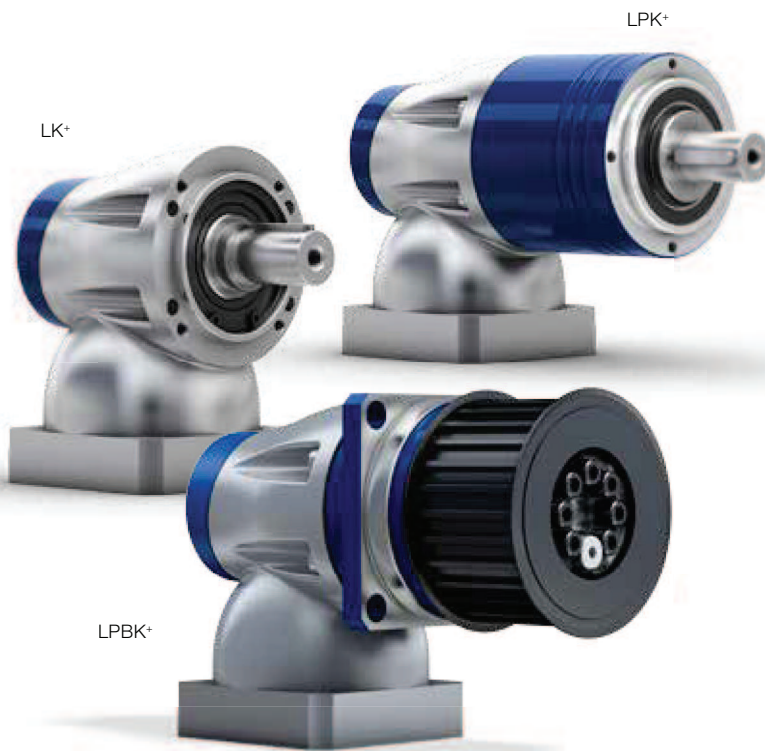


# LK<sup>+</sup>/LPK<sup>+</sup>/LPBK<sup>+</sup> – Economical right-angle precision

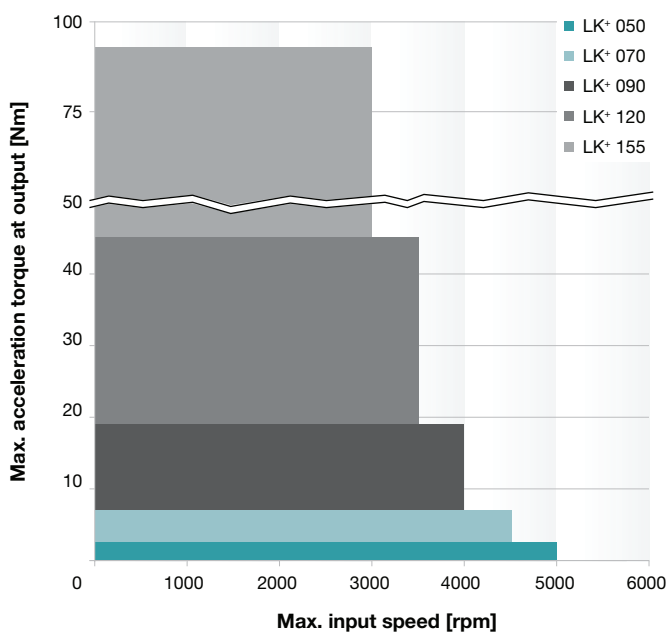


Low backlash right-angle gearheads with output shaft or output flange. This gearhead series is suitable for economical applications.

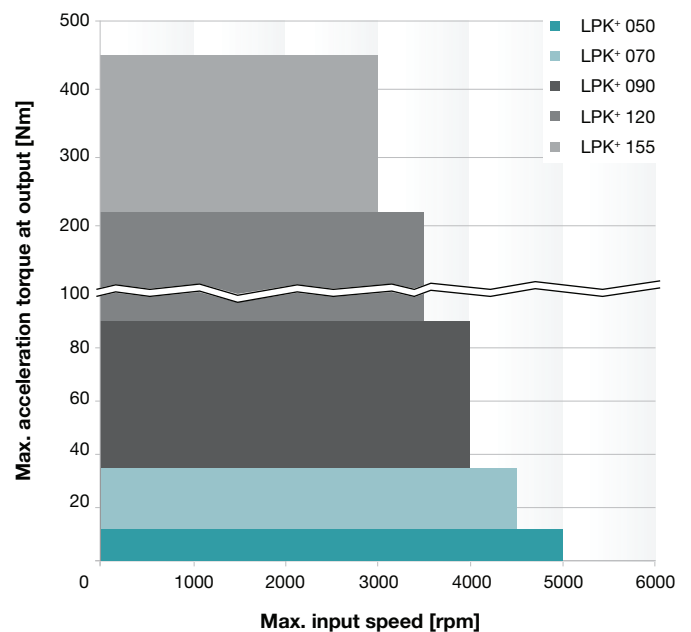
The LPBK<sup>+</sup> is especially suitable for compact belt drives.

## Quick size selection

**LK<sup>+</sup>** (example for  $i = 1$ )  
For applications in cyclic operation ( $DC \leq 60\%$ )  
or continuous operation ( $DC \geq 60\%$ )



**LPK<sup>+</sup>/LPBK<sup>+</sup>** (example for  $i = 5$ )  
For applications in cyclic operation ( $DC \leq 60\%$ )  
or continuous operation ( $DC \geq 60\%$ )



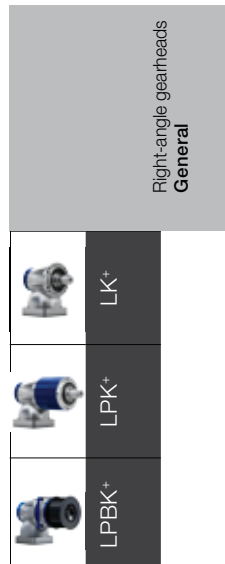
# Versions and Applications

Features	LK+ MO version page 324	LPK+ MO version page 334	LPBK+ MO version page 344
Power density	•	••	••
Positioning accuracy	•	••	••
High input speeds	••	••	••
Torsional rigidity	•	•	••
Space-saving design	••	••	•••

## Product features

Ratios <sup>c)</sup>		1 – 1	3 – 100	3 – 100
Torsional backlash [arcmin] <sup>c)</sup>	Standard	≤ 15	≤ 12	≤ 12
	Reduced	–	–	–
<b>Output type</b>				
Smooth output shaft			•	
Keywayed output shaft		•	•	
Output flange				•
<b>Input type</b>				
Motor mounted version		•	•	•
<b>Type</b>				
Food-grade lubrication <sup>a) b)</sup>		•	•	•
<b>Accessories</b>				
Coupling		•	•	
Rack		•	•	
Belt pulley				•
B5 flange		•	•	

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



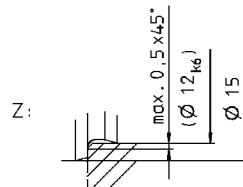
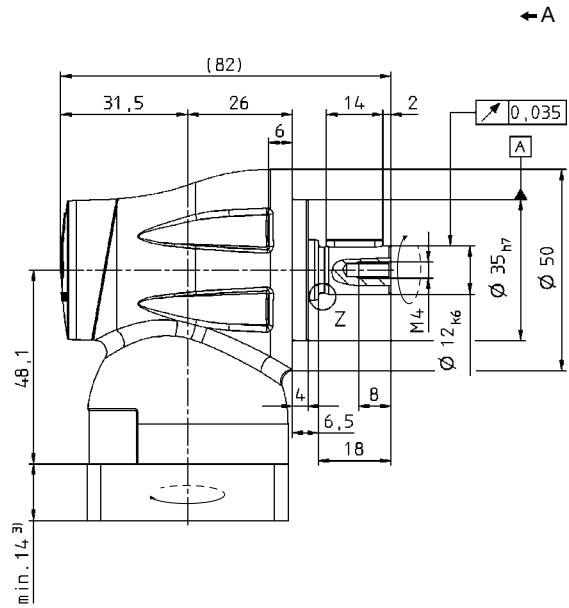
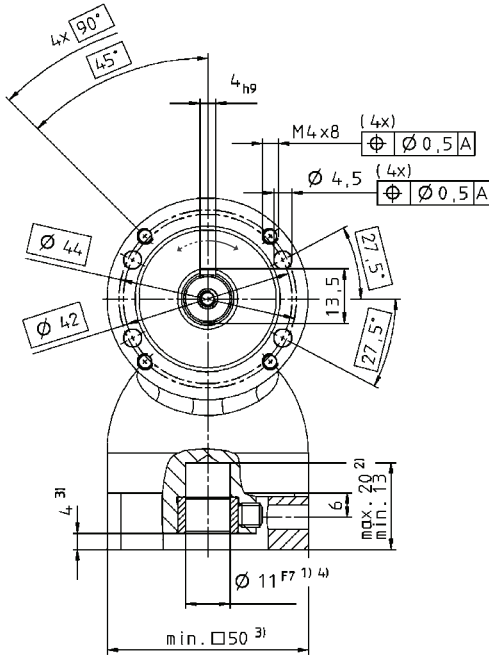
# LK+ 050 1-stage

		<b>1-stage</b>	
<b>Ratio</b>	<b><i>i</i></b>		<b>1</b>
Max. acceleration torque (max. 1000 cycles per hour)	$T_{2B}$	Nm	2.5
		in.lb	22
Nominal output torque (with $n_m$ )	$T_{2N}$	Nm	1.2
		in.lb	11
Emergency stop torque (permitted 1000 times during the service life of the gearhead)	$T_{2Not}$	Nm	5
		in.lb	44
Nominal input speed (with $T_{2N}$ and 20°C ambient temperature <sup>a)</sup> )	$n_{1N}$	rpm	3200
Max. input speed	$n_{1Max}$	rpm	5000
Mean no load running torque (with $n_1 = 3000$ rpm and 20°C gearhead temperature)	$T_{012}$	Nm	0.2
		in.lb	1.8
Max. torsional backlash	$j_t$	arcmin	≤ 25
Torsional rigidity	$C_{t21}$	Nm/ arcmin	-
		in.lb/ arcmin	
Max. axial force <sup>b)</sup>	$F_{2AMax}$	N	100
		lb <sub>f</sub>	23
Max. radial force <sup>b)</sup>	$F_{2RMax}$	N	650
		lb <sub>f</sub>	146
Efficiency at full load	$\eta$	%	95
Service life (For calculation, see the Chapter "Information")	$L_n$	h	> 20000
Weight incl. standard adapter plate	$m$	kg	0.7
		lb <sub>m</sub>	1.5
Operating noise (with $n_1 = 3000$ rpm no load)	$L_{PA}$	dB(A)	≤ 72
Max. permitted housing temperature		°C	+90
		F	194
Ambient temperature		°C	-15 to +40
		F	5 to 104
Lubrication			Lubricated for life
Paint			without
Direction of rotation			Motor and gearhead same direction
Protection class			IP 64
Moment of inertia (relates to the drive)	$J_t$	kgcm <sup>2</sup>	0.14
		10 <sup>-3</sup> in.lb.s <sup>2</sup>	0.12

<sup>a)</sup> For higher ambient temperatures, please reduce input speed


<sup>b)</sup> Refers to center of the output shaft, if  $n_2 = 1000$  rpm


1-stage:



Non-tolerated dimensions  $\pm 1$  mm

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

 CAD data is available under <http://www.wittenstein-alpha.de/en/info-and-cad-finder.html>

 Motor mounting according to operating manual

# LK+ 070 1-stage

		<b>1-stage</b>	
<b>Ratio</b>	<b><i>i</i></b>		<b>1</b>
Max. acceleration torque (max. 1000 cycles per hour)	$T_{2B}$	Nm	7
		in.lb	60
Nominal output torque (with $n_m$ )	$T_{2N}$	Nm	3.7
		in.lb	33
Emergency stop torque (permitted 1000 times during the service life of the gearhead)	$T_{2Not}$	Nm	15
		in.lb	130
Nominal input speed (with $T_{2N}$ and 20°C ambient temperature) <sup>a)</sup>	$n_{1N}$	rpm	3000
Max. input speed	$n_{1Max}$	rpm	4500
Mean no load running torque (with $n_1 = 3000$ rpm and 20°C gearhead temperature)	$T_{012}$	Nm	0.4
		in.lb	3.5
Max. torsional backlash	$j_t$	arcmin	≤ 20
Torsional rigidity	$C_{t21}$	Nm/ arcmin	-
		in.lb/ arcmin	
Max. axial force <sup>b)</sup>	$F_{2AMax}$	N	200
		lb <sub>f</sub>	45
Max. radial force <sup>b)</sup>	$F_{2RMax}$	N	1450
		lb <sub>f</sub>	330
Efficiency at full load	$\eta$	%	95
Service life (For calculation, see the Chapter "Information")	$L_n$	h	> 20000
Weight incl. standard adapter plate	$m$	kg	1.9
		lb <sub>m</sub>	4.2
Operating noise (with $n_1 = 3000$ rpm no load)	$L_{PA}$	dB(A)	≤ 73
Max. permitted housing temperature	°C		+90
	F		194
Ambient temperature	°C		-15 to 40
	F		5 to 104
Lubrication	Lubricated for life		
Paint	without		
Direction of rotation	Motor and gearhead same direction		
Protection class	IP 64		
Moment of inertia (relates to the drive)	$J_t$	kgcm <sup>2</sup>	0.7
		10 <sup>-3</sup> in.lb.s <sup>2</sup>	0.6

<sup>a)</sup> For higher ambient temperatures, please reduce input speed

<sup>b)</sup> Refers to center of the output shaft, if  $n_2 = 1000$  rpm

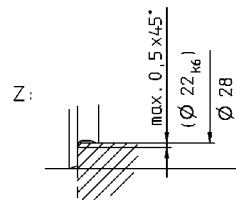
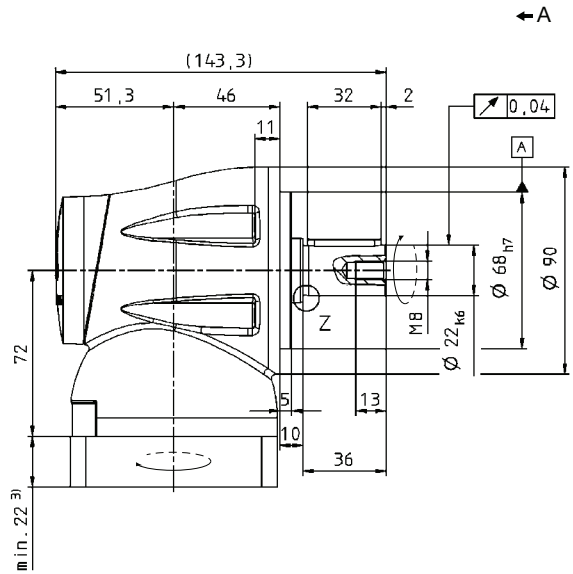
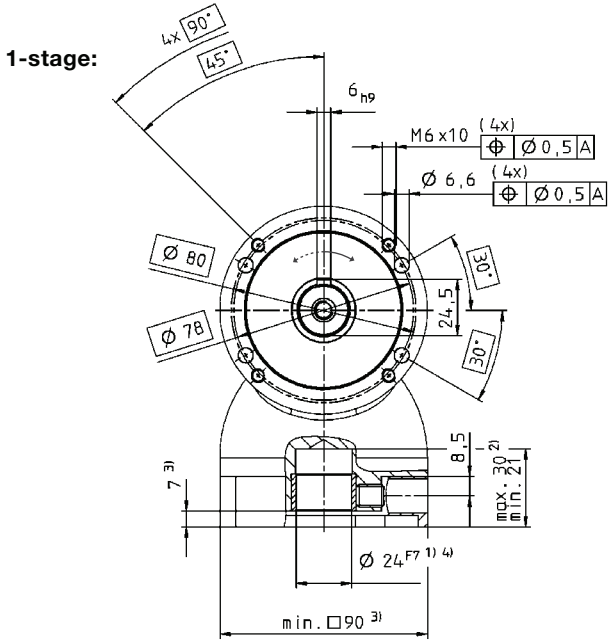


# LK+ 090 1-stage

		<b>1-stage</b>	
<b>Ratio</b>	<b><i>i</i></b>		<b>1</b>
Max. acceleration torque (max. 1000 cycles per hour)	$T_{2B}$	Nm	19
		in.lb	170
Nominal output torque (with $n_m$ )	$T_{2N}$	Nm	9.3
		in.lb	82
Emergency stop torque (permitted 1000 times during the service life of the gearhead)	$T_{2Not}$	Nm	37
		in.lb	330
Nominal input speed (with $T_{2N}$ and 20°C ambient temperature) <sup>a)</sup>	$n_{1N}$	rpm	2700
Max. input speed	$n_{1Max}$	rpm	4000
Mean no load running torque (with $n_1 = 3000$ rpm and 20°C gearhead temperature)	$T_{012}$	Nm	0.9
		in.lb	8.0
Max. torsional backlash	$j_t$	arcmin	≤ 15
Torsional rigidity	$C_{t21}$	Nm/ arcmin	1.3
		in.lb/ arcmin	11
Max. axial force <sup>b)</sup>	$F_{2AMax}$	N	450
		lb <sub>f</sub>	100
Max. radial force <sup>b)</sup>	$F_{2RMax}$	N	2400
		lb <sub>f</sub>	540
Efficiency at full load	$\eta$	%	95
Service life (For calculation, see the Chapter "Information")	$L_n$	h	> 20000
Weight incl. standard adapter plate	$m$	kg	3.2
		lb <sub>m</sub>	7.1
Operating noise (with $n_1 = 3000$ rpm no load)	$L_{PA}$	dB(A)	≤ 76
Max. permitted housing temperature	°C		+90
	F		194
Ambient temperature	°C		-15 to 40
	F		5 to 104
Lubrication	Lubricated for life		
Paint	without		
Direction of rotation	Motor and gearhead same direction		
Protection class	IP 64		
Moment of inertia (relates to the drive)	$J_t$	kgcm <sup>2</sup>	3.3
		10 <sup>-3</sup> in.lb.s <sup>2</sup>	2.9


<sup>a)</sup> For higher ambient temperatures, please reduce input speed


<sup>b)</sup> Refers to center of the output shaft, if  $n_2 = 1000$  rpm



Non-tolerated dimensions  $\pm 1$  mm

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

 CAD data is available under <http://www.wittenstein-alpha.de/en/info-and-cad-finder.html>

 Motor mounting according to operating manual



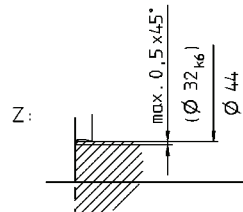
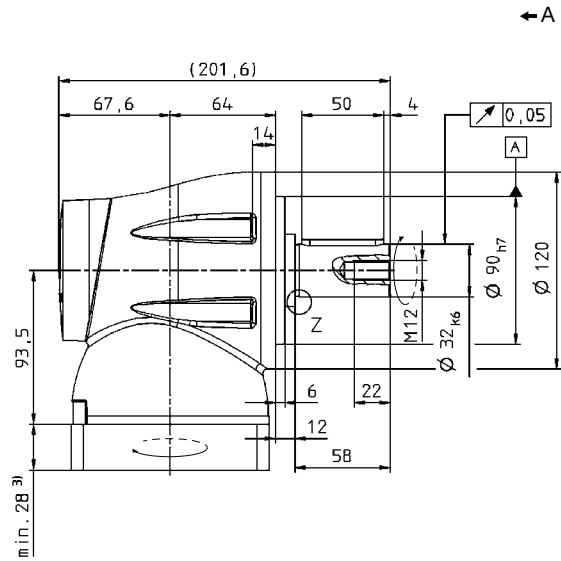
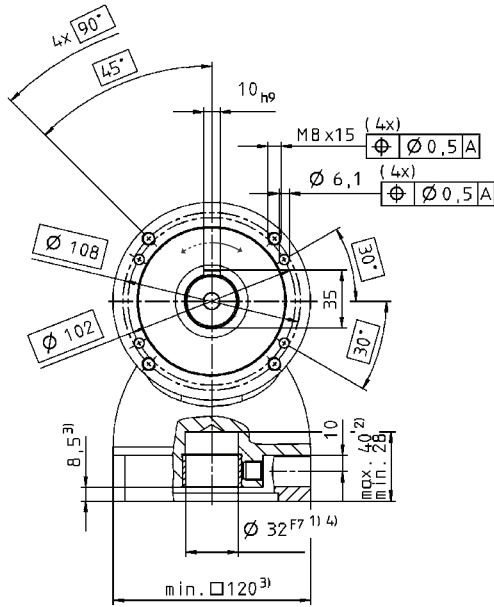
# LK+ 120 1-stage

		<b>1-stage</b>	
<b>Ratio</b>	<b><i>i</i></b>	<b>1</b>	
Max. acceleration torque (max. 1000 cycles per hour)	$T_{2B}$	Nm	45
		in.lb	400
Nominal output torque (with $n_m$ )	$T_{2N}$	Nm	23
		in.lb	200
Emergency stop torque (permitted 1000 times during the service life of the gearhead)	$T_{2Not}$	Nm	93
		in.lb	820
Nominal input speed (with $T_{2N}$ and 20°C ambient temperature) <sup>a)</sup>	$n_{1N}$	rpm	2100
Max. input speed	$n_{1Max}$	rpm	3500
Mean no load running torque (with $n_1 = 3000$ rpm and 20°C gearhead temperature)	$T_{012}$	Nm	2.5
		in.lb	22
Max. torsional backlash	$j_t$	arcmin	≤ 10
Torsional rigidity	$C_{t21}$	Nm/ arcmin	-
		in.lb/ arcmin	
Max. axial force <sup>b)</sup>	$F_{2AMax}$	N	750
		lb <sub>f</sub>	170
Max. radial force <sup>b)</sup>	$F_{2RMax}$	N	4600
		lb <sub>f</sub>	1040
Efficiency at full load	$\eta$	%	95
Service life (For calculation, see the Chapter "Information")	$L_n$	h	> 20000
Weight incl. standard adapter plate	$m$	kg	8.9
		lb <sub>m</sub>	20
Operating noise (with $n_1 = 3000$ rpm no load)	$L_{PA}$	dB(A)	≤ 76
Max. permitted housing temperature		°C	+90
		F	194
Ambient temperature		°C	-15 to 40
		F	5 to 104
Lubrication			Lubricated for life
Paint			without
Direction of rotation			Motor and gearhead same direction
Protection class			IP 64
Moment of inertia (relates to the drive)	$J_t$	kgcm <sup>2</sup>	14
		10 <sup>-3</sup> in.lb.s <sup>2</sup>	12

<sup>a)</sup> For higher ambient temperatures, please reduce input speed


<sup>b)</sup> Refers to center of the output shaft, if  $n_2 = 1000$  rpm


1-stage:



Non-tolerated dimensions  $\pm 1$  mm

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

 CAD data is available under <http://www.wittenstein-alpha.de/en/info-and-cad-finder.html>

 Motor mounting according to operating manual

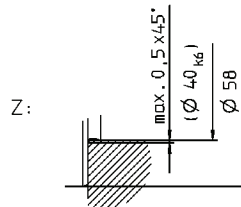
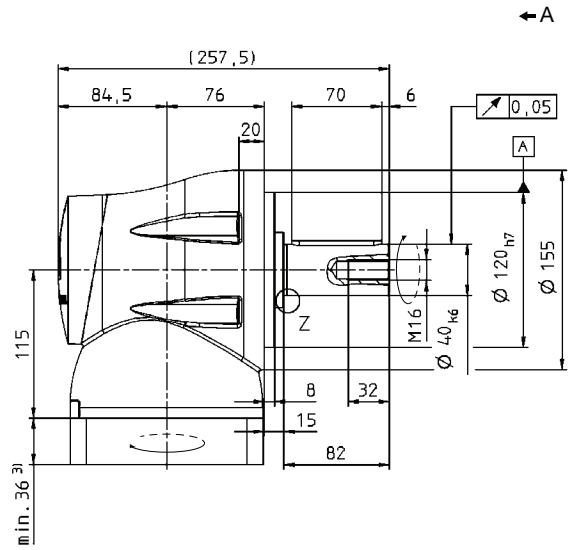
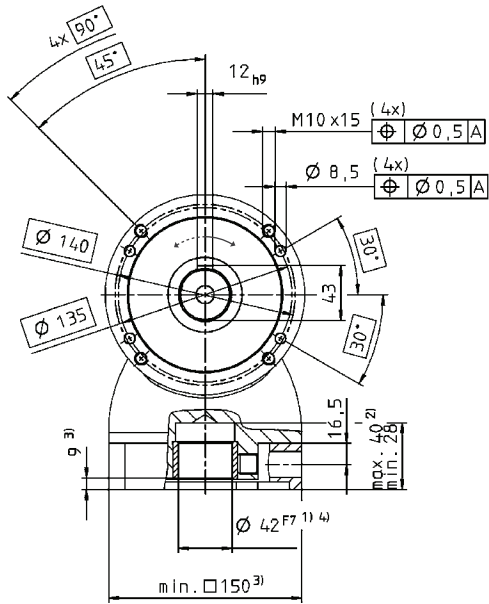
# LK+ 155 1-stage

		<b>1-stage</b>	
<b>Ratio</b>	<b><i>i</i></b>		<b>1</b>
Max. acceleration torque (max. 1000 cycles per hour)	$T_{2B}$	Nm	93
		in.lb	820
Nominal output torque (with $n_m$ )	$T_{2N}$	Nm	66
		in.lb	580
Emergency stop torque (permitted 1000 times during the service life of the gearhead)	$T_{2Not}$	Nm	194
		in.lb	1720
Nominal input speed (with $T_{2N}$ and 20°C ambient temperature) <sup>a)</sup>	$n_{1N}$	rpm	1600
Max. input speed	$n_{1Max}$	rpm	3000
Mean no load running torque (with $n_1 = 3000$ rpm and 20°C gearhead temperature)	$T_{012}$	Nm	4.5
		in.lb	
Max. torsional backlash	$j_t$	arcmin	≤ 8
			40
Torsional rigidity	$C_{t21}$	Nm/ arcmin	-
		in.lb/ arcmin	
Max. axial force <sup>b)</sup>	$F_{2AMax}$	N	1000
		lb <sub>f</sub>	225
Max. radial force <sup>b)</sup>	$F_{2RMax}$	N	7500
		lb <sub>f</sub>	1690
Efficiency at full load	$\eta$	%	95
Service life (For calculation, see the Chapter "Information")	$L_n$	h	> 20000
Weight incl. standard adapter plate	$m$	kg	19
		lb <sub>m</sub>	42
Operating noise (with $n_1 = 3000$ rpm no load)	$L_{PA}$	dB(A)	≤ 78
Max. permitted housing temperature		°C	+90
		F	194
Ambient temperature		°C	-15 to 40
		F	5 to 104
Lubrication			Lubricated for life
Paint			without
Direction of rotation			Motor and gearhead same direction
Protection class			IP 64
Moment of inertia (relates to the drive)	$J_i$	kgcm <sup>2</sup>	57
		10 <sup>-3</sup> in.lb.s <sup>2</sup>	51

<sup>a)</sup> For higher ambient temperatures, please reduce input speed


<sup>b)</sup> Refers to center of the output shaft, if  $n_2 = 1000$  rpm


1-stage:



Non-tolerated dimensions  $\pm 1$  mm

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

 CAD data is available under <http://www.wittenstein-alpha.de/en/info-and-cad-finder.html>

 Motor mounting according to operating manual

# LPK+ 050 2/3-stage

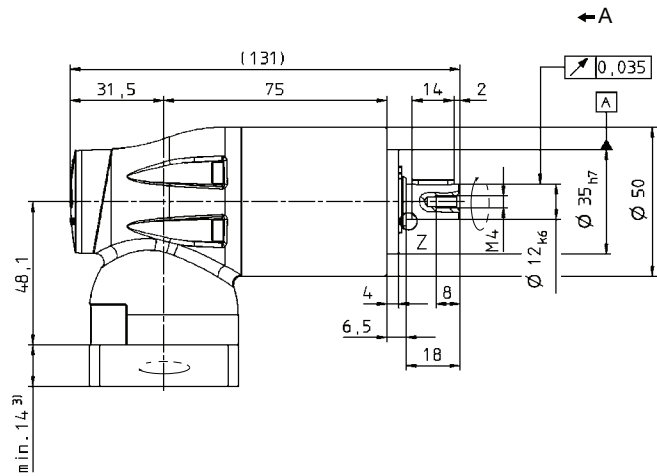
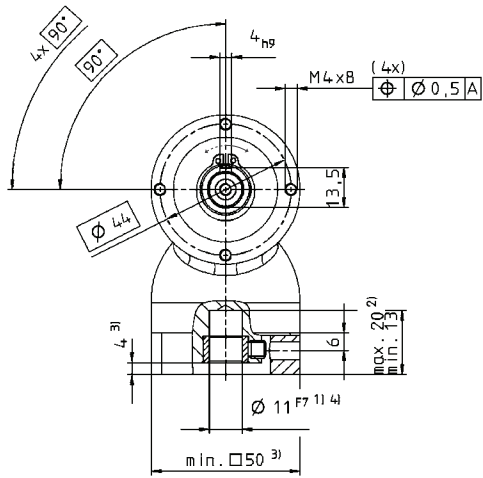
Ratio	<i>i</i>	2-stage				3-stage							
		4	5	7	10	16	20	25	35	50	70	100	
Max. acceleration torque (max. 1000 cycles per hour)	$T_{2B}$	Nm	11	12	12	11	11	11	12	12	12	12	11
		in.lb	100	110	110	100	100	100	110	110	110	110	100
Nominal output torque (with $n_m$ )	$T_{2N}$	Nm	5.2	5.7	5.7	5.2	5.2	5.2	5.7	5.7	5.7	5.7	5.2
		in.lb	46	50	50	46	46	46	50	50	50	50	46
Emergency stop torque (permitted 1000 times during the service life of the gearhead)	$T_{2Not}$	Nm	26	26	26	26	26	26	26	26	26	26	26
		in.lb	230	230	230	230	230	230	230	230	230	230	230
Nominal input speed (with $T_{2N}$ and 20°C ambient temperature) <sup>a)</sup>	$n_{1N}$	rpm	3200	3200	3200	3200	3200	3200	3200	3200	3200	3200	
Max. input speed	$n_{1Max}$	rpm	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)	$T_{012}$	Nm	0.17	0.17	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	
		in.lb	1.5	1.5	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	
Max. torsional backlash	$j_t$	arcmin	≤ 16				≤ 15						
Torsional rigidity	$C_{t21}$	Nm/ arcmin	-				-						
		in.lb/ arcmin											
Max. axial force <sup>b)</sup>	$F_{2AMax}$	N	700				700						
		lb <sub>f</sub>	160				160						
Max. radial force <sup>b)</sup>	$F_{2RMax}$	N	650				650						
		lb <sub>f</sub>	150				150						
Efficiency at full load	$\eta$	%	92				90						
Service life (For calculation, see the Chapter "Information")	$L_n$	h	> 20000				> 20000						
Weight incl. standard adapter plate	$m$	kg	1.4				1.6						
		lb <sub>m</sub>	3.1				3.5						
Operating noise (for $i=10$ and $n_1=3000$ rpm without load)	$L_{PA}$	dB(A)	≤72										
Max. permitted housing temperature	°C		+90										
	F		194										
Ambient temperature	°C		-15 to 40										
	F		5 to 104										
Lubrication	Lubricated for life												
Paint	Blue RAL 5002												
Direction of rotation	Motor and gearhead same direction												
Protection class	IP 64												
Moment of inertia (relates to the drive)	$J_t$	kgcm <sup>2</sup>	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16
		10 <sup>-3</sup> in.lb.s <sup>2</sup>	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14

<sup>a)</sup> For higher ambient temperatures, please reduce input speed

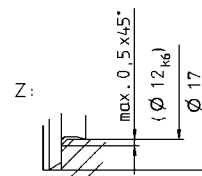
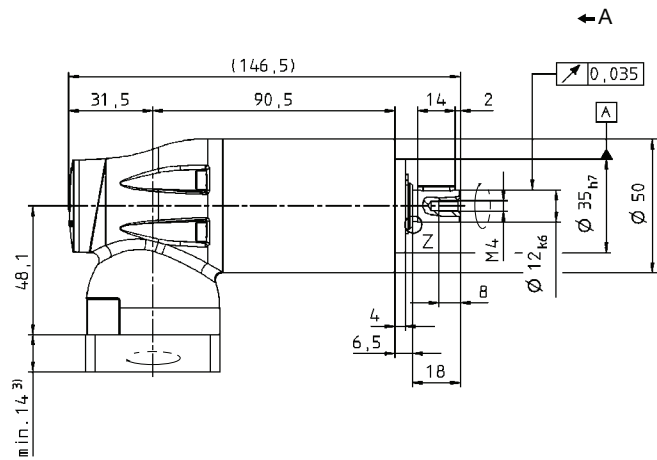
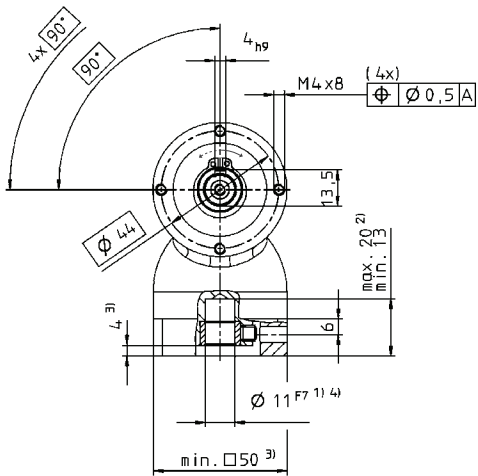
<sup>b)</sup> Refers to center of the output shaft, if  $n_2 = 100$  rpm

View A

2-stage:




3-stage:



Non-tolerated dimensions  $\pm 1$  mm

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

CAD data is available under  
<http://www.wittenstein-alpha.de/en/info-and-cad-finder.html>

 Motor mounting according to operating manual

# LPK+ 070 2/3-stage

Ratio <sup>c)</sup>	<i>i</i>	2-stage						3-stage						
		3	4	5	7	10	16	20	25	30	50	70	100	
Max. acceleration torque (max. 1000 cycles per hour)	$T_{2B}$	Nm	22	29	35	35	32	35	35	35	32	35	35	32
		in.lb	190	260	310	310	280	310	310	310	280	310	310	280
Nominal output torque (with $n_m$ )	$T_{2N}$	Nm	11	15	18	18	16.5	18	18	18	16.5	18	18	16.5
		in.lb	100	130	160	160	150	160	160	160	160	160	160	160
Emergency stop torque (permitted 1000 times during the service life of the gearhead)	$T_{2Not}$	Nm	45	60	75	75	75	75	75	75	75	75	75	75
		in.lb	400	530	664	660	660	660	660	660	660	660	660	660
Nominal input speed (with $T_{2N}$ and 20°C ambient temperature) <sup>a)</sup>	$n_{1N}$	rpm	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	
Max. input speed	$n_{1Max}$	rpm	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	
Mean no load running torque (with $n_1=3000$ rpm and 20°C gearhead temperature)	$T_{012}$	Nm	0.72	0.71	0.67	0.66	0.62	0.63	0.63	0.59	0.59	0.59	0.59	0.59
		in.lb	6.4	6.3	2.9	5.8	5.5	5.6	5.6	5.2	5.2	5.2	5.2	5.2
Max. torsional backlash	$j_t$	arcmin	≤ 14						≤ 12					
Torsional rigidity	$C_{t21}$	Nm/ arcmin	1	1,5	2	2	2	3	3	3	3	3	3	3
		in.lb/ arcmin	9	13	17	21	21	27	27	27	25	28	28	25
Max. axial force <sup>b)</sup>	$F_{2AMax}$	N	1550						1550					
		lb <sub>f</sub>	350						350					
Max. radial force <sup>b)</sup>	$F_{2RMax}$	N	1450						1450					
		lb <sub>f</sub>	330						330					
Efficiency at full load	$\eta$	%	92						90					
Service life (For calculation, see the Chapter "Information")	$L_n$	h	> 20000						> 20000					
Weight incl. standard adapter plate	<i>m</i>	kg	3.8						4.2					
		lb <sub>m</sub>	8.4						9.3					
Operating noise (for $i=10$ and $n_1=3000$ rpm without load)	$L_{PA}$	dB(A)	≤73											
Max. permitted housing temperature	°C		+90											
	F		194											
Ambient temperature	°C		-15 to 40											
	F		5 to 104											
Lubrication	Lubricated for life													
Paint	Blue RAL 5002													
Direction of rotation	Motor and gearhead same direction													
Protection class	IP 64													
Moment of inertia (relates to the drive)	$J_t$	kgcm <sup>2</sup>	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
		10 <sup>-3</sup> in.lb.s <sup>2</sup>	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75

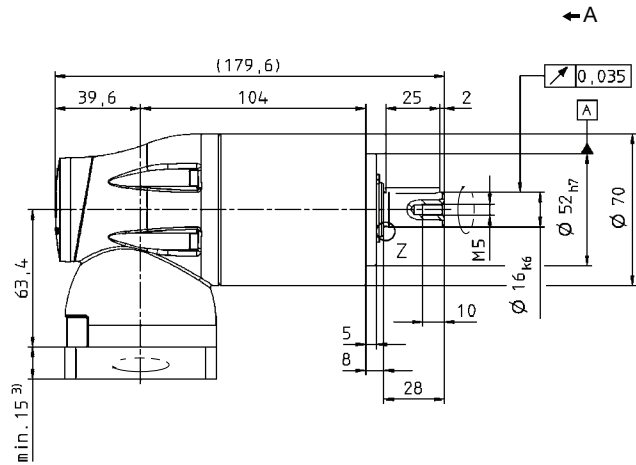
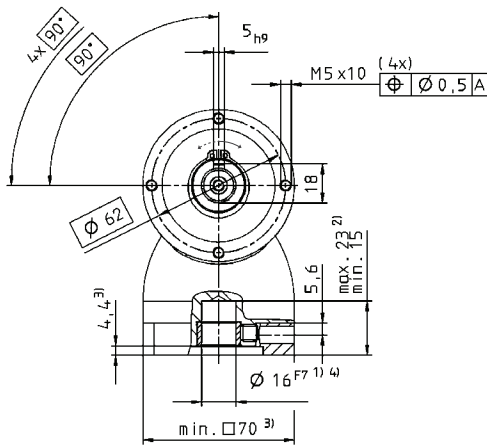
<sup>a)</sup> For higher ambient temperatures, please reduce input speed

<sup>b)</sup> Refers to center of the output shaft, if  $n_2 = 100$  rpm

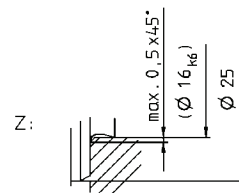
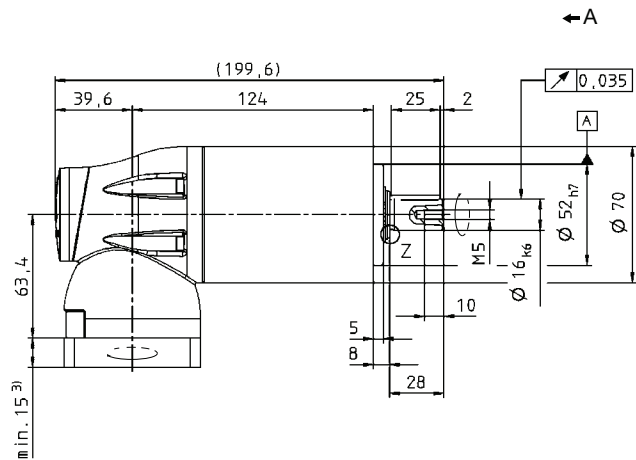
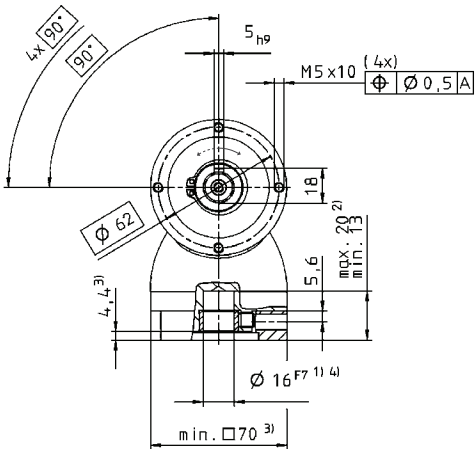
<sup>c)</sup> Other ratios are available on request:  $i = 15, 21, 28$  and  $35$

View A

2-stage:



3-stage:



Non-tolerated dimensions  $\pm 1$  mm

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

CAD data is available under <http://www.wittenstein-alpha.de/en/info-and-cad-finder.html>

Motor mounting according to operating manual



# LPK+ 090 2/3-stage

Ratio <sup>c)</sup>	<i>i</i>	2-stage					3-stage							
		3	4	5	7	10	16	20	25	30	50	70	100	
Max. acceleration torque (max. 1000 cycles per hour)	$T_{2B}$	Nm	56	74	90	90	80	90	90	90	80	90	90	80
		in.lb	500	650	800	800	710	800	800	800	710	800	800	710
Nominal output torque (with $n_m$ )	$T_{2N}$	Nm	28	37	45	45	40	45	45	45	40	45	45	40
		in.lb	250	330	400	400	350	400	400	400	400	400	400	350
Emergency stop torque (permitted 1000 times during the service life of the gearhead)	$T_{2Not}$	Nm	110	150	190	190	190	190	190	190	190	190	190	190
		in.lb	970	1330	1680	1680	1680	1680	1680	1680	1680	1680	1680	1680
Nominal input speed (with $T_{2N}$ and 20°C ambient temperature) <sup>a)</sup>	$n_{1N}$	rpm	2700	2700	2700	2700	2700	2700	2700	2700	2700	2700	2700	
Max. input speed	$n_{1Max}$	rpm	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)	$T_{012}$	Nm	1.83	1.83	1.72	1.63	1.63	1.6	1.6	1.6	1.6	1.6	1.6	1.6
		in.lb	16	16	15	14	14	14	14	14	14	14	14	14
Max. torsional backlash	$j_t$	arcmin	≤ 12					≤ 11						
Torsional rigidity	$C_{t21}$	Nm/ arcmin	4.9	6.5	7.3	8.2	8.0	9.2	9.4	9.4	8.4	9.5	9.5	8.5
		in.lb/ arcmin	43	58	65	73	71	81	83	83	74	84	84	75
Max. axial force <sup>b)</sup>	$F_{2AMax}$	N	1900					1900						
		lb <sub>f</sub>	430					430						
Max. radial force <sup>b)</sup>	$F_{2RMax}$	N	2400					2400						
		lb <sub>f</sub>	540					540						
Efficiency at full load	$\eta$	%	92					90						
Service life (For calculation, see the Chapter "Information")	$L_n$	h	> 20000					> 20000						
Weight incl. standard adapter plate	<i>m</i>	kg	6.9					7.9						
		lb <sub>m</sub>	15					17						
Operating noise (for $i = 10$ and $n_1 = 3000$ rpm without load)	$L_{PA}$	dB(A)	≤ 76											
Max. permitted housing temperature	°C		+90											
	F		194											
Ambient temperature	°C		-15 to 40											
	F		5 to 104											
Lubrication	Lubricated for life													
Paint	Blue RAL 5002													
Direction of rotation	Motor and gearhead same direction													
Protection class	IP 64													
Moment of inertia (relates to the drive)	$J_t$	kgcm <sup>2</sup>	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1
		10 <sup>-3</sup> in.lb.s <sup>2</sup>	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6

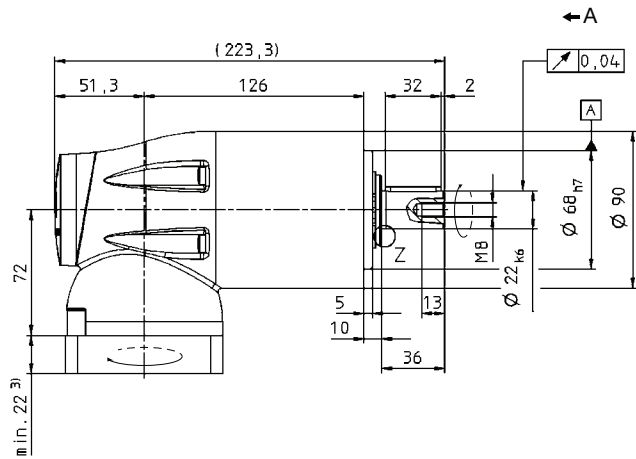
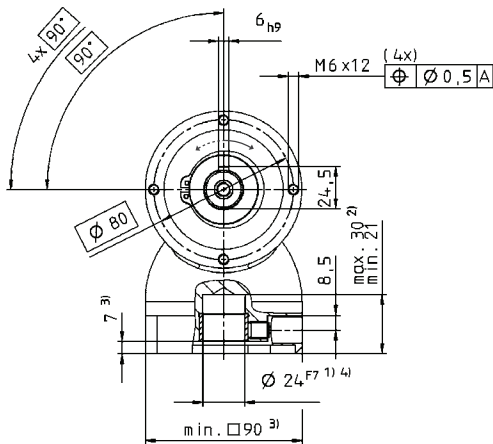
<sup>a)</sup> For higher ambient temperatures, please reduce input speed

<sup>b)</sup> Refers to center of the output shaft, if  $n_2 = 100$  rpm

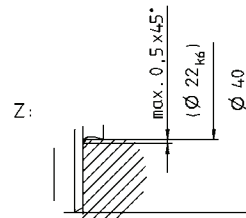
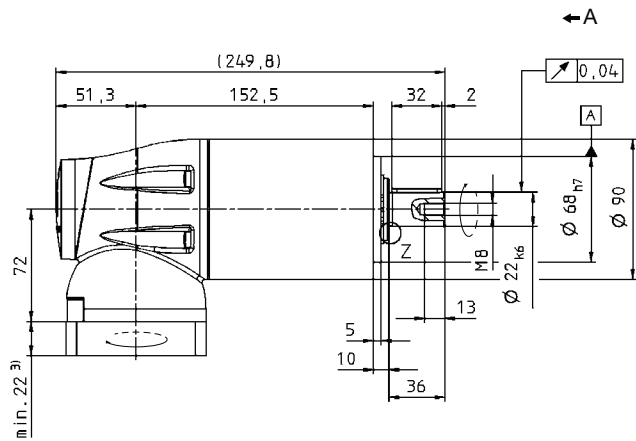
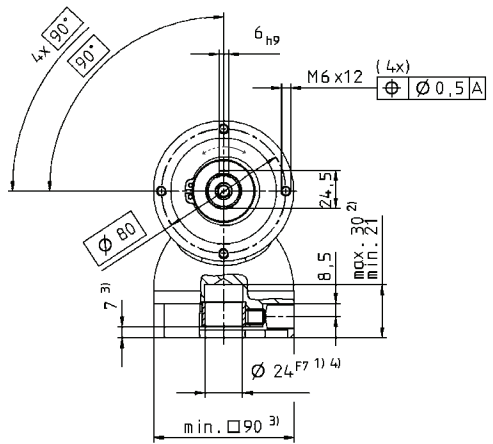
<sup>c)</sup> Other ratios are available on request:  $i = 15, 21, 28$  and  $35$

View A

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.

CAD data is available under <http://www.wittenstein-alpha.de/en/info-and-cad-finder.html>

Motor mounting according to operating manual

# LPK+ 120 2/3-stage

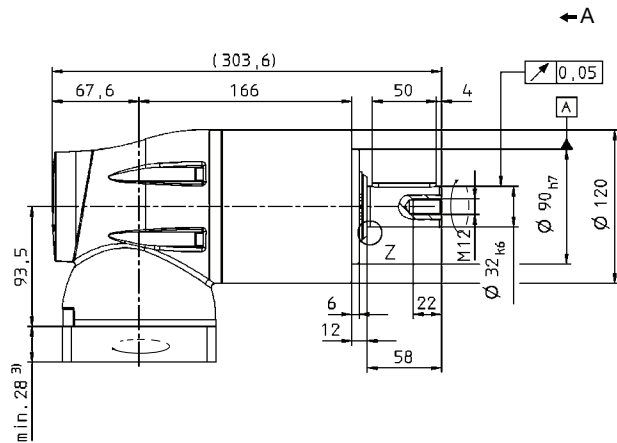
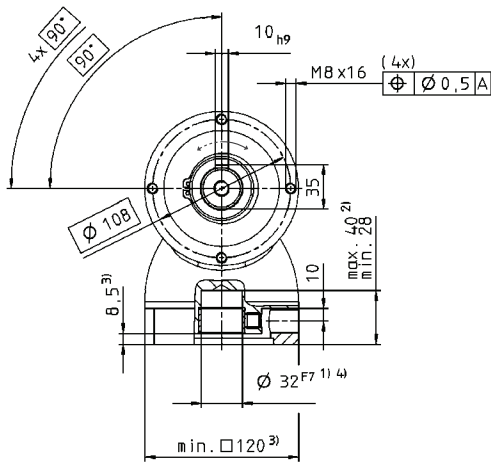
Ratio <sup>a)</sup>	<i>i</i>	2-stage					3-stage							
		3	4	5	7	10	16	20	25	30	50	70	100	
Max. acceleration torque (max. 1000 cycles per hour)	$T_{2B}$	Nm	136	181	220	220	200	220	220	220	200	220	220	200
		in.lb	1200	1600	1950	1950	1770	1950	1950	1950	1770	1950	1950	1770
Nominal output torque (with $n_m$ )	$T_{2N}$	Nm	68	91	110	110	100	110	110	110	100	110	110	100
		in.lb	600	810	970	970	890	970	970	970	890	970	970	890
Emergency stop torque (permitted 1000 times during the service life of the gearhead)	$T_{2Not}$	Nm	280	380	480	480	480	480	480	480	480	480	480	480
		in.lb	2500	3400	4200	4200	4200	4200	4200	4200	4200	4200	4200	4200
Nominal input speed (with $T_{2N}$ and 20°C ambient temperature) <sup>a)</sup>	$n_{1N}$	rpm	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	
Max. input speed	$n_{1Max}$	rpm	3500	3500	3500	3500	3500	3500	3500	3500	3500	3500	3500	
Mean no load running torque (with $n_1 = 3000$ rpm and 20°C gearhead temperature)	$T_{012}$	Nm	3.3	3.3	3.09	3.09	3.09	2.96	2.96	2.96	2.96	2.52	2.52	2.52
		in.lb	29	29	27	27	27	26	26	26	26	22	22	22
Max. torsional backlash	$j_t$	arcmin	≤ 11					≤ 11						
Torsional rigidity	$C_{t21}$	Nm/ arcmin	19	22	23	24	22	25	25	25	22	25	25	22
		in.lb/ arcmin	170	190	210	210	190	220	220	220	190	220	220	190
Max. axial force <sup>b)</sup>	$F_{2AMax}$	N	4000					4000						
		lb <sub>f</sub>	900					900						
Max. radial force <sup>b)</sup>	$F_{2RMax}$	N	4600					4600						
		lb <sub>f</sub>	1040					1040						
Efficiency at full load	$\eta$	%	92					90						
Service life (For calculation, see the Chapter "Information")	$L_n$	h	> 20000					> 20000						
Weight incl. standard adapter plate	<i>m</i>	kg	17					19						
		lb <sub>m</sub>	37					42						
Operating noise (for $i = 10$ and $n_1 = 3000$ rpm without load)	$L_{PA}$	dB(A)	≤ 76											
Max. permitted housing temperature	°C		+90											
	F		194											
Ambient temperature	°C		-15 to 40											
	F		5 to 104											
Lubrication	Lubricated for life													
Paint	Blue RAL 5002													
Direction of rotation	Motor and gearhead same direction													
Protection class	IP 64													
Moment of inertia (relates to the drive)	$J_i$	kgcm <sup>2</sup>	17	17	17	17	17	17	17	17	17	17	17	17
		10 <sup>-3</sup> in.lb.s <sup>2</sup>	15	15	15	15	15	15	15	15	15	15	15	15

<sup>a)</sup> For higher ambient temperatures, please reduce input speed

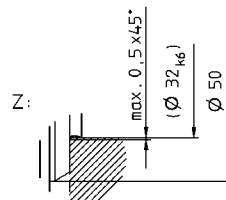
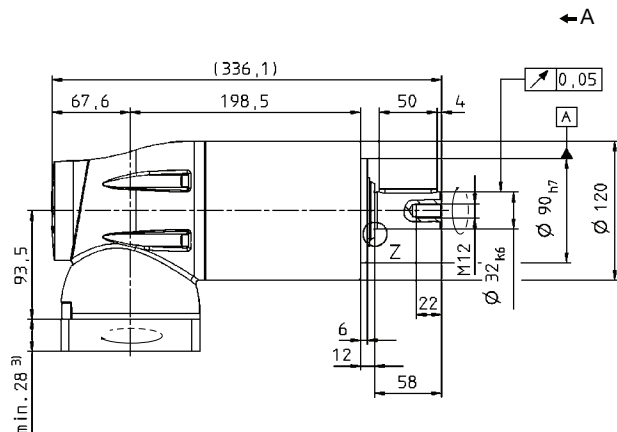
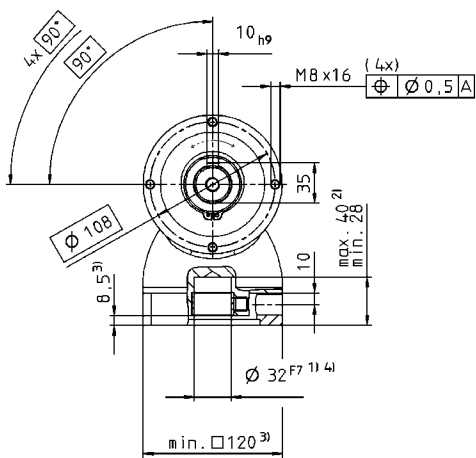
<sup>b)</sup> Refers to center of the output shaft, if  $n_2 = 100$  rpm

<sup>c)</sup> Other ratios are available on request:  $i = 15, 21, 28$  and  $35$

**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.

CAD data is available under <http://www.wittenstein-alpha.de/en/info-and-cad-finder.html>

Motor mounting according to operating manual

# LPK+ 155 2/3-stage

Ratio	<i>i</i>	2-stage		3-stage			
		5	10	25	50	100	
Max. acceleration torque (max. 1000 cycles per hour)	$T_{2B}$	Nm	450	350	450	450	350
		in.lb	4000	3100	4000	4000	3100
Nominal output torque (with $n_m$ )	$T_{2N}$	Nm	320	190	320	320	190
		in.lb	2800	1700	2800	2800	1700
Emergency stop torque (permitted 1000 times during the service life of the gearhead)	$T_{2Not}$	Nm	1000	1000	1000	1000	1000
		in.lb	8850	8850	8850	8850	8850
Nominal input speed (with $T_{2N}$ and 20°C ambient temperature <sup>a)</sup> )	$n_{1N}$	rpm	1600	1600	1600	1600	1600
Max. input speed	$n_{1Max}$	rpm	3000	3000	3500	3500	3500
Mean no load running torque (with $n_1 = 3000$ rpm and 20°C gearhead temperature)	$T_{012}$	Nm	7.3	7.0	3.5	3.3	3.2
		in.lb					
Max. torsional backlash	$j_t$	arcmin	≤ 10		≤ 11		
Torsional rigidity	$C_{t21}$	Nm/ arcmin	44	42	55	55	44
		in.lb/ arcmin	390	370	480	490	390
Max. axial force <sup>b)</sup>	$F_{2AMax}$	N	6000		6000		
		lb <sub>f</sub>	1350		1350		
Max. radial force <sup>b)</sup>	$F_{2RMax}$	N	7500		7500		
		lb <sub>f</sub>	1690		1690		
Efficiency at full load	$\eta$	%	92		90		
Service life (For calculation, see the Chapter "Information")	$L_n$	h	> 20000		> 20000		
Weight incl. standard adapter plate	$m$	kg	35		39		
		lb <sub>m</sub>	77		86		
Operating noise (for $i = 10$ and $n_1 = 3000$ rpm without load)	$L_{PA}$	dB(A)	≤ 78				
Max. permitted housing temperature	°C		+90				
	F		194				
Ambient temperature	°C		-15 to 40				
	F		5 to 104				
Lubrication	Lubricated for life						
Paint	Blue RAL 5002						
Direction of rotation	Motor and gearhead same direction						
Protection class	IP 64						
Moment of inertia (relates to the drive)	$J_i$	kgcm <sup>2</sup>	75	75	17	17	17
		10 <sup>-3</sup> in.lb.s <sup>2</sup>	66	66	15	15	15

<sup>a)</sup> For higher ambient temperatures, please reduce input speed

<sup>b)</sup> Refers to center of the output shaft,  $i = 100$  rpm



# LPBK+ 070 2-/3-stage

Ratio	<i>i</i>	2-stage					3-stage									
		3	4	5	7	10	16	20	25	30	35	50	70	100		
Max. acceleration torque (max. 1000 cycles per hour)	$T_{2B}$	Nm	22	29	35	35	32	35	35	35	32	35	35	35	32	
		in.lb	190	260	310	310	280	310	310	310	280	310	310	310	280	
Nominal output torque (with $n_m$ )	$T_{2N}$	Nm	11	15	18	18	16.5	18	18	18	16.5	18	18	18	16.5	
		in.lb	100	130	160	160	150	160	160	160	150	160	160	160	150	
Emergency stop torque (permitted 1000 times during the service life of the gearhead)	$T_{2Not}$	Nm	45	60	75	75	75	75	75	75	75	75	75	75	75	
		in.lb	400	530	660	660	660	664	664	664	664	664	664	664	664	
Nominal input speed (with $T_{2N}$ and 20°C ambient temperature) <sup>a)</sup>	$n_{1N}$	rpm	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000		
Max. input speed	$n_{1Max}$	rpm	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500		
Mean no load running torque (with $n_1=3000$ rpm and 20°C gearhead temperature)	$T_{012}$	Nm	0.72	0.71	0.67	0.66	0.62	0.63	0.63	0.59	0.59	0.59	0.59	0.59		
		in.lb	6.4	6.3	2.9	5.8	5.5	5.6	5.6	5.2	5.2	5.2	5.2	5.2		
Max. torsional backlash	$j_t$	arcmin	≤ 14					≤ 12								
Torsional rigidity	$C_{t21}$	Nm/ arcmin	-	-	-	-	-	-	-	-	-	-	-	-		
		in.lb/ arcmin	-	-	-	-	-	-	-	-	-	-	-	-		
Max. axial force <sup>b)</sup>	$F_{2AMax}$	N	1550					1550								
		lb <sub>f</sub>	350					350								
Max. radial force <sup>c)</sup>	$F_{2RMax}$	N	3000					3000								
		lb <sub>f</sub>	680					680								
Efficiency at full load	$\eta$	%	92					90								
Service life (For calculation, see the Chapter "Information")	$L_n$	h	> 20000					> 20000								
Weight incl. standard adapter plate	$m$	kg	3.4					3.8								
		lb <sub>m</sub>	7.5					8.4								
Operating noise (for $i=10$ and $n_1=3000$ rpm without load)	$L_{PA}$	dB(A)	≤ 73													
Max. permitted housing temperature		°C	+90													
		F	194													
Ambient temperature		°C	-15 to 40													
		F	5 to 104													
Lubrication			Lubricated for life													
Paint			Blue RAL 5002													
Direction of rotation			Motor and gearhead same direction													
Protection class			IP 64													
Moment of inertia (relates to the drive)	$J_t$	kgcm <sup>2</sup>	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85		
		10 <sup>-3</sup> in.lb.s <sup>2</sup>	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75		

<sup>a)</sup> For higher ambient temperatures, please reduce input speed

<sup>b)</sup> Refers to center of the output shaft, if  $n_2 = 100$  rpm

<sup>c)</sup> With mounted PLPB+ belt pulley and 100 rpm





# LPBK+ 090 2-stage

Ratio	<i>i</i>	2-stage					3-stage									
		3	4	5	7	10	16	20	25	30	35	50	70	100		
Max. acceleration torque (max. 1000 cycles per hour)	$T_{2B}$	Nm	56	74	90	90	80	90	90	90	80	90	90	90	80	
		in.lb	500	650	800	800	710	800	800	800	710	800	800	800	710	
Nominal output torque (with $n_m$ )	$T_{2N}$	Nm	28	37	45	45	40	45	45	45	40	45	45	45	40	
		in.lb	250	330	400	400	350	400	400	400	350	400	400	400	350	
Emergency stop torque (permitted 1000 times during the service life of the gearhead)	$T_{2Not}$	Nm	110	150	190	190	190	190	190	190	190	190	190	190	190	
		in.lb	970	1330	1680	1680	1680	1680	1680	1680	1680	1680	1680	1680	1680	
Nominal input speed (with $T_{2N}$ and 20°C ambient temperature) <sup>a)</sup>	$n_{1N}$	rpm	2700	2700	2700	2700	2700	2700	2700	2700	2700	2700	2700	2700		
Max. input speed	$n_{1Max}$	rpm	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)	$T_{012}$	Nm	1.83	1.83	1.72	1.63	1.63	1.6	1.6	1.6	1.6	1.6	1.6	1.6		
		in.lb	16	16	15	14	14	14	14	14	14	14	14	14		
Max. torsional backlash	$j_t$	arcmin	≤ 12					≤ 11								
Torsional rigidity	$C_{t21}$	Nm/ arcmin	-	-	-	-	-	-	-	-	-	-	-	-		
		in.lb/ arcmin	-	-	-	-	-	-	-	-	-	-	-	-		
Max. axial force <sup>b)</sup>	$F_{2AMax}$	N	1900					1900								
		lb <sub>f</sub>	430					430								
Max. radial force <sup>c)</sup>	$F_{2RMax}$	N	4300					4300								
		lb <sub>f</sub>	970					970								
Efficiency at full load	$\eta$	%	92					90								
Service life (For calculation, see the Chapter "Information")	$L_n$	h	> 20000					> 20000								
Weight incl. standard adapter plate	$m$	kg	6.2					6.9								
		lb <sub>m</sub>	14					15								
Operating noise (for $i=10$ and $n_1=3000$ rpm without load)	$L_{PA}$	dB(A)	≤ 76													
Max. permitted housing temperature	°C															
	F		194													
Ambient temperature	°C		-15 to 40													
	F		5 to 104													
Lubrication	Lubricated for life															
Paint	Blue RAL 5002															
Direction of rotation	Motor and gearhead same direction															
Protection class	IP 64															
Moment of inertia (relates to the drive)	$J_t$	kgcm <sup>2</sup>	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1		
		10 <sup>-3</sup> in.lb.s <sup>2</sup>	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6		

<sup>a)</sup> For higher ambient temperatures, please reduce input speed

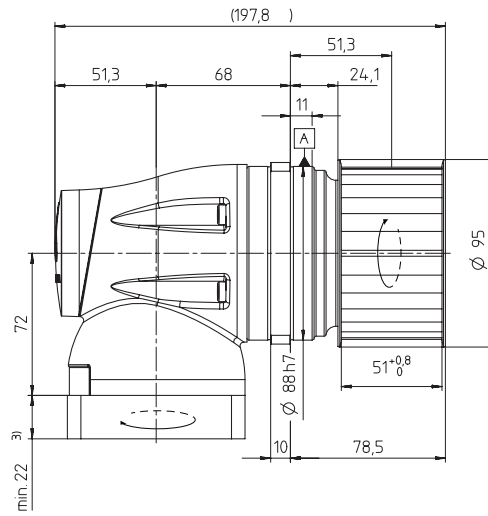
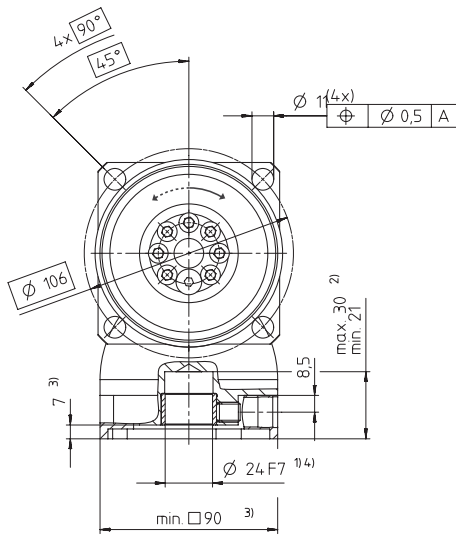
<sup>b)</sup> Refers to center of the output shaft, if  $n_2 = 100$  rpm

<sup>c)</sup> With mounted PLPB+ belt pulley and 100 rpm

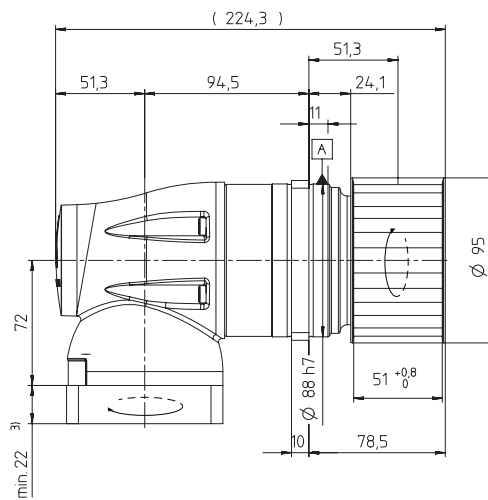
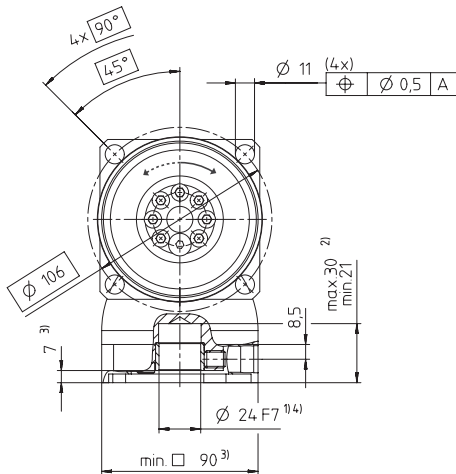
View A

2-stage:

← A



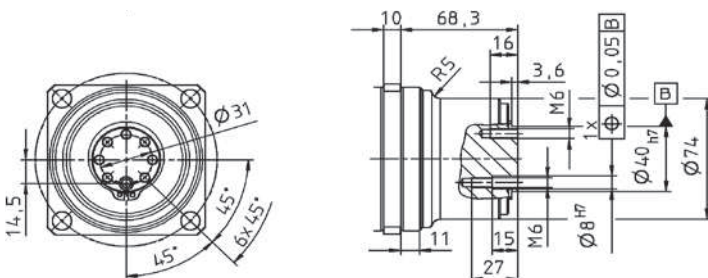
3-stage:



Supplement: Belt pulley PLPB+ (not included in the scope of delivery – please order separately)

Belt Pulley PLPB+ 090 Profile AT10-0			
Pitch	$p$	mm	10
Number of teeth	$z$		28
Circumference	$z * p$	mm/rotation	280
Inertia	$J$	kgcm <sup>2</sup>	10.95
Mass	$m$	kg	0.82

Illustration: Output flange without belt pulley



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.

CAD data is available under <http://www.wittenstein-alpha.de/en/info-and-cad-finder.html>

Motor mounting according to operating manual

# LPBK+ 120 2-/3-stage

Ratio	<i>i</i>	2-stage					3-stage									
		3	4	5	7	10	16	20	25	30	35	50	70	100		
Max. acceleration torque (max. 1000 cycles per hour)	$T_{2B}$	Nm	136	181	220	220	200	220	220	220	200	220	220	220	200	
		in.lb	1200	1600	1950	1950	1770	1950	1950	1950	1770	1950	1950	1950	1770	
Nominal output torque (with $n_m$ )	$T_{2N}$	Nm	68	91	110	110	100	110	110	110	100	110	110	110	100	
		in.lb	600	810	970	970	890	970	970	970	890	970	970	970	890	
Emergency stop torque (permitted 1000 times during the service life of the gearhead)	$T_{2Not}$	Nm	280	380	480	480	480	480	480	480	480	480	480	480	480	
		in.lb	2500	3400	4200	4200	4200	4200	4200	4200	4200	4200	4200	4200	4200	
Nominal input speed (with $T_{2N}$ and 20°C ambient temperature <sup>a)</sup> )	$n_{1N}$	rpm	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100		
Max. input speed	$n_{1Max}$	rpm	3500	3500	3500	3500	3500	3500	3500	3500	3500	3500	3500	3500		
Mean no load running torque (with $n_1=3000$ rpm and 20°C gearhead temperature)	$T_{012}$	Nm	3.3	3.3	3.09	3.09	3.09	2.96	2.96	2.96	2.96	2.52	2.52	2.52	2.52	
		in.lb	29	29	27	27	27	26	26	26	26	22	22	22	22	
Max. torsional backlash	$j_t$	arcmin	≤ 11					≤ 11								
Torsional rigidity	$C_{t21}$	Nm/ arcmin	-	-	-	-	-	-	-	-	-	-	-	-	-	
		in.lb/ arcmin	-	-	-	-	-	-	-	-	-	-	-	-	-	
Max. axial force <sup>b)</sup>	$F_{2AMax}$	N	4000					4000								
		lb <sub>f</sub>	900					900								
Max. radial force <sup>c)</sup>	$F_{2RMax}$	N	9500					9500								
		lb <sub>f</sub>	2100					2100								
Efficiency at full load	$\eta$	%	92					90								
Service life (For calculation, see the Chapter "Information")	$L_n$	h	> 20000					> 20000								
Weight incl. standard adapter plate	$m$	kg	16					17								
		lb <sub>m</sub>	34					37								
Operating noise (for $i=10$ and $n_1=3000$ rpm without load)	$L_{PA}$	dB(A)	≤ 76													
Max. permitted housing temperature	°C		90													
	F		194													
Ambient temperature	°C		-15 to 40													
	F		5 to 104													
Lubrication	Lubricated for life															
Paint	Blue RAL 5002															
Direction of rotation	Motor and gearhead same direction															
Protection class	IP 64															
Moment of inertia (relates to the drive)	$J_t$	kgcm <sup>2</sup>	17	17	17	17	17	17	17	17	17	17	17	17	17	
		10 <sup>-3</sup> in.lb.s <sup>2</sup>	15	15	15	15	15	15	15	15	15	15	15	15	15	

<sup>a)</sup> For higher ambient temperatures, please reduce input speed

<sup>b)</sup> Refers to center of the output shaft, if  $n_2 = 100$  rpm

<sup>c)</sup> With mounted PLPB+ belt pulley and 100 rpm

