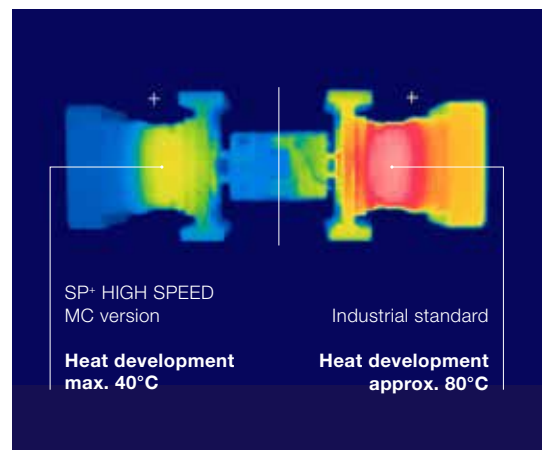


# SP+/SP+ HIGH SPEED – The classic all-rounder

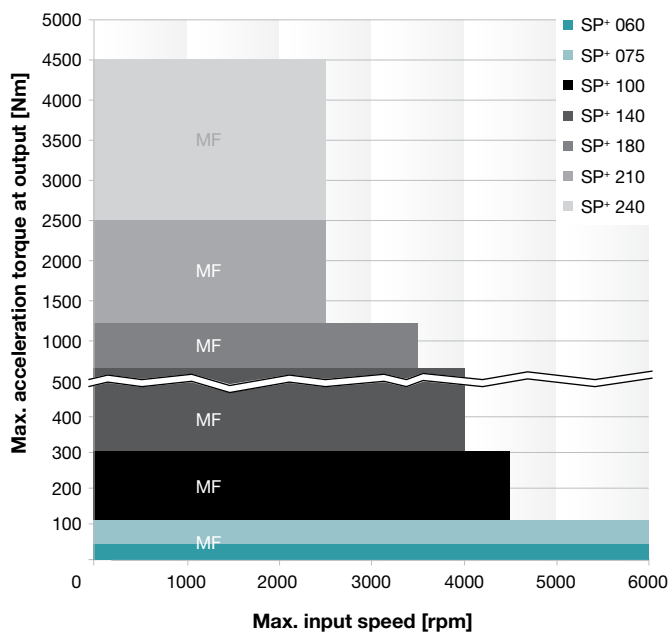


The low backlash planetary gearhead with output shaft. The standard version is ideally suited for high positioning accuracy and highly dynamic cyclic operation. The SP+ HIGH SPEED is particularly well suited for applications with maximum speeds during continuous operation.

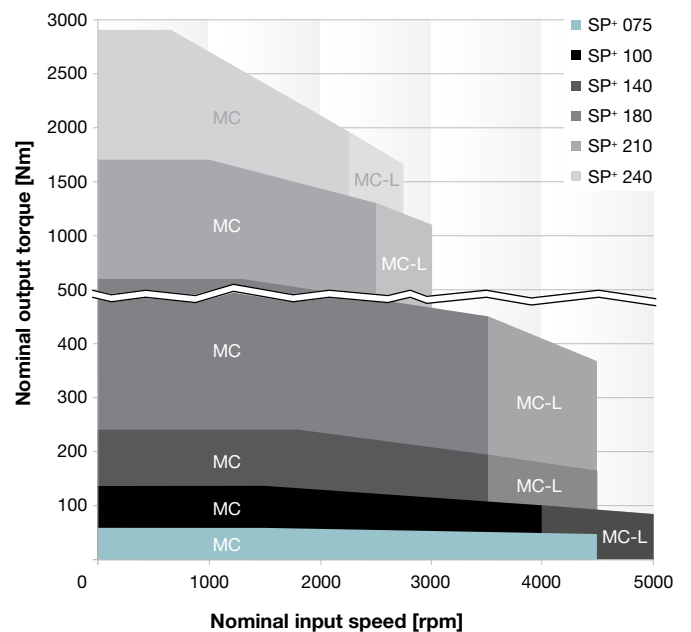


## Quick size selection

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



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



# Versions and Applications

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

## Product features

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

<sup>a)</sup> Power reduction: technical data available upon request    <sup>b)</sup> Please contact WITTENSTEIN alpha    <sup>c)</sup> In relation to reference sizes

Planetary gearheads  
High End



SP+  
MF  
MC  
MC-L

# SP+ 060 MF 1-stage

				1-stage					
Ratio <sup>a)</sup>		<i>i</i>		3	4	5	7	10	
cymex®-optimized acceleration torque (please contact us regarding the design)	$T_{2Bcym}$	Nm	in.lb	–	58	60	54	–	
				–	513	531	478	–	
Max. acceleration torque (max. 1000 cycles per hour)	$T_{2B}$	Nm	in.lb	30	42	42	42	32	
				266	372	372	372	283	
Nominal output torque (with $n_{2N}$ )	$T_{2N}$	Nm	in.lb	17	26	26	26	17	
				150	230	230	230	150	
Emergency stop torque (permitted 1000 times during the service life of the gearhead)	$T_{2Not}$	Nm	in.lb	80	100	100	100	80	
				708	885	885	885	708	
Nominal input speed (with $T_{2N}$ and 20°C ambient temperature <sup>b)</sup> )	$n_{1N}$	rpm		3300	3300	3300	4000	4000	
Max. input speed	$n_{1max}$	rpm		6000	6000	6000	6000	6000	
Mean no load running torque (with $n_1=3000$ rpm and 20°C gearhead temperature <sup>c)</sup> )	$T_{012}$	Nm	in.lb	0.9	0.7	0.6	0.4	0.3	
				8.0	6.2	5.3	3.5	2.7	
Max. torsional backlash	$j_t$	arcmin		Standard $\leq 4$ / Reduced $\leq 2$					
Torsional rigidity	$C_{I21}$	Nm/arcmin	in.lb/arcmin	4.5					
				40					
Max. axial force <sup>d)</sup>	$F_{2AMax}$	N	lb <sub>f</sub>	2400					
				540					
Max. radial force <sup>d)</sup>	$F_{2RMax}$	N	lb <sub>f</sub>	2800					
				630					
Max. tilting torque	$M_{2KMMax}$	Nm	in.lb	152					
				1345					
Efficiency at full load	$\eta$	%		97					
Service life (For calculation, see the Chapter "Information")	$L_h$	h		> 20000					
Weight incl. standard adapter plate	$m$	kg	lb <sub>m</sub>	1.9					
				4.2					
Operating noise (with $i=10$ and $n_1=3000$ rpm no load)	$L_{PA}$	dB(A)		$\leq 58$					
Max. permitted housing temperature		°C	F	+90					
				194					
Ambient temperature		°C	F	-15 to +40					
				5 to 104					
Lubrication	Lubricated for life								
Paint	Blue RAL 5002								
Direction of rotation	Motor and gearhead same direction								
Protection class	IP 65								
Moment of inertia (relates to the drive)	B	11	$J_1$	kgcm <sup>2</sup>	0.21	0.15	0.12	0.10	0.09
				10 <sup>-3</sup> in.lb.s <sup>2</sup>	0.18	0.13	0.11	0.09	0.08
Clamping hub diameter [mm]	C	14	$J_1$	kgcm <sup>2</sup>	0.28	0.22	0.20	0.18	0.17
				10 <sup>-3</sup> in.lb.s <sup>2</sup>	0.25	0.20	0.17	0.16	0.15
	E	19	$J_1$	kgcm <sup>2</sup>	0.61	0.55	0.52	0.50	0.49
				10 <sup>-3</sup> in.lb.s <sup>2</sup>	0.54	0.48	0.46	0.44	0.43

Reduced mass moments of inertia available on request.

<sup>a)</sup> Other ratios available on request

<sup>b)</sup> For higher ambient temperatures, please reduce input speed

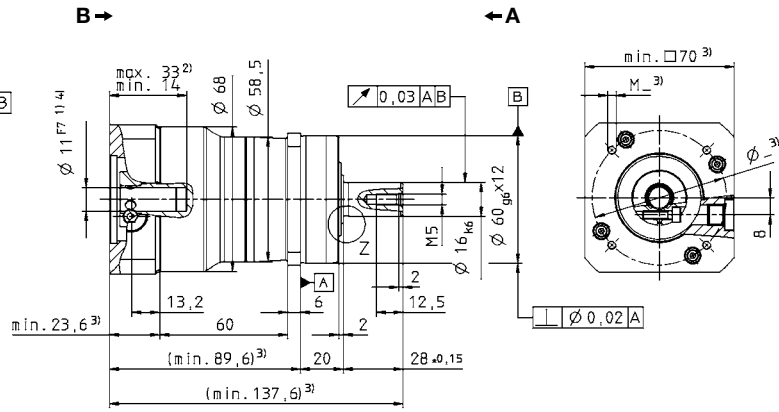
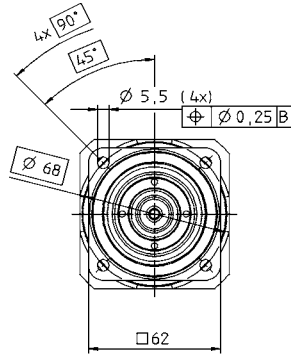
<sup>c)</sup> Valid for clamping hub diameter of 14 mm

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

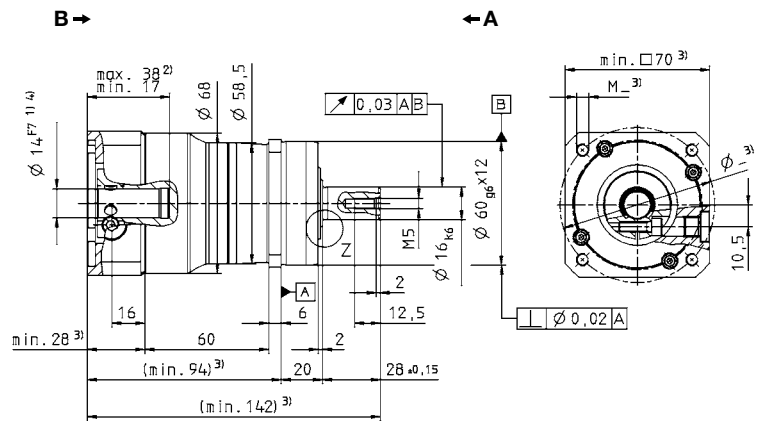
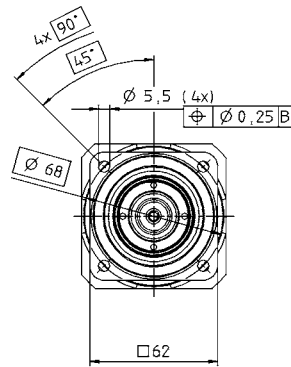
View A

View B

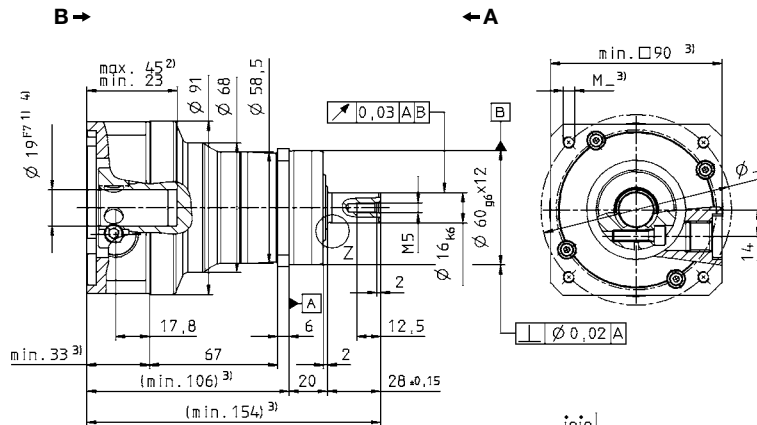
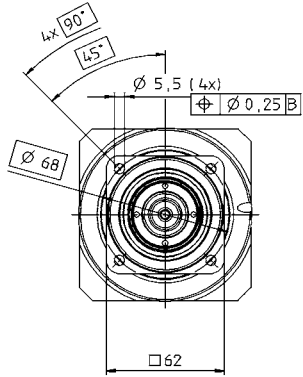
up to 11<sup>4)</sup>(B)  
clamping hub diameter



up to 14<sup>4)</sup>(C)  
clamping hub diameter<sup>1)</sup>

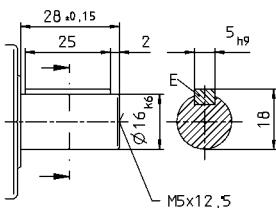


up to 19<sup>4)</sup>(E)  
clamping hub diameter

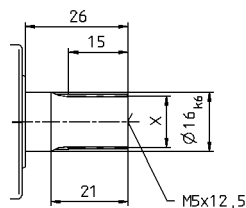


Alternatives: Output shaft variants

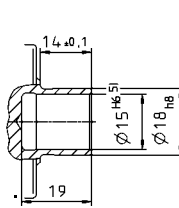
Output shaft with key in mm  
E = key as per DIN 6885, sheet 1, form A



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



Shaft mounted  
Mounted via shrink disc



Non-tolerated dimensions ± 1 mm

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

CAD data is available under [www.wittenstein-alpha.com](http://www.wittenstein-alpha.com)

Motor mounting according to operating manual

Planetary gearheads  
High End

SP+

MF

# SP+ 060 MF 2-stage

				2-stage									
Ratio <sup>a)</sup>		<i>i</i>		16	20	25	28	35	40	50	70	100	
cymex®-optimized acceleration torque (please contact us regarding the design)	$T_{2Bcym}$	Nm		58	58	60	58	60	58	60	54	–	
		in.lb		513	513	531	513	531	513	531	478	–	
Max. acceleration torque (max. 1000 cycles per hour)	$T_{2B}$	Nm		42	42	42	42	42	42	42	42	32	
		in.lb		372	372	372	372	372	372	372	372	283	
Nominal output torque (with $n_{1N}$ )	$T_{2N}$	Nm		26	26	26	26	26	26	26	26	17	
		in.lb		230	230	230	230	230	230	230	230	150	
Emergency stop torque (permitted 1000 times during the service life of the gearhead)	$T_{2Not}$	Nm		100	100	100	100	100	100	100	100	80	
		in.lb		885	885	885	885	885	885	885	885	708	
Nominal input speed (with $T_{2N}$ and 20°C ambient temperature) <sup>b)</sup>	$n_{1N}$	rpm		4400	4400	4400	4400	4400	4400	4800	5500	5500	
Max. input speed	$n_{1max}$	rpm		6000	6000	6000	6000	6000	6000	6000	6000	6000	
Mean no load running torque (with $n_1=3000$ rpm and 20°C gearhead temperature) <sup>c)</sup>	$T_{012}$	Nm		0.5	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.2	
		in.lb		4.4	3.5	3.5	2.7	2.7	2.7	2.7	2.7	1.8	
Max. torsional backlash	$j_t$	arcmin		Standard $\leq 6$ / Reduced $\leq 4$									
Torsional rigidity	$C_{I21}$	Nm/arcmin		4.5									
		in.lb/arcmin		40									
Max. axial force <sup>d)</sup>	$F_{2AMax}$	N		2400									
		lb <sub>f</sub>		540									
Max. radial force <sup>d)</sup>	$F_{2RMax}$	N		2800									
		lb <sub>f</sub>		630									
Max. tilting moment	$M_{2KMMax}$	Nm		152									
		in.lb		1345									
Efficiency at full load	$\eta$	%		94									
Service life (For calculation, see the Chapter "Information")	$L_h$	h		> 20000									
Weight incl. standard adapter plate	$m$	kg		2.0									
		lb <sub>m</sub>		4.4									
Operating noise (with $i=100$ and $n_1=3000$ rpm no load)	$L_{PA}$	dB(A)		$\leq 58$									
Max. permitted housing temperature		°C		+90									
		F		194									
Ambient temperature		°C		-15 to +40									
		F		5 to 104									
Lubrication				Lubricated for life									
Paint				Blue RAL 5002									
Direction of rotation				Motor and gearhead same direction									
Protection class				IP 65									
Moment of inertia (relates to the drive)	B	11	$J_1$	kgcm <sup>2</sup>	0.077	0.069	0.068	0.061	0.061	0.057	0.057	0.056	0.056
				10 <sup>-3</sup> in.lb.s <sup>2</sup>	0.068	0.061	0.060	0.054	0.054	0.050	0.050	0.050	0.050
Clamping hub diameter [mm]	C	14	$J_1$	kgcm <sup>2</sup>	0.17	0.16	0.16	0.16	0.16	0.15	0.15	0.15	0.15
				10 <sup>-3</sup> in.lb.s <sup>2</sup>	0.15	0.15	0.14	0.14	0.14	0.14	0.13	0.13	0.13

Reduced mass moments of inertia available on request.

<sup>a)</sup> Other ratios available on request

<sup>b)</sup> For higher ambient temperatures, please reduce input speed

<sup>c)</sup> Valid for clamping hub diameter of 11 mm

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

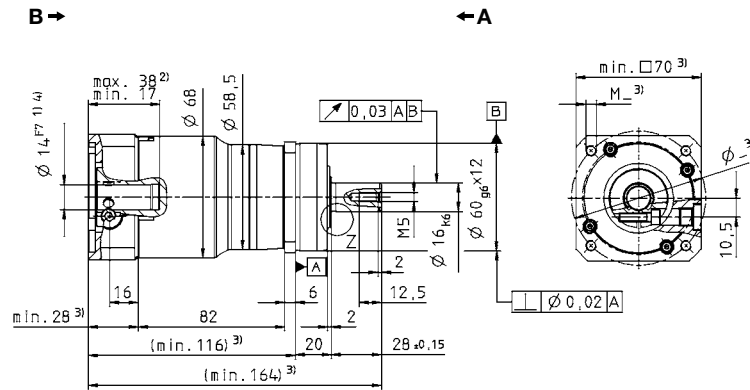
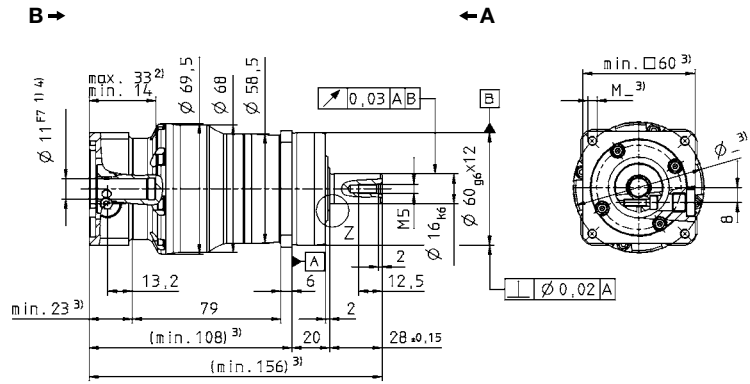
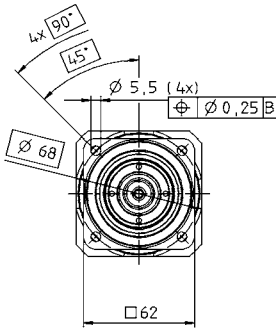
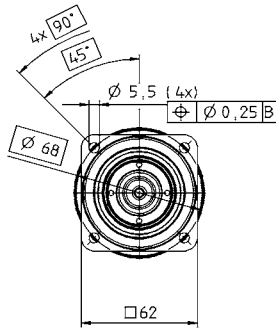
View A

View B

Motor shaft diameter [mm]

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

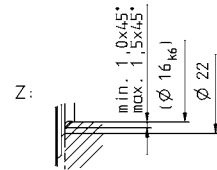
up to 14<sup>4)</sup>(C)  
clamping hub diameter



Planetary gearheads  
High End

SP+

MF

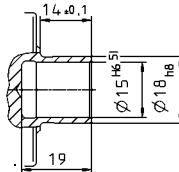
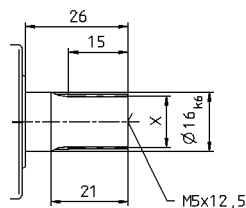
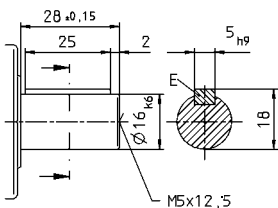


Alternatives: Output shaft variants

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

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

Shaft mounted  
Mounted via shrink disc



Non-tolerated dimensions ± 1 mm

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

CAD data is available under [www.wittenstein-alpha.com](http://www.wittenstein-alpha.com)

Motor mounting according to operating manual

# SP+ 075 MF 1-stage

				1-stage					
Ratio <sup>a)</sup>		<i>i</i>		3	4	5	7	10	
cymex®-optimized acceleration torque (please contact us regarding the design)	$T_{2Bcym}$	Nm		–	142	160	142	100	
			in.lb		–	1254	1416	1254	883
Max. acceleration torque (max. 1000 cycles per hour)	$T_{2B}$	Nm		85	110	110	110	95	
			in.lb		752	974	974	974	841
Nominal output torque (with $n_{2N}$ )	$T_{2N}$	Nm		47	75	75	75	52	
			in.lb		416	664	664	664	460
Emergency stop torque (permitted 1000 times during the service life of the gearhead)	$T_{2Not}$	Nm		200	250	250	250	200	
			in.lb		1770	2213	2213	2213	1770
Nominal input speed (with $T_{2N}$ and 20°C ambient temperature) <sup>b)</sup>	$n_{1N}$	rpm		2900	2900	2900	3100	3100	
Max. input speed	$n_{1Max}$	rpm		6000	6000	6000	6000	6000	
Mean no load running torque (with $n_1=3000$ rpm and 20°C gearhead temperature) <sup>c)</sup>	$T_{012}$	Nm		1.8	1.4	1.1	0.8	0.6	
			in.lb		15.9	12.4	9.7	7.1	5.3
Max. torsional backlash	$j_t$	arcmin		Standard $\leq 4$ / Reduced $\leq 2$					
Torsional rigidity	$C_{I21}$	Nm/arcmin		10					
			in.lb/arcmin		89				
Max. axial force <sup>d)</sup>	$F_{2AMax}$	N		3350					
			lb <sub>f</sub>		754				
Max. radial force <sup>d)</sup>	$F_{2RMax}$	N		4200					
			lb <sub>f</sub>		945				
Max. tilting moment	$M_{2KMMax}$	Nm		236					
			in.lb		2089				
Efficiency at full load	$\eta$	%		97					
Service life (For calculation, see the Chapter "Information")	$L_h$	h		> 20000					
Weight incl. standard adapter plate	$m$	kg		3.9					
			lb <sub>m</sub>		8.6				
Operating noise (with $i=10$ and $n_1=3000$ rpm no load)	$L_{PA}$	dB(A)		$\leq 59$					
Max. permitted housing temperature		°C		+90					
			F		194				
Ambient temperature		°C		-15 to +40					
			F		5 to 104				
Lubrication				Lubricated for life					
Paint				Blue RAL 5002					
Direction of rotation				Motor and gearhead same direction					
Protection class				IP 65					
Moment of inertia (relates to the drive)	C	14	$J_1$	kgcm <sup>2</sup>	0.86	0.61	0.51	0.42	0.38
				10 <sup>-3</sup> in.lb.s <sup>2</sup>	0.76	0.54	0.46	0.37	0.33
Clamping hub diameter [mm]	E	19	$J_1$	kgcm <sup>2</sup>	1.03	0.78	0.68	0.59	0.54
				10 <sup>-3</sup> in.lb.s <sup>2</sup>	0.91	0.69	0.60	0.52	0.48
	G	24	$J_1$	kgcm <sup>2</sup>	2.40	2.15	2.05	1.96	1.91
				10 <sup>-3</sup> in.lb.s <sup>2</sup>	2.12	1.90	1.81	1.73	1.69

Reduced mass moments of inertia available on request.

<sup>a)</sup> Other ratios available on request

<sup>b)</sup> For higher ambient temperatures, please reduce input speed

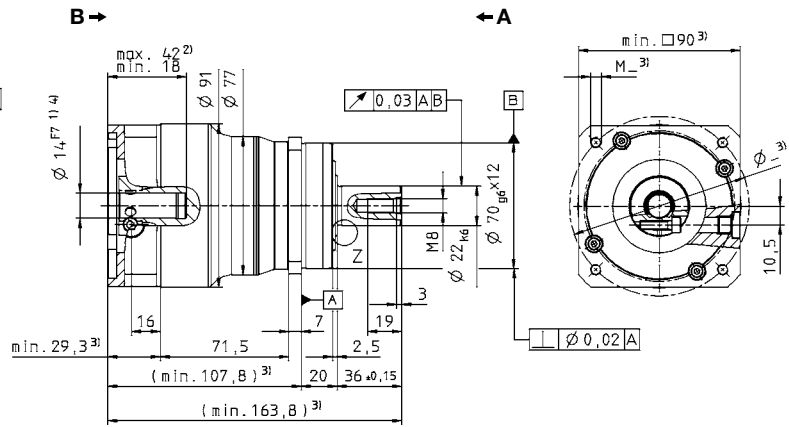
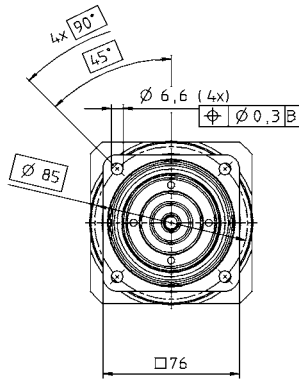
<sup>c)</sup> Valid for clamping hub diameter of 19 mm

<sup>d)</sup> Refers to centre of the output shaft or flange

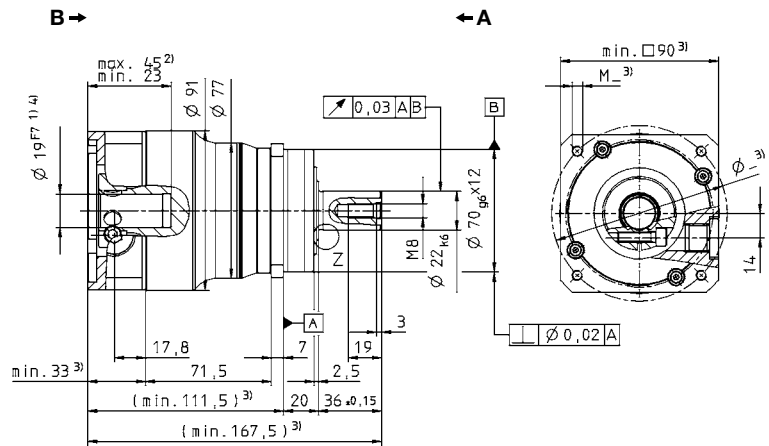
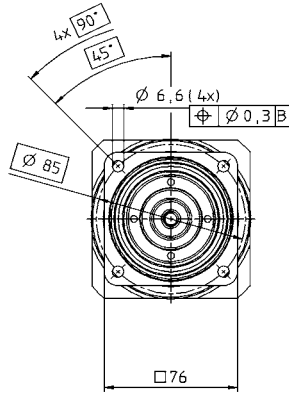
View A

View B

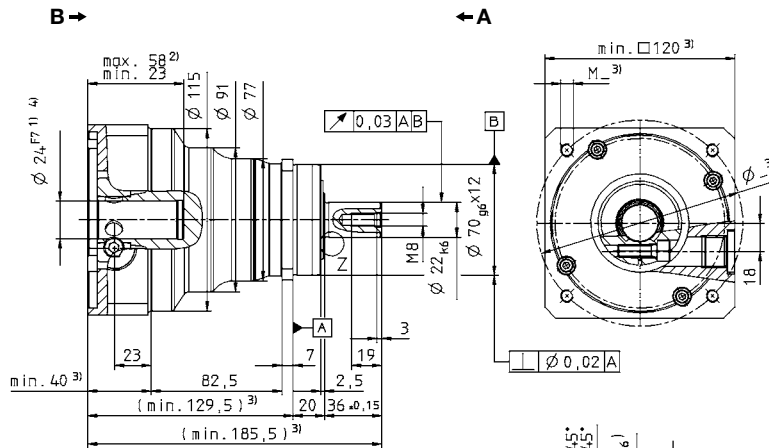
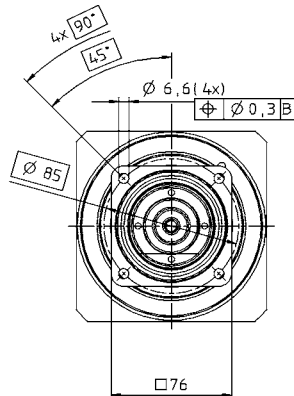
up to 14<sup>4)</sup> (C)  
clamping hub diameter



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



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

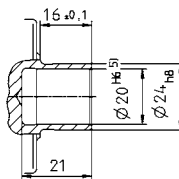
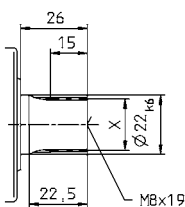
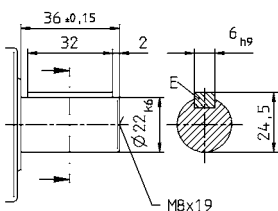


Alternatives: Output shaft variants

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

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

Shaft mounted  
Mounted via shrink disc



Non-tolerated dimensions ± 1 mm

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

CAD data is available under [www.wittenstein-alpha.com](http://www.wittenstein-alpha.com)

Motor mounting according to operating manual

Planetary gearheads  
High End

SP+

MF



# SP+ 075 MF 2-stage

				2-stage										
Ratio <sup>a)</sup>		<i>i</i>		16	20	25	28	35	40	50	70	100		
cymex®-optimized acceleration torque (please contact us regarding the design)		$T_{2Bcym}$	Nm	142	142	160	142	160	135	160	142	100		
				in.lb	1254	1254	1416	1254	1416	1195	1416	1254	883	
Max. acceleration torque (max. 1000 cycles per hour)		$T_{2B}$	Nm	110	110	110	110	110	110	110	110	90		
				in.lb	974	974	974	974	974	974	974	974	797	
Nominal output torque (with $n_{2N}$ )		$T_{2N}$	Nm	75	75	75	75	75	75	75	75	52		
				in.lb	664	664	664	664	664	664	664	664	460	
Emergency stop torque (permitted 1000 times during the service life of the gearhead)		$T_{2Not}$	Nm	250	250	250	250	250	250	250	250	200		
				in.lb	2213	2213	2213	2213	2213	2213	2213	2213	1770	
Nominal input speed (with $T_{2N}$ and 20°C ambient temperature) <sup>b)</sup>		$n_{1N}$	rpm	3500	3500	3500	3500	3500	3500	3800	4500	4500		
Max. input speed		$n_{1Max}$	rpm	6000	6000	6000	6000	6000	6000	6000	6000	6000		
Mean no load running torque (with $n_1=3000$ rpm and 20°C gearhead temperature) <sup>c)</sup>		$T_{012}$	Nm	0.8	0.6	0.6	0.5	0.4	0.4	0.3	0.3	0.3		
				in.lb	4.4	3.5	3.5	2.7	2.7	1.8	1.8	1.8	1.8	
Max. torsional backlash		$j_t$	arcmin	Standard $\leq 6$ / Reduced $\leq 4$										
Torsional rigidity		$C_{I21}$	Nm/arcmin	10										
				in.lb/arcmin	89									
Max. axial force <sup>d)</sup>		$F_{2AMax}$	N	3350										
				lb <sub>f</sub>	754									
Max. radial force <sup>d)</sup>		$F_{2RMax}$	N	4200										
				lb <sub>f</sub>	945									
Max. tilting moment		$M_{2KMax}$	Nm	236										
				in.lb	2089									
Efficiency at full load		$\eta$	%	94										
Service life (For calculation, see the Chapter "Information")		$L_h$	h	> 20000										
Weight incl. standard adapter plate		$m$	kg	3.6										
				lb <sub>m</sub>	8.0									
Operating noise (with $i=100$ and $n_1=3000$ rpm no load)		$L_{PA}$	dB(A)	$\leq 59$										
Max. permitted housing temperature			°C	+90										
				F	194									
Ambient temperature			°C	-15 to +40										
				F	5 to 104									
Lubrication		Lubricated for life												
Paint		Blue RAL 5002												
Direction of rotation		Motor and gearhead same direction												
Protection class		IP 65												
Moment of inertia (relates to the drive)		B	11	$J_1$	kgcm <sup>2</sup>	0.16	0.13	0.13	0.10	0.10	0.091	0.090	0.089	0.089
					10 <sup>3</sup> in.lb.s <sup>2</sup>	0.14	0.11	0.11	0.092	0.090	0.081	0.080	0.079	0.079
Clamping hub diameter [mm]		C	14	$J_1$	kgcm <sup>2</sup>	0.23	0.20	0.20	0.18	0.18	0.17	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	0.15	0.15	0.14	0.14
		E	19	$J_1$	kgcm <sup>2</sup>	0.55	0.53	0.52	0.50	0.50	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	0.43	0.43	0.43	0.43

Reduced mass moments of inertia available on request.

<sup>a)</sup> Other ratios available on request

<sup>b)</sup> For higher ambient temperatures, please reduce input speed

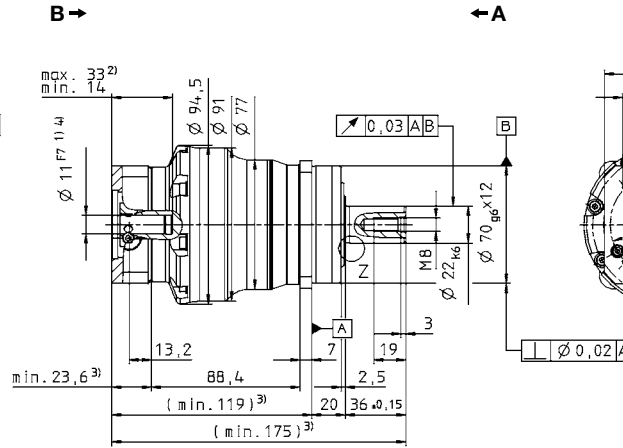
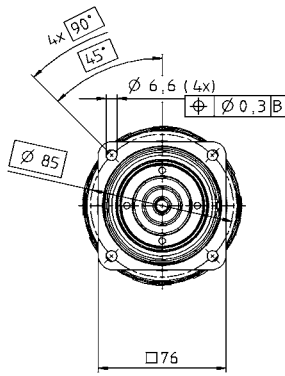
<sup>c)</sup> Valid for clamping hub diameter of 14 mm

<sup>d)</sup> Refers to centre of the output shaft or flange

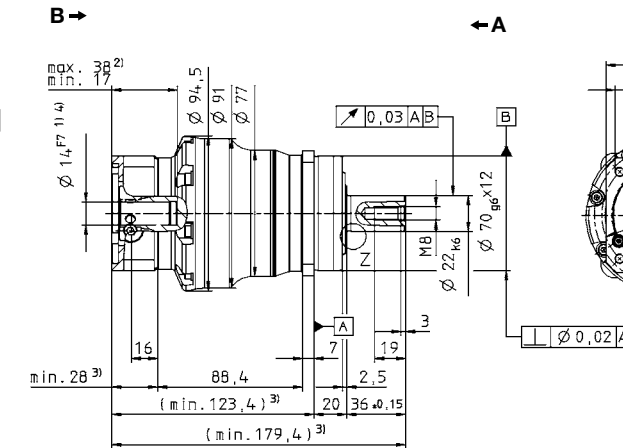
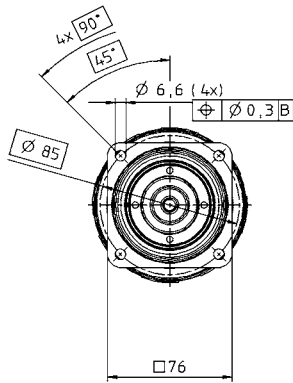
View A

View B

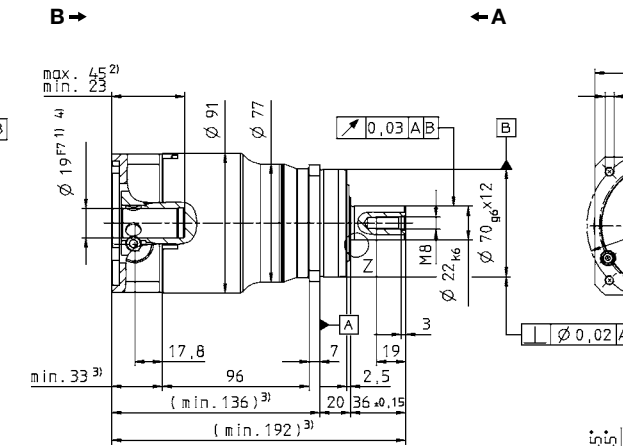
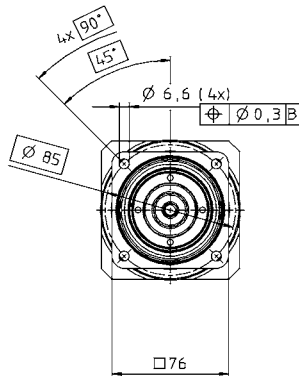
up to 11<sup>4)</sup> (B)  
clamping hub diameter



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



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

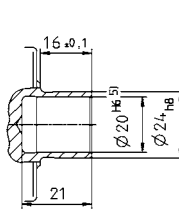
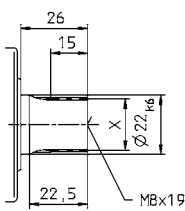
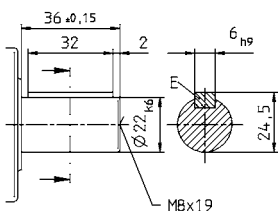


Alternatives: Output shaft variants

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

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

Shaft mounted  
Mounted via shrink disc



Non-tolerated dimensions ± 1 mm

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

CAD data is available under [www.wittenstein-alpha.com](http://www.wittenstein-alpha.com)

Motor mounting according to operating manual

Planetary gearheads  
High End

SP+  
MF

# SP+ 100 MF 1-stage

				1-stage					
Ratio <sup>a)</sup>		<i>i</i>		3	4	5	7	10	
cymex®-optimized acceleration torque (please contact us regarding the design)	$T_{2Bcym}$	Nm		–	370	400	330	260	
			in.lb		–	3275	3540	2921	2301
Max. acceleration torque (max. 1000 cycles per hour)	$T_{2B}$	Nm		235	315	315	315	235	
			in.lb		2080	2788	2788	2080	
Nominal output torque (with $n_{1N}$ )	$T_{2N}$	Nm		120	180	175	170	120	
			in.lb		1062	1593	1549	1505	1062
Emergency stop torque (permitted 1000 times during the service life of the gearhead)	$T_{2Not}$	Nm		500	625	625	625	500	
			in.lb		4425	5531	5531	5531	4425
Nominal input speed (with $T_{2N}$ and 20°C ambient temperature <sup>b)</sup> )	$n_{1N}$	rpm		2500	2500	2500	2800	2800	
Max. input speed	$n_{1Max}$	rpm		4500	4500	4500	4500	4500	
Mean no load running torque (with $n_1=3000$ rpm and 20°C gearhead temperature <sup>c)</sup> )	$T_{012}$	Nm		3.5	2.7	2.4	1.6	1.4	
			in.lb		31.0	23.9	21.2	14.2	12.4
Max. torsional backlash	$j_t$	arcmin	Standard $\leq 3$ / Reduced $\leq 1$						
Torsional rigidity	$C_{I21}$	Nm/arcmin		31					
			in.lb/arcmin		274				
Max. axial force <sup>d)</sup>	$F_{2AMax}$	N		5650					
			lb <sub>f</sub>		1271				
Max. radial force <sup>d)</sup>	$F_{2RMax}$	N		6600					
			lb <sub>f</sub>		1485				
Max. tilting moment	$M_{2KMax}$	Nm		487					
			in.lb		4310				
Efficiency at full load	$\eta$	%		97					
Service life (For calculation, see the Chapter "Information")	$L_h$	h		> 20000					
Weight incl. standard adapter plate	$m$	kg		7.7					
			lb <sub>m</sub>		17.0				
Operating noise (with $i=10$ and $n_1=3000$ rpm no load)	$L_{PA}$	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						
Paint			Blue RAL 5002						
Direction of rotation			Motor and gearhead same direction						
Protection class			IP 65						
Moment of inertia (relates to the drive)	E	19	$J_1$	kgcm <sup>2</sup>	3.29	2.35	1.92	1.60	1.38
				10 <sup>3</sup> in.lb.s <sup>2</sup>	2.91	2.08	1.70	1.42	1.22
Clamping hub diameter [mm]	G	24	$J_1$	kgcm <sup>2</sup>	3.99	3.04	2.61	2.29	2.07
				10 <sup>3</sup> in.lb.s <sup>2</sup>	3.53	2.69	2.31	2.03	1.83
	H	28	$J_1$	kgcm <sup>2</sup>	3.59	2.65	2.22	1.90	1.68
				10 <sup>3</sup> in.lb.s <sup>2</sup>	3.18	2.35	1.97	1.68	1.49
K	38	$J_1$	kgcm <sup>2</sup>	11.1	10.1	9.68	9.36	9.14	
			10 <sup>3</sup> in.lb.s <sup>2</sup>	9.78	8.95	8.57	8.28	8.09	

Reduced mass moments of inertia available on request.

<sup>a)</sup> Other ratios available on request

<sup>b)</sup> For higher ambient temperatures, please reduce input speed

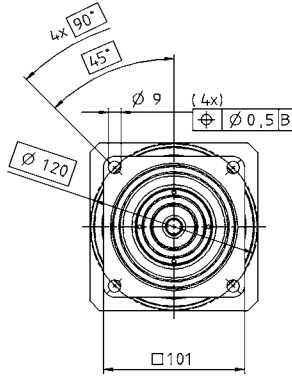
<sup>c)</sup> Valid for clamping hub diameter of 24 mm

<sup>d)</sup> Refers to centre of the output shaft or flange

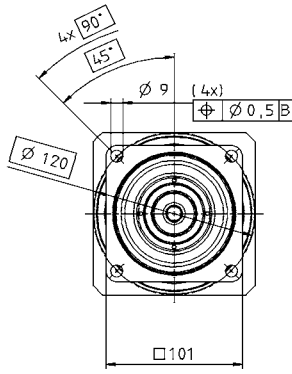
View A

View B

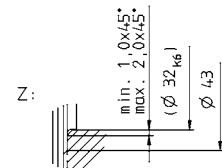
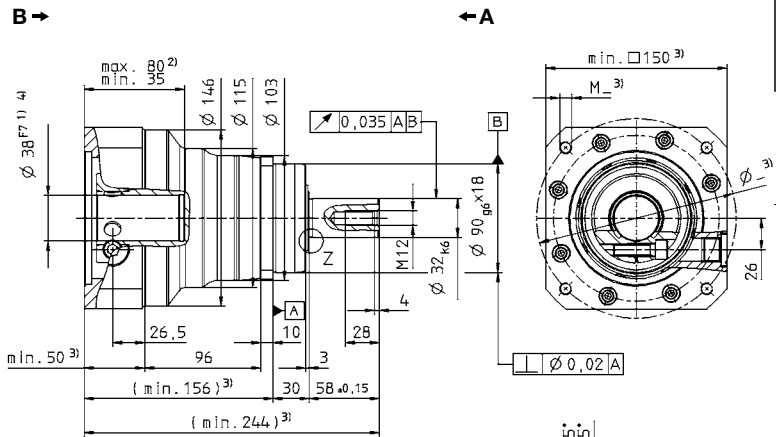
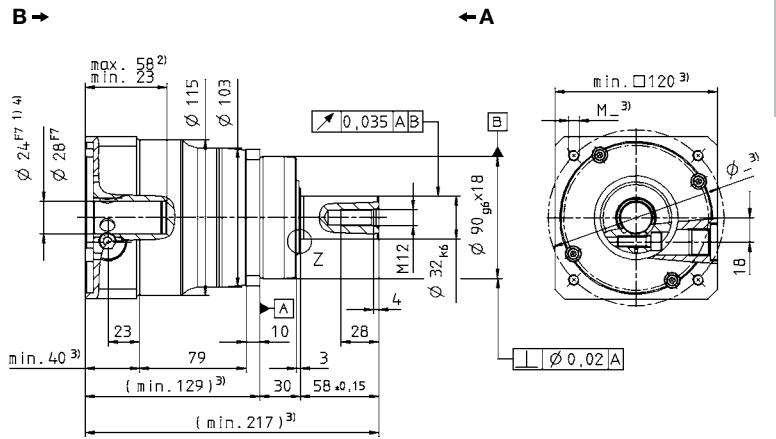
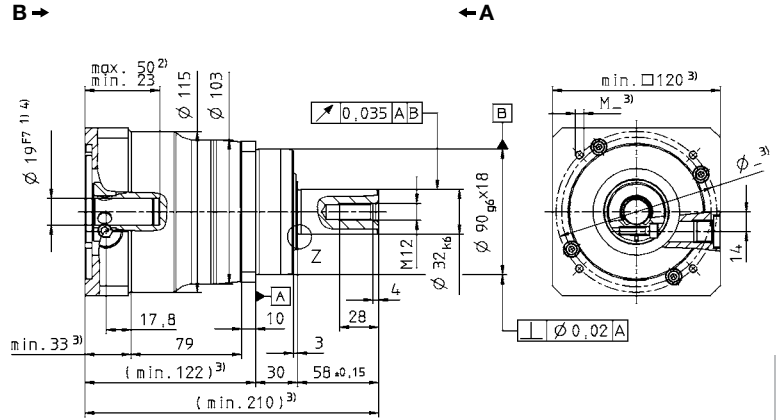
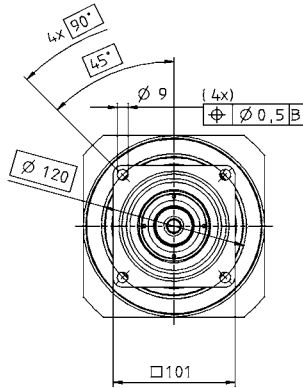
up to 19<sup>4)</sup> (E)  
clamping hub diameter



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



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

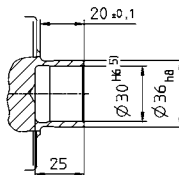
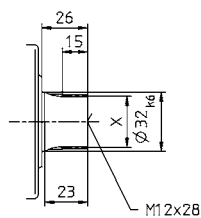
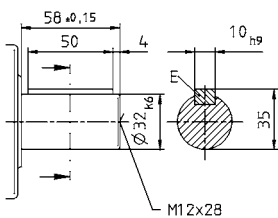


Alternatives: Output shaft variants

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

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

Shaft mounted  
Mounted via shrink disc



Non-tolerated dimensions ± 1 mm

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

CAD data is available under [www.wittenstein-alpha.com](http://www.wittenstein-alpha.com)

Motor mounting according to operating manual

Planetary gearheads  
High End

SP+

MF

# SP+ 100 MF 2-stage

				2-stage									
Ratio <sup>a)</sup>		<i>i</i>		16	20	25	28	35	40	50	70	100	
cymex®-optimized acceleration torque (please contact us regarding the design)	$T_{2Bcym}$	Nm		370	370	400	370	400	370	400	330	260	
		in.lb		3275	3275	3540	3275	3540	3275	3540	2921	2301	
Max. acceleration torque (max. 1000 cycles per hour)	$T_{2B}$	Nm		315	315	315	315	315	315	315	315	235	
		in.lb		2788	2788	2788	2788	2788	2788	2788	2788	2080	
Nominal output torque (with $n_{1N}$ )	$T_{2N}$	Nm		180	180	175	180	175	180	175	170	120	
		in.lb		1593	1593	1549	1593	1549	1593	1549	1505	1062	
Emergency stop torque (permitted 1000 times during the service life of the gearhead)	$T_{2Not}$	Nm		625	625	625	625	625	625	625	625	500	
		in.lb		5531	5531	5531	5531	5531	5531	5531	5531	4425	
Nominal input speed (with $T_{2N}$ and 20°C ambient temperature <sup>b)</sup> )	$n_{1N}$	rpm		3100	3100	3100	3100	3100	3100	3500	4200	4200	
Max. input speed	$n_{1Max}$	rpm		6000	6000	6000	6000	6000	6000	6000	6000	6000	
Mean no load running torque (with $n_1=3000$ rpm and 20°C gearhead temperature <sup>c)</sup> )	$T_{012}$	Nm		1.5	1.2	1.1	0.9	0.8	0.7	0.6	0.5	0.5	
		in.lb		13.3	10.6	9.7	8.8	7.1	6.2	5.3	4.4	4.4	
Max. torsional backlash	$j_t$	arcmin		Standard $\leq 5$ / Reduced $\leq 3$									
Torsional rigidity	$C_{I21}$	Nm/arcmin		31									
		in.lb/arcmin		274									
Max. axial force <sup>d)</sup>	$F_{2AMax}$	N		5650									
		lb <sub>f</sub>		1271									
Max. radial force <sup>d)</sup>	$F_{2RMax}$	N		6600									
		lb <sub>f</sub>		1485									
Max. tilting moment	$M_{2KMMax}$	Nm		487									
		in.lb		4310									
Efficiency at full load	$\eta$	%		94									
Service life (For calculation, see the Chapter "Information")	$L_h$	h		> 20000									
Weight incl. standard adapter plate	$m$	kg		7.9									
		lb <sub>m</sub>		17.5									
Operating noise (with $i=100$ and $n_1=3000$ rpm no load)	$L_{PA}$	dB(A)		$\leq 60$									
Max. permitted housing temperature		°C		+90									
		F		194									
Ambient temperature		°C		-15 to +40									
		F		5 to 104									
Lubrication				Lubricated for life									
Paint				Blue RAL 5002									
Direction of rotation				Motor and gearhead same direction									
Protection class				IP 65									
Moment of inertia (relates to the drive)	C	14	$J_1$	kgcm <sup>2</sup>	0.64	0.54	0.52	0.43	0.43	0.38	0.38	0.37	0.37
				10 <sup>3</sup> in.lb.s <sup>2</sup>	0.57	0.47	0.46	0.38	0.38	0.34	0.33	0.33	0.33
Clamping hub diameter [mm]	E	19	$J_1$	kgcm <sup>2</sup>	0.81	0.70	0.69	0.60	0.59	0.55	0.54	0.54	0.54
				10 <sup>3</sup> in.lb.s <sup>2</sup>	0.72	0.62	0.61	0.53	0.52	0.48	0.48	0.48	0.47
	G	24	$J_1$	kgcm <sup>2</sup>	2.18	2.07	2.05	1.97	1.96	1.92	1.91	1.91	1.91
				10 <sup>3</sup> in.lb.s <sup>2</sup>	1.93	1.83	1.82	1.74	1.74	1.70	1.69	1.69	1.69
	H	28	$J_1$	kgcm <sup>2</sup>	1.98	1.90	1.88	1.81	1.80	1.76	1.75	1.75	1.75
				10 <sup>3</sup> in.lb.s <sup>2</sup>	1.75	1.68	1.66	1.60	1.59	1.56	1.55	1.55	1.55

Reduced mass moments of inertia available on request.

<sup>a)</sup> Other ratios available on request

<sup>b)</sup> For higher ambient temperatures, please reduce input speed

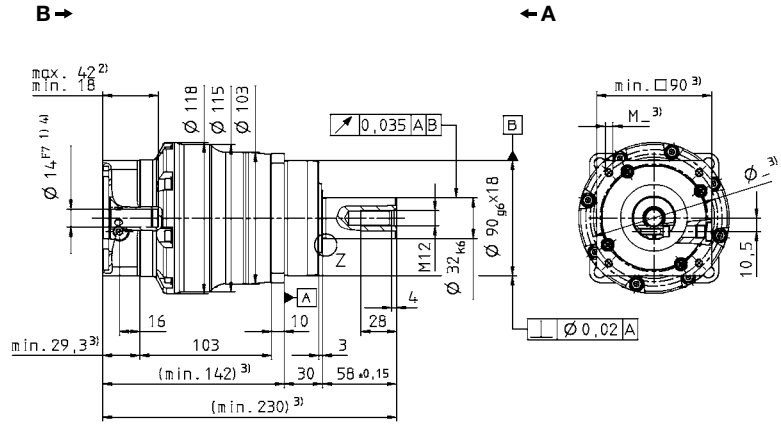
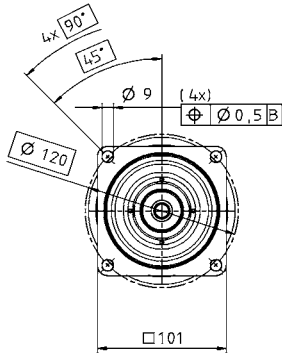
<sup>c)</sup> Valid for clamping hub diameter of 19 mm

<sup>d)</sup> Refers to centre of the output shaft or flange

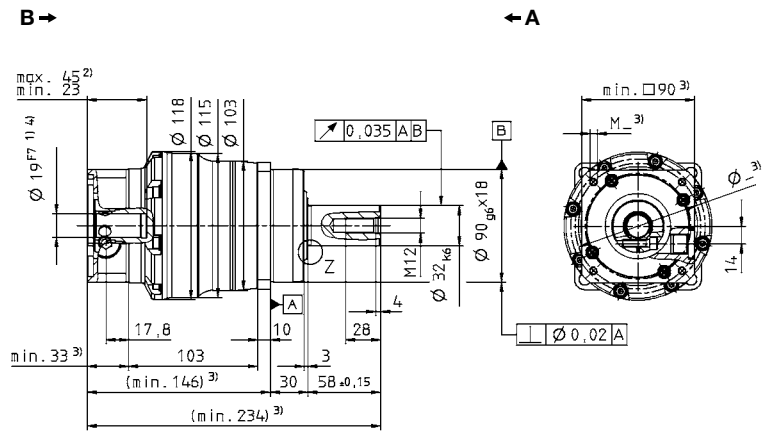
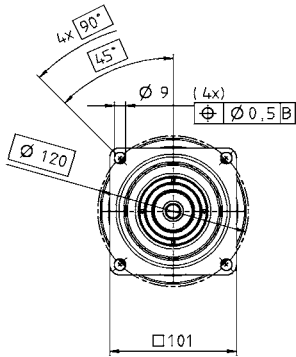
View A

View B

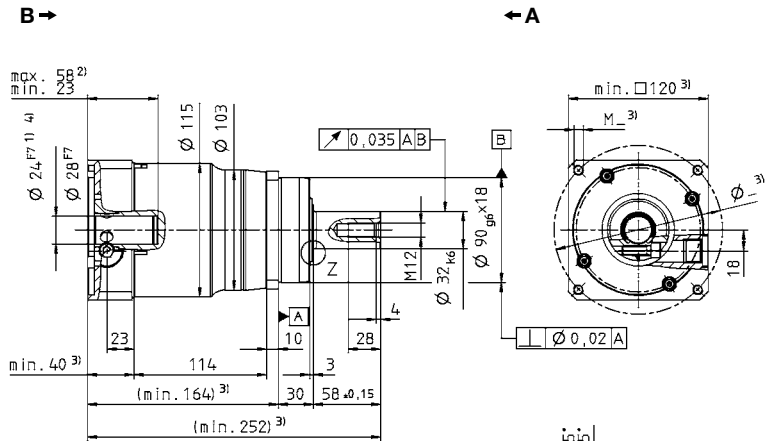
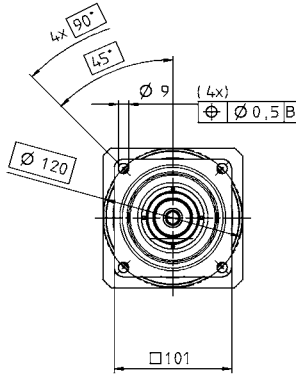
up to 14<sup>4)</sup> (C)  
clamping hub diameter



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



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

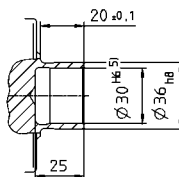
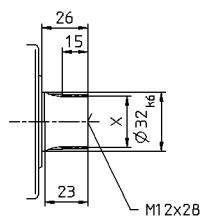
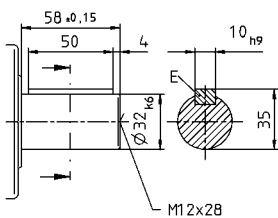


Alternatives: Output shaft variants

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

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

Shaft mounted  
Mounted via shrink disc



Non-tolerated dimensions ± 1 mm

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

CAD data is available under [www.wittenstein-alpha.com](http://www.wittenstein-alpha.com)

Motor mounting according to operating manual

Planetary gearheads  
High End

SP+

MF

# SP+ 140 MF 1-stage

				1-stage					
Ratio <sup>a)</sup>		<i>i</i>		3	4	5	7	10	
cymex <sup>®</sup> -optimized acceleration torque (please contact us regarding the design)	$T_{2Bcym}$	Nm		–	710	755	680	560	
				in.lb	–	6284	6682	6018	4956
Max. acceleration torque (max. 1000 cycles per hour)	$T_{2B}$	Nm		390	660	660	660	530	
				in.lb	3451.5	5841	5841	5841	4691
Nominal output torque (with $n_{1N}$ )	$T_{2N}$	Nm		200	360	360	360	220	
				in.lb	1770	3186	3186	3186	1947
Emergency stop torque (permitted 1000 times during the service life of the gearhead)	$T_{2Not}$	Nm		1000	1250	1250	1250	1000	
				in.lb	8850	11063	11063	11063	8850
Nominal input speed (with $T_{2N}$ and 20°C ambient temperature <sup>b)</sup> )	$n_{1N}$	rpm		2100	2100	2100	2600	2600	
Max. input speed	$n_{1Max}$	rpm		4000	4000	4000	4000	4000	
Mean no load running torque (with $n_1=3000$ rpm and 20°C gearhead temperature <sup>c)</sup> )	$T_{012}$	Nm		7.6	5.8	4.7	3.4	2.5	
				in.lb	67	51	42	30	22
Max. torsional backlash	$j_t$	arcmin		Standard $\leq 3$ / Reduced $\leq 1$					
Torsional rigidity	$C_{I21}$	Nm/arcmin		53					
				in.lb/arcmin	469				
Max. axial force <sup>d)</sup>	$F_{2AMax}$	N		9870					
				lb <sub>f</sub>	2221				
Max. radial force <sup>d)</sup>	$F_{2RMax}$	N		9900					
				lb <sub>f</sub>	2228				
Max. tilting moment	$M_{2KMMax}$	Nm		952					
				in.lb	8425				
Efficiency at full load	$\eta$	%		97					
Service life (For calculation, see the Chapter "Information")	$L_h$	h		> 20000					
Weight incl. standard adapter plate	$m$	kg		17.2					
				lb <sub>m</sub>	38.0				
Operating noise (with $i=10$ and $n_1=3000$ rpm no load)	$L_{PA}$	dB(A)		$\leq 65$					
Max. permitted housing temperature		°C		+90					
				F	194				
Ambient temperature		°C		-15 to +40					
				F	5 to 104				
Lubrication				Lubricated for life					
Paint				Blue RAL 5002					
Direction of rotation				Motor and gearhead same direction					
Protection class				IP 65					
Moment of inertia (relates to the drive)	G	24	$J_1$	kgcm <sup>2</sup>	10.7	7.82	6.79	5.84	5.28
				10 <sup>3</sup> in.lb.s <sup>2</sup>	9.45	6.92	6.01	5.17	4.67
Clamping hub diameter [mm]	I	32	$J_1$	kgcm <sup>2</sup>	13.8	11.0	9.95	9.01	8.44
				10 <sup>3</sup> in.lb.s <sup>2</sup>	12.3	9.72	8.81	7.97	7.47
	K	38	$J_1$	kgcm <sup>2</sup>	14.9	12.1	11.0	10.1	9.51
				10 <sup>3</sup> in.lb.s <sup>2</sup>	13.2	10.7	9.76	8.92	8.42
M	48	$J_1$	kgcm <sup>2</sup>	29.5	26.7	25.6	24.7	24.2	
			10 <sup>3</sup> in.lb.s <sup>2</sup>	26.1	23.6	22.7	21.9	21.4	

Reduced mass moments of inertia available on request.

<sup>a)</sup> Other ratios available on request

<sup>b)</sup> For higher ambient temperatures, please reduce input speed

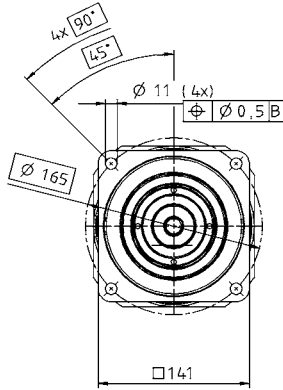
<sup>c)</sup> Valid for clamping hub diameter of 38 mm

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

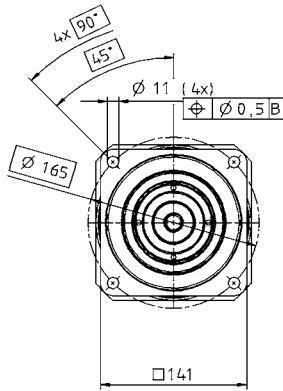
View A

View B

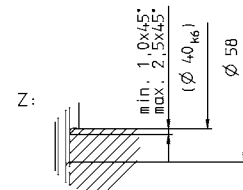
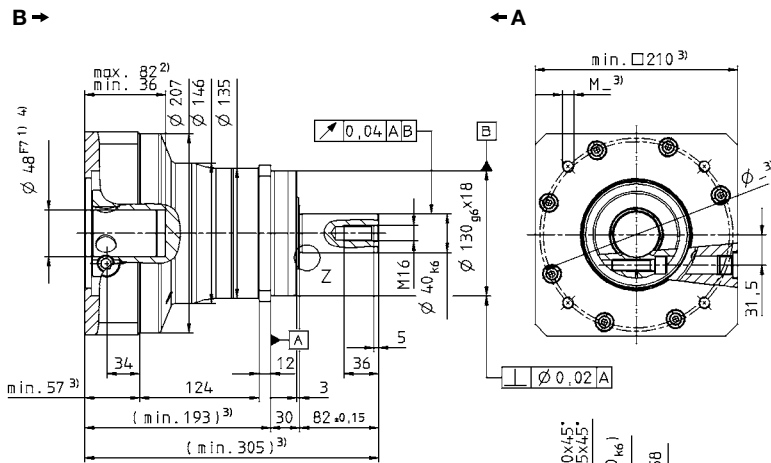
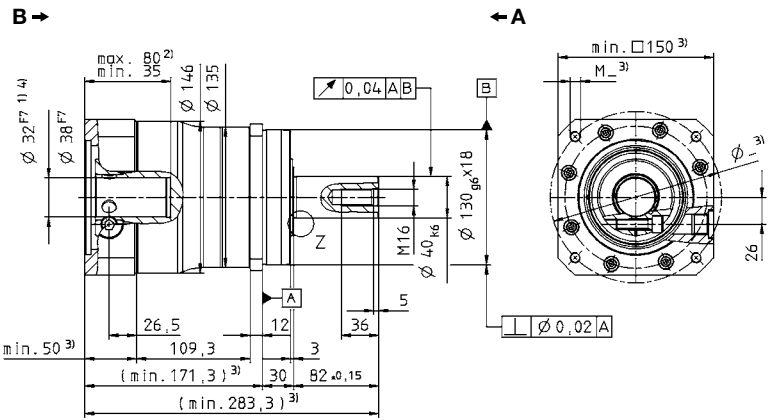
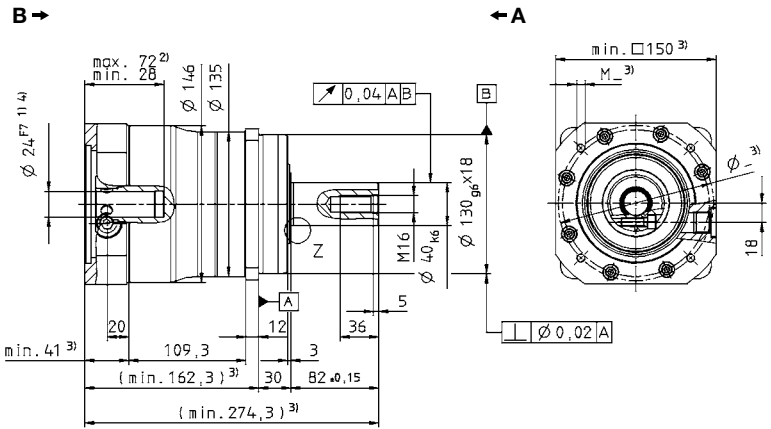
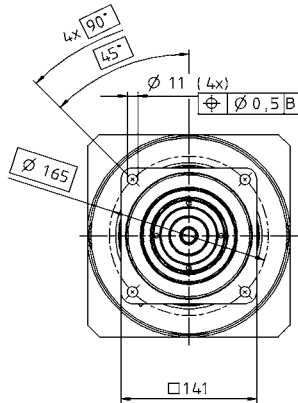
up to 24<sup>4)</sup> (G)  
clamping hub diameter



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

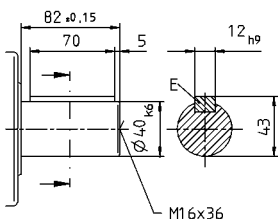


up to 48<sup>4)</sup> (M)  
clamping hub diameter

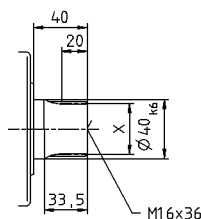


Alternatives: Output shaft variants

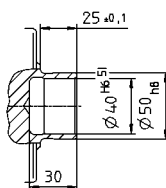
Output shaft with key in mm  
E = key as per DIN 6885, sheet 1, form A



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



Shaft mounted  
Mounted via shrink disc



Non-tolerated dimensions ± 1 mm

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

CAD data is available under [www.wittenstein-alpha.com](http://www.wittenstein-alpha.com)

Motor mounting according to operating manual

Planetary gearheads  
High End

SP+

MF



# SP+ 140 MF 2-stage

				2-stage									
Ratio <sup>a)</sup>		<i>i</i>		16	20	25	28	35	40	50	70	100	
cymex®-optimized acceleration torque (please contact us regarding the design)	$T_{2Bcym}$	Nm		710	710	755	710	755	710	755	680	560	
				in.lb	6284	6284	6682	6284	6682	6284	6682	6018	4956
Max. acceleration torque (max. 1000 cycles per hour)	$T_{2B}$	Nm		660	660	660	660	660	660	660	660	530	
				in.lb	5841	5841	5841	5841	5841	5841	5841	5841	4691
Nominal output torque (with $n_m$ )	$T_{2N}$	Nm		360	360	360	360	360	360	360	360	220	
				in.lb	3186	3186	3186	3186	3186	3186	3186	3186	1947
Emergency stop torque (permitted 1000 times during the service life of the gearhead)	$T_{2Not}$	Nm		1250	1250	1250	1250	1250	1250	1250	1250	1000	
				in.lb	11063	11063	11063	11063	11063	11063	11063	11063	8850
Nominal input speed (with $T_{2N}$ and 20°C ambient temperature) <sup>b)</sup>	$n_{1N}$	rpm		2900	2900	2900	2900	2900	2900	3200	3200	3900	
Max. input speed <sup>c)</sup>	$n_{1Max}$	rpm		5000	5000	5000	5000	5000	5000	5000	5000	5000	
Mean no load running torque (with $n_1=3000$ rpm and 20°C gearhead temperature) <sup>c)</sup>	$T_{012}$	Nm		3.3	2.7	2.4	1.9	1.8	1.4	1.3	1.2	1.1	
				in.lb	29.2	23.9	21.2	16.9	15.9	12.4	11.5	10.6	9.7
Max. torsional backlash	$j_t$	arcmin		Standard $\leq 5$ / Reduced $\leq 3$									
Torsional rigidity	$C_{I21}$	Nm/arcmin		53									
				in.lb/arcmin	469								
Max. axial force <sup>d)</sup>	$F_{2AMax}$	N		9870									
				lb <sub>f</sub>	2221								
Max. radial force <sup>d)</sup>	$F_{2RMax}$	N		9900									
				lb <sub>f</sub>	2228								
Max. tilting moment	$M_{2KMMax}$	Nm		952									
				in.lb	8425								
Efficiency at full load	$\eta$	%		94									
Service life (For calculation, see the Chapter "Information")	$L_h$	h		> 20000									
Weight incl. standard adapter plate	$m$	kg		17									
				lb <sub>m</sub>	37.6								
Operating noise (with $i=100$ and $n_1=3000$ rpm no load)	$L_{PA}$	dB(A)		$\leq 63$									
Max. permitted housing temperature		°C		+90									
				F	194								
Ambient temperature		°C		-15 to +40									
				F	5 to 104								
Lubrication	Lubricated for life												
Paint	Blue RAL 5002												
Direction of rotation	Motor and gearhead same direction												
Protection class	IP 65												
Moment of inertia (relates to the drive)	E	19	$J_1$	kgcm <sup>2</sup>	2.50	2.01	1.97	1.65	1.63	1.40	1.39	1.38	1.38
				10 <sup>3</sup> in.lb.s <sup>2</sup>	2.21	1.78	1.75	1.46	1.44	1.24	1.23	1.22	1.22
Clamping hub diameter [mm]	G	24	$J_1$	kgcm <sup>2</sup>	3.19	2.71	2.67	2.34	2.32	2.10	2.08	2.08	2.07
				10 <sup>3</sup> in.lb.s <sup>2</sup>	2.82	2.40	2.36	2.07	2.05	1.85	1.85	1.84	1.83
	K	38	$J_1$	kgcm <sup>2</sup>	10.3	9.77	9.73	9.41	9.39	9.16	9.15	9.14	9.14
				10 <sup>3</sup> in.lb.s <sup>2</sup>	9.07	8.65	8.61	8.33	8.31	8.11	8.10	8.09	8.09

Reduced mass moments of inertia available on request.

<sup>a)</sup> Other ratios available on request

<sup>b)</sup> For higher ambient temperatures, please reduce input speed

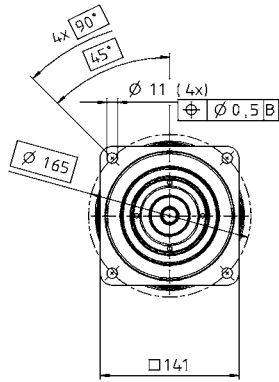
<sup>c)</sup> Valid for clamping hub diameter of 24 mm

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

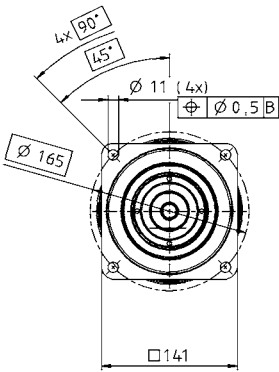
View A

View B

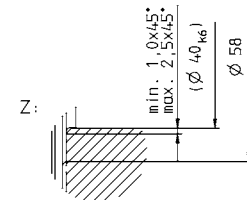
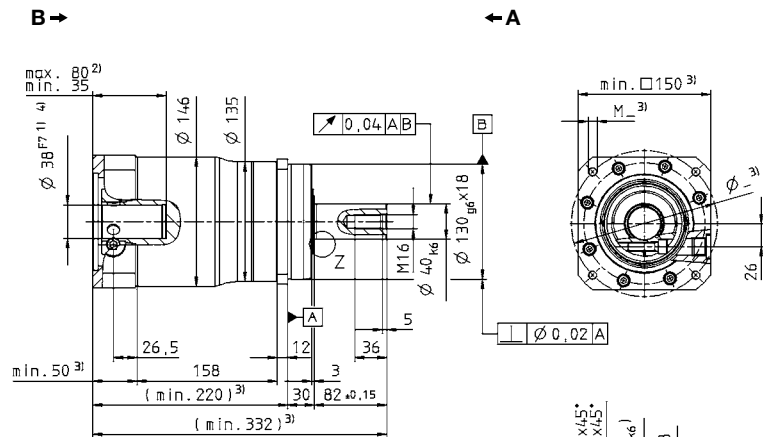
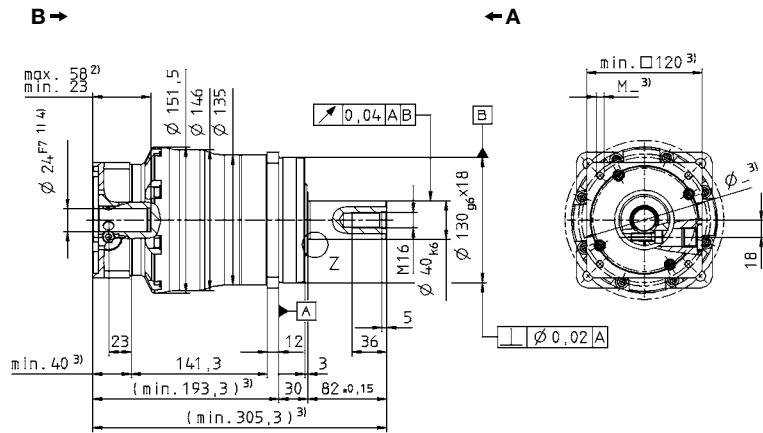
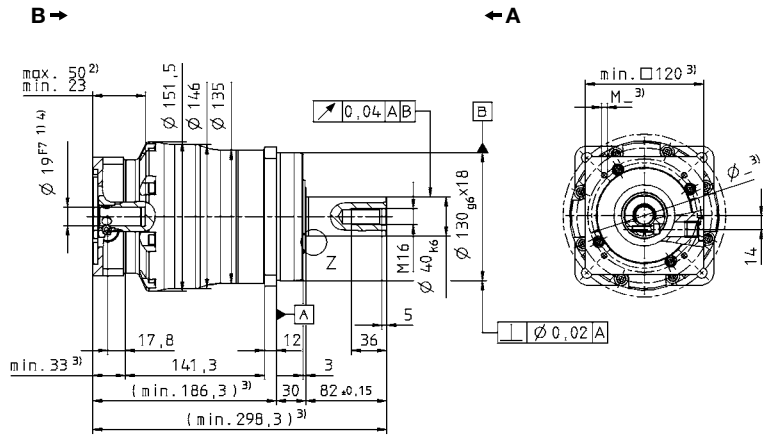
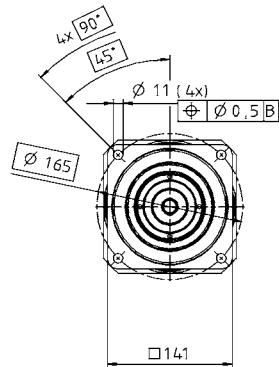
up to 19<sup>4)</sup> (E)  
clamping hub diameter



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



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

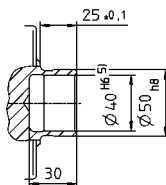
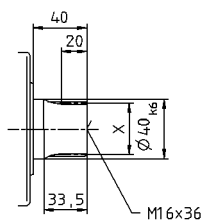
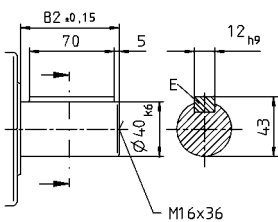


Alternatives: Output shaft variants

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

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

Shaft mounted  
Mounted via shrink disc



Non-tolerated dimensions ± 1 mm

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

CAD data is available under [www.wittenstein-alpha.com](http://www.wittenstein-alpha.com)

Motor mounting according to operating manual

Planetary gearheads  
High End

SP+

MF

# SP+ 180 MF 1-stage

				1-stage					
Ratio <sup>a)</sup>		<i>i</i>		3	4	5	7	10	
cymex <sup>®</sup> -optimized acceleration torque (please contact us regarding the design)	$T_{2Bcym}$	Nm	in.lb	–	1785	1890	1785	1400	
				–	15797	16727	15797	12390	
Max. acceleration torque (max. 1000 cycles per hour)	$T_{2B}$	Nm	in.lb	970	1210	1210	1210	970	
				8585	10709	10709	10709	8585	
Nominal output torque (with $n_{2N}$ )	$T_{2N}$	Nm	in.lb	530	750	750	750	750	
				4691	6638	6638	6638	6638	
Emergency stop torque (permitted 1000 times during the service life of the gearhead)	$T_{2Not}$	Nm	in.lb	2200	2750	2750	2750	2200	
				19470	24338	24338	24338	29470	
Nominal input speed (with $T_{2N}$ and 20°C ambient temperature <sup>b)</sup> )	$n_{1N}$	rpm		1500	1500	1500	2300	2300	
Max. input speed	$n_{1Max}$	rpm		3500	3500	3500	3500	3500	
Mean no load running torque (with $n_1=3000$ rpm and 20°C gearhead temperature <sup>c)</sup> )	$T_{012}$	Nm	in.lb	14.0	11.0	9.0	6.8	5.0	
				123.9	97.4	79.7	60.2	44.3	
Max. torsional backlash	$j_t$	arcmin		Standard $\leq 3$ / Reduced $\leq 1$					
Torsional rigidity	$C_{I21}$	Nm/arcmin	in.lb/arcmin	175					
				1549					
Max. axial force <sup>d)</sup>	$F_{2AMax}$	N	lb <sub>f</sub>	14150					
				3184					
Max. radial force <sup>d)</sup>	$F_{2RMax}$	N	lb <sub>f</sub>	15400					
				3465					
Max. tilting moment	$M_{2KMMax}$	Nm	in.lb	1600					
				14160					
Efficiency at full load	$\eta$	%		97					
Service life (For calculation, see the Chapter "Information")	$L_h$	h		> 20000					
Weight incl. standard adapter plate	$m$	kg	lb <sub>m</sub>	34					
				75.1					
Operating noise (with $i=10$ and $n_1=3000$ rpm no load)	$L_{PA}$	dB(A)		$\leq 66$					
Max. permitted housing temperature		°C	F	+90					
				194					
Ambient temperature		°C	F	-15 to +40					
				5 to 104					
Lubrication	Lubricated for life								
Paint	Blue RAL 5002								
Direction of rotation	Motor and gearhead same direction								
Protection class	IP 65								
Moment of inertia (relates to the drive)	K	38	$J_1$	kgcm <sup>2</sup>	50.8	33.9	27.9	22.2	19.2
				10 <sup>3</sup> in.lb.s <sup>2</sup>	45.0	30.0	24.7	19.7	17.0
Clamping hub diameter [mm]	M	48	$J_1$	kgcm <sup>2</sup>	58.2	41.2	35.3	29.6	26.5
				10 <sup>3</sup> in.lb.s <sup>2</sup>	51.5	36.5	31.2	26.2	23.5
	N	55	$J_1$	kgcm <sup>2</sup>	65.7	49.7	44.0	38.5	35.4
				10 <sup>3</sup> in.lb.s <sup>2</sup>	58.2	44.0	38.9	34.0	31.4

Reduced mass moments of inertia available on request.

<sup>a)</sup> Other ratios available on request

<sup>b)</sup> For higher ambient temperatures, please reduce input speed

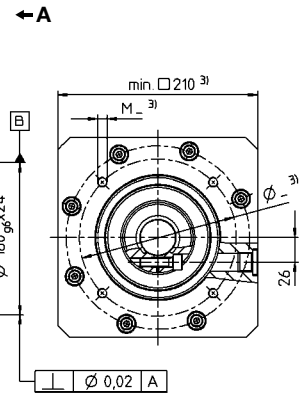
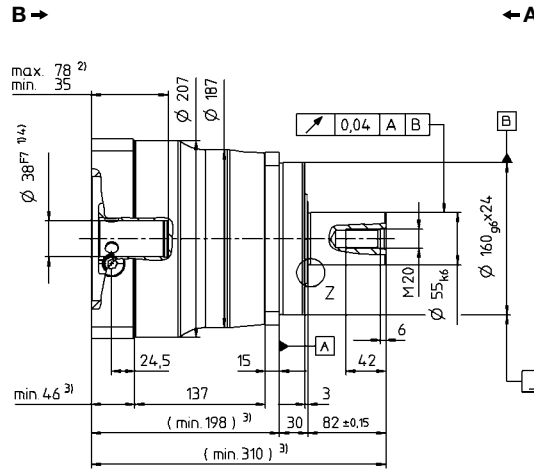
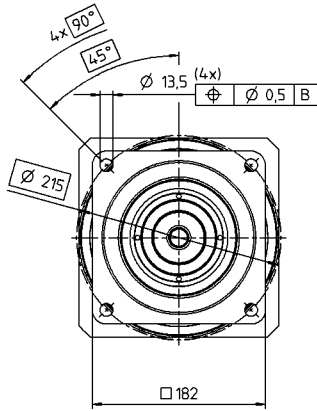
<sup>c)</sup> Valid for clamping hub diameter of 48 mm

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

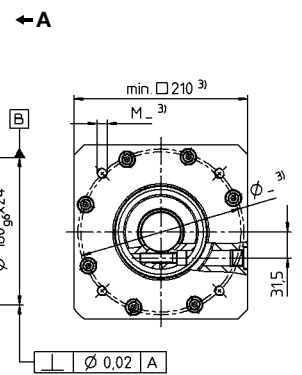
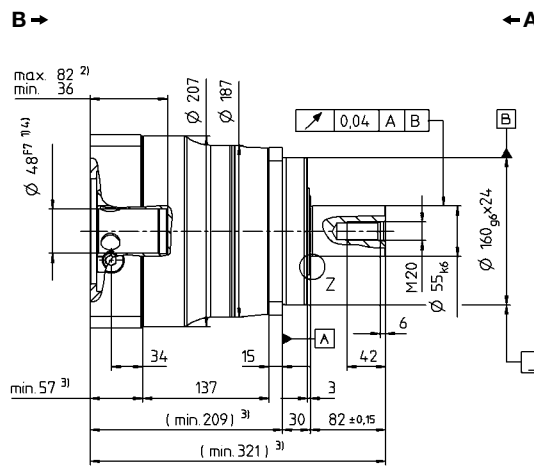
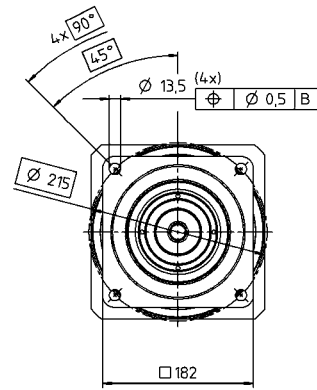
View A

View B

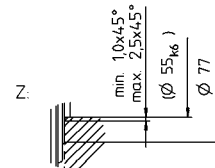
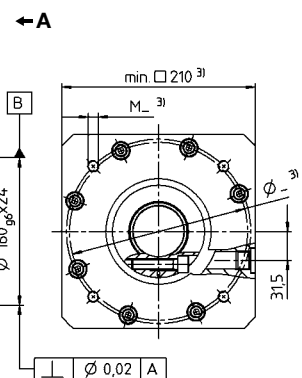
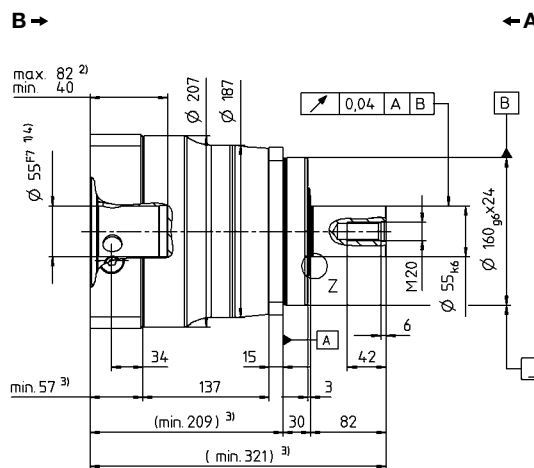
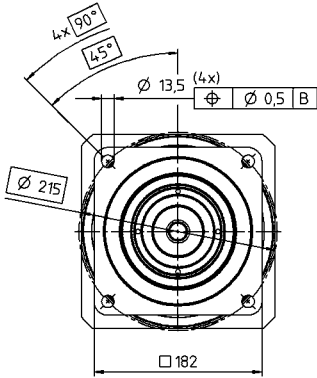
up to 38<sup>4)</sup> (K)  
clamping hub diameter



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

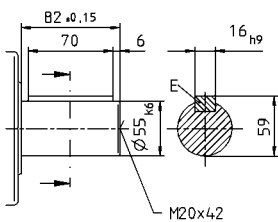


up to 55<sup>4)</sup> (N)  
clamping hub diameter

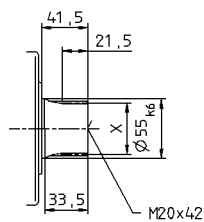


### Alternatives: Output shaft variants

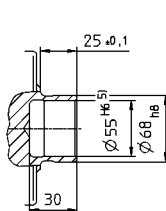
Output shaft with key in mm  
E = key as per DIN 6885, sheet 1, form A



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



Shaft mounted  
Mounted via shrink disc



Non-tolerated dimensions ± 1 mm

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

CAD data is available under [www.wittenstein-alpha.com](http://www.wittenstein-alpha.com)

Motor mounting according to operating manual

# SP+ 180 MF 2-stage

				2-stage									
Ratio <sup>a)</sup>		<i>i</i>		16	20	25	28	35	40	50	70	100	
cymex <sup>®</sup> -optimized acceleration torque <small>(please contact us regarding the design)</small>	$T_{2Bcym}$	Nm		1785	1785	1890	1785	1890	1785	1800	1785	1400	
				in.lb	15797	15797	16727	15797	16727	15797	15930	15797	12390
Max. acceleration torque <small>(max. 1000 cycles per hour)</small>	$T_{2B}$	Nm		1210	1210	1210	1210	1210	1210	1210	1210	970	
				in.lb	10709	10709	10709	10709	10709	10709	10709	10709	8585
Nominal output torque <small>(with <math>n_{1N}</math>)</small>	$T_{2N}$	Nm		750	750	750	750	750	750	750	750	750	
				in.lb	6638	6638	6638	6638	6638	6638	6637	6638	6638
Emergency stop torque <small>(permitted 1000 times during the service life of the gearhead)</small>	$T_{2Not}$	Nm		2750	2750	2750	2750	2750	2750	2750	2750	2200	
				in.lb	24338	24338	24338	24338	24338	24338	24338	24338	19470
Nominal input speed <small>(with <math>T_{2N}</math> and 20°C ambient temperature) <sup>b)</sup></small>	$n_{1N}$	rpm		2700	2700	2700	2700	2700	2700	2900	3200	3400	
Max. input speed <sup>c)</sup>	$n_{1Max}$	rpm		4500	4500	4500	4500	4500	4000	4500	4500	4500	
Mean no load running torque <small>(with <math>n_1=3000</math> rpm and 20°C gearhead temperature) <sup>c)</sup></small>	$T_{012}$	Nm		5.3	4.3	3.9	3.1	2.8	2.3	2.1	1.9	1.7	
				in.lb	46,9	38,1	34,5	27,4	24,8	20,4	18,6	16,8	15,0
Max. torsional backlash	$j_t$	arcmin		Standard $\leq 5$ / Reduced $\leq 3$									
Torsional rigidity	$C_{I21}$	Nm/arcmin		175									
				in.lb/arcmin	1549								
Max. axial force <sup>d)</sup>	$F_{2AMax}$	N		14150									
				lb <sub>f</sub>	3184								
Max. radial force <sup>d)</sup>	$F_{2RMax}$	N		15400									
				lb <sub>f</sub>	3465								
Max. tilting moment	$M_{2KMMax}$	Nm		1600									
				in.lb	14160								
Efficiency at full load	$\eta$	%		94									
Service life <small>(For calculation, see the Chapter "Information")</small>	$L_h$	h		> 20000									
Weight incl. standard adapter plate	$m$	kg		36.4									
				lb <sub>m</sub>	80.4								
Operating noise <small>(with <math>i=100</math> and <math>n_1=3000</math> rpm no load)</small>	$L_{PA}$	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									
Paint				Blue RAL 5002									
Direction of rotation				Motor and gearhead same direction									
Protection class				IP 65									
Moment of inertia <small>(relates to the drive)</small>	G	24	$J_1$	kgcm <sup>2</sup>	9.27	7.72	7.48	6.32	6.20	5.51	5.45	5.39	5.36
				10 <sup>3</sup> in.lb.s <sup>2</sup>	8.20	6.83	6.62	5.59	5.49	4.88	4.82	4.77	4.74
Clamping hub diameter [mm]	I	32	$J_1$	kgcm <sup>2</sup>	12.4	10.9	10.6	9.48	9.36	8.67	8.61	8.55	8.52
				10 <sup>3</sup> in.lb.s <sup>2</sup>	11.0	9.63	9.42	8.39	8.28	7.67	7.62	7.57	7.54
	K	38	$J_1$	kgcm <sup>2</sup>	13.5	12.0	11.7	10.6	10.4	9.74	9.68	9.63	9.60
				10 <sup>3</sup> in.lb.s <sup>2</sup>	12.0	10.6	10.4	9.34	9.23	8.62	8.57	8.52	8.49
	M	48	$J_1$	kgcm <sup>2</sup>	28.1	26.6	26.3	25.2	25.1	24.4	24.3	24.3	24.3
				10 <sup>3</sup> in.lb.s <sup>2</sup>	24.9	23.5	23.3	22.3	22.2	21.6	21.5	21.5	21.5

Reduced mass moments of inertia available on request.

<sup>a)</sup> Other ratios available on request

<sup>b)</sup> For higher ambient temperatures, please reduce input speed

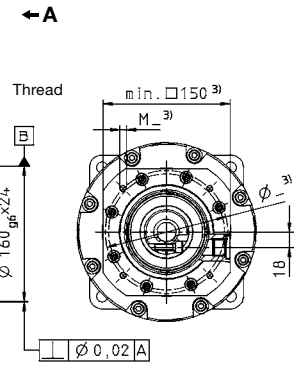
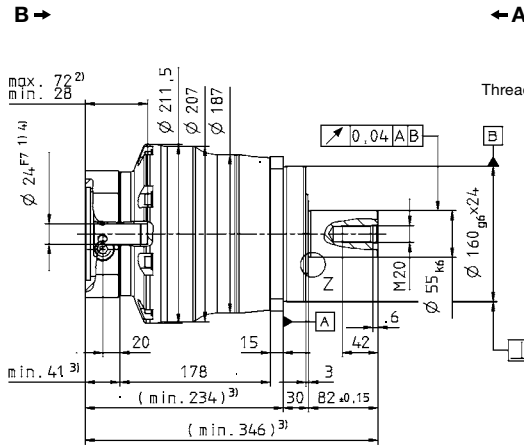
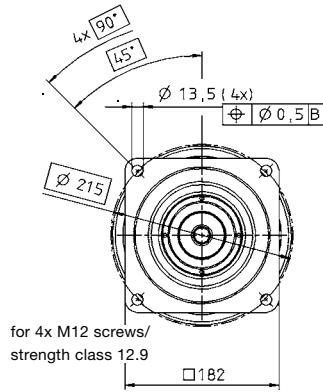
<sup>c)</sup> Valid for clamping hub diameter of 38 mm

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

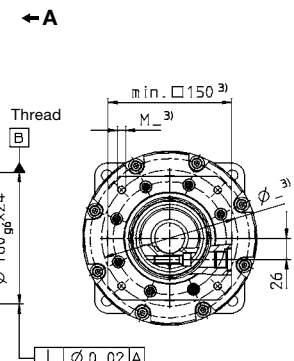
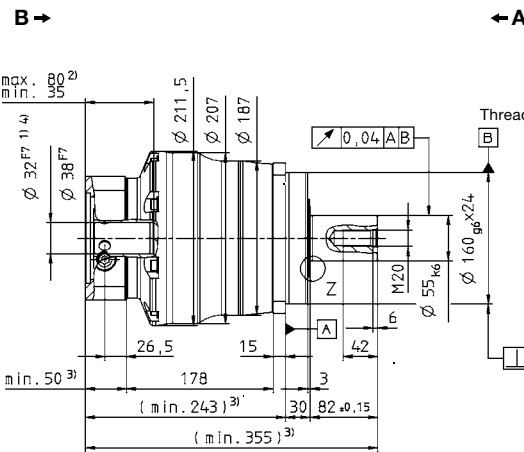
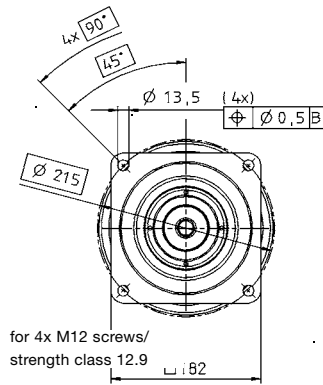
View A

View B

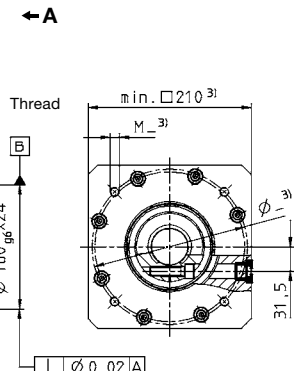
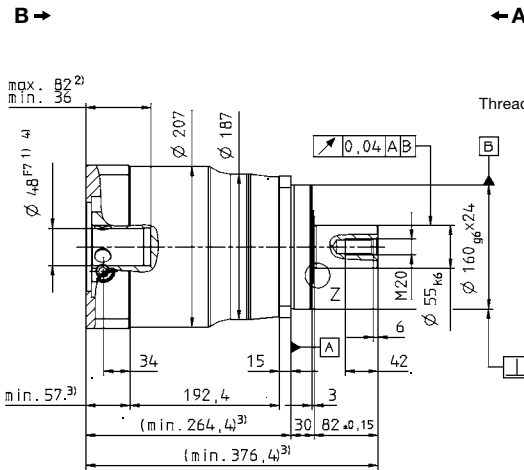
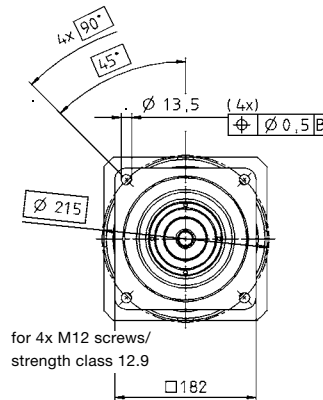
up to 24<sup>4)</sup> (G) clamping hub diameter



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



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

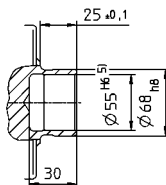
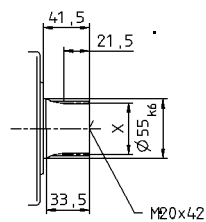
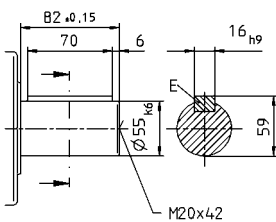


Alternatives: Output shaft variants

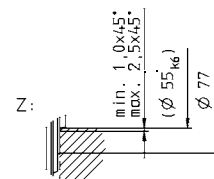
Output shaft with key in mm  
E = key as per DIN 6885, sheet 1, form A

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

Shaft mounted  
Mounted via shrink disc



Z: Detail



Connecting part

Non-tolerated dimensions ± 1 mm

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

CAD data is available under [www.wittenstein-alpha.com](http://www.wittenstein-alpha.com)

Motor mounting according to operating manual

Planetary gearheads  
High End

SP+

MF

# SP+ 210 MF 1/2-stage

				1-stage					2-stage													
Ratio <sup>a)</sup>				<b>3</b>	<b>4</b>	<b>5</b>	<b>7</b>	<b>10</b>	<b>16</b>	<b>20</b>	<b>25</b>	<b>28</b>	<b>35</b>	<b>40</b>	<b>50</b>	<b>70</b>	<b>100</b>					
cymex <sup>®</sup> -optimized acceleration torque (please contact us regarding the design)				$T_{2Bcym}$	Nm		- Please contact us -															
		in.lb																				
Max. acceleration torque (max. 1000 cycles per hour)				$T_{2B}$	Nm		1600	2500	2500	2400	1900	2400	2500	2500	2400	2400	2400	1900				
		in.lb			14160	22125	22125	21240	16815	21240	22125	22125	21240	21240	21240	21240	16815					
Nominal output torque (with $n_m$ )				$T_{2N}$	Nm		1100	1500	1500	1400	1000	1500	1500	1500	1500	1500	1400	1000				
		in.lb			9735	13275	13275	12390	8850	13275	13275	13275	13275	13275	13275	12390	8850					
Emergency stop torque (permitted 1000 times during the service life of the gearhead)				$T_{2Not}$	Nm		5000	5200	5200	5200	5000	5200	5200	5200	5200	5200	5000	5000				
		in.lb			44250	46020	46020	46020	44250	46020	46020	46020	46020	46020	46020	46020	44250					
Nominal input speed (with $T_{2N}$ and 20°C ambient temperature) <sup>b)</sup>				$n_{1N}$	rpm	1200	1200	1500	1700	2000	2500	2500	2500	2500	2500	3000	3000					
Max. input speed				$n_{1Max}$	rpm	2500	2500	2500	2500	2500	3500	3500	3500	3500	3500	3500	3500					
Mean no load running torque (with $n_1=2000$ rpm and 20°C gearhead temperature)				$T_{012}$	Nm		32	22	17	11	7,0	7,0	6,0	5,5	4,5	4,0	3,5	3,0				
		in.lb			283	195	151	97	62	62	53	49	40	35	31	31	31	27				
Max. torsional backlash				$j_t$	arcmin	Standard $\leq 3$ / Reduced $\leq 1$					Standard $\leq 5$ / Reduced $\leq 3$											
Torsional rigidity				$C_{t21}$	Nm/ arcmin		400					400										
		in.lb/ arcmin			3540					3540												
Max. axial force <sup>c)</sup>				$F_{2AMax}$	N		30000					30000										
		lb <sub>f</sub>			6750					6750												
Max. radial force <sup>c)</sup>				$F_{2RMMax}$	N		21000					21000										
		lb <sub>f</sub>			4725					4725												
Max. tilting moment				$M_{2KMMax}$	Nm		3100					3100										
		in.lb			27435					2744												
Efficiency at full load				$\eta$	%	97					94											
Service life (For calculation, see the Chapter "Information")				$L_h$	h	> 20000					> 20000											
Weight incl. standard adapter plate				$m$	kg		56					53										
		lb <sub>m</sub>			124					117												
Operating noise (with $i=10$ and $n_1=2000$ rpm no load)				$L_{PA}$	dB(A)	$\leq 64$																
Max. permitted housing temperature						$+90$																
						194																
Ambient temperature						$-15$ to $+40$																
						5 to 104																
Lubrication				Lubricated for life																		
Paint				Blue RAL 5002																		
Direction of rotation				Motor and gearhead same direction																		
Protection class				IP 65																		
Moment of inertia (relates to the drive)				M	48	$J_1$	kgcm <sup>2</sup>		-	-	-	-	-	34.5	31.5	30.8	30.0	29.7	28.5	28.3	28.1	28.0
		10 <sup>-2</sup> in.lb.s <sup>2</sup>					30.5	27.9	27.3	26.6	26.3	25.2	25.0	24.9	24.8							
Clamping hub diameter (mm)				N	55	$J_1$	kgcm <sup>2</sup>		139.0	94.3	76.9	61.5	53.1	-	-	-	-	-	-	-	-	-
		10 <sup>-2</sup> in.lb.s <sup>2</sup>					118.2	80.2	65.4	52.3	45.1	-	-	-	-	-	-	-	-	-	-	-

Reduced mass moments of inertia available on request.

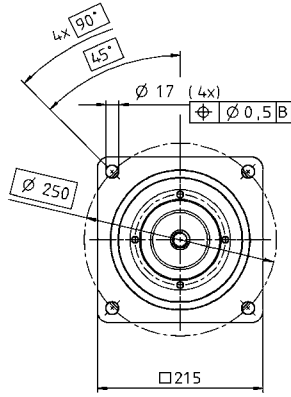
<sup>a)</sup> Other ratios available on request

<sup>b)</sup> For higher ambient temperatures, please reduce input speed

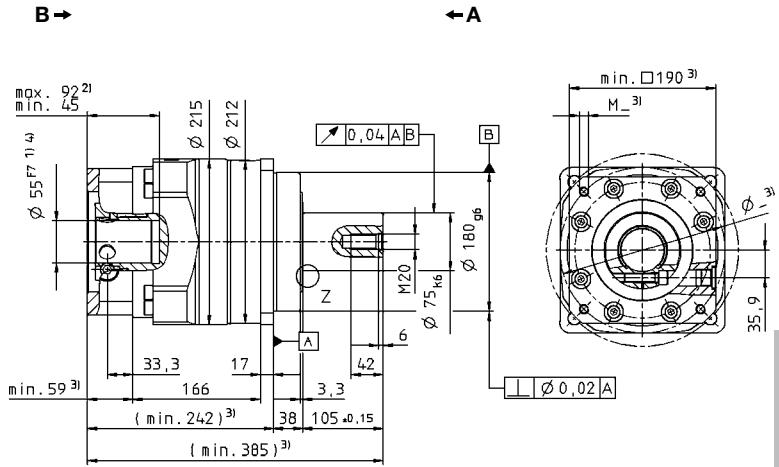
<sup>c)</sup> Refers to center of the output shaft or flange

Motor shaft diameter [mm]

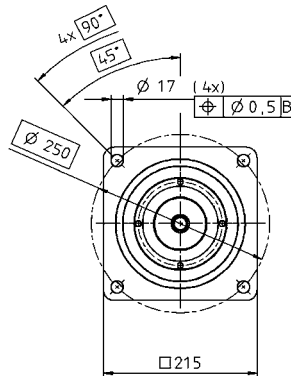
1-stage:



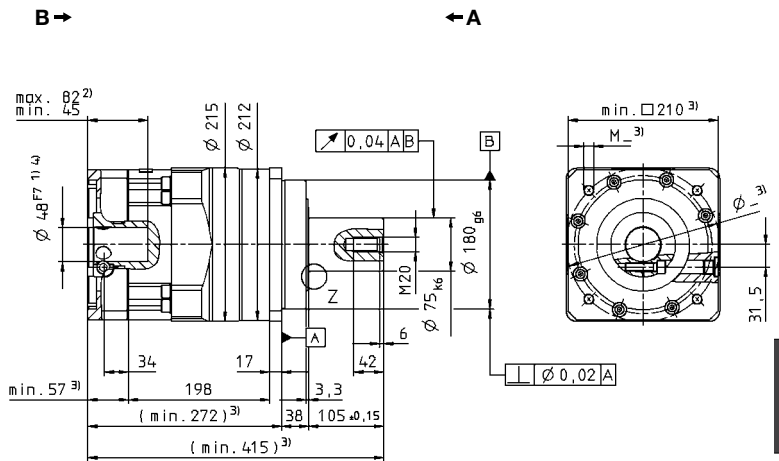
up to 55<sup>4)</sup> (N)  
clamping hub  
diameter



2-stage:



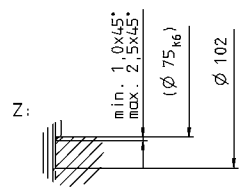
up to 48<sup>4)</sup> (M)  
clamping hub  
diameter



Planetary gearheads  
High End

SP+

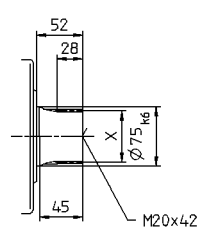
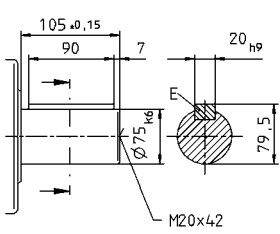
MF



Alternatives: Output shaft variants

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

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



- Non-tolerated dimensions ± 1.5 mm
- 1) Check motor shaft fit.
  - 2) Min./Max. permissible motor shaft length.  
Longer motor shafts are adaptable, please contact us.
  - 3) The dimensions depend on the motor.
  - 4) Smaller motor shaft diameter is compensated by a bushing with a minimum thickness of 1 mm.

CAD data is available under [www.wittenstein-alpha.com](http://www.wittenstein-alpha.com)

Motor mounting according to operating manual



# SP+ 240 MF 1/2-stage

				1-stage					2-stage										
Ratio <sup>a)</sup>				<b>3</b>	<b>4</b>	<b>5</b>	<b>7</b>	<b>10</b>	<b>16</b>	<b>20</b>	<b>25</b>	<b>28</b>	<b>35</b>	<b>40</b>	<b>50</b>	<b>70</b>	<b>100</b>		
cymex®-optimized acceleration torque (please contact us regarding the design)		$T_{2Bcym}$	Nm	- Please contact us -															
			in.lb																
Max. acceleration torque (max. 1000 cycles per hour)		$T_{2B}$	Nm	2750	4500	4500	4300	3400	4500	4500	4500	4500	4500	4000	4300	4300	3400		
			in.lb	24338	39825	39825	38055	30090	39825	39825	39825	39825	39825	39825	35400	38055	38055	30090	
Nominal output torque (with $n_m$ )		$T_{2N}$	Nm	1500	2500	2500	2300	1700	2500	2500	2500	2500	2500	2500	2500	2300	1700		
			in.lb	13275	22125	22125	20355	15045	22125	22125	22125	22125	22125	22125	22125	20355	15045		
Emergency stop torque (permitted 1000 times during the service life of the gearhead)		$T_{2Not}$	Nm	6800	8500	8500	8500	6800	8500	8500	8500	8500	8500	8500	8500	8500	6800		
			in.lb	60180	75225	75225	75225	60180	75225	75225	75225	75225	75225	75225	75225	75225	60180		
Nominal input speed (with $T_{2N}$ and 20°C ambient temperature) <sup>b)</sup>		$n_{1N}$	rpm	1000	1000	1200	1500	1700	2300	2500	2500	2500	2500	2500	2500	2800	2800		
Max. input speed		$n_{1Max}$	rpm	2500	2500	2500	2500	2500	3500	3500	3500	3500	3500	3500	3500	3500	3500		
Mean no load running torque (with $n_1=2000$ rpm and 20°C gearhead temperature)		$T_{012}$	Nm	45	35	26	16	11	11	9,0	8,0	7,0	6,0	5,0	4,5	4,0	4,0		
			in.lb	398	310	230	142	97	97	80	71	62	53	44	40	35	35		
Max. torsional backlash		$j_t$	arcmin	Standard $\leq 3$ / Reduced $\leq 1$					Standard $\leq 5$ / Reduced $\leq 3$										
Torsional rigidity		$C_{t21}$	Nm/ arcmin	550					550										
			in.lb/ arcmin	4868					4868										
Max. axial force <sup>c)</sup>		$F_{2AMax}$	N	33000					33000										
			lb <sub>f</sub>	7425					7425										
Max. radial force <sup>c)</sup>		$F_{2RMMax}$	N	30000					30000										
			lb <sub>f</sub>	6750					6750										
Max. tilting moment		$M_{2KMMax}$	Nm	5000					5000										
			in.lb	44250					44250										
Efficiency at full load		$\eta$	%	97					94										
Service life (For calculation, see the Chapter "Information")		$L_h$	h	> 20000					> 20000										
Weight incl. standard adapter plate		$m$	kg	77					76										
			lb <sub>m</sub>	170					168										
Operating noise (with $i=10$ and $n_1=2000$ rpm no load)		$L_{PA}$	dB(A)	$\leq 66$															
Max. permitted housing temperature				$+90$															
				194															
Ambient temperature				$-15$ to $+40$															
				5 to 104															
Lubrication				Lubricated for life															
Paint				Blue RAL 5002															
Direction of rotation				Motor and gearhead same direction															
Protection class				IP 65															
Moment of inertia (relates to the drive)		M	48	$J_1$	kgcm <sup>2</sup>	-	-	-	-	-	39.2	34.6	33.2	30.5	29.7	28.2	27.9	27.6	27.5
					$10^{-2}$ in.lb.s <sup>2</sup>	-	-	-	-	-	-	-	34.7	30.6	29.4	27.0	26.3	25.0	24.7
Clamping hub diameter [mm]		O	60	$J_1$	kgcm <sup>2</sup>	260.2	198.2	163.0	138,3	124,7	-	-	-	-	-	-	-	-	-
					$10^{-2}$ in.lb.s <sup>2</sup>	230.3	175.4	144.3	122,4	110,4	-	-	-	-	-	-	-	-	-

Reduced mass moments of inertia available on request.

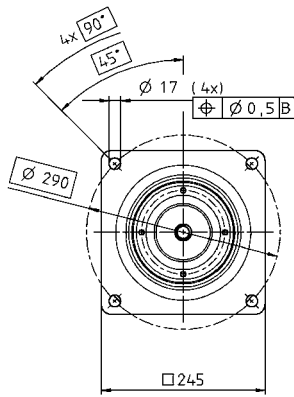
<sup>a)</sup> Other ratios available on request

<sup>b)</sup> For higher ambient temperatures, please reduce input speed

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

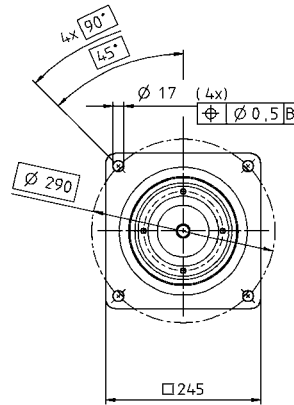
Motor shaft diameter [mm]

1-stage:

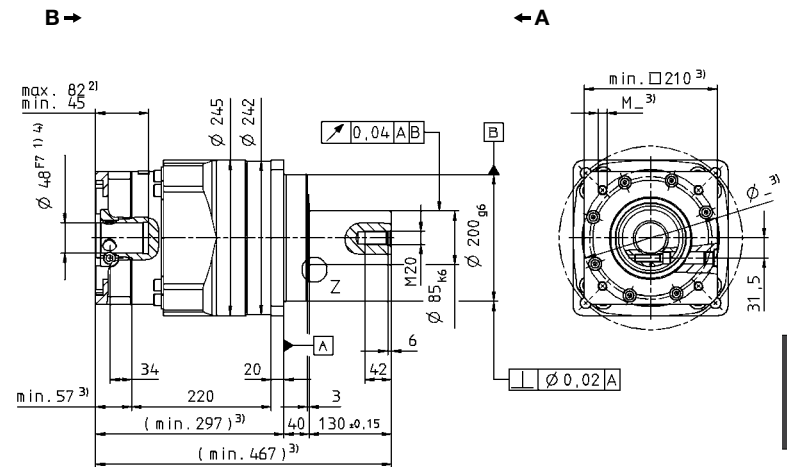
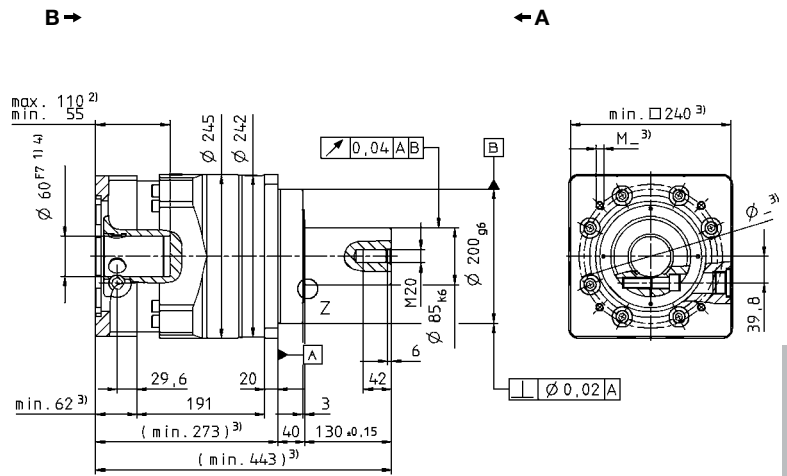


up to 60<sup>4)</sup> (O)  
clamping hub diameter

2-stage:



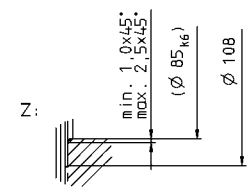
up to 48<sup>4)</sup> (M)  
clamping hub diameter



Planetary gearheads  
High End

SP+

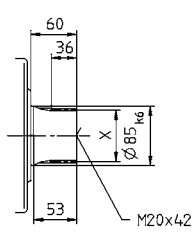
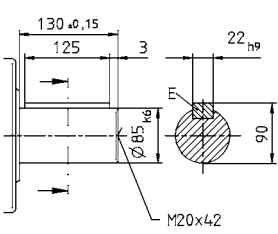
MF



Alternatives: Output shaft variants

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

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



- Non-tolerated dimensions ± 1.5 mm
- 1) Check motor shaft fit.
  - 2) Min./Max. permissible motor shaft length.  
Longer motor shafts are adaptable, please contact us.
  - 3) The dimensions depend on the motor.
  - 4) Smaller motor shaft diameter is compensated by a bushing with a minimum thickness of 1 mm.

CAD data is available under [www.wittenstein-alpha.com](http://www.wittenstein-alpha.com)

Motor mounting according to operating manual

# SP+ 075 MC HIGH SPEED 1-stage

				1-stage					
Ratio <sup>a)</sup>		<i>i</i>		3	4	5	7	10	
Max. acceleration torque (max. 1000 cycles per hour)	$T_{2B}$			Nm	68	90	90	90	70
				in.lb	602	797	797	797	620
cymex®-optimized nominal torque (please contact us regarding the design)	$T_{2Ncym}$			Nm	–	60	60	60	35
				in.lb	–	531	531	531	310
Nominal output torque (with $n_m$ )	$T_{2N}$			Nm	28	48	48	48	30
				in.lb	248	425	425	425	266
Emergency stop torque (permitted 1000 times during the service life of the gearhead)	$T_{2Not}$			Nm	200	250	250	250	200
				in.lb	1770	2213	2213	2213	1770
Nominal input speed (with $T_{2N}$ and 20°C ambient temperature) <sup>b)</sup>	$n_{1N}$		rpm	4500	4500	4500	4500	4500	
Max. input speed	$n_{1Max}$		rpm	6000	6000	6000	6000	6000	
Mean no load running torque (with $n_1=2000$ rpm and 20°C gearhead temperature) <sup>c)</sup>	$T_{012}$			Nm	1.4	1.1	0.9	0.6	0.5
				in.lb	12.4	9.7	8.0	5.3	4.4
Max. torsional backlash	$j_t$		arcmin	Standard $\leq 6$ / Reduced $\leq 4$					
Torsional rigidity	$C_{I21}$			Nm/arcmin	10				
				in.lb/arcmin	89				
Max. axial force <sup>d)</sup>	$F_{2AMax}$			N	3350				
				lb <sub>f</sub>	754				
Max. radial force <sup>d)</sup>	$F_{2RMax}$			N	4200				
				lb <sub>f</sub>	945				
Max. tilting moment	$M_{2KMMax}$			Nm	236				
				in.lb	2089				
Efficiency at full load	$\eta$		%	98.5					
Service life (For calculation, see the Chapter "Information")	$L_h$		h	> 30000					
Weight incl. standard adapter plate	$m$			kg	3.9				
				lb <sub>m</sub>	8.6				
Operating noise (with $i=10$ and $n_1=3000$ rpm no load)	$L_{PA}$		dB(A)	$\leq 59$					
Max. permitted housing temperature				°C	+90				
				F	194				
Ambient temperature				°C	-15 to +40				
				F	5 to 104				
Lubrication				Lubricated for life					
Paint				Blue RAL 5002					
Direction of rotation				Motor and gearhead same direction					
Protection class				IP 65					
Moment of inertia (relates to the drive)	E	19	$J_1$	kgcm <sup>2</sup>	1.03	0.78	0.68	0.59	0.54
				10 <sup>-3</sup> in.lb.s <sup>2</sup>	0.91	0.69	0.60	0.52	0.48
Clamping hub diameter [mm]	G	24	$J_1$	kgcm <sup>2</sup>	2.40	2.15	2.05	1.96	1.91
				10 <sup>-3</sup> in.lb.s <sup>2</sup>	2.12	1.90	1.81	1.73	1.69

Reduced mass moments of inertia available on request.

<sup>a)</sup> Other ratios available on request

<sup>b)</sup> For higher ambient temperatures, please reduce input speed

<sup>c)</sup> Valid for clamping hub diameter of 19 mm

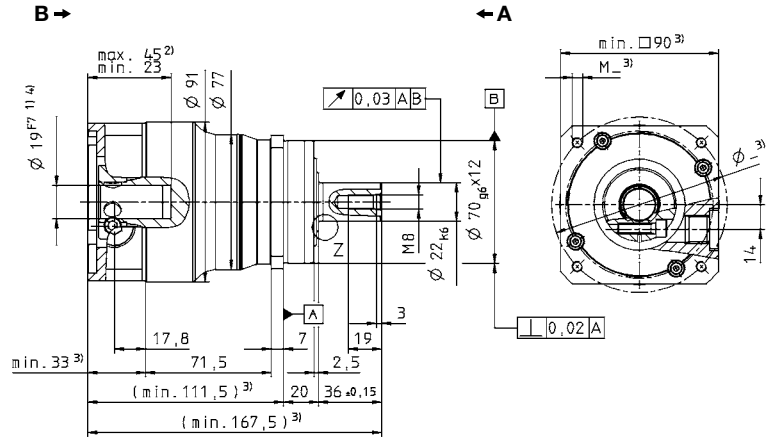
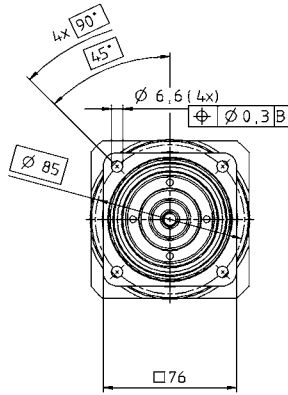
<sup>d)</sup> Refers to centre of the output shaft or flange

View A

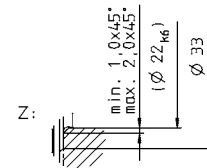
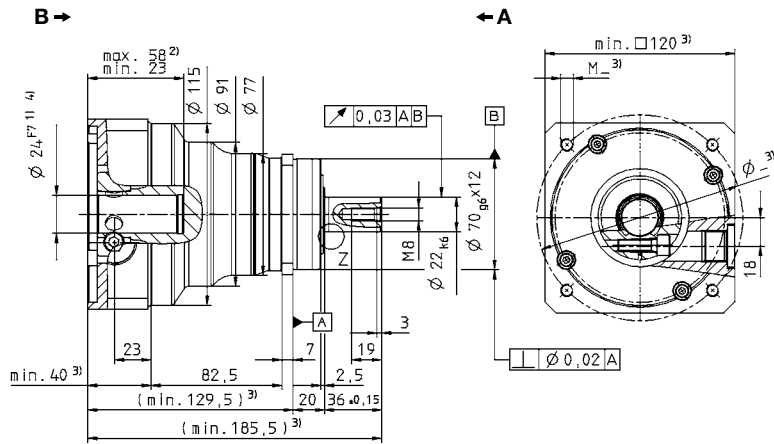
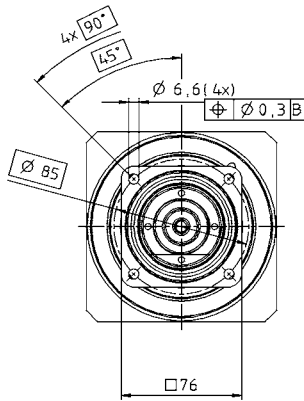
View B

Motor shaft diameter [mm]

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



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



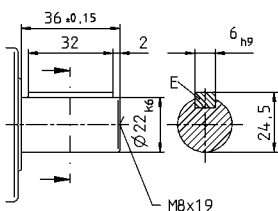
Planetary gearheads  
High End

SP+

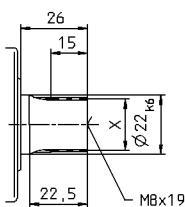
MC

Alternatives: Output shaft variants

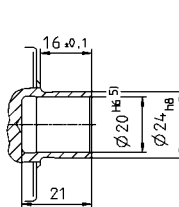
Output shaft with key in mm  
E = key as per DIN 6885, sheet 1, form A



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



Shaft mounted  
Mounted via shrink disc



Non-tolerated dimensions ± 1 mm

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

CAD data is available under [www.wittenstein-alpha.com](http://www.wittenstein-alpha.com)

Motor mounting according to operating manual

# SP+ 075 MC HIGH SPEED 2-stage

				2-stage										
Ratio <sup>a)</sup>		<i>i</i>		16	20	25	28	35	40	50	70	100		
Max. acceleration torque (max. 1000 cycles per hour)		$T_{2B}$		Nm	90	90	90	90	90	90	90	70		
				in.lb	797	797	797	797	797	797	797	797	620	
cymex®-optimized nominal torque (please contact us regarding the design)		$T_{2Ncym}$		Nm	-	-	-	-	-	60	-	35		
				in.lb	-	-	-	-	-	531	-	-	310	
Nominal output torque (with $n_m$ )		$T_{2N}$		Nm	60	60	60	60	60	55	60	60	30	
				in.lb	531	531	531	531	531	487	531	531	266	
Emergency stop torque (permitted 1000 times during the service life of the gearhead)		$T_{2Not}$		Nm	250	250	250	250	250	250	250	200		
				in.lb	2213	2213	2213	2213	2213	2213	2213	2213	1770	
Nominal input speed (with $T_{2N}$ and 20°C ambient temperature) <sup>b)</sup>		$n_{1N}$	rpm	4500	4500	4500	4500	4500	4500	4500	4500	4500		
Max. input speed		$n_{1Max}$	rpm	6000	6000	6000	6000	6000	6000	6000	6000	6000		
Mean no load running torque (with $n_1=2000$ rpm and 20°C gearhead temperature) <sup>c)</sup>		$T_{012}$		Nm	0.5	0.4	0.4	0.3	0.3	0.2	0.2	0.2		
				in.lb	4.4	3.5	3.5	2.7	2.7	1.8	1.8	1.8	1.8	
Max. torsional backlash		$j_t$	arcmin	Standard ≤ 8 / Reduced ≤ 6										
Torsional rigidity		$C_{I21}$		Nm/arcmin	10									
				in.lb/arcmin	89									
Max. axial force <sup>d)</sup>		$F_{2AMax}$		N	3350									
				lb <sub>f</sub>	754									
Max. radial force <sup>d)</sup>		$F_{2RMax}$		N	4200									
				lb <sub>f</sub>	945									
Max. tilting moment		$M_{2KMMax}$		Nm	236									
				in.lb	2089									
Efficiency at full load		$\eta$	%	96,5										
Service life (For calculation, see the Chapter "Information")		$L_h$	h	> 30000										
Weight incl. standard adapter plate		$m$		kg	3,6									
				lb <sub>m</sub>	8.0									
Operating noise (with $i=100$ and $n_1=3000$ rpm no load)		$L_{PA}$	dB(A)	≤ 59										
Max. permitted housing temperature				°C	+90									
				F	194									
Ambient temperature				°C	-15 to +40									
				F	5 to 104									
Lubrication		Lubricated for life												
Paint		Blue RAL 5002												
Direction of rotation		Motor and gearhead same direction												
Protection class		IP 65												
Moment of inertia (relates to the drive)		C	14	$J_1$	kgcm <sup>2</sup>	0.23	0.20	0.20	0.18	0.18	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	0.15	0.15	0.14	0.14
Clamping hub diameter [mm]		E	19	$J_1$	kgcm <sup>2</sup>	0.55	0.53	0.52	0.50	0.50	0.49	0.49	0.49	0.49
					10 <sup>-3</sup> in.lb.s <sup>2</sup>	0.49	0.47	0.46	0.45	0.44	0.43	0.43	0.43	0.43

Reduced mass moments of inertia available on request.

<sup>a)</sup> Other ratios available on request

<sup>b)</sup> For higher ambient temperatures, please reduce input speed

<sup>c)</sup> Valid for clamping hub diameter of 14 mm

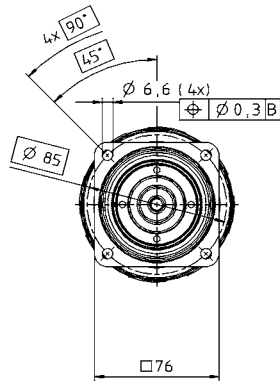
<sup>d)</sup> Refers to centre of the output shaft or flange

View A

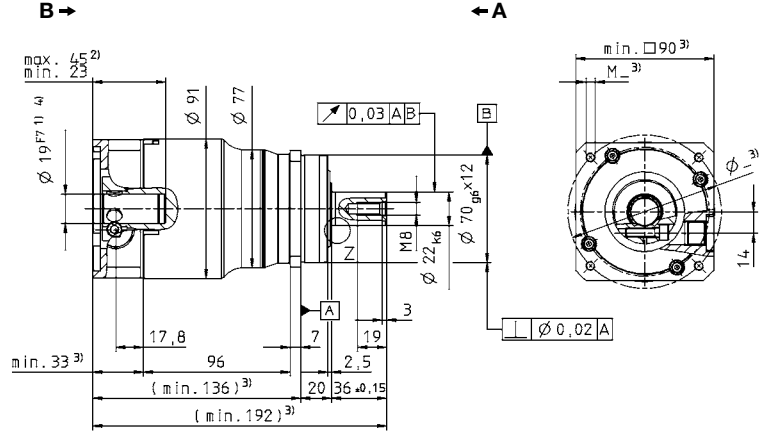
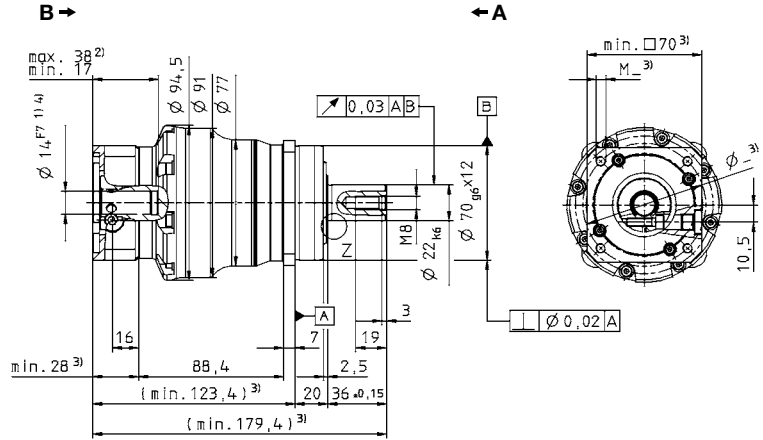
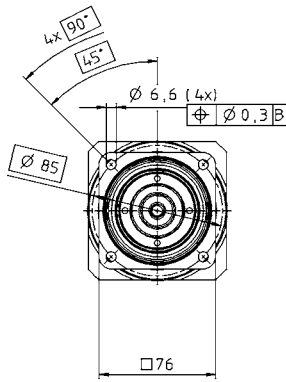
View B

Motor shaft diameter [mm]

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



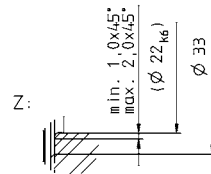
up to 19<sup>4)</sup> (E)  
clamping hub diameter



Planetary gearheads  
High End

SP+

MC

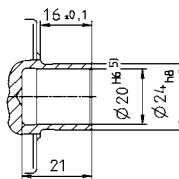
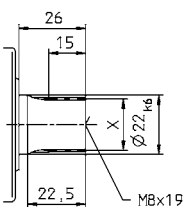
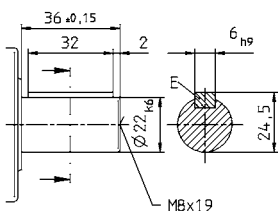


Alternatives: Output shaft variants

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

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

Shaft mounted  
Mounted via shrink disc



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

CAD data is available under [www.wittenstein-alpha.com](http://www.wittenstein-alpha.com)

Motor mounting according to operating manual

# SP+ 100 MC HIGH SPEED 1-stage

				Standard version MC					Friction optimized version L					
Ratio <sup>a)</sup>		<i>i</i>		3	4	5	7	10	3	4	5	7	10	
Max. acceleration torque (max. 1000 cycles per hour)	$T_{2B}$	Nm	in.lb	180	240	240	240	180	180	240	240	240	180	
				1593	2124	2124	2124	1593	1593	2124	2124	2124	1593	
cymex <sup>®</sup> -optimized nominal torque (please contact us regarding the design)	$T_{2Ncym}$	Nm	in.lb	95	135	135	135	90	95	135	135	135	90	
				841	1195	1195	1195	797	841	1195	1195	1195	797	
Nominal output torque (with $n_{1N}$ )	$T_{2N}$	Nm	in.lb	70	100	105	105	80	70	100	105	105	80	
				620	885	929	929	708	620	885	929	929	708	
Emergency stop torque (permitted 1000 times during the service life of the gearhead)	$T_{2Not}$	Nm	in.lb	500	625	625	625	500	500	625	625	625	500	
				4425	5531	5531	5531	4425	4425	5531	5531	5531	4425	
Nominal input speed (with $T_{2N}$ and 20°C ambient temperature) <sup>b)</sup>	$n_{1N}$	rpm		3500	4000	4500	4500	4500	3500	4000	4500	4500	4500	
cymex <sup>®</sup> optimized speed (please contact us regarding the design)	$n_{1Ncym}$	rpm		-	-	-	-	-	4500	5000	5000	5000	5000	
Max. input speed	$n_{1Max}$	rpm		6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	
Mean no load running torque (with $n_1 = 2000$ rpm and 20°C gearhead temperature) <sup>c)</sup>	$T_{012}$	Nm	in.lb	2.4	2.1	1.8	1.1	0.8	0.7	-	-	-	-	
				21.2	18.6	15.9	9.74	7.08	6.2	-	-	-	-	
Max. torsional backlash	$j_t$	arcmin		Standard $\leq 4$ / Reduced $\leq 2$										
Torsional rigidity	$C_{t21}$	Nm/ arcmin	in.lb/ arcmin	31										
				274										
Max. axial force <sup>d)</sup>	$F_{2AMax}$	N	lb <sub>f</sub>	5650					-					
				1271					-					
Max. radial force <sup>d)</sup>	$F_{2RMMax}$	N	lb <sub>f</sub>	6600					1000					
				1485					225					
Max. tilting moment	$M_{2KMMax}$	Nm	in.lb	487					72					
				4310					637					
Efficiency at full load	$\eta$	%		98.5					99					
Service life (For calculation, see the Chapter "Information")	$L_h$	h		> 30000										
Weight incl. standard adapter plate	$m$	kg	lb <sub>m</sub>	7.7					17.0					
				17.0					7.7					
Operating noise (with $i=10$ and $n_1=3000$ rpm no load)	$L_{PA}$	dB(A)		$\leq 64$										
Max. permitted housing temperature		°C	F	+90					194					
				194					+90					
Ambient temperature		°C	F	-15 to +40					5 to 104					
				5 to 104					-15 to +40					
Lubrication				Lubricated for life										
Paint				Blue RAL 5002										
Direction of rotation				Motor and gear head same direction										
Protection class				IP 65					IP 52					
Moment of inertia (relates to the drive)	G	24	$J_1$	kgcm <sup>2</sup>	3.99	3.04	2.61	2.29	2.07	3.99	3.04	2.61	2.29	2.07
				10 <sup>3</sup> in.lb.s <sup>2</sup>	3.53	2.69	2.31	2.03	1.83	3.53	2.69	2.31	2.03	1.83
Clamping hub diameter [mm]	K	38	$J_1$	kgcm <sup>2</sup>	11.1	10.1	9.68	9.36	9.14	11.1	10.1	9.68	9.36	9.14
				10 <sup>3</sup> in.lb.s <sup>2</sup>	9.78	8.95	8.57	8.28	8.09	9.78	8.95	8.57	8.28	8.09

Reduced mass moments of inertia available on request.

<sup>a)</sup> Other ratios available on request

<sup>b)</sup> For higher ambient temperatures, please reduce input speed

<sup>c)</sup> Valid for clamping hub diameter of 24 mm

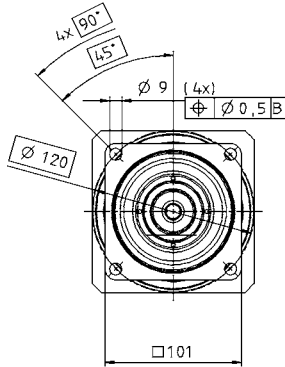
<sup>d)</sup> Refers to centre of the output shaft or flange

View A

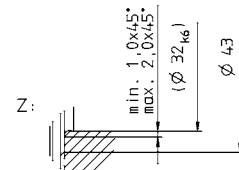
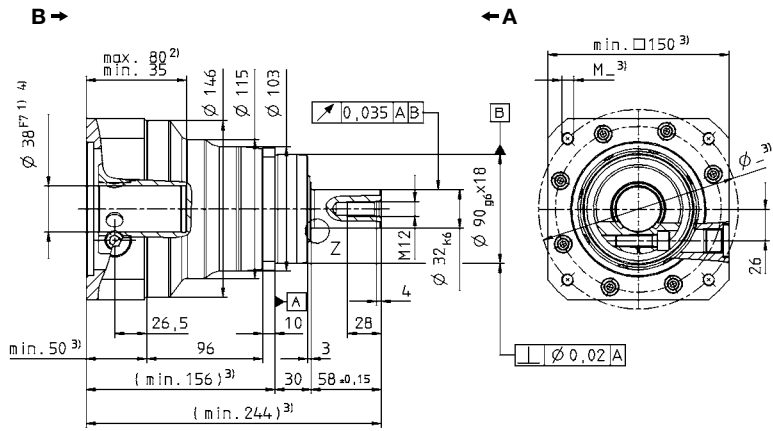
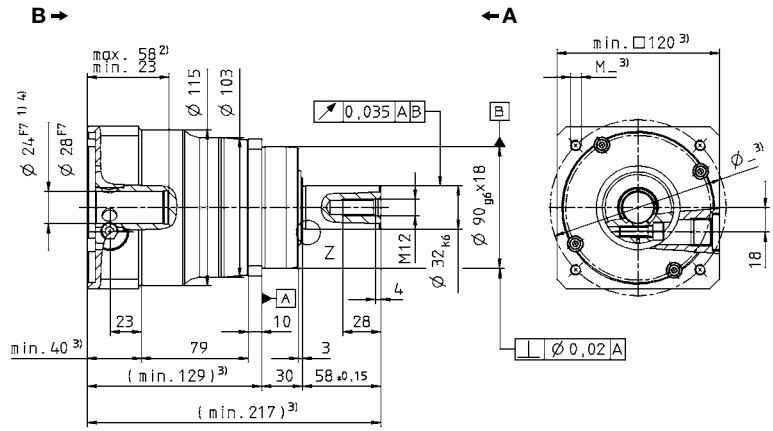
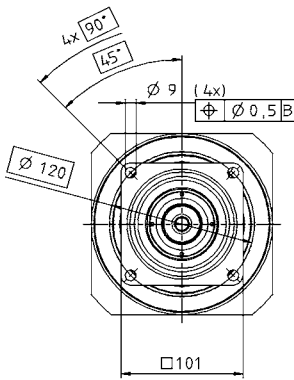
View B

Motor shaft diameter [mm]

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



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



Planetary gearheads  
High End

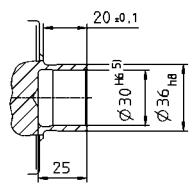
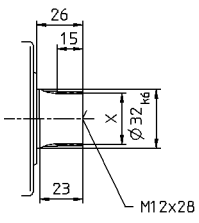
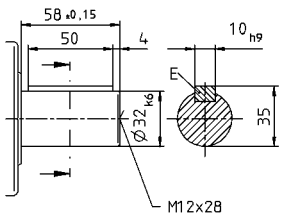
SP+  
MC  
MC-L

Alternatives: Output shaft variants

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

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

Shaft mounted  
Mounted via shrink disc



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

CAD data is available under [www.wittenstein-alpha.com](http://www.wittenstein-alpha.com)

Motor mounting according to operating manual



# SP+ 100 MC HIGH SPEED 2-stage

				2-stage									
Ratio <sup>a)</sup>		<i>i</i>		16	20	25	28	35	40	50	70	100	
Max. acceleration torque (max. 1000 cycles per hour)	$T_{2B}$			Nm	240	240	240	240	240	240	240	180	
				in.lb	2124	2124	2124	2124	2124	2124	2124	2124	1593
cymex®-optimized nominal torque (please contact us regarding the design)	$T_{2Ncym}$			Nm	-	-	-	-	-	-	-	90	
				in.lb	-	-	-	-	-	-	-	-	797
Nominal output torque (with $n_{2N}$ )	$T_{2N}$			Nm	140	140	140	140	140	140	135	80	
				in.lb	1239	1239	1239	1239	1239	1239	1239	1195	708
Emergency stop torque (permitted 1000 times during the service life of the gearhead)	$T_{2Not}$			Nm	625	625	625	625	625	625	625	500	
				in.lb	5531	5531	5531	5531	5531	5531	5531	5531	4425
Nominal input speed (with $T_{2N}$ and 20°C ambient temperature) <sup>b)</sup>	$n_{1N}$		rpm	4500	4500	4500	4500	4500	4500	4500	4500	4500	
Max. input speed	$n_{1Max}$		rpm	6000	6000	6000	6000	6000	6000	6000	6000	6000	
Mean no load running torque (with $n_1=2000$ rpm and 20°C gearhead temperature) <sup>c)</sup>	$T_{012}$			Nm	0.8	0.7	0.6	0.5	0.4	0.4	0.3	0.3	
				in.lb	7.1	6.2	5.3	4.4	3.5	3.5	2.7	2.7	2.7
Max. torsional backlash	$j_t$		arcmin	Standard $\leq 6$ / Reduced $\leq 4$									
Torsional rigidity	$C_{I21}$			Nm/arcmin	31								
				in.lb/arcmin	274								
Max. axial force <sup>d)</sup>	$F_{2AMax}$			N	5650								
				lb <sub>f</sub>	1271								
Max. radial force <sup>d)</sup>	$F_{2RMax}$			N	6600								
				lb <sub>f</sub>	1485								
Max. tilting moment	$M_{2KMMax}$			Nm	487								
				in.lb	4310								
Efficiency at full load	$\eta$		%	96.5									
Service life (For calculation, see the Chapter "Information")	$L_h$		h	> 30000									
Weight incl. standard adapter plate	$m$			kg	7.9								
				lb <sub>m</sub>	17.5								
Operating noise (with $i=100$ and $n_1=3000$ rpm no load)	$L_{PA}$		dB(A)	$\leq 60$									
Max. permitted housing temperature				°C	+90								
				F	194								
Ambient temperature				°C	-15 to +40								
				F	5 to 104								
Lubrication				Lubricated for life									
Paint				Blue RAL 5002									
Direction of rotation				Motor and gearhead same direction									
Protection class				IP 65									
Moment of inertia (relates to the drive)	E	19	$J_1$	kgcm <sup>2</sup>	0.81	0.70	0.69	0.60	0.59	0.55	0.54	0.54	0.54
				10 <sup>-3</sup> in.lb.s <sup>2</sup>	0.72	0.62	0.61	0.53	0.52	0.48	0.48	0.48	0.47
Clamping hub diameter [mm]	G	24	$J_1$	kgcm <sup>2</sup>	2.18	2.07	2.05	1.97	1.96	1.92	1.91	1.91	1.91
				10 <sup>-3</sup> in.lb.s <sup>2</sup>	1.93	1.83	1.82	1.74	1.74	1.70	1.69	1.69	1.69

Reduced mass moments of inertia available on request.

<sup>a)</sup> Other ratios available on request

<sup>b)</sup> For higher ambient temperatures, please reduce input speed

<sup>c)</sup> Valid for clamping hub diameter of 19 mm

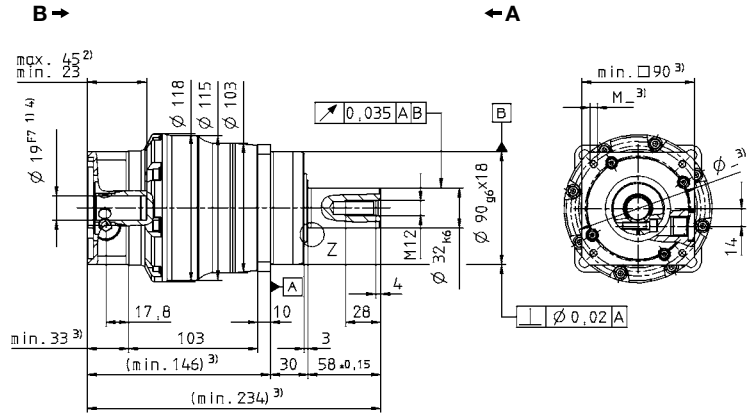
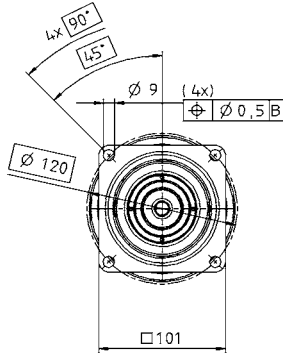
<sup>d)</sup> Refers to centre of the output shaft or flange

View A

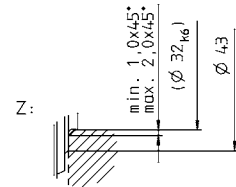
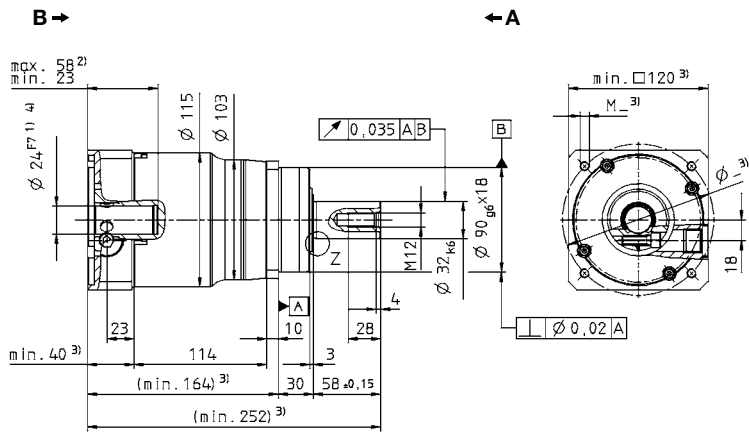
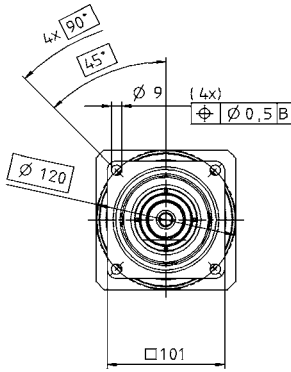
View B

Motor shaft diameter [mm]

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



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



Planetary gearheads  
High End

SP+

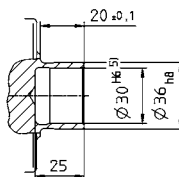
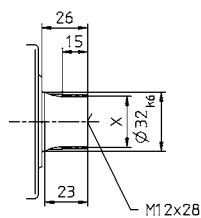
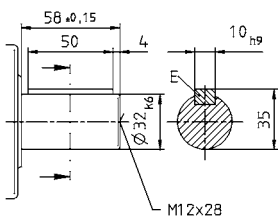
MC

Alternatives: Output shaft variants

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

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

Shaft mounted  
Mounted via shrink disc



Non-tolerated dimensions ± 1 mm

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

CAD data is available under [www.wittenstein-alpha.com](http://www.wittenstein-alpha.com)

Motor mounting according to operating manual

# SP+ 140 MC HIGH SPEED 1-stage

				Standard version MC					Friction optimized version L					
Ratio <sup>a)</sup>		<i>i</i>		3	4	5	7	10	3	4	5	7	10	
Max. acceleration torque (max. 1000 cycles per hour)	$T_{2B}$	Nm		310	480	480	480	380	310	480	480	480	380	
				in.lb	2744	4248	4248	4248	3363	2744	4248	4248	4248	3363
cymex <sup>®</sup> -optimized nominal torque (please contact us regarding the design)	$T_{2Ncym}$	Nm		150	240	240	270	180	150	240	240	270	180	
				in.lb	1328	2124	2124	2390	1593	2744	4248	4248	4248	3363
Nominal output torque (with $n_{1N}$ )	$T_{2N}$	Nm		130	195	205	210	160	130	195	205	210	160	
				in.lb	1151	1726	1814	1859	1416	1151	1726	1814	1859	1416
Emergency stop torque (permitted 1000 times during the service life of the gearhead)	$T_{2Not}$	Nm		1000	1250	1250	1250	1000	1000	1250	1250	1250	1000	
				in.lb	8850	11063	11063	11063	8850	8850	11063	11063	11063	8850
Nominal input speed (with $T_{2N}$ and 20°C ambient temperature) <sup>b)</sup>	$n_{1N}$	rpm		3000	3500	4500	4500	4500	3000	3500	4500	4500	4500	
cymex <sup>®</sup> optimized speed (please contact us regarding the design)	$n_{1Ncym}$	rpm		-	-	-	-	-	4000	4500	5000	5000	5000	
Max. input speed	$n_{1Max}$	rpm		6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	
Mean no load running torque (with $n_1 = 2000$ rpm and 20°C gearhead temperature) <sup>c)</sup>	$T_{012}$	Nm		5.1	3.9	3.1	2.3	1.6	1.0	-	-	-	-	
				in.lb	45.1	34.5	27.4	20.4	14.2	8.9	-	-	-	-
Max. torsional backlash	$j_t$	arcmin		Standard $\leq 4$ / Reduced $\leq 2$										
Torsional rigidity	$C_{t21}$	Nm/ arcmin		53										
				in.lb/ arcmin	469									
Max. axial force <sup>d)</sup>	$F_{2AMax}$	N		9870					-					
				lb <sub>f</sub>	2221					-				
Max. radial force <sup>d)</sup>	$F_{2RMMax}$	N		9900					1200					
				lb <sub>f</sub>	2228					270				
Max. tilting moment	$M_{2KMMax}$	Nm		952					110					
				in.lb	8425					974				
Efficiency at full load	$\eta$	%		98.5					99					
Service life (For calculation, see the Chapter "Information")	$L_h$	h		> 30000										
Weight incl. standard adapter plate	$m$	kg		17.2										
				lb <sub>m</sub>	38									
Operating noise (with $i=10$ and $n_1=3000$ rpm no load)	$L_{PA}$	dB(A)		$\leq 65$										
Max. permitted housing temperature		°C		+90										
				F	194									
Ambient temperature		°C		-15 to +40										
				F	5 to 104									
Lubrication				Lubricated for life										
Paint				Blue RAL 5002										
Direction of rotation				Motor and gearhead same direction										
Protection class				IP 65					IP 52					
Moment of inertia (relates to the drive)	K	38	$J_1$	kgcm <sup>2</sup>	14.9	12.1	11.0	10.1	9.51	14.9	12.1	11.0	10.1	9.51
				10 <sup>-3</sup> in.lb.s <sup>2</sup>	13.2	10.7	9.8	8.9	8.4	13.2	10.7	9.8	8.9	8.4
Clamping hub diameter [mm]	M	48	$J_1$	kgcm <sup>2</sup>	29.5	26.7	25.6	24.7	24.2	29.5	26.7	25.6	24.7	24.2
				10 <sup>-3</sup> in.lb.s <sup>2</sup>	26.1	23.6	22.7	21.9	21.4	26.1	23.6	22.7	21.9	21.4

Reduced mass moments of inertia available on request.

<sup>a)</sup> Other ratios available on request

<sup>b)</sup> For higher ambient temperatures, please reduce input speed

<sup>c)</sup> Valid for clamping hub diameter of 38 mm

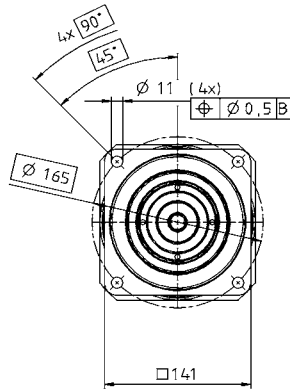
<sup>d)</sup> Refers to center of the output shaft or flange

View A

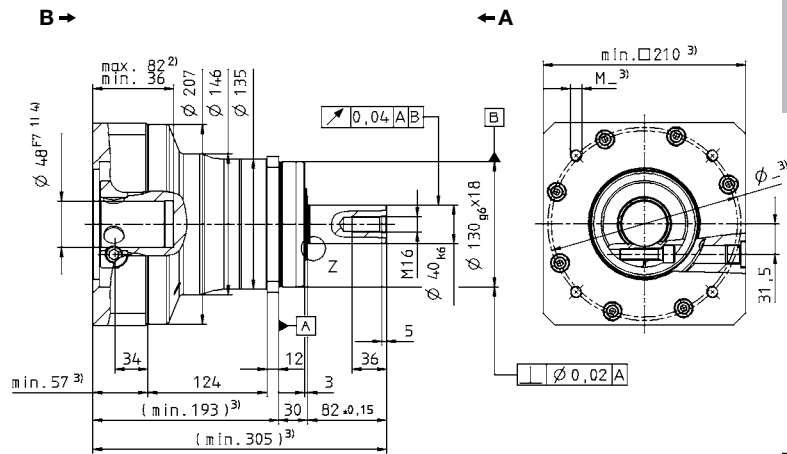
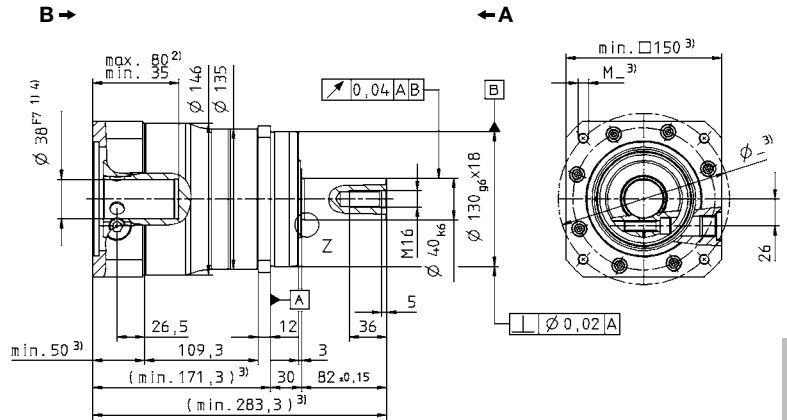
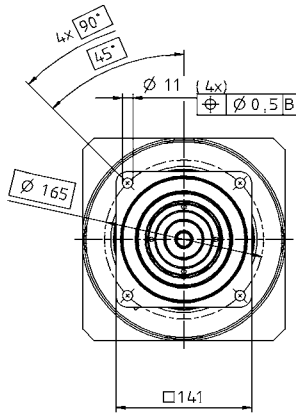
View B

Motor shaft diameter [mm]

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



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

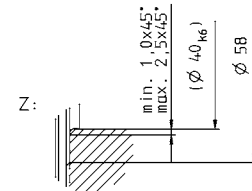


Planetary gearheads  
High End

SP+

MC

MC-L

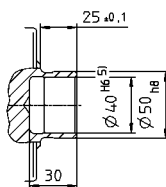
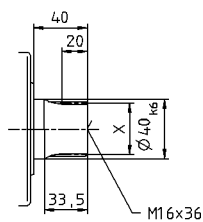
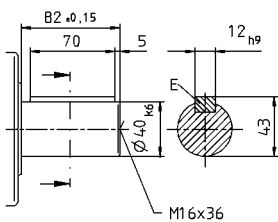


Alternatives: Output shaft variants

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

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

Shaft mounted  
Mounted via shrink disc



Non-tolerated dimensions ± 1 mm

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

CAD data is available under [www.wittenstein-alpha.com](http://www.wittenstein-alpha.com)

Motor mounting according to operating manual

# SP+ 140 MC HIGH SPEED 2-stage

				2-stage									
Ratio <sup>a)</sup>		<i>i</i>		16	20	25	28	35	40	50	70	100	
Max. acceleration torque (max. 1000 cycles per hour)	$T_{2B}$	Nm		480	480	480	480	480	480	480	480	380	
				in.lb	4248	4248	4248	4248	4248	4248	4248	4248	3363
cymex®-optimized nominal torque (please contact us regarding the design)	$T_{2Ncym}$	Nm		290	290	290	-	-	-	-	-	-	
				in.lb	2567	2567	2567	-	-	-	-	-	-
Nominal output torque (with $n_{2N}$ )	$T_{2N}$	Nm		260	280	280	290	290	290	290	260	180	
				in.lb	2301	2478	2478	2567	2567	2567	2567	2301	1593
Emergency stop torque (permitted 1000 times during the service life of the gearhead)	$T_{2Not}$	Nm		1250	1250	1250	1250	1250	1250	1250	1250	1000	
				in.lb	11063	11063	11063	11063	11063	11063	11063	11063	8850
Nominal input speed (with $T_{2N}$ and 20°C ambient temperature) <sup>b)</sup>	$n_{1N}$	rpm		4500	4500	4500	4500	4500	4500	4500	4500	4500	
Max. input speed	$n_{1Max}$	rpm		6000	6000	6000	6000	6000	6000	6000	6000	6000	
Mean no load running torque (with $n_1=2000$ rpm and 20°C gearhead temperature) <sup>c)</sup>	$T_{012}$	Nm		1.6	1.3	1.2	1.0	0.9	0.7	0.6	0.5	0.5	
				in.lb	14.2	11.5	10.6	8.9	8.0	6.2	5.3	4.4	4.4
Max. torsional backlash	$j_t$	arcmin		Standard $\leq 6$ / Reduced $\leq 4$									
Torsional rigidity	$C_{I21}$	Nm/arcmin		53									
				in.lb/arcmin	469								
Max. axial force <sup>d)</sup>	$F_{2AMax}$	N		9870									
				lb <sub>f</sub>	2221								
Max. radial force <sup>d)</sup>	$F_{2RMax}$	N		9900									
				lb <sub>f</sub>	2228								
Max. tilting moment	$M_{2KMMax}$	Nm		952									
				in.lb	8425								
Efficiency at full load	$\eta$	%		96.5									
Service life (For calculation, see the Chapter "Information")	$L_h$	h		> 30000									
Weight incl. standard adapter plate	$m$	kg		17									
				lb <sub>m</sub>	38								
Operating noise (with $i=100$ and $n_1=3000$ rpm no load)	$L_{PA}$	dB(A)		$\leq 63$									
Max. permitted housing temperature		°C		+90									
				F	194								
Ambient temperature		°C		-15 to +40									
				F	5 to 104								
Lubrication				Lubricated for life									
Paint				Blue RAL 5002									
Direction of rotation				Motor and gearhead same direction									
Protection class				IP 65									
Moment of inertia (relates to the drive)	G	24	$J_1$	kgcm <sup>2</sup>	3.19	2.71	2.67	2.34	2.32	2.10	2.08	2.08	2.07
				10 <sup>-3</sup> in.lb.s <sup>2</sup>	2.82	2.40	2.36	2.07	2.05	1.85	1.85	1.84	1.83
Clamping hub diameter [mm]	K	38	$J_1$	kgcm <sup>2</sup>	10.3	9.77	9.73	9.41	9.39	9.16	9.15	9.14	9.14
				10 <sup>-3</sup> in.lb.s <sup>2</sup>	9.07	8.65	8.61	8.33	8.31	8.11	8.10	8.09	8.09

Reduced mass moments of inertia available on request.

<sup>a)</sup> Other ratios available on request

<sup>b)</sup> For higher ambient temperatures, please reduce input speed

<sup>c)</sup> Valid for clamping hub diameter of 24 mm

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

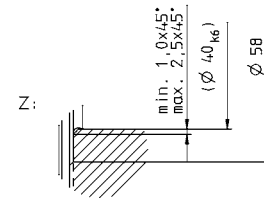
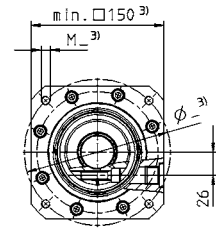
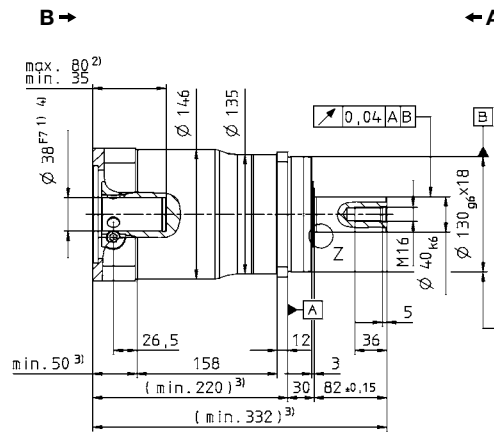
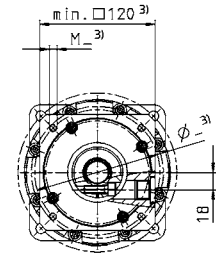
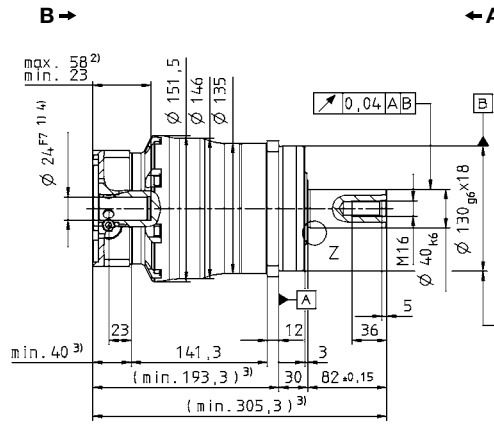
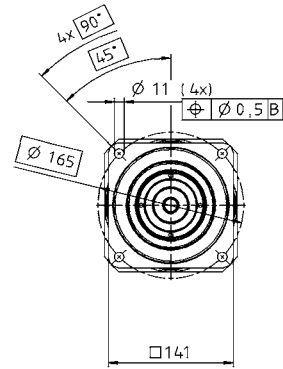
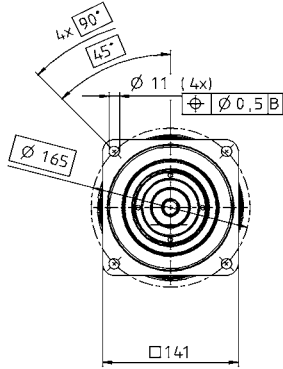
View A

View B

Motor shaft diameter [mm]

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

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



Planetary gearheads  
High End

SP+

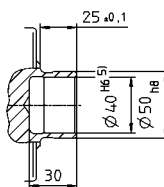
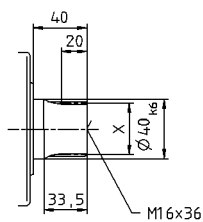
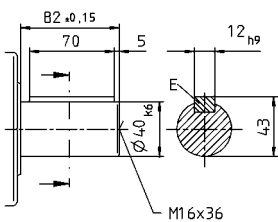
MC

Alternatives: Output shaft variants

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

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

Shaft mounted  
Mounted via shrink disc



Non-tolerated dimensions ± 1 mm

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

CAD data is available under [www.wittenstein-alpha.com](http://www.wittenstein-alpha.com)

Motor mounting according to operating manual

# SP+ 180 MC HIGH SPEED 1-stage

				Standard version MC					Friction optimized version L					
Ratio <sup>a)</sup>		<i>i</i>		3	4	5	7	10	3	4	5	7	10	
Max. acceleration torque (max. 1000 cycles per hour)	$T_{2B}$	Nm	in.lb	700	880	880	880	700	700	880	880	880	700	
				6195	7788	7788	7788	6195	6195	7788	7788	7788	6195	
cymex <sup>®</sup> -optimized nominal torque (please contact us regarding the design)	$T_{2Ncym}$	Nm	in.lb	350	600	600	600	540	350	600	600	600	540	
				3098	5310	5310	5310	4779	3098	5310	5310	5310	3098	
Nominal output torque (with $n_m$ )	$T_{2N}$	Nm	in.lb	290	450	440	450	400	290	450	450	450	400	
				2567	3983	3894	3983	3540	2567	3983	3983	3983	3540	
Emergency stop torque (permitted 1000 times during the service life of the gearhead)	$T_{2Not}$	Nm	in.lb	2200	2750	2750	2750	2200	2200	2750	2750	2750	2200	
				19470	24338	24338	24338	19470	19470	24338	24338	24338	19470	
Nominal input speed (with $T_{2N}$ and 20°C ambient temperature) <sup>b)</sup>	$n_{1N}$	rpm		3000	3500	4500	4500	4500	3000	3500	4500	4500	4500	
cymex <sup>®</sup> optimized speed (please contact us regarding the design)	$n_{1Ncym}$	rpm		-	-	-	-	-	4000	4500	5000	5000	5000	
Max. input speed	$n_{1Max}$	rpm		4500	6000	6000	6000	6000	4500	6000	6000	6000	6000	
Mean no load running torque (with $n_i = 2000$ rpm and 20°C gearhead temperature) <sup>c)</sup>	$T_{012}$	Nm	in.lb	10.2	7.7	6.2	4.5	3.2	3.0	-	-	-	-	
				90.3	68.1	54.9	39.8	28.3	26.6	-	-	-	-	
Max. torsional backlash	$j_t$	arcmin	Standard $\leq 4$ / Reduced $\leq 2$											
Torsional rigidity	$C_{t21}$	Nm/ arcmin	in.lb/ arcmin	175										
				1549										
Max. axial force <sup>d)</sup>	$F_{2AMax}$	N	lb <sub>f</sub>	14150					-					
				3184					-					
Max. radial force <sup>d)</sup>	$F_{2RMMax}$	N	lb <sub>f</sub>	15400					2000					
				3465					450					
Max. tilting moment	$M_{2KMMax}$	Nm	in.lb	1600					208					
				14160					1841					
Efficiency at full load	$\eta$	%	98.5					99						
Service life (For calculation, see the Chapter "Information")	$L_h$	h	> 30000											
Weight incl. standard adapter plate	$m$	kg	lb <sub>m</sub>	34					75					
				75					34					
Operating noise (with $i=10$ and $n_i=3000$ rpm no load)	$L_{PA}$	dB(A)	$\leq 66$											
Max. permitted housing temperature		°C	F	+90					194					
				194					+90					
Ambient temperature		°C	F	-15 to +40					5 to 104					
				5 to 104					-15 to +40					
Lubrication	Lubricated for life													
Paint	Blue RAL 5002													
Direction of rotation	Motor and gearhead same direction													
Protection class	IP 65						IP 52							
Moment of inertia (relates to the drive)	M	48	$J_1$	kgcm <sup>2</sup>	58.5	41.6	35.6	30.0	26.9	58.5	41.6	35.6	30.0	26.9
				10 <sup>-3</sup> in.lb.s <sup>2</sup>	51.8	36.8	31.5	26.6	23.8	51.8	36.8	31.5	26.6	23.8

Reduced mass moments of inertia available on request.

<sup>a)</sup> Other ratios available on request

<sup>b)</sup> For higher ambient temperatures, please reduce input speed

<sup>c)</sup> Valid for clamping hub diameter of 48 mm

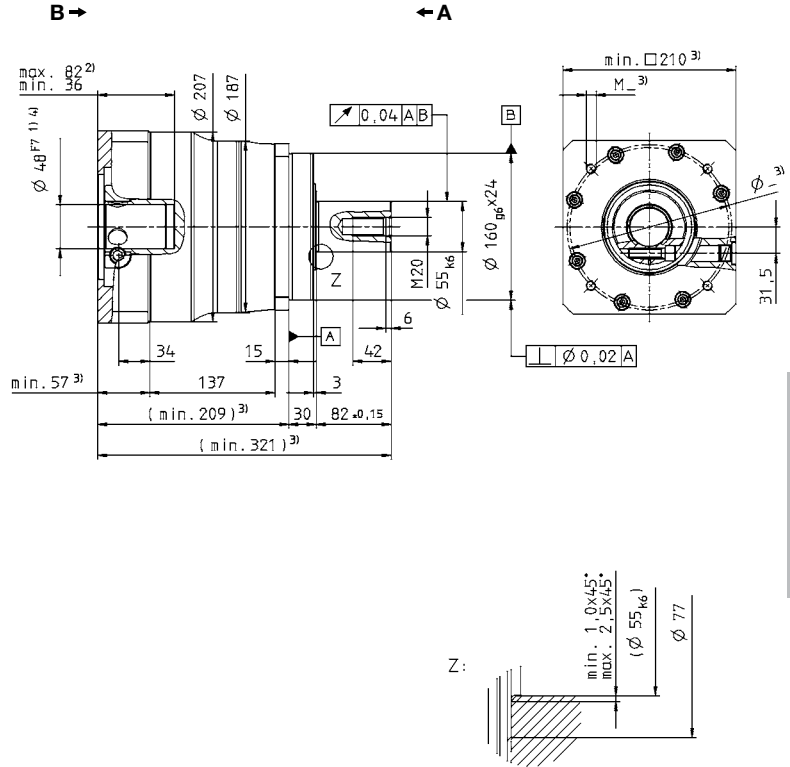
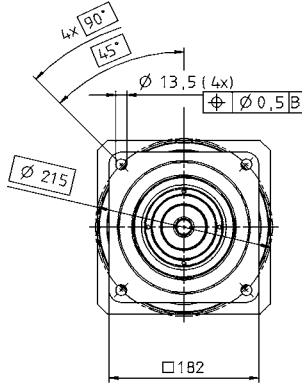
<sup>d)</sup> Refers to center of the output shaft or flange

View A

View B

Motor shaft diameter [mm]

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



Planetary gearheads  
High End

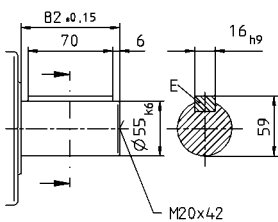
SP+

MC

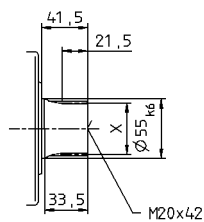
MC-L

Alternatives: Output shaft variants

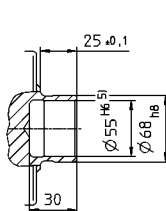
Output shaft with key in mm  
E = key as per DIN 6885, sheet 1, form A



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



Shaft mounted  
Mounted via shrink disc



Non-tolerated dimensions ± 1 mm

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

CAD data is available under [www.wittenstein-alpha.com](http://www.wittenstein-alpha.com)

Motor mounting according to operating manual



# SP+ 180 MC HIGH SPEED 2-stage

				2-stage									
Ratio <sup>a)</sup>	<i>i</i>			16	20	25	28	35	40	50	70	100	
Max. acceleration torque (max. 1000 cycles per hour)	$T_{2B}$		Nm	880	880	880	880	880	880	880	880	700	
			in.lb	7788	7788	7788	7788	7788	7788	7788	7788	7788	6195
cymex®-optimized nominal torque (please contact us regarding the design)	$T_{2Ncym}$		Nm	–	–	–	–	–	–	–	–	–	
			in.lb	–	–	–	–	–	–	–	–	–	–
Nominal output torque (with $n_m$ )	$T_{2N}$		Nm	600	600	600	600	600	600	600	600	600	
			in.lb	5310	5310	5310	5310	5310	5310	5310	5310	5310	5310
Emergency stop torque (permitted 1000 times during the service life of the gearhead)	$T_{2Not}$		Nm	2750	2750	2750	2750	2750	2750	2750	2750	2200	
			in.lb	24338	24338	24338	24338	24338	24338	24338	24338	24338	19470
Nominal input speed (with $T_{2N}$ and 20°C ambient temperature) <sup>b)</sup>	$n_{1N}$		rpm	4500	4500	4500	4500	4500	4500	4500	4500	4500	
Max. input speed	$n_{1Max}$		rpm	6000	6000	6000	6000	6000	6000	6000	6000	6000	
Mean no load running torque (with $n_1=2000$ rpm and 20°C gearhead temperature) <sup>c)</sup>	$T_{012}$		Nm	3.2	2.6	2.3	1.9	1.7	1.4	1.2	1.0	0.9	
			in.lb	28.3	23.0	20.4	16.8	15.0	12.4	10.6	8.9	8.0	
Max. torsional backlash	$j_t$		arcmin	Standard $\leq 6$ / Reduced $\leq 4$									
Torsional rigidity	$C_{I21}$		Nm/arcmin	175									
			in.lb/arcmin	149									
Max. axial force <sup>d)</sup>	$F_{2AMax}$		N	14150									
			lb <sub>f</sub>	3184									
Max. radial force <sup>d)</sup>	$F_{2RMax}$		N	15400									
			lb <sub>f</sub>	3465									
Max. tilting moment	$M_{2KMMax}$		Nm	1600									
			in.lb	14160									
Efficiency at full load	$\eta$		%	96.5									
Service life (For calculation, see the Chapter "Information")	$L_h$		h	> 30000									
Weight incl. standard adapter plate	$m$		kg	36									
			lb <sub>m</sub>	80									
Operating noise (with $i=100$ and $n_1=3000$ rpm no load)	$L_{PA}$		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									
Paint				Blue RAL 5002									
Direction of rotation				Motor and gearhead same direction									
Protection class				IP 65									
Moment of inertia (relates to the drive)	K	38	$J_1$	kgcm <sup>2</sup>	13.5	12.0	11.7	10.6	10.4	9.74	9.68	9.63	9.60
				10 <sup>-3</sup> in.lb.s <sup>2</sup>	12.0	10.6	10.4	9.34	9.23	8.62	8.57	8.52	8.49
Clamping hub diameter [mm]													

Reduced mass moments of inertia available on request.

<sup>a)</sup> Other ratios available on request

<sup>b)</sup> For higher ambient temperatures, please reduce input speed

<sup>c)</sup> Valid for clamping hub diameter of 38 mm

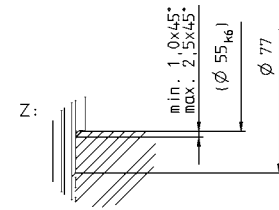
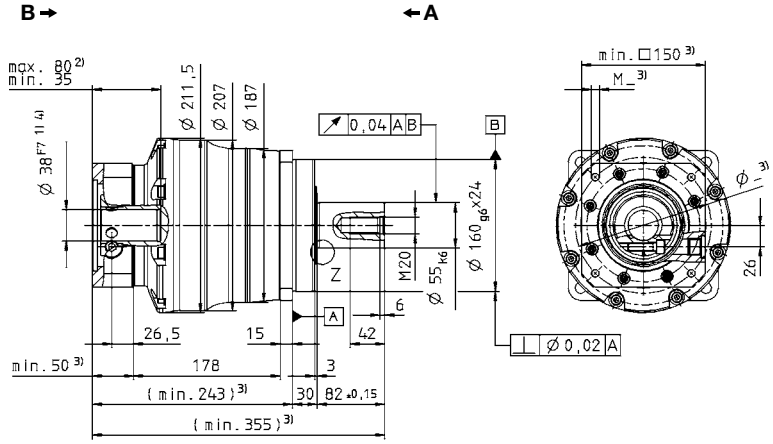
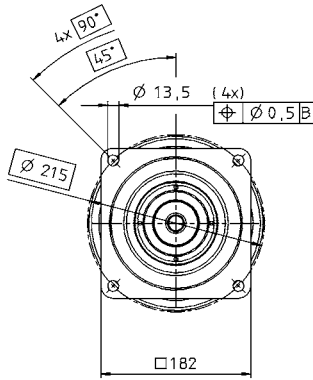
<sup>d)</sup> Refers to center of the output shaft or flange

View A

View B

Motor shaft diameter [mm]

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



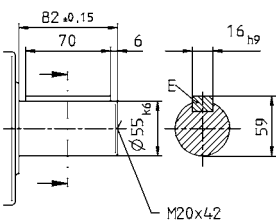
Planetary gearheads  
High End

SP+

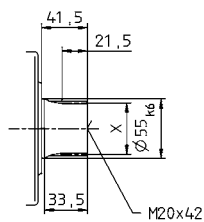
MC

Alternatives: Output shaft variants

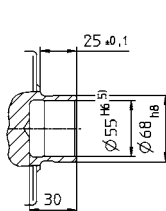
Output shaft with key in mm  
E = key as per DIN 6885, sheet 1, form A



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



Shaft mounted  
Mounted via shrink disc



Non-tolerated dimensions ± 1 mm

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

CAD data is available under [www.wittenstein-alpha.com](http://www.wittenstein-alpha.com)

Motor mounting according to operating manual

# SP+ 210 MC HIGH SPEED 1-stage

				Standard version MC					Friction optimized version L						
Ratio <sup>a)</sup>		<i>i</i>		3	4	5	7	10	3	4	5	7	10		
Max. acceleration torque (max. 1000 cycles per hour)		$T_{2B}$	Nm	1200	2000	2000	1700	1200	1200	2000	2000	1700	1200		
			in.lb	10620	17700	17700	15045	10620	10620	17700	17700	15045	10620		
cymex <sup>®</sup> -optimized nominal torque (please contact us regarding the design)		$T_{2Ncym}$	Nm	- Please contact us -											
			in.lb												
Nominal output torque (with $n_m$ )		$T_{2N}$	Nm	900	1300	1150	1000	800	900	1300	1150	1000	800		
			in.lb	7965	11505	10178	8850	7080	7965	11505	10178	8850	7080		
Emergency stop torque (permitted 1000 times during the service life of the gearhead)		$T_{2Not}$	Nm	5000	5200	5200	5200	5000	5000	5200	5200	5200	5000		
			in.lb	44250	46020	46020	46020	44250	44250	46020	46020	46020	44250		
Nominal input speed (with $T_{2N}$ and 20°C ambient temperature) <sup>b)</sup>		$n_{1N}$	rpm	2250	2500	3500	3500	3500	2250	2500	3500	3500	3500		
cymex <sup>®</sup> optimized speed (please contact us regarding the design)		$n_{1Ncym}$	rpm	-	-	-	-	-	2750	3000	4000	4000	4000		
Max. input speed		$n_{1Max}$	rpm	3400	6000	6000	6000	6000	6000	6000	6000	6000	6000		
Mean no load running torque (with $n_i = 2000$ rpm and 20°C gearhead temperature) <sup>c)</sup>		$T_{012}$	Nm	13.0	9.0	6.5	4.0	2.5	5.5	4.9	4.6	4.0	3.4		
			in.lb	115.1	79.7	57.5	35.4	22.1	49	43	41	35	30		
Max. torsional backlash		$j_t$	arcmin	Standard $\leq 4$ / Reduced $\leq 2$											
Torsional rigidity		$C_{t21}$	Nm/ arcmin	400											
			in.lb/ arcmin	3540											
Max. axial force <sup>d)</sup>		$F_{2AMax}$	N	30000					8000						
			lb <sub>f</sub>	6750					1800						
Max. radial force <sup>d)</sup>		$F_{2RMMax}$	N	21000					2500						
			lb <sub>f</sub>	4725					563						
Max. tilting moment		$M_{2KMMax}$	Nm	3100					310						
			in.lb	27435					2744						
Efficiency at full load		$\eta$	%	98.5					99.0						
Service life (For calculation, see the Chapter "Information")		$L_h$	h	> 30000											
Weight incl. standard adapter plate		$m$	kg	56											
			lb <sub>m</sub>	124											
Operating noise (with $i=10$ and $n_i=2000$ rpm no load)		$L_{PA}$	dB(A)	< 64											
Max. permitted housing temperature				°C					+90						
				F					194						
Ambient temperature				°C					-15 to +40						
				F					5 to 104						
Lubrication		Lubricated for life													
Paint		Blue RAL 5002													
Direction of rotation		Motor and gearhead same direction													
Protection class		IP 65					IP 52								
Moment of inertia (relates to the drive)		N	55	$J_1$	kgcm <sup>2</sup>	139.0	94.3	76.9	61.5	53.1	139.0	94.3	76.9	61.5	53.1
Clamping hub diameter [mm]					10 <sup>3</sup> in.lb.s <sup>2</sup>	123.0	83.5	68.1	54.4	47.0	123.0	83.5	68.1	54.4	47.0

Reduced mass moments of inertia available on request.

<sup>a)</sup> Other ratios available on request

<sup>b)</sup> For higher ambient temperatures, please reduce input speed

<sup>c)</sup> Valid for clamping hub diameter of 55 mm

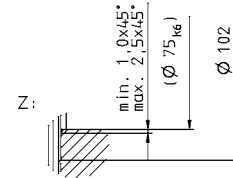
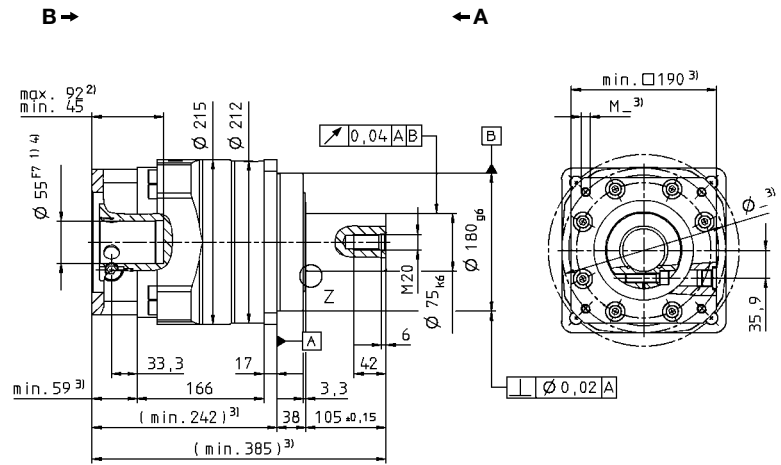
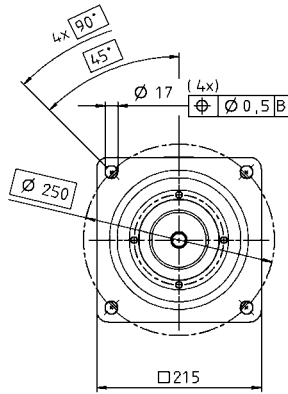
<sup>d)</sup> Refers to center of the output shaft or flange

View A

View B

Motor shaft diameter [mm]

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



Planetary gearheads  
High End

SP+

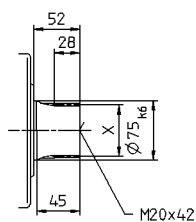
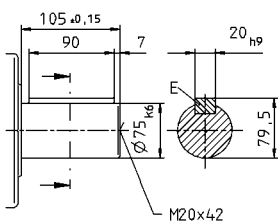
MC

MC-L

Alternatives: Output shaft variants

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

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



Non-tolerated dimensions ± 1.5 mm

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

CAD data is available under [www.wittenstein-alpha.com](http://www.wittenstein-alpha.com)

Motor mounting according to operating manual

# SP+ 210 MC HIGH SPEED 2-stage

				2-stage									
Ratio <sup>a)</sup>	<i>i</i>			16	20	25	28	35	40	50	70	100	
Max. acceleration torque (max. 1000 cycles per hour)	$T_{2B}$		Nm	1680	1800	2000	1680	1920	1040	1300	1700	1200	
			in.lb	14868	15930	17700	14868	16992	9204	11505	15045	10620	
cymex®-optimized nominal torque (please contact us regarding the design)	$T_{2Ncym}$		Nm	- Please contact us -									
Nominal output torque (with $n_m$ )	$T_{2N}$		Nm	840	780	975	780	975	800	1000	1000	800	
			in.lb	7434	6903	8629	6903	8629	7080	8850	8850	7080	
Emergency stop torque (permitted 1000 times during the service life of the gearhead)	$T_{2Not}$		Nm	5200	5200	5200	5200	5200	5200	5200	5200	5000	
			in.lb	46020	46020	46020	46020	46020	46020	46020	46020	44250	
Nominal input speed (with $T_{2N}$ and 20°C ambient temperature) <sup>b)</sup>	$n_{1N}$		rpm	3500	4500	4500	4500	4500	4500	4500	4500	4500	
Max. input speed	$n_{1Max}$		rpm	6000	6000	6000	6000	6000	6000	6000	6000	6000	
Mean no load running torque (with $n_i=2000$ rpm and 20°C gearhead temperature)	$T_{012}$		Nm	3.0	2,5	2,5	2,0	2,0	1,5	1,5	1,5	1,5	
			in.lb	27	22	22	18	18	13	13	13	13	
Max. torsional backlash	$j_t$		arcmin	Standard $\leq 4$ / Reduced $\leq 2$									
Torsional rigidity	$C_{t21}$		Nm/ arcmin	400									
			in.lb/ arcmin	3540									
Max. axial force <sup>c)</sup>	$F_{2AMax}$		N	30000									
			lb <sub>f</sub>	6750									
Max. radial force <sup>c)</sup>	$F_{2RMMax}$		N	21000									
			lb <sub>f</sub>	4725									
Max. tilting moment	$M_{2KMMax}$		Nm	3100									
			in.lb	27435									
Efficiency at full load	$\eta$		%	96.5									
Service life (For calculation, see the Chapter "Information")	$L_h$		h	> 30000									
Weight incl. standard adapter plate	$m$		kg	53									
			lb <sub>m</sub>	117									
Operating noise (with $i=10$ and $n_i=2000$ rpm no load)	$L_{PA}$		dB(A)										
Max. permitted housing temperature			°C										
			F										
Ambient temperature			°C	-15 to +40									
			F	32 to 194									
Lubrication				Lubricated for life									
Paint				Blue RAL 5002									
Direction of rotation				Motor and gearhead same direction									
Protection class													
Moment of inertia (relates to the drive)	M	48	$J_1$	kgcm <sup>2</sup>	34.5	31.5	30.8	30.0	29.7	28.5	28.3	28.1	28.0
				10 <sup>-3</sup> in.lb.s <sup>2</sup>	30.5	27.9	27.3	26.6	26.3	25.2	25.0	24.9	24.8
Clamping hub diameter (mm)													

Reduced mass moments of inertia available on request.

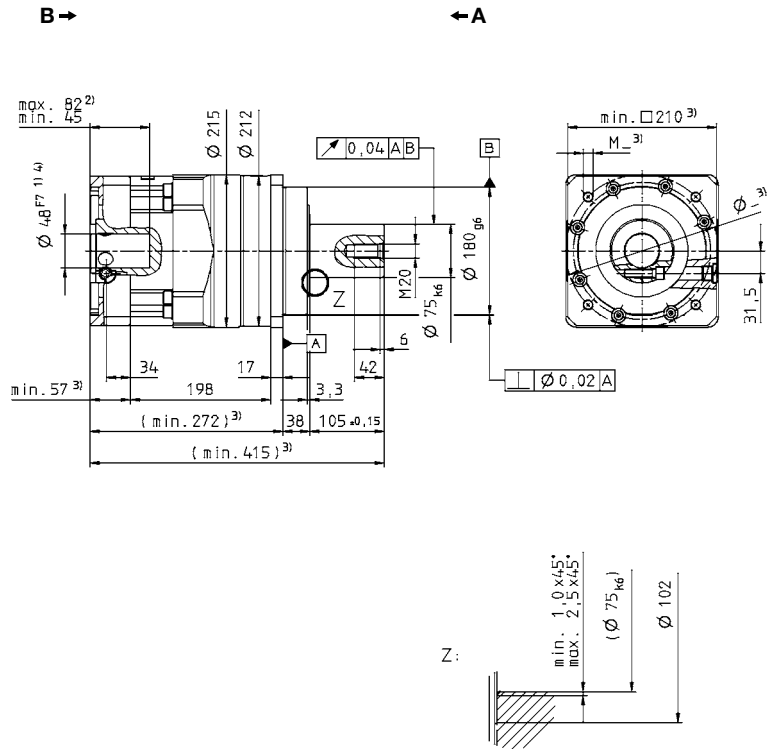
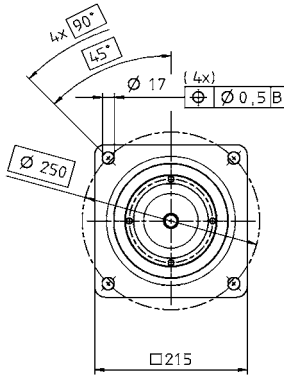
<sup>a)</sup> Other ratios available on request

<sup>b)</sup> For higher ambient temperatures, please reduce input speed

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

Motor shaft diameter [mm]

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



Planetary gearheads  
High End

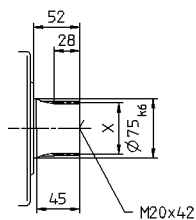
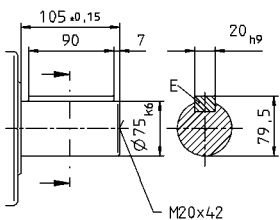
SP+

MC

Alternatives: Output shaft variants

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

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



Non-tolerated dimensions ± 1.5 mm

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

CAD data is available under [www.wittenstein-alpha.com](http://www.wittenstein-alpha.com)

Motor mounting according to operating manual

# SP+ 240 MC HIGH SPEED 1-stage

			Standard version MC					Friction optimized version L						
Ratio <sup>a)</sup>	<i>i</i>		3	4	5	7	10	3	4	5	7	10		
Max. acceleration torque (max. 1000 cycles per hour)	$T_{2B}$	Nm in.lb	1750 15488	3500 30975	3600 31860	2700 23895	1800 15930	1750 15488	3500 30975	3600 31860	2700 23895	1800 15930		
cymex <sup>®</sup> -optimized nominal torque (please contact us regarding the design)	$T_{2Ncym}$	Nm in.lb	- Please contact us -											
Nominal output torque (with $n_m$ )	$T_{2N}$	Nm in.lb	1400 12390	1960 17346	1770 15665	1500 13275	1100 9735	1400 12390	1960 17346	1770 15665	1500 13275	1100 9735		
Emergency stop torque (permitted 1000 times during the service life of the gearhead)	$T_{2Not}$	Nm in.lb	6800 60180	8500 75225	8500 75225	8500 75225	6800 60180	6800 60180	8500 75225	8500 75225	8500 75225	6800 60180		
Nominal input speed (with $T_{2N}$ and 20°C ambient temperature) <sup>b)</sup>	$n_{1N}$	rpm	1750	2250	3000	3000	3000	1750	2250	3000	3000	3000		
cymex <sup>®</sup> optimized speed (please contact us regarding the design)	$n_{1Ncym}$	rpm	-	-	-	-	-	2250	2750	3500	3500	3500		
Max. input speed	$n_{1Max}$	rpm	3400	4000	5000	5000	5000	3400	5000	5000	5000	5000		
Mean no load running torque (with $n_1 = 2000$ rpm and 20°C gearhead temperature) <sup>c)</sup>	$T_{012}$	Nm in.lb	24 212	18 159	13 115	7.0 62	5.0 44	8.0 71	7.0 62	6.0 53	5.0 44	4.2 37		
Max. torsional backlash	$j_t$	arcmin	Standard $\leq 4$ / Reduced $\leq 2$											
Torsional rigidity	$C_{t21}$	Nm/ arcmin	550											
		in.lb/ arcmin	4868											
Max. axial force <sup>d)</sup>	$F_{2AMax}$	N	33000					10000						
		lb <sub>f</sub>	7425					2250						
Max. radial force <sup>d)</sup>	$F_{2RMMax}$	N	30000					2000						
		lb <sub>f</sub>	6750					450						
Max. tilting moment	$M_{2KMMax}$	Nm	5000					280						
		in.lb	44250					2478						
Efficiency at full load	$\eta$	%	98.5					99						
Service life (For calculation, see the Chapter "Information")	$L_h$	h	> 30000											
Weight incl. standard adapter plate	$m$	kg	77											
		lb <sub>m</sub>	170											
Operating noise (with $i=10$ and $n_1=2000$ rpm no load)	$L_{PA}$	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													
Paint	Blue RAL 5002													
Direction of rotation	Motor and gearhead same direction													
Protection class	IP 65						IP 52							
Moment of inertia (relates to the drive)	O	60	$J_1$	kgcm <sup>2</sup>	260.2	198.2	163.0	138.3	124.7	260.2	198.2	163.0	84.4	70.8
				10 <sup>-3</sup> in.lb.s <sup>2</sup>	230.3	175.4	144.3	122.4	110.4	230.3	175.4	144.3	74.7	62.7

Reduced mass moments of inertia available on request.

<sup>a)</sup> Other ratios available on request

<sup>b)</sup> For higher ambient temperatures, please reduce input speed

<sup>c)</sup> Valid for clamping hub diameter of 60 mm

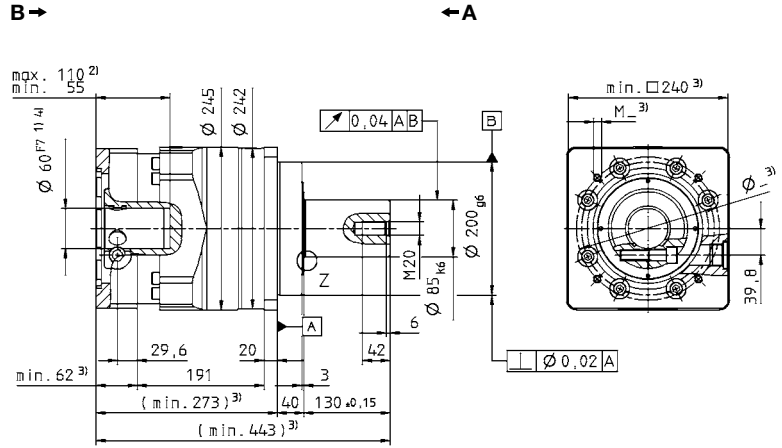
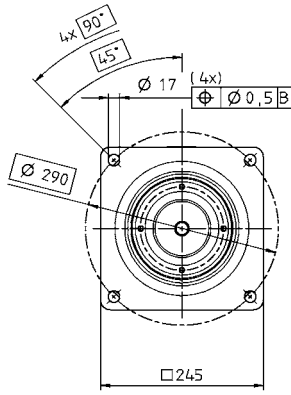
<sup>d)</sup> Refers to center of the output shaft or flange

View A

View B

Motor shaft diameter [mm]

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



Planetary gearheads  
High End

SP+

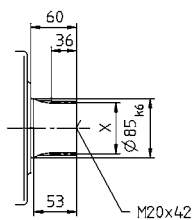
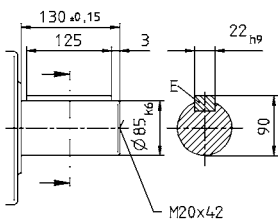
MC

MC-L

Alternatives: Output shaft variants

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

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



Non-tolerated dimensions ± 1.5 mm

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

CAD data is available under [www.wittenstein-alpha.com](http://www.wittenstein-alpha.com)

Motor mounting according to operating manual



# SP+ 240 MC HIGH SPEED 2-stage

			2-stage										
Ratio <sup>a)</sup>	<i>i</i>		16	20	25	28	35	40	50	70	100		
Max. acceleration torque (max. 1000 cycles per hour)	$T_{2B}$	Nm	3500	3500	3600	2900	3600	1680	2100	2700	1800		
		in.lb	30975	30975	31860	25665	31860	14868	18585	23895	15930		
cymex®-optimized nominal torque (please contact us regarding the design)	$T_{2Ncym}$		- Please contact us -										
Nominal output torque (with $n_m$ )	$T_{2N}$	Nm	1790	1770	1730	1840	1930	1300	1625	1500	1100		
		in.lb	15842	15665	15311	16284	17081	11505	14381	13275	9735		
Emergency stop torque (permitted 1000 times during the service life of the gearhead)	$T_{2Not}$	Nm	8500	8500	8500	8500	8500	8500	8500	8500	6800		
		in.lb	75225	75225	75225	75225	75225	75225	75225	75225	60180		
Nominal input speed (with $T_{2N}$ and 20°C ambient temperature) <sup>b)</sup>	$n_{1N}$		rpm	3500	4500	4500	4500	4500	4500	4500	4500		
Max. input speed	$n_{1Max}$		rpm	6000	6000	6000	6000	6000	6000	6000	6000		
Mean no load running torque (with $n_i=2000$ rpm and 20°C gearhead temperature)	$T_{012}$	Nm	5,0	4,5	4,0	3,5	3,0	2,5	2,5	2,5	2,0		
		in.lb	44	40	35	31	27	22	22	22	18		
Max. torsional backlash	$j_t$	arcmin	Standard $\leq 5$ / Reduced $\leq 4$										
Torsional rigidity	$C_{t21}$	Nm/ arcmin	550										
		in.lb/ arcmin	4868										
Max. axial force <sup>c)</sup>	$F_{2AMax}$	N	33000										
		lb <sub>f</sub>	7425										
Max. radial force <sup>c)</sup>	$F_{2RMMax}$	N	30000										
		lb <sub>f</sub>	6750										
Max. tilting moment	$M_{2KMMax}$	Nm	5000										
		in.lb	44250										
Efficiency at full load	$\eta$	%	96.5										
Service life (For calculation, see the Chapter "Information")	$L_h$	h	> 30000										
Weight incl. standard adapter plate	<i>m</i>	kg	76										
		lb <sub>m</sub>	168										
Operating noise (with $i=10$ and $n_i=2000$ rpm no load)	$L_{PA}$	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										
Paint			Blue RAL 5002										
Direction of rotation			Motor and gearhead same direction										
Protection class			IP 65										
Moment of inertia (relates to the drive) Clamping hub diameter [mm]	M	48	$J_1$	kgcm <sup>2</sup>	39.2	34.6	33.2	30.5	29.7	28.2	27.9	27.6	27.5
				10 <sup>-7</sup> in.lb.s <sup>2</sup>	34.7	30.6	29.4	27.0	26.3	25.0	24.7	24.4	24.3

Reduced mass moments of inertia available on request.

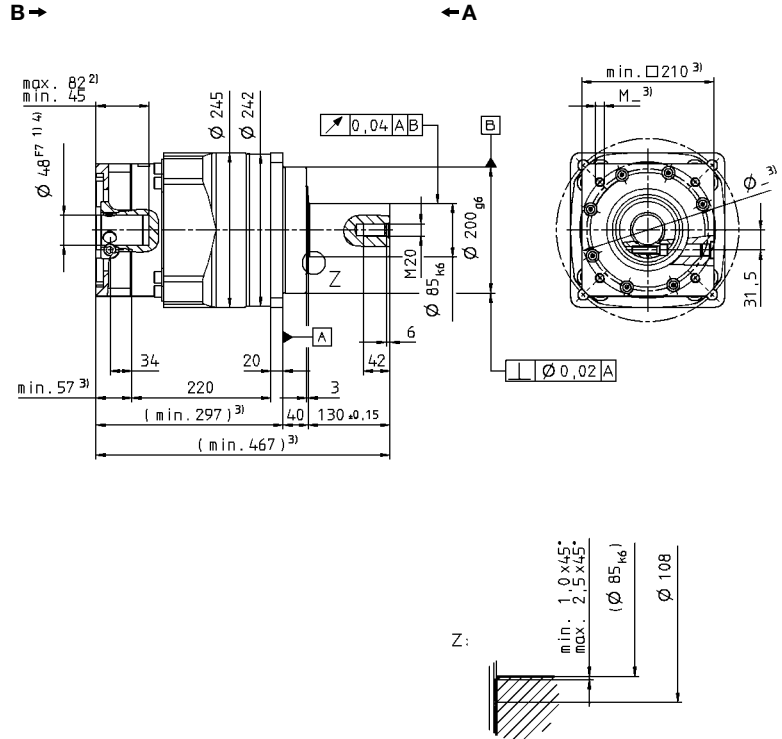
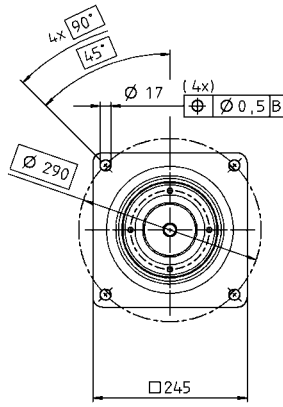
<sup>a)</sup> Other ratios available on request

<sup>b)</sup> For higher ambient temperatures, please reduce input speed

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

Motor shaft diameter [mm]

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



Planetary gearheads  
High End

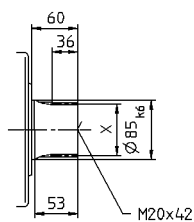
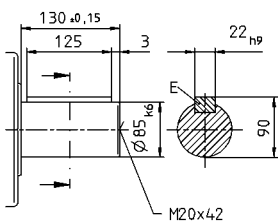
SP+

MC

Alternatives: Output shaft variants

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

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



Non-tolerated dimensions ± 1.5 mm

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

CAD data is available under [www.wittenstein-alpha.com](http://www.wittenstein-alpha.com)

Motor mounting according to operating manual