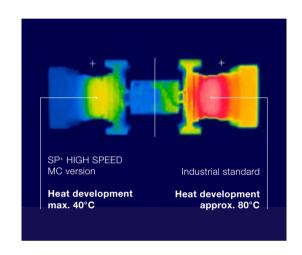
SP+/SP+ HIGH SPEED - The classic all-rounder



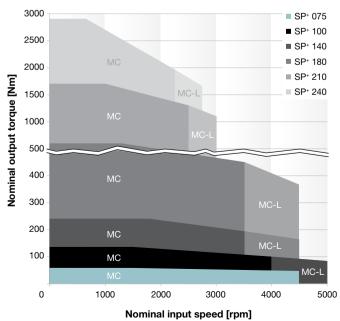
The low backlash planetary gearhead with output shaft. The standard version is ideally suited for high positioning accuracy and highly dynamic cyclic operation. The SP+ HIGH SPEED is particularly well suited for applications with maximum speeds during continuous operation.



Quick size selection

SP $^+$ **MF** (example for i = 4) For applications in cyclic operation (ED ≤ 60%) 5000 ■ SP+ 060 ■ SP+ 075 4500 ■ SP+ 100 Max. acceleration torque at output [Nm] 4000 ■ SP+ 140 3500 ■ SP+ 210 3000 SP+ 240 2500 2000 1500 1000 500 400 MF 300 200 MF 100 0 1000 2000 3000 4000 5000 6000 Max. input speed [rpm]

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



Planetary gearheads

Versions and Applications

Features	SP* MF version page 76	SP* HIGH SPEED MC version page 100	SP* HIGH SPEED MC-L version page 104
Application	Cyclic operation (duty cycle ≤ 60%)	Continuous operation (duty cycle ≥ 60%)	Continuous operation (duty cycle ≥ 60%)
Positioning accuracy (e.g. clamped drives)	••	•	•
Highly dynamic applications	••	•	•
High input speeds	•	••	•••
Temperature-sensitive applications	•	••	•••
Low no-load running torque	•	••	•••

Product features

Ratios c)		3 -100	3 -100	3 -10
Torsional backlash	Standard	≤ 3	≤ 4	≤ 4
[arcmin] ^{c)}	Reduced	≤1	≤ 2	≤ 2
Output type				
Smooth output shaft		•	•	•
Output shaft with key		•	•	•
Output shaft with involu	ute gearing	•	•	
Mounted shaft Connect	ed via shrink disc	•	•	
Input type				
Motor mounted version	1	•	•	•
Input shaft		•		
Туре				
ATEX a)		•	•	
Food-grade lubrication	a) b)	•	•	•
Corrosion resistant a) b)		•	•	
Optimized mass mome	nt of inertia ^{a)}	•		
Accessories				
Coupling		•	•	•
Rack		•	•	
Pinion		•	•	
Shrink disc		•	•	
torqXis sensor flange		•	•	•
Intermediate plate for co	oling connection	•	•	•

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



₹

9

MC-L

SP* 060 MF 1-stage

							1-s	tage								
Ratio ^{a)}			i		3	4	5	7	8	10						
cymex®-optimized acceleration torque			T _{2Bcym}	Nm	_	58	60	54	_	_						
(please contact us regarding the design)			* 2Bcym	in.lb		513	531	478								
Max. acceleration torque			T _{2B}	Nm	30	42	42	42	32	32						
(max. 1000 cycles per hour)			20	in.lb	266	372	372	372	283	283						
Nominal output torque (with n ₁₀)			T _{2N}	Nm in.lb	17 150	26 230	26	26 230	17 150	17 150						
				Nm	80	100	100	100	80	80						
Emergency stop torque (permitted 1000 times during the service life of the geart	nead)		T _{2Not}	in.lb	708	885	885	885	708	708						
Nominal input speed (with T_{2N} and 20°C ambient temperature) b)			n _{1N}	rpm	3300	3300	3300	4000	4000	4000						
Max. input speed			n _{1max}	rpm	6000	6000	6000	6000	6000	6000						
Mean no load running torque			_	Nm	0.9	0.7	0.6	0.4	0.3	0.3						
(with n,=3000 rpm and 20°C gearhead temperature) c)			T ₀₁₂	in.lb	8.0	6.2	5.3	3.5	2.7	2.7						
Max. torsional backlash			j_t	arcmin			Standard ≤ 4	/ Reduced ≤ 2								
Torsional rigidity			C _{t21}	Nm/ arcmin				.5								
			t21	in.lb/ arcmin				.0								
Max. axial force d			F _{2AMax}	N 				.00								
				lb _f				800								
Max. radial force d			F _{2RMax}	lb,												
				Nm	630 152											
Max. tilting torque			M _{2KMax}	in.lb	1345											
Efficiency at full load			η	%			97									
Service life (For calculation, see the Chapter "Information")			L	h			> 20	0000								
Mainting standard adopter plate				kg			1	.9								
Weight incl. standard adapter plate			m	lb _m			4	.2		_						
Operating noise (with i=10 and n;=3000 rpm no load)			L _{PA}	dB(A)			≤	58								
Max. permitted housing temperature				°C				90								
				F				94								
Ambient temperature				°C				0 +40								
Lubrication				F				ed for life								
Paint							AL 5002									
Direction of rotation							Motor and gearhe	ead same direction	1							
Protection class							IP	65								
				kacm²	0.01	0.15	0.10	0.10	0.10	0.00						
Moment of inertia	В	11	J_1	kgcm ²	0.21 0.18	0.15 0.13	0.12	0.10	0.10	0.09						
(relates to the drive)				kgcm²	0.18	0.13	0.20	0.09	0.16	0.16						
Clamping hub diameter [mm]	С	14	J_{1}	10 ⁻³ in.lb.s ²	0.25	0.20	0.17	0.16	0.14	0.15						
		4.5	.	kgcm ²	0.61	0.55	0.52	0.50	0.49	0.49						
	Е	19	J_1	10 ⁻³ in.lb.s ²	0.54	0.48	0.46	0.44	0.43	0.43						

^{a)} Other ratios available on request

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

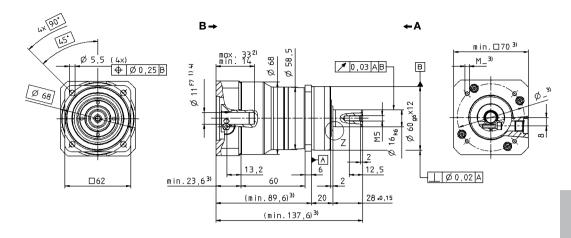
Valid for clamping hub diameter of 14 mm
 Refers to center of the output shaft or flange

View A View



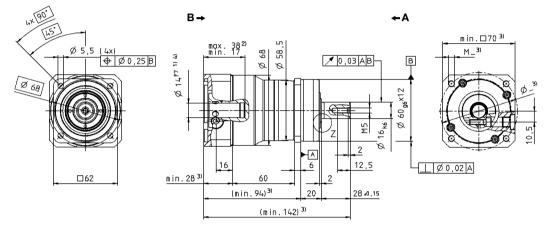
up to 11 ⁴⁾ (B) clamping hub diameter



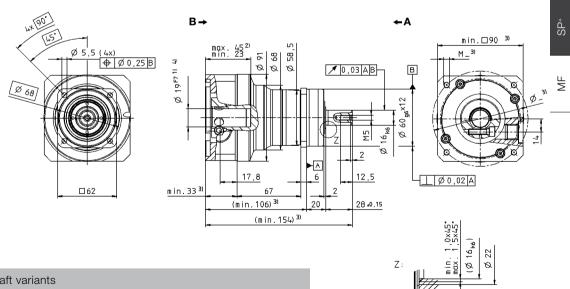


up to 14 ⁴ (C) clamping hub diameter)

Motor shaft diameter [mm]

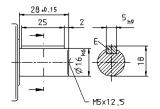


up to 19 ⁴⁾ (E) clamping hub diameter

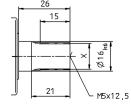


Alternatives: Output shaft variants

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

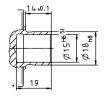


Involute gearing DIN 5480 in mm X = W 16 x 0.8 x 30 x 18 x 6m, DIN 5480



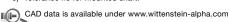
Shaft mounted

Mounted via shrink disc



Non-tolerated dimensions \pm 1 mm

- 1) Check motor shaft fit.
- Min./Max. permissible motor shaft length.
 Longer motor shafts are 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.



SP* 060 MF 2-stage

									2-s	tage							
Ratio a)			i		16	20	25	28	32	35	40	50	70	100			
cymex®-optimized acceleration torque			T	Nm	58	58	60	58	-	60	58	60	54	-			
(please contact us regarding the design)			T _{2Bcym}	in.lb	513	513	531	513	-	531	513	531	478	-			
Max. acceleration torque (max. 1000 cycles per hour)			T _{2B}	Nm in.lb	42 372	42 372	42 372	42 372	32 283	42 372	42 372	42 372	42 372	32 283			
Nominal output torque (with n _m)			T _{2N}	Nm in.lb	26 230	26 230	26 230	26 230	26 230	26 230	26 230	26 230	26 230	17 150			
Emergency stop torque			T _{2Not}	Nm	100	100	100	100	100	100	100	100	100	80			
(permitted 1000 times during the service life of the gear	head)		* 2Not	in.lb	885	885	885	885	885	885	885	885	885	708			
Nominal input speed (with T_{2N} and 20°C ambient temperature) b)			n _{1N}	rpm	4400	4400	4400	4400	4400	4400	4400	4800	5500	5500			
Max. input speed			n _{1max}	rpm	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000			
Mean no load running torque			_	Nm	0.5	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.2			
(with n_1 =3000 rpm and 20°C gearhead temperature) c)			T ₀₁₂	in.lb	4.4	3.5	3.5	2.7	2.7	2.7	2.7	2.7	2.7	1.8			
Max. torsional backlash			j_t	arcmin				Sta	andard ≤ 6	/ Reduced	≤ 4						
				Nm/ arcmin					4	.5							
Torsional rigidity			C _{t21}	in.lb/ arcmin					4	0							
Max. axial force d			_	N					24	00							
IMAX. AXIAI TOICE			F _{2AMax}	lb _f													
Max. radial force ^{d)}			F _{2RMax}	N lb,	2800 630												
				Nm						52							
Max. tilting moment			M _{2KMax}	in.lb					13	45							
Efficiency at full load			η	%					9	4							
Service life (For calculation, see the Chapter "Information")			L,	h					> 20	0000							
				kg					2	.0							
Weight incl. standard adapter plate			m	lb _m					4	.4							
Operating noise (with i=100 and n _i =3000 rpm no load)			L _{PA}	dB(A)					≤	58							
Max parmitted housing temporations				°C					+9	90							
Max. permitted housing temperature				F						94							
Ambient temperature				°C					-15 t	0 +40							
·				F						104							
Lubrication									Lubricat	ed for life							
Paint	,								Blue R	AL 5002							
Direction of rotation								Motor	and gearhe	ad same d	irection						
Protection class									IP	65							
				kgcm ²	0.077	0.069	0.068	0.061	0.077	0.061	0.057	0.057	0.056	0.056			
Moment of inertia (relates to the drive)	В	11	$J_{_{1}}$	10 ⁻³ in.lb.s ²	0.068	0.061	0.060	0.054	0.068	0.054	0.050	0.050	0.050	0.050			
	-	4.4	,	kgcm ²	0.17	0.16	0.16	0.16	0.18	0.16	0.15	0.15	0.15	0.15			
Clamping hub diameter [mm]	С	14	J_{1}	10 ⁻³ in.lb.s ²	0.15	0.15	0.14	0.14	0.16	0.14	0.14	0.13	0.13	0.13			

a) Other ratios available on request

 $^{^{\}mbox{\scriptsize b)}}$ For higher ambient temperatures, please reduce input speed

c) Valid for clamping hub diameter of 11 mm

d) Refers to center of the output shaft or flange

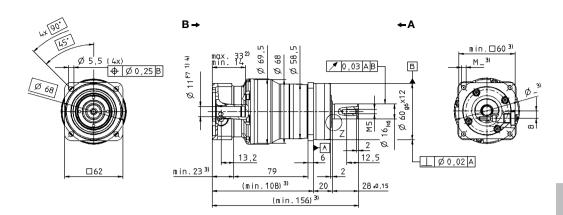
View A View

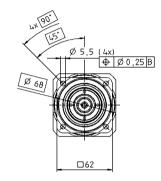


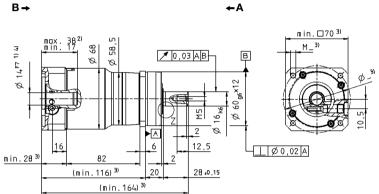




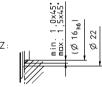
up to 14 ⁴⁾ (C) clamping hub diameter







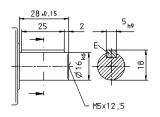




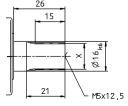
 \mathbb{A}

Alternatives: Output shaft variants

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

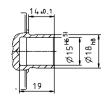


Involute gearing DIN 5480 in mm X = W 16 x 0.8 x 30 x 18 x 6m, DIN 5480



Shaft mounted

Mounted via shrink disc



Non-tolerated dimensions ± 1 mm

- 1) Check motor shaft fit.
- Min./Max. permissible motor shaft length.
 Longer motor shafts are 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.



SP* 075 MF 1-stage

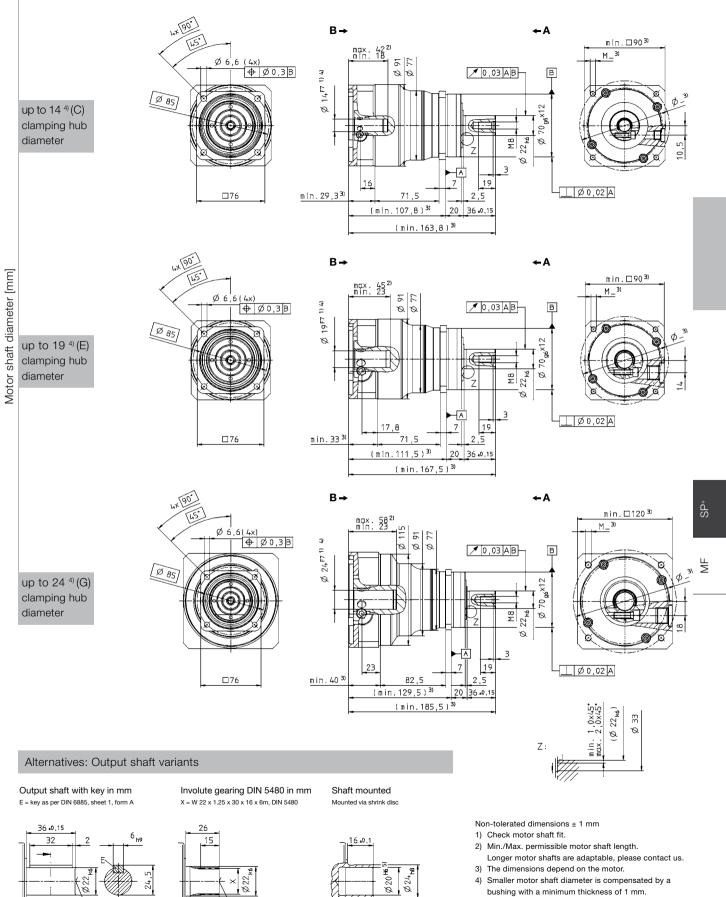
							1-st	age			
Ratio ^{a)}	-		i		3	4	5	7	8	10	
cymex®-optimized acceleration torque			_	Nm	-	142	160	142	100	100	
(please contact us regarding the design)			T _{2Bcym}	in.lb	-	1254	1416	1254	885	883	
Max. acceleration torque			T _{2B}	Nm	85	110	110	110	95	95	
(max. 1000 cycles per hour)			* 2B	in.lb	752	974	974	974	841	841	
Nominal output torque			T _{2N}	Nm	47	75	75	75	52	52	
(with n _{1N})			- 2N	in.lb	416	664	664	664	460	460	
Emergency stop torque permitted 1000 times during the service life of the gear	acad)		T _{2Not}	Nm	200	250	250	250	200	200	
	ieau)			in.lb	1770	2213	2213	2213	1770	1770	
Nominal input speed with T _{2N} and 20°C ambient temperature) b)			n _{1N}	rpm	2900	2900	2900	3100	3100	3100	
Max. input speed			n _{1Max}	rpm	6000	6000	6000	6000	6000	6000	
Mean no load running torque			_	Nm	1.8	1.4	1.1	0.8	0.6	0.6	
with n,=3000 rpm and 20°C gearhead temperature) c)			T ₀₁₂	in.lb	15.9	12.4	9.7	7.1	5.3	5.3	
Max. torsional backlash			j_t	arcmin			Standard ≤ 4	/ Reduced ≤ 2			
Torgianal rigidity			_	Nm/ arcmin			1	0			
Torsional rigidity			C _{t21}	in.lb/ arcmin			8	9			
Max. axial force d			F _{2AMax}	N			33	50			
Wax. axial lords			2AMax	lb _f			7:	54			
Max. radial force d)			F _{2RMax}	N				00			
			ZHIVIAX	-	lb, 945						
Max. tilting moment			M _{2KMax}	Nm · ··							
				in.lb			20	89			
Efficiency at full load			η	%			9	7			
Service life (For calculation, see the Chapter "Information")			L _h	h			> 20	0000			
Weight incl. standardadapter plate			m	kg			3	.9			
weight incl. Standardadapter plate			""	lb _m			8	.6			
Operating noise (with <i>i</i> =10 and <i>n</i> ,=3000 rpm no load)			L _{PA}	dB(A)			≤	59			
Max permitted housing temporature				°C			+	90			
Max. permitted housing temperature				F			1:	94	<u> </u>		
Ambient temperature				°C				o +40			
- p				F			5 to	104			
Lubrication							Lubricat	ed for life			
Paint				Blue RAL 5002							
Direction of rotation							Motor and gearhe	ad same direction	1		
Protection class							IP	65			
				kgcm ²	0.86	0.61	0.51	0.42	0.38	0.37	
Moment of inertia	С	14	$J_{_{1}}$	10°3 in.lb.s²	0.76	0.54	0.46	0.42	0.34	0.33	
(relates to the drive)				kgcm ²	1.03	0.78	0.68	0.59	0.54	0.54	
Clamping hub diameter [mm]	Е	19	$J_{_1}$	10 ⁻³ in.lb.s ²	0.91	0.69	0.60	0.52	0.48	0.48	
				kgcm ²	2.40	2.15	2.05	1.96	1.91	1.91	
	G	24	$J_{\scriptscriptstyle 1}$	10 ⁻³ in.lb.s ²	2.12	1.90	1.81	1.73	1.69	1.69	

^{a)} Other ratios available on request

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

Valid for clamping hub diameter of 19 mm
 Refers to centre of the output shaft or flange

WITTENSTEIN alpha



22,5

M8x19

5) Tolerance h6 for mounted shaft.

SP+ 075 MF 2-stage

									2-st	tage							
Ratio ^{a)}			i		16	20	25	28	32	35	40	50	70	100			
cymex®-optimized acceleration torque			T _{2Bcym}	Nm	142	142	160	142	100	160	135	160	142	100			
(please contact us regarding the design)			2Bcym	in.lb	1254	1254	1416	1254	885	1416	1195	1416	1254	883			
Max. acceleration torque			T _{2B}	Nm 	110	110	110	110	95	110	110	110	110	90			
(max. 1000 cycles per hour)				in.lb Nm	974 75	974 75	974 75	974 75	841 75	974 75	974 75	974 75	974 75	797 52			
Nominal output torque (with n_{1N})			T _{2N}	in.lb	664	664	664	664	664	664	664	664	664	460			
Emergency stop torque				Nm	250	250	250	250	250	250	250	250	250	200			
(permitted 1000 times during the service life of the gear	head)		T _{2Not}	in.lb	2213	2213	2213	2213	2213	2213	2213	2213	2213	1770			
Nominal input speed (with T_{2N} and 20°C ambient temperature) b)			n _{1N}	rpm	3500	3500	3500	3500	3500	3500	3500	3800	4500	4500			
Max. input speed			n _{1Max}	rpm	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000			
Mean no load running torque			T	Nm	0.8	0.6	0.6	0.5	0.5	0.4	0.4	0.3	0.3	0.3			
(with n_1 =3000 rpm and 20°C gearhead temperature) c)			T ₀₁₂	in.lb	4.4	3.5	3.5	2.7	4.4	2.7	1.8	1.8	1.8	1.8			
Max. torsional backlash			j_t	arcmin				Sta	andard ≤ 6	/ Reduced	≤ 4						
Torsional rigidity			C _{t21}	Nm/ arcmin						0							
			121	in.lb/ arcmin						9							
Max. axial force d			F _{2AMax}	Ib,						50							
				N	754 4200												
Max. radial force d			F _{2RMax}	lb,	945												
May tilting moment			14	Nm	236												
Max. tilting moment			M _{2KMax}	in.lb					20	89							
Efficiency at full load			η	%	94												
Service life (For calculation, see the Chapter "Information")			L	h					> 20	0000							
Weight incl. standard adapter plate			m	kg					3	.6							
Weight mon standard adaptor plate				lb _m					8	.0							
Operating noise (with i=100 and n _i =3000 rpm no load)			L _{PA}	dB(A)					≤	59							
Max. permitted housing temperature				°C						90							
- ,				°C						94							
Ambient temperature				F						0 +40 104							
Lubrication				•						ed for life							
Paint					Blue RAL 5002												
Direction of rotation								Motor	and gearhe	ad same d	lirection						
Protection class									IP	65							
Mamont of inartia	_	44	,	kgcm ²	0.16	0.13	0.13	0.10	0.16	0.10	0.091	0.090	0.089	0.089			
Moment of inertia (relates to the drive)	В	11	$J_{_{1}}$	10 ⁻³ in.lb.s ²	0.14	0.11	0.11	0.092	0.142	0.090	0.081	0.080	0.079	0.079			
Clamping hub diameter [mm]	С	14	$J_{\scriptscriptstyle 1}$	kgcm ²	0.23	0.20	0.20	0.18	0.23	0.18	0.17	0.16	0.16	0.16			
oraniping nub diameter [riffit]	_	ļ	-1	10 ⁻³ in.lb.s ²	0.20	0.18	0.18	0.16	0.20	0.16	0.15	0.15	0.14	0.14			
	Е	19	J_{1}	kgcm ²	0.55	0.53	0.52	0.50	0.57	0.50	0.49	0.49	0.49	0.49			
			<u> </u>	kgcm ² 0.5		0.47	0.46	0.44	0.50	0.44	0.43	0.43	0.43	0.43			

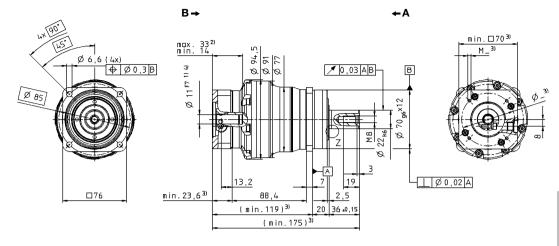
^{a)} Other ratios available on request

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

Valid for clamping hub diameter of 14 mm
 Refers to centre of the output shaft or flange



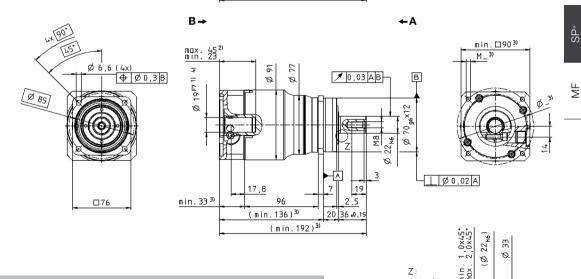




Motor shaft diameter [mm] up to 14 4) (C) clamping hub diameter

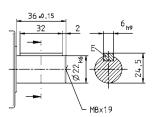
B→ ←A min.□70³⁾ max. 38²⁾ min. 17 M_3) 46 Ø 14F7 114) ∅,03 AB Ø ₿ Ø 85 Λ - _ _ | Ø 0,02 A 19 min.28³⁾ □76 88,4 2,5 (min. 123,4)3) 20 36 .0.15 (min.179,4)³⁾

up to 19 4) (E) clamping hub diameter

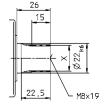


Alternatives: Output shaft variants

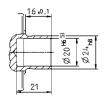
Output shaft with key in mm E = key as per DIN 6885, sheet 1, form A



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

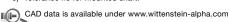


Shaft mounted Mounted via shrink disc



Non-tolerated dimensions \pm 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.





SP* 100 MF 1-stage

							1-st	tage								
Ratio ^{a)}			i		3	4	5	7	8	10						
cymex®-optimized acceleration torqu	ie		T	Nm	-	370	400	330	260	260						
(please contact us regarding the design)			T _{2Bcym}	in.lb	-	3275	3540	2921	2301	2301						
Max. acceleration torque			T _{2B}	Nm	235	315	315	315	235	235						
(max. 1000 cycles per hour)			* 2B	in.lb	2080	2788	2788	2788	2080	2080						
Nominal output torque			T _{2N}	Nm	120	180	175	170	120	120						
(with n _{1N})			2N	in.lb	1062	1593	1549	1505	1062	1062						
Emergency stop torque			T _{2Not}	Nm	500	625	625	625	500	500						
(permitted 1000 times during the service life of the g	earnead)		2760	in.lb	4425	5531	5531	5531	4425	4425						
Nominal input speed (with T_{2N} and 20°C ambient temperature) b)			n _{1N}	rpm	2500	2500	2500	2800	2800	2800						
Max. input speed			n _{1Max}	rpm	4500	4500	4500	4500	4500	4500						
Mean no load running torque			_	Nm	3.5	2.7	2.4	1.6	1.4	1.4						
(with n_1 =3000 rpm and 20°C gearhead temperature)	c)		T ₀₁₂	in.lb	31.0	23.9	21.2	14.2	12.4	12.4						
Max. torsional backlash			j_t	arcmin			Standard ≤ 3	/ Reduced ≤ 1								
				Nm/ arcmin				31								
Torsional rigidity			C _{t21}	in.lb/ arcmin				74								
				N												
Max. axial force d			F _{2AMax}	lb,				271								
				N				800								
Max. radial force d			F _{2RMax}	lb,	1485											
	-			Nm	487											
Max. tilting moment			M _{2KMax}	in.lb	4310											
Efficiency at full load			η	%	97											
Service life (For calculation, see the Chapter "Information")			L	h	> 20000											
				kg		,	7	7.7								
Weight incl. standard adapter plate			m	lb _m			17	7.0								
Operating noise (with <i>i</i> =10 and <i>n</i> ,=3000 rpm no load)			L _{PA}	dB(A)			≤	64								
Many required by the state of t				°C			+:	90								
Max. permitted housing temperature				F			11	94								
Ambient temporature				°C			-15 t	o +40								
Ambient temperature				F			5 to	104								
Lubrication							Lubricat	ed for life								
Paint							Blue R	AL 5002								
Direction of rotation							Motor and gearhe	ead same direction	ı							
Protection class							IP	65								
				kgcm ²	3.29	2.35	1.92	1.60	1.38	1.38						
Moment of inertia (relates to the drive)	Е	19	J_1	10 ⁻³ in.lb.s ²	2.91	2.08	1.70	1.42	1.22	1.22						
		6.1	,	kgcm ²	3.99	3.04	2.61	2.29	2.07	2.07						
Clamping hub diameter [mm]	G	24	J_1	10 ⁻³ in.lb.s ²	3.53	2.69	2.31	2.03	1.83	1.83						
			ļ ,	kgcm ²	3.59	2.65	2.22	1.90	1.68	1.68						
	Н	28	J_1	10 ⁻³ in.lb.s ²	3.18	2.35	1.97	1.68	1.49	1.49						
	1.0		ļ ,	kgcm ²	11.1	10.1	9.68	9.36	9.14	9.14						
	K	38	J_1	10 ⁻³ in.lb.s ²	9.78	8.95	8.57	8.28	8.09	8.09						

^{a)} Other ratios available on request

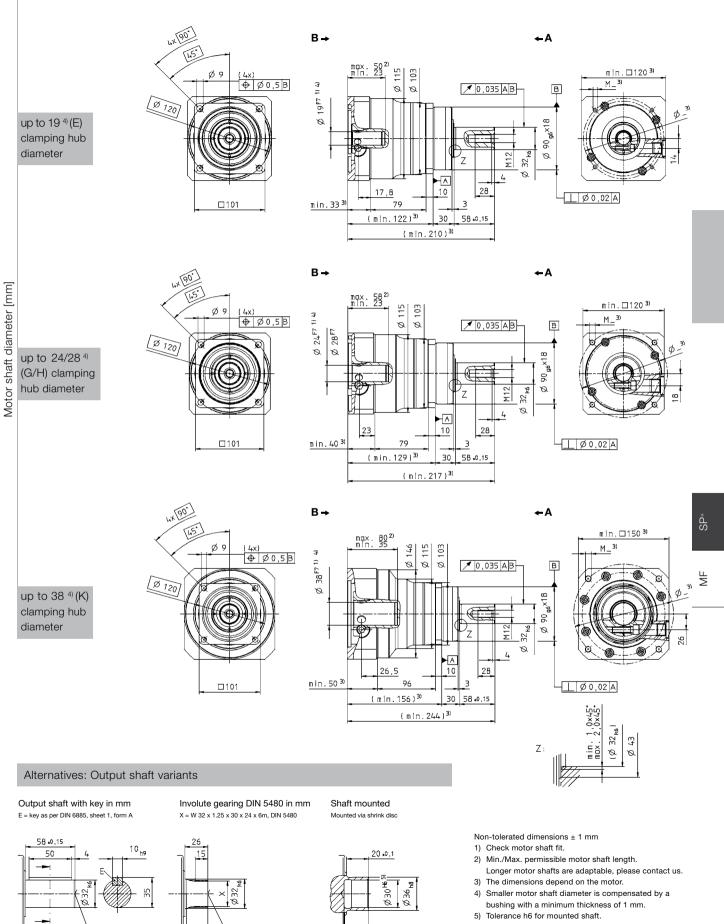
 $^{^{\}mbox{\scriptsize b)}}$ For higher ambient temperatures, please reduce input speed

c) Valid for clamping hub diameter of 24 mm

d) Refers to centre of the output shaft or flange

wittenstein alpha

View A View



M12x28

M12x28

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

SP* 100 MF 2-stage

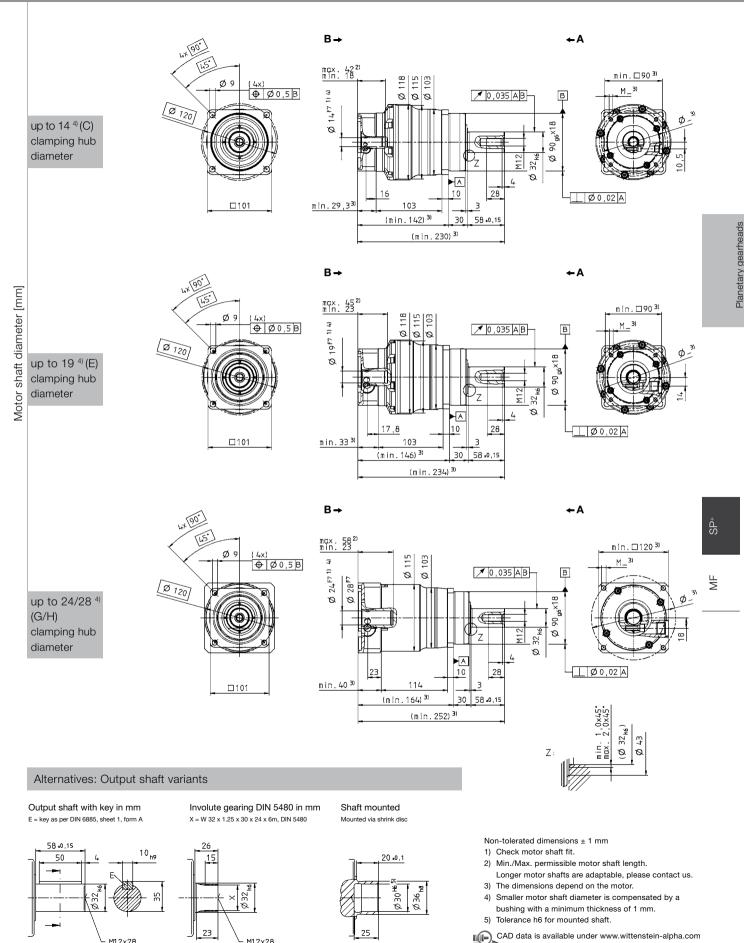
									2-st	tage							
Ratio ^{a)}			i		16	20	25	28	32	35	40	50	70	100			
cymex®-optimized acceleration torque			T _{2Bcym}	Nm	370	370	400	370	260	400	370	400	330	260			
(please contact us regarding the design)			ZBCylll	in.lb	3275	3275	3540	3275	2301	3540	3275	3540	2921	2301			
Max. acceleration torque (max. 1000 cycles per hour)			T _{2B}	Nm in.lb	315 2788	315 2788	315 2788	315 2788	235	315 2788	315 2788	315 2788	315 2788	235			
Nominal output torque				Nm	180	180	175	180	180	175	180	175	170	120			
(with n_{1N})			T_{2N}	in.lb	1593	1593	1549	1593	1593	1549	1593	1549	1505	1062			
Emergency stop torque	dd\		T _{2Not}	Nm	625	625	625	625	625	625	625	625	625	500			
(permitted 1000 times during the service life of the gear	mead)			in.lb	5531	5531	5531	5531	5531	5531	5531	5531	5531	4425			
Nominal input speed (with T_{2N} and 20°C ambient temperature) b)			n _{1N}	rpm	3100	3100	3100	3100	3100	3100	3100	3500	4200	4200			
Max. input speed			n _{1Max}	rpm	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000			
Mean no load running torque			T ₀₁₂	Nm	1.5	1.2	1.1	0.9	0.9	0.8	0.7	0.6	0.5	0.5			
(with n_1 =3000 rpm and 20°C gearhead temperature) c)			012	in.lb	13.3	10.6	9.7	8.8	8.8	7.1	6.2	5.3	4.4	4.4			
Max. torsional backlash			j_t	arcmin				Sta	andard ≤ 5	/ Reduced	≤ 3						
Torsional rigidity			C _{t21}	Nm/ arcmin					3								
			121	in.lb/ arcmin						74							
Max. axial force d			F _{2AMax}	Ib,					12	550 71							
				N						600							
Max. radial force d)			F _{2RMax}	lb,	1485												
Max. tilting moment			M _{2KMax}	Nm	487												
Efficiency at full load			η														
Service life																	
(For calculation, see the Chapter "Information")			L _h	h						0000							
Weight incl. standardadapter plate			m	kg lb _m					7 17								
Operating noise (with i =100 and n_i =3000 rpm no load)			L _{PA}	dB(A)					≤	60							
May permitted housing temperature				°C					+9	90							
Max. permitted housing temperature				F						94							
Ambient temperature				°C F						0 +40							
Lubrication										ed for life							
Paint									Blue R	AL 5002							
Direction of rotation								Motor	and gearhe	ad same d	lirection						
Protection class									IP	65							
Managed of the C				kgcm ²	0.64	0.54	0.52	0.43	0.63	0.43	0.38	0.38	0.37	0.37			
Moment of inertia (relates to the drive)	С	14	J_1	10 ⁻³ in.lb.s ²	0.57	0.47	0.46	0.38	0.56	0.38	0.34	0.33	0.33	0.33			
Clamping bub diameter [r]	Е	19	$J_{_{1}}$	kgcm ²	0.81	0.70	0.69	0.60	0.80	0.59	0.55	0.54	0.54	0.54			
Clamping hub diameter [mm]	_		1	10 ⁻³ in.lb.s ²	0.72	0.62	0.61	0.53	0.71	0.52	0.48	0.48	0.48	0.47			
	G	24	$J_{_{1}}$	kgcm ²	2.18	2.07	2.05	1.97	2.23	1.96	1.92	1.91	1.91	1.91			
	1	1	I '	10 ⁻³ in.lb.s ²	1.93	1.83	1.82	1.74	1.97	1.74	1.70	1.69	1.69	1.69			
				kgcm ²	1,98	1,90	1,88	1,81	2.06	1,80	1,76	1,75	1,75	1,75			

^{a)} Other ratios available on request

 $^{^{\}mbox{\scriptsize b)}}$ For higher ambient temperatures, please reduce input speed

c) Valid for clamping hub diameter of 19 mm

d) Refers to centre of the output shaft or flange



M12x28

M12x28

Motor mounting according to operating manual

SP* 140 MF 1-stage

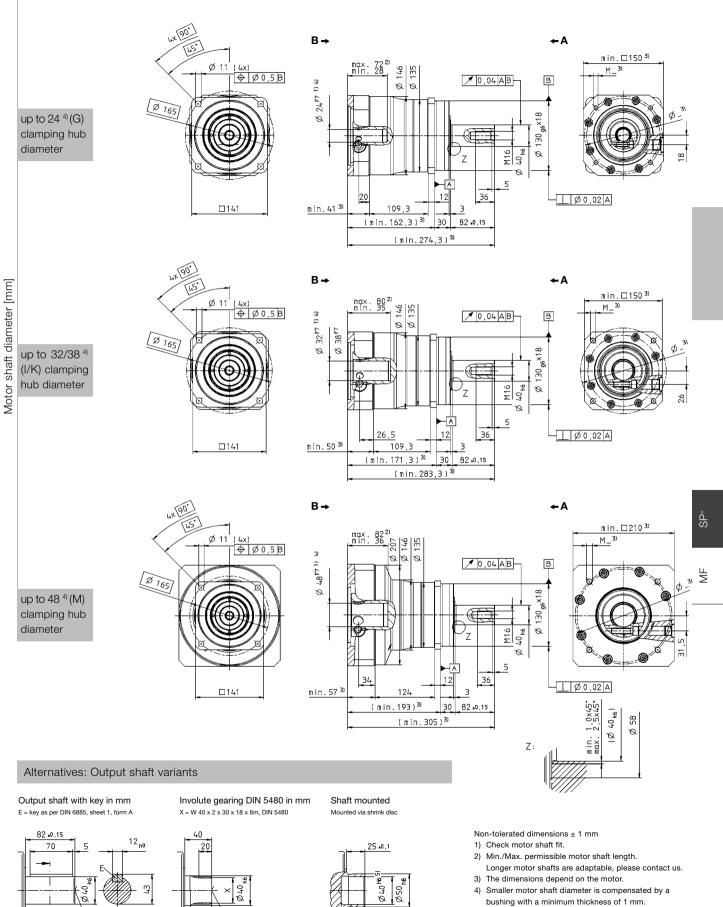
							1-st	age								
Ratio ^{a)}			i		3	4	5	7	8	10						
cymex®-optimized acceleration torque)		т	Nm	-	710	755	680	560	560						
(please contact us regarding the design)			T _{2Bcym}	in.lb	-	6284	6682	6018	4956	4956						
Max. acceleration torque			T _{2B}	Nm	390	660	660	660	530	530						
(max. 1000 cycles per hour)			28	in.lb	3451.5	5841	5841	5841	4691	4691						
Nominal output torque (with n_m)			T _{2N}	Nm	200	360	360	360	220	220						
	-			in.lb Nm	1770 1000	3186 1250	3186 1250	3186 1250	1947	1947 1000						
Emergency stop torque permitted 1000 times during the service life of the ge	arhead)		T _{2Not}	in.lb	8850	11063	11063	11063	8850	8850						
Nominal input speed (with T_{2N} and 20°C ambient temperature) b)			n _{1N}	rpm	2100	2100	2100	2600	2600	2600						
Max. input speed			n _{1Max}	rpm	4000	4000	4000	4000	4000	4000						
Mean no load running torque			T	Nm	7.6	5.8	4.7	3.4	2.5	2.5						
with n_{τ} =3000 rpm and 20°C gearhead temperature) of)		T ₀₁₂	in.lb	67	51	42	30	22	22						
Max. torsional backlash			j_t	arcmin			Standard ≤ 3 /	/ Reduced ≤ 1								
Torsional rigidity			C ₁₂₁	Nm/ arcmin			5	3								
			t21	in.lb/ arcmin			46									
Max. axial force d			F _{2AMax}	N		9870 2221										
			ZAIVIdX	lb _f												
Max. radial force d)			F _{2RMax}	N	9900 2228											
				lb _f Nm	2228 952											
Max. tilting moment			M _{2KMax}	in.lb	8425											
Efficiency at full load			η	%	97											
Service life (For calculation, see the Chapter "Information")			L _h	h	> 20000											
Weight incl. standard adapter plate			m	kg			17	7.2								
				lb _m			38	3.0								
Operating noise (with i=10 and n,= 3000 rpm no load)			L _{PA}	dB(A)				65								
Max. permitted housing temperature				°C			+9									
	_			F °C			15									
Ambient temperature				°C F				0 +40 104								
Lubrication				F			5 to									
Paint							Blue RA	AL 5002								
Direction of rotation							Motor and gearhe	ad same direction	ı							
Protection class							IP	65								
Moment of inertia	G	0.4	,	kgcm ²	10.7	7.82	6.79	5.84	5.83	5.28						
relates to the drive)	G	24	J ₁	10 ⁻³ in.lb.s ²	9.45	6.92	6.01	5.17	5.16	4.67						
Clamping bub diameter [r1		32	J,	kgcm ²	13.8	11.0	9.95	9.01	9.00	8.44						
Clamping hub diameter [mm]	Ŀ		-1	10 ⁻³ in.lb.s ²	12.3	9.72	8.81	7.97	7.97	7.47						
	K	38	$J_{_{1}}$	kgcm ²	14.9	12.1	11.0	10.1	10.1	9.51						
			-1	10 ⁻³ in.lb.s ²	13.2	10.7	9.76	8.92	8.94	8.42						
	M	48	$J_{_{1}}$	kgcm ²	29.5	26.7	25.6	24.7	25.0	24.2						
			Ι΄	10 ⁻³ in.lb.s ²	26.1	23.6	22.7	21.9	22.1	21.4						

^{a)} Other ratios available on request

 $^{^{\}mbox{\scriptsize b)}}$ For higher ambient temperatures, please reduce input speed

c) Valid for clamping hub diameter of 38 mm

d) Refers to center of the output shaft or flange



M16x36

M16×36

89

5) Tolerance h6 for mounted shaft.

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

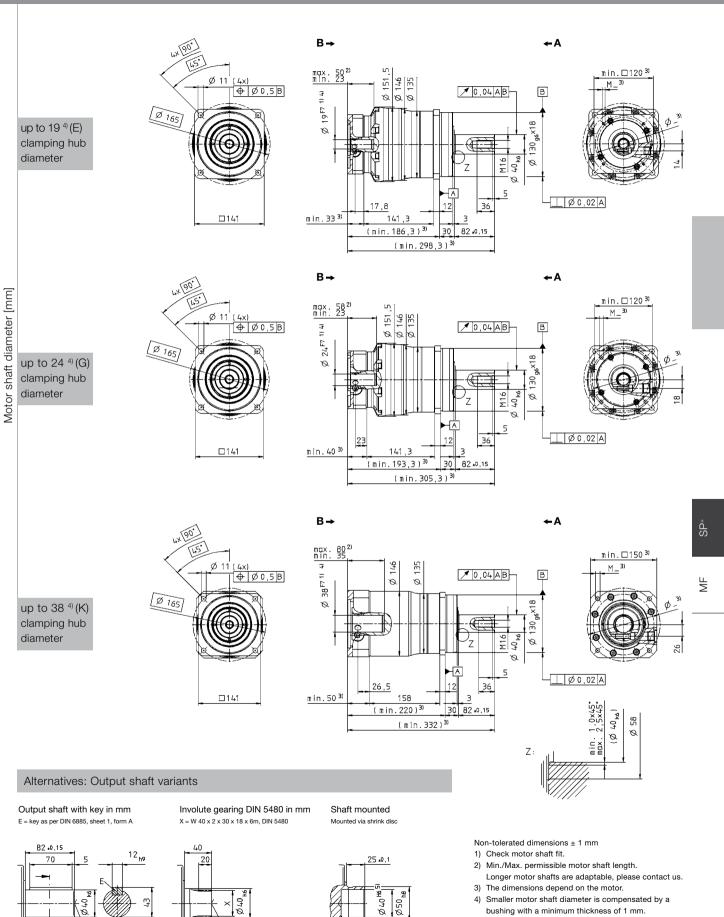
SP* 140 MF 2-stage

									2- s	tage							
Ratio ^{a)}			i		16	20	25	28	32	35	40	50	70	100			
cymex®-optimized acceleration torque			T _{2Bcym}	Nm	710	710	755	710	560	755	710	755	680	560			
(please contact us regarding the design)			2Bcym	in.lb	6284	6284	6682	6284	4956	6682	6284	6682	6018	4956			
Max. acceleration torque			T _{2B}	Nm 	660	660	660	660	530	660	660	660	660	530			
(max. 1000 cycles per hour)				in.lb Nm	5841 360	5841 360	5841	5841 360	4691 360	5841 360	5841 360	5841 360	5841 360	4691 220			
Nominal output torque (with n_{1N})			T _{2N}	in.lb	3186	3186	360 3186	3186	3186	3186	3186	3186	3186	1947			
Emergency stop torque				Nm	1250	1250	1250	1250	1250	1250	1250	1250	1250	1000			
(permitted 1000 times during the service life of the gear	head)		T _{2Not}	in.lb	11063	11063	11063	11063	11063	11063	11063	11063	11063	8850			
Nominal input speed (with T_{2N} and 20°C ambient temperature) b)			n _{1N}	rpm	2900	2900	2900	2900	2900	2900	2900	3200	3200	3900			
Max. input speed c)			n _{1Max}	rpm	5000	5000	5000	5000	5000	5000	5000	5000	5000	5000			
Mean no load running torque			T	Nm	3.3	2.7	2.4	1.9	1.9	1.8	1.4	1.3	1.2	1.1			
(with n ₁ =3000 rpm and 20°C gearhead temperature) c)			T ₀₁₂	in.lb	29.2	23.9	21.2	16.8	16.8	15.9	12.4	11.5	10.6	9.7			
Max. torsional backlash			\dot{J}_t	arcmin				Sta	andard ≤ 5	/ Reduced	≤ 3						
Torsional rigidity			C ₁₂₁	Nm/ arcmin					5								
<u> </u>			121	in.lb/ arcmin						59							
Max. axial force d			F _{2AMax}	Ib,					98								
	-	-		N N	2221 9900												
Max. radial force d			F _{2RMax}	lb,	2228												
				Nm	952												
Max. tilting moment			M _{2KMax}	in.lb	8425												
Efficiency at full load			η	%	94												
Service life (For calculation, see the Chapter "Information")			L	h					> 20	0000							
Weight inclusted adoptor plate				kg					1	7							
Weight incl. standard adapter plate			m	lb _m					37	'.6							
Operating noise (with i=100 and n;=3000 rpm no load)			L _{PA}	dB(A)					≤	63							
Max. permitted housing temperature				°C					+9	90							
,				F					19								
Ambient temperature				°C F		-				0 +40							
Lubrication										104 ed for life							
Paint									Blue R	AL 5002							
Direction of rotation	-							Motor	and gearhe	ad same d	irection						
Protection class									IP	65							
				kgcm ²	2.50	2.01	1.97	1.65	2.48	1.63	1.40	1.39	1.38	1.38			
Moment of inertia	Е	19	J_1	10°3 in.lb.s²	2.21	1.78	1.75	1.46	2.19	1.44	1.24	1.23	1.22	1.22			
(relates to the drive)	_	0.4	,	kgcm ²	3.19	2.71	2.67	2.34	3.18	2.32	2.10	2.08	2.08	2.07			
Clamping hub diameter [mm]	G	24	J ₁	10 ⁻³ in.lb.s ²	2.82	2.40	2.36	2.07	2.81	2.05	1.85	1.85	1.84	1.83			
	K	38	J_{i}	kgcm ²	10.3	9.77	9.73	9.41	9.32	9.39	9.16	9.15	9.14	9.14			
			_ ′	10 ⁻³ in.lb.s ²	9.07	8.65	8.61	8.33	8.25	8.31	8.11	8.10	8.09	8.09			

^{a)} Other ratios available on request

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

Valid for clamping hub diameter of 24 mm
 Refers to center of the output shaft or flange



M16x36

M16×36

bushing with a minimum thickness of 1 mm.

Motor mounting according to operating manual

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

5) Tolerance h6 for mounted shaft.

SP* 180 MF 1-stage

							1-stage						
Ratio ^{a)}			i		3	4	5	7	10				
cymex®-optimized acceleration torque			_	Nm	-	1785	1890	1785	1400				
(please contact us regarding the design)			T _{2Bcym}	in.lb	-	15797	16727	15797	12390				
Max. acceleration torque			_	Nm	970	1210	1210	1210	970				
(max. 1000 cycles per hour)			T _{2B}	in.lb	8585	10709	10709	10709	8585				
Nominal output torque			T _{2N}	Nm	530	750	750	750	750				
(with n _{1N})			* 2N	in.lb	4691	6638	6638	6638	6638				
Emergency stop torque			T _{2Not}	Nm	2200	2750	2750	2750	2200				
(permitted 1000 times during the service life of the gear	rhead)		ZIVOI	in.lb	19470	24338	24338	24338	29470				
Nominal input speed (with T _{2N} and 20°C ambient temperature) b)			n _{1N}	rpm	1500	1500	1500	2300	2300				
Max. input speed			n _{1Max}	rpm	3500	3500	3500	3500	3500				
Mean no load running torque			T ₀₁₂	Nm	14.0	11.0	9.0	6.8	5.0				
(with n ₁ =3000 rpm and 20°C gearhead temperature) c)			012	in.lb	123.9	97.4	79.7	60.2	44.3				
Max. torsional backlash			j_t	arcmin		St	andard ≤ 3 / Reduced ≤	≤1					
Torsional rigidity			C _{t21}	Nm/ arcmin			175						
Torsional rigidity			U _{t21}	in.lb/ arcmin			1549						
Max. axial force d			F _{2AMax}	N			14150						
			* 2AMax	lb _f	15400								
Max. radial force d			F _{2RMax}	N									
			ZHIVIdX	lb _f									
Max. tilting moment			M _{2KMax}		Nm 1600								
Efficiency at full load	-		η		in.lb 14160 % 97								
Service life				h			> 20000						
(For calculation, see the Chapter "Information")			L _h	kg			34						
Weight incl. standard adapter plate			m	lb _m			75.1						
Operating noise (with i=10 and n,=3000 rpm no load)			L _{PA}	dB(A)			≤ 66						
Many assumptional livery 2				°C			+90						
Max. permitted housing temperature				F			194						
Ambient temperature				°C			-15 to +40						
, and one tomporature				F			5 to 104						
Lubrication					Lubricated for life								
Paint							Blue RAL 5002						
Direction of rotation						Motor	and gearhead same di	rection					
Protection class							IP 65						
				kgcm ²	50.8	33.9	27.9	22.2	19.2				
Moment of inertia (relates to the drive)	K	38	J_1	10 ⁻³ in.lb.s ²	45.0	30.0	24.7	19.7	17.0				
(rolates to the unive)				kgcm ²	58.2	41.2	35.3	29.6	26.5				
Clamping hub diameter [mm]	M	48	$J_{_{1}}$	10 ⁻³ in.lb.s ²	51.5	36.5	31.2	26.2	23.5				
	p. 1		,	kgcm ²	65.7	49.7	44.0	38.5	35.4				
	N	55	J_1	10 ⁻³ in.lb.s ²	58.2	44.0	38.9	34.0	31.4				

^{a)} Other ratios available on request

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

Valid for clamping hub diameter of 48 mm
 Refers to center of the output shaft or flange

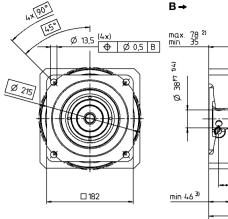


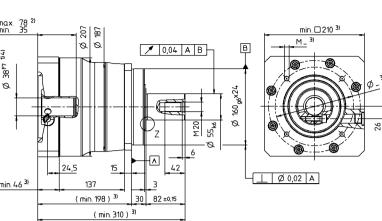
←A



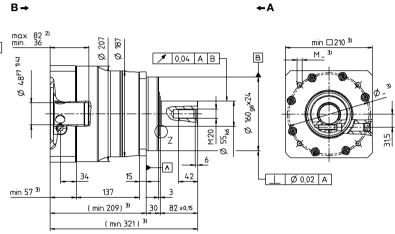
up to 48 4) (M) clamping hub diameter

Motor shaft diameter [mm]

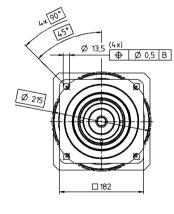


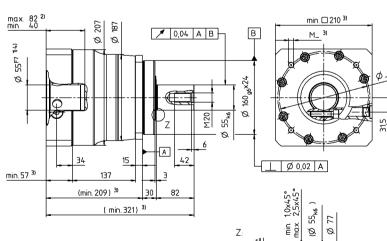


Ø 13,5 (4x) Ø 215 □182



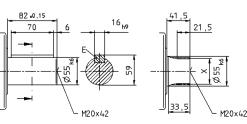
up to 55 4) (N) clamping hub diameter





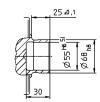
Alternatives: Output shaft variants

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



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

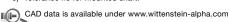
B→



Shaft mounted Mounted via shrink disc

Non-tolerated dimensions \pm 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.



Motor mounting according to operating manual

 $\mathbb{A}^{\mathbb{N}}$

SP* 180 MF 2-stage

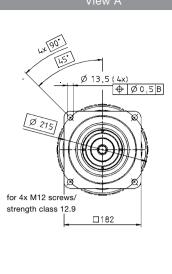
Name and continuous and a continuous a									2-stage								
Processor Proc	Ratio ^{a)}		i		16	20	25	28	35	40	50	70	100				
Main	cymex®-optimized acceleration torque		T	Nm	1785	1785	1890	1785	1890	1785	1800	1785	1400				
Monimal output torque Form Form Monimal output torque Form Monimal output Monimal output Monima	please contact us regarding the design)		2Bcym	in.lb	15797	15797	16727	15797	16727	15797	15930	15797	12390				
Normal polygon between Normal polygon Normal polygo	·		T	Nm	1210	1210	1210	1210	1210	1210	1210	1210	970				
Feb Part P	max. 1000 cycles per hour)		- 28									-	8585				
Minus Control Contro			T _{2N}										750				
Table			1										6638				
Nominal input speed Part		d)	T _{2Not}										1947				
Max. torsional backlash			n _{1N}										3400				
In	Max. input speed ©		n _{1Max}	rpm	4500	4500	4500	4500	4500	4000	4500	4500	4500				
Figure 2007	Mean no load running torque		_	Nm	5.3	4.3	3.9	3.1	2.8	2.3	2.1	1.9	1.7				
Torsional rigidity Corporation Corporat			012	in.lb	46,9	38,1	34,5	27,4	24,8	20,4	18,6	16,8	15,0				
Corp. Co	Max. torsional backlash		j_t	arcmin				Standar	rd ≤ 5 / Redu	ıced ≤ 3							
Max. axial force 4	Torsional rigidity		C	Nm/ arcmin					175								
Max. radial force of F ₂₀₀₀₀ Ib, 3184 15400	Total rigidity		U ₁₂₁						1549								
Max. radial force ⁴⁶ F _{3784ac} Max. tilting moment M ₃₆₄₆₅ Nm 1600 Nm 1600 14160 94 Service life For calculation, see the Chapter "Information") Weight incl. standard adapter plate Max. permitted housing temperature The standard housing temperature Ambient temperature F 194 Ambient temperature F 194 Lubrication Motor and gearhead same direction F 1 32 J ₁ kgcm² 9,27 7,72 7,48 6,32 6,20 5,51 5,45 5,39 5,54 1,54 5,39 5,54 1,54 5,53 9 5,54 1,54 5,53 9 5,54 1,54 5,5 9 5,4 9 4,88 4,82 4,77 4,5 6,38 5,5 8,5 5,5 5,5 5,5 5,5 5,5 5,5 5,5 5,	Max. axial force d		F														
Max. tilting moment			ZAMax														
Max. tilting moment	Max. radial force d)		F _{2RMax}														
Max. tilting moment				-													
Service life Fior calculation, see the Chapter "Information" L _n h Service life Fior calculation, see the Chapter "Information" L _n h Service life Servi	Max. tilting moment		M _{2KMax}														
For calculation, see the Chapter "Information" Ln	Efficiency at full load		η	% 94													
Max. permitted housing temperature			L	h					> 20000								
Ibm 80.4 Operating noise L _{PA} dB(A) ≤ 66 Max. permitted housing temperature F 194 Ambient temperature F 194 To the district of the drive) To the drive) For the district of the drive) To the district of the di	Weight incl. standard adapter plate		m						36.4								
Max. permitted housing temperature			1	lb _m					80.4								
The state of the driver F 194	. •		L _{PA}														
Ambient temperature - °C	Max. permitted housing temperature																
F S to 104																	
Lubricated for life	Ambient temperature																
Direction of rotation Motor and gearhead same direction	Lubrication			Г				Lu		life		,					
Protection class G 24 J ₁								Е	lue RAL 500	2							
Moment of inertia (relates to the drive) G 24 J ₁ kgcm² 9.27 7.72 7.48 6.32 6.20 5.51 5.45 5.39 5. 1 32 J ₁ kgcm² 12.4 10.9 10.6 9.48 9.36 8.67 8.61 8.55 8. Clamping hub diameter [mm] K 38 J ₁ kgcm² 13.5 12.0 11.7 10.6 10.4 9.74 9.68 9.63 9. kgcm² 28.1 26.6 26.3 25.2 25.1 24.4 24.3 24.3 24.3	Direction of rotation							Motor and o	gearhead sar	me direction							
Moment of inertia (relates to the drive) I 32 J, kgcm² 12.4 10.9 10.6 9.48 9.36 8.67 8.61 8.55 8. K 38 J, kgcm² 13.5 12.0 11.7 10.6 10.4 9.74 9.68 9.63 9. kgcm² 28.1 26.6 26.3 25.2 25.1 24.4 24.3 24.3 24.3 24.3	Protection class								IP 65								
(relates to the drive) 1 32 J_1	Moment of inertia	G 04	1	kgcm²	9.27	7.72	7.48	6.32	6.20	5.51	5.45	5.39	5.36				
Clamping hub diameter [mm] 1 32 J ₁ 11.0 9.63 9.42 8.39 8.28 7.67 7.62 7.57 7. K 38 J ₁		G 24	J 1	10 ⁻³ in.lb.s ²	8.20	6.83	6.62	5.59	5.49	4.88	4.82	4.77	4.74				
K 38 J, kgcm² 13.5 12.0 11.7 10.6 10.4 9.74 9.68 9.63 9. kgcm² 13.5 12.0 11.7 10.6 10.4 9.74 9.68 9.63 9. kgcm² 28.1 26.6 26.3 25.2 25.1 24.4 24.3 24.3 24.3	Clamping but diameter [mm²]	32	J	kgcm ²	12.4	10.9	10.6	9.48	9.36	8.67	8.61	8.55	8.52				
K 38 J, 10° in.lb.s° 12.0 10.6 10.4 9.34 9.23 8.62 8.57 8.52 8. kgcm² 28.1 26.6 26.3 25.2 25.1 24.4 24.3 24.3 24.3	wamping hub diameter [min]	- 02	1	10 ⁻³ in.lb.s ²	11.0		9.42		8.28		7.62	-	7.54				
kgcm ² 28.1 26.6 26.3 25.2 25.1 24.4 24.3 24.3 24.3		K 38	J_{\star}	<u> </u>				-				-	9.60				
kgcm² 28.1 26.6 26.3 25.2 25.1 24.4 24.3			'									_	8.49				
M 48 J_1 10° in.lb.s' 24.9 23.5 23.3 22.3 22.2 21.6 21.5 21.5 2°		M 48	$J_{_{1}}$	_		_						-	24.3				

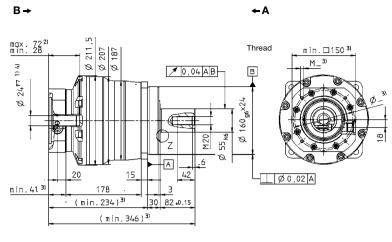
^{a)} Other ratios available on request

 $[\]dot{}^{\rm b)}$ For higher ambient temperatures, please reduce input speed

c) Valid for clamping hub diameter of 38 mm

d) Refers to center of the output shaft or flange





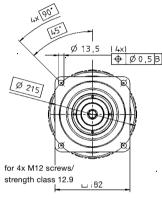


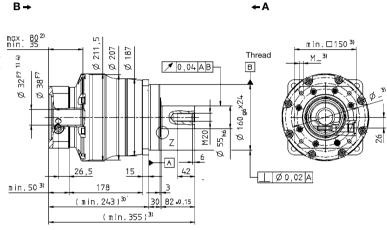
up to 48 4) (M)

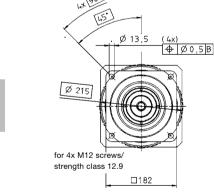
clamping hub diameter

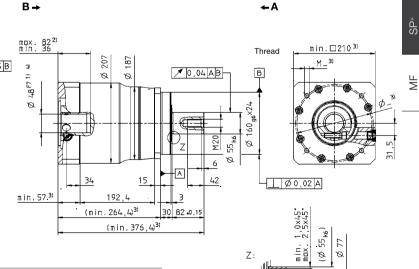
up to 24⁴⁾(G) clamping hub

diameter



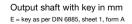


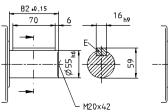




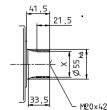
Z: Detail

Alternatives: Output shaft variants

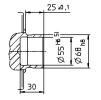




Involute gearing DIN 5480 in mm X = W 55 x 2 x 30 x 26 x 6m, DIN 5480



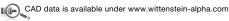
Shaft mounted Mounted via shrink disc



Connecting part

Non-tolerated dimensions \pm 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.



SP+ 210 MF 1/2-stage

							1-stage	•		2-stage									
Ratio a)			i		3	4	5	7	10	16	20	25	28	35	40	50	70	100	
cymex®-optimized acceleration torqu (please contact us regarding the design)	ue		T _{2Bcym}	Nm in.lb				•		- F	Please c	ontact u	s -						
Max. acceleration torque (max. 1000 cycles per hour)			T _{2B}	Nm in.lb	1600 14160	2500 22125	2500 22125	2400 21240	1900 16815	2400 21240	2500 22125	2500 22125	2400 21240	2400 21240	2400 21240	2400 21240	2400 21240	1900 16815	
Nominal output torque (with n_{10})			T _{2N}	Nm in.lb	1100 9735	1500 13275	1500 13275	1400 12390	1000 8850	1500 13275	1500 13275	1500 13275	1500 13275	1500 13275	1500 13275	1500 13275	1400 12390	1000 8850	
Emergency stop torque (permitted 1000 times during the service life of the g	jearhead	i)	T _{2Not}	Nm in.lb	5000 44250	5200 46020	5200 46020	5200 46020	5000 44250	5200 46020	5200 46020	5200 46020	5200 46020	5200 46020	5200 46020	5200 46020	5200 46020	5000 44250	
Nominal input speed (with T _{2N} and 20°C ambient temperature) b)			n _{1N}	rpm	1200	1200	1500	1700	2000	2500	2500	2500	2500	2500	2500	2500	3000	3000	
Max. input speed			n _{1Max}	rpm	2500	2500	2500	2500	2500	3500	3500	3500	3500	3500	3500	3500	3500	3500	
Mean no load running torque (with n,=2000 rpm and 20°C gearhead temperature))		T ₀₁₂	Nm in.lb	32 283	22 195	17 151	11 97	7,0 62	7,0 62	6,0 53	5,5 49	4,5 40	4,0 35	3,5 31	3,5 31	3,5 31	3,0 27	
Max. torsional backlash			j_t	arcmin	S	tandard	≤ 3 / Re	duced ≤	1			S	tandard	≤ 5 / Re	duced ≤	3			
Torsional rigidity			C _{t21}	Nm/ arcmin in.lb/ arcmin			400 3540			400 3540									
Max. axial force o			F _{2AMax}	N lb _f			30000 6750							30000 6750					
Max. radial force ©			F _{2RMax}	N lb _f			21000 4725							21000 4725					
Max. tilting moment			M _{2KMax}	Nm in.lb			3100 27435							3100 2744					
Efficiency at full load			η	%			97							94					
Service life (For calculation, see the Chapter "Information")			L _n	h		:	> 20000			> 20000									
Weight incl. standard adapter plate			m	kg lb _m			56 124						-	53 117					
Operating noise (with i=10 and n,=2000 rpm no load)			L _{PA}	dB(A)						≤ 64									
Max. permitted housing temperature	•			°C F						+90 194									
Ambient temperature				°C F						-15 to +40 5 to 104									
Lubrication										ı	_ubricate	ed for life	е						
Paint											Blue RA	AL 5002							
Direction of rotation									M	lotor and	d gearhe	ad same	e direction	on					
Protection class											IP	65							
Moment of inertia (relates to the drive)	M	48	J,	kgcm ² 10 ⁻³ in.lb.s ²	-	-	-	-	-	34.5 30.5	31.5 27.9	30.8 27.3	30.0 26.6	29.7 26.3	28.5 25.2	28.3 25.0	28.1 24.9	28.0 24.8	
Clamping hub diameter (mm)	N	55	$J_{\scriptscriptstyle 1}$	kgcm²	139.0 118.2	94.3 80.2	76.9 65.4	61.5 52.3	53.1 45.1	-	-	-	-	-	-	-	-	-	

a) Other ratios available on request

b) For higher ambient temperatures, please reduce input speed

c) Refers to center of the output shaft or flange

View A

(min. 385)³⁾

198

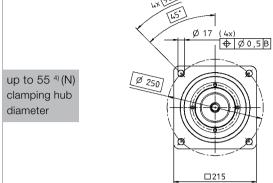
(min. 415)³⁾

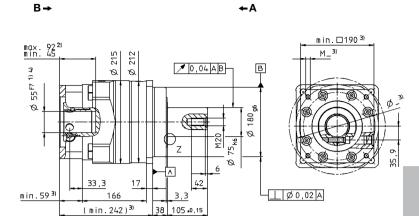
(min. 272)³⁾

B→

<u>min.5</u>7³)



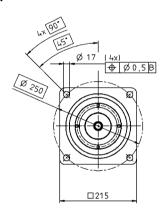


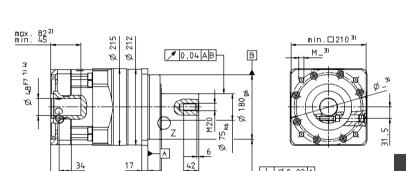


2-stage:



Motor shaft diameter [mm]





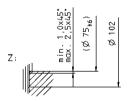
3,3

105 ±0,15

←A

 $\mathbb{A}^{\mathbb{N}}$

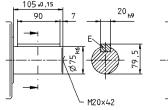
ŠР

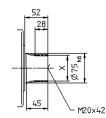


___ Ø 0,02 A

Alternatives: Output shaft variants

Output shaft with key in mm E = key as per DIN 6885, sheet 1, form A Involute gearing DIN 5480 in mm X = W 70 x 2 x 30 x 34 x 6m, DIN 5480





Non-tolerated dimensions \pm 1.5 mm

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



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

SP+ 240 MF 1/2-stage

							1-stage	•		2-stage									
Ratio ^{a)}			i		3	4	5	7	10	16	20	25	28	35	40	50	70	100	
cymex®-optimized acceleration torqu (please contact us regarding the design)	ie		T _{2Bcym}	Nm in.lb						- F	Please c	ontact u	s -						
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	
Nominal output torque			T _{2N}	in.lb Nm	24338 1500	39825 2500	39825 2500	38055 2300	30090 1700	39825 2500	39825 2500	39825 2500	39825 2500	39825 2500	35400 2500	38055 2500	38055 2300	30090 1700	
(with n_{N}) Emergency stop torque			T _{2Not}	in.lb Nm	13275 6800	22125 8500	22125 8500	20355 8500	15045 6800	22125 8500	22125 8500	22125 8500	22125 8500	22125 8500	22125 8500	22125 8500	20355 8500	15045 6800	
(permitted 1000 times during the service life of the general Nominal input speed	earhead	1)	n _{1N}	in.lb rpm	1000	75225 1000	75225 1200	75225 1500	1700	75225 2300	75225 2500	75225 2500	75225 2500	75225 2500	75225 2500	75225 2500	75225 2800	2800	
(with T_{2N} and 20°C ambient temperature) b) Max. input speed				rpm	2500	2500	2500	2500	2500	3500	3500	3500	3500	3500	3500	3500	3500	3500	
Mean no load running torque			n _{1Max}	Nm	45	35	26	16	11	11	9,0	8,0	7,0	6,0	5,0	4,5	4,0	4,0	
(with n_i =2000 rpm and 20°C gearhead temperature)			T ₀₁₂	in.lb	398	310	230	142	97	97	80	71	62	53	44	40	35	35	
Max. torsional backlash			j _t	arcmin	S	tandard	≤ 3 / Re 550	duced ≤	1	Standard ≤ 5 / Reduced ≤ 3 550									
Torsional rigidity			C ₁₂₁	in.lb/ arcmin		4868 4868 33000 33000													
Max. axial force ©			F _{2AMax}	lb _f			7425 30000							7425 30000					
Max. radial force °)			F _{2RMax}	lb _f			6750						-	6750		-			
Max. tilting moment			M _{2KMax}	Nm in.lb		5000 5000 44250 44250													
Efficiency at full load			η	%			97							94					
Service life (For calculation, see the Chapter "Information")			L	h		:	> 20000							> 20000)				
Weight incl. standard adapter plate			m	kg lb _m			77 170			76 168									
Operating noise (with i=10 and n _i =2000 rpm no load)			L _{PA}	dB(A)						≤ 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 RA	AL 5002							
Direction of rotation									M	lotor and	d gearhe	ad same	e direction	on					
Protection class											IP 65								
Moment of inertia	М	48	J ₁	kgcm ²	-	-	-	-	-	39.2 34.7	34.6 30.6	33.2 29.4	30.5 27.0	29.7	28.2	27.9	27.6 24.4	27.5 24.3	
(relates to the drive) Clamping hub diameter [mm]	0	60	J,	kgcm²	260.2	198.2	163.0	138,3	124,7	34.1	30.0	29.4	27.0	20.3	23.0	24.1	24.4	- 24.3	

a) Other ratios available on request

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

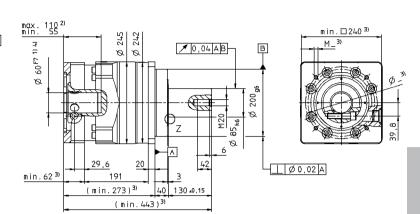
c) Refers to center of the output shaft or flange

View A



Ø 2901 up to 60 4) (O) clamping hub diameter □245

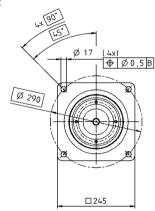
←A B→

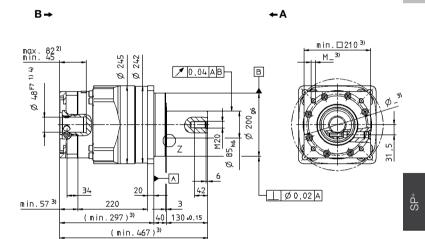


2-stage:

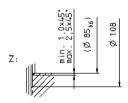
up to 48 4) (M) clamping hub diameter

Motor shaft diameter [mm]



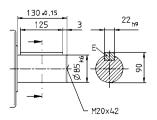


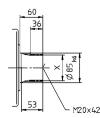
 $\stackrel{\vdash}{\mathsf{M}}$



Alternatives: Output shaft variants

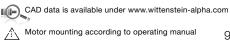
Output shaft with key in mm E = key as per DIN 6885, sheet 1, form A Involute gearing DIN 5480 in mm X = W 80 x 2 x 30 x 38 x 6m, DIN 5480





Non-tolerated dimensions \pm 1.5 mm

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



SP+ 075 MC HIGH SPEED 1-stage

					1-stage										
Ratio ^{a)}			i		3	4	5	7	8	10					
Max. acceleration torque			_	Nm	68	90	90	90	70	70					
(max. 1000 cycles per hour)			T_{2B}	in.lb	602	797	797	797	620	620					
cymex®-optimized nominal torque			T	Nm	-	60	60	60	35	35					
(please contact us regarding the design)			T _{2Ncym}	in.lb	-	531	531	531	310	310					
Nominal output torque			T _{2N}	Nm	28	48	48	48	30	30					
(with n _{1N})			2N	in.lb	248	425	425	425	266	266					
Emergency stop torque (permitted 1000 times during the service life of the gearh	ead)		T _{2Not}	Nm in.lb	200 1770	250 2213	250 2213	250 2213	200 1770	200 1770					
Nominal input speed (with $T_{_{2N}}$ and 20°C ambient temperature) ^{b)}			n _{1N}	rpm	4500	4500	4500	4500	4500	4500					
Max. input speed			n _{1Max}	rpm	6000	6000	6000	6000	6000	6000					
Mean no load running torque	ean no load running torque			Nm	1.4	1.1	0.9	0.6	0.5	0.5					
(with n_i =2000 rpm and 20°C gearhead temperature) c)		T ₀₁₂	in.lb	12.4	12.4 9.7 8.0 5.3 4.4										
Max. torsional backlash			\dot{J}_t	arcmin	Standard ≤ 6 / Reduced ≤ 4										
Torsional rigidity		C ₁₂₁	Nm/ arcmin		10										
Torsional rigidity		U _{t21}	in.lb/ arcmin			8	9								
Max. axial force d			F _{2AMax}	N lb,				54 54							
Max. radial force d			F _{2RMax}	N				200							
Widx. radial force			2RMax	lb _f			94	45							
Max. tilting moment			M _{2KMax}	Nm in.lb				36 189							
Efficiency at full load			η	%				3.5							
Service life (For calculation, see the Chapter "Information")			L _h	h	> 30000										
				kg	3.9										
Weight incl. standardadapter plate			m	lb _m	8.6										
Operating noise (with <i>i</i> =10 and <i>n</i> ,=3000 rpm no load)			L _{PA}	dB(A)			≤	59							
Max. permitted housing temperature				°C	°C +90										
				F											
Ambient temperature				°C				i to +40							
				F				to 104							
Lubrication							LUDIIC	ated for life							
Paint							Blue	RAL 5002							
Direction of rotation					Motor and gearhead same direction										
Protection class					IP 65										
Moment of inertia	nent of inertia E 1					0.78	0.68	0.59	0.42	0.54					
(relates to the drive)	_	19	J,	10 ⁻³ in.lb.s ²	0.91	0.69	0.60	0.52	0.37	0.48					
Clamping bub diameter from	G	24	$J_{_{1}}$	kgcm ²	2.40	2.15	2.05	1.96	2.02	1.91					
Clamping hub diameter [mm]	~		J ₁	10 ⁻³ in.lb.s ²	2.12	1.90	1.81	1.73	1.79	1.69					

a) Other ratios available on request

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

 $^{^{\}mbox{\tiny c)}}$ Valid for clamping hub diameter of 19 mm

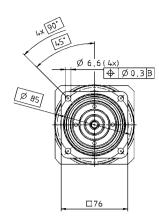
d) Refers to centre of the output shaft or flange

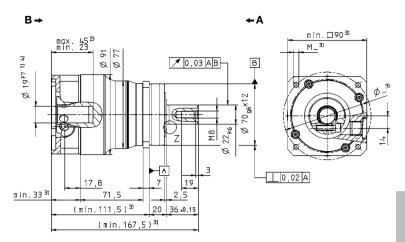
View A View

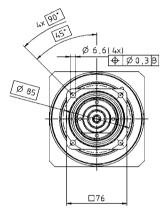


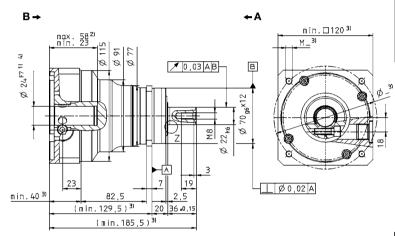
Motor shaft diameter [mm]

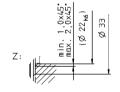
up to 24 ⁴⁾ (G) clamping hub diameter







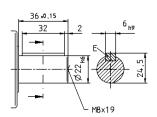




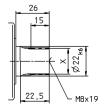
MC

Alternatives: Output shaft variants

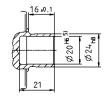
Output shaft with key in mm E = key as per DIN 6885, sheet 1, form A



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

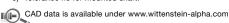


Shaft mounted Mounted via shrink disc



Non-tolerated dimensions ± 1 mm

- 1) Check motor shaft fit.
- Min./Max. permissible motor shaft length.
 Longer motor shafts are 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.





SP+ 075 MC HIGH SPEED 2-stage

				2-stage													
Ratio ^{a)}		i		16	20	25	28	32	35	40	50	70	100				
Max. acceleration torque		T _{2B}	Nm	90	90	90	90	70	90	90	90	90	70				
(max. 1000 cycles per hour)		28	in.lb	797	797	797	797	620	797	797	797	797	620				
cymex®-optimized nominal torque (please contact us regarding the design)		T _{2Ncym}	Nm in.lb	-	_	-	-	-	-	60 531	_	-	35 310				
Nominal output torque (with n_{1N})		T _{2N}	Nm in.lb	60 531	60 531	60 531	60 531	60 531	60 531	55 487	60 531	60 531	30 266				
Emergency stop torque (permitted 1000 times during the service life of the gearhead)		T _{2Not}	Nm in.lb	250 2213	250 2213	250 2213	250 2213	200 1770	250 2213	250 2213	250 2213	250 2213	200 1770				
Nominal input speed (with T_{20} and 20° C ambient temperature) b)		n _{1N}	rpm	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500				
Max. input speed		n _{1Max}	rpm	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000				
Mean no load running torque		T ₀₁₂	Nm	0.5	0.4	0.4	0.3	0.3	0.3	0.2	0.2	0.2	0.2				
(with n ₁ =2000 rpm and 20°C gearhead temperature) c)		012	in.lb	4.4	4.4 3.5 3.5 2.7 2.7 2.7 1.8 1.8								1.8				
Max. torsional backlash		j_t	arcmin	Standard ≤ 8 / Reduced ≤ 6													
Torsional rigidity		C ₁₂₁	Nm/ arcmin						0								
Totolona rigidity			in.lb/ arcmin						9								
Max. axial force d			N Ib _f						50 54								
Max. radial force ^{d)}		F _{2RMax}	N Ib,						00 45								
Max. tilting moment		M _{2KMax}	Nm					23	36								
Efficiency at full load		η	in.lb		-				89 3,5								
Service life			h	> 30000													
(For calculation, see the Chapter "Information")		L _h															
Weight incl. standard adapter plate		m	kg lb _m						,6 0								
Operating noise (with i =100 and n_r =3000 rpm no load)		L _{PA}	dB(A)	8.0 ≤ 59													
May permitted housing temperature			°C	°C +90													
Max. permitted housing temperature			F						94								
Ambient temperature			°C F						o +40 104								
Lubrication								Lubricat	ed for life								
Paint								Blue R	AL 5002								
Direction of rotation					Motor	and gearhe	ead same d	irection									
Protection class	ection class							IP	65								
Moment of inertia C	14	J,	kgcm²	0.23	0.20	0.20	0.18	0.23	0.18	0.16	0.16	0.16	0.16				
(relates to the drive)	179	1	10 ⁻³ in.lb.s ²	0.20	0.18	0.18	0.16	0.203	0.16	0.15	0.15	0.14	0.14				
Clamping hub diameter [mm]	19	J_{1}	kgcm ²	0.55	0.53	0.52	0.50	0.57	0.50	0.49	0.49	0.49	0.49				

a) Other ratios available on request

b) For higher ambient temperatures, please reduce input speed

 $^{^{\}mbox{\tiny c)}}$ Valid for clamping hub diameter of 14 mm

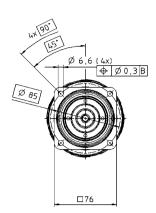
d) Refers to centre of the output shaft or flange

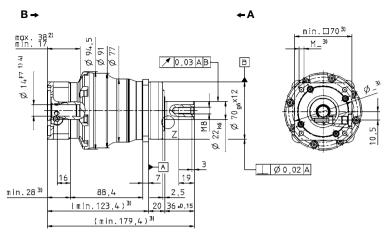


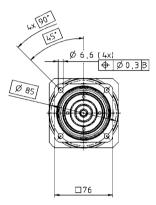
up to 14 4) (C) clamping hub diameter

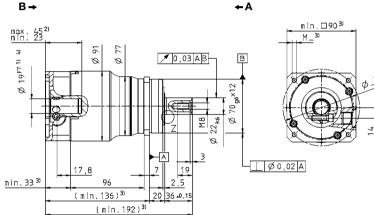
Motor shaft diameter [mm]

up to 19 4) (E) clamping hub diameter





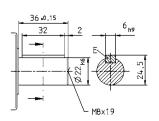




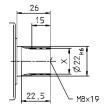
(\$ 22_{k6})

Alternatives: Output shaft variants

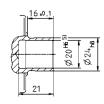
Output shaft with key in mm E = key as per DIN 6885, sheet 1, form A



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

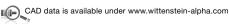


Shaft mounted Mounted via shrink disc



Non-tolerated dimensions \pm 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.



SP+ 100 MC HIGH SPEED 1-stage

Note condensation torque Marie M							Sta	andard v	ersion I	мс		Friction optimized version L								
Min.	Ratio ^{a)}			i		3	4	5	7	8	10	3	4	5	7	8	10			
Manual page	•			Too			_								_		_			
Procession of the procession				25											-		_			
Naminal autjust torque				T _{2Ncym}																
Main																				
Part	1			T _{2N}			_								_		_			
Max. Injust speed Max.	Emergency stop torque			_	Nm	500	625	625	625	500	500	500	625	625	625	500	500			
Max Max May		head)		I _{2Not}	in.lb	4425	5531	5531	5531	4425	4425	4425	5531	5531	5531	4425	4425			
Max Injust Service Max Injust Injus	I			n _{1N}	rpm	3500	4000	4500	4500	4500	4500	3500	4000	4500	4500	4500	4500			
Max. torsional placklash Max. torsional backlash Max. torsional placklash Max. torsional backlash Max. axial force 4 Max. axial force 5 Max. axial force 6 Max				n _{1Ncym}	rpm	-	-	-	-	-	-	4500	5000	5000	5000	5000	5000			
Max. torsional backlash I	Max. input speed	lax. input speed		n _{1Max}	rpm	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000			
Tarsional rigidity				T ₀₁₂																
Torsional rigidity	Max. torsional backlash			j_t	arcmin	Standard ≤ 4 / Reduced ≤ 2														
Max. axial force ⁶ Pastage N	Torsional rigidity			C ₁₂₁																
Max. radial force of	Max. axial force d				N			56	50					20	000					
Max. tilting moment Max. til				ZAWAX																
Max. tilting moment Mm (in.lb) 487 (in.lb) 72 (in.lb) 72 (in.lb) 637 (in.lb) 647 (in.lb) 647 (in.lb) 647 (in.lb) 647 (in.lb) 647 (in.lb) 648 (in.lb)	Max. radial force d			F _{2RMax}																
Efficiency at full load η % 98.5 99					<u> </u>															
Service Ife For calculation, see the Chapter "Information" L _n	Max. tilting moment			M _{2KMax}	in.lb			43	10					63	37					
For calculation, see the Chapter "Information" L_h	Efficiency at full load			η	%	98.5								19						
Weight incl. standard adapter plate m Ibm. 17.0 Operating noise (with i=10 and n₁=3000 rpm no load) L _{PA} dB(A) ≤ 64 Max. permitted housing temperature F 194 Ambient temperature F 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) G 24 J₁ (Rgcm²) 3.99 3.04 2.61 2.29 2.26 2.07 3.99 3.04 2.61 2.29 2.26 2.07 3.99 3.04 2.61 2.29 2.26 2.07 3.99 3.04 2.61 2.03 2.00 1.83 3.53 2.69 2.31 2.03 2.00 1.83 3.53 2.69 2.31 2.03 2.00 1.83 3.53 2.69 2.31 2.03 2.00 1.83 3.53 2.69 2.31 2.03 2.00 1.83 3.53 2.69 2.31 2.03 2.00 1.83 3.53 2.69 2.31 2.03 2.00 1.83 3.53 2.69 2.31 2.03 2.00 1.83 3.53 2.69 2.31 2.03 2.00 1.83 3.53 2.69 2.31 2.03 2.00 1.83 3.53 2.69 2.31 2.03 2.00 1.83 3.53 2.69 2.31 2.03 2.00 1.83 3.53 2.69 2.31 2.03 2.00 1.83 3.53 2.69 2.31 2.03 2.00 1.83 3.53 2.69 2.31 2.03 2.00 1.83 3.53 2.69 2.31 2.03 2.00 1.83 3.53 2.69 2.31 2.03 2.00 2.00 2.00 2.00 2.00 2.00 2.00				L	h	> 30000														
Operating noise (with i=10 and n _i =3000 rpm no load) L _{pA} dB(A) ≤ 64 Max. permitted housing temperature F F 194 Ambient temperature °C F 5 to 104 Lubrication Lubricated for life Paint Blue RAL 5002 Direction of rotation Motor and gearhead same direction Protection class IP 65 IP 52 Moment of inertia (relates to the drive) G 24 J ₁ kgcm² 3.99 3.04 2.61 2.29 2.26 2.07 3.99 3.04 2.61 2.29 2.26 2.07 (3.99 3.04 2.01 2.07 (3.99 3.04 2.01 2.07 (3.99 3.04 2.01 2.07 (3.99 3.04 2.01 2.07 (3.99 3.04 2.01 2.07 (3.99 3.04 2.01 2.07 (3.99 3.04 2.01 2.07 (3.99 3.04 2.01 2.07 (3.99 3.04 2.01 2.07 (3.99 3.04 2.01 2	Weight incl. standard adapter plate			m																
Max. permitted housing temperature	, ,			L _{PA}																
F 194					°C						+9	90								
Ambient temperature F 5 to 104 Lubrication	Max. permitted housing temperature				F						19	94								
F S to 104	Ambient temperature				°C						-15 t	o +40								
Paint Blue RAL 5002 Direction of rotation	Ambient temperature				F						5 to	104								
Direction of rotation	Lubrication										Lubricate	ed for life								
Protection class IP 65 IP 52 Moment of inertia (relates to the drive) Graphing but diameter (mm) K 38 J. Regcm ² 3.99 3.04 2.61 2.29 2.26 2.07 3.99 3.04 2.61 2.29 2.26 2.07 10° in lb.s² 3.53 2.69 2.31 2.03 2.00 1.83 3.53 2.69 2.31 2.03 2.00 1.83 K 38 J.	Paint	_	_								Blue R	AL 5002								
Moment of inertia (relates to the drive) G 24 J, kgcm² 3.99 3.04 2.61 2.29 2.26 2.07 3.99 3.04 2.61 2.29 2.26 2.07 [103 in.lb.s²] 3.53 2.69 2.31 2.03 2.00 1.83 3.53 2.69 2.31 2.03 2.00 1.83 [1.1] 10.1 9.68 9.36 9.55 9.14 11.1 10.1 9.68 9.36 9.55 9.14	Direction of rotation						Motor and gearhead same direction													
Moment of inertia (relates to the drive) G 24 J ₁ 10-3 in.lb.s ² 3.53 2.69 2.31 2.03 2.00 1.83 3.53 2.69 2.31 2.03 2.00 1.83 Kgcm ² 11.1 10.1 9.68 9.36 9.55 9.14 11.1 10.1 9.68 9.36 9.55 9.14	Protection class	otection class						IP 65 IP 52												
(relates to the drive)	Moment of inertia	G	2/1		kgcm ²	3.99	3.04	2.61	2.29	2.26	2.07	3.99	3.04	2.61	2.29	2.26	2.07			
Clamping hub diameter [mm] K 38 J.		3		1																
	Clamping hub diameter [mm]	K	38	J_1	kgcm ²	11.1 9.78	10.1 8.95	9.68 8.57	9.36 8.28	9.55 8.45	9.14 8.09	11.1 9.78	10.1 8.95	9.68 8.57	9.36 8.28	9.55 8.45	9.14 8.09			

^{a)} Other ratios available on request

b) For higher ambient temperatures, please reduce input speed

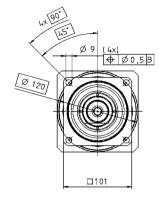
c) Valid for clamping hub diameter of 24 mm

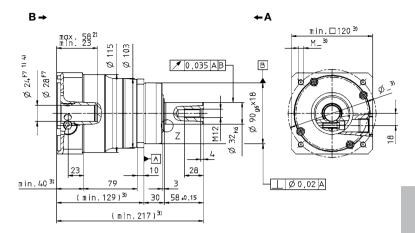
d) Refers to centre of the output shaft or flange



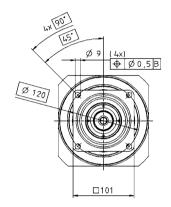


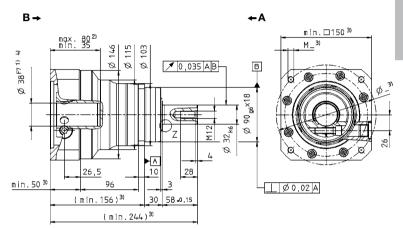
Motor shaft diameter [mm]

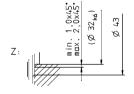




up to 38 4) (K) clamping hub diameter



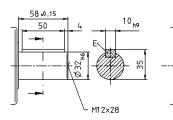




MC

Alternatives: Output shaft variants

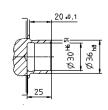
Output shaft with key in mm E = key as per DIN 6885, sheet 1, form A



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

Ø32 46

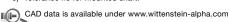
M12x28



Shaft mounted Mounted via shrink disc

Non-tolerated dimensions \pm 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.



SP+ 100 MC HIGH SPEED 2-stage

									2-s	tage							
Ratio ^{a)}			i		16	20	25	28	32	35	40	50	70	100			
Max. acceleration torque			T _{2B}	Nm	240	240	240	240	180	240	240	240	240	180			
(max. 1000 cycles per hour) cymex®-optimized nominal torque				in.lb Nm	2124	2124	2124	2124	1593	2124	2124	2124	2124	1593 90			
(please contact us regarding the design)			T _{2Ncym}	in.lb	-	-	-	-	-	-	-	-	-	0			
Nominal output torque (with n_m)			T _{2N}	Nm in.lb	140 1239	140 1239	140 1239	140 1239	140 1239	140 1239	140 1239	140 1239	135 1195	80 708			
Emergency stop torque (permitted 1000 times during the service life of the gear	nead)		T _{2Not}	Nm in.lb	625 5531	625 5531	625 5531	625 5531	500 4425	625 5531	625 5531	625 5531	625 5531	500 4425			
Nominal input speed (with T _{2M} and 20°C ambient temperature) b)			n _{1N}	rpm	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500			
Max. input speed			n _{1Max}	rpm	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000			
Mean no load running torque			T ₀₁₂	Nm	0.8	0.7	0.6	0.5	0.4	0.4	0.4	0.3	0.3	0.3			
(with n,=2000 rpm and 20°C gearhead temperature) c)			012	in.lb	7.1 6.2 5.3 4.4 3.5 3.5 3.5 2								2.7	2.7			
Max. torsional backlash			\dot{J}_t	arcmin	Standard ≤ 6 / Reduced ≤ 4												
Torsional rigidity	C _{t21}	Nm/ arcmin						1 74									
	N						50										
Max. axial force ^{d)}				lb _f						71							
Max. radial force d			F _{2RMax}	N lb,						85							
Max. tilting moment			M _{2KMax}	Nm						37							
That. thing mornor			2KMax	in.lb	4310												
Efficiency at full load			η	%	96.5												
Service life (For calculation, see the Chapter "Information")			L _h	h													
Weight incl. standardadapter plate			m	kg lb _m	7.9 17.5												
Operating noise (with i=100 and n,=3000 rpm no load)			L _{PA}	dB(A)						60							
Max. permitted housing temperature				°C	+90												
max. pormitted reducing temperature				°C						94							
Ambient temperature				F						o +40 104							
Lubrication									Lubricat	ed for life							
Paint									Blue R	AL 5002							
Direction of rotation					Motor	and gearhe	ead same d	irection									
Protection class									IP	65							
Moment of inertia	Е	19	J,	kgcm ²	0.81	0.70	0.69	0.60	0.80	0.59	0.55	0.54	0.54	0.54			
(relates to the drive)			<u> </u>	10 ⁻³ in.lb.s ² kgcm ²	0.72 2.18	0.62 2.07	0.61 2.05	0.53 1.97	0.71 2.23	0.52 1.96	0.48 1.92	0.48 1.91	0.48 1.91	0.47 1.91			
Clamping hub diameter [mm]	G	24	$J_{\scriptscriptstyle 1}$	10 ⁻³ in.lb.s ²	1.93	1.83	1.82	1.74	1.97	1.74	1.70	1.69	1.69	1.69			

a) Other ratios available on request

b) For higher ambient temperatures, please reduce input speed

 $^{^{\}mbox{\tiny c)}}$ Valid for clamping hub diameter of 19 mm

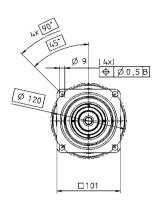
d) Refers to centre of the output shaft or flange

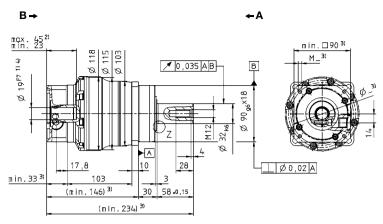


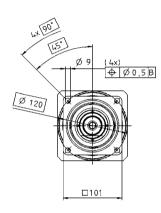


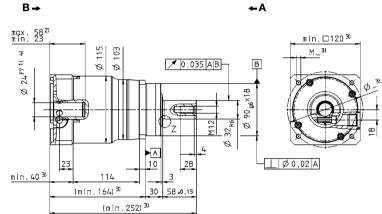
diameter Motor shaft diameter [mm]

> up to 24 4) (G) clamping hub diameter









43 Ø Z:

MC

Alternatives: Output shaft variants

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

58 .0,15 50 M12x28 Involute gearing DIN 5480 in mm X = W 32 x 1.25 x 30 x 24 x 6m, DIN 5480

Ø32 k6

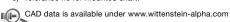
M12x28

20 ±0,1 Ø30#6

Shaft mounted Mounted via shrink disc

Non-tolerated dimensions \pm 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.





SP* 140 MC HIGH SPEED 1-stage

						Sta	ındard v	ersion I	мс			Friction optimized version L							
Ratio ^{a)}			i		3	4	5	7	8	10	3	4	5	7	8	10			
Max. acceleration torque			T _{2B}	Nm	310	480	480	480	380	380	310	480	480	480	380	380			
(max. 1000 cycles per hour)				in.lb Nm	2744 150	4248 240	4248 240	4248 270	3363 180	3363 180	2744 150	4248 240	4248 240	4248 270	3363 180	3363 180			
cymex®-optimized nominal torque (please contact us regarding the design)			T _{2Ncym}	in.lb	1328	2124	2124	2390	1593	1593	2744	4248	4248	4248	3363	3363			
Nominal output torque			T _{2N}	Nm	130	195	205	210	160	160	130	195	205	210	160	160			
(with n_{N})			2N	in.lb	1151	1726	1814	1859	1416	1416	1151	1726	1814	1859	1416	1416			
Emergency stop torque (permitted 1000 times during the service life of the gears)	head)		T _{2Not}	Nm in.lb	1000 8850	1250 11063	1250 11063	1250 11063	1000 8850	1000 8850	1000 8850	1250 11063	1250 11063	1250 11063	1000 8850	1000 8850			
Nominal input speed (with T _{2N} and 20°C ambient temperature) b)			n _{1N}	rpm	3000	3500	4500	4500	4500	4500	3000	3500	4500	4500	4500	4500			
cymex® optimized speed (please contact us regarding the design)			n _{1Ncym}	rpm	_	-	-	-	-	-	4000	4500	5000	5000	5000	5000			
Max. input speed	fax. input speed		n _{1Max}	rpm	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000			
Mean no load running torque (with n,= 2000 rpm and 20°C gearhead temperature) c)			T ₀₁₂	Nm in.lb	5.1 45.1	3.9 34.5	3.1 27.4	2.3 20.4	1.6 14.2	1.6 14.2	2.0 17.7	1.5 13.3	1.2	1.0 8.9	0.9 8.0	0.9 8.0			
Max. torsional backlash	Max. torsional backlash j_t arcmin						Standard ≤ 4 / Reduced ≤ 2												
Torsional rigidity			C ₁₂₁	Nm/ arcmin							i3 69								
Max. axial force d			F _{2AMax}	N lb _f	9870 3000 2221 675														
Max. radial force d)			F _{2RMax}	N			99							:00					
				lb _f Nm				28 52					1:						
Max. tilting moment			M _{2KMax}	in.lb				25						74					
Efficiency at full load			η	%	98.5														
Service life (For calculation, see the Chapter "Information")			L	h	> 30000														
Weight incl. standard adapter plate			m	kg lb _m	17.2 38														
Operating noise (with <i>i</i> =10 and <i>n</i> ₁ =3000 rpm no load)			L _{PA}	dB(A)	A) ≤ 65														
Max. permitted housing temperature				°C	°C +90														
				°C							94 o +40								
Ambient temperature				F							104								
Lubrication										Lubricate	ed for life								
Paint										Blue R	AL 5002								
Direction of rotation		Motor and gearhead same direction																	
Protection class	etion class						IP 65 IP 52												
Moment of inertia	K	38	J ₁	kgcm ²	14.9 13.2	12.1	11.0 9.8	10.1 8.9	10.1	9.51 8.4	14.9 13.2	12.1 10.7	11.0 9.8	10.1 8.9	10.1	9.51 8.4			
(relates to the drive)		4.7		kgcm ²	29.5	26.7	25.6	24.7	-	24.2	29.5	26.7	25.6	24.7	25.0	24.2			
Clamping hub diameter [mm]	M	48	$J_{\scriptscriptstyle 1}$	10 ⁻³ in.lb.s ²	26.1	23.6	22.7	21.9	-	21.4	26.1	23.6	22.7	21.9	22.1	21.4			

Reduced mass moments of inertia available on request.

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

^{a)} Other ratios available on request

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

o) Valid for clamping hub diameter of 38 mm

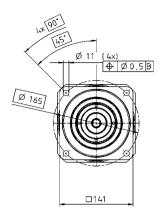
d) Refers to center of the output shaft or flange

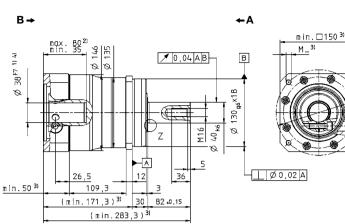
View A View

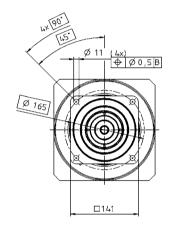


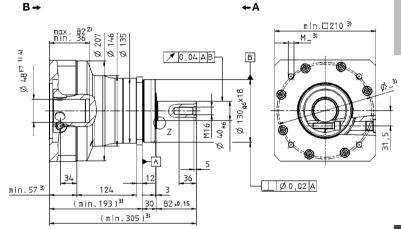
up to 38 ⁴⁾ (K) clamping hub diameter

up to 48 4) (M) clamping hub diameter









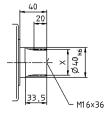
1,0x45. 2,5x45. \$ 40_{K6}) \$ 58

min. 1,0x45 max. 2,5x45 (\$\phi\$ 40 ke)

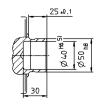
Alternatives: Output shaft variants

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

82.0.15 70 5 12_{h9} M16x36 Involute gearing DIN 5480 in mm X = W 40 x 2 x 30 x 18 x 6m, DIN 5480

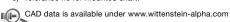


Shaft mounted Mounted via shrink disc



Non-tolerated dimensions ± 1 mm

- 1) Check motor shaft fit.
- Min./Max. permissible motor shaft length.
 Longer motor shafts are 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.



MC

SP+ 140 MC HIGH SPEED 2-stage

									2- s	tage								
Ratio ^{a)}			i		16	20	25	28	32	35	40	50	70	100				
Max. acceleration torque			T	Nm	480	480	480	480	380	480	480	480	480	380				
(max. 1000 cycles per hour)			T _{2B}	in.lb	4248	4248	4248	4248	3363	4248	4248	4248	4248	3363				
cymex®-optimized nominal torque			T _{2Ncym}	Nm	290	290	290	_	_	_	_	_	_	_				
(please contact us regarding the design)			* 2Ncym	in.lb	2567	2567	2567											
Nominal output torque			T _{2N}	Nm	260	280	280	290	290	290	290	290	260	180				
(with n _{1N})			- 2N	in.lb	2301	2478	2478	2567	2567	2567	2567	2567	2301	1593				
Emergency stop torque			T _{2Not}	Nm	1250	1250	1250	1250	1000	1250	1250	1250	1250	1000				
(permitted 1000 times during the service life of the gear	nead)		27101	in.lb	11063	11063	11063	11063	8850	11063	11063	11063	11063	8850				
Nominal input speed (with T _{2N} and 20°C ambient temperature) b)			n _{1N}	rpm	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500				
Max. input speed			n _{1Max}	rpm	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000				
Mean no load running torque			7	Nm	1.6	1.3	1.2	1.0	1.0	0.9	0.7	0.6	0.5	0.5				
(with n_1 = 2000 rpm and 20°C gearhead temperature) c)			T ₀₁₂	in.lb	14.2	11.5	10.6	8.9	8.9	8.0	6.2	5.3	4.4	4.4				
						Standard ≤ 6 / Reduced ≤ 4												
Torsional rigidity				Nm/ arcmin					5	3								
Torsional rigidity			C _{t21}	in.lb/ arcmin		469												
May axial force di			_	N					98	70								
Max. axial force ^d			F _{2AMax}	lb _f					22	21								
Max. radial force d			F _{2RMax}	N					99	00								
Wax. radial force			2RMax	lb _f					22	28								
Max. tilting moment			M _{2KMax}	Nm					9:	52								
That then give here			2KMax	in.lb	8425													
Efficiency at full load			η	%	96.5													
Service life			L,	h	> 30000													
(For calculation, see the Chapter "Information")			n															
Weight incl. standard adapter plate			m	kg 17														
				lb _m					3	8								
Operating noise (with <i>i</i> =100 and <i>n</i> _, =3000 rpm no load)			L _{PA}	dB(A)					≤	63								
Max. permitted housing temperature				°C	+90													
political reading temperature				F						94								
Ambient temperature				°C						o +40								
				F					5 to	104								
Lubrication									Lubricat	ed for life								
Paint									Blue R	AL 5002								
Direction of rotation								Motor	and gearhe	ead same d	irection							
Protection class					IP 65													
				kgcm ²	3.19	2.71	2.67	2.34	3.18	2.32	2.10	2.08	2.08	2.07				
Moment of inertia	G	24	$J_{_{1}}$	10° in.lb.s²	2.82	2.71	2.36	2.07	2.81	2.32	1.85	1.85	1.84	1.83				
(relates to the drive)				kgcm ²	10.3	9.77	9.73	9.41	9.32	9.39	9.16	9.15	9.14	9.14				
Clamping hub diameter [mm]	K	38	$J_{_{1}}$	10° in.lb.s²	9.07	8.65	8.61	8.33	8.24	8.31	8.11	8.10	8.09	8.09				
					0.01	1 0.00	0.01	1 0.00	0.27	1 0.01	0.11	0.10	0.00	0.00				

Reduced mass moments of inertia available on request.

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

a) Other ratios available on request

b) For higher ambient temperatures, please reduce input speed

 $^{^{\}mbox{\tiny c)}}$ Valid for clamping hub diameter of 24 mm

d) Refers to center of the output shaft or flange

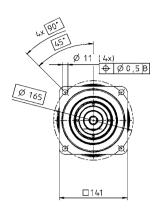
View A View

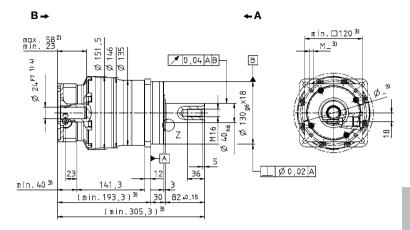


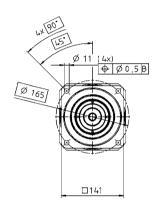
diameter

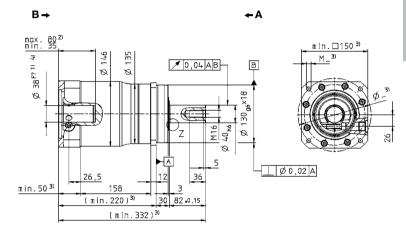
Motor shaft diameter [mm]

up to 38 ⁴⁾ (K) clamping hub diameter







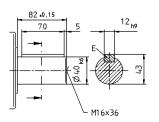


I. 1. 0x45 min. 1. 0x45 (\$ 40 k6) <u></u>т.

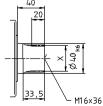
MC

Alternatives: Output shaft variants

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

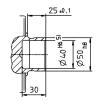


Involute gearing DIN 5480 in mm X = W 40 x 2 x 30 x 18 x 6m, DIN 5480



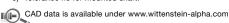
Shaft mounted

Mounted via shrink disc



Non-tolerated dimensions ± 1 mm

- 1) Check motor shaft fit.
- Min./Max. permissible motor shaft length.
 Longer motor shafts are 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.





SP+ 180 MC HIGH SPEED 1-stage

						Stand	ard versio	on MC		Friction optimized version L								
Ratio ^{a)}			i		3	4	5	7	10	3	4	5	7	10				
Max. acceleration torque (max. 1000 cycles per hour)			T _{2B}	Nm in.lb	700 6195	880 7788	880 7788	880 7788	700 6195	700 6195	880 7788	880 7788	880 7788	700 6195				
cymex®-optimized nominal torque			T _{2Ncym}	Nm	350	600	600	600	540	350	600	600	600	540				
(please contact us regarding the design) Nominal output torque			T _{2N}	in.lb Nm	3098 290	5310 450	5310 440	5310 450	4779 400	3098 290	5310 450	5310 450	5310 450	3098 400				
(with n_m) Emergency stop torque				in.lb Nm	2567 2200	3983 2750	3894 2750	3983 2750	3540 2200	2567 2200	3983 2750	3983 2750	3983 2750	3540 2200				
(permitted 1000 times during the service life of the gear	head)		T _{2Not}	in.lb	19470	24338	24338	24338	19470	19470	24338	24338	24338	19470				
Nominal input speed (with T _{2N} and 20°C ambient temperature) b)			n _{1N}	rpm	3000	3500	4500	4500	4500	3000	3500	4500	4500	4500				
cymex® optimized speed (please contact us regarding the design)			n _{1Ncym}	rpm	-	-	-	-	-	4000	4500	5000	5000	5000				
Max. input speed			n _{1Max}	rpm	4500	6000	6000	6000	6000	4500	6000	6000	6000	6000				
Mean no load running torque (with n,=2000 rpm and 20°C gearhead temperature) c)			T ₀₁₂	Nm in.lb	10.2 90.3	7.7 68.1	6.2 54.9	4.5 39.8	3.2 28.3	3.8 34	3.0 27	2.3 20	1.8 16	1.6 14				
Max. torsional backlash								90.3 66.1 54.9 39.6 26.3 34 27 20 16 14 Standard ≤ 4 / Reduced ≤ 2										
Torsional rigidity C_{t21} $\frac{\text{Nm/arcmin}}{\text{in.lb/arcmin}}$						175 1549												
Max. axial force ^{d)}			F _{2AMax}	N			14150 3184			5000 1125								
Max. radial force ^{d)}			F _{2RMax}	lb _f			15400					2000						
Wax. radar 10100				lb _f	3465 450 1600 208													
Max. tilting moment			M _{2KMax}	in.lb			14160					1841						
Efficiency at full load			η	%			98.5					99						
Service life (For calculation, see the Chapter "Information")			L	h	> 30000													
Weight incl. standard adapter plate			m	kg lb _m	34 75													
Operating noise (with <i>i</i> =10 and <i>n_i</i> =3000 rpm no load)			L _{PA}	dB(A)	≤ 66													
Max. permitted housing temperature				°C F														
Ambient temperature				°C	-15 to +40													
Lubrication				F					5 to	104 ed for life								
Paint									Blue RA									
Direction of rotation								Motor			irection							
							ID 65	IVIOLOI		ead same direction								
Protection class							IP 65					IP 52						
Moment of inertia (relates to the drive)	M	48	J_{j}	kgcm ²	58.5	41.6	35.6	30.0	26.9	58.5	41.6	35.6	30.0	26.9				
Clamping hub diameter [mm]				10 ⁻³ in.lb.s ²	51.8	36.8	31.5	26.6	23.8	51.8	36.8	31.5	26.6	23.8				

Reduced mass moments of inertia available on request.

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

a) Other ratios available on request

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

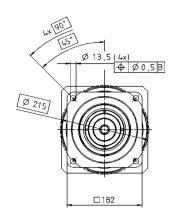
c) Valid for clamping hub diameter of 48 mm

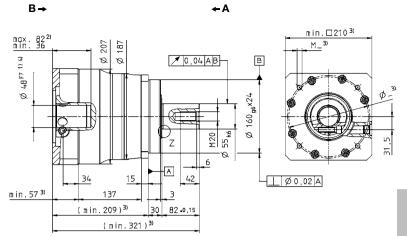
d) Refers to center of the output shaft or flange

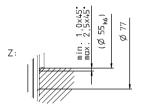
View A View



up to 48 4 (M) clamping hub diameter







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MC

MC-L

Alternatives: Output shaft variants

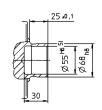
Output shaft with key in mm E = key as per DIN 6885, sheet 1, form A

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

21,5

Ø 55 8

- M20×42

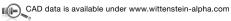


Shaft mounted

Mounted via shrink disc

Non-tolerated dimensions \pm 1 mm

- 1) Check motor shaft fit.
- Min./Max. permissible motor shaft length.
 Longer motor shafts are 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.





SP+ 180 MC HIGH SPEED 2-stage

			2-stage												
Ratio ^{a)}	i		16	20	25	28	35	40	50	70	100				
Max. acceleration torque (max. 1000 cycles per hour)	T _{2B}	Nm	880	880	880	880	880	880	880	880	700				
cymex®-optimized nominal torque (please contact us regarding the design)	T _{2Ncym}	in.lb Nm	7788	7788	7788	7788	7788	7788	7788	7788	6195				
Nominal output torque	T _{2N}	in.lb Nm	600	600	600	600	600	600	600	600	600				
(with $n_{_{\mathit{TM}}}$)	2N	in.lb	5310	5310	5310	5310	5310	5310	5310	5310	5310				
Emergency stop torque (permitted 1000 times during the service life of the gearhead)	T _{2Not}	Nm in.lb	2750 24338	2750 24338	2750 24338	2750 24338	2750 24338	2750 24338	2750 24338	2750 24338	2200 19470				
Nominal input speed (with $T_{\rm 2W}$ and 20°C ambient temperature) ^{b)}	n _{1N}	rpm	4500	4500	4500	4500	4500	4500	4500	4500	4500				
Max. input speed	n _{1Max}	rpm	6000	6000	6000	6000	6000	6000	6000	6000	6000				
Mean no load running torque	_	Nm	3.2	2.6	2.3	1.9	1.7	1.4	1.2	1.0	0.9				
(with n_1 = 2000 rpm and 20°C gearhead temperature) c)	T ₀₁₂	in.lb	28.3	23.0	20.4	16.8	15.0	12.4	10.6	8.9	8.0				
Max. torsional backlash	j_t	arcmin	Standard ≤ 6 / Reduced ≤ 4												
Torsional rigidity	C _{t21}	Nm/ arcmin	175												
	121	in.lb/ arcmin					149								
Max. axial force ^{d)}	F _{2AMax}	N Ib _f					14150 3184								
Max. radial force ^{d)}	F _{2RMax}	N lb,	15400 3465												
Max. tilting moment	M _{2KMax}	Nm in.lb	1600 14160												
Efficiency at full load	η	%	96.5												
Service life (For calculation, see the Chapter "Information")	L _n	h	h > 30000												
		kg 36													
Weight incl. standard adapter plate	m	lb _m	80												
Operating noise (with <i>i</i> =100 and <i>n</i> ₁ =3000 rpm no load)	L _{PA}	dB(A)													
Max. permitted housing temperature		°C					+90								
max. pormitted reducing temperature		F													
Ambient temperature		°C F													
Lubrication						Lu	bricated for	life							
Paint						В	Blue RAL 500)2							
Direction of rotation						Motor and o	gearhead sar	me direction							
Protection class							IP 65								
Moment of inertia (relates to the drive)		kgcm²	13.5	12.0	11.7	10.6	10.4	9.74	9.68	9.63	9.60				
(relates to the drive) K 38	J_1														

Reduced mass moments of inertia available on request.

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

a) Other ratios available on request

b) For higher ambient temperatures, please reduce input speed

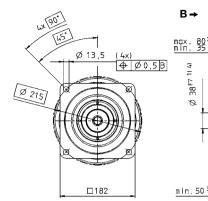
 $^{^{\}mbox{\tiny c)}}$ Valid for clamping hub diameter of 38 mm

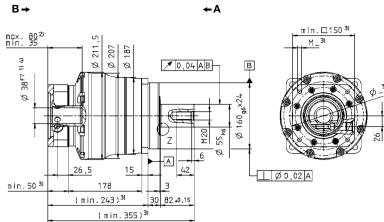
d) Refers to center of the output shaft or flange

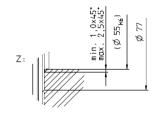
View A View

Motor shaft diameter [mm]

up to 38 ⁴⁾ (K) clamping hub diameter





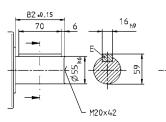


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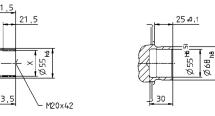
MC

Alternatives: Output shaft variants

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



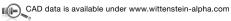
Involute gearing DIN 5480 in mm $X = W 55 \times 2 \times 30 \times 26 \times 6m$, DIN 5480



Shaft mounted Mounted via shrink disc

Non-tolerated dimensions \pm 1 mm

- 1) Check motor shaft fit.
- Min./Max. permissible motor shaft length.
 Longer motor shafts are 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.





SP+ 210 MC HIGH SPEED 1-stage

				Stand	lard version	on MC			Friction o	ptimized	version L	-		
Ratio ^{a)}	i		3	4	5	7	10	3	4	5	7	10		
Max. acceleration torque	T _{2B}	Nm	1200	2000	2000	1700	1200	1200	2000	2000	1700	1200		
(max. 1000 cycles per hour) cymex®-optimized nominal torque		in.lb Nm	10620	17700	17700	15045	10620	10620	17700	17700	15045	10620		
(please contact us regarding the design)	T _{2Ncym}	in.lb					- Please c	ontact us -						
Nominal output torque (with n_{IM})	T _{2N}	Nm in.lb	900 7965	1300 11505	1150 10178	1000 8850	800 7080	900 7965	1300 11505	1150 10178	1000 8850	800 7080		
Emergency stop torque		Nm	5000	5200	5200	5200	5000	5000	5200	5200	5200	5000		
(permitted 1000 times during the service life of the gearhead)	T _{2Not}	in.lb	44250	46020	46020	46020	44250	44250	46020	46020	46020	44250		
Nominal input speed (with T_{2N} and 20°C ambient temperature) ^{b)}	n _{1N}	rpm	2250	2500	3500	3500	3500	2250	2500	3500	3500	3500		
cymex® optimized speed (please contact us regarding the design)	n _{1Ncym}	rpm	-	-	-	-	-	2750	3000	4000	4000	4000		
Max. input speed	n _{1Max}	rpm	3400	6000	6000	6000	6000	6000	6000	6000	6000	6000		
Mean no load running torque (with n,=2000 rpm and 20°C gearhead temperature) c)	T ₀₁₂	Nm in.lb	13.0 115.1	9.0 79.7	6.5 57.5	4.0 35.4	2.5 22.1	5.5 49	4.9 43	4.6 41	4.0 35	3.4 30		
Max. torsional backlash	arcmin	Standard ≤ 4 / Reduced ≤ 2												
Torsional rigidity						00								
	C ₁₂₁	in.lb/ arcmin			30000		35	8000						
Max. axial force ^{d)}	F _{2AMax}	lb,			6750					1800				
Max. radial force d	F _{2RMax}	N			21000					2500				
IVIAX. FAUIAI TOTOE	2RMax	lb _f			4725					563				
Max. tilting moment	M _{2KMax}	Nm in.lb			3100 27435				310 2744					
Efficiency at full load	η	%			98.5		99.0							
Service life (For calculation, see the Chapter "Information")	L	h	h > 30000											
Weight incl. standard adapter plate	m	kg	56											
		lb _m	124											
Operating noise (with <i>i</i> =10 and <i>n</i> ,=2000 rpm no load)	L _{PA}	dB(A)												
Max. permitted housing temperature			°C +90											
		°C	F 194 °C -15 to +40											
Ambient temperature		F					5 to	104						
Lubrication							Lubricate	ed for life						
Paint							Blue R	AL 5002						
Direction of rotation						Motor	and gearhe	ad same d	irection					
Protection class					IP 65			IP 52						
Moment of inertia (relates to the drive) N 5	5 J.	kgcm²	139.0	94.3	76.9	61.5	53.1	139.0	94.3	76.9	61.5	53.1		
Clamping hub diameter [mm]	5 J,	10 ⁻³ in.lb.s ²	123.0	83.5	68.1	54.4	47.0	123.0	83.5	68.1	54.4	47.0		

Reduced mass moments of inertia available on request.

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

a) Other ratios available on request

b) For higher ambient temperatures, please reduce input speed

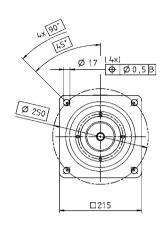
c) Valid for clamping hub diameter of 55 mm

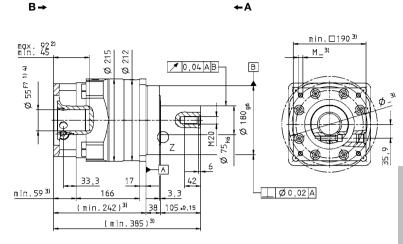
d) Refers to center of the output shaft or flange

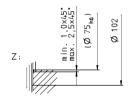
View B

Motor shaft diameter [mm]

up to 55 4) (N) clamping hub diameter

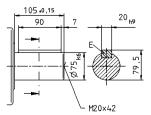


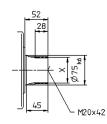




Alternatives: Output shaft variants

Output shaft with key in mm E = key as per DIN 6885, sheet 1, form A Involute gearing DIN 5480 in mm X = W 70 x 2 x 30 x 34 x 6m, DIN 5480





Non-tolerated dimensions \pm 1,5 mm

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





SP+ 210 MC HIGH SPEED 2-stage

								2-stage							
Ratio ^{a)}		i		16	20	25	28	35	40	50	70	100			
Max. acceleration torque (max. 1000 cycles per hour)		T _{2B}	Nm	1680	1800	2000	1680	1920	1040	1300	1700	1200			
cymex®-optimized nominal torque		T _{2Ncym}	in.lb Nm	14868	15930	17700	14868 - Ple	16992 ease contact	9204 us -	11505	15045	10620			
(please contact us regarding the design)		ZNCym		0.40	700	075	i .	975 800 1000 1000 800							
Nominal output torque (with n_m)		T _{2N}	Nm in.lb	840 7434	780 6903	975 8629	780 6903	975 8629	7080	8850	8850	7080			
			Nm	5200	5200	5200	5200	5200	5200	5200	5200	5000			
Emergency stop torque (permitted 1000 times during the service life of the gear	ırhead)	T _{2Not}	in.lb	46020	46020	46020	46020	46020	46020	46020	46020	44250			
Nominal input speed (with $T_{_{2N}}$ and 20°C ambient temperature) ^{b)}		n _{1N}	rpm	3500	4500	4500	4500	4500	4500	4500	4500	4500			
Max. input speed		n _{1Max}	rpm	6000	6000	6000	6000	6000	6000	6000	6000	6000			
Mean no load running torque		_	Nm	3.0	2,5	2,5	2,0	2,0	1,5	1,5	1,5	1,5			
(with $n_{_{7}}$ = 2000 rpm and 20°C gearhead temperature)		T ₀₁₂	in.lb	27	22	22	18	18	13	13	13	13			
Max. torsional backlash		j_t	arcmin	Standard ≤ 4 / Reduced ≤ 2											
Torsional rigidity		C _{t21}	Nm/ arcmin					400							
		121	in.lb/ arcmin					3540							
Max. axial force c)		F _{2AMax}	N lb,	30000 6750											
May realist force ()			NI.	21000											
Max. radial force °)		F _{2RMax}	lb _f					4725							
Max. tilting moment		M _{2KMa}	Nm					3100							
		2KMa.	in.lb					27435							
Efficiency at full load		η	%					96.5							
Service life (For calculation, see the Chapter "Information")		L _h	h					> 30000							
Weight incl. standard adapter plate		m	kg					53							
			lb _m					117							
Operating noise (with <i>i</i> =10 and <i>n</i> ₁ =2000 rpm no load)		L _{PA}	dB(A)												
Max. permitted housing temperature			°C F												
			°C					-15 to +40							
Ambient temperature			F					32 to 194							
Lubrication							Lu	bricated for	life						
Paint							E	Blue RAL 500)2						
Direction of rotation							Motor and	gearhead sar	me direction		,				
Protection class															
Moment of inertia (relates to the drive)			kgcm ²	34.5	31.5	30.8	30.0	29.7	28.5	28.3	28.1	28.0			
(relates to the drive) Clamping hub diameter (mm)	M	48 J ₁	10 ⁻³ in.lb.s ²	30.5	27.9	27.3	26.6	26.3	25.2	25.0	24.9	24.8			

Reduced mass moments of inertia available on request.

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

a) Other ratios available on request

b) For higher ambient temperatures, please reduce input speed

c) Refers to center of the output shaft or flange

View B

B→

up to 48 4) (M)

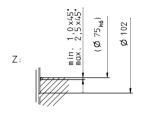
clamping hub diameter

(4x) **⊕** Ø 0,5 B Ø 250

□215

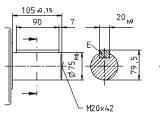
max. 82²⁾ min. 45 Ø 212 min.□210³⁾ Ø 215 M_31 **1** 0,04 AB В Ø 48F7 114) 180 96 75 k6 42 Ø 0,02 A <u>min.57³</u> 198 3,3 (min. 272)³⁾ (min.415)³⁾

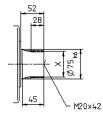
←A



Alternatives: Output shaft variants

Output shaft with key in mm E = key as per DIN 6885, sheet 1, form A Involute gearing DIN 5480 in mm X = W 70 x 2 x 30 x 34 x 6m, DIN 5480





Non-tolerated dimensions \pm 1.5 mm

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



SP+ 240 MC HIGH SPEED 1-stage

				Stand	lard versi	on MC			Friction o	ptimized	version L	<u> </u>		
Ratio ^{a)}	i		3	4	5	7	10	3	4	5	7	10		
Max. acceleration torque (max. 1000 cycles per hour)	T _{2B}	Nm	1750	3500	3600	2700	1800	1750	3500	3600	2700	1800		
cymex®-optimized nominal torque	T _{2Ncym}	in.lb Nm	15488 30975 31860 23895 15930 15488 30975 31860 23895 15930 - Please contact us -											
(please contact us regarding the design)	* 2Ncym	in.lb	1400	1000	1770	1500			1000	1770	1500	1100		
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	1_	Nm	6800	8500	8500	8500	6800	6800	8500	8500	8500	6800		
(permitted 1000 times during the service life of the gearhead)	T _{2Not}	in.lb	60180	75225	75225	75225	60180	60180	75225	75225	75225	60180		
Nominal input speed (with $T_{\rm 2W}$ and 20°C ambient temperature) ^{b)}	n _{1N}	rpm	1750	2250	3000	3000	3000	1750	2250	3000	3000	3000		
cymex® optimized speed (please contact us regarding the design)	n _{1Ncym}	rpm	-	_	-	-	-	2250	2750	3500	3500	3500		
Max. input speed	n _{1Max}	rpm	3400	4000	5000	5000	5000	3400	5000	5000	5000	5000		
Mean no load running torque	T ₀₁₂	Nm	24	18	13	7.0	5.0	8.0	7.0	6.0	5.0	4.2		
(with n_1 =2000 rpm and 20°C gearhead temperature) c)	012	in.lb	212	159	115	62	44	71	62	53	44	37		
Max. torsional backlash	arcmin	Standard ≤ 4 / Reduced ≤ 2 550												
Torsional rigidity	Nm/ arcmin													
	C _{t21}	in.lb/ arcmin			33000		48	68		10000				
Max. axial force ^{d)}	Max. axial force ^{d)}						7425 2250							
Max. radial force ^{d)}		N			30000					2000				
wax. radiai force	F _{2RMax}	lb _f			6750					450				
Max. tilting moment	M _{2KMax}	Nm		-	5000				280					
Efficiency at full load		in.lb			98.5				2478 99					
	η	70			90.5									
Service life (For calculation, see the Chapter "Information")	L _h	h	> 30000											
Weight incl. standard adapter plate	m	kg lb _m	77 170											
Operating noise (with i=10 and n_=2000 rpm no load)	L _{PA}	dB(A)												
		°C												
Max. permitted housing temperature		F												
Ambient temperature		°C						o +40						
<u> </u>		F					5 to	104		-				
Lubrication							Lubricate	ed for life						
Paint							Blue RA	AL 5002						
Direction of rotation				Motor and gearhead same direction										
Protection class		-			IP 65			IP 52						
Moment of inertia (relates to the drive) O 6	D J,	kgcm²	260.2	198.2	163.0	138.3	124.7	260.2	198.2	163.0	84.4	70.8		
Clamping hub diameter [mm]	01	10 ⁻³ in.lb.s ²	230.3	175.4	144.3	122.4	110.4	230.3	175.4	144.3	74.7	62.7		

Reduced mass moments of inertia available on request.

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

a) Other ratios available on request

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

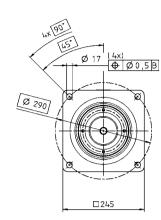
c) Valid for clamping hub diameter of 60 mm

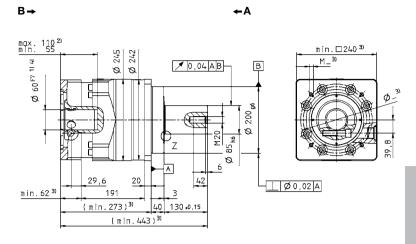
d) Refers to center of the output shaft or flange

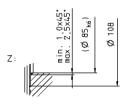
View B

Motor shaft diameter [mm]

up to 60 4) (O) clamping hub diameter





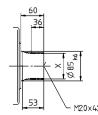


Alternatives: Output shaft variants

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

130 ±0,15 22_{h9} M20×42

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



Non-tolerated dimensions \pm 1,5 mm

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





SP+ 240 MC HIGH SPEED 2-stage

						,	2-stage								
Ratio ^{a)}	i		16	20	25	28	35	40	50	70	100				
Max. acceleration torque (max. 1000 cycles per hour)	T _{2B}	Nm in.lb	3500 30975	3500	3600	2900	3600	1680	2100	2700	1800				
cymex®-optimized nominal torque	T _{2Ncym}	Nm	30975	30975	31860	25665 - Ple	ase contact	14868 t us -	18585	23895	15930				
(please contact us regarding the design) Nominal output torque		in.lb Nm	1790	1770	1730	1840	1930	1300	1625	1500	1100				
(with n _{1N})	T _{2N}	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 in.lb	8500 75225	8500 75225	8500 75225	8500 75225	8500 75225	8500 75225	8500 75225	8500 75225	6800 60180				
Nominal input speed (with T _{2N} and 20°C ambient temperature) b)	n _{1N}	rpm	3500	4500	4500	4500	4500	4500	4500	4500	4500				
Max. input speed	n _{1Max}	rpm	6000	6000	6000	6000	6000	6000	6000	6000	6000				
Mean no load running torque	T ₀₁₂	Nm	5,0	4,5	4,0	3,5	3,0	2,5	2,5	2,5	2,0				
(with n_i =2000 rpm and 20°C gearhead temperature)	012	in.lb	44	40	35	31	27	22	22	22	18				
Max. torsional backlash	j_t	arcmin													
Torsional rigidity	C _{t21}	Nm/ arcmin	550 4868												
	127	in.lb/ arcmin													
Max. axial force ©	F _{2AMax}	N					33000 7425								
		lb _f	30000												
Max. radial force c)	F _{2RMax}	lb,					6750								
		Nm					5000								
Max. tilting moment	M _{2KMax}	in.lb	44250												
Efficiency at full load	η	%					96.5								
Service life (For calculation, see the Chapter "Information")	L _h	h	> 30000												
Weight incl. standard adapter plate	m	kg					76								
The second secon	1	lb _m					168								
Operating noise (with i=10 and n,=2000 rpm no load)	L _{PA}	dB(A)					≤ 66								
Max. permitted housing temperature		°C					+90								
		F °C					194 -15 to +40								
Ambient temperature		F					5 to 104								
Lubrication						Lu	bricated for	life							
Paint						E	Blue RAL 500)2							
Direction of rotation			Blue RAL 5002 Motor and gearhead same direction												
Protection class			Motor and gearhead same direction IP 65												
Moment of inertia	J,	kgcm²	39.2	34.6	33.2	30.5	29.7	28.2	27.9	27.6	27.5				
(relates to the drive) Clamping hub diameter [mm]	- 1	10 ⁻³ in.lb.s ²	34.7	30.6	29.4	27.0	26.3	25.0	24.7	24.4	24.3				

Reduced mass moments of inertia available on request.

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

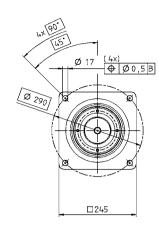
a) Other ratios available on request

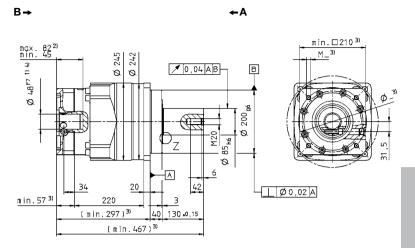
b) For higher ambient temperatures, please reduce input speed

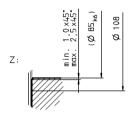
c) Refers to center of the output shaft or flange

View A View B

up to 48 4) (M) clamping hub diameter

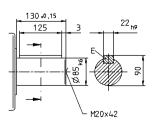


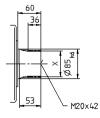




Alternatives: Output shaft variants

Output shaft with key in mm E = key as per DIN 6885, sheet 1, form A Involute gearing DIN 5480 in mm X = W 80 x 2 x 30 x 38 x 6m, DIN 5480





Non-tolerated dimensions \pm 1.5 mm

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



Hygienic design - hygienically safe drive



Fields of application:

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

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

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

Your benefits:

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







HDF

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

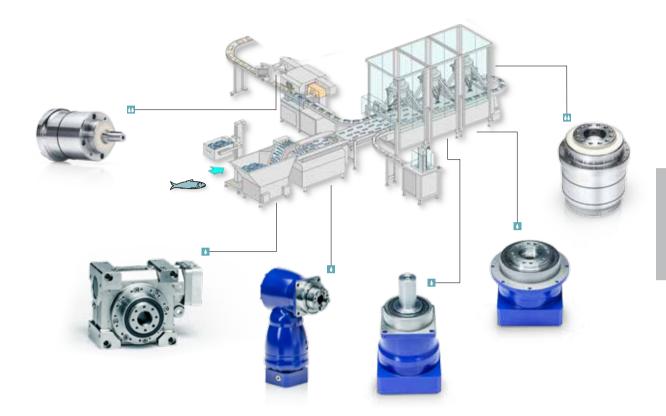
EHEDG certified

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

FDA certified

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

Example application: food processing





Classification according to DIN EN 1672-2

- Application in wet and damp environments (spray area) → process-integrated
- Application in wet areas, including highpressure cleaning as well as contact with cleaning agents and chemicals (food sector)





Previous solution:

Costly encasing of the drive required for protection.

- $\cdot\,$ Dirt and moisture accumulation under the casing possible
- · Large surface to be cleaned
- · Additional costs (construction,
- cleaning effort)

 Trapped heat under the casing impairs the service life of the drive

Hygienic solution:

New freedom in design through use of Hygiene Design drive.

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



data on Hygiene Design can be found online at: