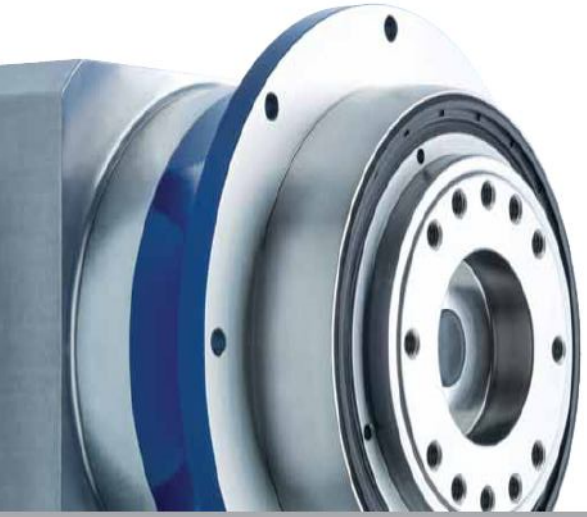
Top performer among compact planetary gearheads with drive flange

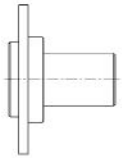


MF version
Designed for:
- Highly dynamic applications
- Greater positioning accuracy
- Space-saving designs

MA version (HIGH TORQUE)
Designed for:
- Maximum power density
- Maximum positioning accuracy
- High torsional rigidity
- Demanding safety requirements

With sensors

See our website and our separate flyer for more information about our washdown solutions



Shaft output

Coupling: BCT

Rack / Pinion

TP⁺

Specifications \ Version	TP⁺ MF/MA		
	+	++	+++
Positioning accuracy		MF	
			MA
Rigidity		MF	
			MA
Smooth-running			
Speed capacity			
Power density		MF	
			MA
Max. axial/radial forces			

Options

With sensors (see page 264)
Washdown version
Food-grade grease

Accessories

Rack / Pinion (see page 236)
Coupling: BCT (see page 282)
Shaft output

Also available as a motor/gearhead unit

				1-stage			
Ratio [a]			*i*	**4**	**5**	**7**	**10**
cymex®-optimized acceleration torque (please contact us regarding the design)			T_{2Bcym} Nm	60	62	60	–
			T_{2Bcym} in.lb	531	549	531	–
Max. acceleration torque (max. 1000 cycles per hour)			T_{2B} Nm	55	55	55	35
			T_{2B} in.lb	487	487	487	310
Nominal output torque (with n_{1N})			T_{2N} Nm	28	28	28	18
			T_{2N} in.lb	248	248	248	159
Emergency stop torque (permitted 1000 times during the service life of the gearhead)			T_{2Not} Nm	100	100	100	100
			T_{2Not} in.lb	885	885	885	885
Nominal input speed (with T_{2N} and 20°C ambient temperature) [b]			n_{1N} rpm	3300	3300	4000	4000
Max. input speed			n_{1Max} rpm	6000	6000	6000	6000
Mean no load running torque (with n_1 = 3000 rpm and 20°C gearhead temperature) [c]			T_{012} Nm	0.95	0.80	0.60	0.45
			T_{012} in.lb	8.41	7.08	5.31	3.98
Max. torsional backlash			j_t arcmin	Standard ≤ 4 / Reduced ≤ 2			
Torsional rigidity [d]			C_{12} Nm/arcmin	12	12	11	8
			C_{12} lb.ft/arcmin	106	106	97	71
Tilting rigidity			C_{2K} Nm/arcmin	–			
			C_{2K} lb.ft/arcmin				
Max. axial force [d]			F_{2AMax} N	1630			
			F_{2AMax} lb_f	367			
Max. tilting moment			M_{2KMax} Nm	110			
			M_{2KMax} in.lb	974			
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	1.4			
			m lb_m	3.1			
Operating noise (with A=10 and n_1 = 3000 rpm no-load)			L_{PA} dB(A)	≤ 58			
Max. permitted housing temperature			°C	+90			
			F	194			
Ambient temperature			°C	0 to +40			
			F	32 to 104			
Lubrication				Lubricated for life			
Paint				Blue RAL 5002			
Direction of rotation				Motor and gearhead same direction			
Protection class				IP 65			
Moment of inertia (relates to the drive)	B	11	J_1 kgcm²	0.17	0.14	0.11	0.09
			J_1 10^{-4} in.lb.s²	0.15	0.12	0.10	0.08
Clamping hub diameter [mm]	C	14	J_1 kgcm²	0.25	0.21	0.18	0.17
			J_1 10^{-4} in.lb.s²	0.22	0.19	0.16	0.15
	E	19	J_1 kgcm²	0.57	0.54	0.51	0.49
			J_1 10^{-4} in.lb.s²	0.50	0.47	0.45	0.43

Reduced mass moments of inertia available on request.

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

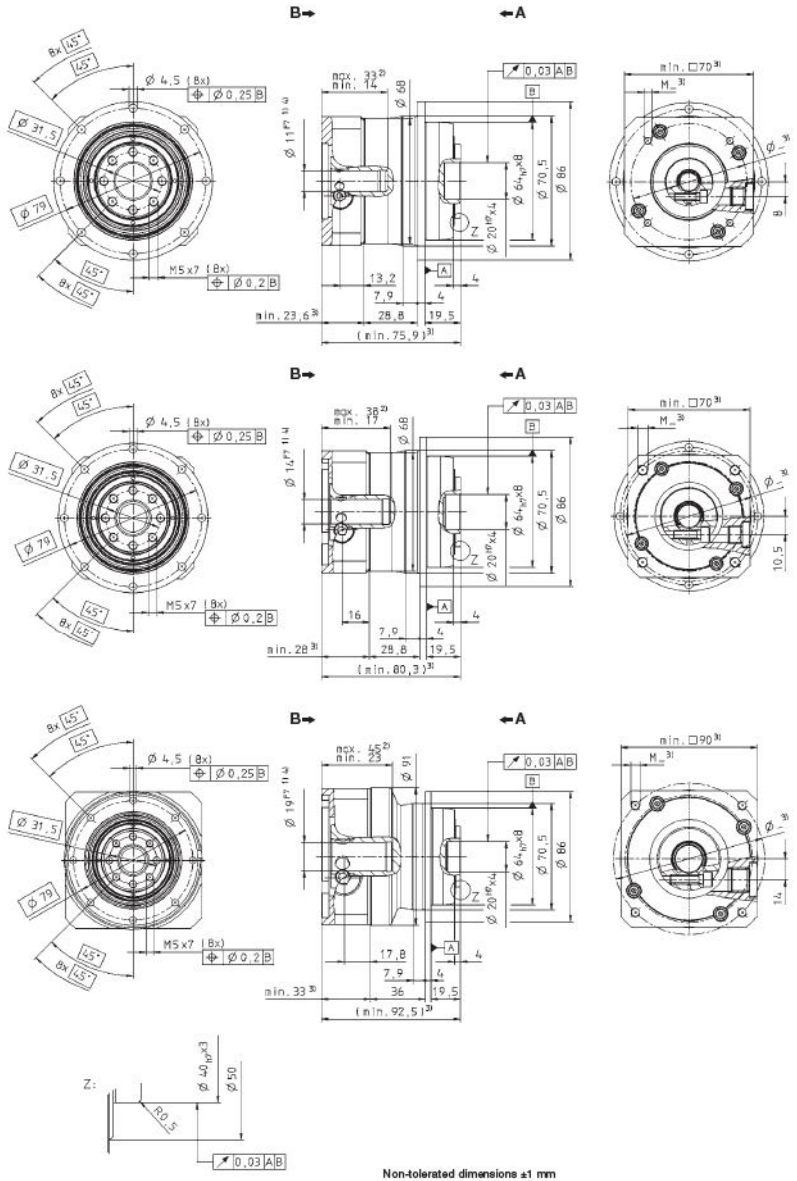
Motor shaft diameter [mm]

up to 11 [4] (B) clamping hub diameter

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

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

View A



View B

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.

⚠ Motor mounting according to operating manual

				2-stage												
Ratio [4]			i	**16**	**20**	**21**	**25**	**28**	**31**	**35**	**40**	**50**	**61**	**70**	**91**	**100**
cymex®-optimized acceleration torque (please contact us regarding the design)			T_{2Bcym} Nm	60	60	–	62	60	–	62	62	62	–	60	–	–
			T_{2Bcym} in.lb	531	531	–	549	531	–	549	549	549	–	531	–	–
Max. acceleration torque (max. 1000 cycles per hour)			T_{2B} Nm	55	55	40	55	55	40	55	55	55	45	55	32	35
			T_{2B} in.lb	487	487	354	487	487	354	487	487	487	398	487	283	310
Nominal output torque (with n_{1N})			T_{2N} Nm	40	40	30	40	40	30	40	40	40	30	40	15	18
			T_{2N} in.lb	354	354	266	354	354	266	354	354	354	266	354	133	159
Emergency stop torque (permitted 1000 times during the service life of the gearhead)			T_{2Not} Nm	100	100	100	100	100	100	100	100	100	100	100	100	100
			T_{2Not} in.lb	885	885	885	885	885	885	885	885	885	885	885	885	885
Nominal input speed (with T_{2N} and 20°C ambient temperature) [5]			n_{1N} rpm	4000	4000	4000	4000	4000	4000	4000	4000	4800	5500	5500	5500	5500
Max. input speed			n_{1Max} rpm	6000	6000	6000	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) [6]			T_{012} Nm	0.55	0.45	0.45	0.45	0.35	0.35	0.30	0.25	0.25	0.20	0.20	0.20	0.20
			T_{012} in.lb	4.87	3.98	3.98	3.98	3.10	3.10	2.66	2.21	2.21	1.77	1.77	1.77	1.77
Max. torsional backlash			j_t arcmin	Standard ≤ 4 / Reduced ≤ 2												
Torsional rigidity [4]			C_{12} Nm/arcmin	12	12	10	12	12	9	12	11	12	9	11	7	8
			C_{12} lb.ft/arcmin	106	106	89	106	106	80	106	97	106	80	97	62	71
Tilting rigidity			C_{2K} Nm/arcmin	–												
			C_{2K} lb.ft/arcmin													
Max. axial force [4]			F_{2AMax} N	1630												
			F_{2AMax} lb_f	367												
Max. tilting moment			M_{2KMax} Nm	110												
			M_{2KMax} in.lb	974												
Efficiency at full load			η %	94												
Service life (For calculation, see the Chapter "Information")			L_h h	> 20000												
Weight incl. standard adapter plate			m kg	1.5												
			m lb_m	3.3												
Operating noise (with A=100 and n_1 = 3000 rpm no load)			L_{PA} dB(A)	≤ 58												
Max. permitted housing temperature			°C	+90												
			F	194												
Ambient temperature			°C	0 to +40												
			F	32 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 (related to the drive) Clamping hub diameter [mm]	B	11	J_1 kgcm²	0.078	0.070	0.074	0.068	0.062	0.072	0.061	0.051	0.057	0.058	0.056	0.057	0.056
			J_1 10^{-4} lb.ft.s²	0.069	0.062	0.066	0.060	0.054	0.064	0.054	0.051	0.050	0.051	0.050	0.051	0.050
	C	14	J_1 kgcm²	0.17	0.17	0.17	0.16	0.16	0.17	0.16	0.15	0.15	0.15	0.15	0.15	0.15
			J_1 10^{-4} lb.ft.s²	0.15	0.15	0.15	0.14	0.14	0.15	0.14	0.14	0.13	0.13	0.13	0.13	0.13

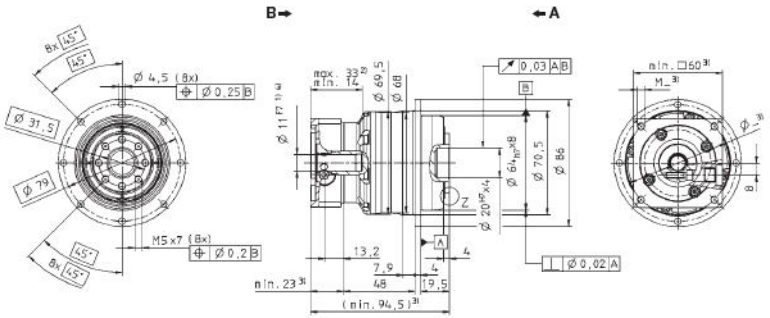
Reduced mass moments of inertia available on request.

[4] Other ratios available on request
[5] For higher ambient temperatures, please reduce input speed
[6] Valid for clamping hub diameter of 11 mm
[7] Refers to center of the output shaft or flange

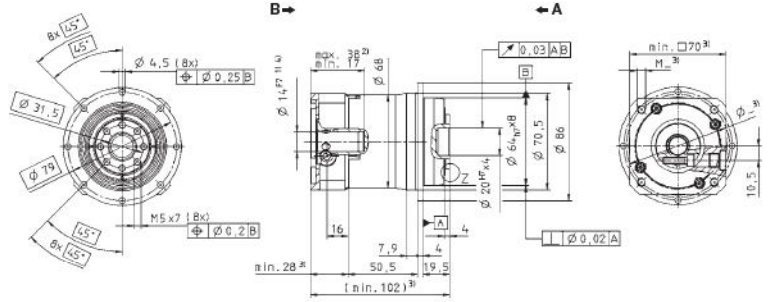
View A View B

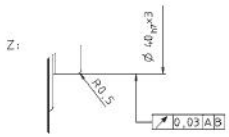
Motor shaft diameter [mm]

up to 11 [4] (B) clamping hub diameter



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





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.

⚠ Motor mounting according to operating manual

				1-stage			
Ratio [a]			*i*	**4**	**5**	**7**	**10**
cymex®-optimized acceleration torque (please contact us regarding the design)			T_{2Bcym} Nm	150	162	162	–
			T_{2Bcym} in.lb	1328	1434	1434	–
Max. acceleration torque (max. 1000 cycles per hour)			T_{2B} Nm	143	143	143	105
			T_{2B} in.lb	1266	1266	1266	929
Nominal output torque (with n_{1N})			T_{2N} Nm	75	75	75	60
			T_{2N} in.lb	664	664	664	531
Emergency stop torque (permitted 1000 times during the service life of the gearhead)			T_{2Not} Nm	250	250	250	250
			T_{2Not} in.lb	2213	2213	2213	2213
Nominal input speed (with T_{2N} and 20°C ambient temperature) [b]			n_{1N} rpm	2600	2900	3100	3100
Max. input speed			n_{1Max} rpm	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	1.0	0.7
			T_{012} in.lb	14.2	11.5	8.85	6.20
Max. torsional backlash			j_t arcmin	Standard ≤ 3 / Reduced ≤ 1			
Torsional rigidity [d]			C_{12} Nm/arcmin	32	33	30	23
			C_{12} lb.ft/arcmin	283	292	266	204
Tilting rigidity			C_{2K} Nm/arcmin	225			
			C_{2K} lb.ft/arcmin	1991			
Max. axial force [d]			F_{2AMax} N	2150			
			F_{2AMax} lb_f	484			
Max. tilting moment			M_{2KMax} Nm	270			
			M_{2KMax} in.lb	2390			
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	3.8			
			m lb_m	8.4			
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	0 to +40			
			F	32 to 104			
Lubrication				Lubricated for life			
Paint				Blue RAL 5002			
Direction of rotation				Motor and gearhead same direction			
Protection class				IP 65			
Moment of inertia (relates to the drive)	C	14	J_1 kgcm²	0.78	0.62	0.48	0.40
			J_1 10^{-4} in.lb.s²	0.69	0.55	0.42	0.35
Clamping hub diameter [mm]	E	19	J_1 kgcm²	0.95	0.79	0.64	0.57
			J_1 10^{-4} in.lb.s²	0.84	0.70	0.57	0.50
	G	24	J_1 kgcm²	2.32	2.16	2.02	1.94
			J_1 10^{-4} in.lb.s²	2.05	1.91	1.78	1.72

Reduced mass moments of inertia available on request.

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

Motor shaft diameter [mm]

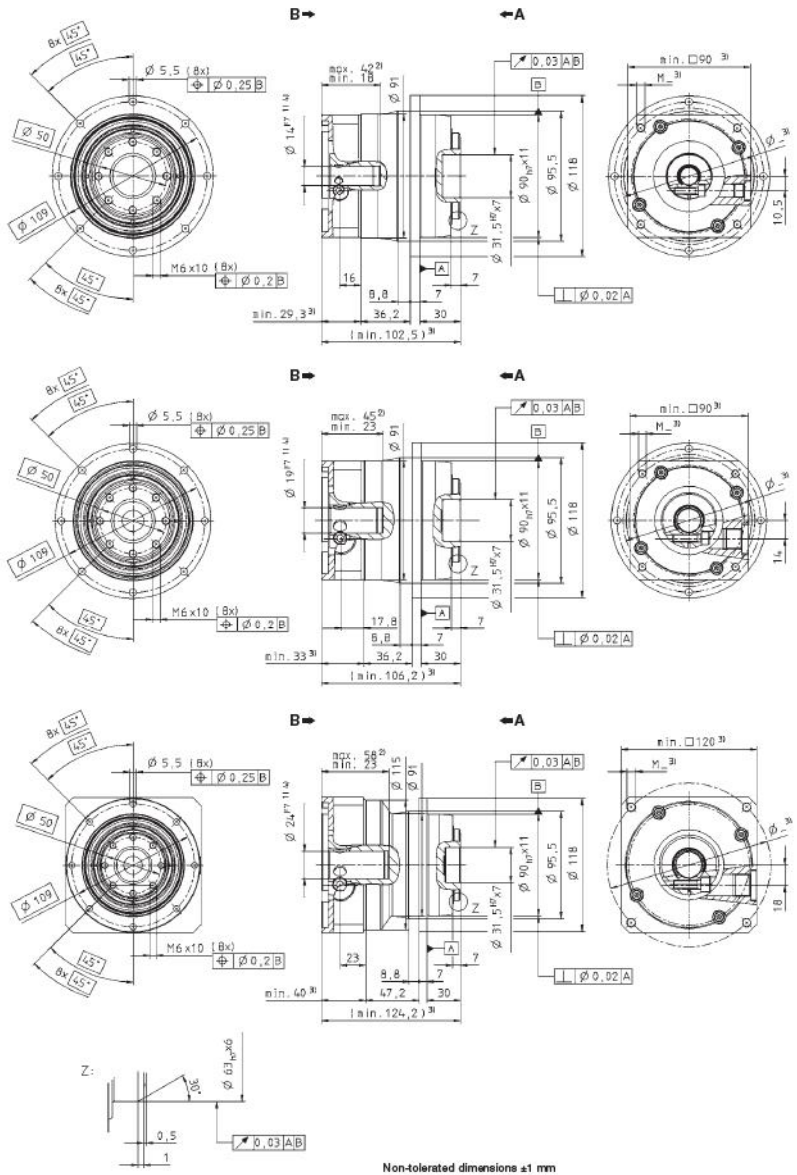
up to 14 [d] (C) clamping hub diameter

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

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

View A

View B



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.

⚠ Motor mounting according to operating manual

				2-stage												
Ratio [d]			i	**16**	**20**	**21**	**25**	**28**	**31**	**35**	**40**	**50**	**61**	**70**	**91**	**100**
cymex®-optimized acceleration torque (please contact us regarding the design)			T_{2Bcym} Nm	162	162	–	162	162	–	162	–	162	–	162	–	–
			T_{2Bcym} in.lb	1434	1434	–	1434	1434	–	1434	–	1434	–	1434	–	–
Max. acceleration torque (max. 1000 cycles per hour)			T_{2B} Nm	143	143	100	143	143	110	143	140	143	110	143	80	105
			T_{2B} in.lb	1266	1266	885	1266	1266	974	1266	1239	1266	974	1266	708	929
Nominal output torque (with n_{1N})			T_{2N} Nm	90	90	80	90	90	70	90	80	90	70	90	35	60
			T_{2N} in.lb	797	797	708	797	797	620	797	708	797	620	797	310	531
Emergency stop torque (permitted 1000 times during the service life of the gearhead)			T_{2Not} Nm	250	250	250	250	250	250	250	250	250	250	250	250	250
			T_{2Not} in.lb	2213	2213	2213	2213	2213	2213	2213	2213	2213	2213	2213	2213	2213
Nominal input speed (with T_{2N} and 20°C ambient temperature) [b]			n_{1N} rpm	3500	3500	3500	3500	3500	3500	3500	3500	3800	4500	4500	4500	4500
Max. input speed			n_{1Max} rpm	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000
Mean no load running torque (with n_1 = 3000 rpm and 20°C gearhead temperature) [c]			T_{012} Nm	0.90	0.75	0.70	0.65	0.55	0.50	0.50	0.40	0.35	0.35	0.35	0.30	0.30
			T_{012} in.lb	7.97	6.64	6.20	5.75	4.87	4.43	4.43	3.54	3.10	3.10	3.10	2.66	2.66
Max. torsional backlash			j_t arcmin	Standard ≤ 3 / Reduced ≤ 1												
Torsional rigidity [d]			C_{12} Nm/arcmin	32	32	26	32	31	24	32	30	30	24	28	21	22
			C_{12} lb.ft/arcmin	283	283	230	283	274	212	283	266	266	212	248	186	195
Tilting rigidity			C_{2K} Nm/arcmin	225												
			C_{2K} lb.ft/arcmin	1991												
Max. axial force [d]			F_{2AMax} N	2150												
			F_{2AMax} lb_f	484												
Max. tilting moment			M_{2KMax} Nm	270												
			M_{2KMax} in.lb	2390												
Efficiency at full load			η %	94												
Service life (For calculation, see the Chapter "Information")			L_h h	> 20000												
Weight incl. standard adapter plate			m kg	3.6												
			m lb_m	8.0												
Operating noise (with A=100 and n_1 = 3000 rpm no load)			L_{PA} dB(A)	≤ 59												
Max. permitted housing temperature			°C	+90												
			F	194												
Ambient temperature			°C	0 to +40												
			F	32 to 104												
Lubrication				Lubricated for life												
Paint				Blue RAL 5002												
Direction of rotation				Motor and gearhead same direction												
Protection class				IP 65												
Moment of inertia (relates to the drive)	B	11	J_1 kgcm²	0.17	0.14	0.15	0.13	0.11	0.13	0.10	0.09	0.09	0.09	0.09	0.09	0.09
			J_1 10^{-4} in.lb.s²	0.15	0.12	0.13	0.12	0.10	0.12	0.09	0.08	0.08	0.08	0.08	0.08	0.08
	C	14	J_1 kgcm²	0.24	0.21	0.22	0.20	0.18	0.21	0.18	0.17	0.17	0.17	0.16	0.16	0.16
Clamping hub diameter [mm]			J_1 10^{-4} lb.ft.s²	0.21	0.19	0.19	0.19	0.16	0.18	0.16	0.15	0.15	0.15	0.14	0.15	0.14
	E	19	J_1 kgcm²	0.56	0.53	0.55	0.53	0.51	0.53	0.50	0.49	0.49	0.49	0.49	0.49	0.49
			J_1 10^{-4} in.lb.s²	0.50	0.47	0.49	0.47	0.45	0.47	0.44	0.43	0.43	0.43	0.43	0.43	0.43

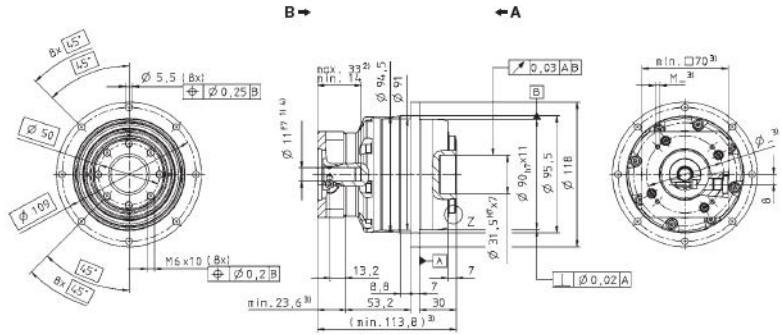
Reduced mass moments of inertia available on request.

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

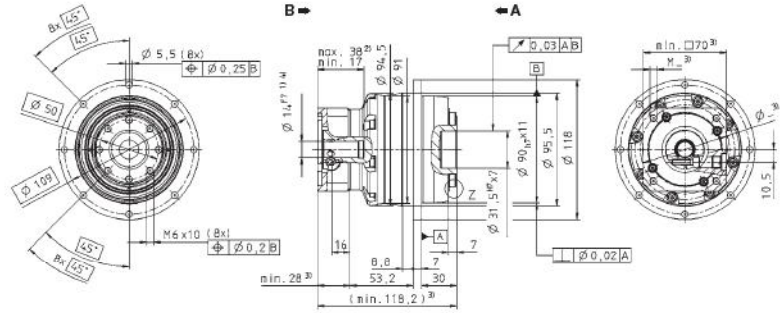
View A View B

Motor shaft diameter [mm]

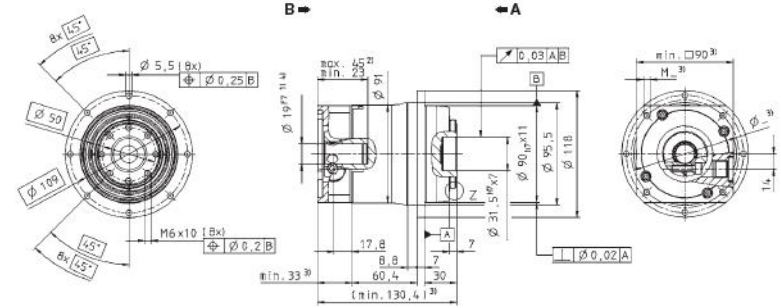
up to 11 [4] (B) clamping hub diameter

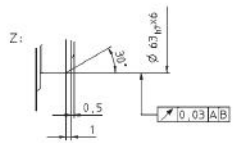


up to 14 [4] (C) clamping hub diameter



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





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.

⚠ Motor mounting according to operating manual

				2-stage				3-stage			
Ratio [a]			*i*	**22**	**27.5**	**38.5**	**55**	**88**	**110**	**154**	**220**
Max. acceleration torque (max. 1000 cycles per hour)			T_{2B} Nm	230	230	230	230	230	230	230	230
			in.lb	2036	2036	2036	2036	2036	2036	2036	2036
Nominal output torque (with n_{1N})			T_{2N} Nm	150	150	180	110	180	180	180	180
			in.lb	1328	1328	1593	974	1593	1593	1593	1593
Emergency stop torque (permitted 1000 times during the service life of the gearhead)			T_{2Not} Nm	525	525	525	525	525	525	525	525
			in.lb	4646	4646	4646	4646	4646	4646	4646	4646
Nominal input speed (with T_{2N} and 20°C ambient temperature) [b]			n_{1N} rpm	4000	4000	4000	4000	4500	4500	4500	4500
Max. input speed			n_{1Max} rpm	6000	6000	6000	6000	6000	6000	6000	6000
Mean no load running torque (with n_1=3000 rpm and 20°C gearhead temperature) [c]			T_{012} Nm	0.42	–	–	–	–	0.23	–	–
			in.lb	3.72					2.04		
Max. torsional backlash			j_t arcmin	≤ 1				≤ 1			
Torsional rigidity [c]			C_{t12} Nm/arcmin	43	43	43	42	42	42	42	42
			lb.in/arcmin	381	381	381	372	372	372	372	372
Tilting rigidity			C_{2K} Nm/arcmin	225				225			
			lb.in/arcmin	1991				1991			
Max. axial force [d]			F_{2AMax} N	2150				2150			
			lb_f	484				484			
Max. tilting moment			M_{2KMax} Nm	400				400			
			in.lb	3540				3540			
Efficiency at full load			η %	94				92			
Service life (For calculation, see the Chapter "Information")			L_h h	> 20000				> 20000			
Weight incl. standard adapter plate			*m* kg	3.2				3.6			
			lb_m	7.1				8.0			
Operating noise (with n_1=3000 rpm no load)			L_{PA} dB(A)	≤ 60				≤ 60			
Max. permitted housing temperature			°C	+90							
			F	194							
Ambient temperature			°C	0 to +40							
			F	32 to 104							
Lubrication				Lubricated for life							
Paint				Blue RAL 5002							
Direction of rotation				Motor and gearhead same direction							
Protection class				IP 65							
Moment of inertia (relates to the drive)	C	14	J_1 kgcm²	0.21	0.18	0.16	0.14	0.16	0.15	0.14	0.13
			10^{-3} in.lb.s²	0.19	0.16	0.14	0.12	0.14	0.13	0.12	0.12
Clamping hub diameter [mm]	E	19	J_1 kgcm²	0.52	0.50	0.47	0.46	–	–	–	–
			10^{-3} in.lb.s²	0.46	0.44	0.42	0.41				

Reduced mass moments of inertia available on request.

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

Motor shaft diameter [mm]

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

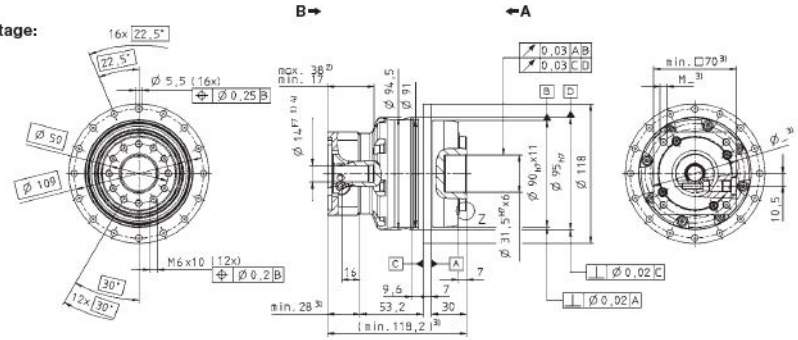
up to 19 [4] (E) clamping hub diameter

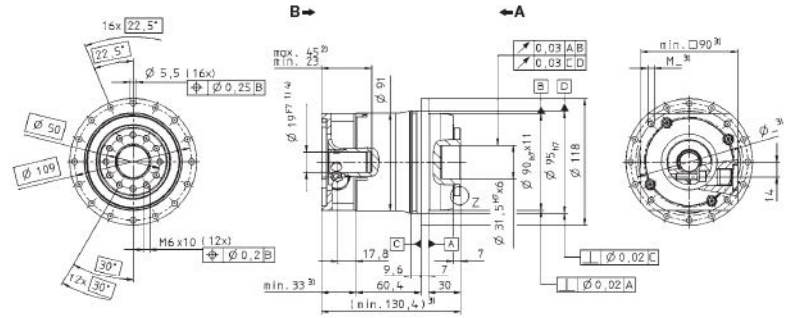
up to 14 [4] (C) clamping hub diameter

View A

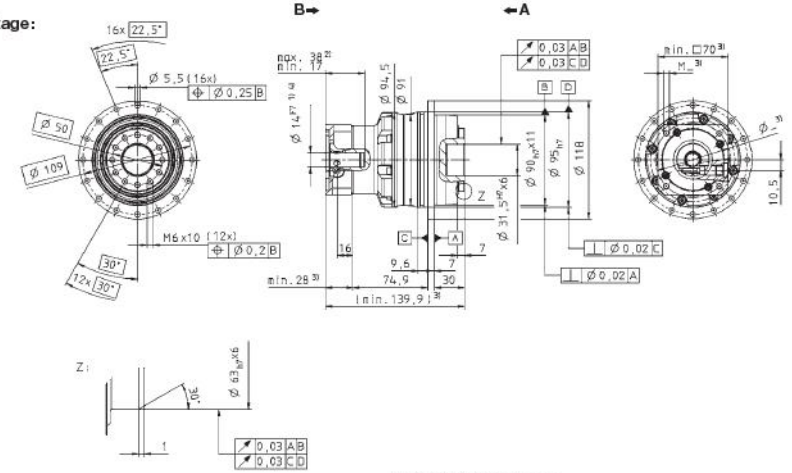
View B

2-stage:





3-stage:



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.

⚠ Motor mounting according to operating manual

				1-stage			
Ratio [a]			*i*	**4**	**5**	**7**	**10**
cymex®-optimized acceleration torque (please contact us regarding the design)			T_{2Bcym}	Nm / in.lb			
				390 / 3452	420 / 3717	350 / 3098	275 / 2434
Max. acceleration torque (max. 1000 cycles per hour)			T_{2B}	Nm / in.lb			
				350 / 3098	380 / 3363	330 / 2921	265 / 2345
Nominal output torque (with n_{1N})			T_{2N}	Nm / in.lb			
				170 / 1505	170 / 1505	170 / 1505	120 / 1062
Emergency stop torque (permitted 1000 times during the service life of the gearhead)			T_{2Not}	Nm / in.lb			
				625 / 5531	625 / 5531	625 / 5531	625 / 5531
Nominal input speed (with T_{2N} and 20°C ambient temperature) [b]			n_{1N}	rpm			
				2300	2500	2500	2500
Max. input speed			n_{1Max}	rpm			
				4500	4500	4500	4500
Mean no load running torque (with n_1=3000 rpm and 20°C gearhead temperature) [c]			T_{012}	Nm / in.lb			
				3.3 / 29.2	2.7 / 23.9	2.0 / 17.7	1.4 / 12.4
Max. torsional backlash			j_t	arcmin			
				Standard ≤ 3 / Reduced ≤ 1			
Torsional rigidity [c]			C_{12}	Nm/arcmin / lb.ft/arcmin			
				80 / 708	86 / 761	76 / 673	62 / 549
Tilting rigidity			C_{2K}	Nm/arcmin / lb.ft/arcmin			
				550 / 4868			
Max. axial force [d]			F_{2AMax}	N / lb_f			
				4150 / 934			
Max. tilting moment			M_{2KMax}	Nm / in.lb			
				440 / 3894			
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 / lb_m			
				6.5 / 14.4			
Operating noise (with i=10 and n_1=3000 rpm no load)			L_{PA}	dB(A)			
				≤ 64			
Max. permitted housing temperature				°C / F			
				+90 / 194			
Ambient temperature				°C / F			
				0 to +40 / 32 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 / 10^{-4} in.lb.s²			
				2.59 / 2.29	2.11 / 1.87	1.69 / 1.50	1.45 / 1.28
Clamping hub diameter [mm]	G	24	J_1	kgcm² / 10^{-4} in.lb.s²			
				3.28 / 2.90	2.80 / 2.48	2.38 / 2.11	2.14 / 1.89
	H	28	J_1	kgcm² / 10^{-4} in.lb.s²			
				2.76 / 2.44	2.36 / 2.09	1.98 / 1.75	1.74 / 1.54
	K	38	J_1	kgcm² / 10^{-4} in.lb.s²			
				10.3 / 9.11	9.87 / 8.73	9.45 / 8.36	9.21 / 8.15

Reduced mass moments of inertia available on request.

[a] Other ratios available on request
[b] For higher ambient temperatures, please reduce input speed
[c] Valid for clamping hub diameter of 24 and 28 mm
[d] Refers to center of the output shaft or flange

Motor shaft diameter [mm]

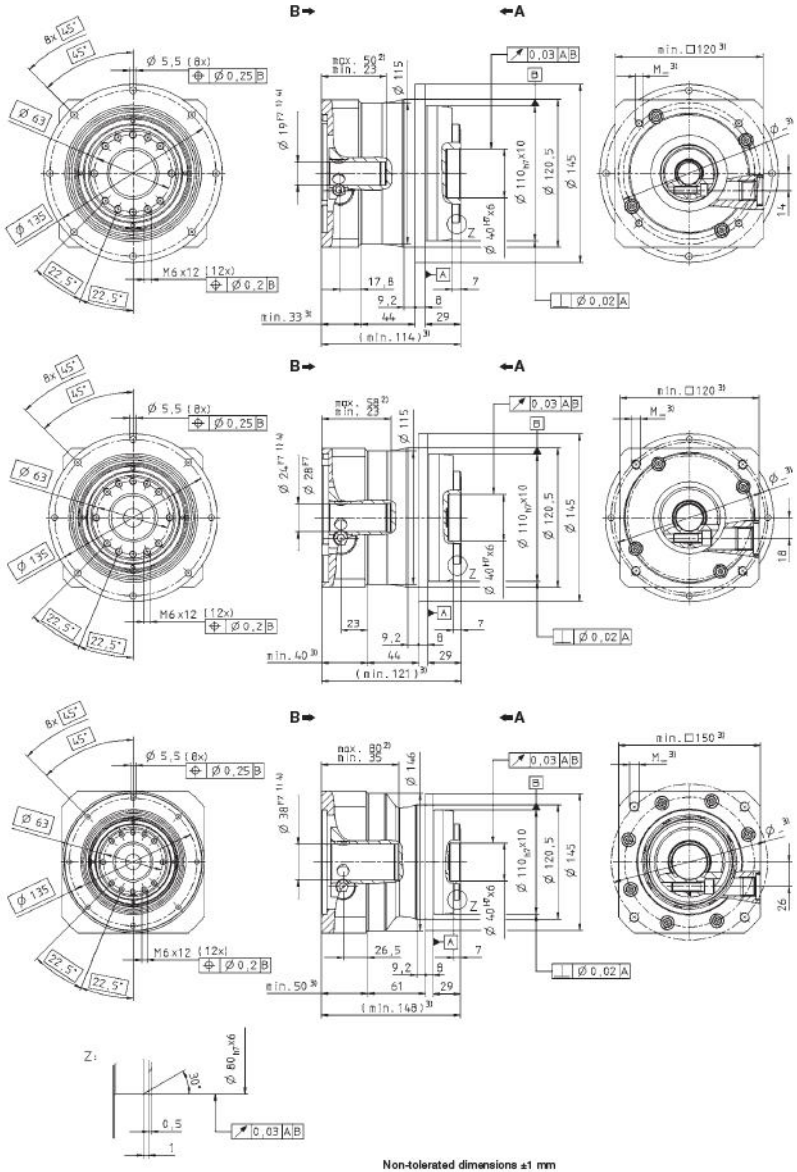
up to 19 [4] (E) clamping hub diameter

up to 24/28 [4] (G/H) clamping hub diameter

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

View A

View B



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.

⚠ Motor mounting according to operating manual

				2-stage												
Ratio [d]			*i*	**16**	**20**	**21**	**25**	**28**	**31**	**35**	**40**	**50**	**61**	**70**	**91**	**100**
cymex®-optimized acceleration torque (please contact us regarding the design)			T_{2Bcym} Nm	390	390	–	420	390	–	420	390	420	–	350	–	275
			T_{2Bcym} in.lb	3452	3452	–	3717	3452	–	3717	3452	3717	–	3098	–	2434
Max. acceleration torque (max. 1000 cycles per hour)			T_{2B} Nm	350	350	300	380	350	300	380	350	380	280	330	250	265
			T_{2B} in.lb	3098	3098	2655	3363	3098	2655	3363	3098	3363	2478	2921	2213	2345
Nominal output torque (with n_{1N})			T_{2N} Nm	200	210	170	200	210	190	220	200	220	170	200	100	120
			T_{2N} in.lb	1770	1859	1505	1770	1859	1682	1947	1770	1947	1505	1770	885	1062
Emergency stop torque (permitted 1000 times during the service life of the gearhead)			T_{2Not} Nm	625	625	625	625	625	625	625	625	625	625	625	625	625
			T_{2Not} in.lb	5531	5531	5531	5531	5531	5531	5531	5531	5531	5531	5531	5531	5531
Nominal input speed (with T_{2N} and 20°C ambient temperature) [b]			n_{1N} rpm	2800	2800	2800	2800	2800	2800	2800	2800	3100	3500	3500	4200	4200
Max. input speed			n_{1Max} rpm	6000	6000	6000	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	1.8	1.5	1.4	1.4	1.1	1.1	1.0	0.8	0.8	0.7	0.7	0.6	0.6
			T_{012} in.lb	15.9	13.3	12.4	12.4	9.7	9.7	8.9	7.1	7.1	6.2	6.2	5.3	5.3
Max. torsional backlash			j_t arcmin	Standard ≤ 3 / Reduced ≤ 1												
Torsional rigidity [d]			C_{12} Nm/arcmin	81	81	70	83	80	54	82	76	80	61	71	55	60
			C_{12} lb.ft/arcmin	717	717	620	735	708	478	726	673	708	540	628	487	531
Tilting rigidity			C_{2K} Nm/arcmin	550												
			C_{2K} lb.ft/arcmin	4867												
Max. axial force [d]			F_{2AMax} N	4150												
			F_{2AMax} lb_f	934												
Max. tilting moment			M_{2KMax} Nm	440												
			M_{2KMax} in.lb	3894												
Efficiency at full load			η %	94												
Service life (For calculation, see the Chapter "Information")			L_h h	> 20000												
Weight incl. standard adapter plate			*m* kg	6.7												
			m lb_m	14.8												
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	0 to +40												
			F	32 to 104												
Lubrication				Lubricated for life												
Paint				Blue RAL 5002												
Direction of rotation				Motor and gearhead same direction												
Protection class				IP 65												
Moment of inertia (relates to the drive)	C	14	J_1 kgcm²	0.66	0.55	0.60	0.53	0.44	0.55	0.43	0.38	0.38	0.39	0.37	0.38	0.37
			J_1 10^{-4} in.lb.s²	0.59	0.49	0.51	0.47	0.39	0.49	0.38	0.34	0.33	0.35	0.33	0.34	0.33
Clamping hub diameter [mm]	E	19	J_1 kgcm²	0.83	0.71	0.77	0.69	0.61	0.72	0.60	0.55	0.54	0.55	0.54	0.54	0.54
			J_1 10^{-4} in.lb.s²	0.73	0.63	0.68	0.61	0.54	0.64	0.53	0.49	0.48	0.4	0.48	0.48	0.48
	G	24	J_1 kgcm²	2.20	2.08	2.14	2.06	1.98	2.09	1.97	1.92	1.92	1.92	1.91	1.92	1.91
			J_1 10^{-4} in.lb.s²	1.95	1.84	1.89	1.82	1.75	1.85	1.74	1.70	1.70	1.70	1.69	1.70	1.69

Reduced mass moments of inertia available on request.

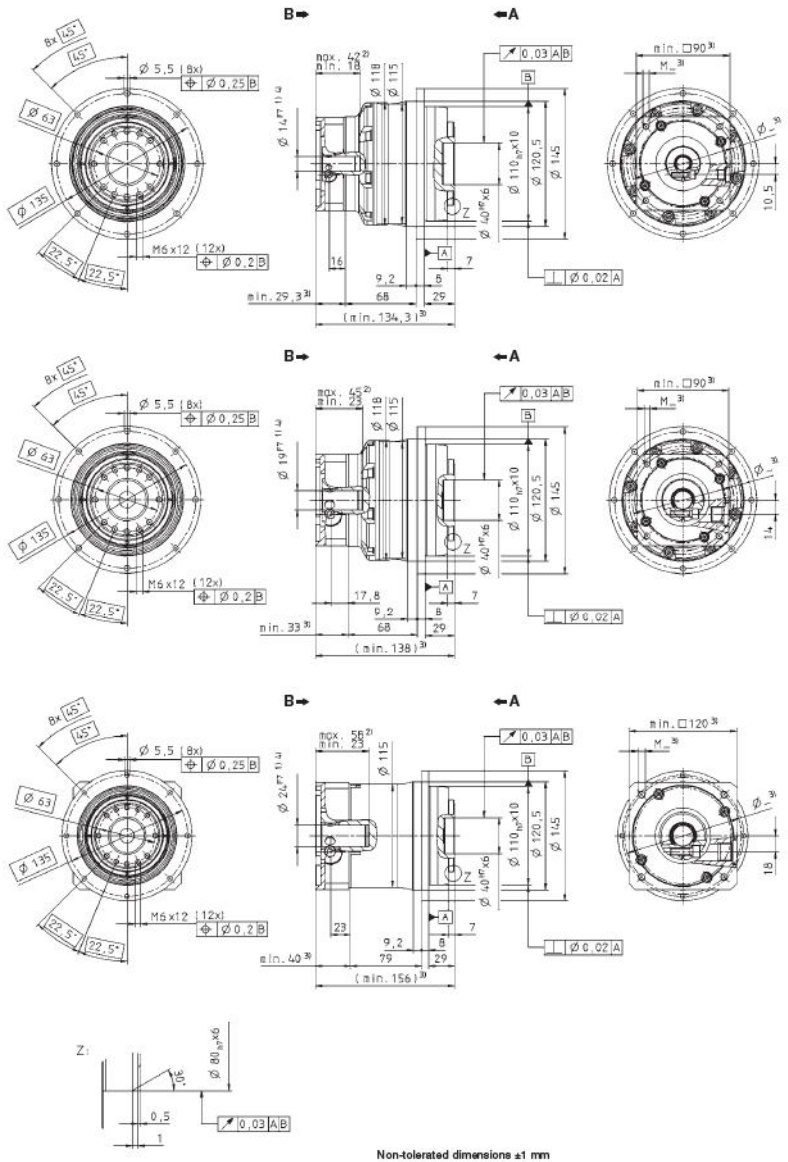
[a] Other ratios available on request
[b] For higher ambient temperatures, please reduce input speed
[c] Valid for clamping hub diameter of 19 mm
[d] Refers to center of the output shaft or flange

Motor shaft diameter [mm]

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

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

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



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.

⚠ Motor mounting according to operating manual

				2-stage				3-stage				
Ratio [a]			i	**22**	**27.5**	**38.5**	**55**	**66**	**88**	**110**	**154**	**220**
Max. acceleration torque (max. 1000 cycles per hour)			T_{2B} Nm	530	530	530	530	480	480	480	480	480
			T_{2B} in.lb	4691	4691	4691	4691	4248	4248	4248	4248	4248
Nominal output torque (with n_{1N})			T_{2N} Nm	320	350	375	375	260	260	260	260	260
			T_{2N} in.lb	2832	3098	3319	3319	2301	2301	2301	2301	2301
Emergency stop torque (permitted 1000 times during the service life of the gearhead)			T_{2Not} Nm	1200	1200	1200	1200	1200	1200	1200	1200	1200
			T_{2Not} in.lb	10620	10620	10620	10620	10620	10620	10620	10620	10620
Nominal input speed (with T_{2N} and 20°C ambient temperature) [b]			n_{1N} rpm	3500	3500	3500	3500	4000	4000	4000	4000	4000
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	1.0	–	–	–	–	–	0.5	–	–
			T_{012} in.lb	8.9						4.4		
Max. torsional backlash			j_t arcmin	≤ 1				≤ 1				
Torsional rigidity [c]			C_{t21} Nm/arcmin	105	105	105	100	95	95	95	95	95
			C_{t21} lb.in/arcmin	929	929	929	885	841	841	841	841	841
Tilting rigidity			C_{2K} Nm/arcmin	550				550				
			C_{2K} lb.in/arcmin	4868				4868				
Max. axial force [d]			F_{2AMax} N	4150				4150				
			F_{2AMax} lb_f	934				934				
Max. tilting moment			M_{2KMax} Nm	550				550				
			M_{2KMax} in.lb	4868				4868				
Efficiency at full load			η %	94				92				
Service life (For calculation, see the Chapter "Information")			L_h h	> 20000				> 20000				
Weight incl. standard adapter plate			m kg	5.6				6.1				
			m lb_m	12.4				13.5				
Operating noise (with n_1=3000 rpm no load)			L_{PA} dB(A)	≤ 62				≤ 62				
Max. permitted housing temperature			°C	+90								
			F	194								
Ambient temperature			°C	0 to +40								
			F	32 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	0.87	0.70	0.60	0.55	0.63	0.56	0.53	0.51	0.50
			J_1 10^{-3} in.lb.s²	0.77	0.62	0.53	0.49	0.56	0.50	0.47	0.45	0.44
Clamping hub diameter [mm]	G	24	J_1 kgcm²	2.39	2.22	2.12	2.07	–	–	–	–	–
			J_1 10^{-3} in.lb.s²	2.12	1.96	1.88	1.83					

Reduced mass moments of inertia available on request.

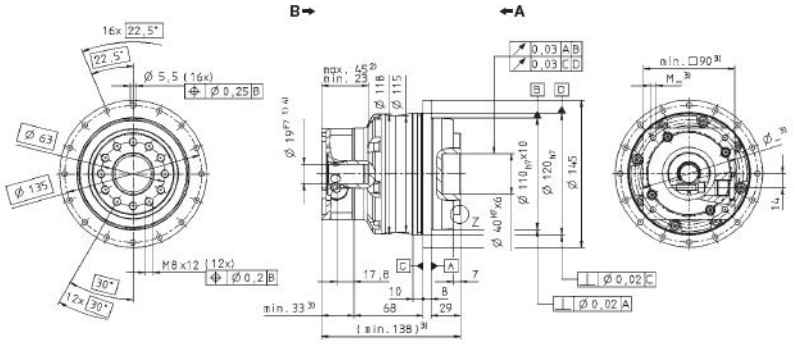
[a] Other ratios available on request
[b] For higher ambient temperatures, please reduce input speed
[c] Valid for clamping hub diameter of 19 mm
[d] Refers to center of the output shaft or flange

View A View B

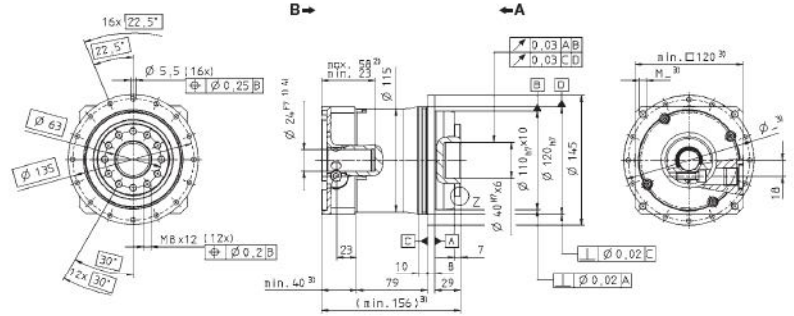
Motor shaft diameter [mm]

2-stage:

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

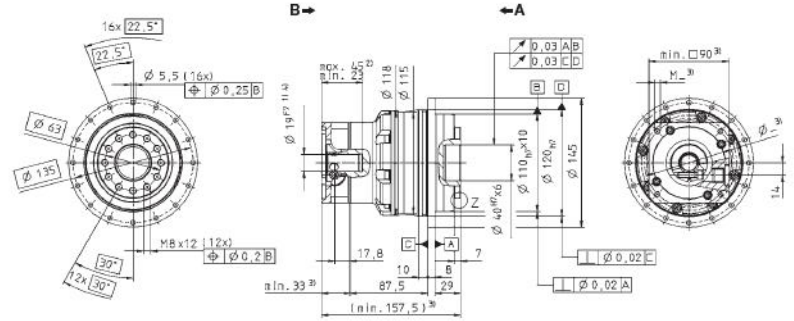


up to 24 [4] (G) clamping hub diameter

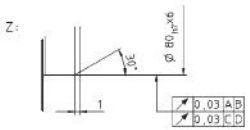


3-stage:

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



Z:



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.

⚠ Motor mounting according to operating manual

				1-stage			
Ratio [a]			*i*	**4**	**5**	**7**	**10**
cymex®-optimized acceleration torque (please contact us regarding the design)			T_{2Bcym} Nm	750	800	–	600
			T_{2Bcym} in.lb	6638	7080	–	5310
Max. acceleration torque (max. 1000 cycles per hour)			T_{2B} Nm	700	700	700	540
			T_{2B} in.lb	6195	6195	6195	4779
Nominal output torque (with n_{1N})			T_{2N} Nm	370	370	370	240
			T_{2N} in.lb	3275	3275	3275	2124
Emergency stop torque (permitted 1000 times during the service life of the gearhead)			T_{2Not} Nm	1250	1250	1250	1250
			T_{2Not} in.lb	11063	11063	11063	11063
Nominal input speed (with T_{2N} and 20°C ambient temperature) [b]			n_{1N} rpm	1900	2000	2500	2500
Max. input speed			n_{1Max} rpm	4000	4000	4000	4000
Mean no load running torque (with n_1=3000 rpm and 20°C gearhead temperature) [c]			T_{012} Nm	8.1	6.6	4.8	3.5
			T_{012} in.lb	71.7	58.4	42.5	31.0
Max. torsional backlash			j_t arcmin	Standard ≤ 3 / Reduced ≤ 1			
Torsional rigidity [c]			C_{12} Nm/arcmin	190	187	159	123
			C_{12} lb.ft/arcmin	1682	1655	1407	1089
Tilting rigidity			C_{2K} Nm/arcmin	560			
			C_{2K} lb.ft/arcmin	4956			
Max. axial force [d]			F_{2AMax} N	6130			
			F_{2AMax} lb_f	1379			
Max. tilting moment			M_{2KMax} Nm	1335			
			M_{2KMax} in.lb	11815			
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	14.0			
			m lb_m	30.9			
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	0 to +40			
			F	32 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	9.47	7.85	6.39	5.54
			J_1 10^{-4} in.lb.s²	8.38	6.95	5.66	4.90
Clamping hub diameter [mm]	I	32	J_1 kgcm²	12.6	11.0	9.55	8.71
			J_1 10^{-4} in.lb.s²	11.1	9.74	8.45	7.70
	K	38	J_1 kgcm²	13.7	12.1	10.6	9.78
			J_1 10^{-4} in.lb.s²	12.1	10.7	9.38	8.65
	M	48	J_1 kgcm²	28.3	26.7	25.3	24.4
			J_1 10^{-4} in.lb.s²	25.0	23.6	22.4	21.6

Reduced mass moments of inertia available on request.

[a] Other ratios available on request
[b] For higher ambient temperatures, please reduce input speed
[c] Valid for clamping hub diameter of 32 and 38 mm
[d] Refers to center of the output shaft or flange

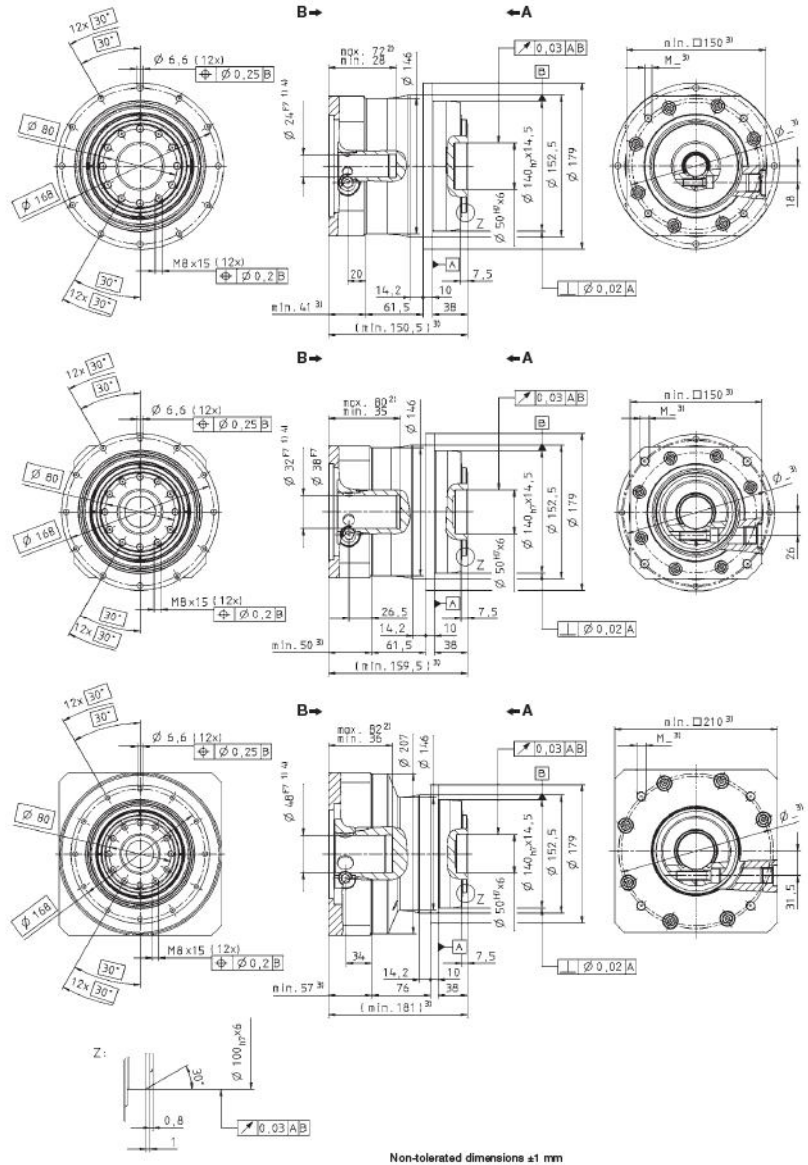
Motor shaft diameter [mm]

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

up to 32/38 [4] (I/K) clamping hub diameter

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

View A View B



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.

⚠ Motor mounting according to operating manual

				2-stage												
Ratio [d]			i	**16**	**20**	**21**	**25**	**28**	**31**	**35**	**40**	**50**	**61**	**70**	**91**	**100**
cymex®-optimized acceleration torque (please contact us regarding the design)			T_{2Bcym} Nm	800	800	–	800	800	–	800	800	800	–	–	–	800
			T_{2Bcym} in.lb	7080	7080	–	7080	7080	–	7080	7080	7080	–	–	–	5310
Max. acceleration torque (max. 1000 cycles per hour)			T_{2B} Nm	750	750	600	750	750	620	750	750	750	550	700	500	540
			T_{2B} in.lb	6638	6638	5310	6638	6638	5487	6638	6638	6638	4868	6195	4425	4779
Nominal output torque (with n_{1N})			T_{2N} Nm	400	400	350	400	400	400	400	400	400	350	400	220	240
			T_{2N} in.lb	3540	3540	3098	3540	3540	3540	3540	3540	3540	3098	3540	1947	2124
Emergency stop torque (permitted 1000 times during the service life of the gearhead)			T_{2Not} Nm	1250	1250	1250	1250	1250	1250	1250	1250	1250	1250	1250	1250	1250
			T_{2Not} in.lb	11063	11063	11063	11063	11063	11063	11063	11063	11063	11063	11063	11063	11063
Nominal input speed (with T_{2N} and 20°C ambient temperature) [b]			n_{1N} rpm	2900	2900	2900	2900	2900	2900	2900	2900	3200	3200	3200	3900	3900
Max. input speed			n_{1Max} rpm	5000	5000	5000	5000	5000	5000	5000	5000	5000	5000	5000	5000	5000
Mean no load running torque (with n_1=3000 rpm and 20°C gearhead temperature) [c]			T_{012} Nm	4.2	3.4	3.3	3.1	2.5	2.4	2.3	1.8	1.7	1.5	1.5	1.4	1.3
			T_{012} in.lb	37.2	30.1	29.2	27.4	22.1	21.2	20.4	15.9	15.1	13.3	13.3	12.4	11.5
Max. torsional backlash			j_t arcmin	Standard ≤ 3 / Reduced ≤ 1												
Torsional rigidity [c]			C_{12} Nm/arcmin	180	185	145	180	180	130	175	175	175	123	145	100	115
			C_{12} lb.ft/arcmin	1593	1637	1283	1593	1593	1151	1549	1549	1549	1089	1283	885	1018
Tilting rigidity			C_{2K} Nm/arcmin	560												
			C_{2K} lb.ft/arcmin	4956												
Max. axial force [d]			F_{2AMax} N	6130												
			F_{2AMax} lb_f	1379												
Max. tilting moment			M_{2KMax} Nm	1335												
			M_{2KMax} in.lb	11815												
Efficiency at full load			η %	94												
Service life (For calculation, see the Chapter "Information")			L_h h	> 20000												
Weight incl. standardadapter plate			m kg	14.1												
			m lb_m	31.2												
Operating noise (with A=100 and n_1=3000 rpm no load)			L_{PA} dB(A)	≤ 63												
Max. permitted housing temperature			°C	+90												
			F	194												
Ambient temperature			°C	0 to +40												
			F	32 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	2.53	2.07	2.30	2.01	1.67	2.12	1.64	1.44	1.42	1.46	1.41	1.43	1.40
			J_1 10^{-4} in.lb.s²	2.24	1.83	2.04	1.78	1.48	1.88	1.45	1.27	1.26	1.29	1.25	1.27	1.24
Clamping hub diameter [mm]	G	24	J_1 kgcm²	3.22	2.77	2.99	2.70	2.36	2.81	2.33	2.13	2.12	2.15	2.10	2.12	2.09
			J_1 10^{-4} in.lb.s²	2.85	2.45	2.65	2.39	2.09	2.49	2.06	1.89	1.88	1.90	1.86	1.88	1.85
	K	38	J_1 kgcm²	10.3	9.83	10.1	9.77	9.43	9.88	9.40	9.20	9.18	9.22	9.17	9.19	9.16
			J_1 10^{-4} in.lb.s²	9.11	8.70	8.94	8.64	8.35	8.74	8.32	8.14	8.12	8.16	8.12	8.13	8.11

Reduced mass moments of inertia available on request.

[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 center of the output shaft or flange

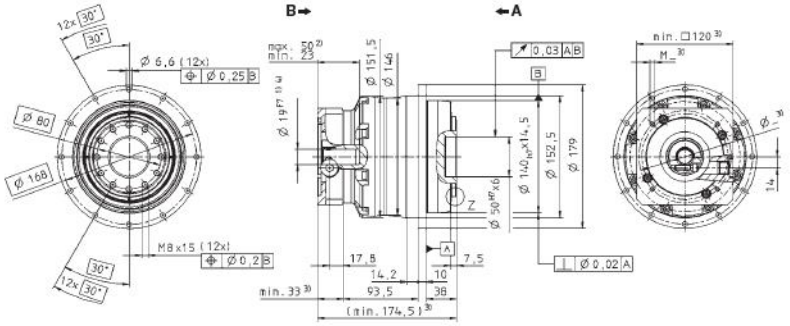
Motor shaft diameter [mm]

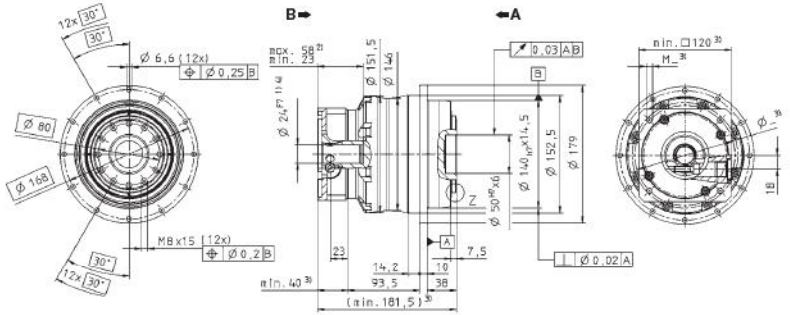
up to 19 [4] (E) clamping hub diameter

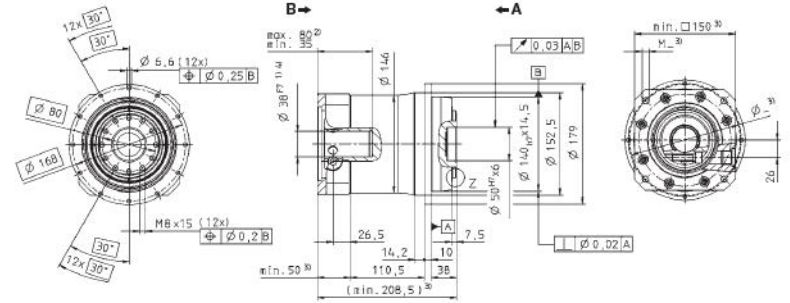
up to 24 [4] (G) clamping hub diameter

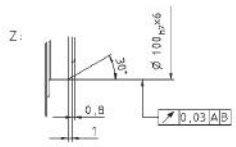
up to 38 [4] (K) clamping hub diameter

View A









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.

⚠ Motor mounting according to operating manual

				2-stage				3-stage				
Ratio [a]			i	22	27.5	38.5	55	66	88	110	154	220
Max. acceleration torque (max. 1000 cycles per hour)			T_{2B} Nm	950	950	950	950	950	950	950	950	950
			T_{2B} in.lb	8408	8408	8408	8408	8408	8408	8408	8408	8408
Nominal output torque (with n_{1N})			T_{2N} Nm	575	600	650	675	675	675	675	675	675
			T_{2N} in.lb	5089	5310	5753	5974	5974	5974	5974	5974	5974
Emergency stop torque (permitted 1000 times during the service life of the gearhead)			T_{2Not} Nm	2375	2375	2375	2375	2375	2375	2375	2375	2375
			T_{2Not} in.lb	21019	21019	21019	21019	21019	21019	21019	21019	21019
Nominal input speed (with T_{2N} and 20°C ambient temperature) [b]			n_{1N} rpm	3000	3000	3000	3000	3500	3500	3500	3500	3500
Max. input speed			n_{1Max} rpm	5000	5000	5000	5000	5000	5000	5000	5000	5000
Mean no load running torque (with n_1=3000 rpm and 20°C gearhead temperature) [c]			T_{012} Nm	2.7	–	–	–	–	–	1.1	–	0.7
			T_{012} in.lb	23.9						9.7		6.2
Max. torsional backlash			j_t arcmin	≤ 1				≤ 1				
Torsional rigidity [c]			C_{12} Nm/arcmin	220	220	220	220	205	205	205	205	205
			C_{12} lb.in/arcmin	1947	1947	1947	1947	1814	1814	1814	1814	1814
Tilting rigidity			C_{2K} Nm/arcmin	560				560				
			C_{2K} lb.in/arcmin	4956				4956				
Max. axial force [d]			F_{2AMax} N	6130				6130				
			F_{2AMax} lb_f	1379				1379				
Max. tilting moment			M_{2KMax} Nm	1335				1335				
			M_{2KMax} in.lb	11815				11815				
Efficiency at full load			η %	94				92				
Service life (For calculation, see the Chapter "Information")			L_h h	> 20000				> 20000				
Weight incl. standard adapter plate			m kg	12.5				13.4				
			m lb_m	27.6				29.6				
Operating noise (with n_1=3000 rpm no load)			L_{PA} dB(A)	≤ 64				≤ 64				
Max. permitted housing temperature			°C	+90								
			F	194								
Ambient temperature			°C	0 to +40								
			F	32 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	3.76	3.32	3.01	2.82	2.61	2.42	2.22	2.12	2.07
			10^{-3} in.lb.s²	3.33	2.94	2.66	2.50	2.31	2.14	1.96	1.88	1.83
Clamping hub diameter [mm]	K	38	J_1 kgcm²	10.7	10.3	9.92	9.73	–	–	–	–	–
			10^{-3} in.lb.s²	9.47	9.11	8.78	8.61					

Reduced mass moments of inertia available on request.

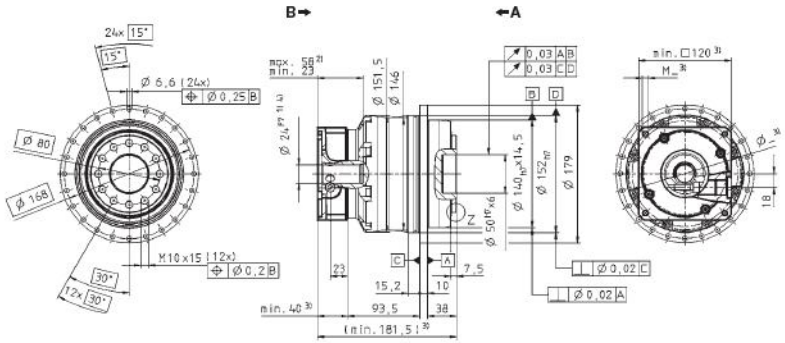
[a] Other ratios available on request
[b] For higher ambient temperatures, please reduce input speed
[c] Valid for clamping hub diameter of 24 mm
[d] Refers to center of the output shaft or flange

View A View B

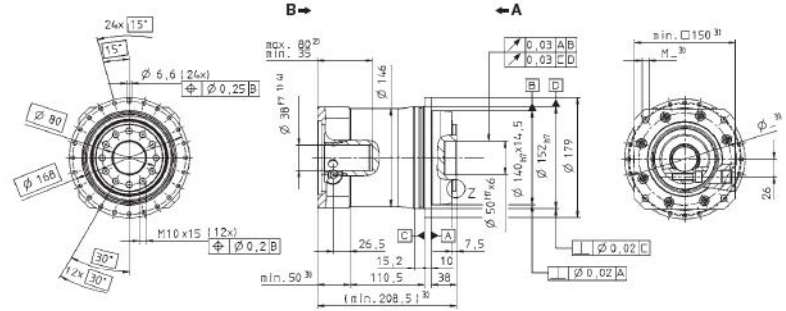
Motor shaft diameter [mm]

2-stage:

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

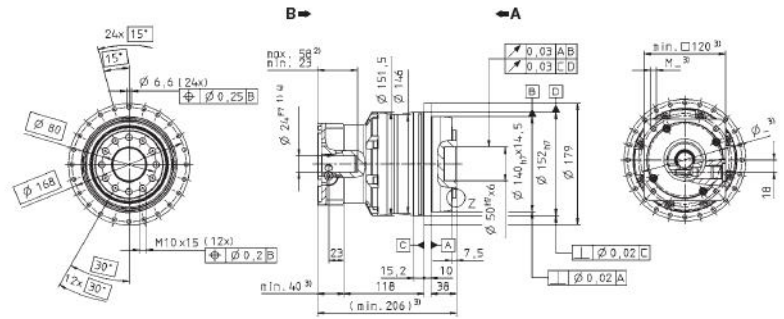


up to 38 [4] (K) clamping hub diameter



3-stage:

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



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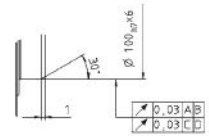


Non-tolerated dimensions ±1 mm

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.

⚠ Motor mounting according to operating manual

				1-stage			
Ratio [a]			*i*	**4**	**5**	**7**	**10**
cymex®-optimized acceleration torque (please contact us regarding the design)			T_{2Bcym} Nm	1900	2000	1900	1500
			T_{2Bcym} in.lb	16815	17700	16815	13275
Max. acceleration torque (max. 1000 cycles per hour)			T_{2B} Nm	1600	1600	1600	1400
			T_{2B} in.lb	14160	14160	14160	12390
Nominal output torque (with n_{1N})			T_{2N} Nm	700	750	750	750
			T_{2N} in.lb	6195	6638	6638	6638
Emergency stop torque (permitted 1000 times during the service life of the gearhead)			T_{2Not} Nm	2750	2750	2750	2750
			T_{2Not} in.lb	24338	24338	24338	24338
Nominal input speed (with T_{2N} and 20°C ambient temperature) [b]			n_{1N} rpm	1400	1500	2000	2000
Max. input speed			n_{1Max} rpm	3500	3500	3500	3500
Mean no load running torque (with n_1 = 3000 rpm and 20°C gearhead temperature) [c]			T_{012} Nm	15.6	12.7	9.4	7.0
			T_{012} in.lb	138.1	112.4	83.2	62.0
Max. torsional backlash			j_t arcmin	Standard ≤ 3 / Reduced ≤ 1			
Torsional rigidity [d]			C_{12} Nm/arcmin	610	610	550	445
			C_{12} lb.ft/arcmin	5399	5399	4868	3938
Tilting rigidity			C_{2K} Nm/arcmin	1452			
			C_{2K} lb.ft/arcmin	12850			
Max. axial force [d]			F_{2AMax} N	10050			
			F_{2AMax} lb_f	2261			
Max. tilting moment			M_{2KMax} Nm	3280			
			M_{2KMax} in.lb	29028			
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	30.0			
			m lb_m	66			
Operating noise (with A=10 and n_1 = 3000 rpm no-load)			L_{PA} dB(A)	≤ 66			
Max. permitted housing temperature			°C	+90			
			F	194			
Ambient temperature			°C	0 to +40			
			F	32 to 104			
Lubrication				Lubricated for life			
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	44.5	34.6	25.5	20.6
			J_1 10^{-4} in.lb.s²	39.4	30.6	22.6	18.2
	M	48	J_1 kgcm²	51.8	41.9	32.9	28.0
Clamping hub diameter [mm]			J_1 10^{-4} in.lb.s²	45.8	37.1	29.1	24.8

Reduced mass moments of inertia available on request.

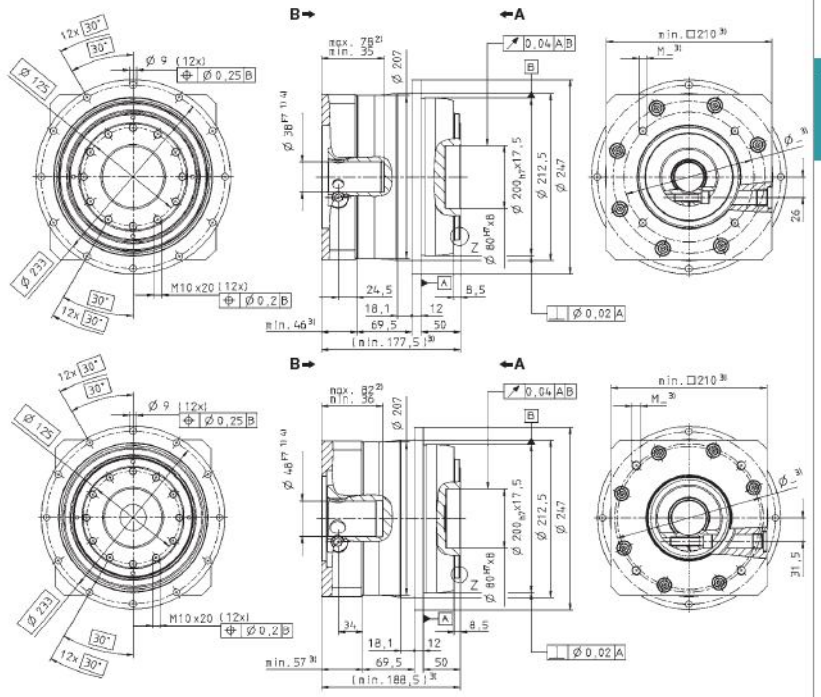
[a] Other ratios available on request
[b] For higher ambient temperatures, please reduce input speed
[c] Valid for clamping hub diameter of 48 mm
[d] Refers to center of the output shaft or flange

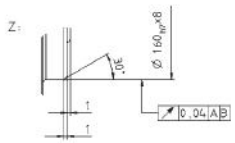
Motor shaft diameter [mm]

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

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

View A





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.

⚠ Motor mounting according to operating manual

				2-stage												
Ratio [a]			i	**16**	**20**	**21**	**25**	**28**	**31**	**35**	**40**	**50**	**61**	**70**	**91**	**100**
cymex®-optimized acceleration torque (please contact us regarding the design)			T_{2Bcym} Nm	2000	2000	–	2000	2000	–	2000	1800	1800	–	1800	–	1500
			T_{2Bcym} in.lb	17700	17700	–	17700	17700	–	17700	15930	15930	–	15930	–	13275
Max. acceleration torque (max. 1000 cycles per hour)			T_{2B} Nm	1600	1600	1400	1600	1600	1600	1600	1600	1600	1400	1600	1300	1400
			T_{2B} in.lb	14160	14160	12390	14160	14160	14160	14160	14160	14160	12390	14160	11505	12390
Nominal output torque (with n_{1N})			T_{2N} Nm	980	980	850	1050	1050	1250	1250	850	1050	1100	900	700	800
			T_{2N} in.lb	8673	8673	7523	9293	9293	11063	11063	7523	9293	9735	7965	6195	7080
Emergency stop torque (permitted 1000 times during the service life of the gearhead)			T_{2Not} Nm	2750	2750	2750	2750	2750	2750	2750	2750	2750	2750	2750	2750	2750
			T_{2Not} in.lb	24338	24338	24338	24338	24338	24338	24338	24338	24338	24338	24338	24338	24338
Nominal input speed (with T_{2N} and 20°C ambient temperature) [b]			n_{1N} rpm	2500	2500	2500	2500	2500	2500	2500	2500	2900	3200	3200	3400	3400
Max. input speed			n_{1Max} rpm	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000
Mean no load running torque (with n_1=3000 rpm and 20°C gearhead temperature) [c]			T_{012} Nm	6.9	5.6	5.5	5.0	4.1	3.9	3.7	3.0	2.7	2.5	2.4	2.2	2.2
			T_{012} in.lb	61.1	49.6	48.7	44.3	36.3	34.5	32.7	26.6	23.9	22.1	21.2	19.5	19.5
Max. torsional backlash			j_t arcmin	Standard ≤ 3 / Reduced ≤ 1												
Torsional rigidity [d]			C_{12} Nm/arcmin	585	580	465	570	560	440	560	520	525	415	480	360	395
			C_{12} lb.ft/arcmin	5177	5133	4115	5045	4956	3894	4956	4602	4646	3673	4248	3186	3496
Tilting rigidity			C_{2K} Nm/arcmin	1452												
			C_{2K} lb.ft/arcmin	12850												
Max. axial force [d]			F_{2AMax} N	10050												
			F_{2AMax} lb_f	2261												
Max. tilting moment			M_{2KMax} Nm	3280												
			M_{2KMax} in.lb	29028												
Efficiency at full load			η %	94												
Service life (For calculation, see the Chapter "Information")			L_h h	> 20000												
Weight incl. standardadapter plate			m kg	34.0												
			m lb_m	75.1												
Operating noise (with M_2=100 and n_1=3000 rpm no load)			L_{PA} dB(A)	≤ 66												
Max. permitted housing temperature			°C	+90												
			F	194												
Ambient temperature			°C	0 to +40												
			F	32 to 104												
Lubrication				Lubricated for life												
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	8.51	8.21	8.98	7.82	6.57	8.09	6.37	5.63	5.54	5.63	5.44	5.50	5.39
			J_1 10^{-4} in.lb.s²	7.53	7.27	7.95	6.92	5.81	7.16	5.64	4.99	4.90	4.99	4.82	4.87	4.77
Clamping hub diameter [mm]	I	32	J_1 kgcm²	11.7	11.4	12.1	11.0	9.73	11.3	9.54	8.80	8.70	8.79	8.61	8.67	8.56
			J_1 10^{-4} in.lb.s²	10.3	10.1	10.7	9.72	8.61	9.96	8.44	7.78	7.70	7.78	7.62	7.67	7.57
	K	38	J_1 kgcm²	12.7	12.5	13.2	12.1	10.6	12.3	10.6	9.87	9.77	9.87	9.66	9.74	9.63
			J_1 10^{-4} in.lb.s²	11.3	11.0	11.7	10.7	9.6	10.9	9.39	8.73	8.65	8.73	8.56	8.62	8.52
	M	48	J_1 kgcm²	27.4	27.1	27.8	26.7	25.4	26.9	25.3	24.5	24.4	24.5	24.3	24.4	24.3
			J_1 10^{-4} in.lb.s²	24.2	24.0	24.6	23.6	22.5	23.8	22.3	21.7	21.6	21.7	21.5	21.6	21.5

Reduced mass moments of inertia available on request.

[a] Other ratios available on request
[b] For higher ambient temperatures, please reduce input speed
[c] Valid for clamping hub diameter of 32 and 38 mm
[d] Refers to center of the output shaft or flange

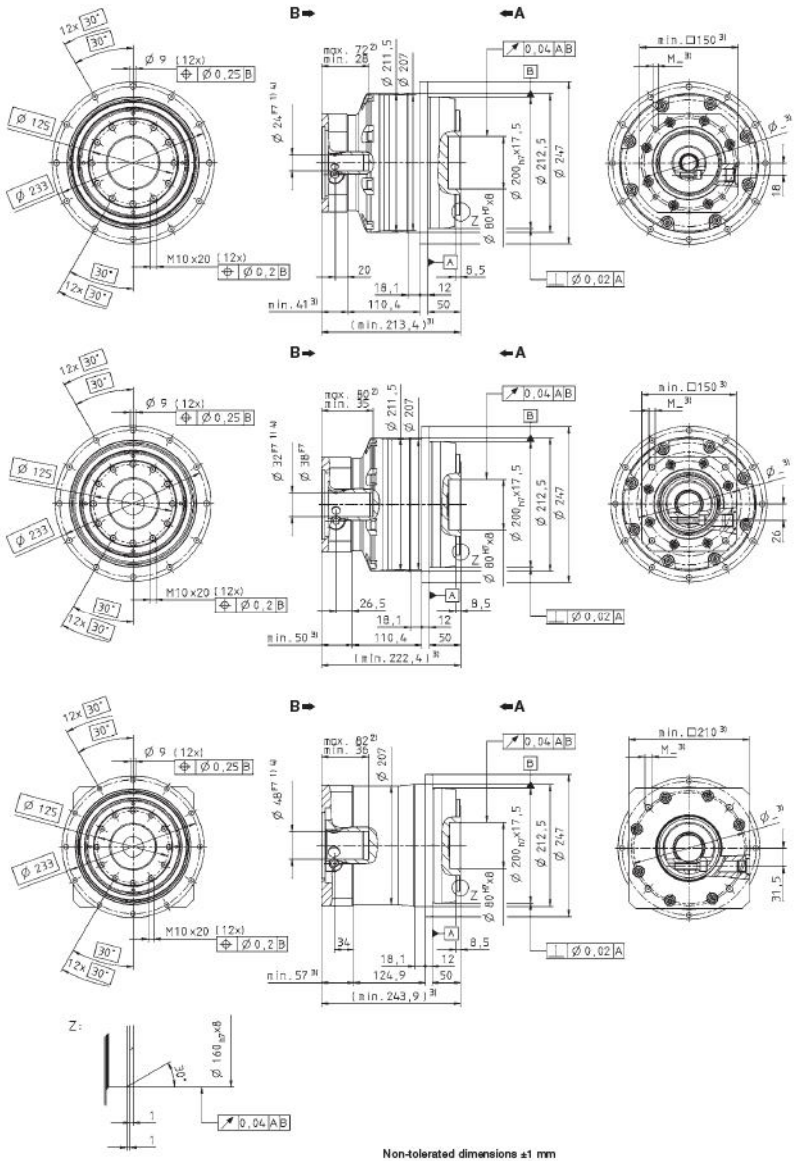
Motor shaft diameter [mm]

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

up to 32/38 [4] (I/K) clamping hub diameter

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

View A



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.

⚠ Motor mounting according to operating manual

				2-stage				3-stage				
Ratio [a]			*i*	**22**	**27.5**	**38.5**	**55**	**66**	**88**	**110**	**154**	**220**
Max. acceleration torque (max. 1000 cycles per hour)			T_{2B}	Nm	3100	3100	3100	2000	2600	2600	2600	2600	2600
				in.lb	27435	27435	27435	17700	23010	23010	23010	23010	23010
Nominal output torque (with n_{1N})			T_{2N}	Nm	1570	1600	1650	1400	1600	1750	1750	1750	1750
				in.lb	13895	14160	14603	12390	14160	15488	15488	15488	15488
Emergency stop torque (permitted 1000 times during the service life of the gearhead)			T_{2Not}	Nm	6500	6500	6500	6500	6500	6500	6500	6500	6500
				in.lb	57525	57525	57525	57525	57525	57525	57525	57525	57525
Nominal input speed (with T_{2N} and 20°C ambient temperature) [b]			n_{1N}	rpm	2500	2500	2500	2500	3000	3000	3000	3000	3000
Max. input speed			n_{1Max}	rpm	4500	4500	4500	4500	4500	4500	4500	4500	4500
Mean no load running torque (with n_1=3000 rpm and 20°C gearhead temperature) [c]			T_{012}	Nm	6.5	–	–	–	–	3.3	2.5	–	–
				in.lb	57.5					29.2	22.1		
Max. torsional backlash			j_t	arcmin	≤ 1				≤ 1				
Torsional rigidity [c]			C_{12}	Nm/arcmin	730	725	715	670	650	650	650	650	650
				lb.in/arcmin	6461	6416	6328	5930	5753	5753	5753	5753	5753
Tilting rigidity			C_{2K}	Nm/arcmin	1452				1452				
				lb.in/arcmin	12850				12850				
Max. axial force [d]			F_{2AMax}	N	10050				10050				
				lb_f	2261				2261				
Max. tilting moment			M_{2KMax}	Nm	3280				3280				
				in.lb	29028				29028				
Efficiency at full load			η	%	94				92				
Service life (For calculation, see the Chapter "Information")			L_h	h	> 20000				> 20000				
Weight incl. standard adapter plate			*m*	kg	33.1				35.4				
				lb_m	73.2				78.2				
Operating noise (with n_1=3000 rpm no load)			L_{PA}	dB(A)	≤ 66				≤ 66				
Max. permitted housing temperature				°C	+90								
				F	194								
Ambient temperature				°C	0 to +40								
				F	32 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	16.6	15.2	13.9	13.1	13.8	10.2	9.77	9.47	9.16
				10^{-3} in.lb.s²	14.7	13.5	12.3	11.6	12.2	9.03	8.65	8.38	8.11
Clamping hub diameter [mm]	M	48	J_1	kgcm²	31.4	29.9	28.7	28.0	–	–	–	–	–
				10^{-3} in.lb.s²	27.8	26.5	25.4	24.8					

Reduced mass moments of inertia available on request.

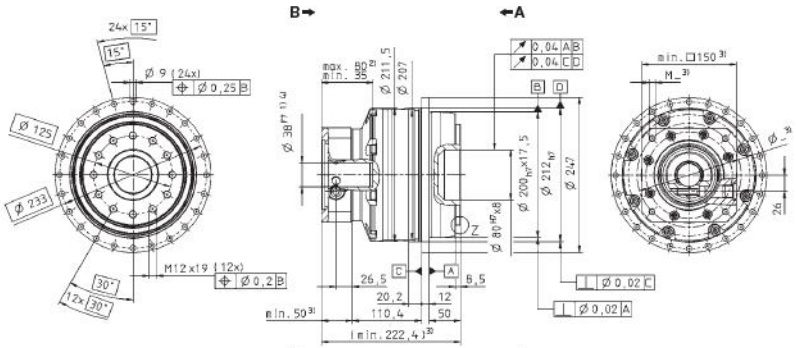
[a] Other ratios available on request
[b] For higher ambient temperatures, please reduce input speed
[c] Valid for clamping hub diameter of 38 mm
[d] Refers to center of the output shaft or flange

View A View B

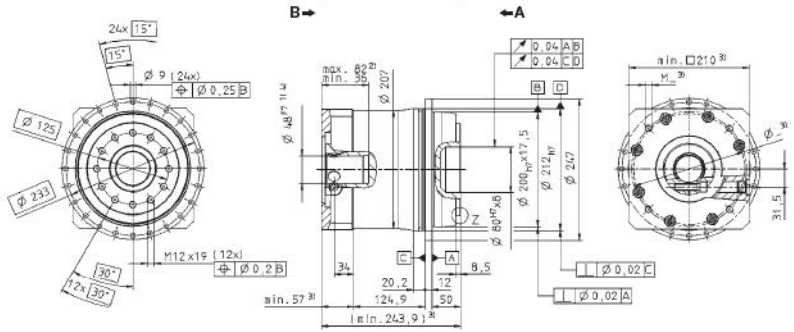
Motor shaft diameter [mm]

2-stage:

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

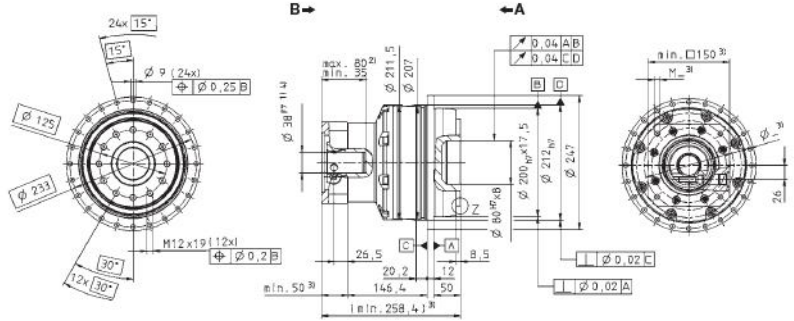


up to 48 [4] (M) clamping hub diameter

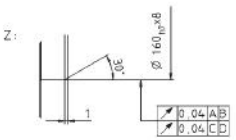


3-stage:

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



Z:



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.

⚠ Motor mounting according to operating manual

				1-stage			2-stage									
Ratio [4]	i			**5**	**7**	**10**	**20**	**21**	**25**	**31**	**35**	**50**	**61**	**70**	**91**	**100**
Max. acceleration torque (max. 1000 cycles per hour)	T_{2B}	Nm		3500	3300	1900	3500	3400	3500	3500	3500	3000	2800	3300	2800	2800
		in.lb		30975	29205	16815	30975	30090	30975	30975	30975	26550	24780	29205	24780	24780
Nominal output torque (with n_{1N})	T_{2N}	Nm		2200	1800	1000	2300	2100	2400	2200	2500	1900	1600	1800	1600	1600
		in.lb		19470	15930	8850	20355	18585	21240	19470	22125	16815	14160	15930	14160	14160
Emergency stop torque (permitted 1000 times during the service life of the gearhead)	T_{2Not}	Nm		8750	8750	8750	8750	8750	8750	8750	8750	8750	8750	8750	8750	8750
		in.lb		77438	77438	77438	77438	77438	77438	77438	77438	77438	77438	77438	77438	77438
Nominal input speed (with T_{2N} and 20°C ambient temperature) [b]	n_{1N}	rpm		1000	1400	1700	2000	2000	2000	2000	2000	2300	2400	2400	2500	2500
Max. input speed	n_{1Max}	rpm		2500	2500	2500	3500	3500	3500	3500	3500	3500	3500	3500	3500	3500
Mean no load running torque (with n_1=2000 rpm and 20°C gearhead temperature)	T_{012}	Nm		23	17	11	10	9,5	9,0	7,0	6,0	5,0	4,0	4,0	3,5	3,5
		in.lb		204	150	97	89	84	80	62	53	44	35	35	31	31
Max. torsional backlash	j_t	arcmin		Standard ≤ 9 / Reduced ≤ 1			Standard ≤ 3 / Reduced ≤ 2									
Torsional rigidity	C_{t12}	Nm/arcmin		1000	900	700	850	800	950	750	900	800	700	800	600	650
		lb.in/arcmin		8850	7965	6195	7523	7080	9408	6638	7965	7080	6195	7080	5310	5753
Tilting rigidity	C_{2K}	Nm/arcmin		5560												
		lb.in/arcmin		49206												
Max. axial force [c]	F_{2AMax}	N		33000												
		lb$_f$		7425												
Max. tilting moment	M_{2KMax}	Nm		3900			5900									
		in.lb		34515			52215									
Efficiency at full load	η	%		95			93									
Service life (For calculation, see the Chapter "Information")	L_h	h		> 20000												
Weight incl. standard adapter plate	m	kg		60			58.5									
		lb$_m$		132.6			129.3									
Operating noise (with A=10 and n_1=2000 rpm without load)	L_{PA}	dB(A)		≤ 64												
Max. permitted housing temperature		°C		+90												
		F		194												
Ambient temperature		°C		0 to +40												
		F		32 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		–	–	–	27.5	27.0	25.9	25.6	22.4	21.5	21.4	21.3	21.2	21.2
		10³ in.lb.s²					24.3	23.9	22.9	22.7	19.8	19.0	18.9	18.9	18.8	18.8
Clamping hub diameter [mm] N 55	J_1	kgcm²		82.6	61.2	49.5	–	–	–	–	–	–	–	–	–	–
		10³ in.lb.s²		73.1	54.2	43.8										

Reduced mass moments of inertia available on request.

[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

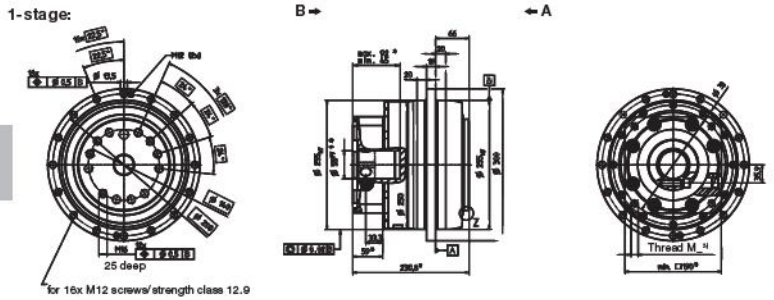
View A View B

Motor shaft diameter [mm]

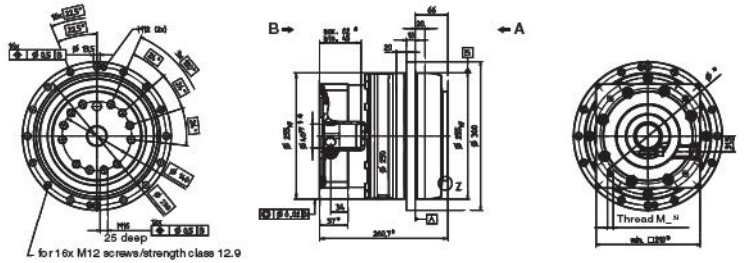
up to 55 [4] (N) clamping hub diameter

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

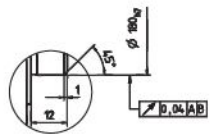
1-stage:



2-stage:



Z: Detail



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.

⚠ Motor mounting according to operating manual

				1-stage	2-stage				3-stage				
Ratio [a]			i	**5.5**	**22**	**27.5**	**38.5**	**55**	**66**	**88**	**110**	**154**	**220**
Max. acceleration torque (max. 1000 cycles per hour)			T_{2B} Nm	4600	5500	5500	5500	3900	5500	5500	5500	5500	5500
			T_{2B} in.lb	40714	48679	48679	48679	34518	48679	48679	48679	48679	48679
Nominal output torque (with n_{1N})			T_{2N} Nm	2200	3500	3500	3500	2500	3500	3500	3500	3500	3500
			T_{2N} in.lb	19472	30978	30978	30978	22127	30978	30978	30978	30978	30978
Emergency stop torque (permitted 1000 times during the service life of the gearhead)			T_{2Not} Nm	8750	13250	13250	13250	13250	13250	13250	13250	13250	13250
			T_{2Not} in.lb	77445	117273	117273	117273	117273	117273	117273	117273	117273	117273
Nominal input speed (with T_{2N} and 20°C ambient temperature) [b]			n_{1N} rpm	1000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Max. input speed			n_{1Max} rpm	2500	3500	3500	3500	3500	3500	3500	3500	3500	3500
Mean no load running torque (with n_1=2000 rpm and 20°C gearhead temperature)			T_{012} Nm	22	12	10	9,0	7,0	6,5	4,5	4,0	3,0	2,0
			T_{012} in.lb	195	106	89	80	62	58	40	35	27	18
Max. torsional backlash			j_t arcmin	Standard ≤ 2/ Reduced ≤ 1	Standard ≤ 3 / Reduced ≤ 1.5								
Torsional rigidity			C_{t12} Nm/arcmin	1400	1200	–	–	–	–	–	1200	–	–
			C_{t12} lb.in/arcmin	12391	10621						10621		
Tilting rigidity			C_{2K} Nm/arcmin	5560									
			C_{2K} lb.in/arcmin	49210									
Max. axial force [c]			F_{2AMax} N	33000									
			F_{2AMax} lb_f	7425									
Max. tilting moment			M_{2KMax} Nm	3900	6500								
			M_{2KMax} in.lb	34518	57530								
Efficiency at full load			η %	95	93								
Service life (For calculation, see "Technical Basics")			L_h h	> 20000									
Weight incl. standard adapter plate			m kg	55	64				67				
			m lb_m	121.25	141.1				147.7				
Operating noise (with n_1=2000 rpm no load)			L_{PA} dB(A)	≤ 68	≤ 67				≤ 66				
Max. permitted housing temperature			°C	+90									
			F	194									
Ambient temperature			°C	0 to +40									
			F	32 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	–	–	–	–	–	16.6	12.9	11.6	10.3	9.50
			J_1 in.lb²						0.0147	0.0114	0.0103	0.0091	0.0084
Clamping hub diameter [mm]	M	48	J_1 kgcm²	–	30.8	27.6	24.9	23.0	–	–	–	–	–
			J_1 in.lb²		0.0273	0.0244	0.0220	0.0204					
	N	55	J_1 kgcm²	129	–	–	–	–	–	–	–	–	–
			J_1 in.lb²	0.1142									

Reduced mass moments of inertia available on request.

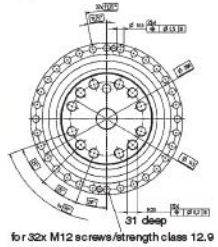
[a] Other ratios available on request
[b] For higher ambient temperatures, please reduce input speed
[c] Refers to center of the output shaft or flange

View A View B

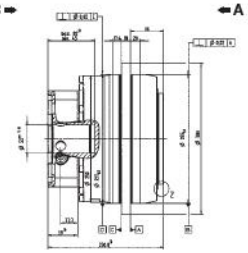
Motor shaft diameter [mm]

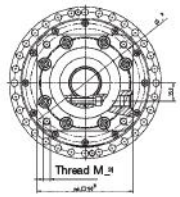
1-stage:

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



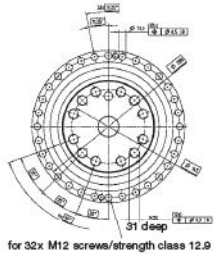
for 32x M12 screws/strength class 12.9



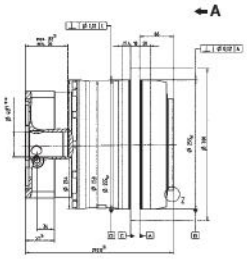


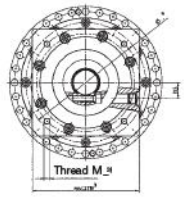
2-stage:

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



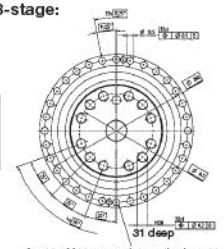
for 32x M12 screws/strength class 12.9



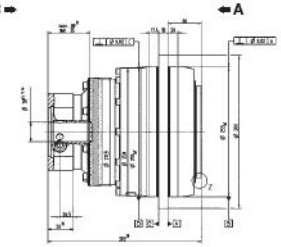


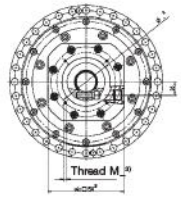
3-stage:

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

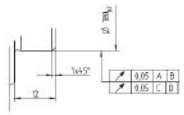


for 32x M12 screws/strength class 12.9





Z: Detail



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.

⚠ Motor mounting according to operating manual

				1-stage			2-stage									
Ratio [4]			*i*	**5**	**7**	**10**	**20**	**21**	**25**	**31**	**35**	**50**	**61**	**70**	**91**	**100**
Max. acceleration torque (max. 1000 cycles per hour)			T_{2B}	Nm	6000	5000	3400	6000	5000	6000	6000	6000	4500	4800	5000	4800	4800
				in.lb	53100	44250	30090	53100	44250	53100	53100	53100	39825	42480	44250	42480	42480
Nominal output torque (with n_{1N})			T_{2N}	Nm	3250	2800	1700	3350	3200	3800	3700	3800	2900	2900	2800	2900	2900
				in.lb	28763	24780	15045	29649	28320	33630	32745	33630	25665	25665	24780	25665	25665
Emergency stop torque (permitted 1000 times during the service life of the gearhead)			T_{2Not}	Nm	15000	15000	15000	15000	15000	15000	15000	15000	15000	15000	15000	15000	15000
				in.lb	132750	132750	132750	132750	132750	132750	132750	132750	132750	132750	132750	132750	132750
Nominal input speed (with T_{2N} and 20°C ambient temperature) [b]			n_{1N}	rpm	900	1300	1500	1500	1500	1500	1500	1500	2000	2100	2100	2200	2200
Max. input speed			n_{1Max}	rpm	2200	2200	2200	3500	3500	3500	3500	3500	3500	3500	3500	3500	3500
Mean no load running torque (with n_1=2000 rpm and 20°C gearhead temperature)			T_{012}	Nm	30	22	14	13	12	10	8,0	7,0	6,0	5,0	5,0	4,5	4,5
				in.lb	266	195	124	115	106	89	71	62	53	44	44	40	40
Max. torsional backlash			j_t	arcmin	Standard ≤ 9 / Reduced ≤ 1			Standard ≤ 3 / Reduced ≤ 2									
Torsional rigidity			C_{t12}	Nm/arcmin	1450	1300	1100	1400	1200	1450	1200	1400	1300	1100	1250	950	1050
				lb.in/arcmin	12833	11505	9735	12390	10620	12833	10620	12390	11505	9735	11063	8401	9293
Tilting rigidity			C_{2K}	Nm/arcmin	9480												
				lb.in/arcmin	83898												
Max. axial force [c]			F_{2AMax}	N	50000												
				lb$_f$	11250												
Max. tilting moment			M_{2KMax}	Nm	5500			8800									
				in.lb	48675			77880									
Efficiency at full load			η	%	95			93									
Service life (For calculation, see the Chapter "Information")			L_h	h	> 20000												
Weight incl. standard adapter plate			m	kg	82			77.5									
				lb$_m$	181.2			171.3									
Operating noise (with A=10 and n_1=2000 rpm no load)			L_{PA}	dB(A)	≤ 66												
Max. permitted housing temperature				°C	+90												
				F	194												
Ambient temperature				°C	0 to +40												
				F	32 to 104												
Lubrication					Lubricated for life												
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	–	–	–	32.3	37.6	31.1	32.8	25.1	23.2	23.6	23.2	23.0	22.7
				10⁻³ in.lb.s²				28.6	33.3	27.5	29.0	22.2	20.5	20.9	20.5	20.4	20.1
Clamping hub diameter [mm]	O	60	J_1	kgcm²	175.5	137.0	115.6	–	–	–	–	–	–	–	–	–	–
				10⁻³ in.lb.s²	155.3	121.2	102.5										

Reduced mass moments of inertia available on request.

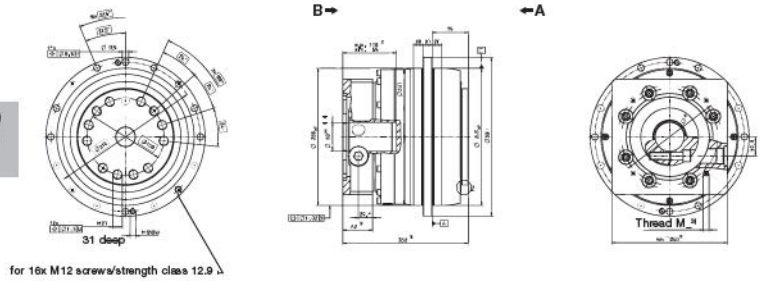
[a] Other ratios available on request
[b] For higher ambient temperatures, please reduce input speed
[c] Refers to center of the output shaft or flange

View A View B

Motor shaft diameter [mm]

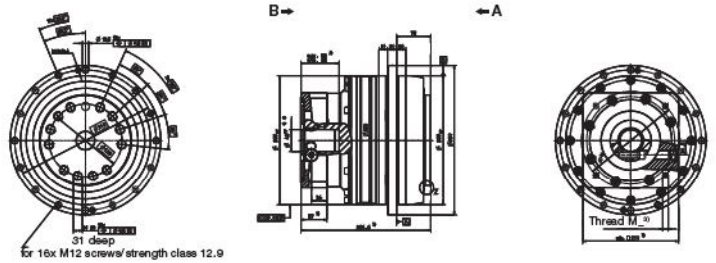
1-stage:

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

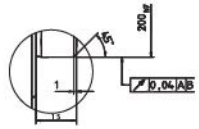


2-stage:

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



Z: Detail



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.

⚠ Motor mounting according to operating manual

				1-stage	2-stage				3-stage				
Ratio [a]			i	**5.5**	**22**	**27.5**	**38.5**	**55**	**66**	**88**	**110**	**154**	**220**
Max. acceleration torque (max. 1000 cycles per hour)			T_{2B} Nm	8000	10000	10000	10000	7200	10000	10000	10000	10000	10000
			T_{2B} in.lb	70806	88508	88508	88508	63726	88508	88508	88508	88508	88508
Nominal output torque (with n_{1N})			T_{2N} Nm	3500	6000	4600	4600	4700	6000	6000	6000	6000	6000
			T_{2N} in.lb	30978	53105	40714	40714	41599	53105	53105	53105	53105	53105
Emergency stop torque (permitted 1000 times during the service life of the gearhead)			T_{2Not} Nm	15000	25000	25000	25000	25000	25000	25000	25000	25000	25000
			T_{2Not} in.lb	132762	221270	221270	221270	221270	221270	221270	221270	221270	221270
Nominal input speed (with T_{2N} and 20°C ambient temperature) [b]			n_{1N} rpm	900	1500	1500	1500	1500	1500	1500	1500	1500	1500
Max. input speed			n_{1Max} rpm	2500	3500	3500	3500	3500	3500	3500	3500	3500	3500
Mean no load running torque (with n_1=2000 rpm and 20°C gearhead temperature)			T_{012} Nm	28	13	14	12	9,0	8,5	6,5	6,0	5,0	4,0
			T_{012} in.lb	248	115	124	106	80	75	58	53	44	35
Max. torsional backlash			j_t arcmin	Standard ≤ 2 / Reduced ≤ 1	Standard ≤ 3 / Reduced ≤ 1.5								
Torsional rigidity			C_{t12} Nm/arcmin	1650	2000	–	–	–	–	–	1500	–	1800
			C_{t12} lb.in/arcmin	14603	17700						13275		15930
Tilting rigidity			C_{2K} Nm/arcmin	9480									
			C_{2K} lb.in/arcmin	83906									
Max. axial force [c]			F_{2AMax} N	50000									
			F_{2AMax} lb$_f$	11250									
Max. tilting moment			M_{2KMax} Nm	6600	9500								
			M_{2KMax} in.lb	58415	84083								
Efficiency at full load			η %	95	93								
Service life (For calculation, see "Technical Basics")			L_h h	> 20000									
Weight incl. standardadapter plate			m kg	80					89				
			m lb$_m$	176.4					196.2				
Operating noise (with n_1=2000 rpm no load)			L_{PA} dB(A)	≤ 68					≤ 67				
Max. permitted housing temperature			°C	+90									
			F	194									
Ambient temperature			°C	0 to +40									
			F	32 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	–	43.8	36.9	30.5	27.0	32.7	28.3	26.7	25.2	24.4
			J_1 in.lbs²		0.0388	0.0327	0.0270	0.0239	0.0289	0.0250	0.0236	0.0223	0.0216
Clamping hub diameter [mm]	O	60	J_1 kgcm²	175	–	–	–	–	–	–	–	–	–
			J_1 in.lbs²	0.1549									

Reduced mass moments of inertia available on request.

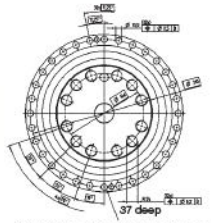
[a] Other ratios available on request
[b] For higher ambient temperatures, please reduce input speed
[c] Refers to center of the output shaft or flange

View A | View B

Motor shaft diameter [mm]

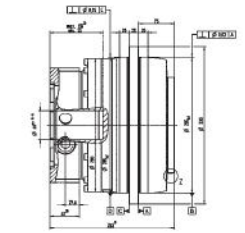
1-stage:

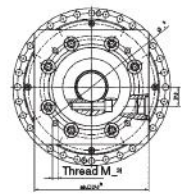
up to 60 [4] (O) clamping hub diameter



for 32x M12 screws/strength class 12.9

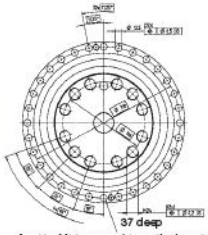
B ➡ ⬅ A





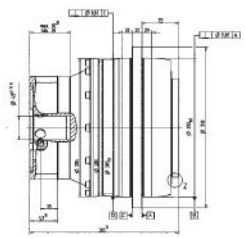
2-stage:

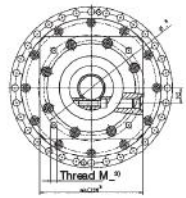
up to 48 [4] (M) clamping hub diameter



for 32x M12 screws/strength class 12.9

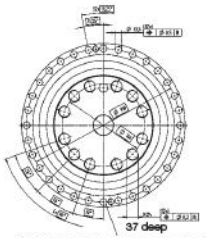
B ➡ ⬅ A





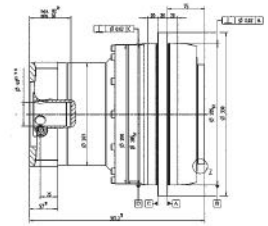
3-stage:

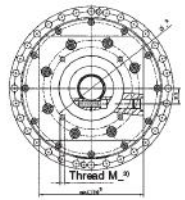
up to 48 [4] (M) clamping hub diameter



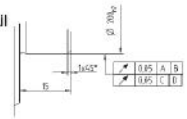
for 32x M12 screws/strength class 12.9

B ➡ ⬅ A





Z: Detail



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.

⚠ Motor mounting according to operating manual