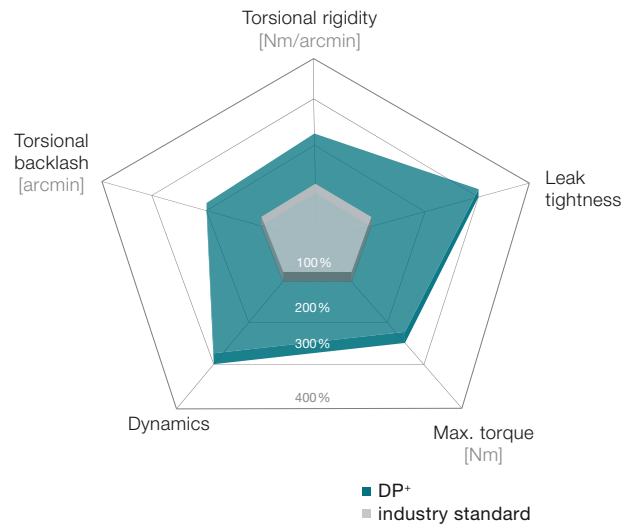# DP⁺ – The right solution for all requirements

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.

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

The DP⁺ compared to the industry standard

Torsional rigidity [Nm/arcmin]

Torsional backlash [arcmin]

Leak tightness

Dynamics

Max. torque [Nm]

100 %
200 %
300 %
400 %

■ DP⁺
■ industry standard

Dry area

DP⁺

premo® TP Line

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

💧 Spray area (close to the process)

DP⁺ (painted)

DP⁺ (unpainted)
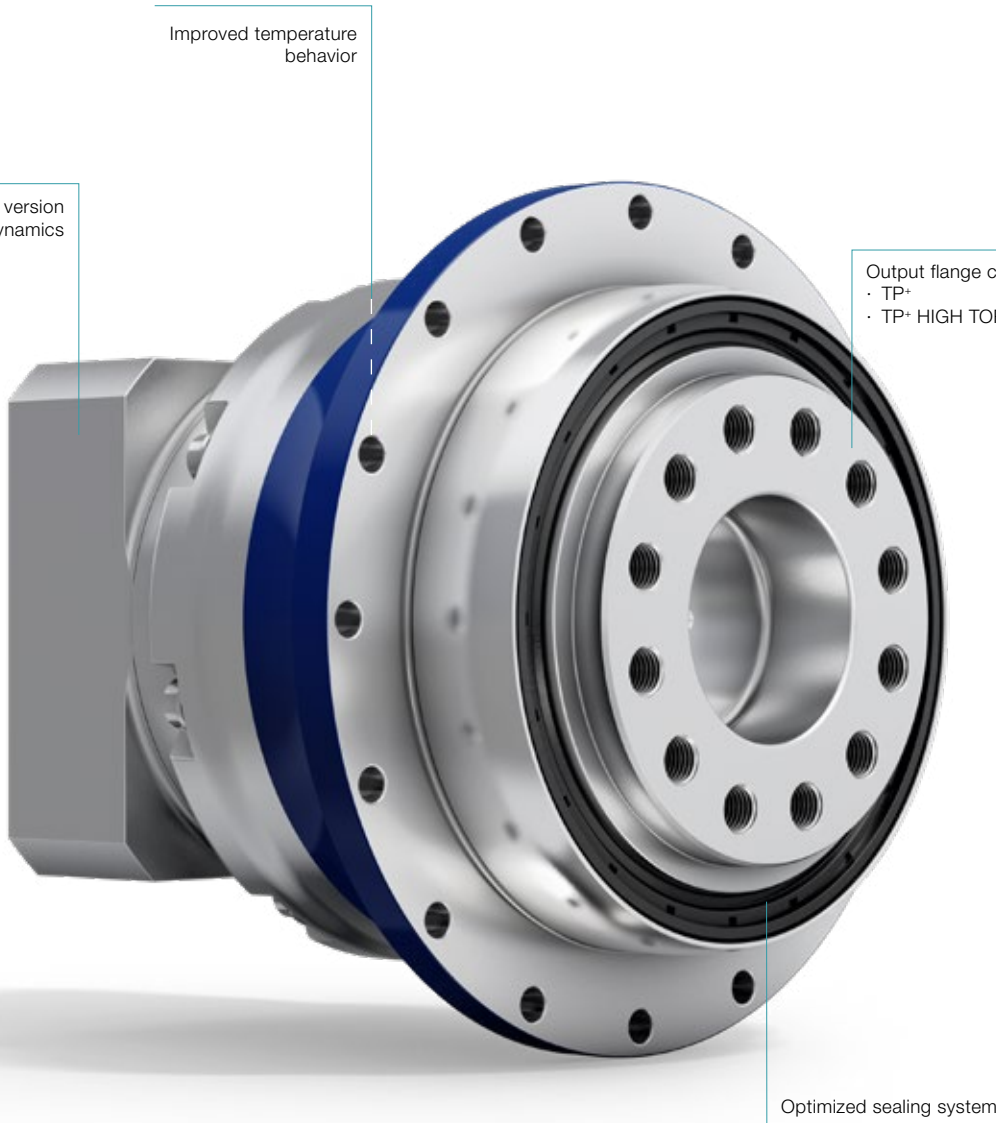
Fields of application: Pharmaceutical industry, Medical technology, Primary packaging without hygiene design requirements, Clean room…

Improved temperature behavior

Mass inertia optimized version for improved dynamics

Output flange compatible with:
· TP+
· TP+ HIGH TORQUE

Optimized sealing system

🌢🌢 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

Ratio	i		2-stage									
			16	**20**	**21**	**25**	**28**	**31**	**32**	**35**	**40**	**50**
Max. torque [a) b)]	$T_{2\alpha}$	Nm	57	57	60	72	57	50	57	72	57	72
		in.lb	507	507	533	634	507	442	507	634	507	634
Max. acceleration torque [b)] (max. 1000 cycles per hour)	T_{2B}	Nm	57	57	48	66	57	48	57	66	57	66
		in.lb	507	507	425	584	507	425	507	584	507	584
Nominal torque (at n_{1N})	T_{2N}	Nm	39	41	32	41	45	36	39	45	46	48
		in.lb	342	365	286	361	403	320	343	399	406	421
Emergency stop torque [a) b)] (permitted 1000 times during the service life of the gearbox)	T_{2Not}	Nm	100	100	100	100	100	100	100	100	100	100
		in.lb	885	885	885	885	885	885	885	885	885	885
Permitted average input speed (at T_{2N} and 20 °C ambient temperature) [d)]	n_{1N}	rpm	4000	4000	4000	4000	4000	4000	4000	4000	4000	4800
Max. input speed	n_{1Max}	rpm	7500	7500	7500	7500	7500	7500	7500	7500	7500	7500
Mean no load running torque [b)] (at n_1 = 3000 rpm and 20 °C gearbox temperature)	T_{012}	Nm	0.28	0.23	0.24	0.22	0.21	0.22	0.21	0.17	0.18	0.17
		in.lb	2.5	2.0	2.1	1.9	1.9	1.9	1.9	1.5	1.6	1.5
Max. backlash	j_t	arcmin	Standard ≤ 4 / Reduced ≤ 2									
Torsional rigidity [b)]	C_{t21}	Nm/arcmin	12	12	10	12	12	9	12	12	11	12
		in.lb/arcmin	106	106	89	106	106	80	106	106	97	106
Tilting rigidity	C_{2K}	Nm/arcmin	85									
		in.lb/arcmin	752									
Max. axial force [c)]	F_{2AMax}	N	2119									
		lb$_f$	477									
Max. tilting moment	M_{2KMax}	Nm	110									
		in.lb	974									
Efficiency at full load	η	%	94									
Service life	L_h	h	> 20000									
Weight (incl. standard adapter plate)	m	kg	1.5									
		lb$_m$	3.3									
Operating noise (at reference ratio and reference speed – ratio-specific values available in cymex®)	L_{PA}	dB(A)	≤ 54									
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)	B	11	J_1	kgcm²	0.078	0.070	0.074	0.068	0.062	0.072	0.062	0.061	0.057	0.057
Clamping hub diameter [mm]				10⁻³ in.lb.s²	0.069	0.062	0.065	0.060	0.055	0.064	0.055	0.054	0.050	0.050
Optimized mass inertia version available on request	C	14	J_1	kgcm²	0.17	0.17	0.17	0.16	0.16	0.17	0.16	0.16	0.15	0.15
				10⁻³ in.lb.s²	0.15	0.15	0.15	0.15	0.14	0.15	0.14	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
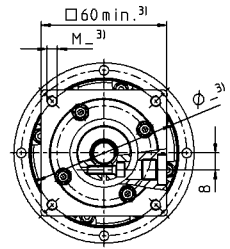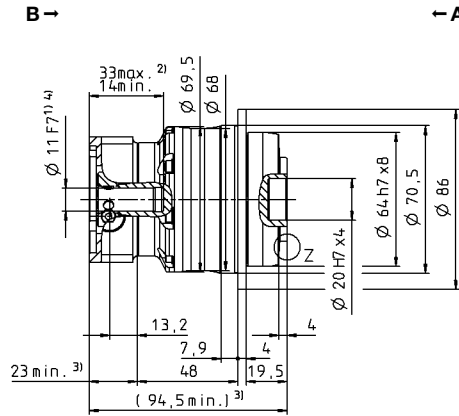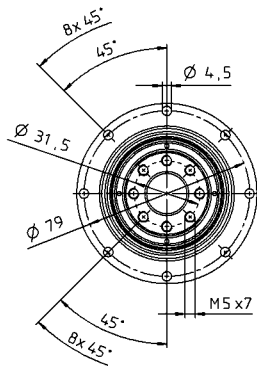[c)] Refers to center of the output shaft or flange
[d)] Please reduce input speed at higher ambient temperatures

WITTENSTEIN | alpha

2-stage

Motor shaft diameter [mm]
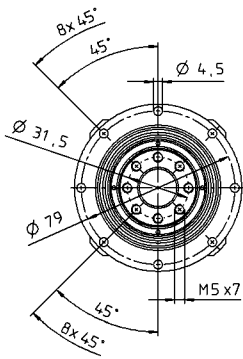
up to 11 [4] (B) [5]
clamping hub
diameter

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 thickness of 1 mm
[5] Standard clamping hub diameter

Application-spec. solutions

DP⁺

MF

DP⁺ 010 MF 2-stage

Ratio	i		2-stage									
			16	20	21	25	28	31	32	35	40	50
Max. torque [a) b)]	$T_{2\alpha}$	Nm	157	126	133	158	157	121	157	158	154	158
		in.lb	1392	1118	1174	1398	1392	1071	1392	1398	1363	1398
Max. acceleration torque [b)] (max. 1000 cycles per hour)	T_{2B}	Nm	157	126	120	158	157	121	157	158	154	158
		in.lb	1392	1113	1062	1398	1392	1071	1392	1398	1363	1398
Nominal torque (at n_{1N})	T_{2N}	Nm	106	101	96	124	107	87	119	126	112	126
		in.lb	935	895	850	1097	945	770	1053	1118	987	1118
Emergency stop torque [a) b)] (permitted 1000 times during the service life of the gearbox)	T_{2Not}	Nm	251	251	251	251	251	251	251	251	251	251
		in.lb	2222	2222	2222	2222	2222	2222	2222	2222	2222	2222
Permitted average input speed (at T_{2N} and 20 °C ambient temperature) [d)]	n_{1N}	rpm	3500	3500	3500	3500	3500	3500	3500	3500	3500	3800
Max. input speed	n_{1Max}	rpm	7500	7500	7500	7500	7500	7500	7500	7500	7500	7500
Mean no load running torque [b)] (at n_1 = 3000 rpm and 20 °C gearbox temperature)	T_{012}	Nm	0.56	0.48	0.47	0.44	0.40	0.40	0.40	0.28	0.32	0.32
		in.lb	5.0	4.2	4.2	3.9	3.5	3.5	3.5	2.5	2.8	2.8
Max. backlash	j_t	arcmin	Standard ≤ 3 / Reduced ≤ 1									
Torsional rigidity [b)]	C_{t21}	Nm/arcmin	32	32	26	32	31	24	31	32	30	30
		in.lb/arcmin	283	283	230	283	274	212	274	283	266	266
Tilting rigidity	C_{2K}	Nm/arcmin	225									
		in.lb/arcmin	1991									
Max. axial force [c)]	F_{2AMax}	N	2795									
		lb_f	629									
Max. tilting moment	M_{2KMax}	Nm	270									
		in.lb	2390									
Efficiency at full load	η	%	94									
Service life	L_h	h	> 20000									
Weight (incl. standard adapter plate)	m	kg	3.6									
		lb_m	8.0									
Operating noise (at reference ratio and reference speed – ratio-specific values available in cymex®)	L_{PA}	dB(A)	≤ 55									
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	B	11	J_1	kgcm²	0.17	0.14	0.15	0.13	0.11	0.14	0.11	0.10	0.09	0.09
				10⁻³ in.lb.s²	0.15	0.12	0.13	0.12	0.10	0.12	0.10	0.09	0.08	0.08
	C	14	J_1	kgcm²	0.24	0.21	0.22	0.20	0.18	0.21	0.18	0.18	0.17	0.17
				10⁻³ in.lb.s²	0.21	0.19	0.20	0.18	0.16	0.18	0.16	0.16	0.15	0.15
	E	19	J_1	kgcm²	0.56	0.53	0.55	0.53	0.51	0.53	0.51	0.50	0.49	0.49
				10⁻³ in.lb.s²	0.50	0.47	0.48	0.47	0.45	0.47	0.45	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
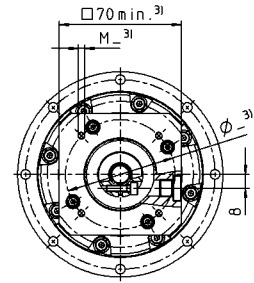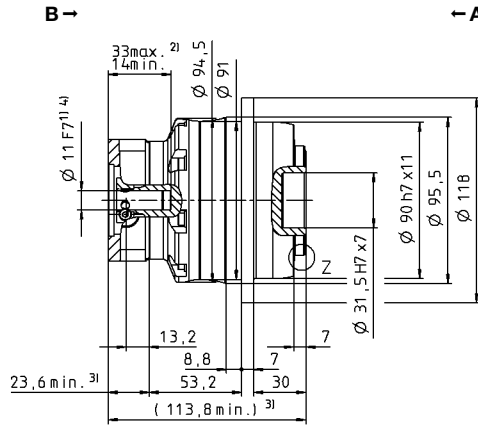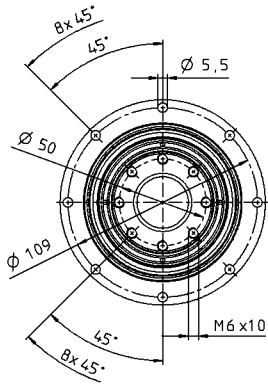c) Refers to center of the output shaft or flange
d) Please reduce input speed at higher ambient temperatures
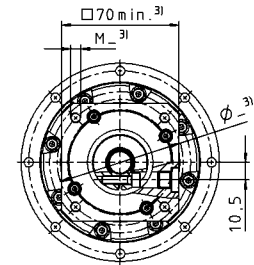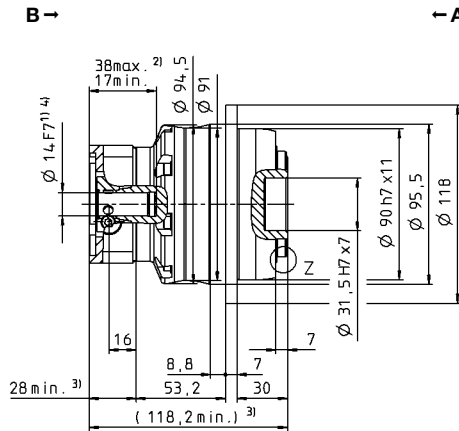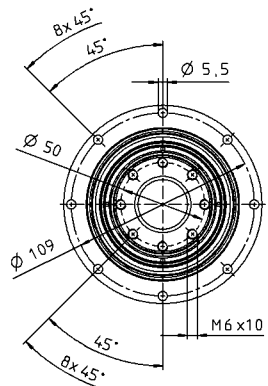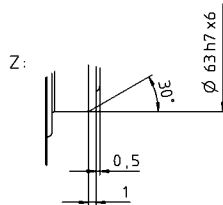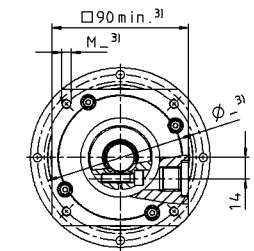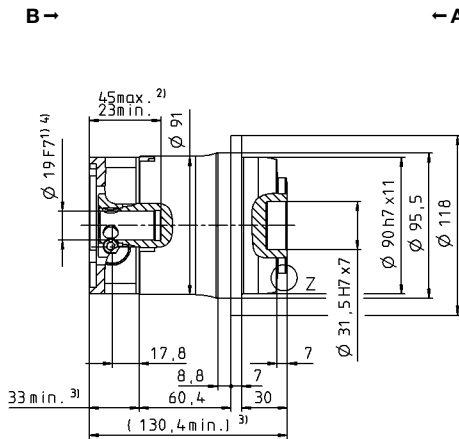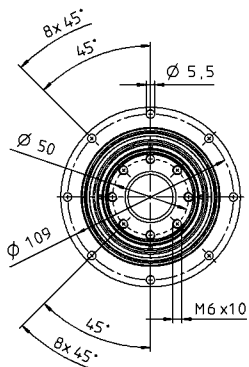
2-stage

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

up to 14 [4] (C) [5] clamping hub diameter

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

Motor shaft diameter [mm]

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 thickness of 1 mm
[5] Standard clamping hub diameter

Application-spec. solutions

DP+

MF

295

DP+ 025 MF 2-stage

Ratio	i		16	20	21	25	28	31	32	35	40	50
							2-stage					
Max. torque [a) b)]	$T_{2\alpha}$	Nm	352	352	352	380	352	352	352	380	352	380
		in.lb	3115	3115	3115	3363	3115	3115	3115	3363	3115	3363
Max. acceleration torque [b)] (max. 1000 cycles per hour)	T_{2B}	Nm	352	352	330	380	352	330	352	380	352	380
		in.lb	3115	3115	2921	3363	3115	2921	3115	3363	3115	3363
Nominal torque (at n_{1N})	T_{2N}	Nm	250	267	211	265	282	231	251	294	282	304
		in.lb	2213	2366	1872	2348	2492	2047	2220	2598	2492	2691
Emergency stop torque [a) b)] (permitted 1000 times during the service life of the gearbox)	T_{2Not}	Nm	625	625	625	625	625	625	625	625	625	625
		in.lb	5532	5532	5532	5532	5532	5532	5532	5532	5532	5532
Permitted average input speed (at T_{2N} and 20 °C ambient temperature) [d)]	n_{1N}	rpm	2800	2800	2800	2800	2800	2800	2800	2800	2800	3100
Max. input speed	n_{1Max}	rpm	7500	7500	7500	7500	7500	7500	7500	7500	7500	7500
Mean no load running torque [b)] (at n_1 = 3000 rpm and 20 °C gearbox temperature)	T_{012}	Nm	1.2	1.0	1.1	0.90	0.80	0.84	0.80	0.60	0.59	0.50
		in.lb	10	8.9	9.9	8.0	7.1	7.4	7.1	5.3	5.2	4.4
Max. backlash	j_t	arcmin	Standard ≤ 3 / Reduced ≤ 1									
Torsional rigidity [b)]	C_{t21}	Nm/arcmin	81	81	70	83	80	54	80	82	76	80
		in.lb/arcmin	717	717	620	735	708	478	708	726	673	708
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	440									
		in.lb	3894									
Efficiency at full load	η	%	94									
Service life	L_h	h	> 20000									
Weight (incl. standard adapter plate)	m	kg	6.7									
		lb_m	14.8									
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	C 14 J_1	kgcm²	0.66	0.55	0.60	0.53	0.44	0.55	0.44	0.43	0.38	0.38
		10^{-3} in.lb.s²	0.58	0.48	0.53	0.47	0.39	0.49	0.39	0.38	0.34	0.33
	E 19 J_1	kgcm²	0.83	0.71	0.77	0.70	0.61	0.72	0.61	0.60	0.55	0.55
		10^{-3} in.lb.s²	0.73	0.63	0.68	0.62	0.54	0.64	0.54	0.53	0.49	0.48
	G 24 J_1	kgcm²	2.20	2.08	2.14	2.07	1.98	2.09	1.98	1.97	1.92	1.92
		10^{-3} in.lb.s²	1.95	1.84	1.89	1.83	1.75	1.85	1.75	1.74	1.70	1.70
	H 28 J_1	kgcm²	2.00	1.91	1.96	1.89	1.82	1.85	1.89	1.81	1.76	1.76
		10^{-3} in.lb.s²	1.77	1.69	1.73	1.67	1.61	1.64	1.67	1.60	1.56	1.56

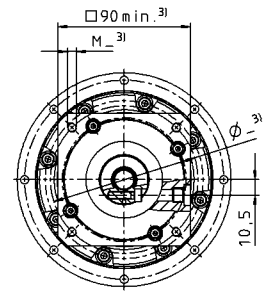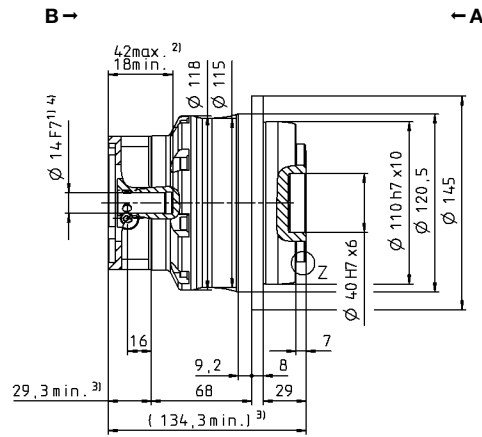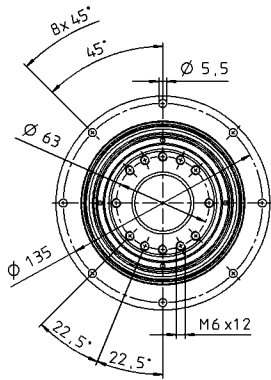Please use our sizing software cymex® for a detailed sizing – www.wittenstein-cymex.com

a) At max. 10 % M_{2KMax}
b) Valid for standard clamping hub diameter
c) Refers to center of the output shaft or flange
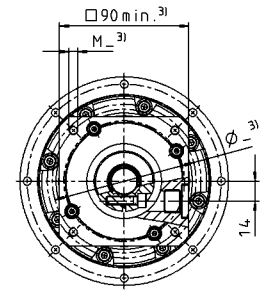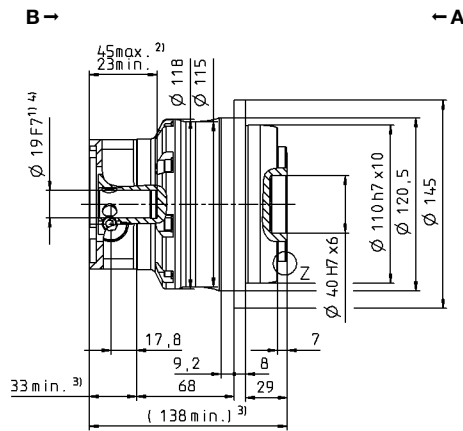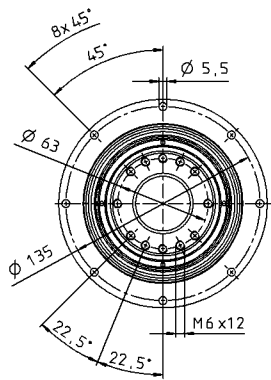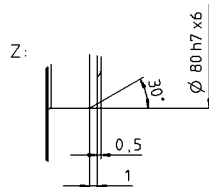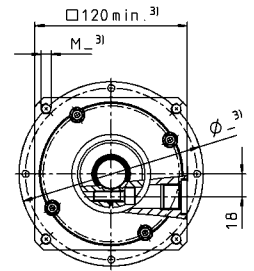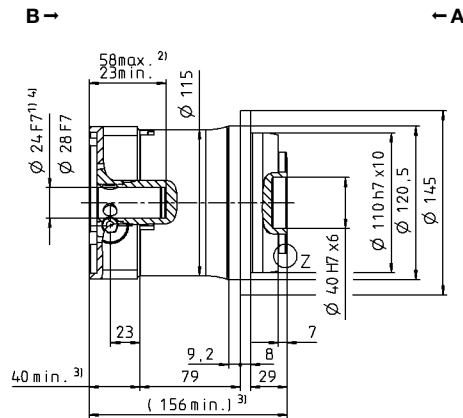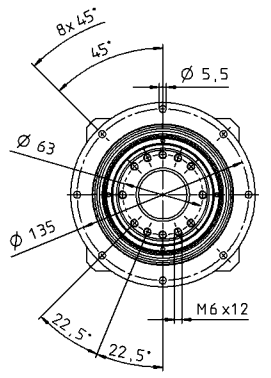d) Please reduce input speed at higher ambient temperatures

2-stage

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

up to 19 [4] (E) [5] clamping hub diameter

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

Motor shaft diameter [mm]

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 thickness of 1 mm
[5] Standard clamping hub diameter

Application-spec. solutions

DP+

MF

297

DP⁺ 050 MF 2-stage

Ratio	i		2-stage									
			16	20	21	25	28	31	32	35	40	50
Max. torque [a) b)]	$T_{2\alpha}$	Nm	825	825	660	825	825	682	825	825	825	825
		in.lb	7302	7302	5842	7302	7302	6036	7302	7302	7302	7302
Max. acceleration torque [b)] (max. 1000 cycles per hour)	T_{2B}	Nm	825	825	660	825	825	682	825	825	825	825
		in.lb	7302	7302	5842	7302	7302	6036	7302	7302	7302	7302
Nominal torque (at n_{1N})	T_{2N}	Nm	461	493	393	489	545	431	464	541	607	585
		in.lb	4078	4361	2476	4332	4824	3812	4104	4792	5370	5179
Emergency stop torque [a) b)] (permitted 1000 times during the service life of the gearbox)	T_{2Not}	Nm	1250	1250	1250	1250	1250	1250	1250	1250	1250	1250
		in.lb	11064	11064	11064	11064	11064	11064	11064	11064	11064	11064
Permitted average input speed (at T_{2N} and 20 °C ambient temperature) [d)]	n_{1N}	rpm	2900	2900	2900	2900	2900	2900	2900	2900	2900	3200
Max. input speed	n_{1Max}	rpm	6250	6250	6250	6250	6250	6250	6250	6250	6250	6250
Mean no load running torque [b)] (at n_1 = 3000 rpm and 20 °C gearbox temperature)	T_{012}	Nm	2.8	2.4	2.2	2.6	2.0	1.9	2.0	1.5	1.5	1.2
		in.lb	25	22	20	23	17	17	17	14	13	11
Max. backlash	j_t	arcmin	Standard ≤ 3 / Reduced ≤ 1									
Torsional rigidity [b)]	C_{t21}	Nm/arcmin	180	185	145	180	180	130	180	175	175	175
		in.lb/arcmin	1593	1637	1283	1593	1593	1151	1593	1549	1549	1549
Tilting rigidity	C_{2K}	Nm/arcmin	560									
		in.lb/arcmin	4956									
Max. axial force [c)]	F_{2AMax}	N	6130									
		lb_f	1379									
Max. tilting moment	M_{2KMax}	Nm	1379									
		in.lb	11816									
Efficiency at full load	η	%	94									
Service life	L_h	h	> 20000									
Weight (incl. standard adapter plate)	m	kg	14.1									
		lb_m	31.2									
Operating noise (at reference ratio and reference speed – ratio-specific values available in cymex®)	L_{PA}	dB(A)	≤ 60									
Max. permitted housing temperature		°C	+90									
		F	194									
Ambient temperature		°C	−15 to +40									
		F	5 to 104									
Lubrication			Lubricated for life									
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 kgcm²	2.53	2.08	2.30	2.01	1.67	2.12	1.67	1.64	1.44	1.42
		10^{-3} in.lb.s²	2.24	1.84	2.04	1.78	1.48	1.88	1.48	1.45	1.27	1.26
	G 24	J_1 kgcm²	3.22	2.77	2.99	2.70	2.37	2.81	2.37	2.33	2.13	2.12
		10^{-3} in.lb.s²	2.85	2.45	2.65	2.39	2.10	2.49	2.10	2.06	1.89	1.88
	K 38	J_1 kgcm²	10.3	9.83	10.1	9.77	9.43	9.88	9.43	9.40	9.20	9.18
		10^{-3} in.lb.s²	9.12	8.70	8.94	8.65	8.35	8.74	8.35	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
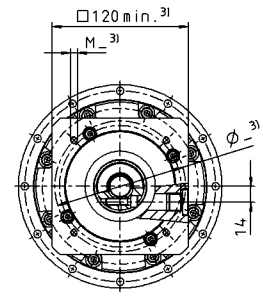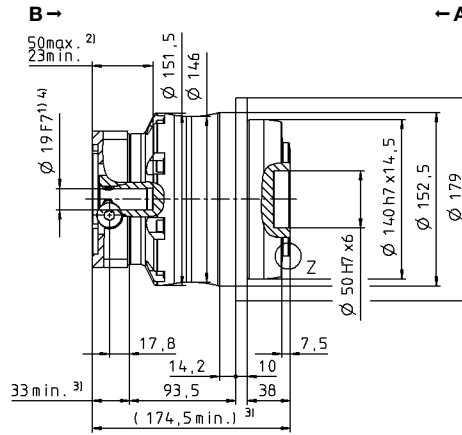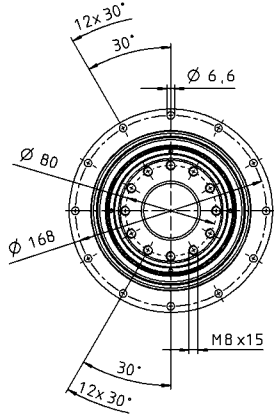[c)] Refers to center of the output shaft or flange
[d)] Please reduce input speed at higher ambient temperatures
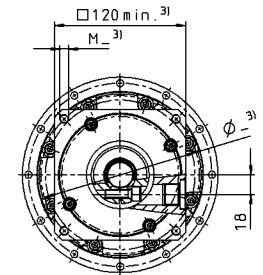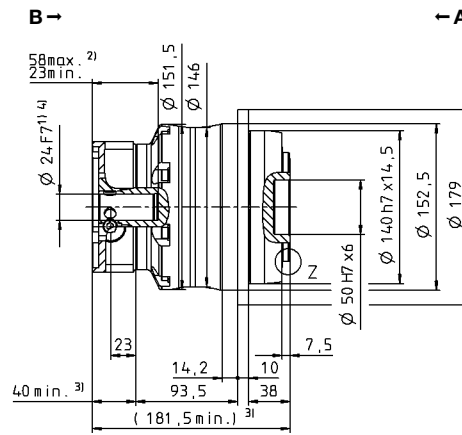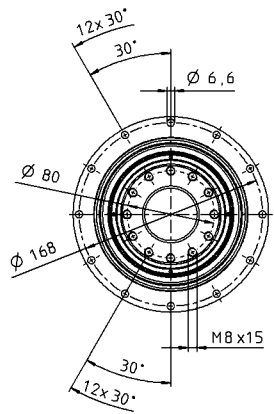
View A	View B

2-stage

Motor shaft diameter [mm]

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

12x30°
30°
Ø 6,6
Ø 80
Ø 168
M8x15
30°
12x30°

B→   ←A
50max. [2]
23min.
Ø 151,5
Ø 146
Ø 19 F7 [1] [4]
17,8
14,2   10
93,5   38
33min. [3]
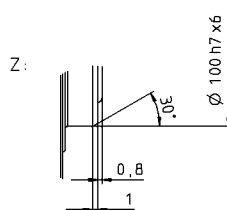(174,5min.) [3]
7,5
140 h7x14,5
Ø 152,5
Ø 179
Z
Ø 50 H7 x6

□120min. [3]
M_ [3]
Ø_ [3]
14

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

12x30°
30°
Ø 6,6
Ø 80
Ø 168
M8x15
30°
12x30°

B→   ←A
58max. [2]
23min.
Ø 151,5
Ø 146
Ø 24 F7 [1] [4]
23
14,2   10
93,5   38
40min. [3]
(181,5min.) [3]
7,5
140 h7x14,5
Ø 152,5
Ø 179
Z
Ø 50 H7 x6

□120min. [3]
M_ [3]
Ø_ [3]
18

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

12x30°
30°
Ø 6,6
Ø 80
Ø 168
M8x15
30°
12x30°

B→   ←A
80max. [2]
35min.
Ø 146
Ø 38 F7 [1] [4]
26,5
14,2   10
110,5   38
50min. [3]
(208,5min.) [3]
7,5
140 h7x14,5
Ø 152,5
Ø 179
Z
Ø 50 H7 x6

□150min. [3]
M_ [3]
Ø_ [3]
26

Z :
Ø 100 h7 x6
30°
0,8
1

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 thickness of 1 mm
[5] Standard clamping hub diameter

Application-spec. solutions

DP+

MF

299

Ratio	i		**2-stage**			
			22	**27.5**	**38.5**	**55**
Max. torque [a) b)]	$T_{2\alpha}$	Nm	315	315	315	315
		in.lb	2788	2788	2788	2788
Max. acceleration torque [b)] (max. 1000 cycles per hour)	T_{2B}	Nm	230	230	230	230
		in.lb	2036	2036	2036	2036
Nominal torque (at n_{1N})	T_{2N}	Nm	140	137	139	147
		in.lb	1242	1213	1230	1303
Emergency stop torque [a) b)] (permitted 1000 times during the service life of the gearbox)	T_{2Not}	Nm	525	525	525	525
		in.lb	4647	4647	4647	4647
Permitted average input speed (at T_{2N} and 20 °C ambient temperature) [d)]	n_{1N}	rpm	4000	4000	4000	4000
Max. input speed	n_{1Max}	rpm	7500	7500	7500	7500
Mean no load running torque [b)] (at n_1 = 3000 rpm and 20 °C gearbox temperature)	T_{012}	Nm	0.52	0.47	0.41	0.38
		in.lb	4.6	4.2	4.0	3.4
Max. backlash	j_t	arcmin	≤ 1			
Torsional rigidity [b)]	C_{t21}	Nm/arcmin	43	43	43	42
		in.lb/arcmin	381	381	381	372
Tilting rigidity	C_{2K}	Nm/arcmin	225			
		in.lb/arcmin	1991			
Max. axial force [c)]	F_{2AMax}	N	2795			
		lb$_f$	629			
Max. tilting moment	M_{2KMax}	Nm	400			
		in.lb	3540			
Efficiency at full load	η	%	94			
Service life	L_h	h	> 20000			
Weight (incl. standard adapter plate)	m	kg	3.2			
		lb$_m$	7.1			
Operating noise (at reference ratio and reference speed – ratio-specific values available in cymex®)	L_{PA}	dB(A)	≤ 56			
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)	C 14 J_1	kgcm²	0.21	0.18	0.16	0.14
		10⁻³ in.lb.s²	0.19	0.16	0.14	0.12
Clamping hub diameter [mm] Optimized mass inertia version available on request	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

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
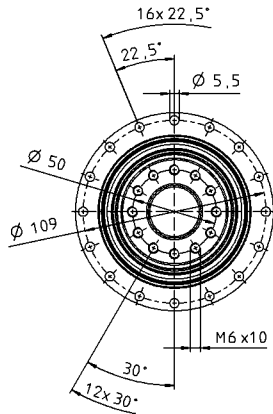[c)] Refers to center of the output shaft or flange
[d)] Please reduce input speed at higher ambient temperatures
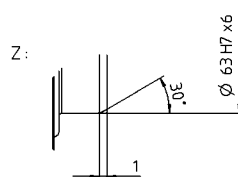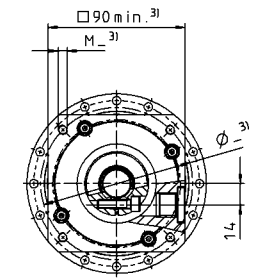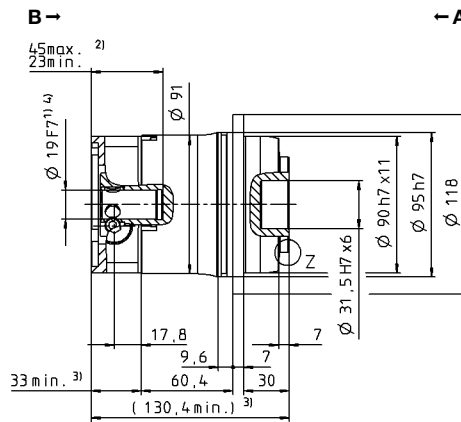
2-stage
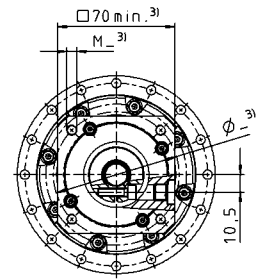
up to 14 [4] (C) [5]
clamping hub
diameter

Motor shaft diameter [mm]

up to 19 [4] (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 thickness of 1 mm
[5] Standard clamping hub diameter

301

DP+ 025 MA 2-stage

Ratio	i		2-stage			
			22	**27.5**	**38.5**	**55**
Max. torque [a) b)]	$T_{2\alpha}$	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_{1N})	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_1 = 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	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)	E	19	J_1	kgcm²	0.87	0.70	0.60	0.55
				10⁻³ in.lb.s²	0.77	0.62	0.53	0.49
Clamping hub diameter [mm] Optimized mass inertia version available on request	G	24	J_1	kgcm²	2.39	2.22	2.12	2.07
				10⁻³ in.lb.s²	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
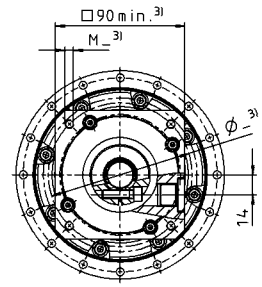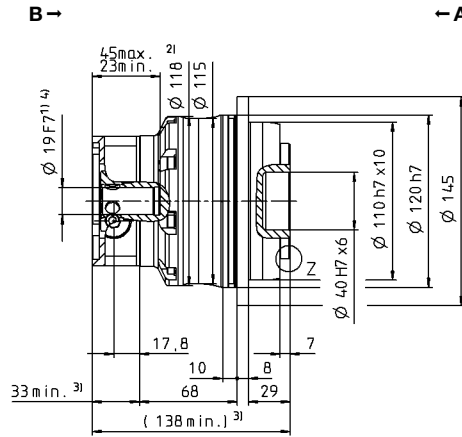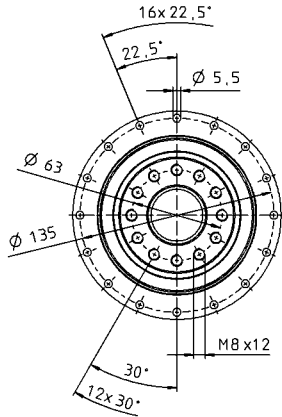c) Refers to center of the output shaft or flange
d) Please reduce input speed at higher ambient temperatures

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2-stage

Motor shaft diameter [mm]
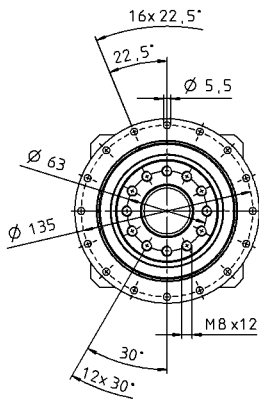
up to 19 [4] (E) [5]
clamping hub
diameter

up to 24 [4] (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 thickness of 1 mm
[5] Standard clamping hub diameter

Application-spec. solutions

DP+

MA

303

DP+ 050 MA 2-stage

Ratio	i		22	27.5	38.5	55
			2-stage			
Max. torque [a) b)]	$T_{2\alpha}$	Nm	1402	1402	1402	1402
		in.lb	12406	12406	12406	12406
Max. acceleration torque [b)] (max. 1000 cycles per hour)	T_{2B}	Nm	992	992	992	992
		in.lb	8780	8780	8780	8780
Nominal torque (at n_{1N})	T_{2N}	Nm	523	566	638	717
		in.lb	4632	5005	5649	6348
Emergency stop torque [a) b)] (permitted 1000 times during the service life of the gearbox)	T_{2Not}	Nm	2375	2375	2375	2375
		in.lb	21021	21021	21021	21021
Permitted average input speed (at T_{2N} and 20 °C ambient temperature) [d)]	n_{1N}	rpm	3000	3000	3000	3000
Max. input speed	n_{1Max}	rpm	6250	6250	6250	6250
Mean no load running torque [b)] (at n_1 = 3000 rpm and 20 °C gearbox temperature)	T_{012}	Nm	2.7	2.4	2.1	1.7
		in.lb	23.9	21.2	18.9	15.0
Max. backlash	j_t	arcmin	≤ 1			
Torsional rigidity [b)]	C_{t21}	Nm/arcmin	220	220	220	220
		in.lb/arcmin	1947	1947	1947	1947
Tilting rigidity	C_{2K}	Nm/arcmin	560			
		in.lb/arcmin	4956			
Max. axial force [c)]	F_{2AMax}	N	6130			
		lb$_f$	1379			
Max. tilting moment	M_{2KMax}	Nm	1335			
		in.lb	11816			
Efficiency at full load	η	%	94			
Service life	L_h	h	> 20000			
Weight (incl. standard adapter plate)	m	kg	12.5			
		lb$_m$	27.6			
Operating noise (at reference ratio and reference speed – ratio-specific values available in cymex®)	L_{PA}	dB(A)	≤ 60			
Max. permitted housing temperature		°C	+90			
		F	194			
Ambient temperature		°C	−15 to +40			
		F	5 to 104			
Lubrication			Lubricated for life			
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)	G 24 J_1	kgcm²	3.80	3.33	3.00	2.80
		10⁻³ in.lb.s²	3.36	2.95	2.66	2.48
Clamping hub diameter [mm] Optimized mass inertia version available on request	K 38 J_1	kgcm²	10.7	10.3	9.90	9.70
		10⁻³ in.lb.s²	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
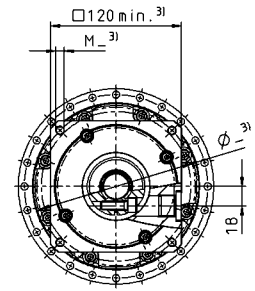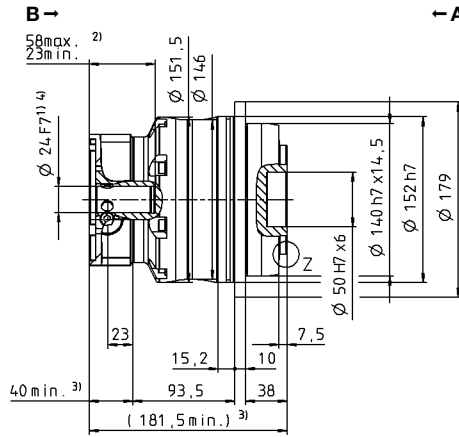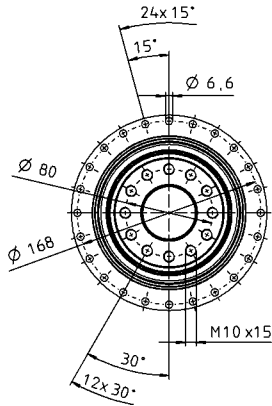d) Please reduce input speed at higher ambient temperatures

WITTENSTEIN | alpha

2-stage

Motor shaft diameter [mm]
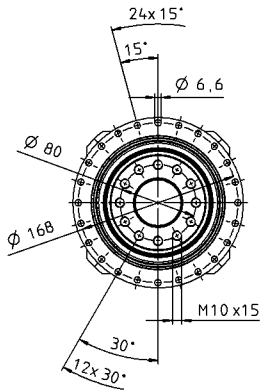
up to 24 [4] (G) [5] clamping hub diameter

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 thickness of 1 mm
[5] Standard clamping hub diameter

Application-spec. solutions

DP⁺

MA