

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



SP<sup>+</sup>

### Product highlights

**Max. torsional backlash** [arcmin] ≤ 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**

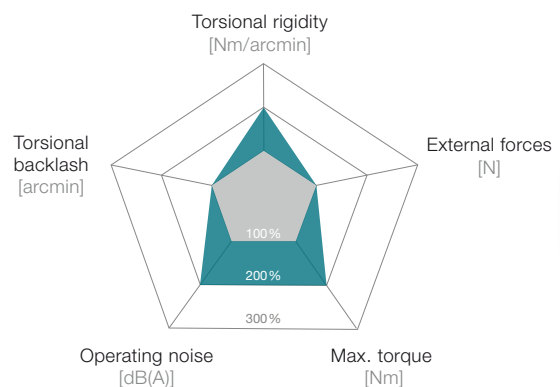
Clamping hub socket, coupling, optimized mass inertia, keyed clamping hub socket

**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.

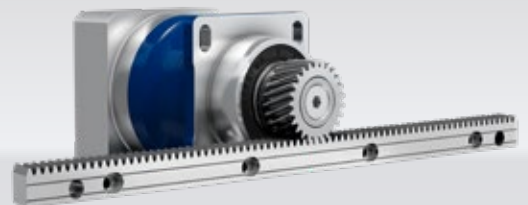
The SP<sup>+</sup> compared to the industry standard



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



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



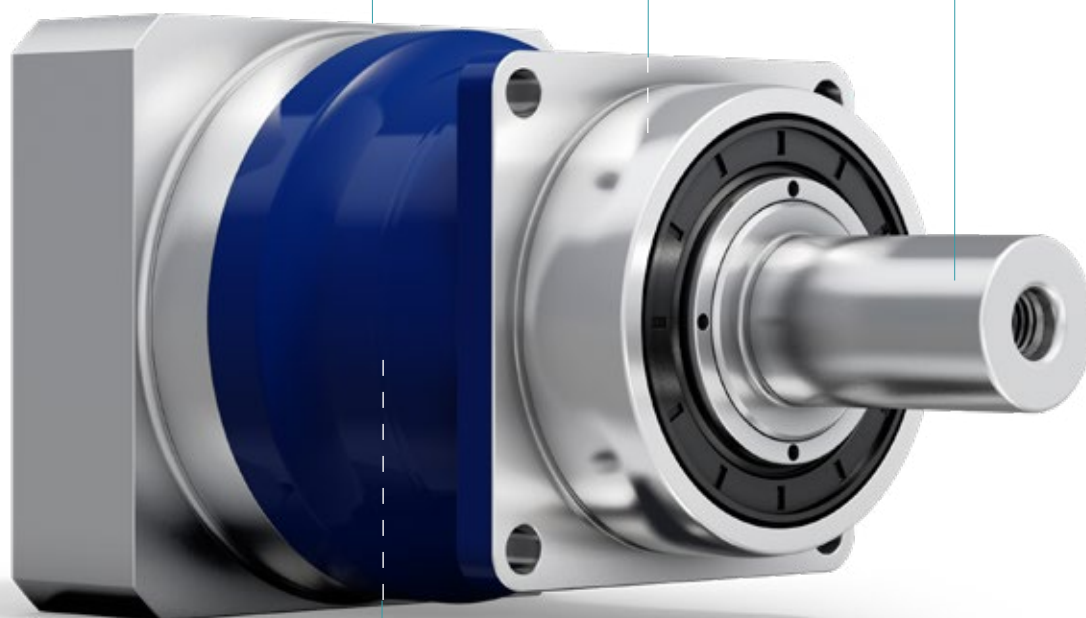
SP<sup>+</sup> with R-flange and rack and pinion

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

Various output configurations

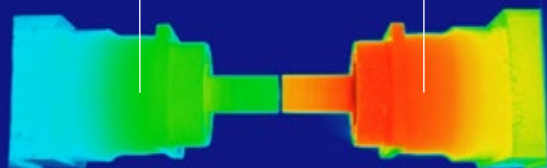
Tapered roller bearing for absorbing axial and radial forces

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+ 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

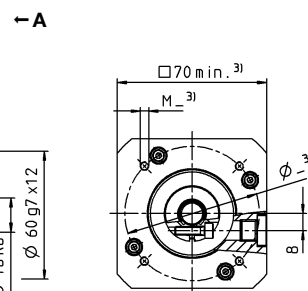
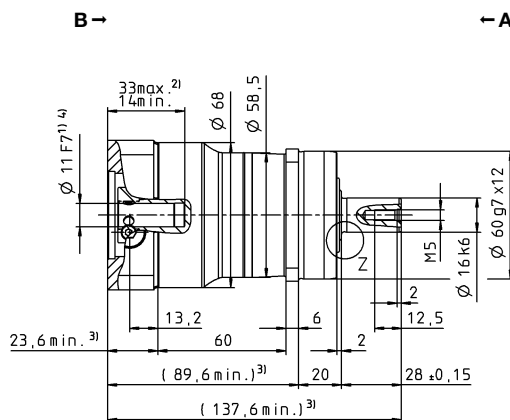
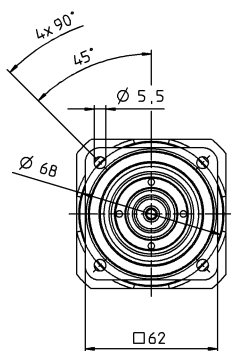
<sup>f)</sup> Please contact us to discuss  
application-specific service lifetimes

View A

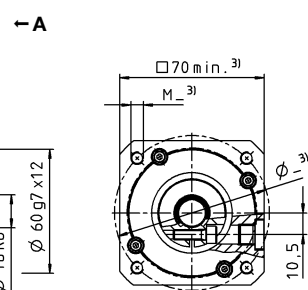
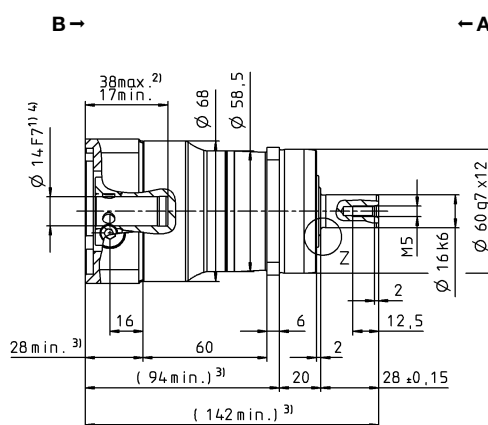
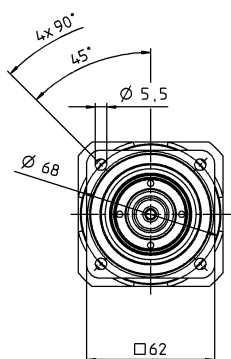
View B

# 1-stage

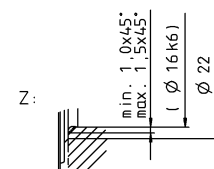
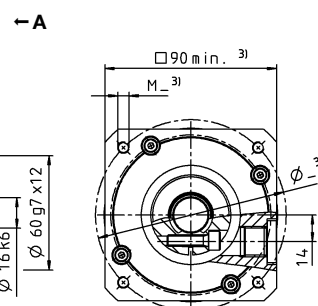
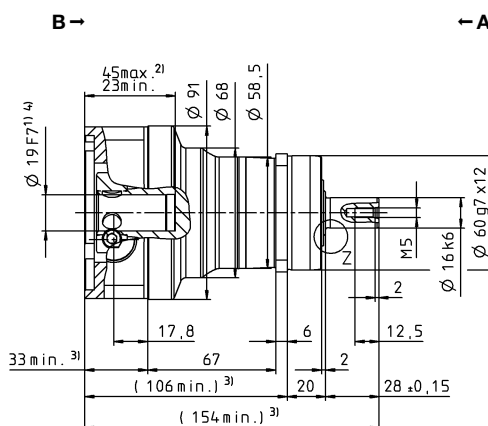
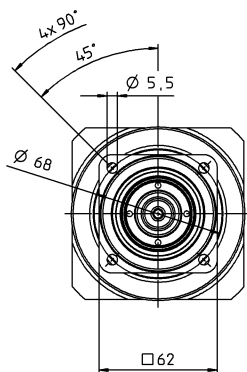
up to 11<sup>4)</sup> (B)  
clamping hub  
diameter



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

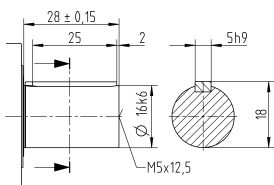


up to 19<sup>4)</sup> (E)  
clamping hub  
diameter

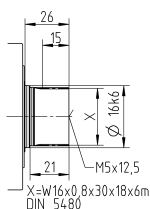


## Other output variants

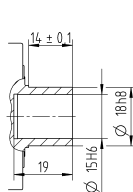
Shaft with key



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										
				<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

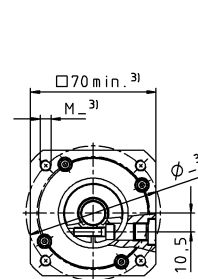
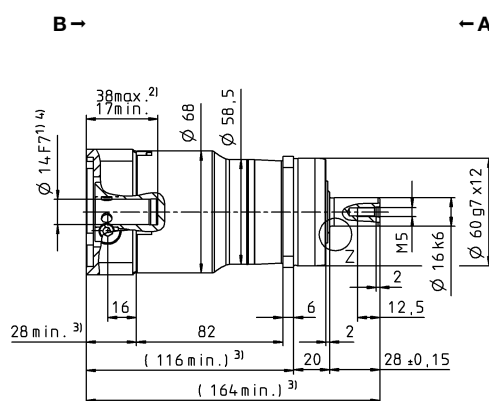
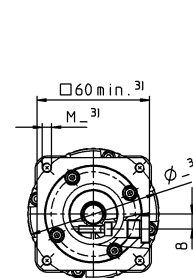
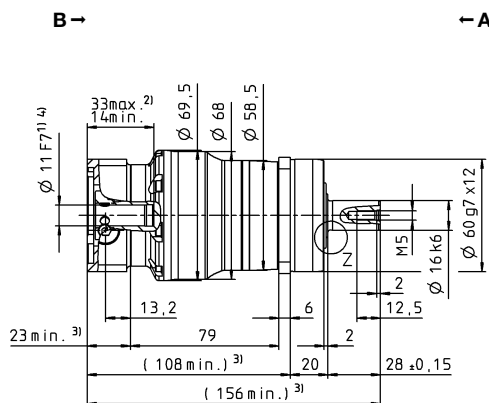
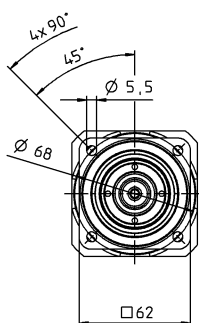
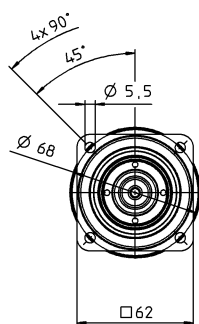
<sup>e)</sup> Smooth shaft

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

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

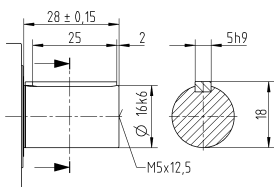
Motor shaft diameter [mm]

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

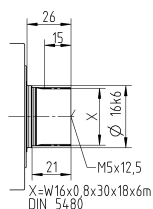


## Other output variants

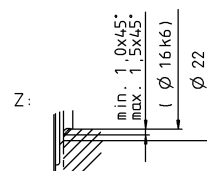
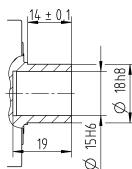
Shaft with key



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+ 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>	Nm	136	176	176	176	152	152
				in.lb	1204	1558	1558	1558	1345	1345
Max. acceleration torque <sup>b) e)</sup> (max. 1000 cycles per hour)			<i>T</i> <sub>2B</sub>	Nm	102	132	132	132	114	114
				in.lb	903	1168	1168	1168	1009	1009
Nominal torque (at <i>n</i> <sub>IN</sub> )			<i>T</i> <sub>2N</sub>	Nm	63	81	81	81	80	81
				in.lb	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>	Nm	139	185	250	250	250	250
				in.lb	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>	rpm	2900	2900	2900	3100	3100	3100
Max. input speed			<i>n</i> <sub>1Max</sub>	rpm	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>	Nm	1.5	1.4	0.96	0.72	0.55	0.52
				in.lb	14	12	8.5	6.4	4.9	4.6
Max. backlash			<i>j</i> <sub>t</sub>	arcmin	Standard ≤ 4 / Reduced ≤ 2					
Torsional rigidity <sup>b)</sup>			<i>C</i> <sub>t21</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>	%	97					
Service life <sup>f)</sup>			<i>L</i> <sub>h</sub>	h	> 20000					
Weight (incl. standard adapter plate)			<i>m</i>	kg	3.9					
				lb <sub>m</sub>	8.6					
Operating noise (at reference ratio and reference speed – ratio-specific values available in cymex®)			<i>L</i> <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®)					BC2-00150AA022.000-X					
				mm	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>	kgcm <sup>2</sup>	0.86	0.61	0.51	0.42	0.38	0.38
				10 <sup>-3</sup> in.lb.s <sup>2</sup>	0.76	0.54	0.45	0.37	0.34	0.34
	E	19	<i>J</i> <sub>i</sub>	kgcm <sup>2</sup>	1.03	0.78	0.68	0.59	0.54	0.54
				10 <sup>-3</sup> in.lb.s <sup>2</sup>	0.91	0.69	0.60	0.52	0.48	0.48
	G	24	<i>J</i> <sub>i</sub>	kgcm <sup>2</sup>	2.40	2.15	2.05	1.96	1.91	1.91
				10 <sup>-3</sup> in.lb.s <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

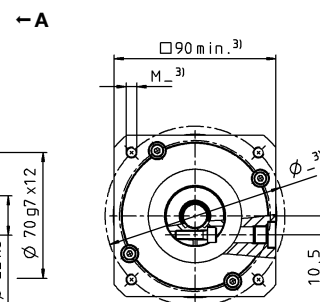
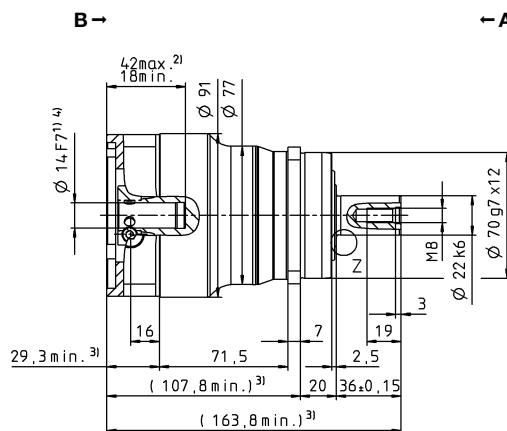
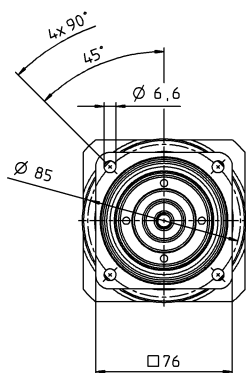
<sup>f)</sup> Please contact us to discuss  
application-specific service lifetimes

View A

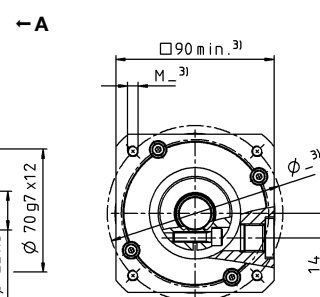
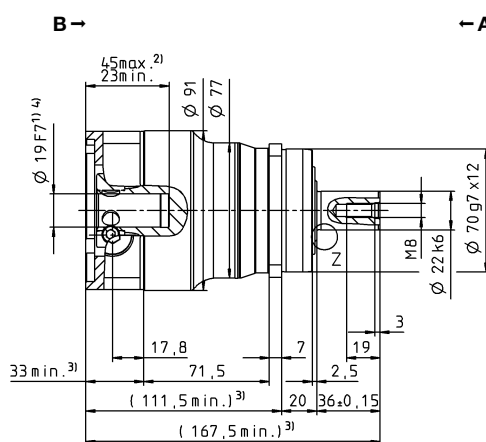
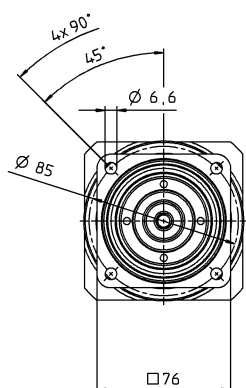
View B

# 1-stage

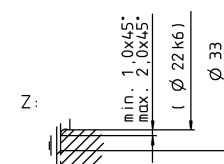
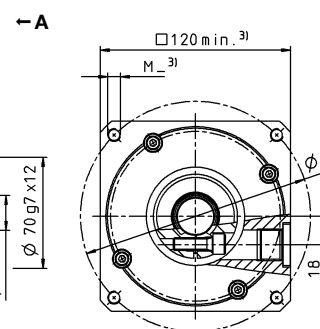
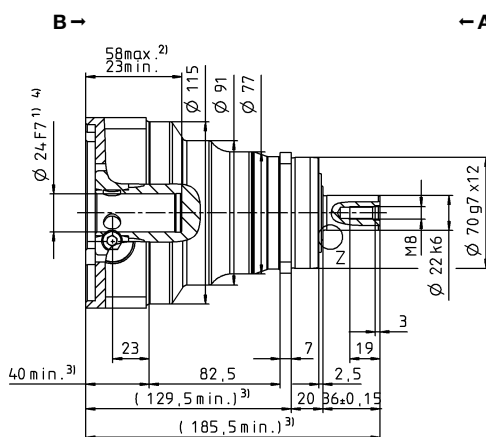
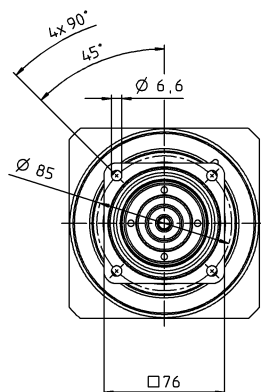
up to 14<sup>4)</sup> (C)  
clamping hub  
diameter



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

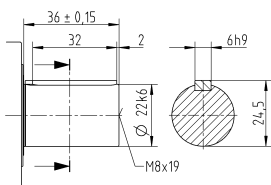


up to 24<sup>4)</sup> (G)  
clamping hub  
diameter

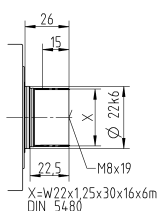


## Other output variants

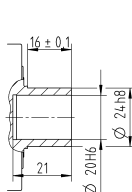
Shaft with key



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												
				<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			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	
			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	

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

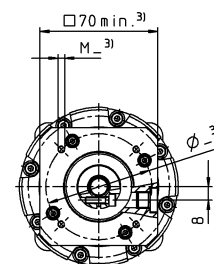
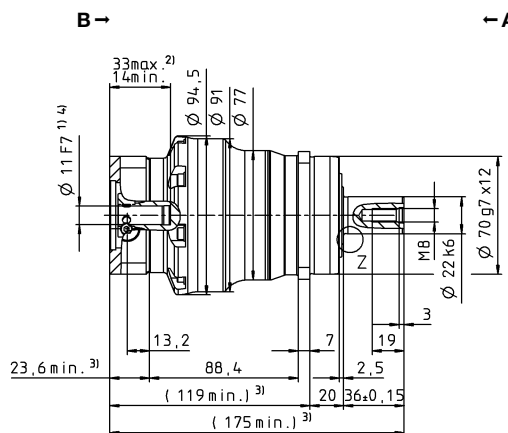
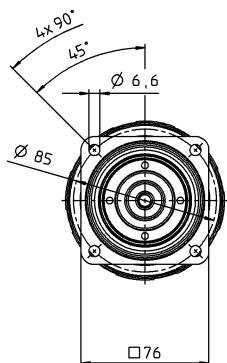
<sup>f)</sup> Please contact us to discuss  
application-specific service lifetimes

View A

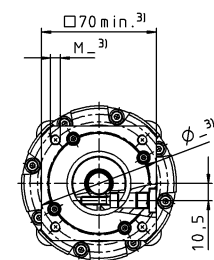
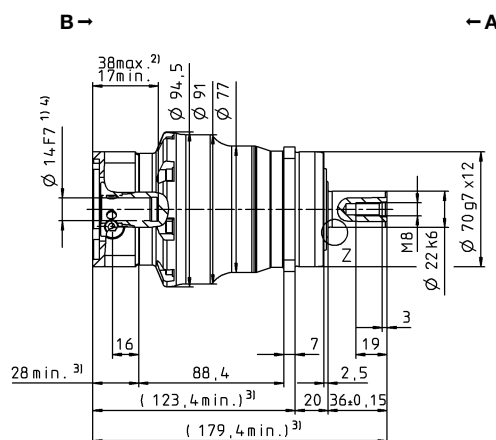
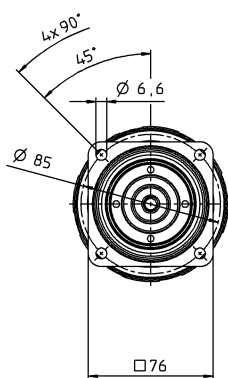
View B

# 2-stage

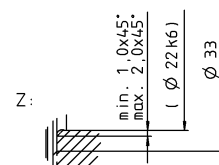
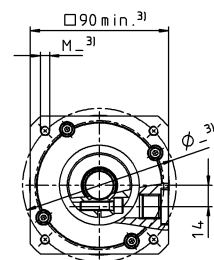
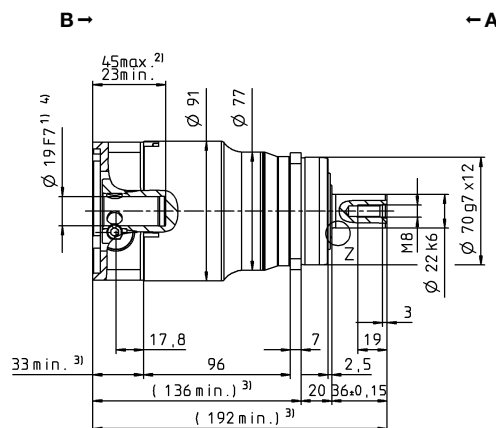
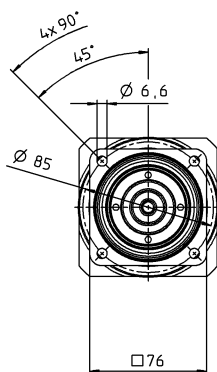
up to 11<sup>4)</sup> (B)  
clamping hub  
diameter



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

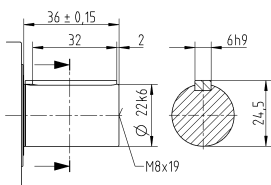


up to 19<sup>4)</sup> (E)  
clamping hub  
diameter

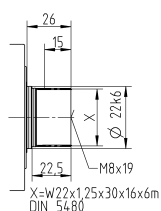


## Other output variants

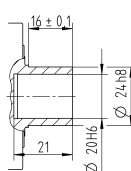
Shaft with key



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>1</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							
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>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

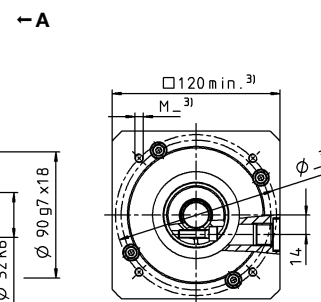
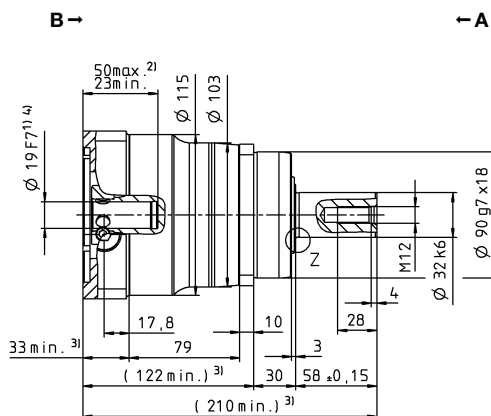
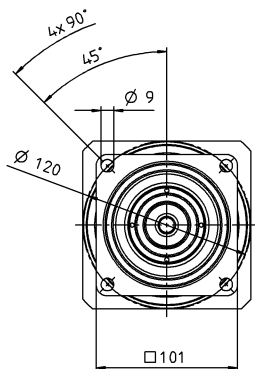
<sup>d)</sup> Please reduce input speed at higher ambient temperatures

<sup>e)</sup> Smooth shaft

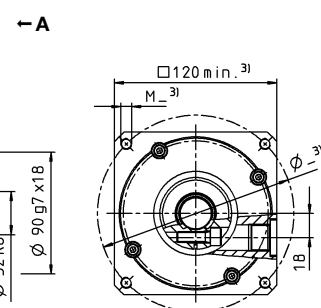
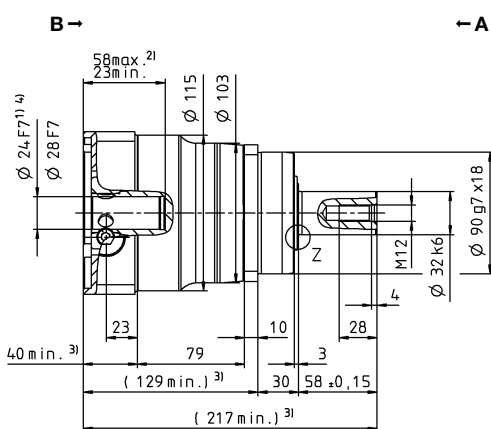
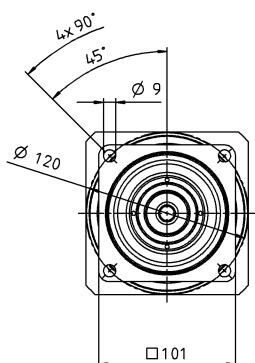
<sup>f)</sup> Please contact us to discuss  
application-specific service lifetimes

# 1-stage

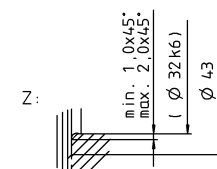
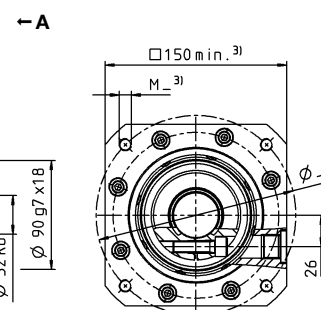
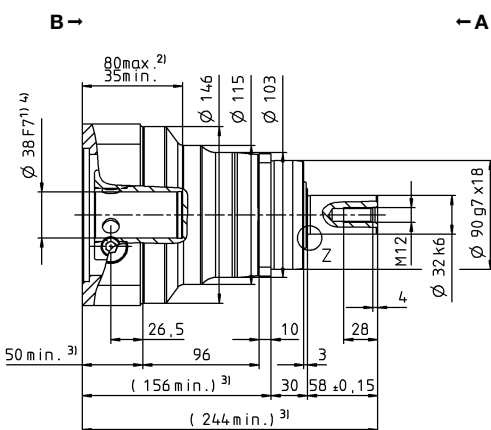
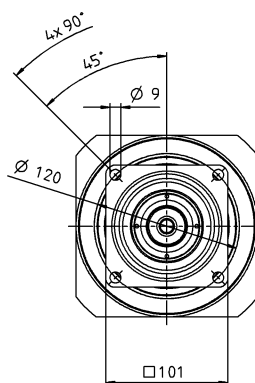
up to 19<sup>4)</sup> (E)  
clamping hub diameter



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

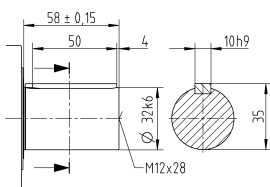


up to 38<sup>4)</sup> (K)  
clamping hub diameter

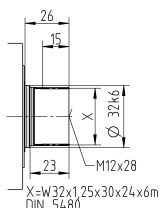


## Other output variants

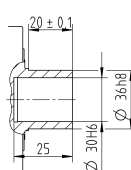
Shaft with key



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>	<i>Nm</i>	347	347	347	347	347	347	347	347	259	347	259	
			<i>in.lb</i>	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>	<i>Nm</i>	347	347	347	347	347	347	347	347	259	347	259	
			<i>in.lb</i>	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>	<i>Nm</i>	243	259	257	277	243	277	277	277	207	277	207	
			<i>in.lb</i>	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>	<i>Nm</i>	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	
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>	3100	3100	3100	3100	3100	3100	3100	3500	3500	4200	4200	
Max. input speed		<i>n</i> <sub>1Max</sub>	<i>rpm</i>	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>	<i>Nm</i>	1.0	0.93	0.85	0.77	0.86	0.54	0.54	0.46	0.46	0.39	0.37	
			<i>in.lb</i>	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>	<i>arcmin</i>	Standard ≤ 5 / Reduced ≤ 3											
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>	%	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>	7.9											
			<i>lb<sub>m</sub></i>	17.5											
Operating noise (at reference ratio and reference speed – ratio-specific values available in cymex®)		<i>L</i> <sub>PA</sub>	<i>dB(A)</i>	≤ 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®)				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	C	14	<i>J</i> <sub>1</sub>	<i>kgcm<sup>2</sup></i>	0.64	0.54	0.52	0.43	0.43	0.43	0.38	0.38	0.54	0.37	0.37
				<i>10<sup>-3</sup> in.lb.s<sup>2</sup></i>	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>	<i>kgcm<sup>2</sup></i>	0.81	0.70	0.68	0.60	0.60	0.59	0.55	0.54	0.38	0.54	0.54
				<i>10<sup>-3</sup> in.lb.s<sup>2</sup></i>	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>	<i>kgcm<sup>2</sup></i>	2.18	2.07	2.05	1.97	1.97	1.96	1.92	1.91	1.91	1.91	1.91
				<i>10<sup>-3</sup> in.lb.s<sup>2</sup></i>	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>	<i>kgcm<sup>2</sup></i>	1.98	1.90	1.88	1.81	1.81	1.80	1.76	1.75	1.75	1.75	1.75
				<i>10<sup>-3</sup> in.lb.s<sup>2</sup></i>	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

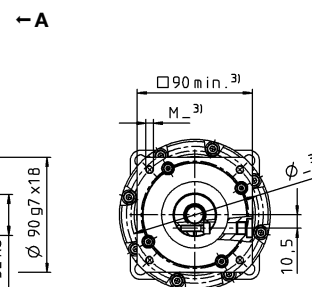
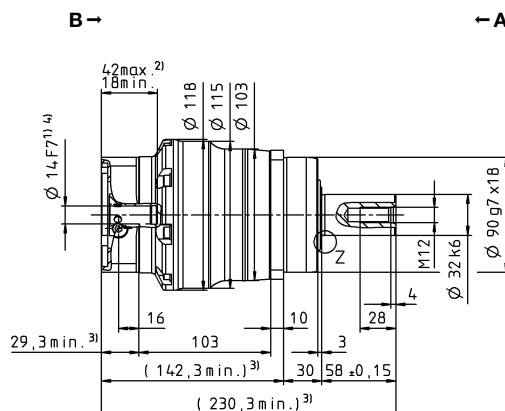
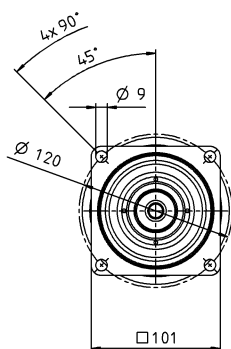
<sup>d)</sup> Please reduce input speed at higher ambient temperatures

<sup>e)</sup> Smooth shaft

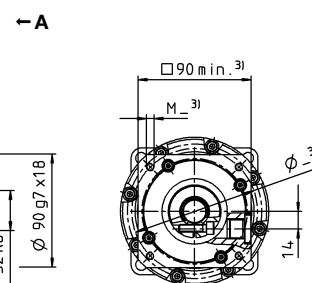
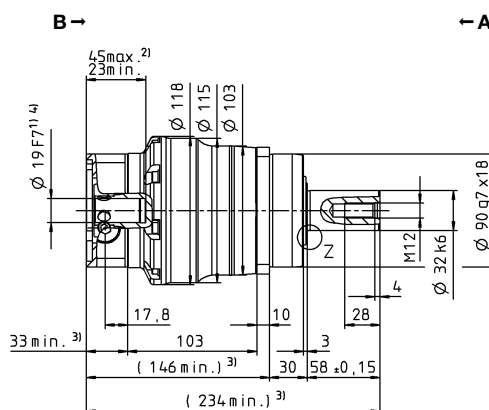
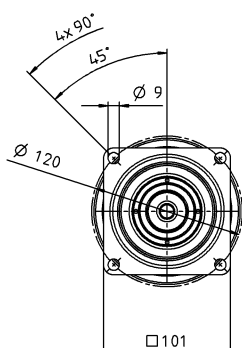
<sup>f)</sup> Please contact us to discuss  
application-specific service lifetimes

# 2-stage

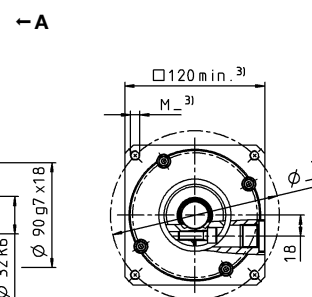
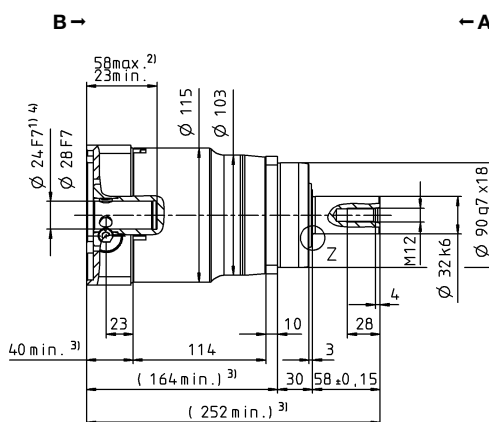
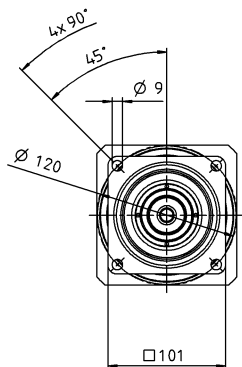
up to 14<sup>4)</sup> (C)  
clamping hub diameter



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

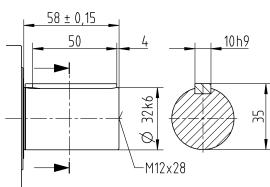


up to 24/28<sup>4)</sup>  
(G/H) clamping  
hub diameter

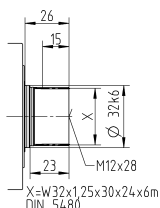


## Other output variants

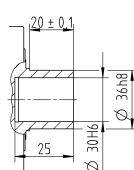
Shaft with key



Splined shaft (DIN 5480)



Shaft mounted



Non-tolerated dimensions are nominal dimensions

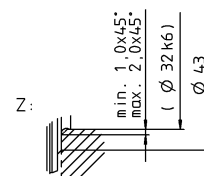
<sup>1)</sup> Check motor shaft fit

<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 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>	624	1056	1056	825	720	720
					<i>in.lb</i>	5523	9346	9346	7302	6373	6373
Max. acceleration torque <sup>b) e)</sup> (max. 1000 cycles per hour)				<i>T</i> <sub>2B</sub>	<i>Nm</i>	468	792	792	792	636	636
					<i>in.lb</i>	4142	7010	7010	7010	5629	5629
Nominal torque (at <i>n</i> <sub>IN</sub> )				<i>T</i> <sub>2N</sub>	<i>Nm</i>	202	335	333	319	312	327
					<i>in.lb</i>	1786	2962	2944	2820	2763	2894
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
					<i>in.lb</i>	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>	2100	2100	2100	2600	2600	2600
Max. input speed				<i>n</i> <sub>1Max</sub>	<i>rpm</i>	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>	6.7	5.4	4.4	3.0	2.5	2.2
					<i>in.lb</i>	60	47	39	27	23	19
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>	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>	%	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>	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					
Metal bellows coupling (recommended product type – validate sizing with cymex®)						BC2-00800AA040.000-X					
					<i>mm</i>	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	<i>J</i> <sub>1</sub>	<i>kgcm<sup>2</sup></i>	10.7	7.82	6.79	5.84	5.28	5.28	
				<i>10<sup>-3</sup> in.lb.s<sup>2</sup></i>	9.47	6.92	6.01	5.17	4.67	4.67	
	I	32	<i>J</i> <sub>1</sub>	<i>kgcm<sup>2</sup></i>	13.8	11.0	9.95	9.00	8.44	8.44	
				<i>10<sup>-3</sup> in.lb.s<sup>2</sup></i>	12.2	9.74	8.81	7.97	7.47	7.47	
	K	38	<i>J</i> <sub>1</sub>	<i>kgcm<sup>2</sup></i>	14.9	12.1	11.0	10.1	9.51	9.51	
				<i>10<sup>-3</sup> in.lb.s<sup>2</sup></i>	13.2	10.7	9.74	8.94	8.42	8.42	
	M	48	<i>J</i> <sub>1</sub>	<i>kgcm<sup>2</sup></i>	29.5	26.7	25.6	24.7	24.2	24.2	
				<i>10<sup>-3</sup> in.lb.s<sup>2</sup></i>	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

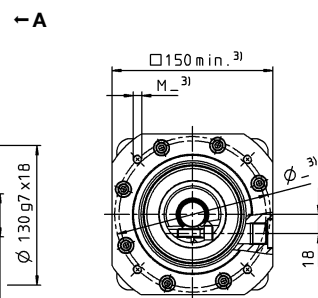
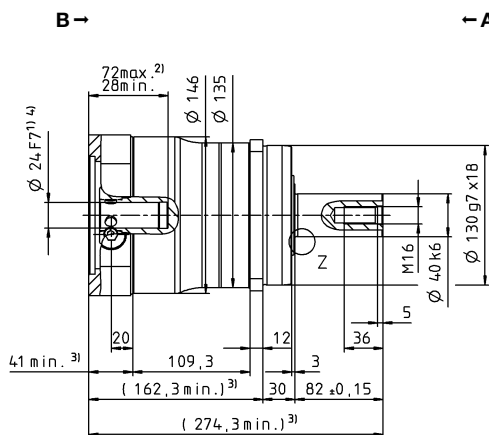
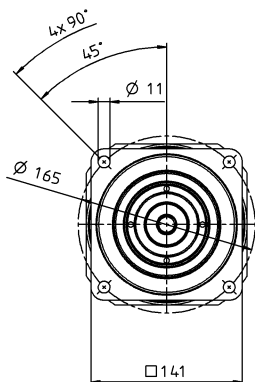
<sup>f)</sup> Please contact us to discuss  
application-specific service lifetimes

View A

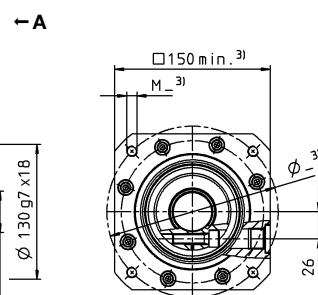
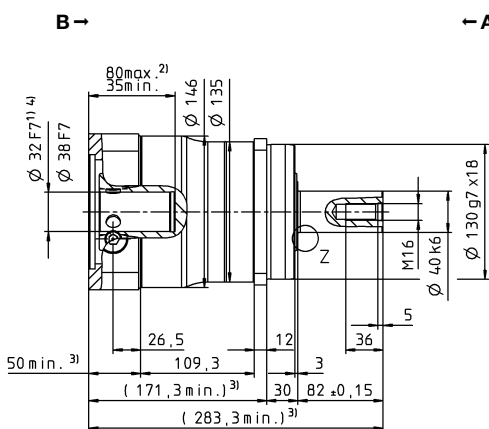
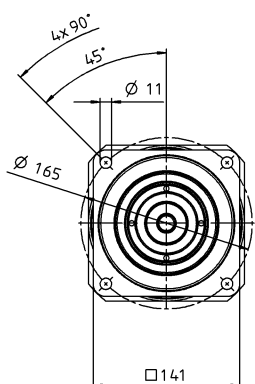
View B

# 1-stage

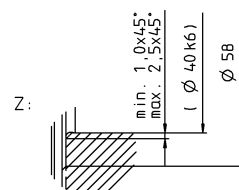
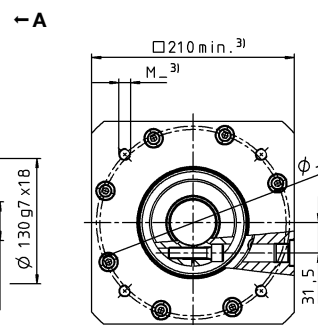
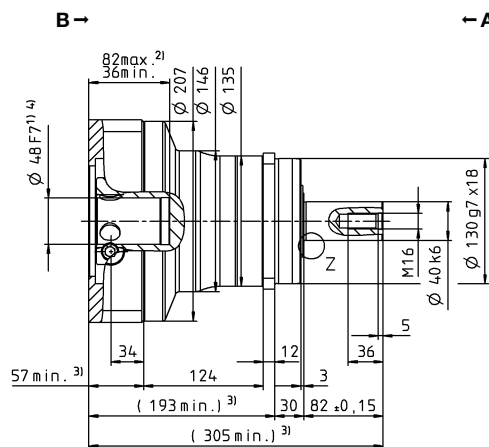
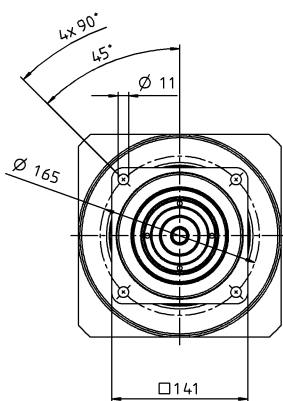
up to 24<sup>4)</sup> (G)  
clamping hub diameter



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

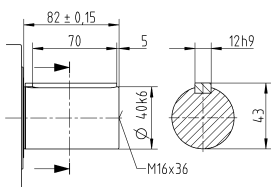


up to 48<sup>4)</sup> (M)  
clamping hub diameter

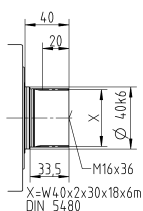


## Other output variants

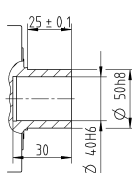
Shaft with key



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 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>	726	726	670	726	726	670	726	670	583	726	583
				<i>in.lb</i>	6426	6426	5934	6426	6426	5934	6426	5934	5160	6426	5160
Max. acceleration torque <sup>b) e)</sup> (max. 1000 cycles per hour)			<i>T</i> <sub>2B</sub>	<i>Nm</i>	726	726	670	726	726	670	726	670	583	726	583
				<i>in.lb</i>	6426	6426	5934	6426	6426	5934	6426	5930	5164	6426	5160
Nominal torque (at <i>n</i> <sub>n</sub> )			<i>T</i> <sub>2N</sub>	<i>Nm</i>	461	493	489	545	464	536	581	536	466	581	466
				<i>in.lb</i>	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)			<i>T</i> <sub>2Not</sub>	<i>Nm</i>	1350	1350	1350	1350	1350	1350	1350	1350	1350	1350	1250
				<i>in.lb</i>	11949	11949	11949	11949	11949	11949	11949	11949	11949	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>	2900	2900	2900	2900	2900	2900	2900	3200	3200	3200	3900
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>i</sub> = 3000 rpm and 20 °C gearbox temperature)			<i>T</i> <sub>012</sub>	<i>Nm</i>	2.4	2.1	2.0	1.8	1.6	1.2	1.2	1.1	1.1	0.88	0.80
				<i>in.lb</i>	21	19	17	16	14	11	11	9.4	9.4	7.8	7.1
Max. backlash			<i>j</i> <sub>t</sub>	<i>arcmin</i>	Standard ≤ 5 / Reduced ≤ 3										
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>	%	94										
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>	17										
				<i>lb<sub>m</sub></i>	37.6										
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> )					BC2-00800AA040.000-X										
				<i>mm</i>	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	<i>J</i> <sub>i</sub>	<i>kgcm</i> <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
				<i>10<sup>-3</sup> in.lb.s</i> <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	<i>J</i> <sub>i</sub>	<i>kgcm</i> <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
				<i>10<sup>-3</sup> in.lb.s</i> <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	<i>J</i> <sub>i</sub>	<i>kgcm</i> <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
				<i>10<sup>-3</sup> in.lb.s</i> <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

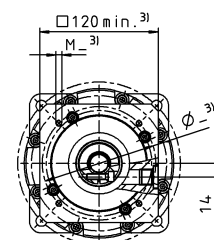
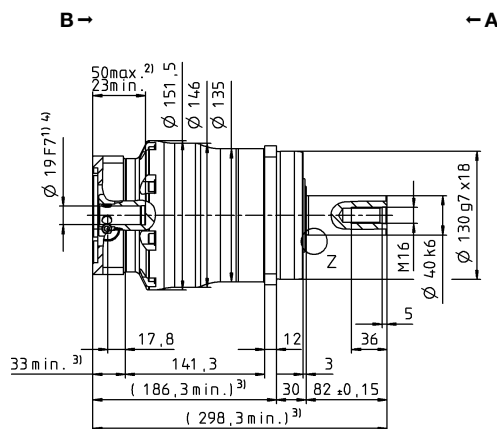
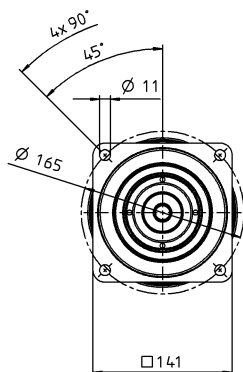
<sup>f)</sup> Please contact us to discuss  
application-specific service lifetimes

View A

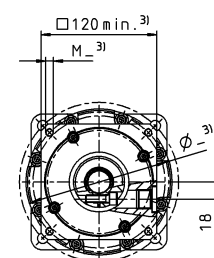
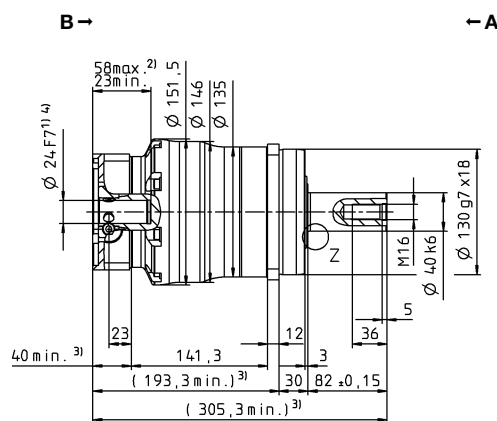
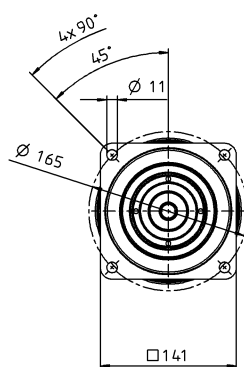
View B

# 2-stage

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

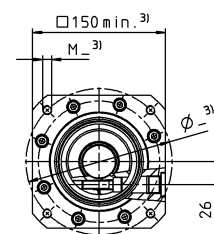
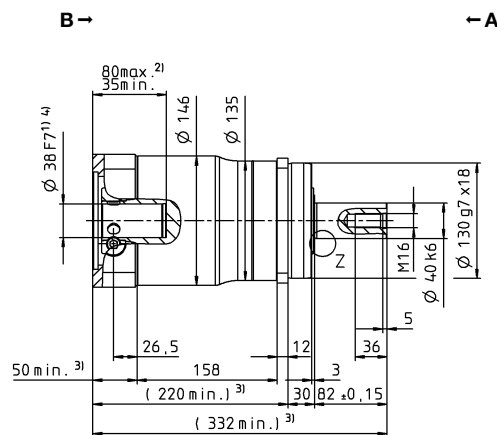
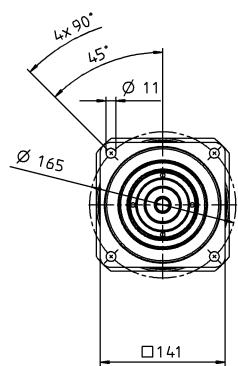


up to 24 <sup>4)</sup> (G) <sup>5)</sup>  
clamping hub  
diameter



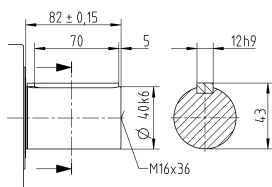
Motor shaft diameter [mm]

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

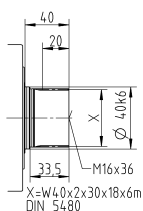


## Other output variants

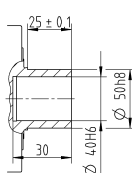
Shaft with key



Splined shaft (DIN 5480)



Shaft mounted



Non-tolerated dimensions are nominal dimensions

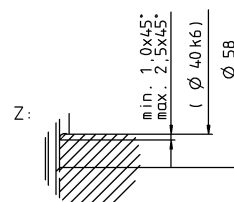
<sup>1)</sup> Check motor shaft fit

<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>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>	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>1</sub>	<i>kgcm<sup>2</sup></i>	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>1</sub>	<i>kgcm<sup>2</sup></i>	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>1</sub>	<i>kgcm<sup>2</sup></i>	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

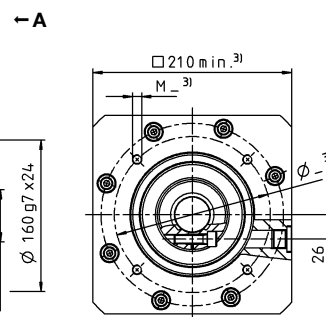
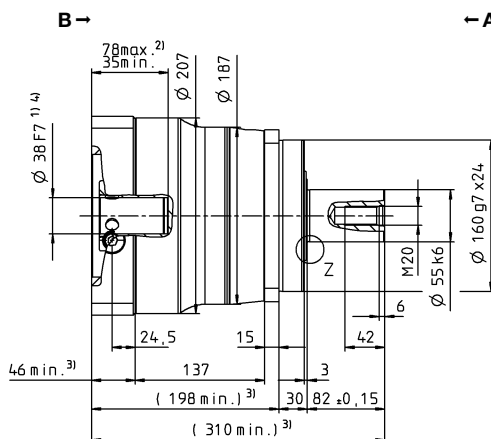
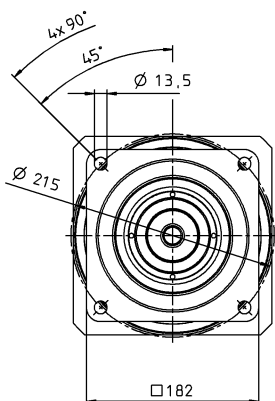
<sup>f)</sup> Please contact us to discuss  
application-specific service lifetimes

View A

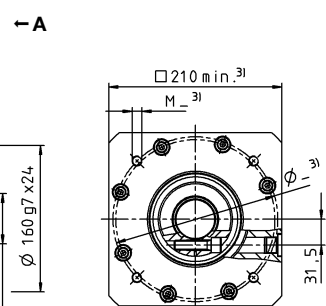
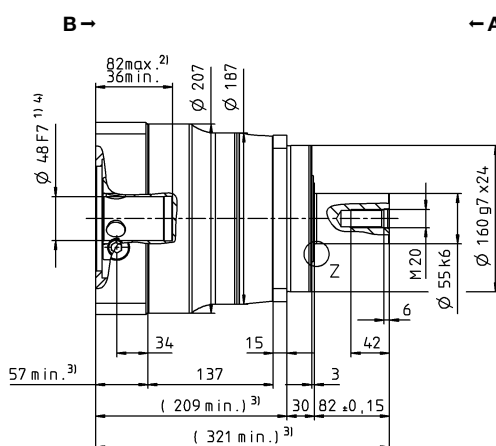
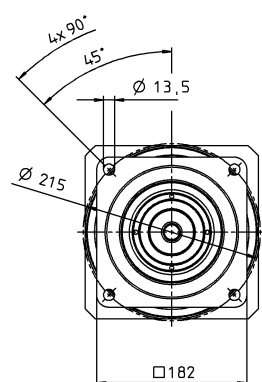
View B

# 1-stage

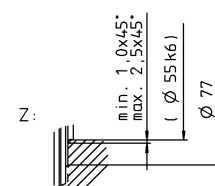
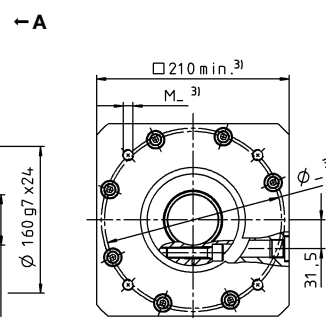
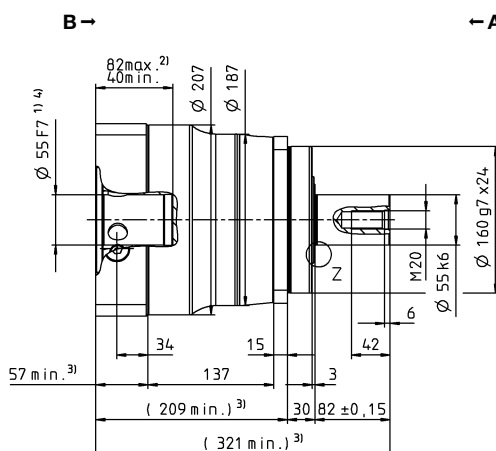
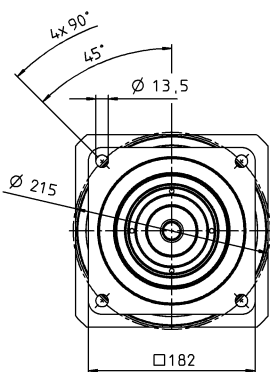
up to 38<sup>4)</sup> (K)  
clamping hub  
diameter



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

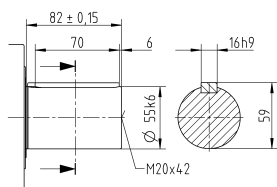


up to 55<sup>4)</sup> (N)<sup>5)</sup>  
clamping hub  
diameter

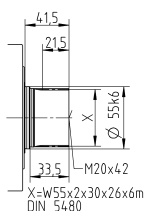


## Other output variants

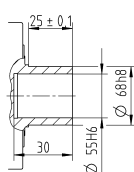
Shaft with key



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	8242	
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	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	8.52	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

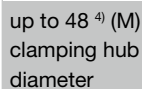
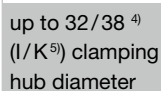
<sup>c)</sup> Refers to center of the output shaft or flange

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

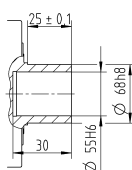
<sup>e)</sup> Smooth shaft

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

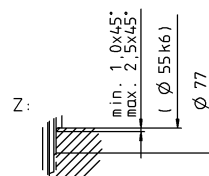
up to 24 <sup>4)</sup> (G)  
clamping hub  
diameter



Shaft mounted



- 5) 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

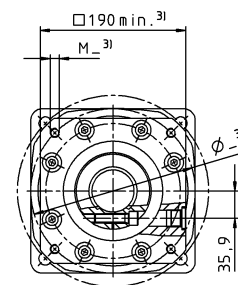
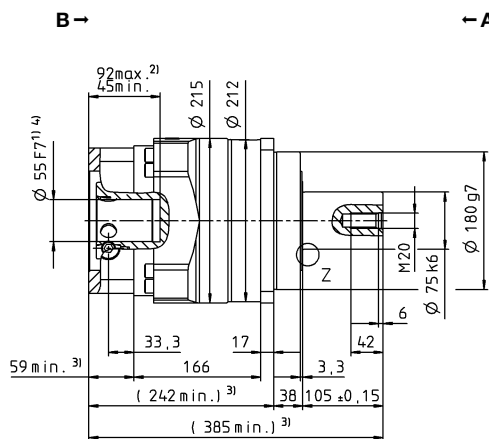
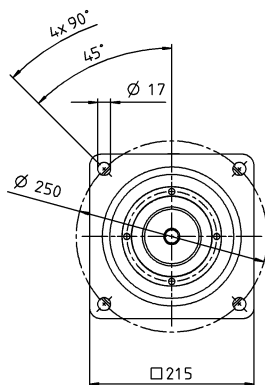
<sup>f)</sup> Please contact us to discuss  
application-specific service lifetimes

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

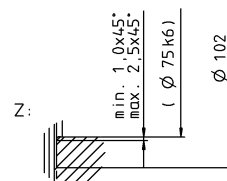
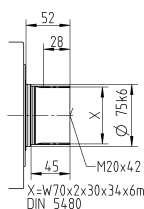
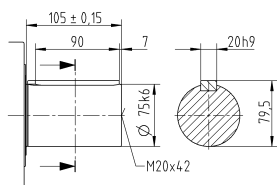
SP

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+ 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>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									
			<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

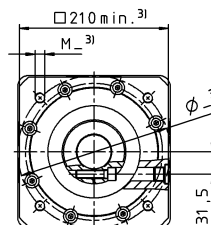
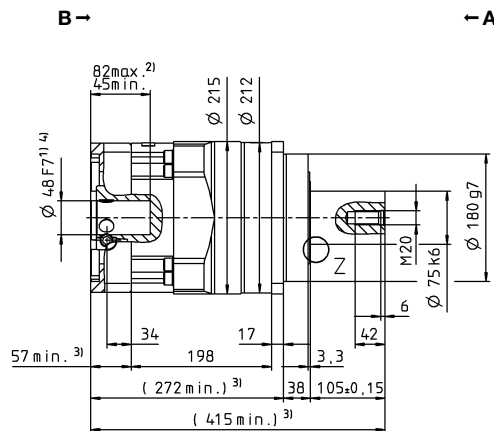
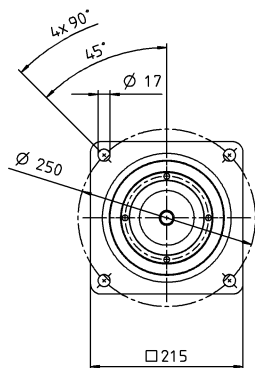
<sup>f)</sup> Please contact us to discuss  
application-specific service lifetimes

View A

View B

Motor shaft diameter [mm]

2-stage

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


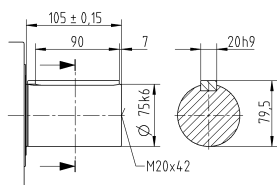
Planetary gearboxes

SP

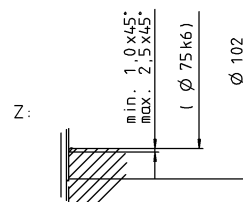
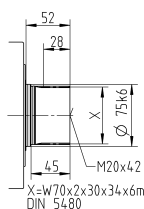
MF

## 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+ 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

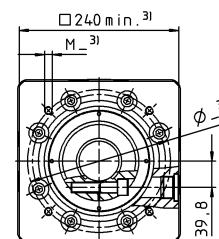
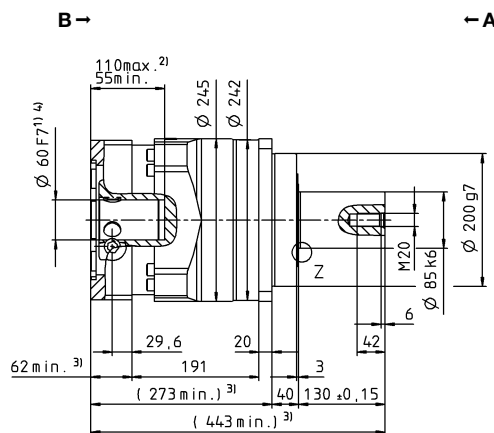
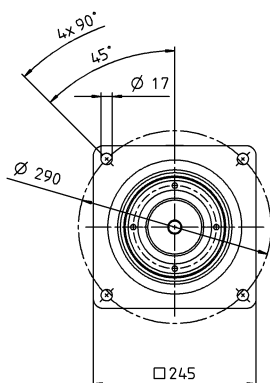
<sup>d)</sup> Please reduce input speed at higher ambient temperatures

<sup>e)</sup> Smooth shaft

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

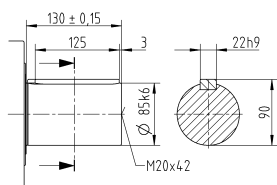
View B

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

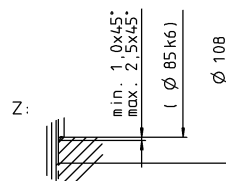
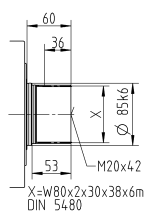
 $\frac{d}{ds}$ 

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>			<i>Nm</i>	5446	5446	5700	5446	5700	5446	5700	5700	3642
				<i>in.lb</i>	48202	48202	50450	48202	50450	48202	50450	50450	50450
Max. acceleration torque <sup>b) e)</sup> (max. 1000 cycles per hour)	<i>T</i> <sub>2B</sub>			<i>Nm</i>	5400	5400	5400	5400	5400	4400	5160	4730	3642
				<i>in.lb</i>	47794	47794	47794	47794	47794	38944	45670	41864	32236
Nominal torque (at <i>n</i> <sub>IN</sub> )	<i>T</i> <sub>2N</sub>			<i>Nm</i>	2658	2596	3198	2667	3283	2803	3457	3784	2914
				<i>in.lb</i>	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>			<i>Nm</i>	8500	8500	8500	8500	8500	8500	8500	8500	6850
				<i>in.lb</i>	75232	75232	75232	75232	75232	75232	75232	75232	75232
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>	2300	2500	2500	2500	2500	2500	2500	2800	2800
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>	8.4	7.1	6.5	5.9	4.5	4.1	3.5	3.0	3.0
				<i>in.lb</i>	74	63	58	52	40	36	31	26	26
Max. backlash	<i>j</i> <sub>t</sub>		<i>arcmin</i>	Standard ≤ 5 / Reduced ≤ 3									
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>		%	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>	76									
			<i>lb<sub>m</sub></i>	168									
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®)				BC2-06000AA085.000-X									
Bore diameter of coupling on the application side				<i>mm</i>	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>	<i>kgcm</i> <sup>2</sup>	39.2	34.6	33.2	30.5	29.7	28.2	27.9	27.6	27.5
				<i>10<sup>-3</sup> in.lb.s</i> <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

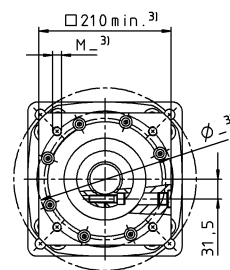
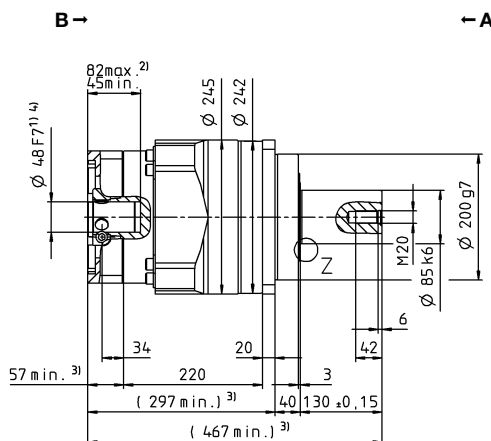
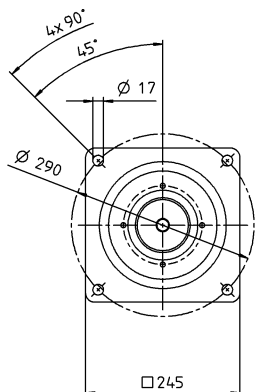
<sup>f)</sup> Please contact us to discuss application-specific service lifetimes

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

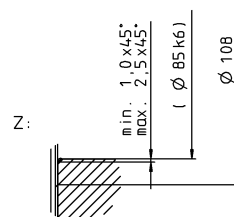
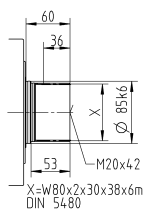
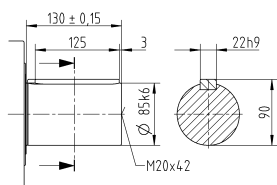
SP<sup>+</sup>

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®)			<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®)					BC2-00080AA022.000-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<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

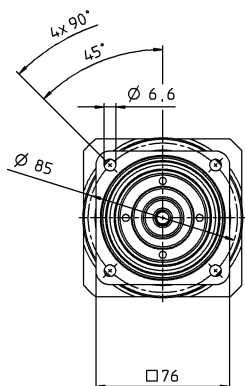
<sup>f)</sup> Please contact us to discuss  
application-specific service lifetimes

View A

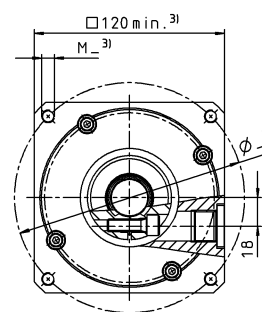
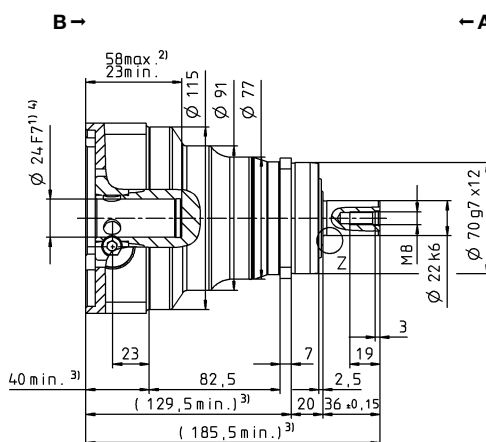
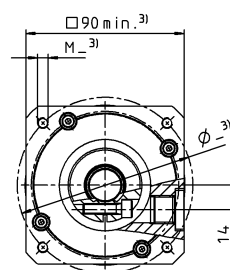
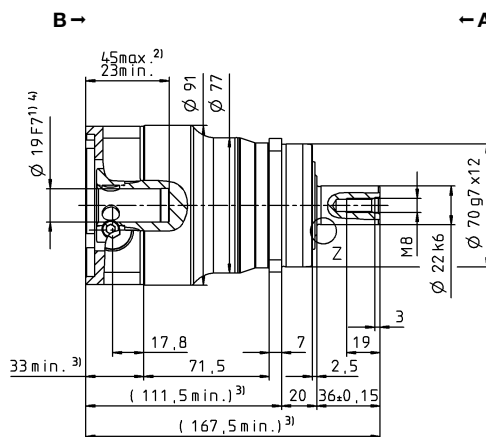
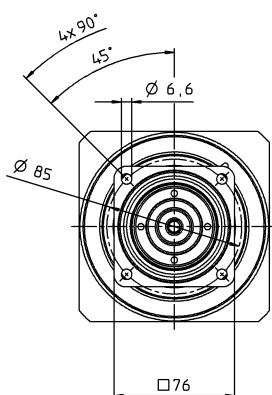
View B

# 1-stage

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



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



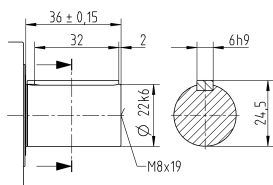
Planetary gearboxes

SP+

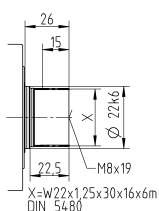
MC

## Other output variants

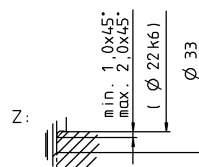
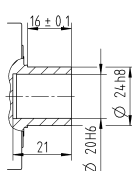
Shaft with key



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> 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										
				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

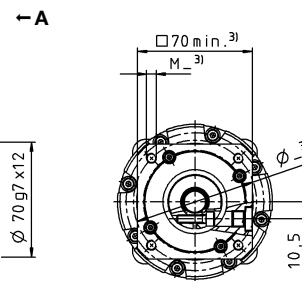
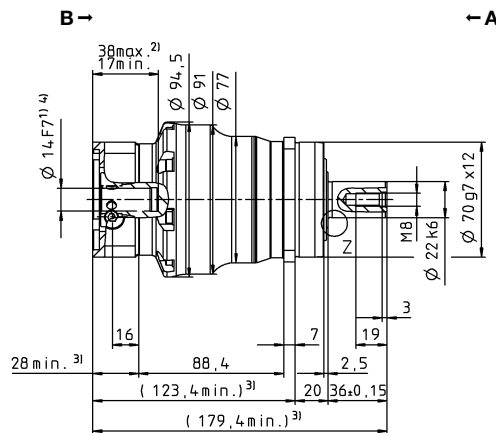
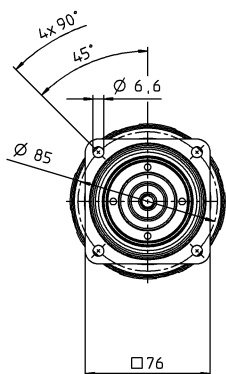
<sup>f)</sup> Please contact us to discuss  
application-specific service lifetimes

View A

View B

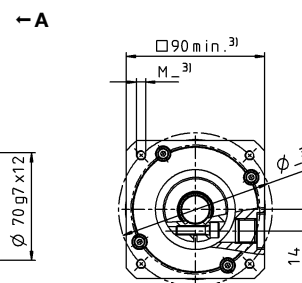
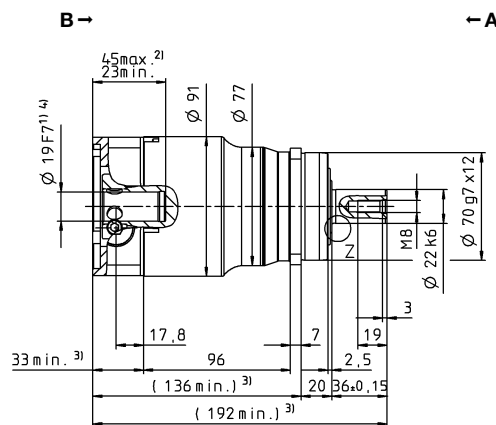
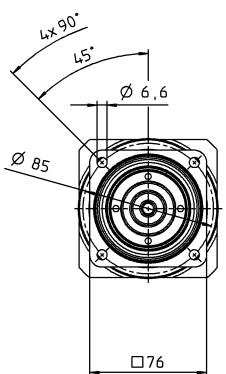
# 2-stage

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

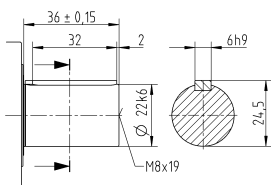


SP

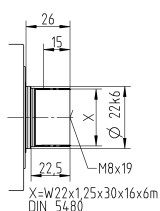
MC

## Other output variants

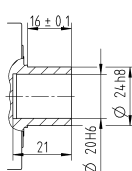
Shaft with key



Splined shaft (DIN 5480)



Shaft mounted



Non-tolerated dimensions are nominal dimensions

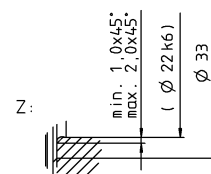
<sup>1)</sup> Check motor shaft fit

<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 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>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						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											
			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<sub>i</sub></i>	<i>kgcm²</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.s²</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<sub>i</sub></i>	<i>kgcm²</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.s²</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

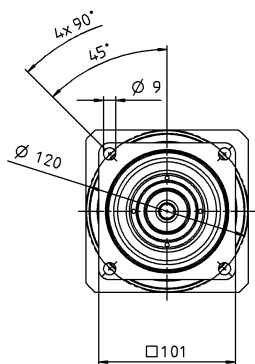
<sup>d)</sup> Please reduce input speed at higher ambient temperatures

<sup>e)</sup> Smooth shaft

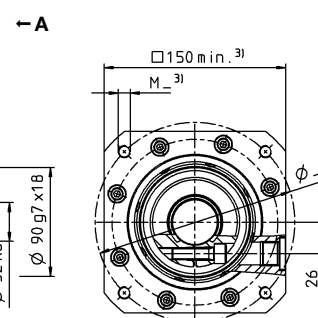
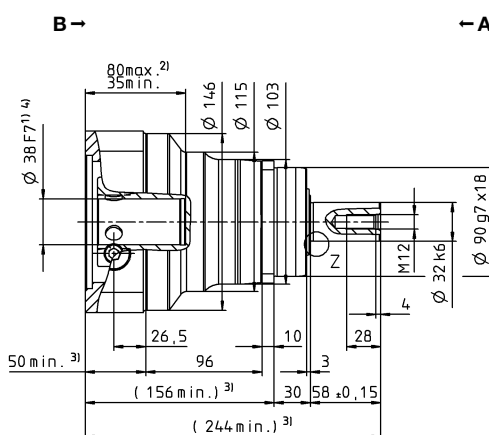
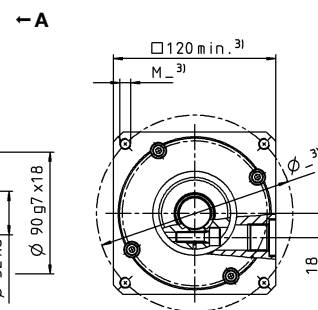
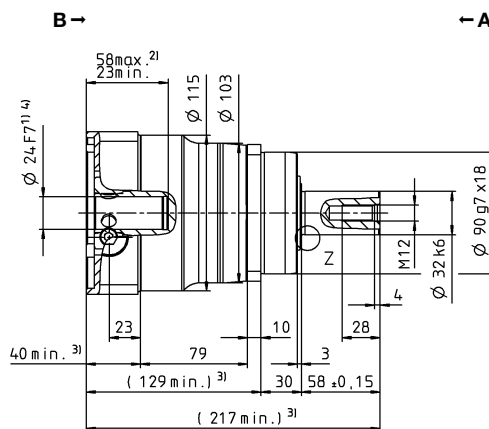
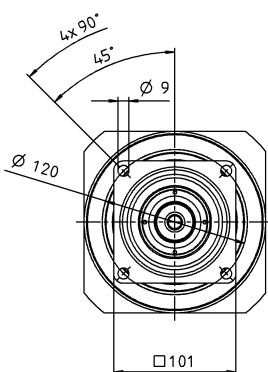
<sup>f)</sup> Please contact us to discuss  
application-specific service lifetimes

# 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



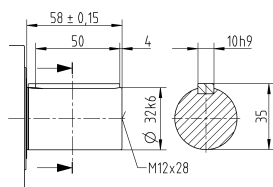
Planetary gearboxes

SP

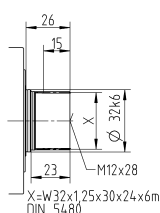
MC

## Other output variants

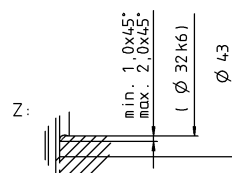
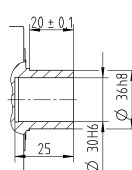
Shaft with key



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>	<i>Nm</i>	240	240	240	240	240	240	240	240	180	240	180
				<i>in.lb</i>	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>	<i>Nm</i>	240	240	240	240	240	240	240	240	180	240	180
				<i>in.lb</i>	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>	<i>Nm</i>	138	148	149	164	141	164	183	182	144	189	144
				<i>in.lb</i>	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>	<i>Nm</i>	625	625	625	625	625	625	625	625	599	625	599
				<i>in.lb</i>	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>	<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>	0.52	0.53	0.48	0.43	0.38	0.28	0.40	0.25	0.25	0.20	0.19
				<i>in.lb</i>	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>	<i>arcmin</i>	Standard ≤ 6 / Reduced ≤ 4										
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										
				<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>	%	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>	7.9										
				<i>lb<sub>m</sub></i>	17.5										
Operating noise (at reference ratio and reference speed – ratio-specific values available in cymex®)			<i>L</i> <sub>PA</sub>	<i>dB(A)</i>	≤ 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®)					BC2-00300AA032.000-X										
				<i>mm</i>	X = 024.000 - 060.000										
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>	0.81	0.70	0.68	0.60	0.43	0.59	0.55	0.54	0.38	0.54	0.54
				<i>10<sup>-3</sup> in.lb.s<sup>2</sup></i>	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>i</sub>	<i>kgcm<sup>2</sup></i>	2.18	2.07	2.05	1.97	2.06	1.96	1.92	1.91	1.91	1.91	1.91
				<i>10<sup>-3</sup> in.lb.s<sup>2</sup></i>	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

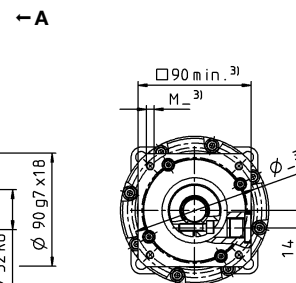
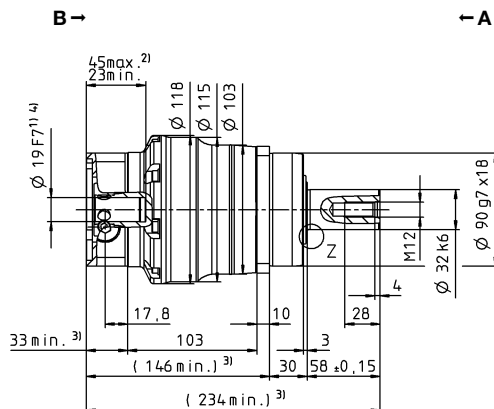
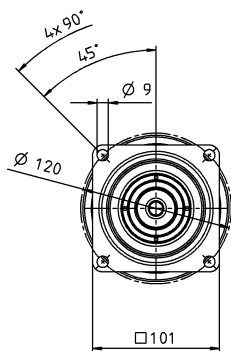
<sup>f)</sup> Please contact us to discuss  
application-specific service lifetimes

View A

View B

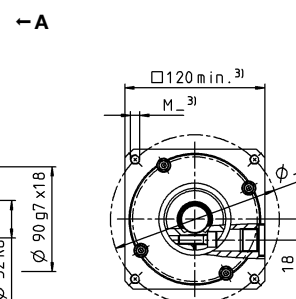
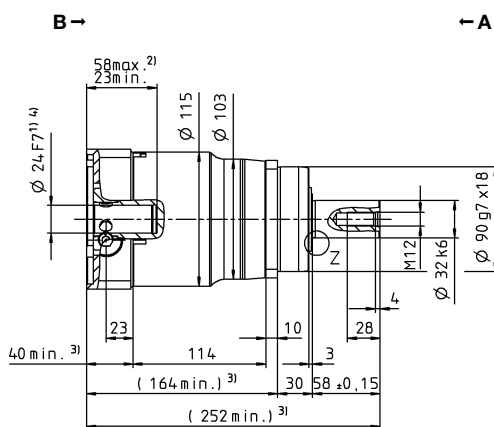
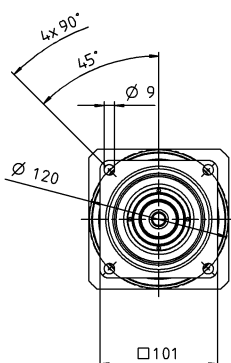
# 2-stage

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

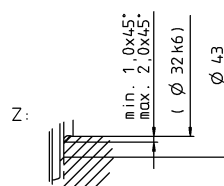
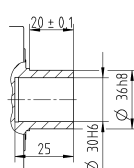
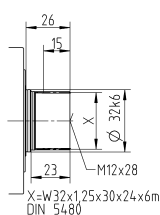
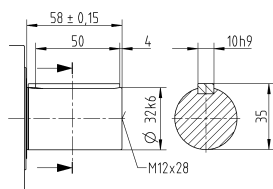
MC

## 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

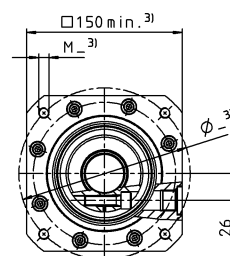
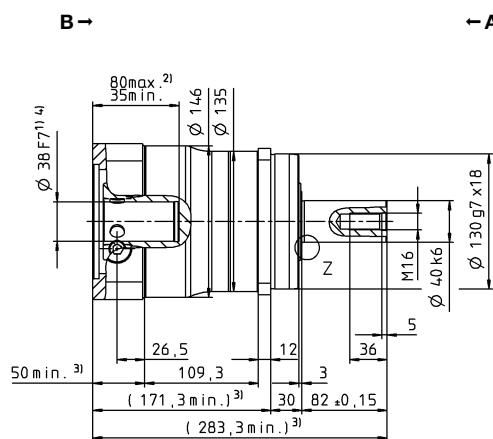
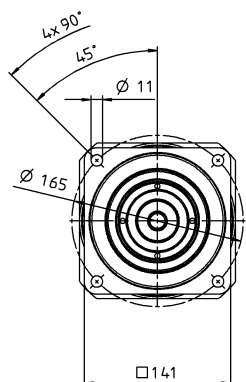
<sup>f)</sup> Please contact us to discuss  
application-specific service lifetimes

View A

View B

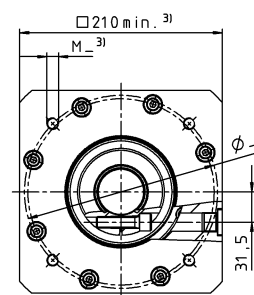
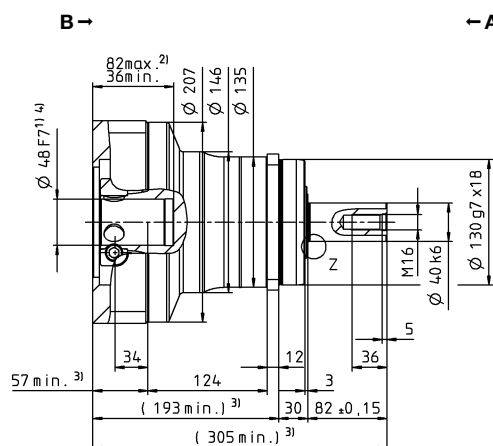
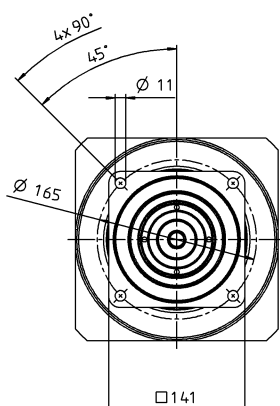
# 1-stage

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

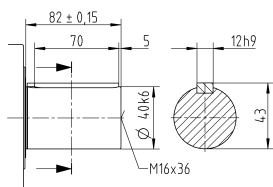

SP<sup>+</sup>

MC

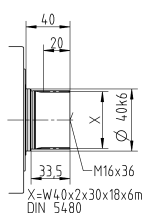
Planetary gearboxes

## Other output variants

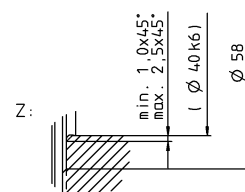
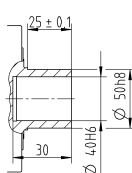
Shaft with key



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

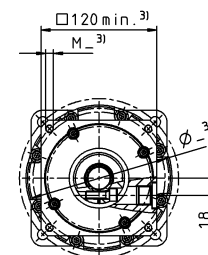
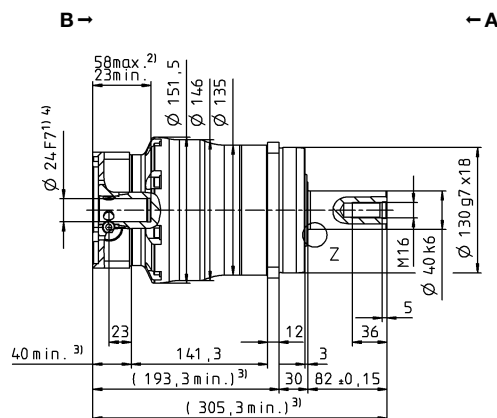
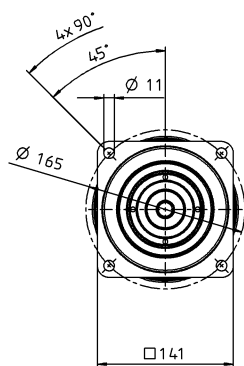
<sup>d)</sup> Please reduce input speed at higher ambient temperatures

<sup>e)</sup> Smooth shaft

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

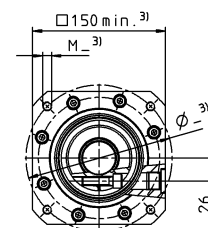
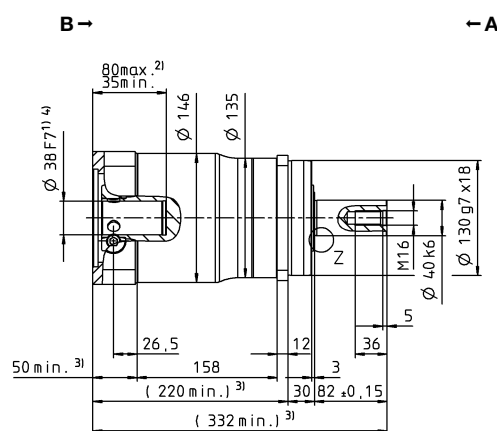
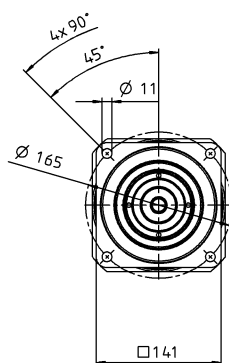
# 2-stage

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

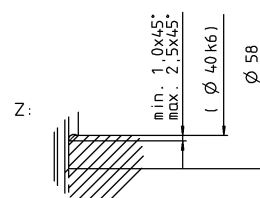
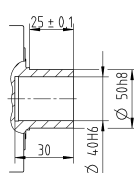
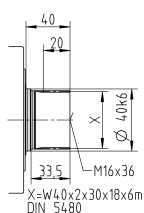
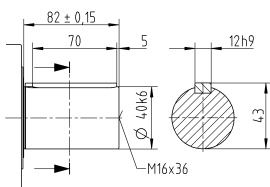
MC

## 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

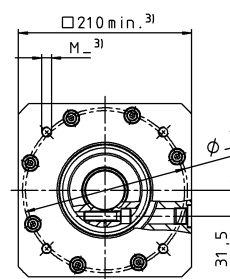
<sup>c)</sup> Refers to center of the output shaft or flange

<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

<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>IN</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>h</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>1</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

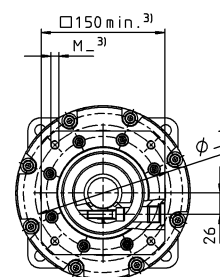
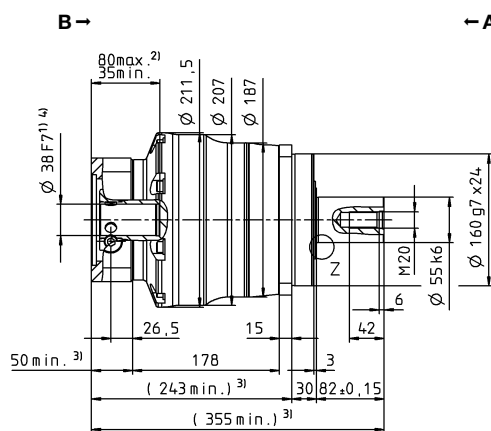
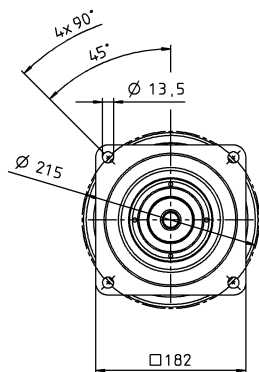
<sup>f)</sup> Please contact us to discuss application-specific service lifetimes

View A

View B

Motor shaft diameter [mm]

2-stage

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


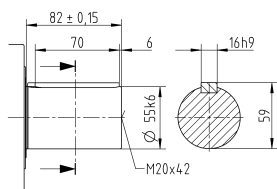
Planetary gearboxes

SP

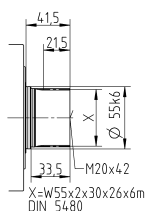
MC

## Other output variants

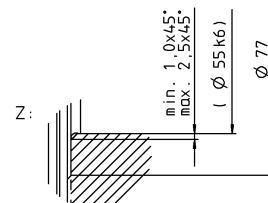
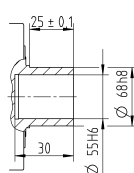
Shaft with key



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+ 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

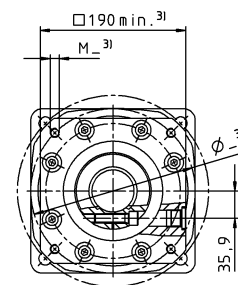
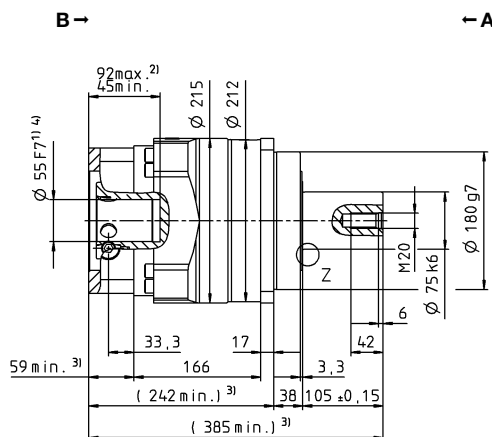
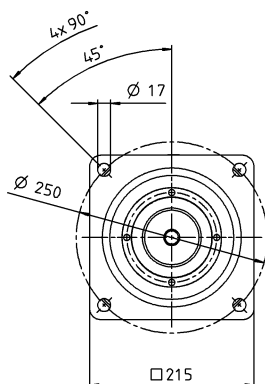
<sup>f)</sup> Please contact us to discuss  
application-specific service lifetimes

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

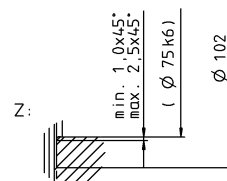
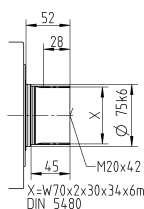
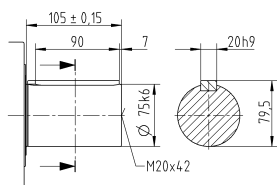
SP

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>IN</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>e)</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>	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

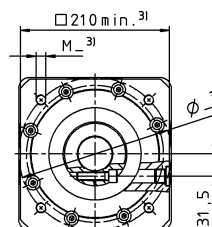
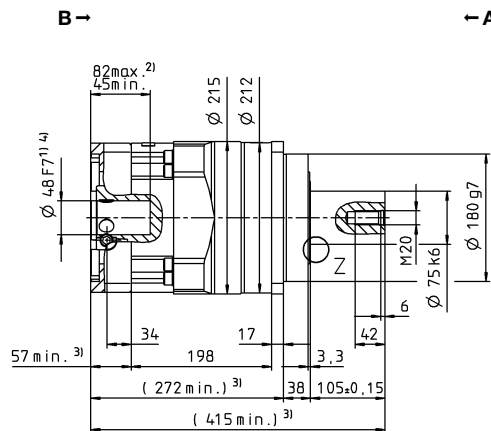
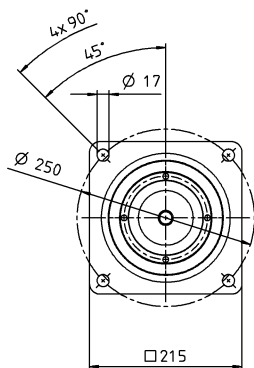
<sup>f)</sup> Please contact us to discuss  
application-specific service lifetimes

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

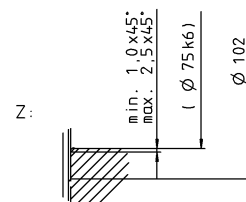
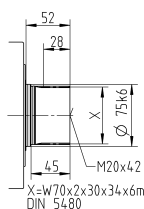
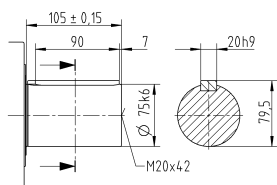
SP

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		4	5	7	8	10	4	5	7	8	10
Max. torque <sup>a) b) e)</sup>			T <sub>2a</sub>	Nm	3500	3600	2700	1800	1800	3500	3600	2700	1800	1800
				in.lb	30978	31863	23897	15931	15931	30978	31863	23897	15931	15931
Max. acceleration torque <sup>b) e)</sup> (max. 1000 cycles per hour)			T <sub>2B</sub>	Nm	3500	3600	2700	1800	1800	3500	3600	2700	1800	1800
				in.lb	30978	31863	23897	15931	15931	30978	31863	23897	15931	15931
Nominal torque (at n <sub>IN</sub> )			T <sub>2N</sub>	Nm	2029	1861	1910	1440	1440	2029	1861	1910	1440	1440
				in.lb	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)			T <sub>2Not</sub>	Nm	8500	8500	8500	6850	6850	8500	8500	8500	6850	6850
				in.lb	75232	75232	75232	60628	60628	75232	75232	75232	60628	60628
Permitted average input speed (at T <sub>2N</sub> and 20 °C ambient temperature) <sup>d)</sup>			n <sub>1N</sub>	rpm	2250	3000	3000	3000	3000	2250	3000	3000	3000	3000
Max. input speed			n <sub>1Max</sub>	rpm	4000	5000	5000	5000	5000	4000	5000	5000	5000	5000
Mean no load running torque <sup>b)</sup> (at n <sub>1</sub> = 2000 rpm and 20 °C gearbox temperature)			T <sub>012</sub>	Nm	16	12	8.6	8.6	5.8	7.0	6.0	5.0	4.8	4.2
				in.lb	141	107	77	77	51	62	53	44	43	37
Max. backlash			j <sub>t</sub>	arcmin	Standard ≤ 4 / Reduced ≤ 2									
Torsional rigidity <sup>b)</sup>			C <sub>121</sub>	Nm/arcmin	550									
				in.lb/arcmin	4868									
Max. axial force <sup>c)</sup>			F <sub>2AMax</sub>	N	33000					10000				
				lb <sub>f</sub>	7425					2250				
Max. lateral force <sup>c)</sup>			F <sub>2QMax</sub>	N	30000					2000				
				lb <sub>f</sub>	6750					450				
Max. tilting moment			M <sub>2KMax</sub>	Nm	5000					280				
				in.lb	44254					2478				
Efficiency at full load			η	%	98.5					99				
Service life <sup>f)</sup>			L <sub>h</sub>	h	> 30000									
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®)			L <sub>PA</sub>	dB(A)	≤ 66									
Max. permitted housing temperature				°C	+90									
				F	194									
Ambient temperature				°C	–15 to +40									
				F	5 to 104									
Lubrication					Lubricated for life									
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									
				mm	X = 050.000 - 090.000									
Mass moment of inertia (relates to the drive) Clamping hub diameter [mm]		O 60	J <sub>I</sub>	kgcm <sup>2</sup>	198	163	138	138	125	198	163	138	138	125
				10 <sup>-3</sup> in.lb.s <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

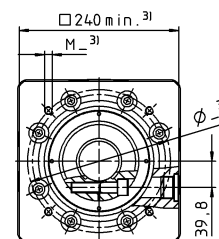
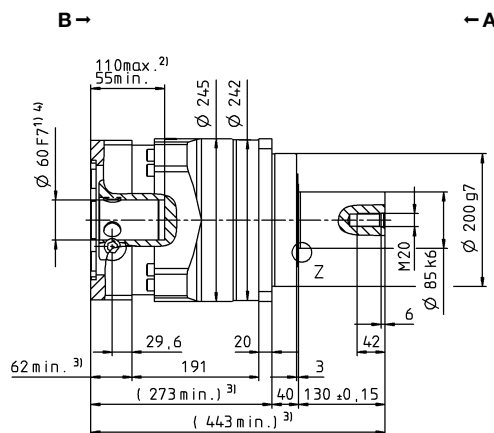
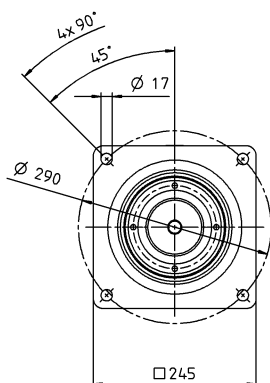
<sup>f)</sup> Please contact us to discuss  
application-specific service lifetimes

View A

View B

Motor shaft diameter [mm]

1-stage

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


Planetary gearboxes

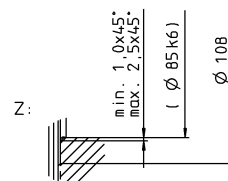
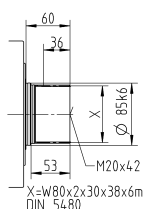
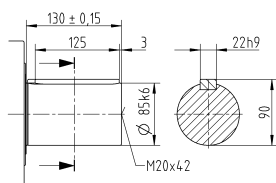
SP

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 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>n</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>i</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>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	25.1	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 %  $F_{2QMax}$

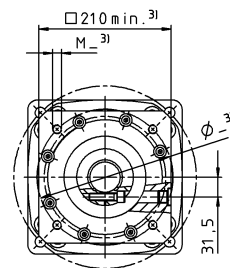
<sup>b)</sup> Valid for standard clamping hub diameter

<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



MC

