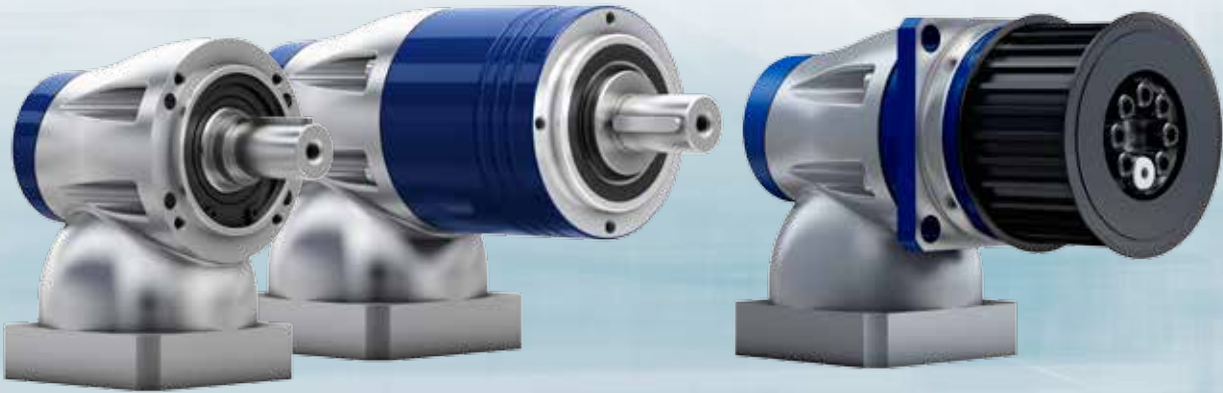


Servo right-angle gearheads General



LK+/LPK+

Economical right-angle precision

- Low backlash bevel gears with output shaft
- Applications in cyclic or continuous operation
- Torsional backlash: ≤ 8 arcmin
- Ratios: 1-100

Product highlights

- Diverse range of transmission ratios
- High nominal speeds

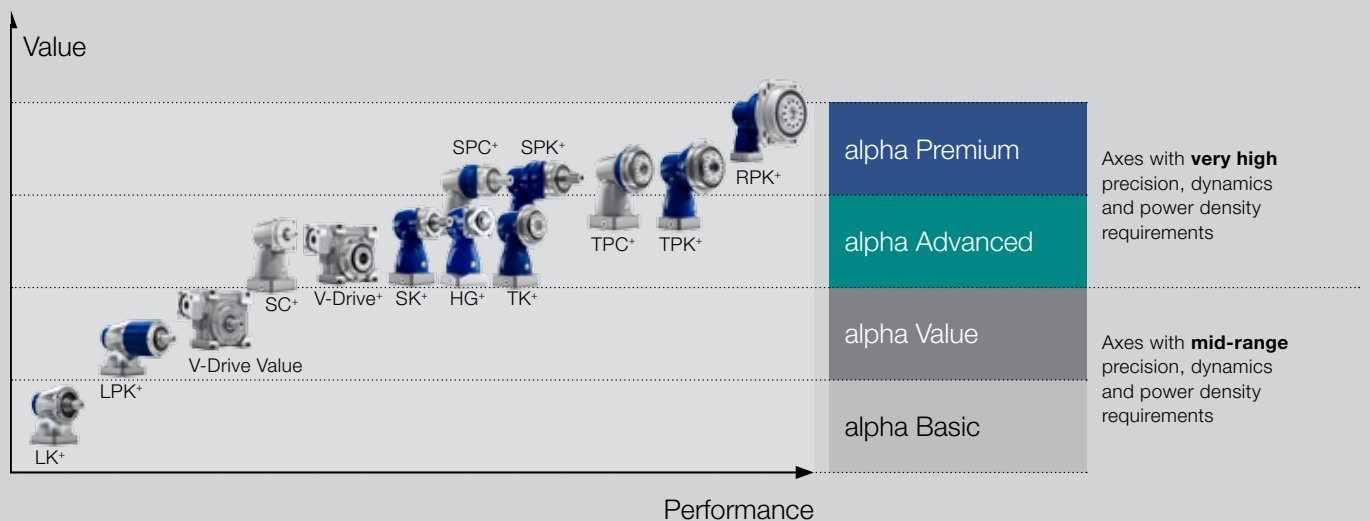
LPBK+

Economical right-angle precision

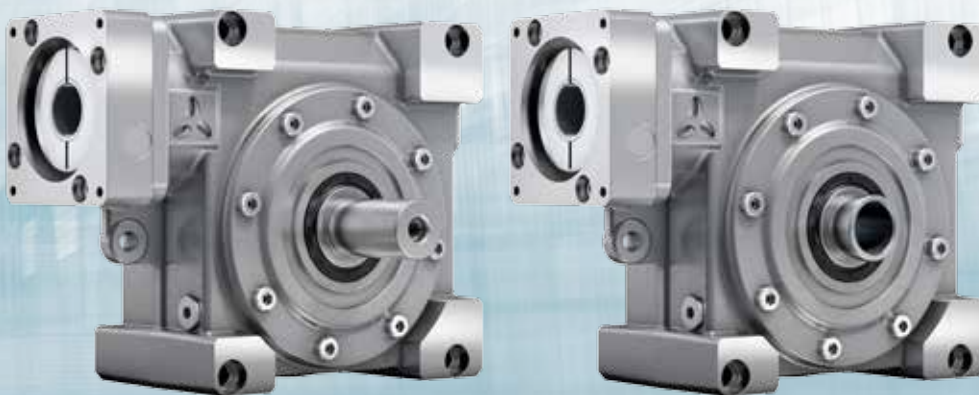
- Low backlash bevel gears with output flange
- Applications in cyclic or continuous operation
- Torsional backlash: ≤ 8 arcmin
- Ratios: 3-100

Product highlights

- Diverse range of transmission ratios
- High nominal speeds
- Optionally available with belt pulley



Now with even
higher torques!



V-Drive Value

Economical servo worm

- Low backlash servo worm gearhead with output shaft and hollow shaft
- Applications in cyclic or continuous operation
- Torsional backlash: ≤ 6 arcmin
- Ratios: 4-40

Product highlights:

- Hollow shaft version
- Single-stage up to $i=40$
- Smooth-running

Simple and convenient

From an optimized design with our cymex® software to the classic, patented WITTENSTEIN alpha motor mounting and grease volume adapted to each model – WITTENSTEIN alpha right-angle gearheads make your life so much easier.

Reliable and accurate

The low torsional backlash and high torsional rigidity of your WITTENSTEIN alpha right-angle gearhead assure maximum positioning accuracy of your drives and precision of your machines – even during highly dynamic operation up to 50,000 cycles/hour.

Maximum durability

Your WITTENSTEIN alpha right-angle gearhead is extremely reliable due to the overall design and 100% WITTENSTEIN alpha inspections: **“mount and forget”**. A length compensation feature integrated in your WITTENSTEIN alpha right-angle gearhead as standard maximizes the lifespan of your servo motor during high-speed continuous operation.

Right-angle gearheads
General

	LK+
	LPK+
	LPBK+
	V-Drive Value

LK⁺/LPK⁺/LPBK⁺ – Economical right-angle precision



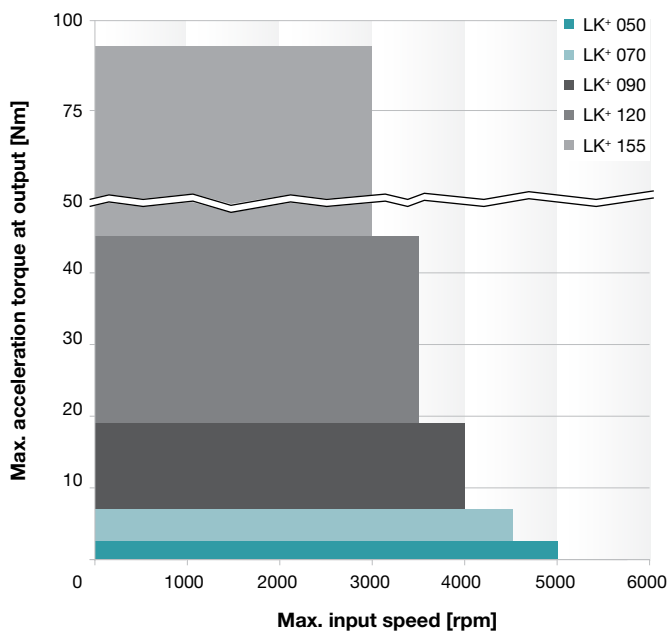
Low backlash right-angle gearheads with output shaft or output flange. This gearhead series is suitable for economical applications.

The LPBK⁺ is especially suitable for compact belt drives.

Quick size selection

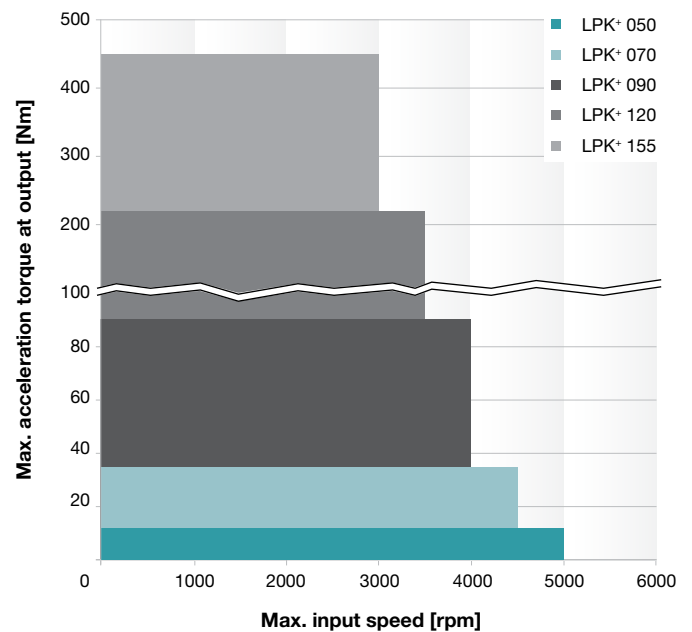
LK⁺ (example for $i = 1$)

For applications in cyclic operation ($DC \leq 60\%$) or continuous operation ($DC \geq 60\%$)



LPK⁺/LPBK⁺ (example for $i = 5$)

For applications in cyclic operation ($DC \leq 60\%$) or continuous operation ($DC \geq 60\%$)



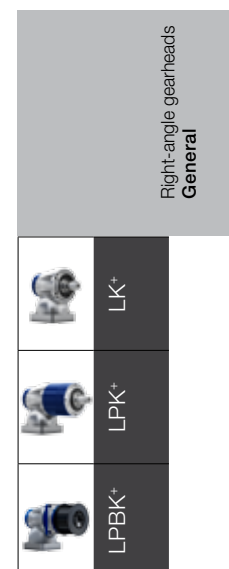
Versions and Applications

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

^{a)} Power reduction: technical data available upon request ^{b)} Please contact WITTENSTEIN alpha ^{c)} In relation to reference sizes



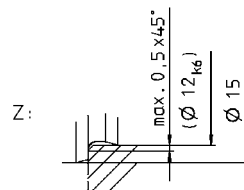
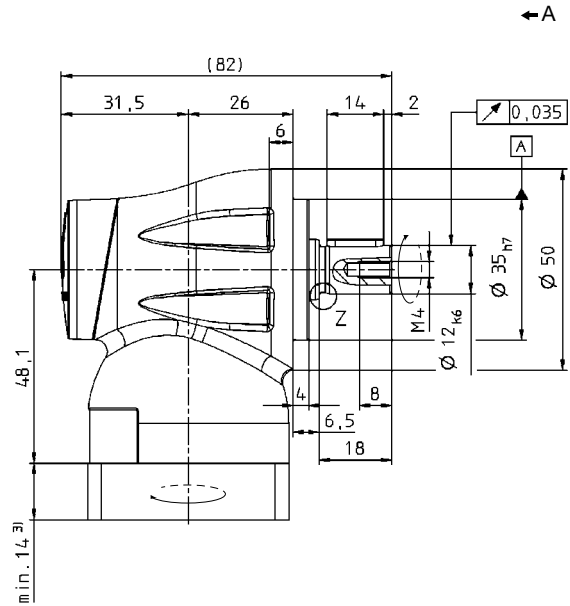
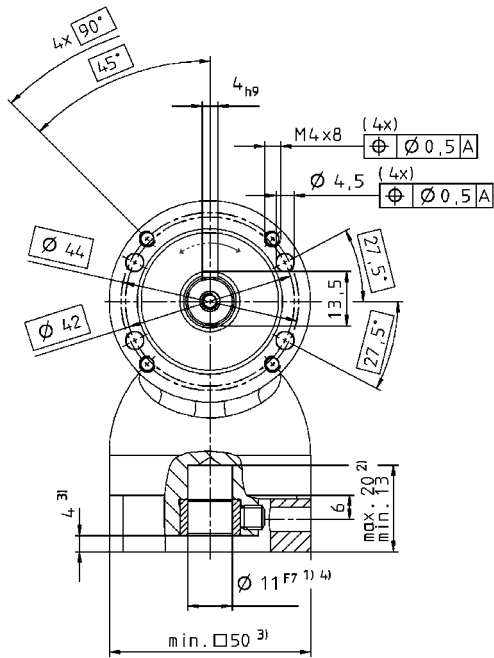
LK+ 050 1-stage

			1-stage
Ratio	i		1
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 ^{a)})	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 ^{b)}	F_{2AMax}	N	100
		lb _f	23
Max. radial force ^{b)}	F_{2RMax}	N	650
		lb _f	146
Efficiency at full load	η	%	95
Service life (For calculation, see the Chapter "Information")	L_h	h	> 20000
Weight incl. standard adapter plate	m	kg lb _m	0.7 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_i	kgcm ² 10 ⁻³ in.lb.s ²	0.14 0.12

^{a)} For higher ambient temperatures, please reduce input speed

^{b)} Refers to center of the output shaft, if $n_2 = 1000$ rpm

1-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>



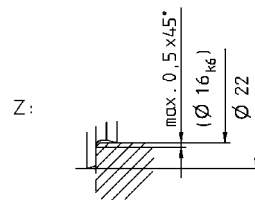
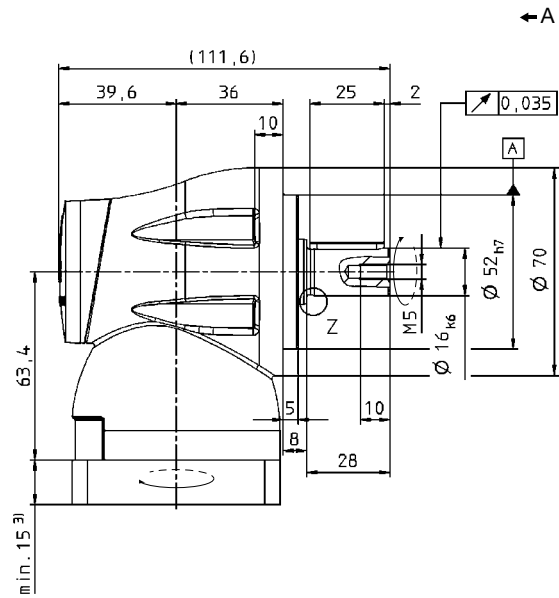
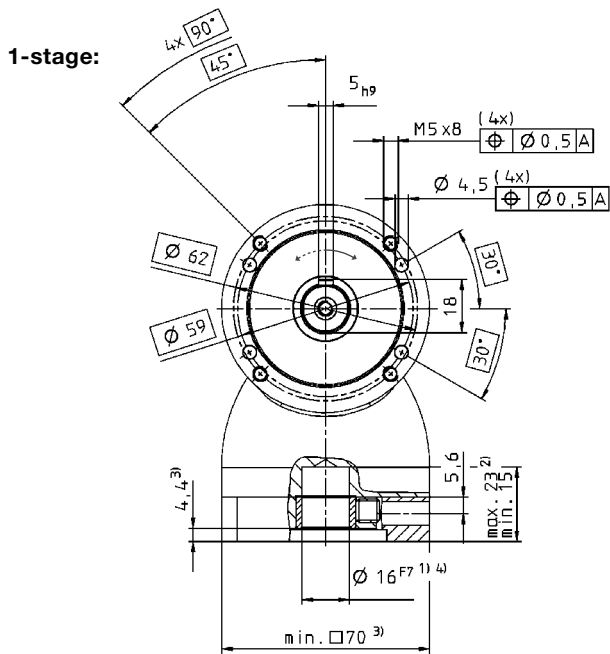
Motor mounting according to operating manual

LK+ 070 1-stage

			1-stage
Ratio	i		1
Max. acceleration torque (max. 1000 cycles per hour)	T_{2B}	Nm in.lb	7 60
Nominal output torque (with n_{1N})	T_{2N}	Nm in.lb	3.7 33
Emergency stop torque (permitted 1000 times during the service life of the gearhead)	T_{2Not}	Nm in.lb	15 130
Nominal input speed (with T_{2N} and 20°C ambient temperature) ^{a)}	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 in.lb	0.4 3.5
Max. torsional backlash	j_t	arcmin	≤ 20
Torsional rigidity	C_{t21}	Nm/ arcmin in.lb/ arcmin	–
Max. axial force ^{b)}	F_{2AMax}	N lb _f	200 45
Max. radial force ^{b)}	F_{2RMax}	N lb _f	1450 330
Efficiency at full load	η	%	95
Service life (For calculation, see the Chapter "Information")	L_h	h	> 20000
Weight incl. standard adapter plate	m	kg lb _m	1.9 4.2
Operating noise (with $n_1 = 3000$ rpm no load)	L_{PA}	dB(A)	≤ 73
Max. permitted housing temperature		°C F	+90 194
Ambient temperature		°C F	-15 to 40 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 ² 10 ⁻³ in.lb.s ²	0.7 0.6

^{a)} For higher ambient temperatures, please reduce input speed

^{b)} Refers to center of the output shaft, if $n_2 = 1000$ rpm



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>



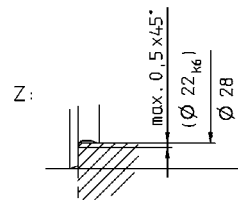
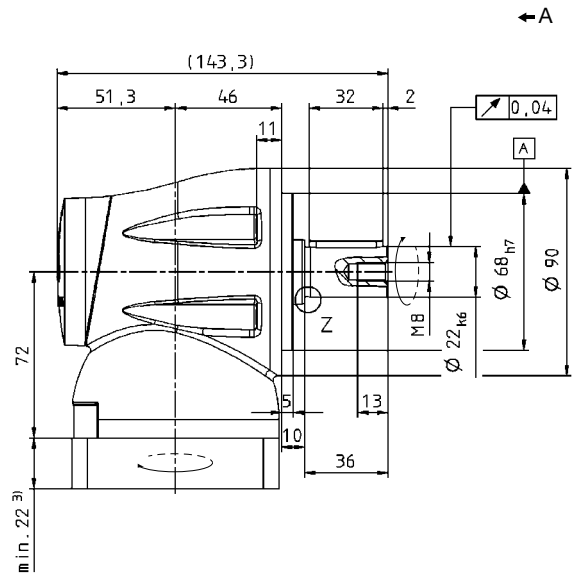
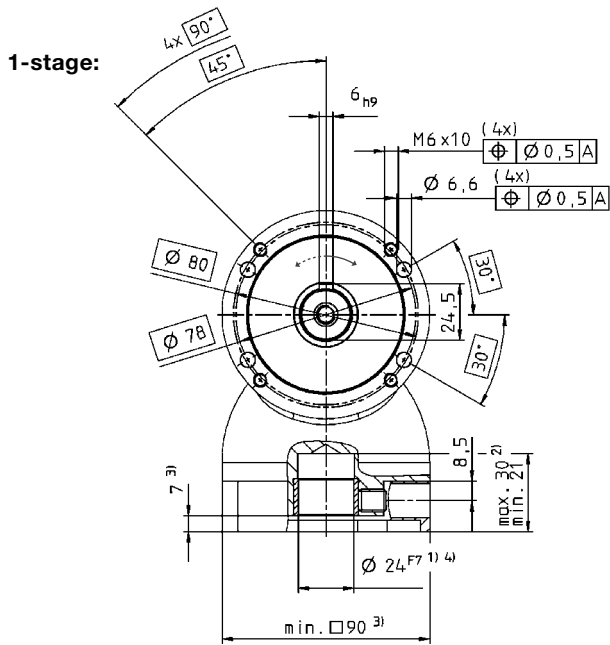
Motor mounting according to operating manual

LK+ 090 1-stage

			1-stage
Ratio	i		1
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) ^{a)}	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 ^{b)}	F_{2AMax}	N	450
		lb _f	100
Max. radial force ^{b)}	F_{2RMax}	N	2400
		lb _f	540
Efficiency at full load	η	%	95
Service life (For calculation, see the Chapter "Information")	L_h	h	> 20000
Weight incl. standard adapter plate	m	kg	3.2
		lb _m	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_i	kgcm ²	3.3
		10 ⁻³ in.lb.s ²	2.9

^{a)} For higher ambient temperatures, please reduce input speed

^{b)} Refers to center of the output shaft, if $n_2 = 1000$ rpm



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.



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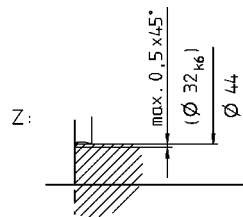
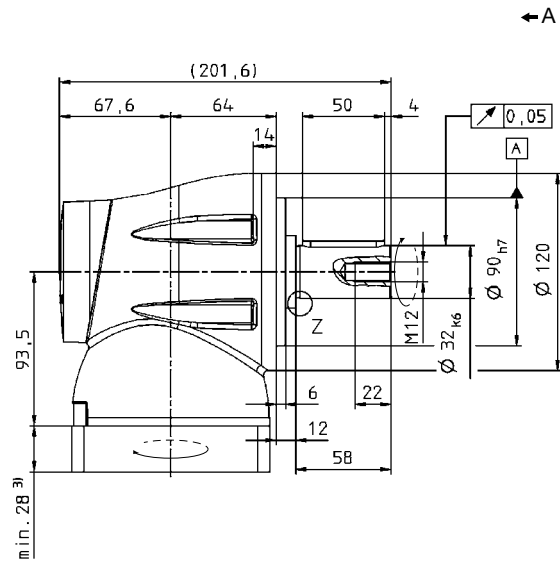
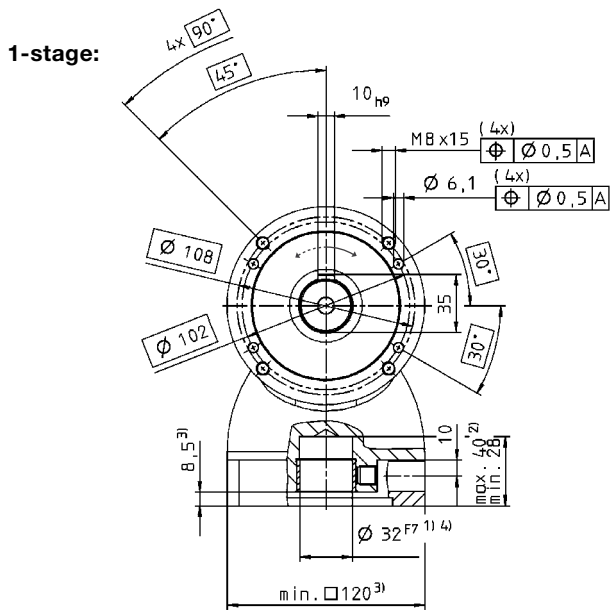
Motor mounting according to operating manual

LK+ 120 1-stage

			1-stage
Ratio	i		1
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) ^{a)}	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 ^{b)}	F_{2AMax}	N	750
		lb _f	170
Max. radial force ^{b)}	F_{2RMax}	N	4600
		lb _f	1040
Efficiency at full load	η	%	95
Service life (For calculation, see the Chapter "Information")	L_h	h	> 20000
Weight incl. standard adapter plate	m	kg lb _m	8.9 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_i	kgcm ² 10 ⁻³ in.lb.s ²	14 12

^{a)} For higher ambient temperatures, please reduce input speed

^{b)} Refers to center of the output shaft, if $n_2 = 1000$ rpm



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
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Motor mounting according to operating manual

LK+ 155 1-stage

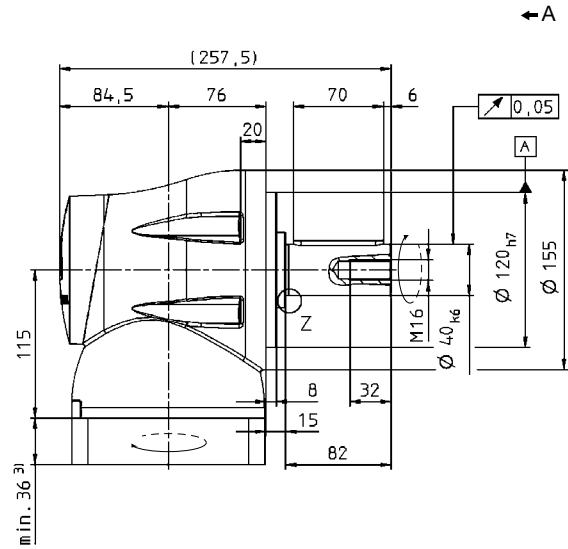
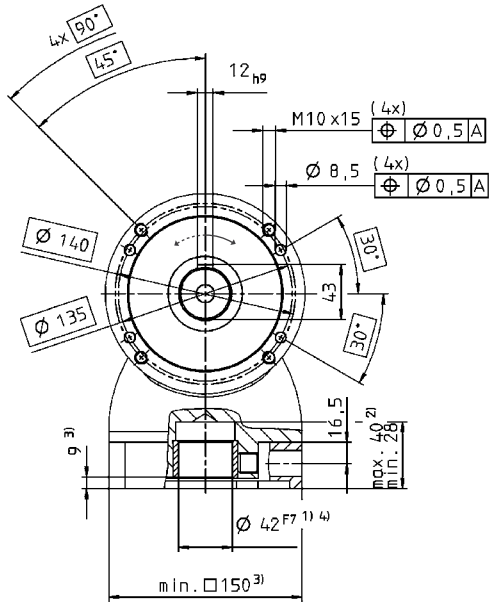
			1-stage
Ratio	i		1
Max. acceleration torque (max. 1000 cycles per hour)	T_{2B}	Nm	93
		in.lb	820
Nominal output torque (with n_m)	T_{2N}	Nm	66
		in.lb	580
Emergency stop torque (permitted 1000 times during the service life of the gearhead)	T_{2Not}	Nm	194
		in.lb	1720
Nominal input speed (with T_{2N} and 20°C ambient temperature) ^{a)}	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 ^{b)}	F_{2AMax}	N	1000
		lb _f	225
Max. radial force ^{b)}	F_{2RMax}	N	7500
		lb _f	1690
Efficiency at full load	η	%	95
Service life (For calculation, see the Chapter "Information")	L_h	h	> 20000
Weight incl. standard adapter plate	m	kg	19
		lb _m	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 ²	57
		10 ⁻³ in.lb.s ²	51

^{a)} For higher ambient temperatures, please reduce input speed

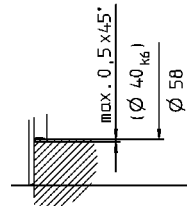
^{b)} Refers to center of the output shaft, if $n_2 = 1000$ rpm

View A

1-stage:



Z:



Non-tolerated dimensions ± 1 mm

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



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

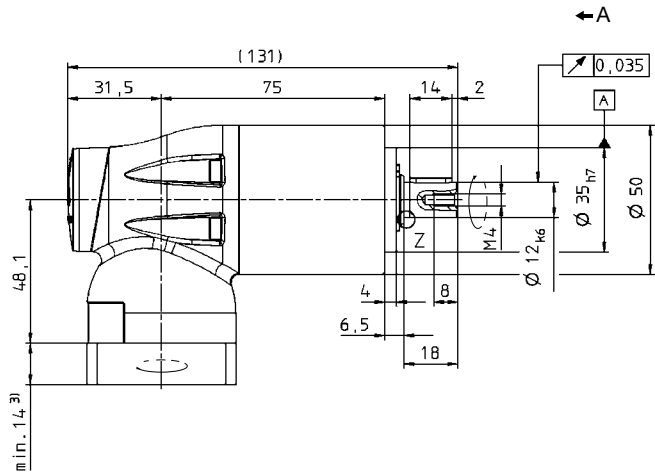
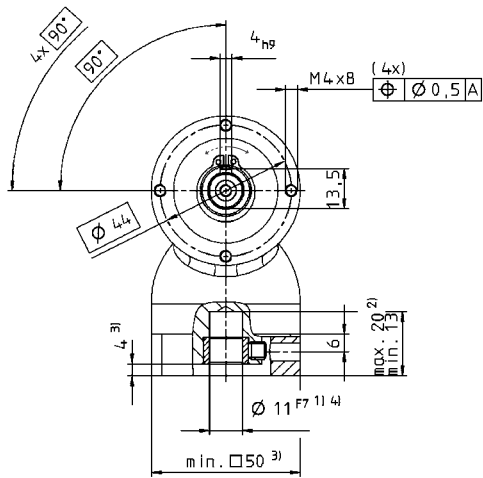
			2-stage				3-stage						
Ratio	<i>i</i>		4	5	7	10	16	20	25	35	50	70	100
Max. acceleration torque (max. 1000 cycles per hour)	<i>T</i> _{2B}	Nm	11	12	12	11	11	11	12	12	12	12	11
		in.lb	100	110	110	100	100	100	110	110	110	110	100
Nominal output torque (with <i>n</i> _{IN})	<i>T</i> _{2N}	Nm	5.2	5.7	5.7	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)	<i>T</i> _{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 <i>T</i> _{2N} and 20°C ambient temperature) ^{a)}	<i>n</i> _{IN}	rpm	3200	3200	3200	3200	3200	3200	3200	3200	3200	3200	3200
Max. input speed	<i>n</i> _{1Max}	rpm	5000	5000	5000	5000	5000	5000	5000	5000	5000	5000	5000
Mean no load running torque (with <i>n</i> _i = 3000 rpm and 20°C gearhead temperature)	<i>T</i> ₀₁₂	Nm	0.17	0.17	0.15	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	1.3
Max. torsional backlash	<i>j</i> _t	arcmin	≤ 16				≤ 15						
Torsional rigidity	<i>C</i> _{t21}	Nm/ arcmin	–				–						
		in.lb/ arcmin											
Max. axial force ^{b)}	<i>F</i> _{2AMax}	N	700				700						
		lb _f	160				160						
Max. radial force ^{b)}	<i>F</i> _{2RMax}	N	650				650						
		lb _f	150				150						
Efficiency at full load	η	%	92				90						
Service life (For calculation, see the Chapter “Information”)	<i>L</i> _h	h	> 20000				> 20000						
Weight incl. standard adapter plate	<i>m</i>	kg	1.4				1.6						
		lb _m	3.1				3.5						
Operating noise (for i = 10 and <i>n</i> _i = 3000 rpm without load)	<i>L</i> _{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)	<i>J</i> _I	kgcm ²	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16
		10 ⁻³ in.lb.s ²	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14

^{a)} For higher ambient temperatures, please reduce input speed

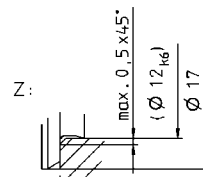
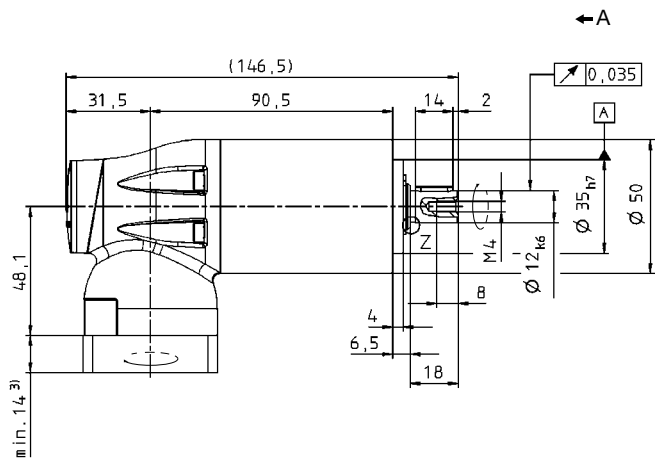
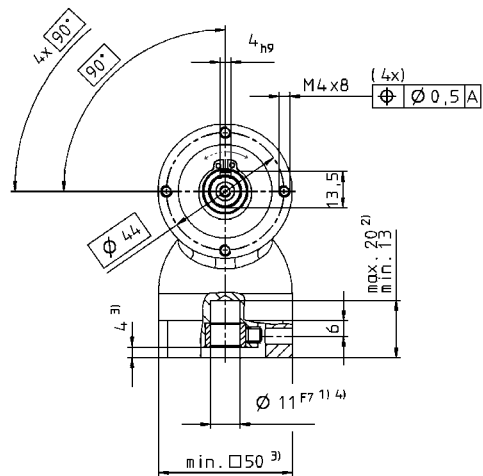
^{b)} Refers to center of the output shaft, if $n_2 = 100$ rpm

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.



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<http://www.wittenstein-alpha.de/en/info-and-cad-finder.html>



Motor mounting according to operating manual

LPK+ 070 2/3-stage

			2-stage					3-stage						
Ratio ^{a)}	<i>i</i>		3	4	5	7	10	16	20	25	30	50	70	100
Max. acceleration torque (max. 1000 cycles per hour)	<i>T</i> _{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 <i>n</i> _N)	<i>T</i> _{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)	<i>T</i> _{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 <i>T</i> _{2N} and 20°C ambient temperature) ^{a)}	<i>n</i> _{1N}	rpm	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000
Max. input speed	<i>n</i> _{1Max}	rpm	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500
Mean no load running torque (with <i>n</i> _i = 3000 rpm and 20°C gearhead temperature)	<i>T</i> 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	<i>j</i> _t	arcmin	≤ 14					≤ 12						
Torsional rigidity	<i>C</i> _{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 ^{b)}	<i>F</i> _{2AMax}	N	1550					1550						
		lb _f	350					350						
Max. radial force ^{b)}	<i>F</i> _{2RMax}	N	1450					1450						
		lb _f	330					330						
Efficiency at full load	η	%	92					90						
Service life (For calculation, see the Chapter “Information”)	<i>L</i> _h	h	> 20000					> 20000						
Weight incl. standard adapter plate	<i>m</i>	kg	3.8					4.2						
		lb _m	8.4					9.3						
Operating noise (for i = 10 and <i>n</i> _i = 3000 rpm without load)	<i>L</i> _{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)	<i>J</i> _i	kgcm²	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 ⁻⁴ in.lb.s²	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75

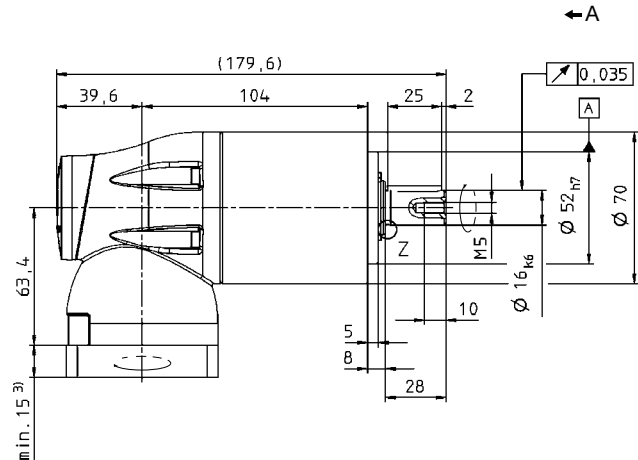
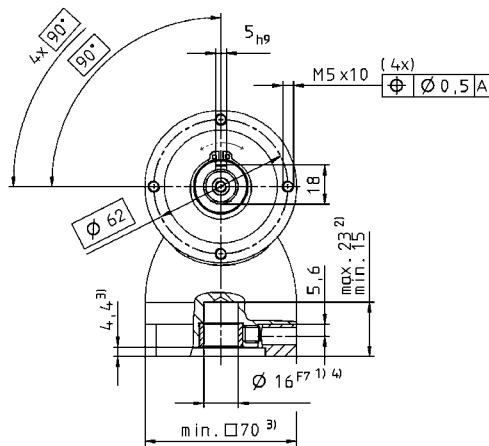
^{a)} For higher ambient temperatures, please reduce input speed

^{b)} Refers to center of the output shaft, if $n_2 = 100$ rpm

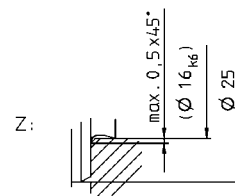
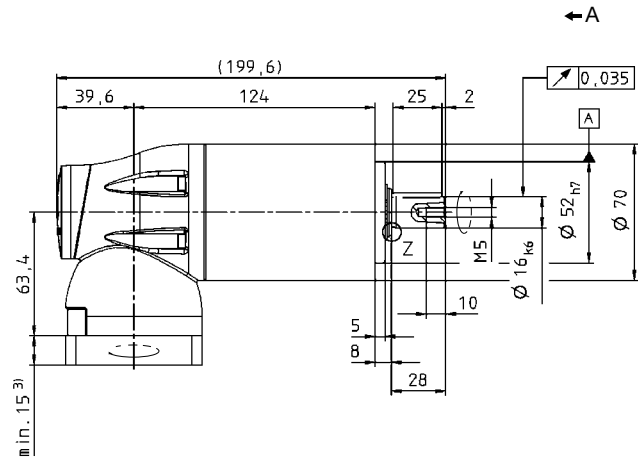
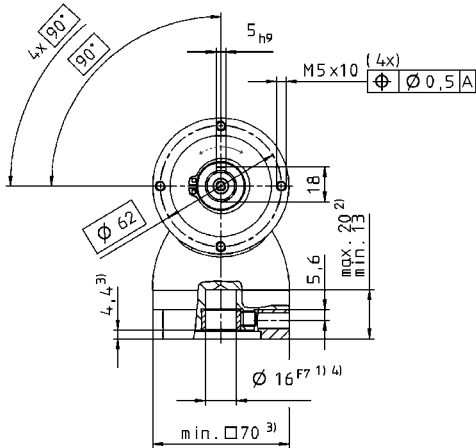
^{c)} Other ratios are available on request: $i = 15, 21, 28$ and 35

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

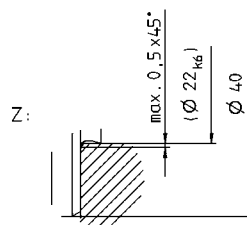
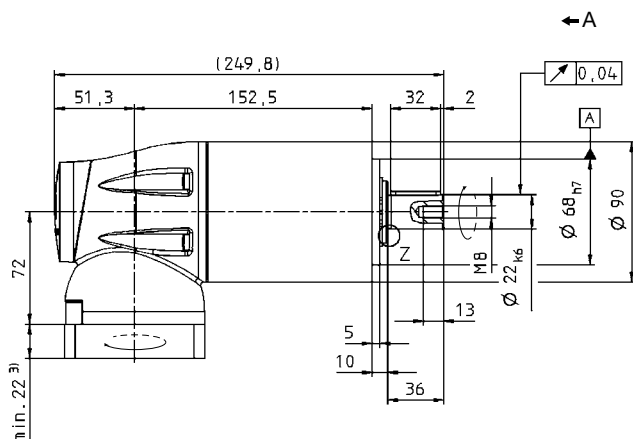
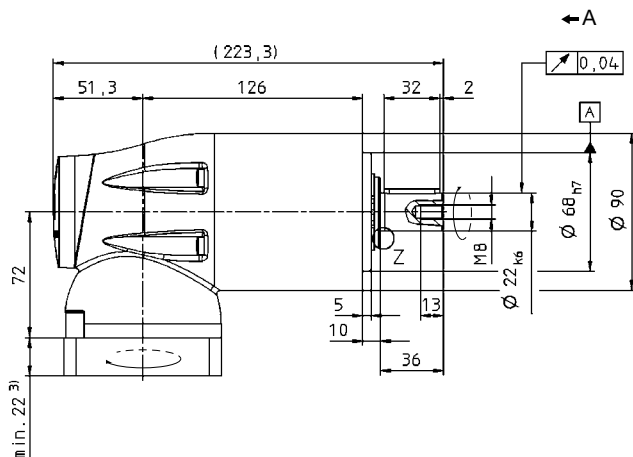
LPK+ 090 2/3-stage

			2-stage					3-stage						
Ratio ^{a)}	<i>i</i>		3	4	5	7	10	16	20	25	30	50	70	100
Max. acceleration torque (max. 1000 cycles per hour)	<i>T</i> _{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 <i>n</i> _N)	<i>T</i> _{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)	<i>T</i> _{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 <i>T</i> _{2N} and 20°C ambient temperature) ^{a)}	<i>n</i> _{1N}	rpm	2700	2700	2700	2700	2700	2700	2700	2700	2700	2700	2700	2700
Max. input speed	<i>n</i> _{1Max}	rpm	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000
Mean no load running torque (with <i>n</i> _i = 3000 rpm and 20°C gearhead temperature)	<i>T</i> 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	<i>j</i> _t	arcmin	≤ 12					≤ 11						
Torsional rigidity	<i>C</i> _{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 ^{b)}	<i>F</i> _{2AMax}	N	1900					1900						
		lb _f	430					430						
Max. radial force ^{b)}	<i>F</i> _{2RMax}	N	2400					2400						
		lb _f	540					540						
Efficiency at full load	η	%	92					90						
Service life (For calculation, see the Chapter “Information”)	<i>L</i> _h	h	> 20000					> 20000						
Weight incl. standard adapter plate	<i>m</i>	kg	6.9					7.9						
		lb _m	15					17						
Operating noise (for i = 10 and <i>n</i> _i = 3000 rpm without load)	<i>L</i> _{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)	<i>J</i> _i	kgcm ²	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 ⁻³ in.lb.s ²	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6

^{a)} For higher ambient temperatures, please reduce input speed

^{b)} Refers to center of the output shaft, if $n_2 = 100$ rpm

^{c)} Other ratios are available on request: $i = 15, 21, 28$ and 35



Right-angle gearheads

General

LPK⁺

LPK+ 120 2/3-stage

			2-stage					3-stage						
Ratio ^{a)}	<i>i</i>		3	4	5	7	10	16	20	25	30	50	70	100
Max. acceleration torque (max. 1000 cycles per hour)	<i>T</i> _{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 <i>n</i> _N)	<i>T</i> _{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)	<i>T</i> _{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 <i>T</i> _{2N} and 20°C ambient temperature) ^{a)}	<i>n</i> _{1N}	rpm	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Max. input speed	<i>n</i> _{1Max}	rpm	3500	3500	3500	3500	3500	3500	3500	3500	3500	3500	3500	3500
Mean no load running torque (with <i>n</i> _i = 3000 rpm and 20°C gearhead temperature)	<i>T</i> 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	<i>j</i> _t	arcmin	≤ 11					≤ 11						
Torsional rigidity	<i>C</i> _{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 ^{b)}	<i>F</i> _{2AMax}	N	4000					4000						
		lb _f	900					900						
Max. radial force ^{b)}	<i>F</i> _{2RMax}	N	4600					4600						
		lb _f	1040					1040						
Efficiency at full load	η	%	92					90						
Service life (For calculation, see the Chapter “Information”)	<i>L</i> _h	h	> 20000					> 20000						
Weight incl. standard adapter plate	<i>m</i>	kg	17					19						
		lb _m	37					42						
Operating noise (for i = 10 and <i>n</i> _i = 3000 rpm without load)	<i>L</i> _{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)	<i>J</i> _i	kgcm²	17	17	17	17	17	17	17	17	17	17	17	17
		10 ⁻³ in.lb.s²	15	15	15	15	15	15	15	15	15	15	15	15

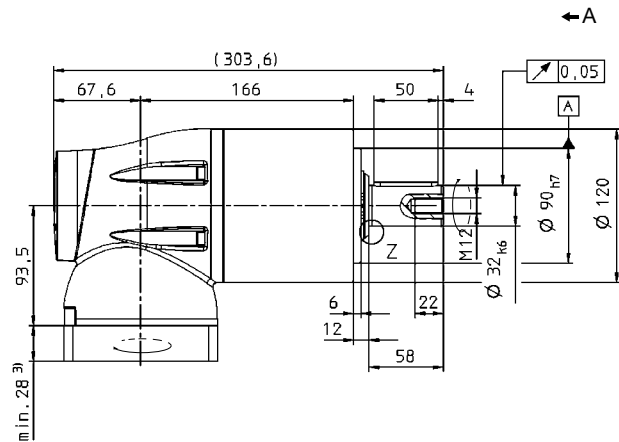
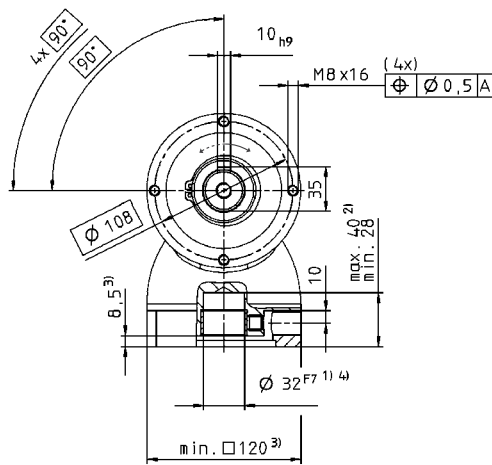
^{a)} For higher ambient temperatures, please reduce input speed

^{b)} Refers to center of the output shaft, if $n_2 = 100$ rpm

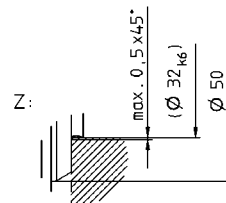
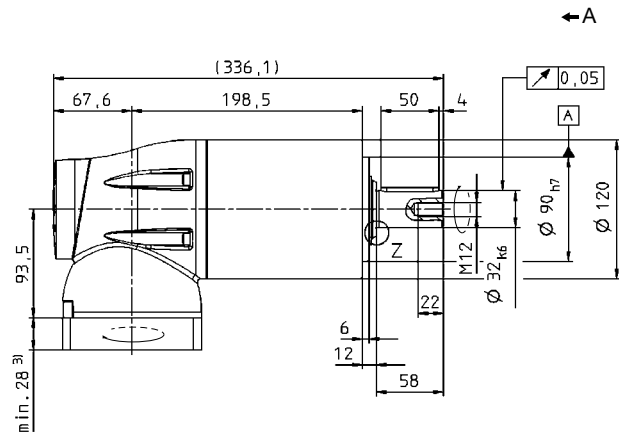
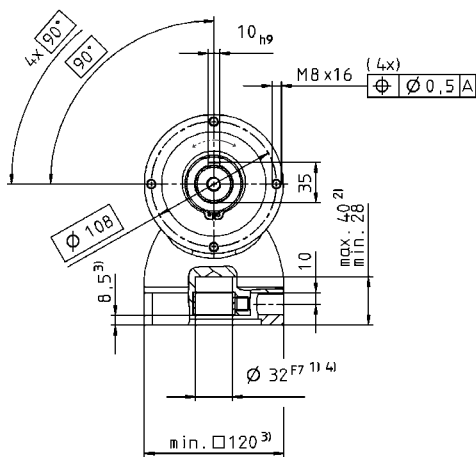
^{c)} Other ratios are available on request: $i = 15, 21, 28$ and 35

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+ 155 2/3-stage

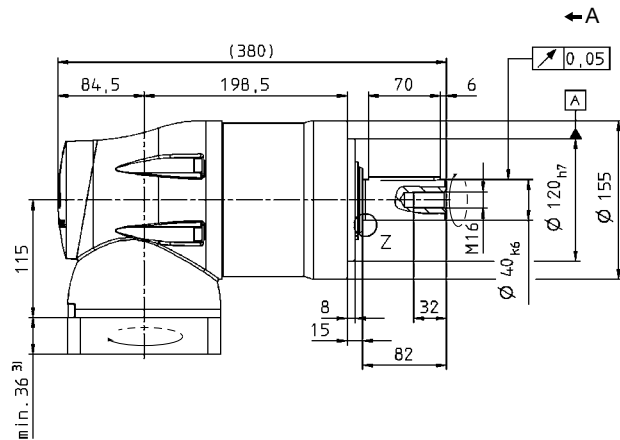
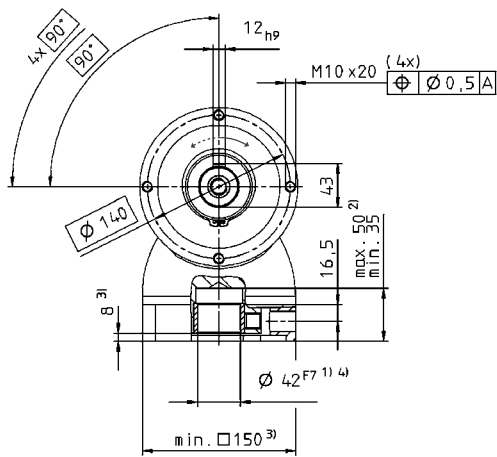
			2-stage		3-stage		
Ratio	<i>i</i>		5	10	25	50	100
Max. acceleration torque (max. 1000 cycles per hour)	T_{2B}	Nm	450	350	450	450	350
		in.lb	4000	3100	4000	4000	3100
Nominal output torque (with n_{1N})	T_{2N}	Nm	320	190	320	320	190
		in.lb	2800	1700	2800	2800	1700
Emergency stop torque (permitted 1000 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) ^{a)}	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 ^{b)}	F_{2AMax}	N	6000		6000		
		lb _f	1350		1350		
Max. radial force ^{b)}	F_{2RMax}	N	7500		7500		
		lb _f	1690		1690		
Efficiency at full load	η	%	92		90		
Service life (For calculation, see the Chapter “Information”)	L_h	h	> 20000		> 20000		
Weight incl. standard adapter plate	m	kg	35		39		
		lb _m	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_1	kgcm²	75	75	17	17	17
		10 ⁻³ in.lb.s²	66	66	15	15	15

^{a)} For higher ambient temperatures, please reduce input speed

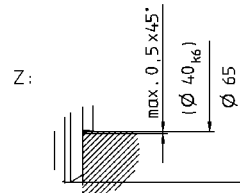
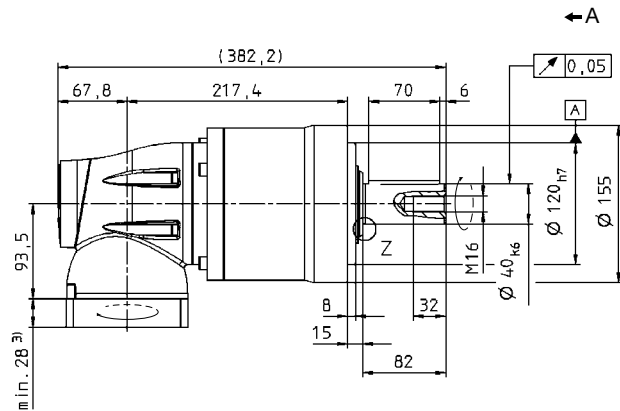
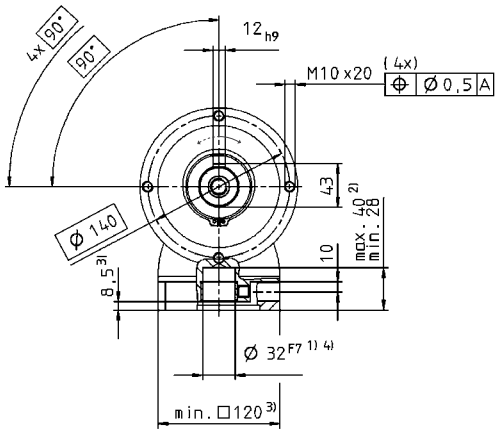
^{b)} Refers to center of the output shaft, if = 100 rpm

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
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Motor mounting according to operating manual

LPBK+ 070 2-/3-stage

			2-stage					3-stage							
Ratio	<i>i</i>		3	4	5	7	10	16	20	25	30	35	50	70	100
Max. acceleration torque (max. 1000 cycles per hour)	<i>T</i> _{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 <i>n</i>_N)	<i>T</i> _{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)	<i>T</i> _{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 <i>T</i>_{2N} and 20°C ambient temperature) ^{a)}	<i>n</i> _{1N}	rpm	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000
Max. input speed	<i>n</i> _{1Max}	rpm	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500
Mean no load running torque (with <i>n</i>_i = 3000 rpm and 20°C gearhead temperature)	<i>T</i> 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	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	5.2
Max. torsional backlash	<i>j</i> _t	arcmin	≤ 14					≤ 12							
Torsional rigidity	<i>C</i> _{t21}	Nm/ arcmin	—	—	—	—	—	—	—	—	—	—	—	—	—
		in.lb/ arcmin	—	—	—	—	—	—	—	—	—	—	—	—	—
Max. axial force ^{b)}	<i>F</i> _{2AMax}	N	1550					1550							
		lb _f	350					350							
Max. radial force ^{c)}	<i>F</i> _{2RMax}	N	3000					3000							
		lb _f	680					680							
Efficiency at full load	η	%	92					90							
Service life (For calculation, see the Chapter “Information”)	<i>L</i> _h	h	> 20000					> 20000							
Weight incl. standard adapter plate	<i>m</i>	kg	3.4					3.8							
		lb _m	7.5					8.4							
Operating noise (for i = 10 and <i>n</i>_i = 3000 rpm without load)	<i>L</i> _{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)	<i>J</i> _i	kgcm²	0.85	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 ⁻⁴ in.lb.s²	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75

^{a)} For higher ambient temperatures, please reduce input speed

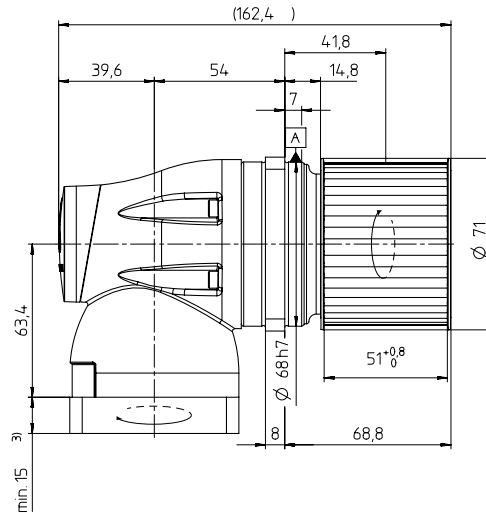
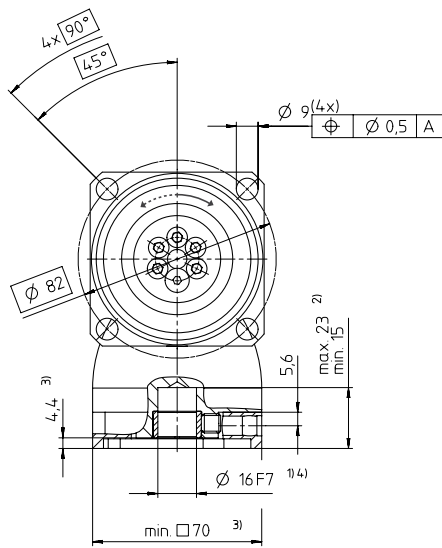
^{b)} Refers to center of the output shaft, if $n_2 = 100$ rpm

^{c)} With mounted PLPB+ belt pulley and 100 rpm

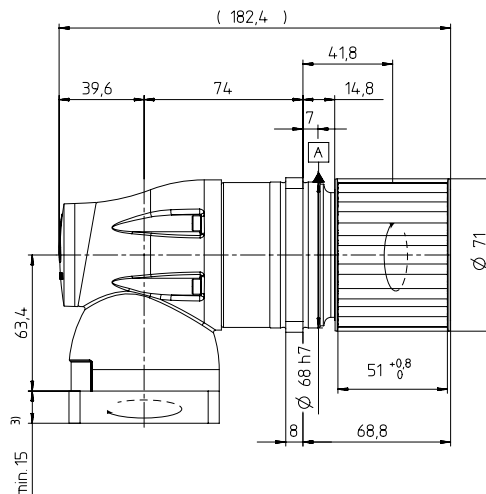
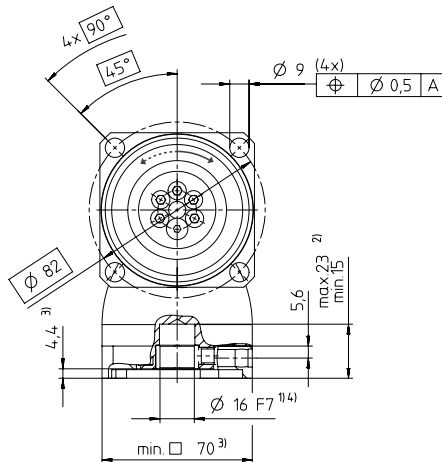
View A

2-stage:

← A



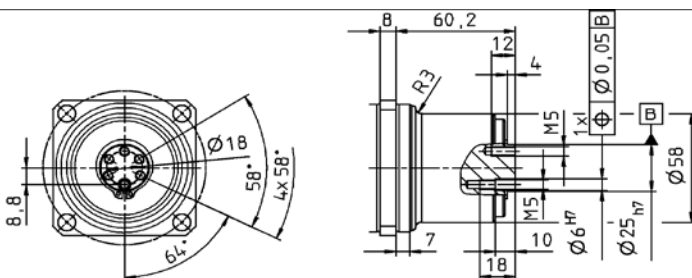
3-stage:



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

Belt Pulley PLPB+ 070 Profile AT5-0			
Pitch	p	mm	5
Number of teeth	z		43
Circumference	$z \cdot p$	mm/rotation	215
Inertia	J	kgcm ²	3.86
Mass	m	kg	0.48

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+ 090 2-stage

			2-stage					3-stage							
Ratio	<i>i</i>		3	4	5	7	10	16	20	25	30	35	50	70	100
Max. acceleration torque (max. 1000 cycles per hour)	<i>T</i> _{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 <i>n</i>_N)	<i>T</i> _{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)	<i>T</i> _{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 <i>T</i>_{2N} and 20°C ambient temperature) ^{a)}	<i>n</i> _{1N}	rpm	2700	2700	2700	2700	2700	2700	2700	2700	2700	2700	2700	2700	2700
Max. input speed	<i>n</i> _{1Max}	rpm	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000
Mean no load running torque (with <i>n</i>_i = 3000 rpm and 20°C gearhead temperature)	<i>T</i> 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	1.6
		in.lb	16	16	15	14	14	14	14	14	14	14	14	14	14
Max. torsional backlash	<i>j</i> _t	arcmin	≤ 12					≤ 11							
Torsional rigidity	<i>C</i> _{t21}	Nm/ arcmin	—	—	—	—	—	—	—	—	—	—	—	—	—
		in.lb/ arcmin	—	—	—	—	—	—	—	—	—	—	—	—	—
Max. axial force ^{b)}	<i>F</i> _{2AMax}	N	1900					1900							
		lb _f	430					430							
Max. radial force ^{c)}	<i>F</i> _{2RMax}	N	4300					4300							
		lb _f	970					970							
Efficiency at full load	η	%	92					90							
Service life (For calculation, see the Chapter “Information”)	<i>L</i> _h	h	> 20000					> 20000							
Weight incl. standard adapter plate	<i>m</i>	kg	6.2					6.9							
		lb _m	14					15							
Operating noise (for i = 10 and <i>n</i>_i = 3000 rpm without load)	<i>L</i> _{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)	<i>J</i> _i	kgcm ²	4.1	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 ⁻⁴ in.lb.s ²	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6

^{a)} For higher ambient temperatures, please reduce input speed

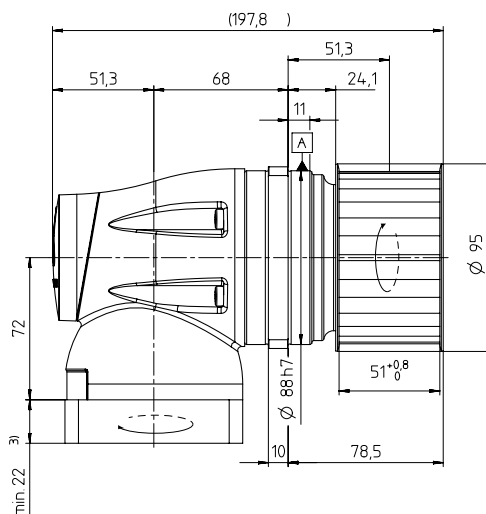
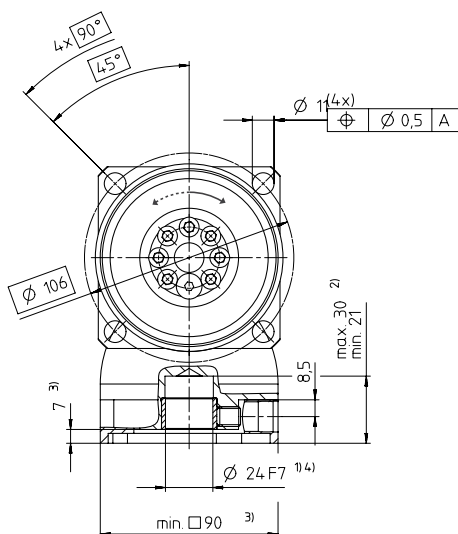
^{b)} Refers to center of the output shaft, if $n_2 = 100$ rpm

^{c)} With mounted PLPB+ belt pulley and 100 rpm

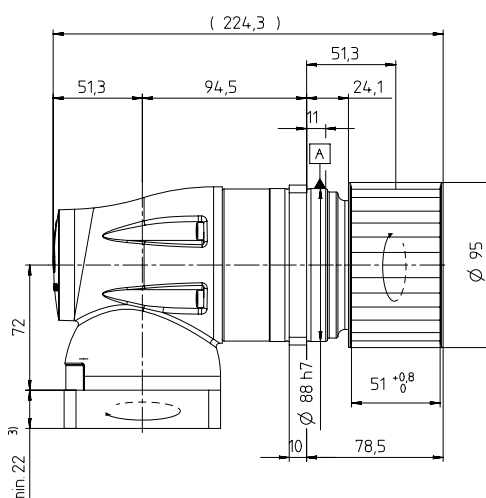
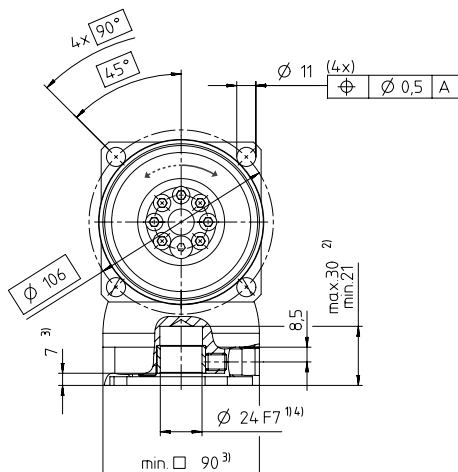
View A

2-stage:

← A



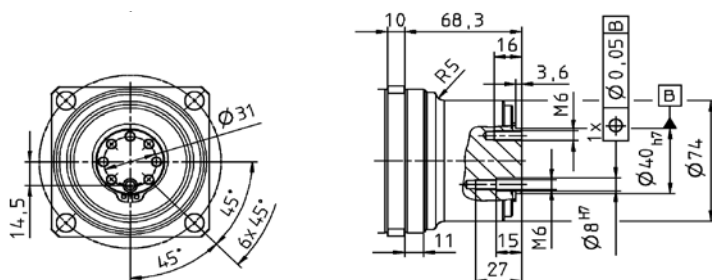
3-stage:



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	$z \cdot p$	mm/rotation 280
Inertia	J	kgcm ² 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.



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Motor mounting according to operating manual

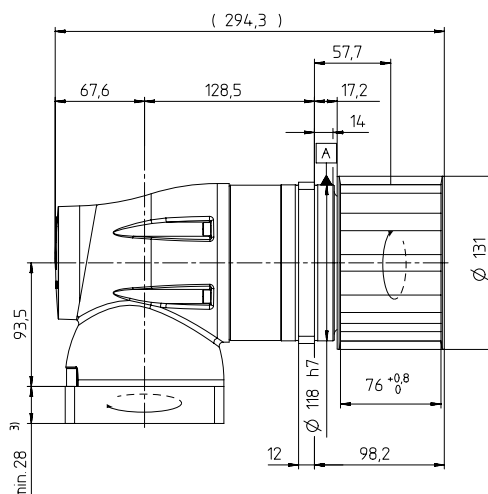
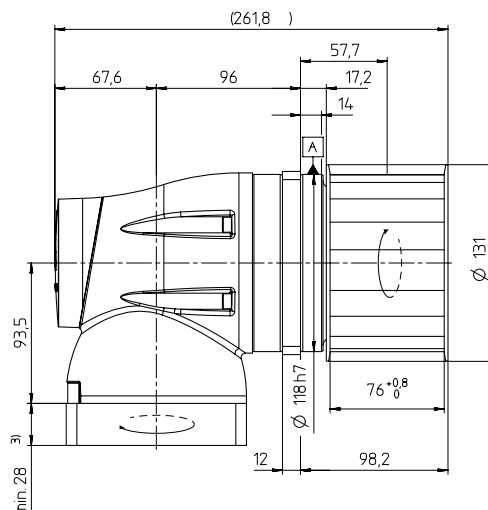
LPBK+ 120 2-/3-stage

			2-stage					3-stage							
Ratio	<i>i</i>		3	4	5	7	10	16	20	25	30	35	50	70	100
Max. acceleration torque (max. 1000 cycles per hour)	<i>T</i> _{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 <i>n</i> _N)	<i>T</i> _{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)	<i>T</i> _{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 <i>T</i> _{2N} and 20°C ambient temperature) ^{a)}	<i>n</i> _{1N}	rpm	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Max. input speed	<i>n</i> _{1Max}	rpm	3500	3500	3500	3500	3500	3500	3500	3500	3500	3500	3500	3500	3500
Mean no load running torque (with <i>n</i> _i = 3000 rpm and 20°C gearhead temperature)	<i>T</i> 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	<i>j</i> _t	arcmin	≤ 11					≤ 11							
Torsional rigidity	<i>C</i> _{t21}	Nm/ arcmin	—	—	—	—	—	—	—	—	—	—	—	—	—
		in.lb/ arcmin	—	—	—	—	—	—	—	—	—	—	—	—	—
Max. axial force ^{b)}	<i>F</i> _{2AMax}	N	4000					4000							
		lb _f	900					900							
Max. radial force ^{c)}	<i>F</i> _{2RMax}	N	9500					9500							
		lb _f	2100					2100							
Efficiency at full load	η	%	92					90							
Service life (For calculation, see the Chapter “Information”)	<i>L</i> _h	h	> 20000					> 20000							
Weight incl. standard adapter plate	<i>m</i>	kg	16					17							
		lb _m	34					37							
Operating noise (for i = 10 and <i>n</i> _i = 3000 rpm without load)	<i>L</i> _{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)	<i>J</i> _i	kgcm²	17	17	17	17	17	17	17	17	17	17	17	17	17
		10 ⁻³ in.lb.s²	15	15	15	15	15	15	15	15	15	15	15	15	15

^{a)} For higher ambient temperatures, please reduce input speed

^{b)} Refers to center of the output shaft, if $n_2 = 100$ rpm

^{c)} With mounted PLPB+ belt pulley and 100 rpm

[illegible]

Technical drawing of a 100 mm diameter ball valve. The left view is a top view showing a circular body with a central bore, four mounting holes, and a 45-degree chamfer. The right view is a side view showing the valve handle, stem, and internal components with various dimensions and tolerances.