

DP+ – The right solution for all requirements

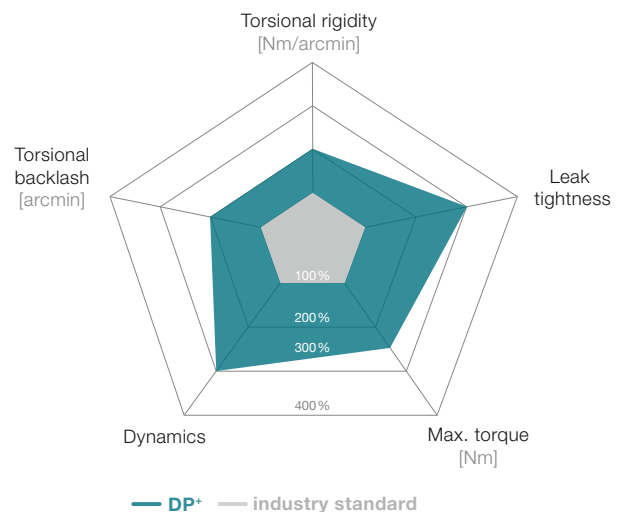


The DP+ planetary gearbox was specially developed for use in Delta robotics applications. Various characteristics allow use of the gearbox in dry, spray and wet areas (HDP+). In addition to an optimized sealing system, this drive solution includes advantages such as improved dynamics due to the optimized moment of inertia. The DP+ is available in four sizes and covers a ratio range of $i = 16 - 55$.

The DP+ compared to the industry standard

Product highlights

- Reliability** Extremely reliable gearboxes prevent cost-intensive machine breakdowns
- Positioning accuracy** Minimal backlash and extreme rigidity ensure maximum positioning accuracy at the tool center point
- Speed** Highest speeds increase machine output
- Maintenance** Highest quality standards guarantee a long service life and extend maintenance intervals
- Consistently high performance** Constant backlash throughout the service life of the gearbox ensures a consistently high performance
- Low inertia** Use of an servo actuator further reduces inertia



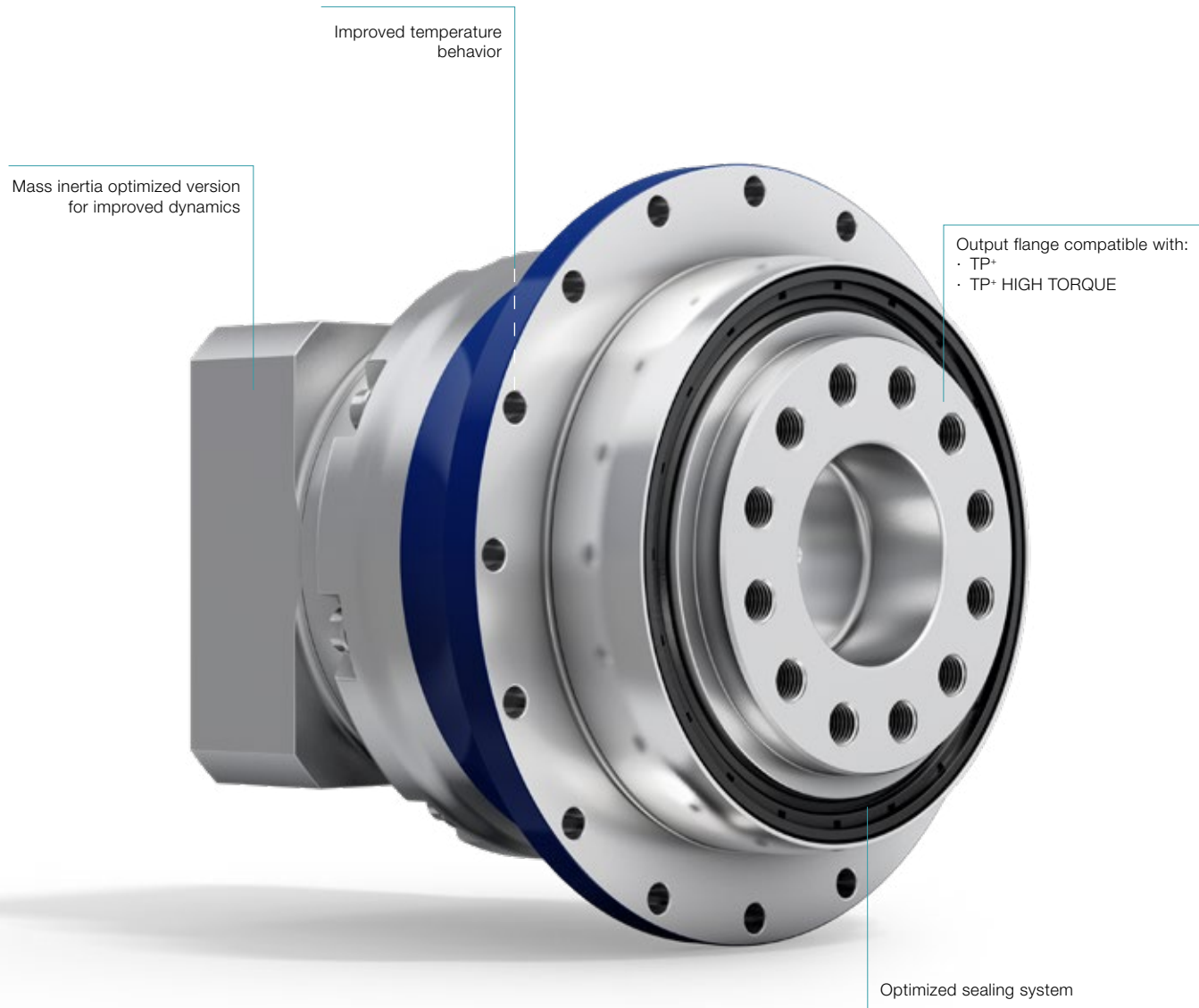
Fields of application: Secondary packaging, Handling, Mounting, Intralogistics ...



Fields of application: Pharmaceutical industry, Medical technology, Primary packaging without hygiene design requirements, Clean room...



More information on Delta robotics: simply scan the QR code with your smartphone.



Application-spec.
solutions

💧 Wet area (integrated in the process)



HDP+

Fields of application: Primary packaging with hygiene design requirements

We are happy to advise you on individual solutions for your project-specific requirements.



Custom solutions

DP+ 004 MF 2-stage

				2-stage											
Ratio			<i>i</i>		16	20	21	25	28	31	35	40	50		
Max. torque ^{a) b)}			<i>T</i> _{2a}	<i>Nm</i>	57	57	60	72	57	50	72	57	72		
				<i>in.lb</i>	507	507	533	634	507	442	634	507	634		
Max. acceleration torque ^{b)} (max. 1000 cycles per hour)			<i>T</i> _{2B}	<i>Nm</i>	57	57	48	66	57	48	66	57	66		
				<i>in.lb</i>	507	507	425	584	507	425	584	507	584		
Nominal torque (at <i>n</i> _n)			<i>T</i> _{2N}	<i>Nm</i>	39	41	32	41	45	36	45	46	48		
				<i>in.lb</i>	342	365	286	361	403	320	399	406	421		
Emergency stop torque ^{a) b)} (permitted 1000 times during the service life of the gearbox)			<i>T</i> _{2Not}	<i>Nm</i>	100	100	100	100	100	100	100	100	100		
				<i>in.lb</i>	885	885	885	885	885	885	885	885	885	885	
Permitted average input speed (at <i>T</i> _{2n} and 20 °C ambient temperature) ^{d)}			<i>n</i> _{1N}	<i>rpm</i>	4000	4000	4000	4000	4000	4000	4000	4000	4800		
Max. input speed			<i>n</i> _{1Max}	<i>rpm</i>	7500	7500	7500	7500	7500	7500	7500	7500	7500		
Mean no load running torque ^{b)} (at <i>n</i> _i = 3000 rpm and 20 °C gearbox temperature)			<i>T</i> ₀₁₂	<i>Nm</i>	0.28	0.23	0.24	0.22	0.21	0.22	0.17	0.18	0.17		
				<i>in.lb</i>	2.5	2.0	2.1	1.9	1.9	1.9	1.5	1.6	1.5		
Max. backlash			<i>j</i> _t	<i>arcmin</i>	Standard ≤ 4 / Reduced ≤ 2										
Torsional rigidity ^{b)}			<i>C</i> _{t21}	<i>Nm/arcmin</i>	12	12	10	12	12	9	12	11	12		
				<i>in.lb/arcmin</i>	106	106	89	106	106	80	106	97	106		
Tilting rigidity			<i>C</i> _{2K}	<i>Nm/arcmin</i>	85										
				<i>in.lb/arcmin</i>	752										
Max. axial force ^{c)}			<i>F</i> _{2AMax}	<i>N</i>	2119										
				<i>lb_f</i>	477										
Max. tilting moment			<i>M</i> _{2KMax}	<i>Nm</i>	110										
				<i>in.lb</i>	974										
Efficiency at full load			<i>η</i>	%	94										
Service life ^{f)}			<i>L</i> _h	<i>h</i>	> 20000										
Weight (incl. standard adapter plate)			<i>m</i>	<i>kg</i>	1.5										
				<i>lb_m</i>	3.3										
Operating noise (at reference ratio and reference speed – ratio-specific values available in cymex®)			<i>L</i> _{PA}	<i>dB(A)</i>	≤ 54										
Max. permitted housing temperature				°C	+90										
				<i>F</i>	194										
Ambient temperature				°C	–15 to +40										
				<i>F</i>	5 to 104										
Lubrication					Lubricated for life										
Direction of rotation					In- and output same direction										
Protection class					IP 65										
Metal bellows coupling (recommended product type – validate sizing with cymex®)					-										
Bore diameter of coupling on the application side				<i>mm</i>	-										
Mass moment of inertia (relates to the drive) Clamping hub diameter [mm] Optimized mass inertia version available on request			B	11	<i>J</i> _i	<i>kgcm²</i>	0.078	0.070	0.074	0.068	0.062	0.072	0.061	0.057	0.057
						<i>10⁻³ in.lb.s²</i>	0.069	0.062	0.065	0.060	0.055	0.064	0.054	0.050	0.050
			C	14	<i>J</i> _i	<i>kgcm²</i>	0.17	0.17	0.17	0.16	0.16	0.17	0.16	0.15	0.15
						<i>10⁻³ in.lb.s²</i>	0.15	0.15	0.15	0.15	0.14	0.15	0.14	0.14	0.14

Please use our sizing software cymex[®] for a detailed sizing – www.wittenstein-cymex.com

^{a)} At max. 10 % M_{2KMax}

^{b)} Valid for standard clamping hub diameter

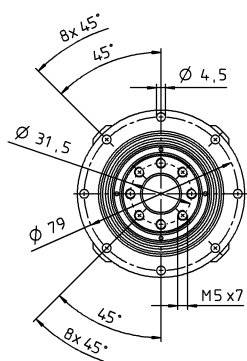
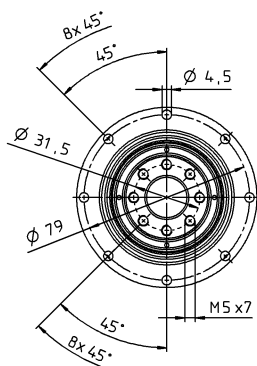
^{c)} Refers to center of the output shaft or flange

^{d)} Please reduce input speed at higher ambient temperatures

^{f)} Please contact us to discuss
application-specific service lifetimes

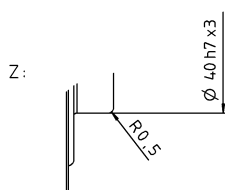
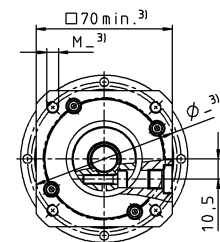
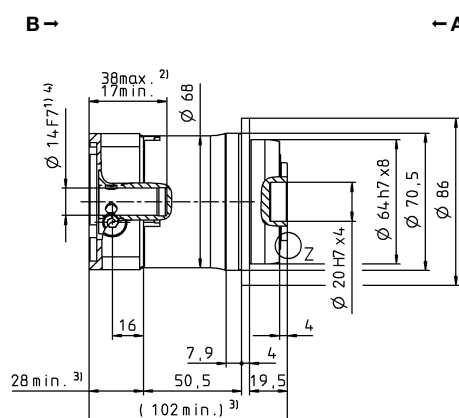
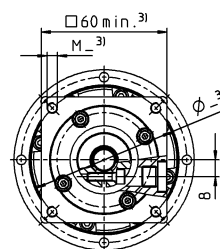
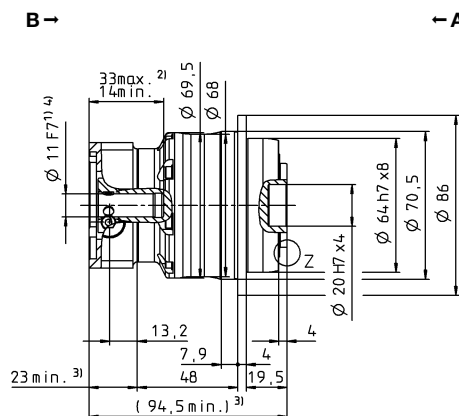
2-stage

up to 11 ⁴⁾ (B) ⁵⁾
clamping hub
diameter



Motor shaft diameter [mm]

up to 14 ⁴⁾ (C)
clamping hub
diameter



Non-tolerated dimensions are nominal dimensions

¹⁾ Check motor shaft fit

²⁾ Min./Max. permissible motor shaft length. Longer motor shafts are possible, please contact alpha.

³⁾ The dimensions depend on the motor

⁴⁾ Smaller motor shaft diameter is compensated by a bushing with a minimum wall thickness of 1 mm

⁵⁾ Standard clamping hub diameter

DP+ 010 MF 2-stage

				2-stage									
Ratio			<i>i</i>		16	20	21	25	28	31	35	40	50
Max. torque ^{a) b)}			<i>T</i> _{2a}	<i>Nm</i>	157	126	133	158	157	121	158	154	158
				<i>in.lb</i>	1392	1118	1174	1398	1392	1071	1398	1363	1398
Max. acceleration torque ^{b)} (max. 1000 cycles per hour)			<i>T</i> _{2B}	<i>Nm</i>	157	126	120	158	157	121	158	154	158
				<i>in.lb</i>	1392	1113	1062	1398	1392	1071	1398	1363	1398
Nominal torque (at <i>n</i> _n)			<i>T</i> _{2N}	<i>Nm</i>	106	101	96	124	107	87	126	112	126
				<i>in.lb</i>	935	895	850	1097	945	770	1118	987	1118
Emergency stop torque ^{a) b)} (permitted 1000 times during the service life of the gearbox)			<i>T</i> _{2Not}	<i>Nm</i>	251	251	251	251	251	251	251	251	251
				<i>in.lb</i>	2222	2222	2222	2222	2222	2222	2222	2222	2222
Permitted average input speed (at <i>T</i> _{2N} and 20 °C ambient temperature) ^{d)}			<i>n</i> _{1N}	<i>rpm</i>	3500	3500	3500	3500	3500	3500	3500	3500	3800
Max. input speed			<i>n</i> _{1Max}	<i>rpm</i>	7500	7500	7500	7500	7500	7500	7500	7500	7500
Mean no load running torque ^{b)} (at <i>n</i> _i = 3000 rpm and 20 °C gearbox temperature)			<i>T</i> ₀₁₂	<i>Nm</i>	0.56	0.48	0.47	0.44	0.40	0.40	0.28	0.32	0.32
				<i>in.lb</i>	5.0	4.2	4.2	3.9	3.5	3.5	2.5	2.8	2.8
Max. backlash			<i>j</i> _t	<i>arcmin</i>	Standard ≤ 3 / Reduced ≤ 1								
Torsional rigidity ^{b)}			<i>C</i> ₁₂₁	<i>Nm/arcmin</i>	32	32	26	32	31	24	32	30	30
				<i>in.lb/arcmin</i>	283	283	230	283	274	212	283	266	266
Tilting rigidity			<i>C</i> _{2K}	<i>Nm/arcmin</i>	225								
				<i>in.lb/arcmin</i>	1991								
Max. axial force ^{c)}			<i>F</i> _{2AMax}	<i>N</i>	2795								
				<i>lb_f</i>	629								
Max. tilting moment			<i>M</i> _{2KMax}	<i>Nm</i>	270								
				<i>in.lb</i>	2390								
Efficiency at full load			<i>η</i>	%	94								
Service life ^{f)}			<i>L</i> _h	<i>h</i>	> 20000								
Weight (incl. standard adapter plate)			<i>m</i>	<i>kg</i>	3.6								
				<i>lb_m</i>	8.0								
Operating noise (at reference ratio and reference speed – ratio-specific values available in cymex®)			<i>L</i> _{PA}	<i>dB(A)</i>	≤ 55								
Max. permitted housing temperature				°C	+90								
				<i>F</i>	194								
Ambient temperature				°C	–15 to +40								
				<i>F</i>	5 to 104								
Lubrication					Lubricated for life								
Direction of rotation					In- and output same direction								
Protection class					IP 65								
Metal bellows coupling (recommended product type – validate sizing with cymex®)					-								
Bore diameter of coupling on the application side				<i>mm</i>	-								
Mass moment of inertia (relates to the drive) Clamping hub diameter [mm] Optimized mass inertia version available on request	B	11	<i>J</i> ₁	<i>kgcm²</i>	0.17	0.14	0.15	0.13	0.11	0.14	0.10	0.09	0.09
				<i>10⁻³ in.lb.s²</i>	0.15	0.12	0.13	0.12	0.10	0.12	0.09	0.08	0.08
	C	14	<i>J</i> ₁	<i>kgcm²</i>	0.24	0.21	0.22	0.20	0.18	0.21	0.18	0.17	0.17
				<i>10⁻³ in.lb.s²</i>	0.21	0.19	0.20	0.18	0.16	0.18	0.16	0.15	0.15
	E	19	<i>J</i> ₁	<i>kgcm²</i>	0.56	0.53	0.55	0.53	0.51	0.53	0.50	0.49	0.49
				<i>10⁻³ in.lb.s²</i>	0.50	0.47	0.48	0.47	0.45	0.47	0.44	0.43	0.43

Please use our sizing software cymex[®] for a detailed sizing – www.wittenstein-cymex.com

^{a)} At max. 10 % M_{2KMax}

^{b)} Valid for standard clamping hub diameter

^{c)} Refers to center of the output shaft or flange

^{d)} Please reduce input speed at higher ambient temperatures

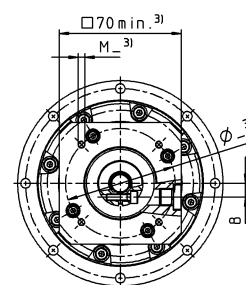
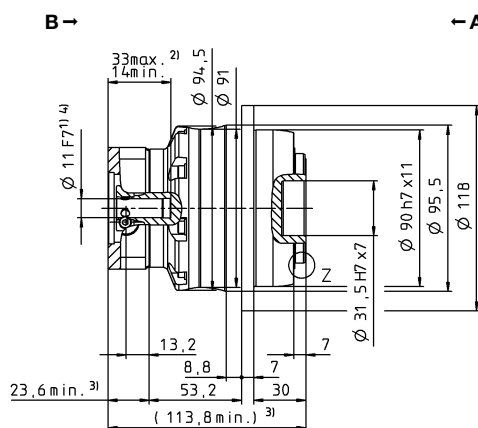
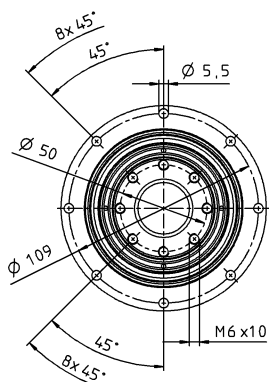
^{f)} Please contact us to discuss
application-specific service lifetimes

View A

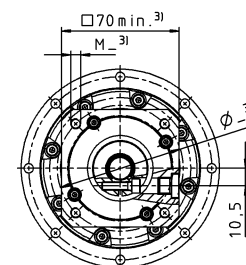
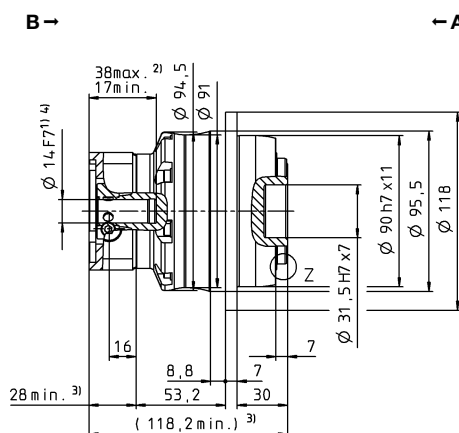
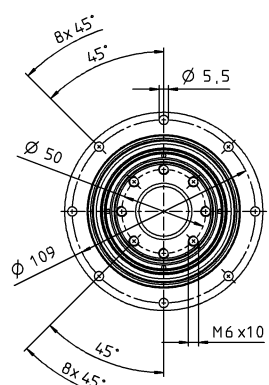
View B

2-stage

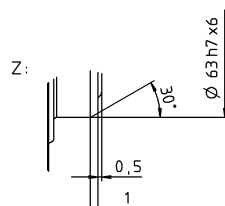
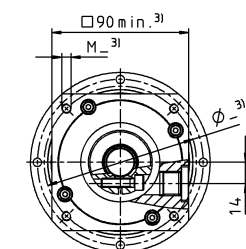
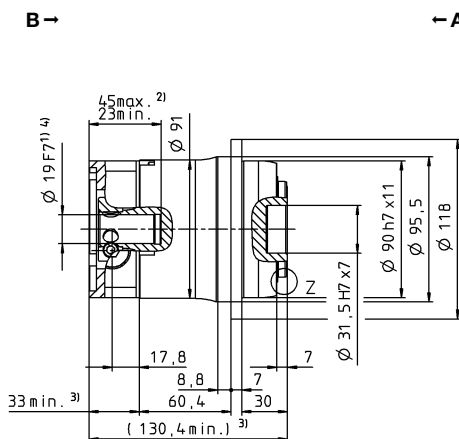
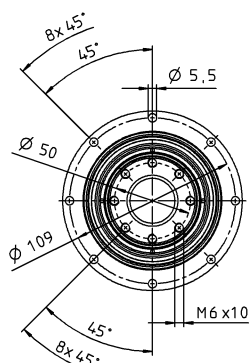
up to 11⁴⁾ (B)
clamping hub
diameter



up to 14⁴⁾ (C)⁵⁾
clamping hub
diameter



up to 19⁴⁾ (E)
clamping hub
diameter



Non-tolerated dimensions are nominal dimensions

¹⁾ Check motor shaft fit

²⁾ Min./Max. permissible motor shaft length. Longer motor shafts are possible, please contact alpha.

³⁾ The dimensions depend on the motor

⁴⁾ Smaller motor shaft diameter is compensated by a bushing with a minimum wall thickness of 1 mm

⁵⁾ Standard clamping hub diameter

DP+ 025 MF 2-stage

				2-stage									
Ratio			<i>i</i>		16	20	21	25	28	31	35	40	50
Max. torque ^{a) b)}			<i>T</i> _{2a}	<i>Nm</i>	352	352	352	380	352	352	380	352	380
				<i>in.lb</i>	3115	3115	3115	3363	3115	3115	3363	3115	3363
Max. acceleration torque ^{b)} (max. 1000 cycles per hour)			<i>T</i> _{2B}	<i>Nm</i>	352	352	330	380	352	330	380	352	380
				<i>in.lb</i>	3115	3115	2921	3363	3115	2921	3363	3115	3363
Nominal torque (at <i>n</i> _n)			<i>T</i> _{2N}	<i>Nm</i>	250	267	211	265	282	231	294	282	304
				<i>in.lb</i>	2213	2366	1872	2348	2492	2047	2598	2492	2691
Emergency stop torque ^{a) b)} (permitted 1000 times during the service life of the gearbox)			<i>T</i> _{2Not}	<i>Nm</i>	625	625	625	625	625	625	625	625	625
				<i>in.lb</i>	5532	5532	5532	5532	5532	5532	5532	5532	5532
Permitted average input speed (at <i>T</i> _{2N} and 20 °C ambient temperature) ^{d)}			<i>n</i> _{1N}	<i>rpm</i>	2800	2800	2800	2800	2800	2800	2800	2800	3100
Max. input speed			<i>n</i> _{1Max}	<i>rpm</i>	7500	7500	7500	7500	7500	7500	7500	7500	7500
Mean no load running torque ^{b)} (at <i>n</i> _i = 3000 rpm and 20 °C gearbox temperature)			<i>T</i> ₀₁₂	<i>Nm</i>	1.2	1.0	1.1	0.90	0.80	0.84	0.60	0.59	0.50
				<i>in.lb</i>	10	8.9	9.9	8.0	7.1	7.4	5.3	5.2	4.4
Max. backlash			<i>j</i> _t	<i>arcmin</i>	Standard ≤ 3 / Reduced ≤ 1								
Torsional rigidity ^{b)}			<i>C</i> _{t21}	<i>Nm/arcmin</i>	81	81	70	83	80	54	82	76	80
				<i>in.lb/arcmin</i>	717	717	620	735	708	478	726	673	708
Tilting rigidity			<i>C</i> _{2K}	<i>Nm/arcmin</i>	550								
				<i>in.lb/arcmin</i>	4868								
Max. axial force ^{c)}			<i>F</i> _{2AMax}	<i>N</i>	4800								
				<i>lb_f</i>	1080								
Max. tilting moment			<i>M</i> _{2KMax}	<i>Nm</i>	440								
				<i>in.lb</i>	3894								
Efficiency at full load			<i>η</i>	%	94								
Service life ^{f)}			<i>L</i> _h	<i>h</i>	> 20000								
Weight (incl. standard adapter plate)			<i>m</i>	<i>kg</i>	6.7								
				<i>lb_m</i>	14.8								
Operating noise (at reference ratio and reference speed – ratio-specific values available in cymex®)			<i>L</i> _{PA}	<i>dB(A)</i>	≤ 58								
Max. permitted housing temperature				°C	+90								
				<i>F</i>	194								
Ambient temperature				°C	–15 to +40								
				<i>F</i>	5 to 104								
Lubrication					Lubricated for life								
Direction of rotation					In- and output same direction								
Protection class					IP 65								
Metal bellows coupling (recommended product type – validate sizing with cymex®)					-								
				<i>mm</i>	-								
Mass moment of inertia (relates to the drive) Clamping hub diameter [mm] Optimized mass inertia version available on request	C	14	<i>J</i> _i	<i>kgcm²</i>	0.66	0.55	0.60	0.53	0.44	0.55	0.43	0.38	0.38
				<i>10⁻³ in.lb.s²</i>	0.58	0.48	0.53	0.47	0.39	0.49	0.38	0.34	0.33
	E	19	<i>J</i> _i	<i>kgcm²</i>	0.83	0.71	0.77	0.70	0.61	0.72	0.60	0.55	0.55
				<i>10⁻³ in.lb.s²</i>	0.73	0.63	0.68	0.62	0.54	0.64	0.53	0.49	0.48
	G	24	<i>J</i> _i	<i>kgcm²</i>	2.20	2.08	2.14	2.07	1.98	2.09	1.97	1.92	1.92
				<i>10⁻³ in.lb.s²</i>	1.95	1.84	1.89	1.83	1.75	1.85	1.74	1.70	1.70
	H	28	<i>J</i> _i	<i>kgcm²</i>	2.00	1.91	1.96	1.89	1.82	1.85	1.81	1.76	1.76
				<i>10⁻³ in.lb.s²</i>	1.77	1.69	1.73	1.67	1.61	1.64	1.60	1.56	1.56

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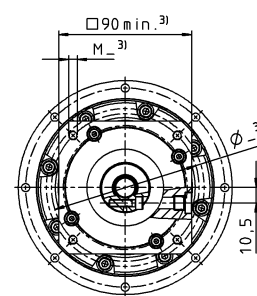
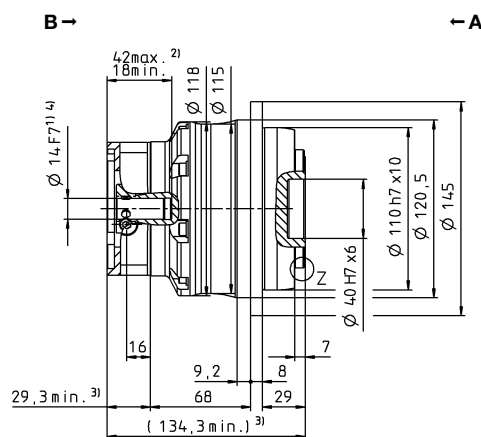
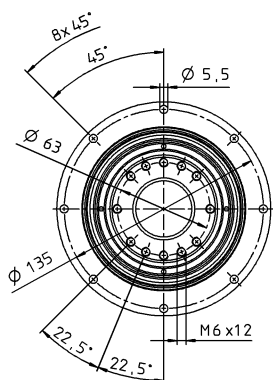
- ^{a)} At max. 10 % M_{2KMax}
^{b)} Valid for standard clamping hub diameter
^{c)} Refers to center of the output shaft or flange
^{d)} Please reduce input speed at higher ambient temperatures
^{f)} Please contact us to discuss application-specific service lifetimes

View A

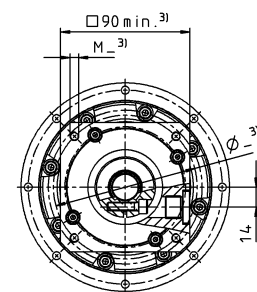
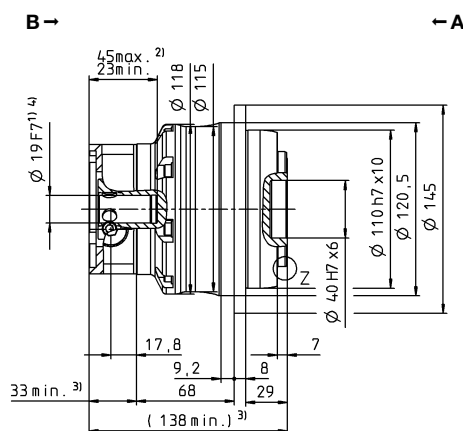
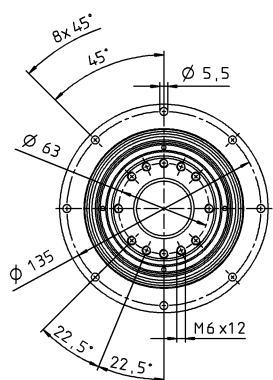
View B

2-stage

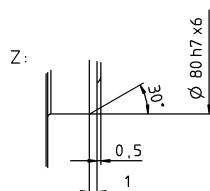
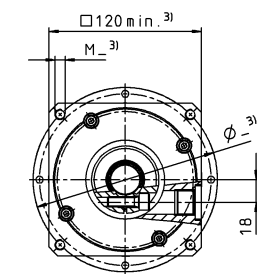
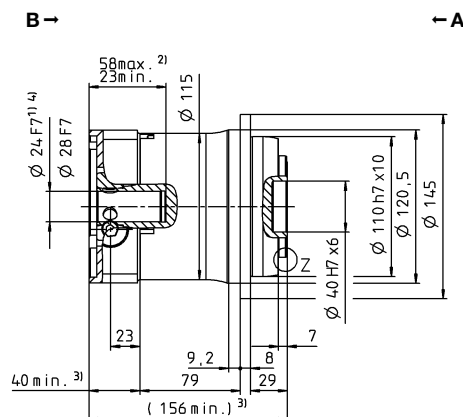
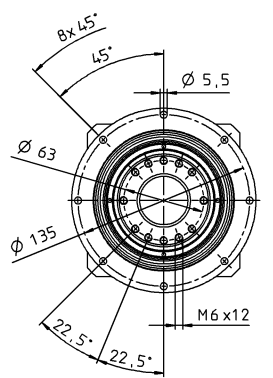
up to 14⁴⁾ (C)
clamping hub
diameter



up to 19⁴⁾ (E)⁵⁾
clamping hub
diameter



up to 24/28⁴⁾
(G/H) clamping
hub diameter



Non-tolerated dimensions are nominal dimensions

¹⁾ Check motor shaft fit

²⁾ Min./Max. permissible motor shaft length. Longer motor shafts are possible, please contact alpha.

³⁾ The dimensions depend on the motor

⁴⁾ Smaller motor shaft diameter is compensated by a bushing with a minimum wall thickness of 1 mm

⁵⁾ Standard clamping hub diameter

Motor shaft diameter [mm]

DP+

MF

Application-spec.
solutions

DP+ 050 MF 2-stage

				2-stage									
Ratio			<i>i</i>		16	20	21	25	28	31	35	40	50
Max. torque ^{a) b)}			<i>T</i> _{2a}	<i>Nm</i>	825	825	660	825	825	682	825	825	825
				<i>in.lb</i>	7302	7302	5842	7302	7302	6036	7302	7302	7302
Max. acceleration torque ^{b)} (max. 1000 cycles per hour)			<i>T</i> _{2B}	<i>Nm</i>	825	825	660	825	825	682	825	825	825
				<i>in.lb</i>	7302	7302	5842	7302	7302	6036	7302	7302	7302
Nominal torque (at <i>n</i> _n)			<i>T</i> _{2N}	<i>Nm</i>	461	493	393	489	545	431	541	607	585
				<i>in.lb</i>	4078	4361	2476	4332	4824	3812	4792	5370	5179
Emergency stop torque ^{a) b)} (permitted 1000 times during the service life of the gearbox)			<i>T</i> _{2Not}	<i>Nm</i>	1250	1250	1250	1250	1250	1250	1250	1250	1250
				<i>in.lb</i>	11064	11064	11064	11064	11064	11064	11064	11064	11064
Permitted average input speed (at <i>T</i> _{2N} and 20 °C ambient temperature) ^{d)}			<i>n</i> _{1N}	<i>rpm</i>	2900	2900	2900	2900	2900	2900	2900	2900	3200
Max. input speed			<i>n</i> _{1Max}	<i>rpm</i>	6250	6250	6250	6250	6250	6250	6250	6250	6250
Mean no load running torque ^{b)} (at <i>n</i> _i = 3000 rpm and 20 °C gearbox temperature)			<i>T</i> ₀₁₂	<i>Nm</i>	2.8	2.4	2.2	2.6	2.0	1.9	1.5	1.5	1.2
				<i>in.lb</i>	25	22	20	23	17	17	14	13	11
Max. backlash			<i>j</i> _t	<i>arcmin</i>	Standard ≤ 3 / Reduced ≤ 1								
Torsional rigidity ^{b)}			<i>C</i> ₁₂₁	<i>Nm/arcmin</i>	180	185	145	180	180	130	175	175	175
				<i>in.lb/arcmin</i>	1593	1637	1283	1593	1593	1151	1549	1549	1549
Tilting rigidity			<i>C</i> _{2K}	<i>Nm/arcmin</i>	560								
				<i>in.lb/arcmin</i>	4956								
Max. axial force ^{c)}			<i>F</i> _{2AMax}	<i>N</i>	6130								
				<i>lb_f</i>	1379								
Max. tilting moment			<i>M</i> _{2KMax}	<i>Nm</i>	1379								
				<i>in.lb</i>	11816								
Efficiency at full load			<i>η</i>	%	94								
Service life ^{f)}			<i>L</i> _h	<i>h</i>	> 20000								
Weight (incl. standard adapter plate)			<i>m</i>	<i>kg</i>	14.1								
				<i>lb_m</i>	31.2								
Operating noise (at reference ratio and reference speed – ratio-specific values available in cymex [®])			<i>L</i> _{PA}	<i>dB(A)</i>	≤ 60								
Max. permitted housing temperature				°C	+90								
				<i>F</i>	194								
Ambient temperature				°C	−15 to +40								
				<i>F</i>	5 to 104								
Lubrication					Lubricated for life								
Direction of rotation					In- and output same direction								
Protection class					IP 65								
Metal bellows coupling (recommended product type – validate sizing with cymex [®])					-								
Bore diameter of coupling on the application side				<i>mm</i>	-								
Mass moment of inertia (relates to the drive) Clamping hub diameter [mm] Optimized mass inertia version available on request	E	19	<i>J</i> _i	<i>kgcm²</i>	2.53	2.08	2.30	2.01	1.67	2.12	1.64	1.44	1.42
				<i>10⁻³ in.lb.s²</i>	2.24	1.84	2.04	1.78	1.48	1.88	1.45	1.27	1.26
	G	24	<i>J</i> _i	<i>kgcm²</i>	3.22	2.77	2.99	2.70	2.37	2.81	2.33	2.13	2.12
				<i>10⁻³ in.lb.s²</i>	2.85	2.45	2.65	2.39	2.10	2.49	2.06	1.89	1.88
	K	38	<i>J</i> _i	<i>kgcm²</i>	10.3	9.83	10.1	9.77	9.43	9.88	9.40	9.20	9.18
				<i>10⁻³ in.lb.s²</i>	9.12	8.70	8.94	8.65	8.35	8.74	8.32	8.14	8.12

Please use our sizing software cymex[®] for a detailed sizing – www.wittenstein-cymex.com

^{a)} At max. 10 % M_{2KMax}

^{b)} Valid for standard clamping hub diameter

^{c)} Refers to center of the output shaft or flange

^{d)} Please reduce input speed at higher ambient temperatures

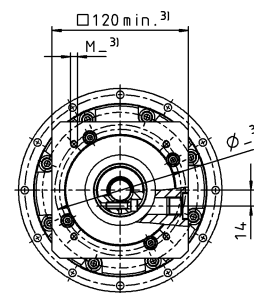
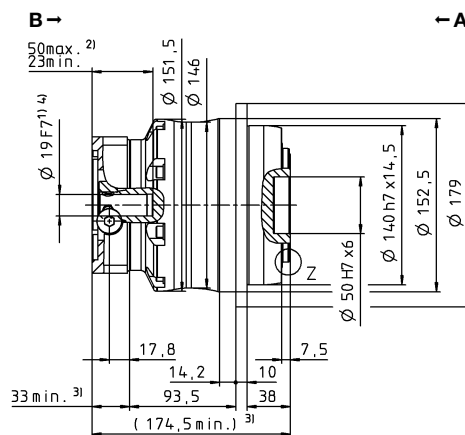
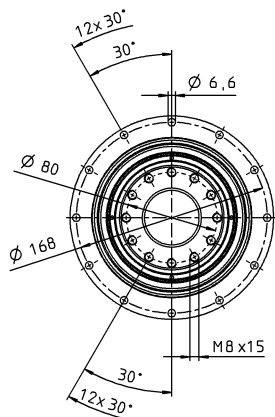
^{f)} Please contact us to discuss
application-specific service lifetimes

View A

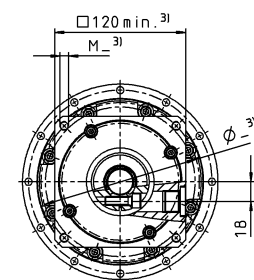
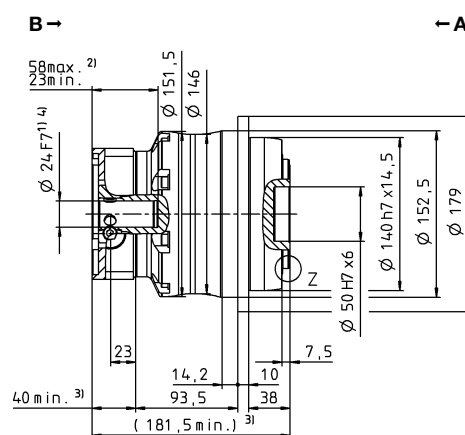
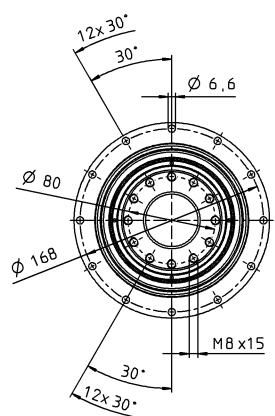
View B

2-stage

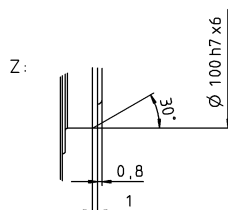
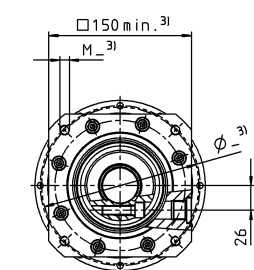
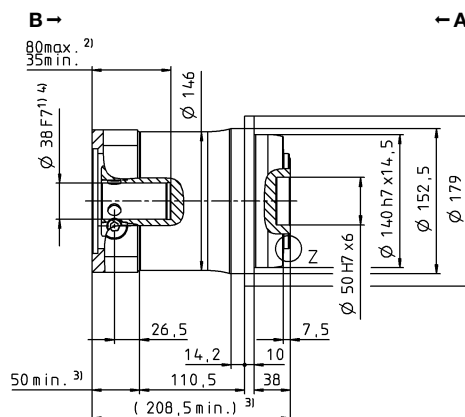
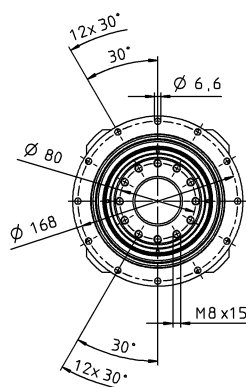
up to 19⁴⁾ (E)
clamping hub
diameter



up to 24⁴⁾ (G)⁵⁾
clamping hub
diameter



up to 38⁴⁾ (K)
clamping hub
diameter



Non-tolerated dimensions are nominal dimensions

¹⁾ Check motor shaft fit

²⁾ Min./Max. permissible motor shaft length. Longer motor shafts are possible, please contact alpha.

³⁾ The dimensions depend on the motor

⁴⁾ Smaller motor shaft diameter is compensated by a bushing with a minimum wall thickness of 1 mm

⁵⁾ Standard clamping hub diameter

DP+ 010 MA 2-stage

				2-stage				
Ratio			<i>i</i>		22	27.5	38.5	55
Max. torque ^{a) b)}			<i>T</i> _{2a}	<i>Nm</i>	315	315	315	315
				<i>in.lb</i>	2788	2788	2788	2788
Max. acceleration torque ^{b)} (max. 1000 cycles per hour)			<i>T</i> _{2B}	<i>Nm</i>	230	230	230	230
				<i>in.lb</i>	2036	2036	2036	2036
Nominal torque (at <i>n</i> _n)			<i>T</i> _{2N}	<i>Nm</i>	140	137	139	147
				<i>in.lb</i>	1242	1213	1230	1303
Emergency stop torque ^{a) b)} (permitted 1000 times during the service life of the gearbox)			<i>T</i> _{2Not}	<i>Nm</i>	525	525	525	525
				<i>in.lb</i>	4647	4647	4647	4647
Permitted average input speed (at <i>T</i> _{2N} and 20 °C ambient temperature) ^{d)}			<i>n</i> _{1N}	<i>rpm</i>	4000	4000	4000	4000
Max. input speed			<i>n</i> _{1Max}	<i>rpm</i>	7500	7500	7500	7500
Mean no load running torque ^{b)} (at <i>n</i> _i = 3000 rpm and 20 °C gearbox temperature)			<i>T</i> ₀₁₂	<i>Nm</i>	0.52	0.47	0.41	0.38
				<i>in.lb</i>	4.6	4.2	4.0	3.4
Max. backlash			<i>j</i> _t	<i>arcmin</i>	≤ 1			
Torsional rigidity ^{b)}			<i>C</i> _{t21}	<i>Nm/arcmin</i>	43	43	43	42
				<i>in.lb/arcmin</i>	381	381	381	372
Tilting rigidity			<i>C</i> _{2K}	<i>Nm/arcmin</i>	225			
				<i>in.lb/arcmin</i>	1991			
Max. axial force ^{c)}			<i>F</i> _{2AMax}	<i>N</i>	2795			
				<i>lb_f</i>	629			
Max. tilting moment			<i>M</i> _{2KMax}	<i>Nm</i>	400			
				<i>in.lb</i>	3540			
Efficiency at full load			<i>η</i>	%	94			
Service life ^{f)}			<i>L</i> _h	<i>h</i>	> 20000			
Weight (incl. standard adapter plate)			<i>m</i>	<i>kg</i>	3.2			
				<i>lb_m</i>	7.1			
Operating noise (at reference ratio and reference speed – ratio-specific values available in cymex®)			<i>L</i> _{PA}	<i>dB(A)</i>	≤ 56			
Max. permitted housing temperature				°C	+90			
				<i>F</i>	194			
Ambient temperature				°C	–15 to +40			
				<i>F</i>	5 to 104			
Lubrication					Lubricated for life			
Direction of rotation					In- and output same direction			
Protection class					IP 65			
Metal bellows coupling (recommended product type – validate sizing with cymex®)					-			
Bore diameter of coupling on the application side				<i>mm</i>	-			
Mass moment of inertia (relates to the drive) Clamping hub diameter [mm] Optimized mass inertia version available on request	C	14	<i>J</i> _i	<i>kgcm</i> ²	0.21	0.18	0.16	0.14
				<i>10⁻³ in.lb.s</i> ²	0.19	0.16	0.14	0.12
	E	19	<i>J</i> _i	<i>kgcm</i> ²	0.52	0.50	0.47	0.46
				<i>10⁻³ in.lb.s</i> ²	0.46	0.44	0.42	0.41

Please use our sizing software cymex[®] for a detailed sizing – www.wittenstein-cymex.com

^{a)} At max. 10 % M_{2KMax}

^{b)} Valid for standard clamping hub diameter

^{c)} Refers to center of the output shaft or flange

^{d)} Please reduce input speed at higher ambient temperatures

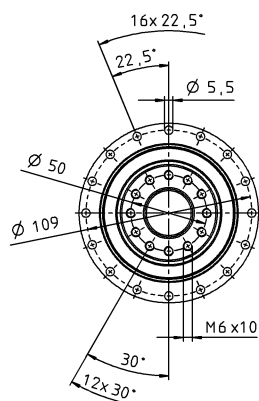
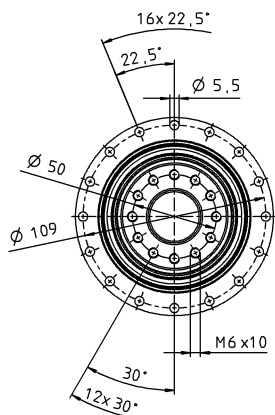
^{f)} Please contact us to discuss
application-specific service lifetimes

View A

View B

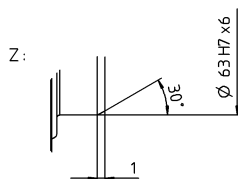
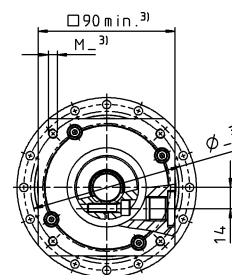
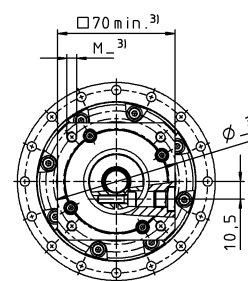
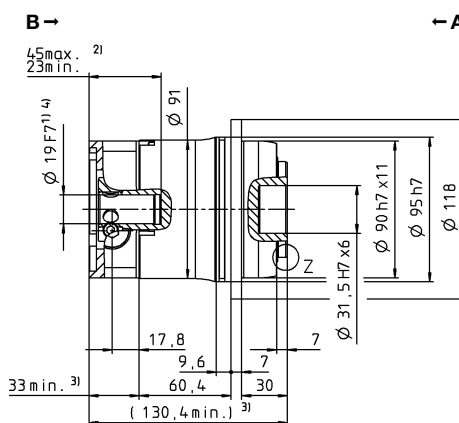
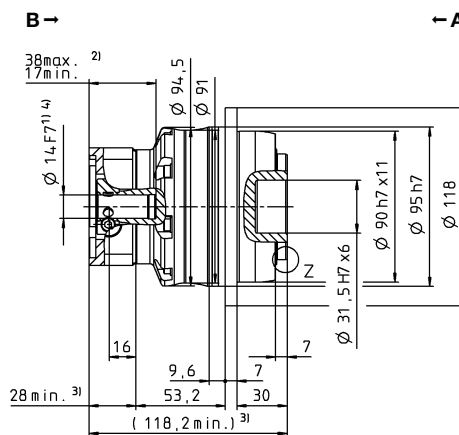
2-stage

up to 14⁴⁾ (C)⁵⁾
clamping hub
diameter



Motor shaft diameter [mm]

up to 19⁴⁾ (E)
clamping hub
diameter



Non-tolerated dimensions are nominal dimensions

¹⁾ Check motor shaft fit

²⁾ Min./Max. permissible motor shaft length. Longer motor shafts are possible, please contact alpha.

³⁾ The dimensions depend on the motor

⁴⁾ Smaller motor shaft diameter is compensated by a bushing with a minimum wall thickness of 1 mm

⁵⁾ Standard clamping hub diameter

DP+ 025 MA 2-stage

				2-stage			
Ratio	<i>i</i>			22	27.5	38.5	55
Max. torque ^{a) b)}	T_{2a}	Nm		583	583	583	583
		in.lb		5160	5160	5160	5160
Max. acceleration torque ^{b)} (max. 1000 cycles per hour)	T_{2B}	Nm		530	530	530	530
		in.lb		4691	4691	4691	4691
Nominal torque (at n_n)	T_{2N}	Nm		312	314	371	413
		in.lb		2762	2775	3286	3652
Emergency stop torque ^{a) b)} (permitted 1000 times during the service life of the gearbox)	T_{2Not}	Nm		1200	1200	1200	1200
		in.lb		10621	10621	10621	10621
Permitted average input speed (at T_{2N} and 20 °C ambient temperature) ^{d)}	n_{1N}	rpm		3500	3500	3500	3500
Max. input speed	n_{1Max}	rpm		7500	7500	7500	7500
Mean no load running torque ^{b)} (at $n_i = 3000$ rpm and 20 °C gearbox temperature)	T_{012}	Nm		1.0	0.87	0.78	0.70
		in.lb		9.2	7.7	6.9	6.2
Max. backlash	j_t	arcmin		≤ 1			
Torsional rigidity ^{b)}	C_{t21}	Nm/arcmin		105	105	105	100
		in.lb/arcmin		929	929	929	885
Tilting rigidity	C_{2K}	Nm/arcmin		550			
		in.lb/arcmin		4868			
Max. axial force ^{c)}	F_{2AMax}	N		4800			
		lb _f		1080			
Max. tilting moment	M_{2KMax}	Nm		550			
		in.lb		4868			
Efficiency at full load	η	%		94			
Service life ^{f)}	L_h	h		> 20000			
Weight (incl. standard adapter plate)	m	kg		5.6			
		lb _m		12.4			
Operating noise (at reference ratio and reference speed – ratio-specific values available in cymex [®])	L_{PA}	dB(A)		≤ 58			
Max. permitted housing temperature		°C		+90			
		F		194			
Ambient temperature		°C		–15 to +40			
		F		5 to 104			
Lubrication				Lubricated for life			
Direction of rotation				In- and output same direction			
Protection class				IP 65			
Metal bellows coupling (recommended product type – validate sizing with cymex [®])				-			
Bore diameter of coupling on the application side		mm		-			
Mass moment of inertia (relates to the drive) Clamping hub diameter [mm] Optimized mass inertia version available on request	E 19	J_1	kgcm ²	0.87	0.70	0.60	0.55
			10 ⁻³ in.lb.s ²	0.77	0.62	0.53	0.49
	G 24	J_1	kgcm ²	2.39	2.22	2.12	2.07
			10 ⁻³ in.lb.s ²	2.12	1.96	1.88	1.83

Please use our sizing software cymex[®] for a detailed sizing – www.wittenstein-cymex.com

^{a)} At max. 10 % M_{2KMax}

^{b)} Valid for standard clamping hub diameter

^{c)} Refers to center of the output shaft or flange

^{d)} Please reduce input speed at higher ambient temperatures

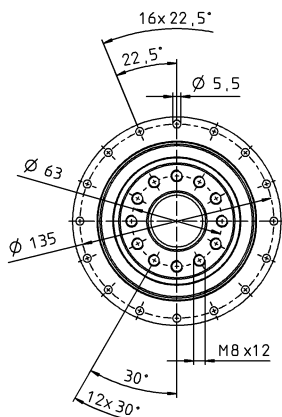
^{f)} Please contact us to discuss
application-specific service lifetimes

View A

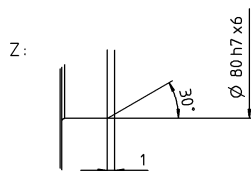
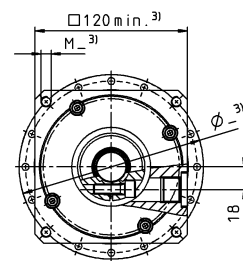
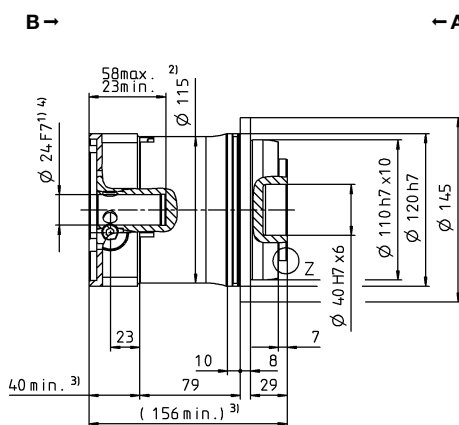
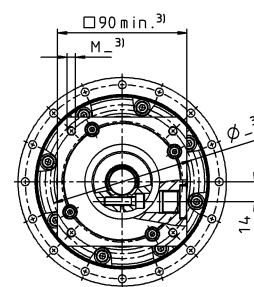
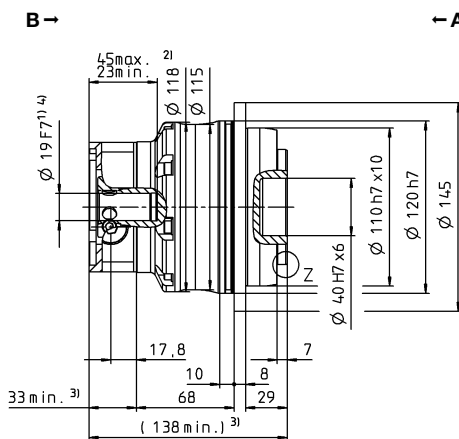
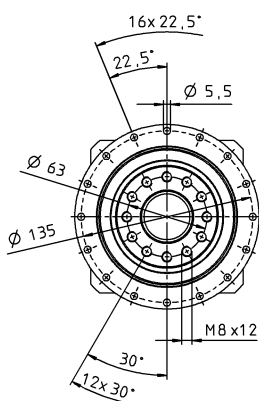
View B

2-stage

up to 19⁴⁾ (E)⁵⁾
clamping hub
diameter



up to 24⁴⁾ (G)
clamping hub
diameter



Non-tolerated dimensions are nominal dimensions

¹⁾ Check motor shaft fit

²⁾ Min./Max. permissible motor shaft length. Longer motor shafts are possible, please contact alpha.

³⁾ The dimensions depend on the motor

⁴⁾ Smaller motor shaft diameter is compensated by a bushing with a minimum wall thickness of 1 mm

⁵⁾ Standard clamping hub diameter

DP+ 050 MA 2-stage

				2-stage				
Ratio			<i>i</i>		22	27.5	38.5	55
Max. torque ^{a) b)}			<i>T</i> _{2a}	<i>Nm</i>	1402	1402	1402	1402
				<i>in.lb</i>	12406	12406	12406	12406
Max. acceleration torque ^{b)} (max. 1000 cycles per hour)			<i>T</i> _{2B}	<i>Nm</i>	992	992	992	992
				<i>in.lb</i>	8780	8780	8780	8780
Nominal torque (at <i>n</i> _n)			<i>T</i> _{2N}	<i>Nm</i>	523	566	638	717
				<i>in.lb</i>	4632	5005	5649	6348
Emergency stop torque ^{a) b)} (permitted 1000 times during the service life of the gearbox)			<i>T</i> _{2Not}	<i>Nm</i>	2375	2375	2375	2375
				<i>in.lb</i>	21021	21021	21021	21021
Permitted average input speed (at <i>T</i> _{2N} and 20 °C ambient temperature) ^{d)}			<i>n</i> _{1N}	<i>rpm</i>	3000	3000	3000	3000
Max. input speed			<i>n</i> _{1Max}	<i>rpm</i>	6250	6250	6250	6250
Mean no load running torque ^{b)} (at <i>n</i> _i = 3000 rpm and 20 °C gearbox temperature)			<i>T</i> ₀₁₂	<i>Nm</i>	2.7	2.4	2.1	1.7
				<i>in.lb</i>	23.9	21.2	18.9	15.0
Max. backlash			<i>j</i> _t	<i>arcmin</i>	≤ 1			
Torsional rigidity ^{b)}			<i>C</i> _{t21}	<i>Nm/arcmin</i>	220	220	220	220
				<i>in.lb/arcmin</i>	1947	1947	1947	1947
Tilting rigidity			<i>C</i> _{2K}	<i>Nm/arcmin</i>	560			
				<i>in.lb/arcmin</i>	4956			
Max. axial force ^{c)}			<i>F</i> _{2AMax}	<i>N</i>	6130			
				<i>lb_f</i>	1379			
Max. tilting moment			<i>M</i> _{2KMax}	<i>Nm</i>	1335			
				<i>in.lb</i>	11816			
Efficiency at full load			<i>η</i>	%	94			
Service life ^{f)}			<i>L</i> _h	<i>h</i>	> 20000			
Weight (incl. standard adapter plate)			<i>m</i>	<i>kg</i>	12.5			
				<i>lb_m</i>	27.6			
Operating noise (at reference ratio and reference speed – ratio-specific values available in cymex®)			<i>L</i> _{PA}	<i>dB(A)</i>	≤ 60			
Max. permitted housing temperature				°C	+90			
				<i>F</i>	194			
Ambient temperature				°C	–15 to +40			
				<i>F</i>	5 to 104			
Lubrication					Lubricated for life			
Direction of rotation					In- and output same direction			
Protection class					IP 65			
Metal bellows coupling (recommended product type – validate sizing with cymex®)					-			
Bore diameter of coupling on the application side				<i>mm</i>	-			
Mass moment of inertia (relates to the drive) Clamping hub diameter [mm] Optimized mass inertia version available on request	G	24	<i>J</i> _i	<i>kgcm</i> ²	3.80	3.33	3.00	2.80
				<i>10⁻³ in.lb.s</i> ²	3.36	2.95	2.66	2.48
	K	38	<i>J</i> _i	<i>kgcm</i> ²	10.7	10.3	9.90	9.70
				<i>10⁻³ in.lb.s</i> ²	9.47	9.12	8.76	8.58

Please use our sizing software cymex[®] for a detailed sizing – www.wittenstein-cymex.com

^{a)} At max. 10 % M_{2KMax}

^{b)} Valid for standard clamping hub diameter

^{c)} Refers to center of the output shaft or flange

^{d)} Please reduce input speed at higher ambient temperatures

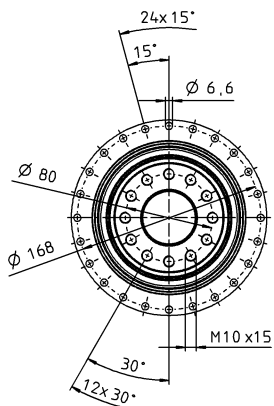
^{f)} Please contact us to discuss
application-specific service lifetimes

View A

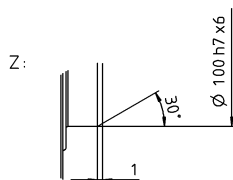
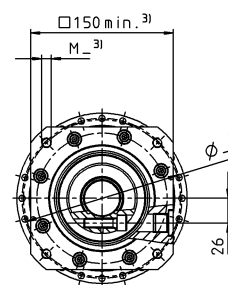
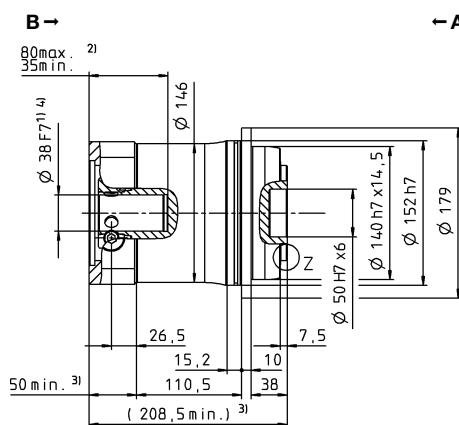
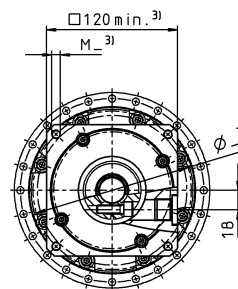
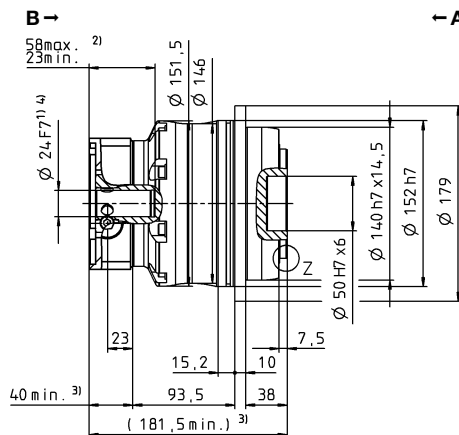
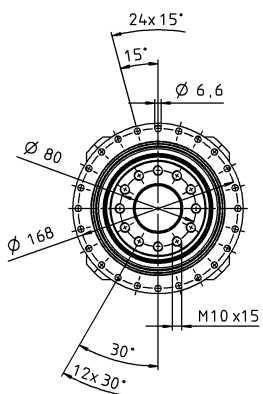
View B

2-stage

up to 24 ⁴⁾ (G) ⁵⁾
clamping hub
diameter



up to 38 ⁴⁾ (K)
clamping hub
diameter



Non-tolerated dimensions are nominal dimensions

¹⁾ Check motor shaft fit

²⁾ Min./Max. permissible motor shaft length. Longer motor shafts are possible, please contact alpha.

³⁾ The dimensions depend on the motor

⁴⁾ Smaller motor shaft diameter is compensated by a bushing with a minimum wall thickness of 1 mm

⁵⁾ Standard clamping hub diameter