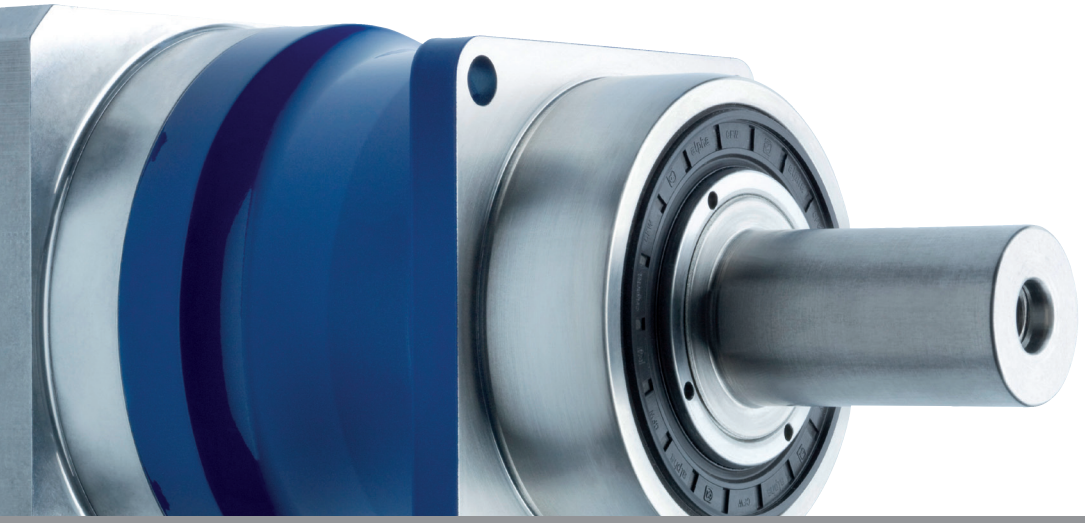
SP+ MC version HIGH SPEED®

Energy savings for your drive

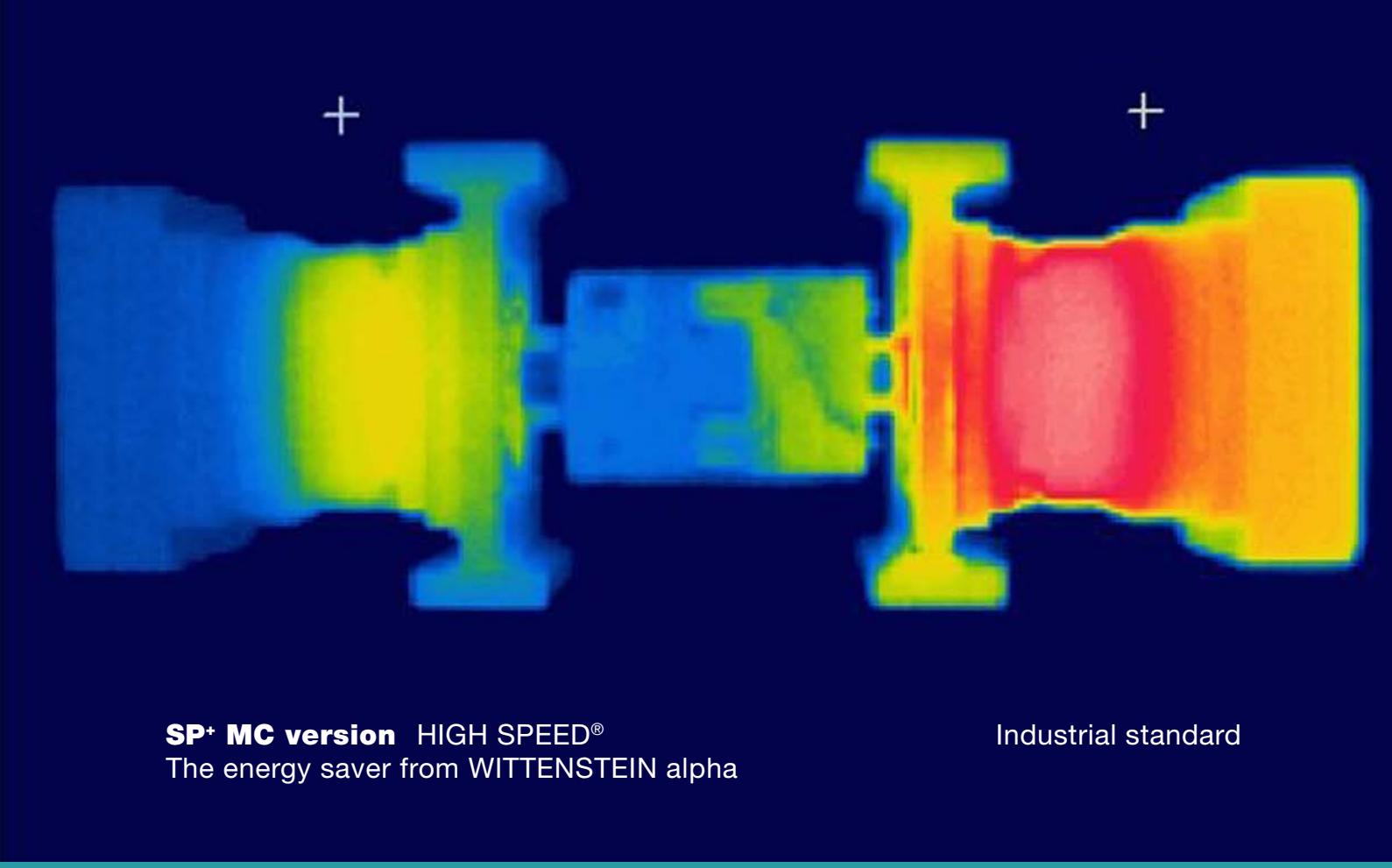


MC version HIGH SPEED®
Preferred use:
- Long duty cycles (>60%)
- High nominal speeds
- Temperature-sensitive applications
- Drive trains with high control quality

Friction optimized MC version (L)
Preferred use:
- Long duty cycles (>60%)
- Very high nominal speeds
- Highly temperature-sensitive applications
- Drive trains with high control quality
- Very low no-load running torque

SP+

Specifications \ Version	**SP+ MC** HIGH SPEED®		
	+	**++**	**+++**
Positioning accuracy			
Rigidity			
Smooth-running			
Speed capacity			
Power density			
Max. axial/radial forces			



SP+ MC version HIGH SPEED®
The energy saver from WITTENSTEIN alpha

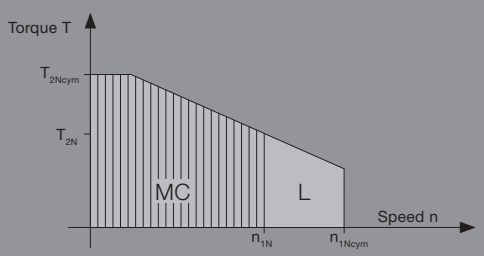
Industrial standard

Compared with conventional planetary gearheads, the SP+ HIGH SPEED® represents a significant development in efficiency. This can be illustrated directly using thermal imaging. Left: the alpha energy saver; right: a conventional industrial standard gearhead. You can see how the gearhead on the right becomes hot, while the SP+ HIGH SPEED® remains cool.
In absolute values, this means: approx. 40 degrees Celsius (104 degrees Fahrenheit) on the left, approx. 80 degrees Celsius (176 degrees Fahrenheit) on the right.

Options

Food-grade grease NSF
Version with optimized mass moment of inertia
L version (high nominal speed, friction optimized)

Performance data description, MC/L version



Accessories

Rack / Pinion (see page 310)
Shrink disc (see page 342)
Couplings (see page 342)
Sensor flange

SP+ 075 MC HIGH SPEED® 1-stage

					1-stage				
Ratio [a]			***i***		**3**	**4**	**5**	**7**	**10**
Max. acceleration torque (max. 1000 cycles per hour)			T_{2B}	Nm	68	90	90	90	70
				in.lb	602	797	797	797	620
cymex®-optimal nominal torque (please contact us regarding the design)			T_{2Ncym}	Nm	–	60	60	60	35
				in.lb	–	531	531	531	310
Nominal output torque (with n_{1N})			T_{2N}	Nm	28	48	48	48	30
				in.lb	248	425	425	425	266
Emergency stop torque (permitted 1000 times during the service life of the gearhead)			T_{2Not}	Nm	200	250	250	250	200
				in.lb	1770	2213	2213	2213	1770
Nominal input speed (with T_{2N} and 20°C ambient temperature) [b]			n_{1N}	rpm	4500	4500	4500	4500	4500
Max. input speed			n_{1Max}	rpm	6000	6000	6000	6000	6000
Mean no load running torque (with n_1 = 3000 rpm and 20°C gearhead temperature) [c]			T_{012}	Nm	1.4	1.1	0.9	0.6	0.5
				in.lb	12.4	9.7	8.0	5.3	4.4
Max. torsional backlash			j_t	arcmin	Standard ≤ 6 / Reduced ≤ 4				
Torsional rigidity			C_{t21}	Nm/ arcmin	10				
				in lb/ arcmin	89				
Max. axial force [d]			F_{2AMax}	N	3350				
				lb_f	754				
Max. radial force [d]			F_{2RMax}	N	4200				
				lb_f	945				
Max. tilting moment			M_{2KMax}	Nm	236				
				in.lb	2089				
Efficiency at full load			η	%	98.5				
Service life (For calculation, see the Chapter "Information")			L_h	h	> 30000				
Weight incl. standardadapter plate			*m*	kg	3.9				
				lb_m	8.6				
Operating noise (with *i*=10 and n_1 = 3000 rpm no load)			L_{PA}	dB(A)	≤ 59				
Max. permitted housing temperature				°C	+90				
				F	194				
Ambient temperature				°C	-15 to +40				
				F	5 to 104				
Lubrication					Lubricated for life				
Paint					Blue RAL 5002				
Direction of rotation					Motor and gearhead same direction				
Protection class					IP 65				
Moment of inertia (relates to the drive)	E	19	J_1	kgcm²	1.03	0.78	0.68	0.59	0.54
				10^{-3} in lb s²	0.91	0.69	0.60	0.52	0.48
Clamping hub diameter [mm]	G	24	J_1	kgcm²	2.40	2.15	2.05	1.96	1.91
				10^{-3} in lb s²	2.12	1.90	1.81	1.73	1.69

Reduced mass moments of inertia available on request.

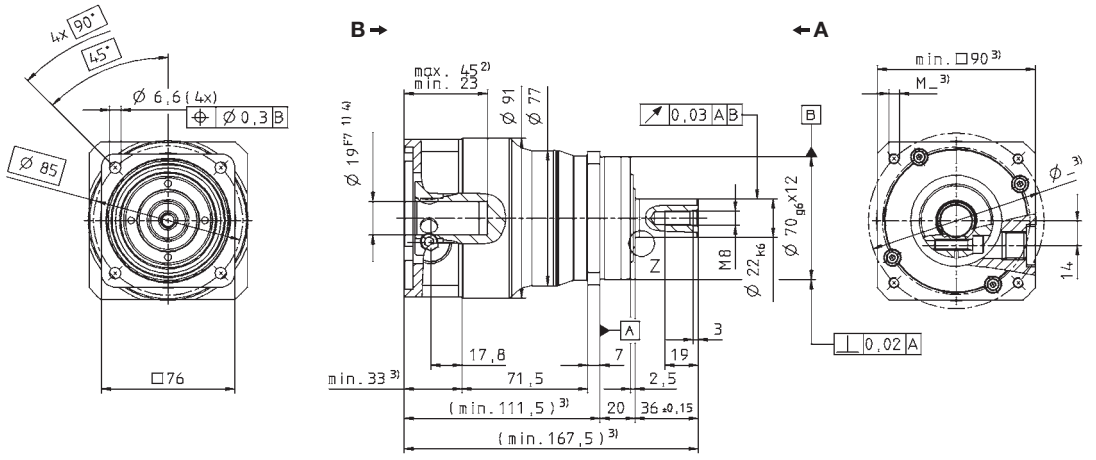
[a] Other ratios available on request
[b] For higher ambient temperatures, please contact us
[c] Valid for clamping hub diameter of 19 mm
[d] Refers to centre of the output shaft or flange

View A

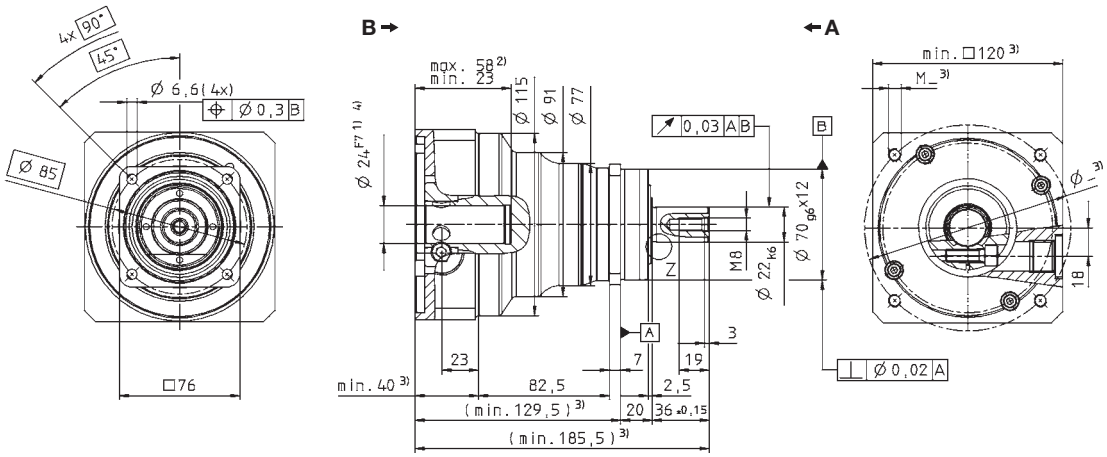
View B

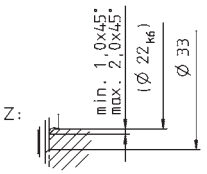
Motor shaft diameter [mm]

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



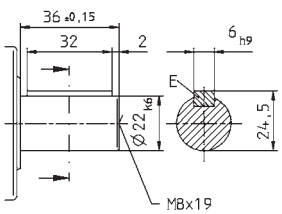
up to 24 [4] (G) clamping hub diameter



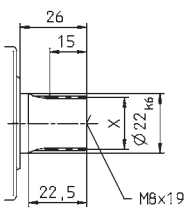


Alternatives: Output shaft variants

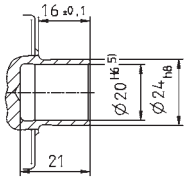
Keywayed output shaft in mm
E = key as per DIN 6885, sheet 1, form A



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



Shaft mounted
Mounted via shrink disc



Non-tolerated dimensions ± 1 mm

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

⚠ Motor mounting according to operating manual

SP+ 075 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)			Nm	T_{2B}	90	90	90	90	90	90	90	90	70
			in.lb		797	797	797	797	797	797	797	797	620
cymex®-optimal nominal torque (please contact us regarding the design)			Nm	T_{2Ncym}	–	–	–	–	–	60	–	–	35
			in.lb							531			310
Nominal output torque (with n_{1N})			Nm	T_{2N}	60	60	60	60	60	55	60	60	30
			in.lb		531	531	531	531	531	487	531	531	266
Emergency stop torque (permitted 1000 times during the service life of the gearhead)			Nm	T_{2Not}	250	250	250	250	250	250	250	250	200
			in.lb		2213	2213	2213	2213	2213	2213	2213	2213	1770
Nominal input speed (with T_{2N} and 20°C ambient temperature) [b]			rpm	n_{1N}	4500	4500	4500	4500	4500	4500	4500	4500	4500
Max. input speed			rpm	n_{1Max}	6000	6000	6000	6000	6000	6000	6000	6000	6000
Mean no load running torque (with n_1 = 3000 rpm and 20°C gearhead temperature) [c]			Nm	T_{012}	0.5	0.4	0.4	0.3	0.3	0.2	0.2	0.2	0.2
			in.lb		4.4	3.5	3.5	2.7	2.7	1.8	1.8	1.8	1.8
Max. torsional backlash			arcmin	j_t	Standard ≤ 8 / Reduced ≤ 6								
Torsional rigidity			Nm/ arcmin	C_{t21}	10								
			in lb/ arcmin		89								
Max. axial force [d]			N	F_{2AMax}	3350								
			lb_f		754								
Max. radial force [d]			N	F_{2RMax}	4200								
			lb_f		945								
Max. tilting moment			Nm	M_{2KMax}	236								
			in.lb		2089								
Efficiency at full load			%	η	96,5								
Service life (For calculation, see the Chapter "Information")			h	L_h	> 30000								
Weight incl. standard adapter plate			kg	*m*	3,6								
			lb_m		8.0								
Operating noise (with *i*=100 and n_1 = 3000 rpm no load)			dB(A)	L_{PA}	≤ 59								
Max. permitted housing temperature			°C		+90								
			F		194								
Ambient temperature			°C		-15 to +40								
			F		5 to 104								
Lubrication					Lubricated for life								
Paint					Blue RAL 5002								
Direction of rotation					Motor and gearhead same direction								
Protection class					IP 65								
Moment of inertia (relates to the drive)	C	14	kgcm²	J_1	0.23	0.20	0.20	0.18	0.18	0.16	0.16	0.16	0.16
			10^{-3} in b s²		0.20	0.18	0.18	0.16	0.16	0.15	0.15	0.14	0.14
Clamping hub diameter [mm]	E	19	kgcm²	J_1	0.55	0.53	0.52	0.50	0.50	0.49	0.49	0.49	0.49
			10^{-3} in b s²		0.49	0.47	0.46	0.45	0.44	0.43	0.43	0.43	0.43

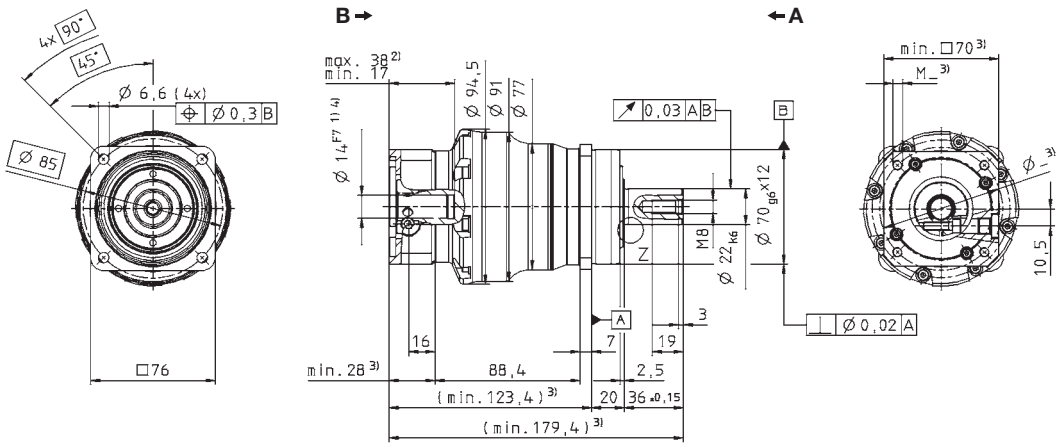
Reduced mass moments of inertia available on request.

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

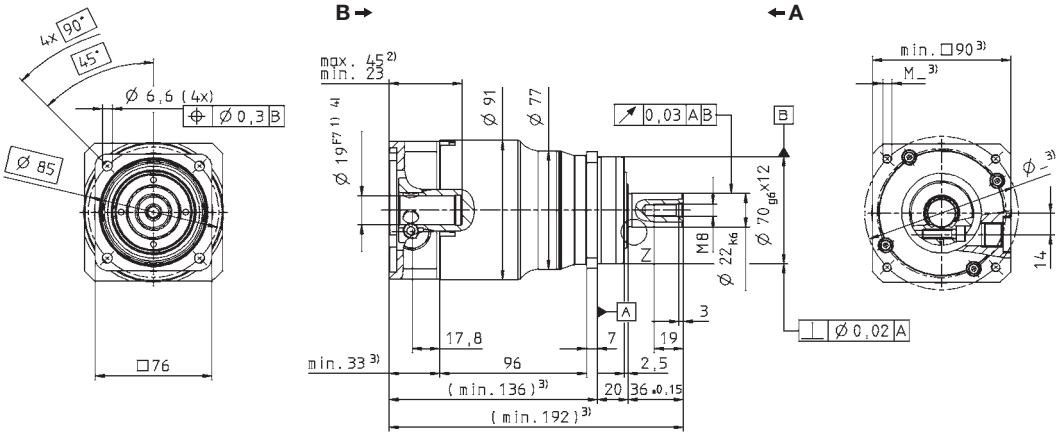
View A | View B

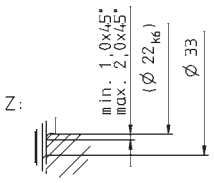
Motor shaft diameter [mm]

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



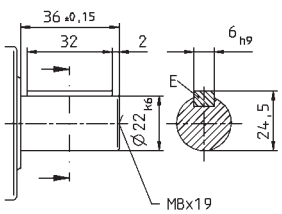
up to 19 [4] (E) clamping hub diameter



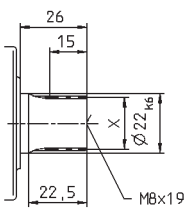


Alternatives: Output shaft variants

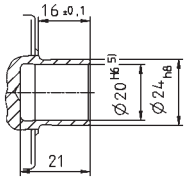
Keywayed output shaft in mm
E = key as per DIN 6885, sheet 1, form A



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



Shaft mounted
Mounted via shrink disc



Non-tolerated dimensions ± 1 mm

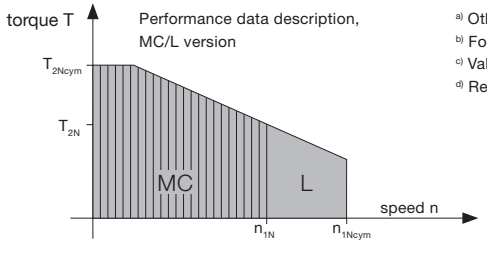
1) Check motor shaft fit.
2) Min./Max. permissible motor shaft length. Longer motor shafts are adaptable, please contact us.
3) The dimensions depend on the motor.
4) Smaller motor shaft diameter is compensated by a bushing with a minimum thickness of 1 mm.
5) Tolerance h6 for mounted shaft.

⚠ Motor mounting according to operating manual

SP+ 100 MC HIGH SPEED® 1-stage

				Standard version MC					Friction optimized version L				
Ratio [a]			***i***	**3**	**4**	**5**	**7**	**10**	**3**	**4**	**5**	**7**	**10**
Max. acceleration torque (max. 1000 cycles per hour)			T_{2B} Nm	180	240	240	240	180	180	240	240	240	180
			T_{2B} in.lb	1593	2124	2124	2124	1593	1593	2124	2124	2124	1593
cymex®-optimal nominal torque (please contact us regarding the design)			T_{2Ncym} Nm	95	135	135	135	90	95	135	135	135	90
			T_{2Ncym} in.lb	841	1195	1195	1195	797	841	1195	1195	1195	797
Nominal output torque (with n_{1N})			T_{2N} Nm	70	100	105	105	80	70	100	105	105	80
			T_{2N} in.lb	620	885	929	929	708	620	885	929	929	708
Emergency stop torque (permitted 1000 times during the service life of the gearhead)			T_{2Not} Nm	500	625	625	625	500	500	625	625	625	500
			T_{2Not} in.lb	4425	5531	5531	5531	4425	4425	5531	5531	5531	4425
Nominal input speed (with T_{2N} and 20°C ambient temperature) [b]			n_{1N} rpm	3500	4000	4500	4500	4500	3500	4000	4500	4500	4500
cymex® optimized speed (please contact us regarding the design)			n_{1Ncym} rpm	–	–	–	–	–	4500	5000	5000	5000	5000
Max. input speed			n_{1Max} rpm	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000
Mean no load running torque (with n_1=3000 rpm and 20°C gearhead temperature) [c]			T_{012} Nm	2.4	2.1	1.8	1.1	0.8	0.7	–	–	–	–
			T_{012} in.lb	21.2	18.6	15.9	9.74	7.08	6.2	–	–	–	–
Max. torsional backlash			j_t arcmin	Standard ≤ 4 / Reduced ≤ 2									
Torsional rigidity			C_{t21} Nm/ arcmin	31									
			C_{t21} in lb/ arcmin	274									
Max. axial force [d]			F_{2AMax} N	5650					–				
			F_{2AMax} lb_f	1271					–				
Max. radial force [d]			F_{2RMax} N	6600					1000				
			F_{2RMax} lb_f	1485					225				
Max. tilting moment			M_{2KMax} Nm	487					72				
			M_{2KMax} in.lb	4310					637				
Efficiency at full load			η %	98.5					99				
Service life (For calculation, see the Chapter "Information")			L_h h	> 30000									
Weight incl. standard adapter plate			m kg	7.7									
			m lb_m	17.0									
Operating noise (with i=10 and n_1=3000 rpm no load)			L_{PA} dB(A)	≤ 64									
Max. permitted housing temperature			°C	+90									
			F	194									
Ambient temperature			°C	-15 to +40									
			F	5 to 104									
Lubrication				Lubricated for life									
Paint				Blue RAL 5002									
Direction of rotation				Motor and gearhead same direction									
Protection class				IP 65					IP 52				
Moment of inertia (relates to the drive)	G	24	J_1 kgcm²	3.99	3.04	2.61	2.29	2.07	3.99	3.04	2.61	2.29	2.07
			J_1 10^{-3} in lb s²	3.53	2.69	2.31	2.03	1.83	3.53	2.69	2.31	2.03	1.83
Clamping hub diameter [mm]	K	38	J_1 kgcm²	11.1	10.1	9.68	9.36	9.14	11.1	10.1	9.68	9.36	9.14
			J_1 10^{-3} in lb s²	9.78	8.95	8.57	8.28	8.09	9.78	8.95	8.57	8.28	8.09

Reduced mass moments of inertia available on request.



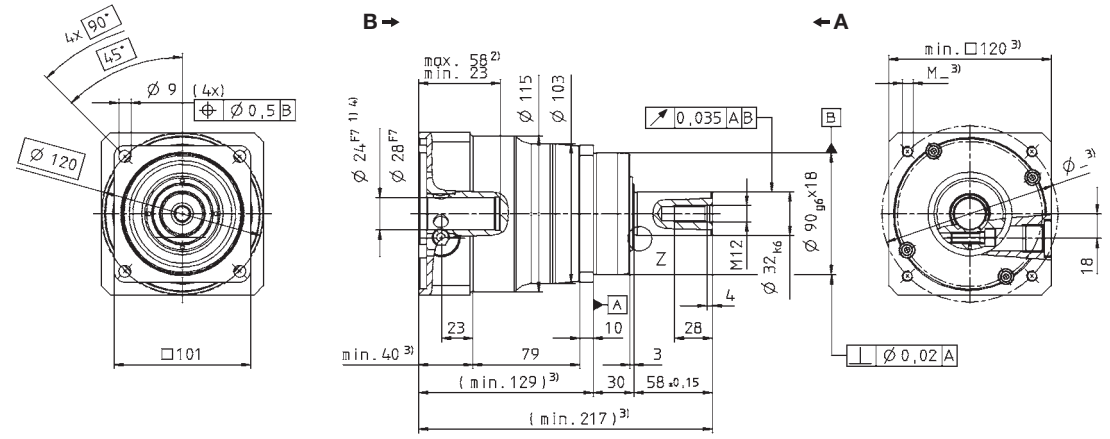
[a] Other ratios available on request
[b] For higher ambient temperatures, please contact us
[c] Valid for clamping hub diameter of 24 mm
[d] Refers to centre of the output shaft or flange

View A

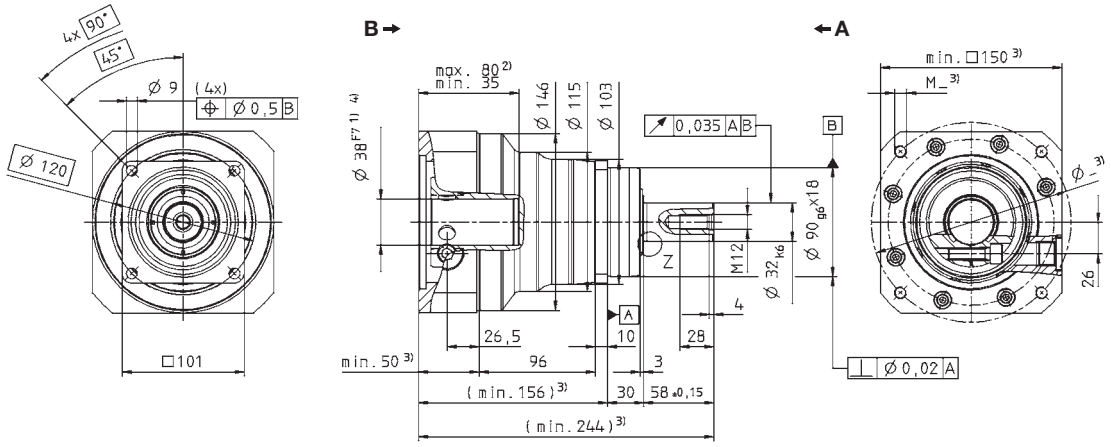
View B

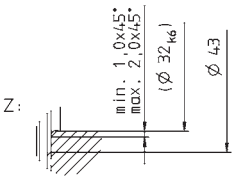
Motor shaft diameter [mm]

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



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

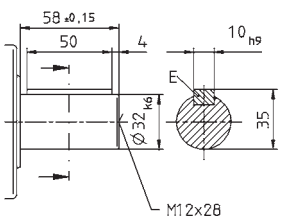




Alternatives: Output shaft variants

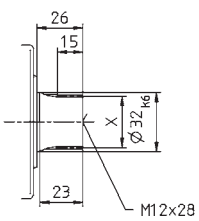
Keywayed output shaft in mm

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



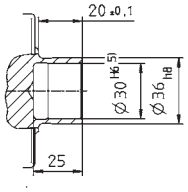
Involute gearing DIN 5480 in mm

X = W 32 x 1.25 x 30 x 24 x 6m, DIN 5480



Shaft mounted

Mounted via shrink disc



Non-tolerated dimensions ± 1 mm

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

⚠ Motor mounting according to operating manual

				2-stage								
Ratio [a]			*i*	**16**	**20**	**25**	**28**	**35**	**40**	**50**	**70**	**100**
Max. acceleration torque (max. 1000 cycles per hour)			T_{2B} Nm	240	240	240	240	240	240	240	240	180
			T_{2B} in.lb	2124	2124	2124	2124	2124	2124	2124	2124	1593
cymex®-optimal nominal torque (please contact us regarding the design)			T_{2Ncym} Nm	–	–	–	–	–	–	–	–	90
			T_{2Ncym} in.lb									797
Nominal output torque (with n_{1N})			T_{2N} Nm	140	140	140	140	140	140	140	135	80
			T_{2N} in.lb	1239	1239	1239	1239	1239	1239	1239	1195	708
Emergency stop torque (permitted 1000 times during the service life of the gearhead)			T_{2Not} Nm	625	625	625	625	625	625	625	625	500
			T_{2Not} in.lb	5531	5531	5531	5531	5531	5531	5531	5531	4425
Nominal input speed (with T_{2N} and 20°C ambient temperature) [b]			n_{1N} rpm	4500	4500	4500	4500	4500	4500	4500	4500	4500
Max. input speed			n_{1Max} rpm	6000	6000	6000	6000	6000	6000	6000	6000	6000
Mean no load running torque (with n_1 = 3000 rpm and 20°C gearhead temperature) [c]			T_{012} Nm	0.8	0.7	0.6	0.5	0.4	0.4	0.3	0.3	0.3
			T_{012} in.lb	7.1	6.2	5.3	4.4	3.5	3.5	2.7	2.7	2.7
Max. torsional backlash			j_t arcmin	Standard ≤ 6 / Reduced ≤ 4								
Torsional rigidity			C_{t21} Nm/ arcmin	31								
			C_{t21} in lb/ arcmin	274								
Max. axial force [d]			F_{2AMax} N	5650								
			F_{2AMax} lb_f	1271								
Max. radial force [d]			F_{2RMax} N	6600								
			F_{2RMax} lb_f	1485								
Max. tilting moment			M_{2KMax} Nm	487								
			M_{2KMax} in.lb	4310								
Efficiency at full load			η %	96.5								
Service life (For calculation, see the Chapter "Information")			L_h h	> 30000								
Weight incl. standardadapter plate			*m* kg	7.9								
			m lb_m	17.5								
Operating noise (with *i*=100 and n_1 = 3000 rpm no load)			L_{PA} dB(A)	≤ 60								
Max. permitted housing temperature			°C	+90								
			F	194								
Ambient temperature			°C	-15 to +40								
			F	5 to 104								
Lubrication				Lubricated for life								
Paint				Blue RAL 5002								
Direction of rotation				Motor and gearhead same direction								
Protection class				IP 65								
Moment of inertia (relates to the drive)	E	19	J_1 kgcm²	0.81	0.70	0.69	0.60	0.59	0.55	0.54	0.54	0.54
			J_1 10^{-3} in lb s²	0.72	0.62	0.61	0.53	0.52	0.48	0.48	0.48	0.47
Clamping hub diameter [mm]	G	24	J_1 kgcm²	2.18	2.07	2.05	1.97	1.96	1.92	1.91	1.91	1.91
			J_1 10^{-3} in lb s²	1.93	1.83	1.82	1.74	1.74	1.70	1.69	1.69	1.69

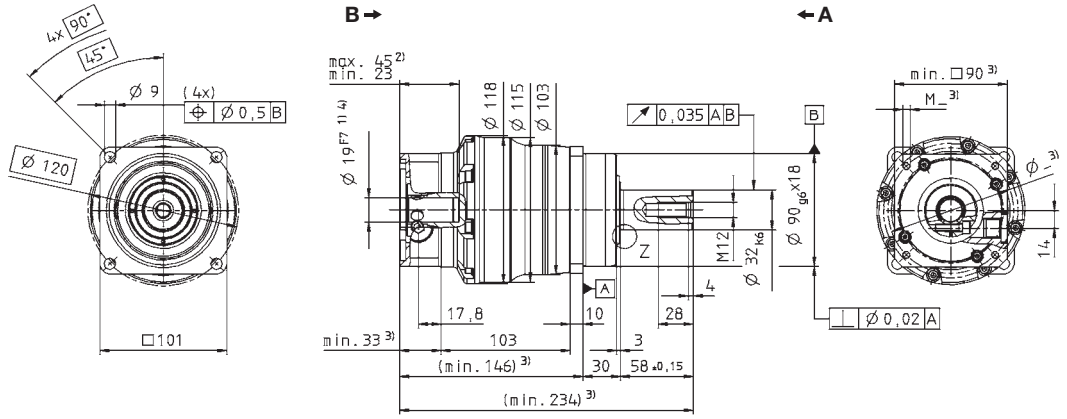
Reduced mass moments of inertia available on request.

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

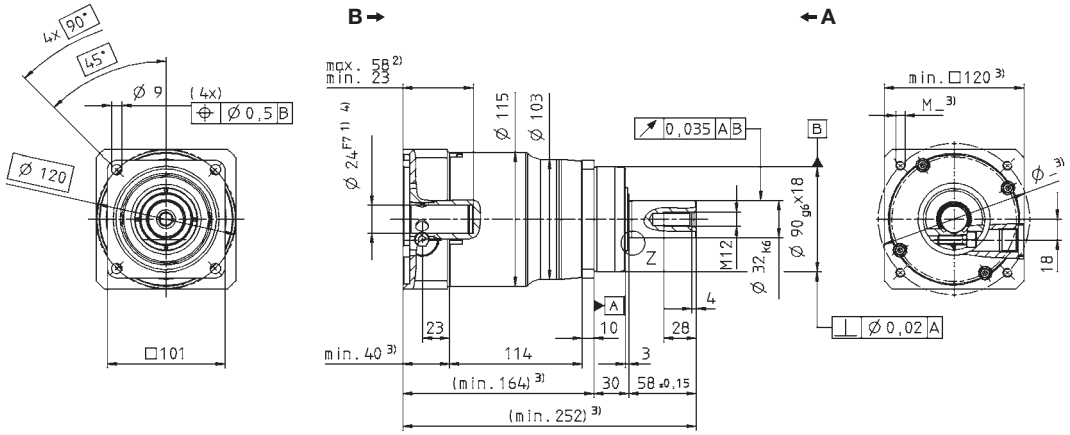
View A | View B

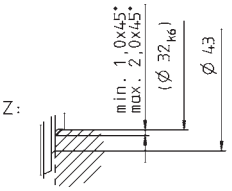
Motor shaft diameter [mm]

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



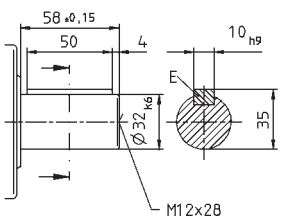
up to 24 [4] (G) clamping hub diameter



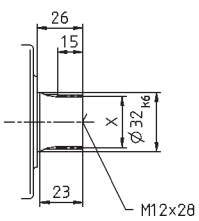


Alternatives: Output shaft variants

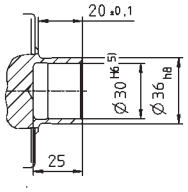
Keywayed output shaft in mm
E = key as per DIN 6885, sheet 1, form A



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



Shaft mounted
Mounted via shrink disc



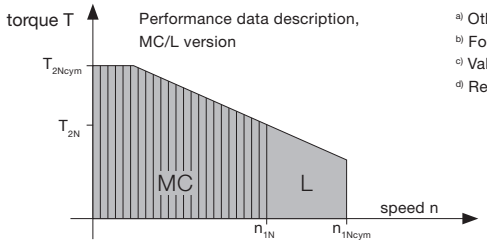
Non-tolerated dimensions ± 1 mm

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

⚠ Motor mounting according to operating manual

				Standard version MC					Friction optimized version L				
Ratio [a]			***i***	**3**	**4**	**5**	**7**	**10**	**3**	**4**	**5**	**7**	**10**
Max. acceleration torque (max. 1000 cycles per hour)			T_{2B} Nm	310	480	480	480	380	310	480	480	480	380
			T_{2B} in.lb	2744	4248	4248	4248	3363	2744	4248	4248	4248	3363
cymex®-optimal nominal torque (please contact us regarding the design)			T_{2Ncym} Nm	150	240	240	270	180	150	240	240	270	180
			T_{2Ncym} in.lb	1328	2124	2124	2390	1593	2744	4248	4248	4248	3363
Nominal output torque (with n_{1N})			T_{2N} Nm	130	195	205	210	160	130	195	205	210	160
			T_{2N} in.lb	1151	1726	1814	1859	1416	1151	1726	1814	1859	1416
Emergency stop torque (permitted 1000 times during the service life of the gearhead)			T_{2Not} Nm	1000	1250	1250	1250	1000	1000	1250	1250	1250	1000
			T_{2Not} in.lb	8850	11063	11063	11063	8850	8850	11063	11063	11063	8850
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	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000
Mean no load running torque (with n_1=3000 rpm and 20°C gearhead temperature) [c]			T_{012} Nm	5.1	3.9	3.1	2.3	1.6	1.0	–	–	–	–
			T_{012} in.lb	45.1	34.5	27.4	20.4	14.2	8.9	–	–	–	–
Max. torsional backlash			j_t arcmin	Standard ≤ 4 / Reduced ≤ 2									
Torsional rigidity			C_{t21} Nm/ arcmin	53									
			C_{t21} in lb/ arcmin	469									
Max. axial force [d]			F_{2AMax} N	9870					–				
			F_{2AMax} lb_f	2221					–				
Max. radial force [d]			F_{2RMax} N	9900					1200				
			F_{2RMax} lb_f	2228					270				
Max. tilting moment			M_{2KMax} Nm	952					110				
			M_{2KMax} in.lb	8425					974				
Efficiency at full load			η %	98.5					99				
Service life (For calculation, see the Chapter "Information")			L_h h	> 30000									
Weight incl. standard adapter plate			m kg	17.2									
			m lb_m	38									
Operating noise (with i=10 and n_1=3000 rpm no load)			L_{PA} dB(A)	≤ 65									
Max. permitted housing temperature			°C	+90									
			F	194									
Ambient temperature			°C	-15 to +40									
			F	5 to 104									
Lubrication				Lubricated for life									
Paint				Blue RAL 5002									
Direction of rotation				Motor and gearhead same direction									
Protection class				IP 65					IP 52				
Moment of inertia (relates to the drive)	K	38	J_1 kgcm²	14.9	12.1	11.0	10.1	9.51	14.9	12.1	11.0	10.1	9.51
			J_1 10^{-3} in lb s²	13.2	10.7	9.8	8.9	8.4	13.2	10.7	9.8	8.9	8.4
Clamping hub diameter [mm]	M	48	J_1 kgcm²	29.5	26.7	25.6	24.7	24.2	29.5	26.7	25.6	24.7	24.2
			J_1 10^{-3} in lb s²	26.1	23.6	22.7	21.9	21.4	26.1	23.6	22.7	21.9	21.4

Reduced mass moments of inertia available on request.

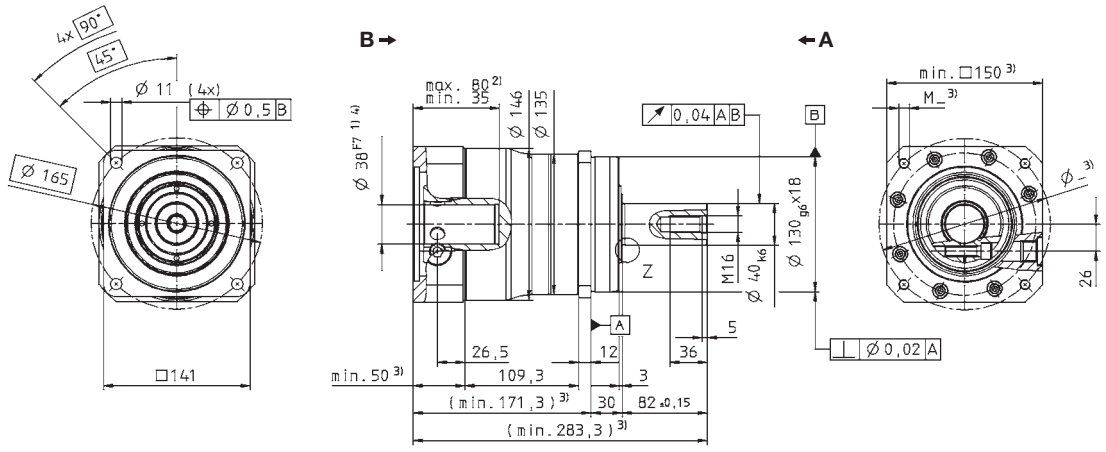


[a] Other ratios available on request
[b] For higher ambient temperatures, please contact us
[c] Valid for clamping hub diameter of 38 mm
[d] Refers to center of the output shaft or flange

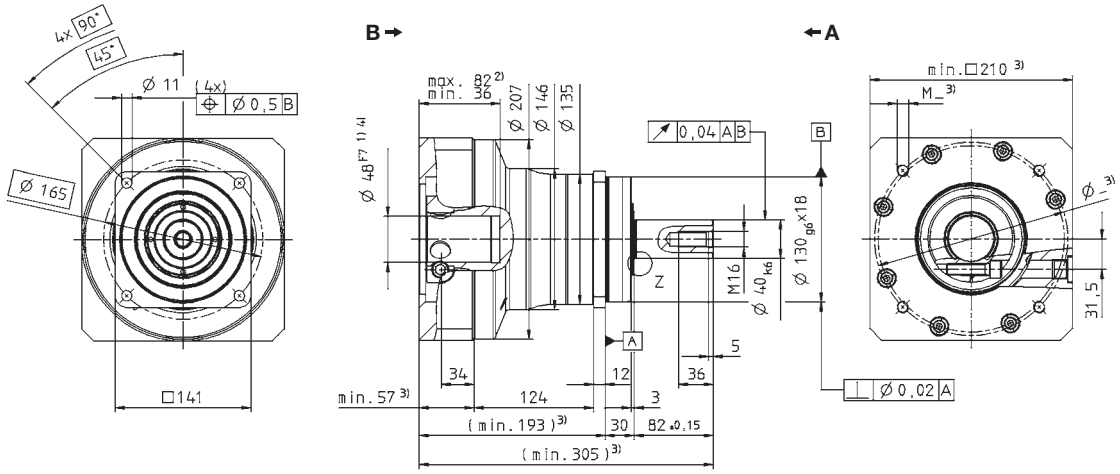
View A | View B

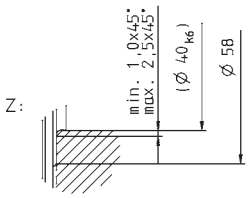
Motor shaft diameter [mm]

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



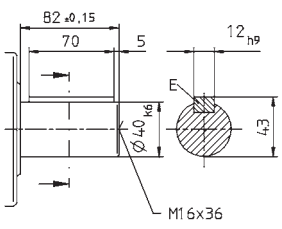
up to 48 [4] (M) clamping hub diameter



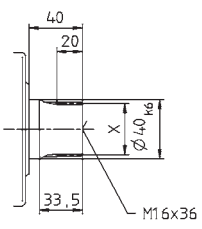


Alternatives: Output shaft variants

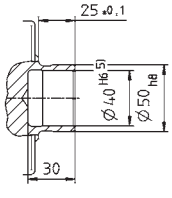
Keywayed output shaft in mm
E = key as per DIN 6885, sheet 1, form A



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



Shaft mounted
Mounted via shrink disc



Non-tolerated dimensions ± 1 mm

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

⚠ Motor mounting according to operating manual

				2-stage								
Ratio [a]			*i*	**16**	**20**	**25**	**28**	**35**	**40**	**50**	**70**	**100**
Max. acceleration torque (max. 1000 cycles per hour)			T_{2B} Nm	480	480	480	480	480	480	480	480	380
			T_{2B} in.lb	4248	4248	4248	4248	4248	4248	4248	4248	3363
cymex®-optimal nominal torque (please contact us regarding the design)			T_{2Ncym} Nm	290	290	290	–	–	–	–	–	–
			T_{2Ncym} in.lb	2567	2567	2567						
Nominal output torque (with n_{1N})			T_{2N} Nm	260	280	280	290	290	290	290	260	180
			T_{2N} in.lb	2301	2478	2478	2567	2567	2567	2567	2301	1593
Emergency stop torque (permitted 1000 times during the service life of the gearhead)			T_{2Not} Nm	1250	1250	1250	1250	1250	1250	1250	1250	1000
			T_{2Not} in.lb	11063	11063	11063	11063	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
Max. input speed			n_{1Max} rpm	6000	6000	6000	6000	6000	6000	6000	6000	6000
Mean no load running torque (with n_1 = 3000 rpm and 20°C gearhead temperature) [c]			T_{012} Nm	1.6	1.3	1.2	1.0	0.9	0.7	0.6	0.5	0.5
			T_{012} in.lb	14.2	11.5	10.6	8.9	8.0	6.2	5.3	4.4	4.4
Max. torsional backlash			j_t arcmin	Standard ≤ 6 / Reduced ≤ 4								
Torsional rigidity			C_{t21} Nm/ arcmin	53								
			C_{t21} in lb/ arcmin	469								
Max. axial force [d]			F_{2AMax} N	9870								
			F_{2AMax} lb_f	2221								
Max. radial force [d]			F_{2RMax} N	9900								
			F_{2RMax} lb_f	2228								
Max. tilting moment			M_{2KMax} Nm	952								
			M_{2KMax} in.lb	8425								
Efficiency at full load			η %	96.5								
Service life (For calculation, see the Chapter "Information")			L_h h	> 30000								
Weight incl. standard adapter plate			*m* kg	17								
			m lb_m	38								
Operating noise (with *i*=100 and n_1 = 3000 rpm no load)			L_{PA} dB(A)	≤ 63								
Max. permitted housing temperature			°C	+90								
			F	194								
Ambient temperature			°C	-15 to +40								
			F	5 to 104								
Lubrication				Lubricated for life								
Paint				Blue RAL 5002								
Direction of rotation				Motor and gearhead same direction								
Protection class				IP 65								
Moment of inertia (relates to the drive)	G	24	J_1 kgcm²	3.19	2.71	2.67	2.34	2.32	2.10	2.08	2.08	2.07
			J_1 10^{-3} in lb s²	2.82	2.40	2.36	2.07	2.05	1.85	1.85	1.84	1.83
Clamping hub diameter [mm]	K	38	J_1 kgcm²	10.3	9.77	9.73	9.41	9.39	9.16	9.15	9.14	9.14
			J_1 10^{-3} in lb s²	9.07	8.65	8.61	8.33	8.31	8.11	8.10	8.09	8.09

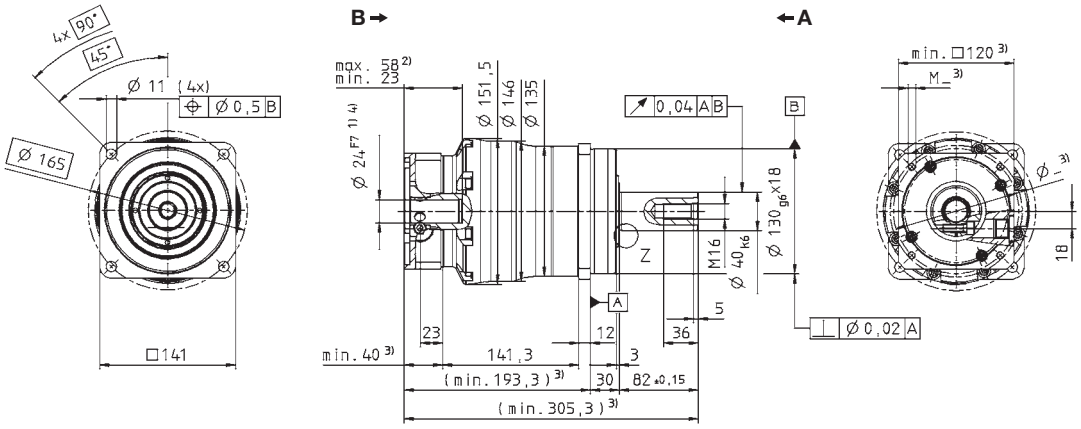
Reduced mass moments of inertia available on request.

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

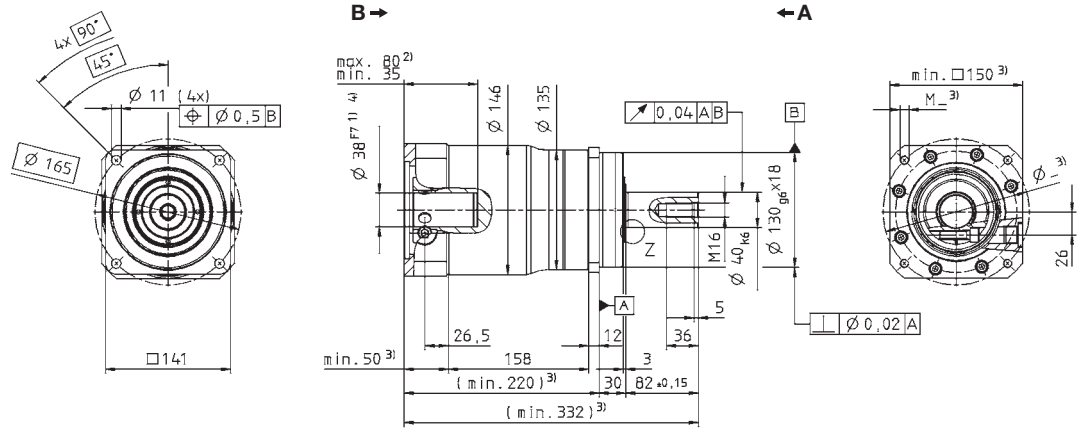
View A View B

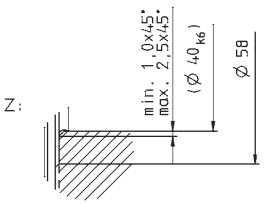
Motor shaft diameter [mm]

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



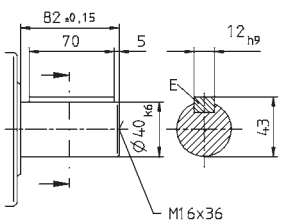
up to 38 [4] (K) clamping hub diameter



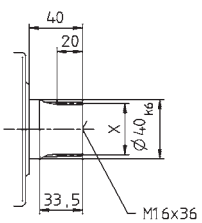


Alternatives: Output shaft variants

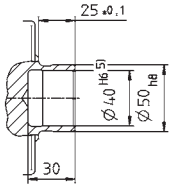
Keywayed output shaft in mm
E = key as per DIN 6885, sheet 1, form A



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



Shaft mounted
Mounted via shrink disc



Non-tolerated dimensions ± 1 mm

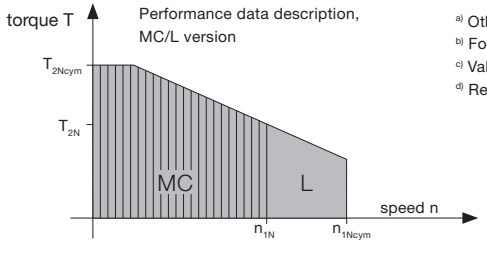
1) Check motor shaft fit.
2) Min./Max. permissible motor shaft length. Longer motor shafts are adaptable, please contact us.
3) The dimensions depend on the motor.
4) Smaller motor shaft diameter is compensated by a bushing with a minimum thickness of 1 mm.
5) Tolerance h6 for mounted shaft.

⚠ Motor mounting according to operating manual

SP+ 180 MC HIGH SPEED® 1-stage

			Standard version MC					Friction optimized version L				
Ratio [a]	***i***		**3**	**4**	**5**	**7**	**10**	**3**	**4**	**5**	**7**	**10**
Max. acceleration torque (max. 1000 cycles per hour)	T_{2B}	Nm	700	880	880	880	700	700	880	880	880	700
		in.lb	6195	7788	7788	7788	6195					
cymex®-optimal nominal torque (please contact us regarding the design)	T_{2Ncym}	Nm	350	600	600	600	540	350	600	600	600	540
		in.lb	3098	5310	5310	5310	4779					
Nominal output torque (with n_{1N})	T_{2N}	Nm	290	450	440	450	400	290	450	450	450	400
		in.lb	2567	3983	3894	3983	3540					
Emergency stop torque (permitted 1000 times during the service life of the gearhead)	T_{2Not}	Nm	2200	2750	2750	2750	2200	2200	2750	2750	2750	2200
		in.lb	19470	24338	24338	24338	19470					
Nominal input speed (with T_{2N} and 20°C ambient temperature) [b]	n_{1N}	rpm	3000	3500	4500	4500	4500	3000	3500	4500	4500	4500
cymex® optimized speed (please contact us regarding the design)	n_{1Ncym}	rpm	–	–	–	–	–	4000	4500	5000	5000	5000
Max. input speed	n_{1Max}	rpm	4500	6000	6000	6000	6000	4500	6000	6000	6000	6000
Mean no load running torque (with n_1=3000 rpm and 20°C gearhead temperature) [c]	T_{012}	Nm	10.2	7.7	6.2	4.5	3.2	3.0	–	–	–	–
		in.lb	90.3	68.1	54.9	39.8	28.3	26.6	–	–	–	–
Max. torsional backlash	j_t	arcmin	Standard ≤ 4 / Reduced ≤ 2									
Torsional rigidity	C_{t21}	Nm/ arcmin	175									
		in lb/ arcmin	1549									
Max. axial force [d]	F_{2AMax}	N	14150					–				
		lb_f	3184					–				
Max. radial force [d]	F_{2RMax}	N	15400					2000				
		lb_f	3465					450				
Max. tilting moment	M_{2KMax}	Nm	1600					208				
		in.lb	14160					1841				
Efficiency at full load	η	%	98.5					99				
Service life (For calculation, see the Chapter "Information")	L_h	h	> 30000									
Weight incl. standard adapter plate	m	kg	34									
		lb_m	75									
Operating noise (with i=10 and n_1=3000 rpm no load)	L_{PA}	dB(A)	≤ 66									
Max. permitted housing temperature		°C	+90									
		F	194									
Ambient temperature		°C	-15 to +40									
		F	5 to 104									
Lubrication			Lubricated for life									
Paint			Blue RAL 5002									
Direction of rotation			Motor and gearhead same direction									
Protection class			IP 65					IP 52				
Moment of inertia (relates to the drive) **M** **48**	J_1	kgcm²	58.5	41.6	35.6	30.0	26.9	58.5	41.6	35.6	30.0	26.9
Clamping hub diameter [mm]		10^{-3} in lb s²	51.8	36.8	31.5	26.6	23.8	51.8	36.8	31.5	26.6	23.8

Reduced mass moments of inertia available on request.

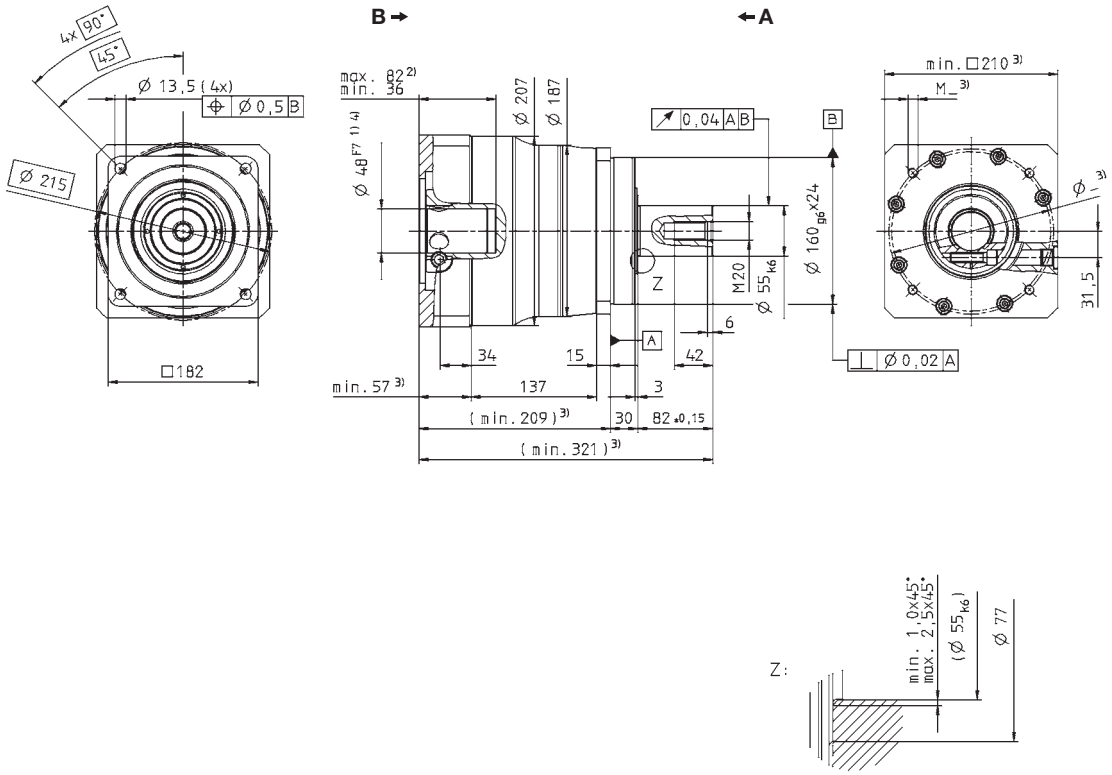


[a] Other ratios available on request
[b] For higher ambient temperatures, please contact us
[c] Valid for clamping hub diameter of 48 mm
[d] Refers to center of the output shaft or flange

View A View B

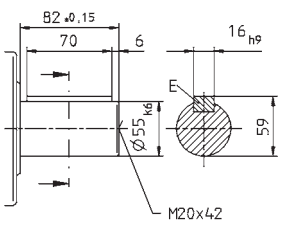
Motor shaft diameter [mm]

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

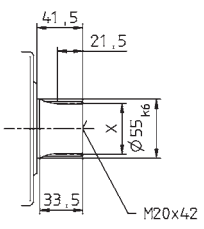


Alternatives: Output shaft variants

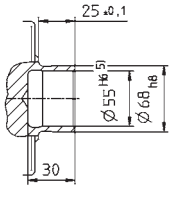
Keywayed output shaft in mm
E = key as per DIN 6885, sheet 1, form A



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



Shaft mounted
Mounted via shrink disc



Non-tolerated dimensions ± 1 mm

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

⚠ Motor mounting according to operating manual

			2-stage								
Ratio [a]	*i*		**16**	**20**	**25**	**28**	**35**	**40**	**50**	**70**	**100**
Max. acceleration torque (max. 1000 cycles per hour)	T_{2B}	Nm	880	880	880	880	880	880	880	880	700
		in.lb	7788	7788	7788	7788	7788	7788	7788	7788	6195
cymex®-optimal nominal torque (please contact us regarding the design)	T_{2Ncym}	Nm	–	–	–	–	–	–	–	–	–
		in.lb									
Nominal output torque (with n_{1N})	T_{2N}	Nm	600	600	600	600	600	600	600	600	600
		in.lb	5310	5310	5310	5310	5310	5310	5310	5310	5310
Emergency stop torque (permitted 1000 times during the service life of the gearhead)	T_{2Not}	Nm	2750	2750	2750	2750	2750	2750	2750	2750	2200
		in.lb	24338	24338	24338	24338	24338	24338	24338	24338	19470
Nominal input speed (with T_{2N} and 20°C ambient temperature) [b]	n_{1N}	rpm	4500	4500	4500	4500	4500	4500	4500	4500	4500
Max. input speed	n_{1Max}	rpm	6000	6000	6000	6000	6000	6000	6000	6000	6000
Mean no load running torque (with n_1 = 3000 rpm and 20°C gearhead temperature) [c]	T_{012}	Nm	3.2	2.6	2.3	1.9	1.7	1.4	1.2	1.0	0.9
		in.lb	28.3	23.0	20.4	16.8	15.0	12.4	10.6	8.9	8.0
Max. torsional backlash	j_t	arcmin	Standard ≤ 6 / Reduced ≤ 4								
Torsional rigidity	C_{t21}	Nm/ arcmin	175								
		in lb/ arcmin	149								
Max. axial force [d]	F_{2AMax}	N	14150								
		lb_f	3184								
Max. radial force [d]	F_{2RMax}	N	15400								
		lb_f	3465								
Max. tilting moment	M_{2KMax}	Nm	1600								
		in.lb	14160								
Efficiency at full load	η	%	96.5								
Service life (For calculation, see the Chapter "Information")	L_h	h	> 30000								
Weight incl. standard adapter plate	*m*	kg	36								
		lb_m	80								
Operating noise (with *i*=100 and n_1 = 3000 rpm no load)	L_{PA}	dB(A)	≤ 66								
Max. permitted housing temperature		°C	+90								
		F	194								
Ambient temperature		°C	-15 to +40								
		F	5 to 104								
Lubrication			Lubricated for life								
Paint			Blue RAL 5002								
Direction of rotation			Motor and gearhead same direction								
Protection class			IP 65								
Moment of inertia (relates to the drive)	K	38	J_1	kgcm²	13.5	12.0	11.7	10.6	10.4	9.74	9.68	9.63	9.60
Clamping hub diameter [mm]				10^{-3} in b s²	12.0	10.6	10.4	9.34	9.23	8.62	8.57	8.52	8.49

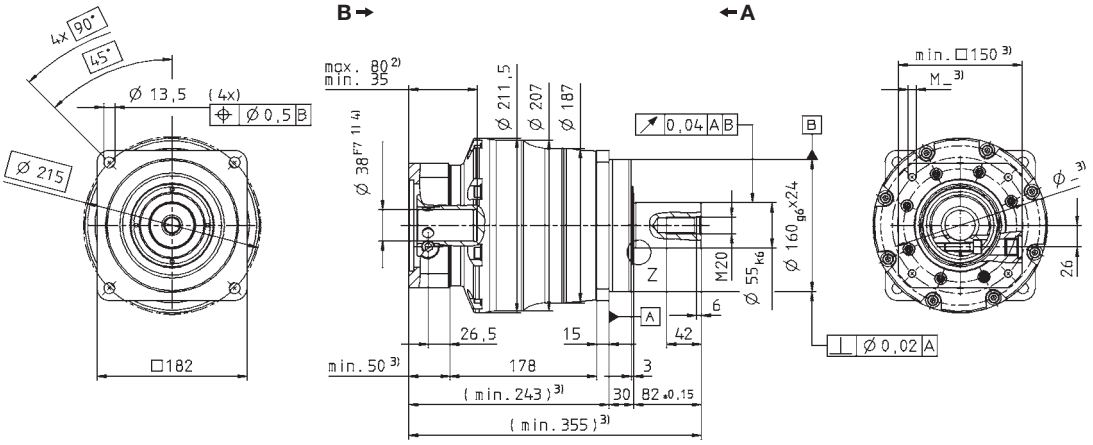
Reduced mass moments of inertia available on request.

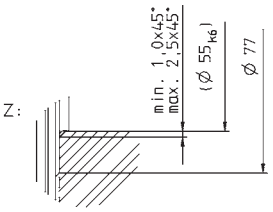
[a] Other ratios available on request
[b] For higher ambient temperatures, please contact us
[c] Valid for clamping hub diameter of 38 mm
[d] Refers to center of the output shaft or flange

View A View B

Motor shaft diameter [mm]

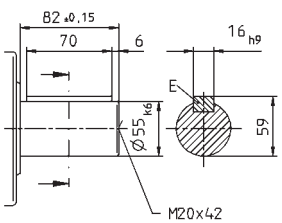
up to 38 [4] (K) clamping hub diameter



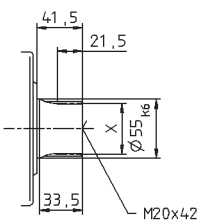


Alternatives: Output shaft variants

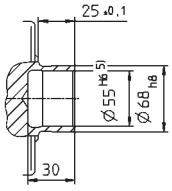
Keywayed output shaft in mm
E = key as per DIN 6885, sheet 1, form A



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



Shaft mounted
Mounted via shrink disc



Non-tolerated dimensions ± 1 mm

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

⚠ Motor mounting according to operating manual

SP+ 210 MC HIGH SPEED® 1/2-stage

				1-stage					2-stage								
Ratio [a]			***i***	**3**	**4**	**5**	**7**	**10**	**16**	**20**	**25**	**28**	**35**	**40**	**50**	**70**	**100**
Max. acceleration torque (max. 1000 cycles per hour)			T_{2B} Nm	1200	2000	2000	1700	1200	1680	1800	2000	1680	1920	1040	1300	1700	1200
			T_{2B} in.lb	10620	17700	17700	15045	10620	14868	15930	17700	14868	16992	9204	11505	15045	10620
cymex®-optimal nominal torque (please contact us regarding the design)			T_{2Ncym} Nm	- Please contact us -													
			T_{2Ncym} in.lb														
Nominal output torque (with n_{1N})			T_{2N} Nm	900	1300	1150	1000	800	840	780	975	780	975	800	1000	1000	800
			T_{2N} in.lb	7965	11505	10178	8850	7080	7434	6903	8629	6903	8629	7080	8850	8850	7080
Emergency stop torque (permitted 1000 times during the service life of the gearhead)			T_{2Not} Nm	5000	5200	5200	5200	5000	5200	5200	5200	5200	5200	5200	5200	5200	5000
			T_{2Not} in.lb	44250	46020	46020	46020	44250	46020	46020	46020	46020	46020	46020	46020	46020	44250
Nominal input speed (with T_{2N} and 20°C ambient temperature) [b]			n_{1N} rpm	2250	2500	3500	3500	3500	3500	4500	4500	4500	4500	4500	4500	4500	4500
Max. input speed			n_{1Max} rpm	3400	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000
Mean no load running torque (with n_1 = 2000 rpm and 20°C gearhead temperature)			T_{012} Nm	13.0	9.0	6.5	4.0	2.5	3.0	2,5	2,5	2,0	2,0	1,5	1,5	1,5	1,5
			T_{012} in.lb	115.1	79.7	57.5	35.4	22.1	27	22	22	18	18	13	13	13	13
Max. torsional backlash			j_t arcmin	Standard ≤ 4 / Reduced ≤ 2					Standard ≤ 5 / Reduced ≤ 4								
Torsional rigidity			C_{t21} Nm/ arcmin	400					400								
			C_{t21} in lb/ arcmin	3540					3540								
Max. axial force [c]			F_{2AMax} N	30000					30000								
			F_{2AMax} lb_f	6750					6750								
Max. radial force [c]			F_{2RMax} N	21000					21000								
			F_{2RMax} lb_f	4725					4725								
Max. tilting moment			M_{2KMax} Nm	3100					3100								
			M_{2KMax} in.lb	27435					27435								
Efficiency at full load			η %	98.5					96.5								
Service life (For calculation, see the Chapter "Information")			L_h h	> 30000					> 30000								
Weight incl. standard adapter plate			m kg	56					53								
			m lb_m	124					117								
Operating noise (with i=10 and n_1 = 2000 rpm no load)			L_{PA} dB(A)	≤ 64													
Max. permitted housing temperature			°C	+90													
			F	194													
Ambient temperature			°C	-15 to +40													
			F	32 to 194													
Lubrication				Lubricated for life													
Paint				Blue RAL 5002													
Direction of rotation				Motor and gearhead same direction													
Protection class				IP 65													
Moment of inertia (relates to the drive)	M	48	J_1 kgcm²	-	-	-	-	-	34.5	31.5	30.8	30.0	29.7	28.5	28.3	28.1	28.0
			J_1 10^{-3} in lb s²						30.5	27.9	27.3	26.6	26.3	25.2	25.0	24.9	24.8
Clamping hub diameter (mm)	N	55	J_1 kgcm²	139.0	94.3	76.9	61.5	53.1	-	-	-	-	-	-	-	-	-
			J_1 10^{-3} in lb s²	123.0	83.5	68.1	54.4	47.0									

Reduced mass moments of inertia available on request.

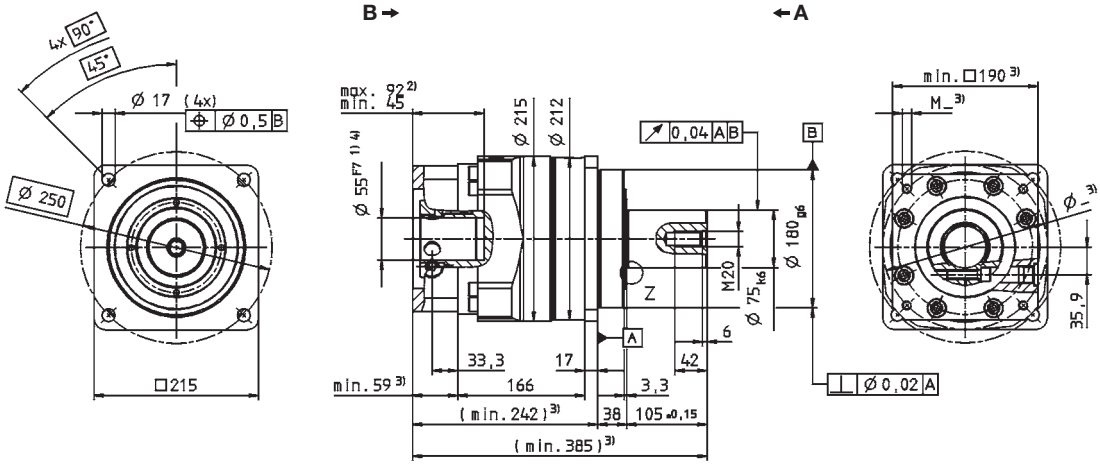
[a] Other ratios available on request
[b] For higher ambient temperatures, please contact us
[c] Refers to center of the output shaft or flange

View A | View B

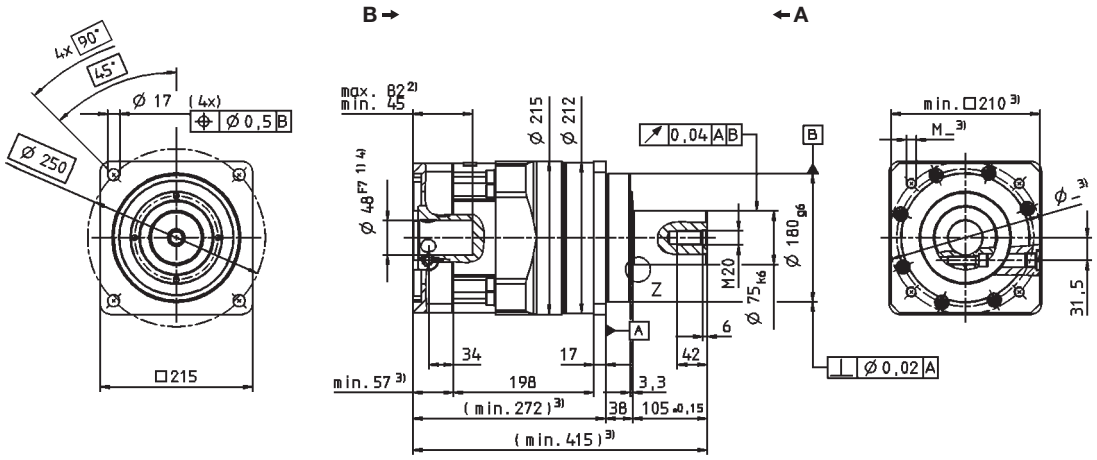
Motor shaft diameter [mm]

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

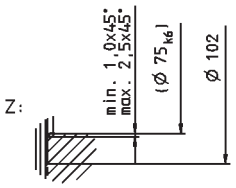
1-stage:



2-stage:

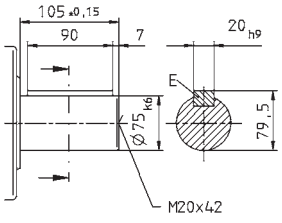


up to 48 [4] (M) clamping hub diameter

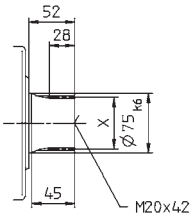


Alternatives: Output shaft variants

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



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



Non-tolerated dimensions ± 1.5 mm

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

⚠ Motor mounting according to operating manual

SP+ 240 MC HIGH SPEED® 1/2-stage

				1-stage					2-stage								
Ratio [a]			***i***	**3**	**4**	**5**	**7**	**10**	**16**	**20**	**25**	**28**	**35**	**40**	**50**	**70**	**100**
Max. acceleration torque (max. 1000 cycles per hour)			T_{2B} Nm	1750	3500	3600	2700	1800	3500	3500	3600	2900	3600	1680	2100	2700	1800
			T_{2B} in.lb	15488	30975	31860	23895	15930	30975	30975	31860	25665	31860	14868	18585	23895	15930
cymex®-optimal nominal torque (please contact us regarding the design)			T_{2Ncym} Nm	- Please contact us -													
			T_{2Ncym} in.lb														
Nominal output torque (with n_{1N})			T_{2N} Nm	1400	1960	1770	1500	1100	1790	1770	1730	1840	1930	1300	1625	1500	1100
			T_{2N} in.lb	12390	17346	15665	13275	9735	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	6800	8500	8500	8500	6800	8500	8500	8500	8500	8500	8500	8500	8500	6800
			T_{2Not} in.lb	60180	75225	75225	75225	60180	75225	75225	75225	75225	75225	75225	75225	75225	60180
Nominal input speed (with T_{2N} and 20°C ambient temperature) [b]			n_{1N} rpm	1750	2250	3000	3000	3000	3500	4500	4500	4500	4500	4500	4500	4500	4500
Max. input speed			n_{1Max} rpm	3400	4000	5000	5000	5000	6000	6000	6000	6000	6000	6000	6000	6000	6000
Mean no load running torque (with n_1 = 2000 rpm and 20°C gearhead temperature)			T_{012} Nm	24	18	13	7,0	5,0	5,0	4,5	4,0	3,5	3,0	2,5	2,5	2,5	2,0
			T_{012} in.lb	212	159	115	62	44	44	40	35	31	27	22	22	22	18
Max. torsional backlash			j_t arcmin	Standard ≤ 4 / Reduced ≤ 2					Standard ≤ 5 / Reduced ≤ 4								
Torsional rigidity			C_{t21} Nm/ arcmin	550					550								
			C_{t21} in lb/ arcmin	4868					4868								
Max. axial force [c]			F_{2AMax} N	33000					33000								
			F_{2AMax} lb_f	7425					7425								
Max. radial force [c]			F_{2RMax} N	30000					30000								
			F_{2RMax} lb_f	6750					6750								
Max. tilting moment			M_{2KMax} Nm	5000					5000								
			M_{2KMax} in.lb	44250					44250								
Efficiency at full load			η %	98.5					96.5								
Service life (For calculation, see the Chapter "Information")			L_h h	> 30000					> 30000								
Weight incl. standard adapter plate			m kg	77					76								
			m lb_m	170					168								
Operating noise (with i=10 and n_1 = 3000 rpm no load)			L_{PA} dB(A)	≤ 66													
Max. permitted housing temperature			°C	+90													
			F	194													
Ambient temperature			°C	-15 to +40													
			F	5 to 104													
Lubrication				Lubricated for life													
Paint				Blue RAL 5002													
Direction of rotation				Motor and gearhead same direction													
Protection class				IP 65													
Moment of inertia (relates to the drive)	M	48	J_1 kgcm²	-	-	-	-	-	39.2	34.6	33.2	30.5	29.7	28.2	27.9	27.6	27.5
			J_1 10^{-3} in lb s²						34.7	30.6	29.4	27.0	26.3	25.0	24.7	24.4	24.3
Clamping hub diameter [mm]	O	60	J_1 kgcm²	260.2	198.2	163.0	84.4	70.8	-	-	-	-	-	-	-	-	-
			J_1 10^{-3} in lb s²	230.3	175.4	144.3	74.7	62.7									

Reduced mass moments of inertia available on request.

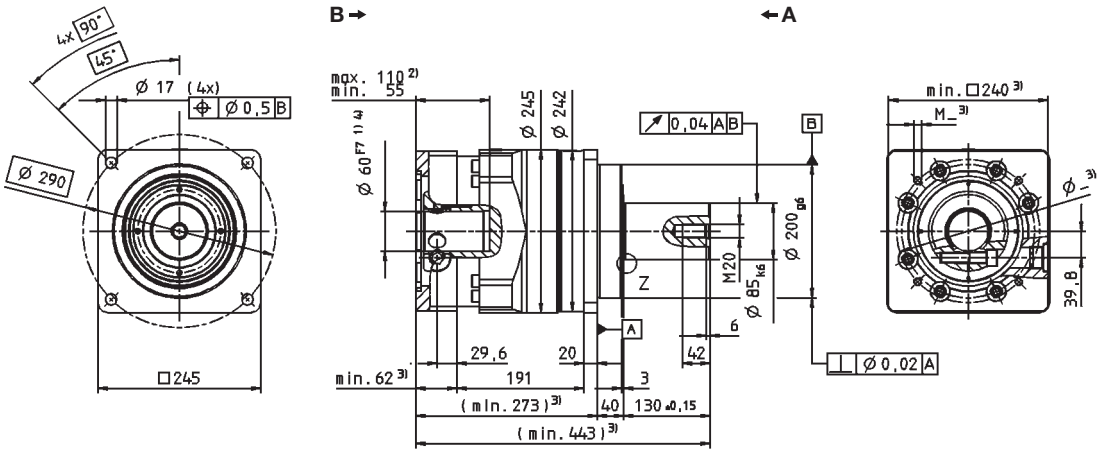
[a] Other ratios available on request
[b] For higher ambient temperatures, please contact us
[c] Refers to center of the output shaft or flange

View A | View B

Motor shaft diameter [mm]

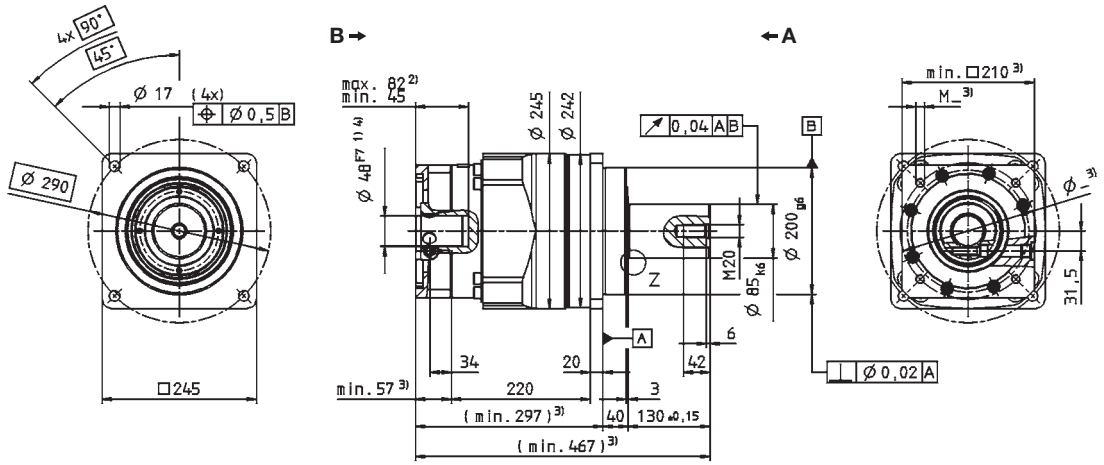
up to 60 [4] (O) clamping hub diameter

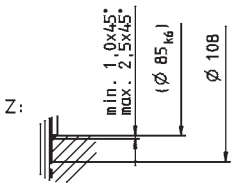
1-stage:



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

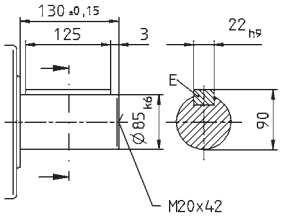
2-stage:



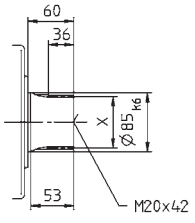


Alternatives: Output shaft variants

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



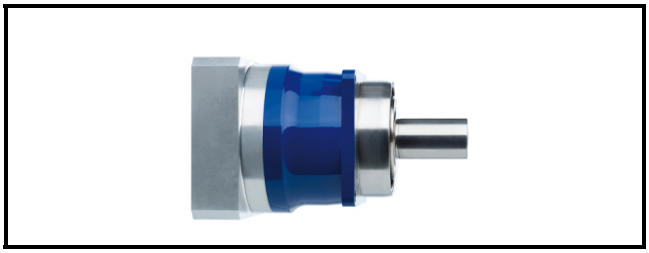
Involute gearing DIN 5480 in mm
X = W 80 x 2 x 30 x 38 x 6m, DIN 5480



Non-tolerated dimensions ± 1.5 mm

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

⚠ Motor mounting according to operating manual



alpha SP+ & SP+ HIGH SPEED®

S P 0 7 5 S - M C 1 - 1 0 - 1 E 1 / MOTOR

Series
SP+

Frame Size
75, 100, 140, 180, 210, 240

Type Code
S - Standard
F - Food Grade Lubrication
E - ATEX
L - Low Energy Version (100, 140, 180)
A - Aluminum Clamping Ring

Gearhead Variations
M - Motor mounting

Gearhead Model
C - Continuous Duty

Number of Stages
See "SP+MC Ratios" chart

Ratio
See "SP+MC Ratios" chart

Shaft Design
0 - Smooth Shaft
1 - Keyed Shaft
2 - Involute Shaft
3 - System Output
5 - Hollow Shaft

Clamping Hub Diameter
See following charts

Backlash
1 - Standard
0 - Reduced

SP+MC Ratios

Stages	1-Stage					2-Stage								
Ratios	3	4	5	7	10	16	20	25	28	35	40	50	70	100

SP+ MC Clamping Hub Diameters

Frame	B	C	E	G	H	I	K	M	N	O
	11	14	19	24	28	32	38	48	55	60
SP075S-MC1			X	X						
SP075S-MC2		X	X							
SP100S-MC1				X			X			
SP100S-MC2			X	X						
SP140S-MC1							X	X		
SP140S-MC2				X			X			
SP180S-MC1								X		
SP180S-MC2							X			
SP210S-MC1									X	
SP210S-MC2								X		
SP240S-MC1										X
SP240S-MC2								X		

WITTENSTEIN, Inc.
1249 Humbracht Circle
Bartlett, IL 60103, USA
Tel +1 630 540 5300
Fax +1 630 736 6100
info@wittenstein-us.com
www.wittenstein-us.com