key	E	H	B	-	1*
	 Splined shaft (DIN 5480)	F	I	C	-	2*
SPK <sup>+</sup>	 Blind hollow shaft	O	P	N	-	5*
TK <sup>+</sup>	 Flanged hollow shaft	D	G	6	5*	0
TPK <sup>+</sup>	 Flange	D	G	6	-	0*
HG <sup>+</sup>	 Hollow shaft	D	G	6*	5*	0

\* Standard version: please specify characteristic „S“ in the order code

# Ordering code – Worm gearboxes



# Mounting positions and clamping hub diameters

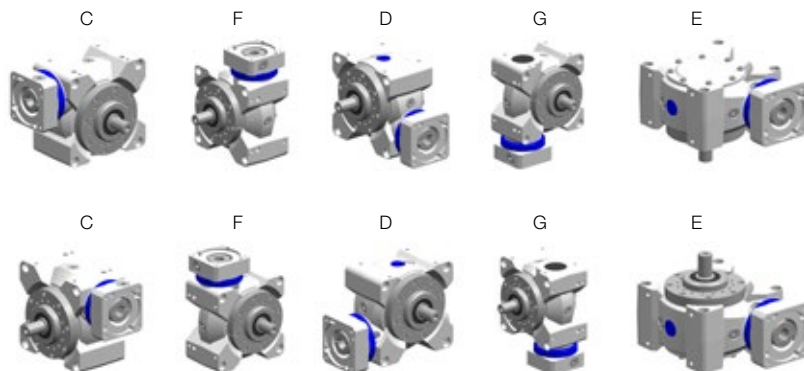
Output side A:  
View of motor interface,  
Output left  
Only valid for VS<sup>+</sup>, VT<sup>+</sup>



Output side B:  
View of motor interface,  
Output right  
Only valid for VS<sup>+</sup>, VT<sup>+</sup>



Installation position (only important for defining the bleed screw)



**For VH<sup>+</sup> and VS<sup>+</sup> with dual shaft output or hollow shaft, the orientation of the output drive is not required.**

## Clamping hub diameter

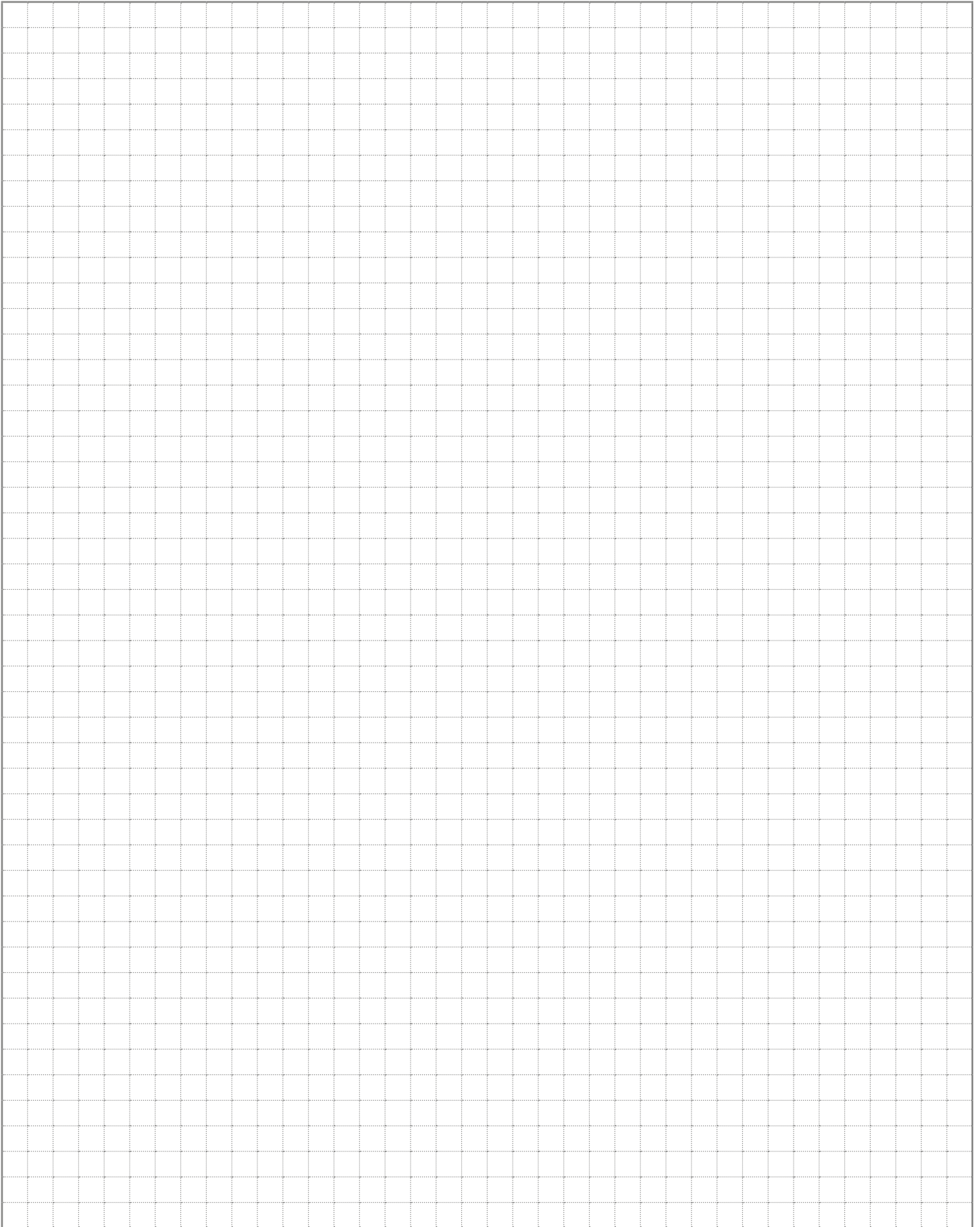
(see technical data sheet for possible diameters)

Code letter	mm	Code letter	mm
B	11	I	32
C	14	K	38
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.









alpha

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Subject to technical changes. alpha Advanced Line

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

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