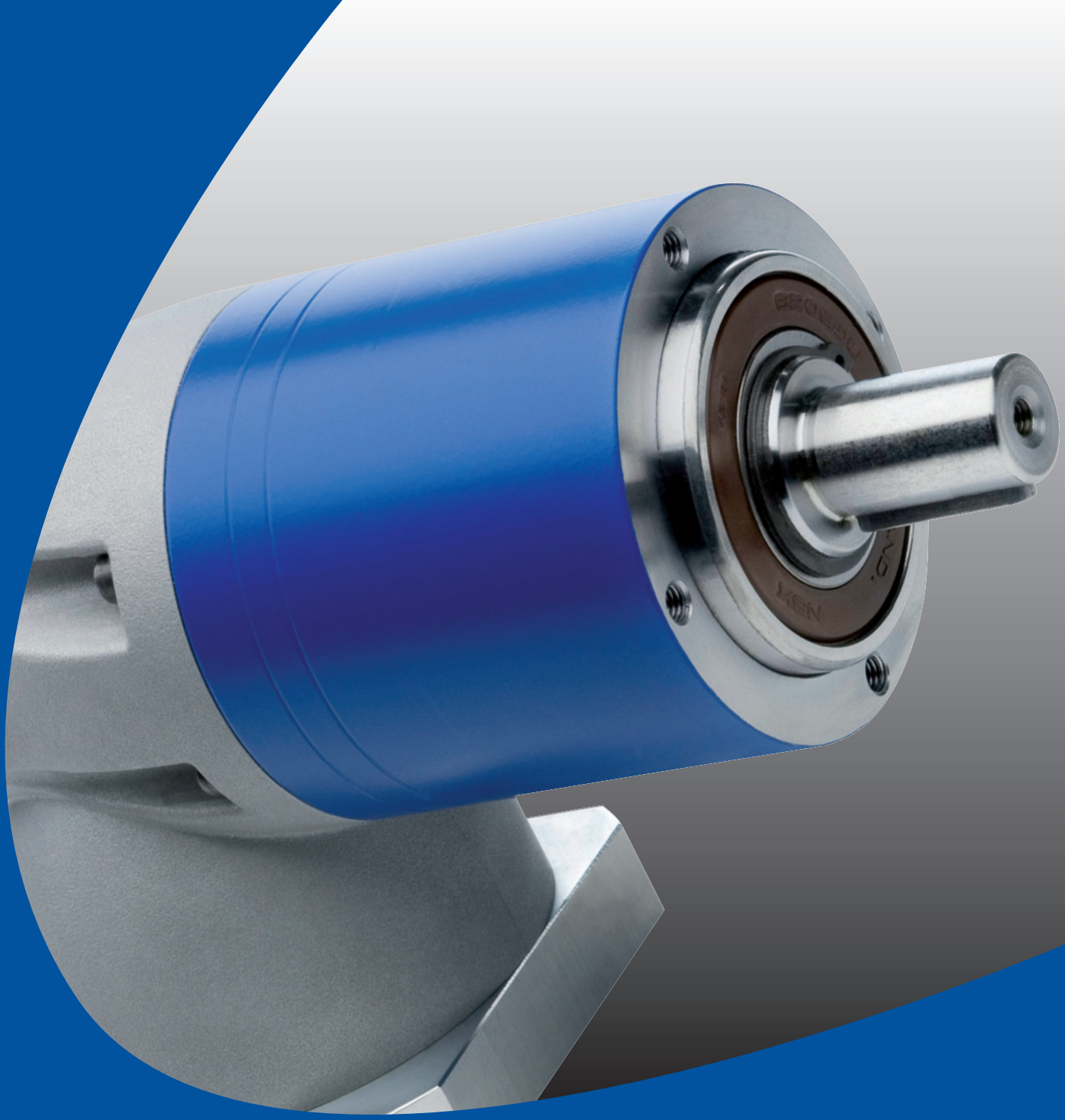


LK+/LPK+ - efficient angle precision

alpha

a WITTENSTEIN AG company

LK+/LPK+ – efficient angle precision

Maximum economy

LK+/LPK+ Right-Angle Gearheads offer unbeatable value for money, are incredibly efficient and require absolutely no maintenance.

Total reliability

LK+/LPK+ are renowned for their endurance – in cyclic or continuous duty.

High efficiency

A two-stage LPK+ achieves 92% efficiency at full load.

LK+

Added flexibility

LK+/LPK+ are suitable for any installation position, motor type or operating mode. Courtesy of the universal alpha motor mounting system, mounting is completed in under five minutes. The gearhead is supplied with an adapter that fits your motor exactly.

Cutting edge innovations made by alpha

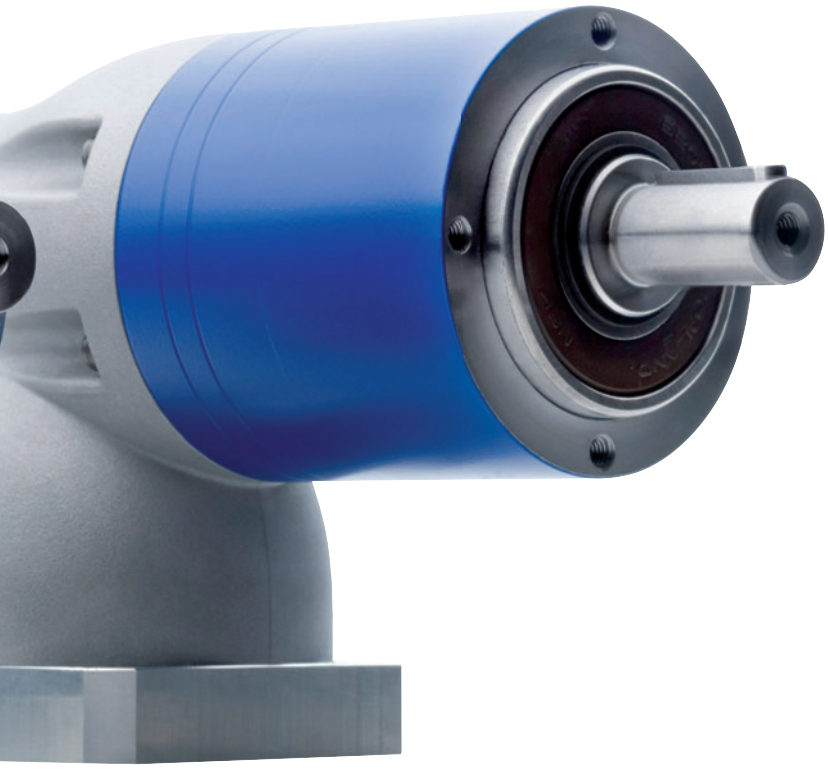
We have been developing, manufacturing and distributing low-backlash planetary gearheads, servo right-angled gearheads, complete drive units and planetary elevator machines with an integrated servo motor since 1984.
Profit from our comprehensive service package:
From individual components to complete systems, backed up by expert engineering services. A thousand employees worldwide are committed to our cause. alpha's home is in Germany – in Igersheim on the Romantic Road in northern Baden-Württemberg.

alpha is a member of the WITTENSTEIN AG which has rightly established a name for itself with numerous innovations in industries such as aerospace and simulation, medical technology, elevator drives and Formula One racing.

WITTENSTEIN – being one with the future!

For any application

LK+/LPK+ are ideally suited to all servo applications where economy is just as important as top performance.



LPK+

Short delivery times

LK+/LPK+ are standard products that are usually delivered within one to two weeks.
Our special service:
With alpha speedline®, LK+/LPK+ can be dispatched in just 24/48 hours.

Leaders of the pack

We are driven by a desire to enhance our customers' success with products and systems from alpha. We set benchmarks when it comes to precision, performance and durability. Our ground-breaking technology gives our customers an edge in their respective market sectors. Place your trust in premium quality and total reliability from alpha. Choose world class engineering – the foundation for strong partnerships and added value that is passed on to your customers.

alpha benefits at a glance:

Record-breaking lifespan
Extremely long service life that results from intelligent design.

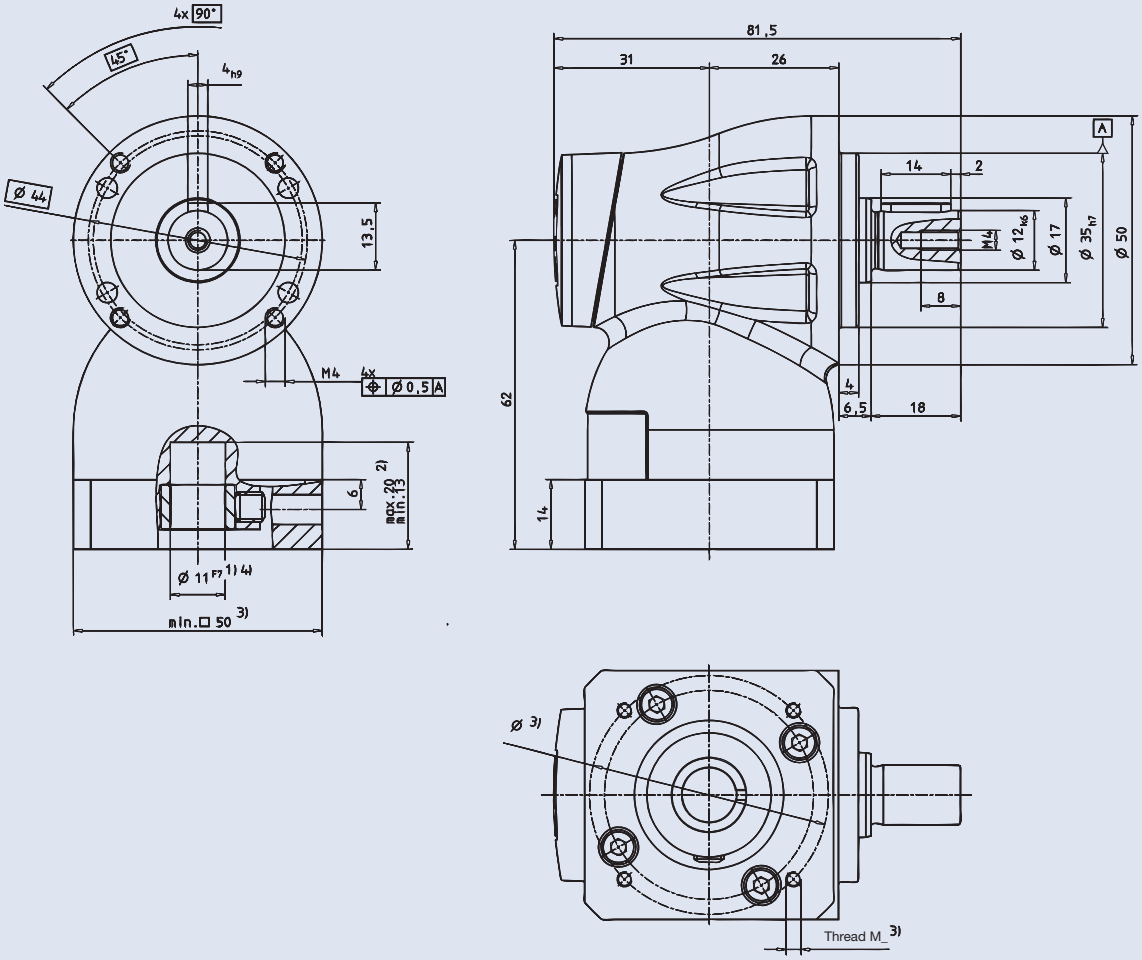
Motor mounting is child's play
Simple and reliable mounting in a single step

Top quality from the alpha stable
In-house development and manufacture of all products combined with a pioneering spirit and an insatiable urge to improve.

alpha speedline®
speedline delivery if your production process can't wait.
Dispatch of your alpha gearheads from our factory is guaranteed in just 24 or 48 hours.
Our speedline delivery service has been operating successfully throughout Europe since 2004.

alpha

1-stage



Non-toleranced dimensions ±1 mm
1) Check motor shaft fit.
2) Min./max. permissible motor shaft length. Longer motor shafts are possible on request: please contact alpha.
3) Dimensions depend on motor.
4) Smaller motor shaft diameters possible with bushing.

⚠ Motor mounting in accordance with Operating Manual.

The through bores are not meant for the machine mounting.
If you have any questions, please contact alpha.

Technical Specifications LK+ 050		1-stage
Ratio	i	1
Maximum acceleration torque (max. 1000 cycles per hour)	T_{2B} Nm	2.5
Nominal output torque	T_{2N} Nm	1.2
Emergency stop torque (Permissible 1000 times during the lifespan of the gearhead)	T_{2Not} Nm	5
Nominal input speed (At 20 °C ambient temperature) [a]	n_{1N} min^{-1}	3200
No-load running torque (At n_1=3000 min^{-1} and at 20 °C gearhead temperature)	T_{012} Nm	–
Maximum input speed	n_{1Max} min^{-1}	5000
Torsional backlash	j_t arcmin	≤ 15
Torsional rigidity	C_{t21} Nm/arcmin	–
Max. axial force [b]	F_{2AMax} N	100
Max. radial force [b]	F_{2RMax} Nm	650
Efficiency at full load	η %	> 95
Service life	L_h h	> 20000
Weight incl. adapter plate	m kg	0.7
Noise level (n_1=3000 min^{-1})	L_{PA} dB(A)	–
Max. permissible housing temperature	°C	90
Ambient temperature	°C	0 up to +40
Lubrication		Flow Grease
Paint		without
Type of protection		IP 64
Mass moment of inertia (referring to the drive)	J_1 $kgcm^2$	0.14

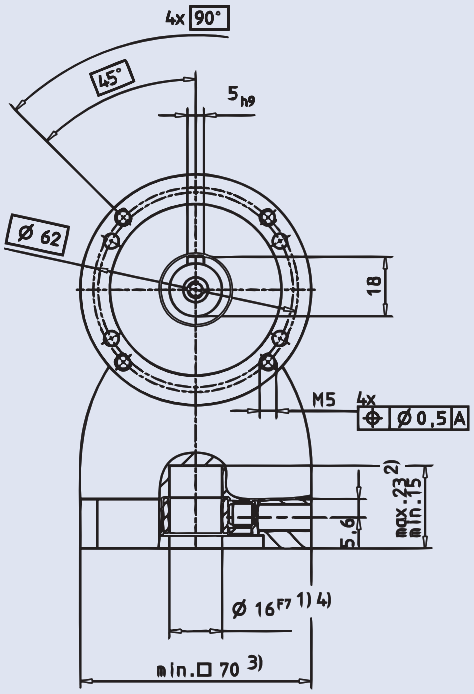
Conversion table

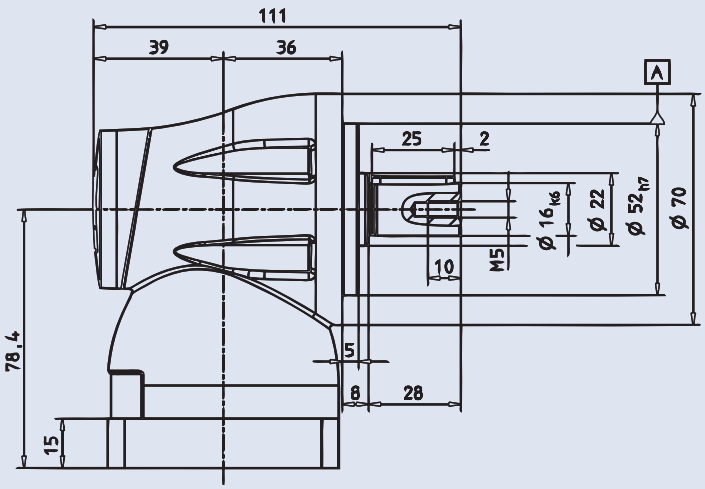
1 mm	=	0.039 in
1 Nm	=	8.85 in.lb
1 $kgcm^2$	=	8.85 x 10^{-4} in.lb.s^2
1 N	=	0.225 lb_f
1 kg	=	2.21 lb_m

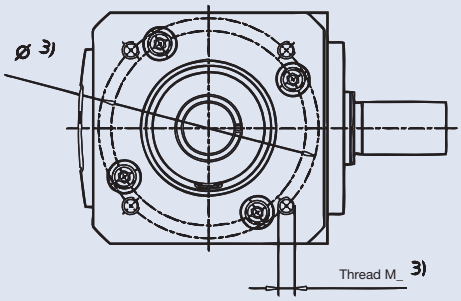
a) For higher ambient temperature, reduce nominal input speed n_{1N}.
b) In reference to centre of output shaft n_1 = 1000 min^{-1}.

alpha

1-stage







Non-toleranced dimensions ±1 mm
1) Check motor shaft fit.
2) Min./max. permissible motor shaft length. Longer motor shafts are possible on request: please contact alpha.
3) Dimensions depend on motor.
4) Smaller motor shaft diameters possible with bushing.

⚠ Motor mounting in accordance with Operating Manual.#

The through bores are not meant for the machine mounting.
If you have any questions, please contact alpha.

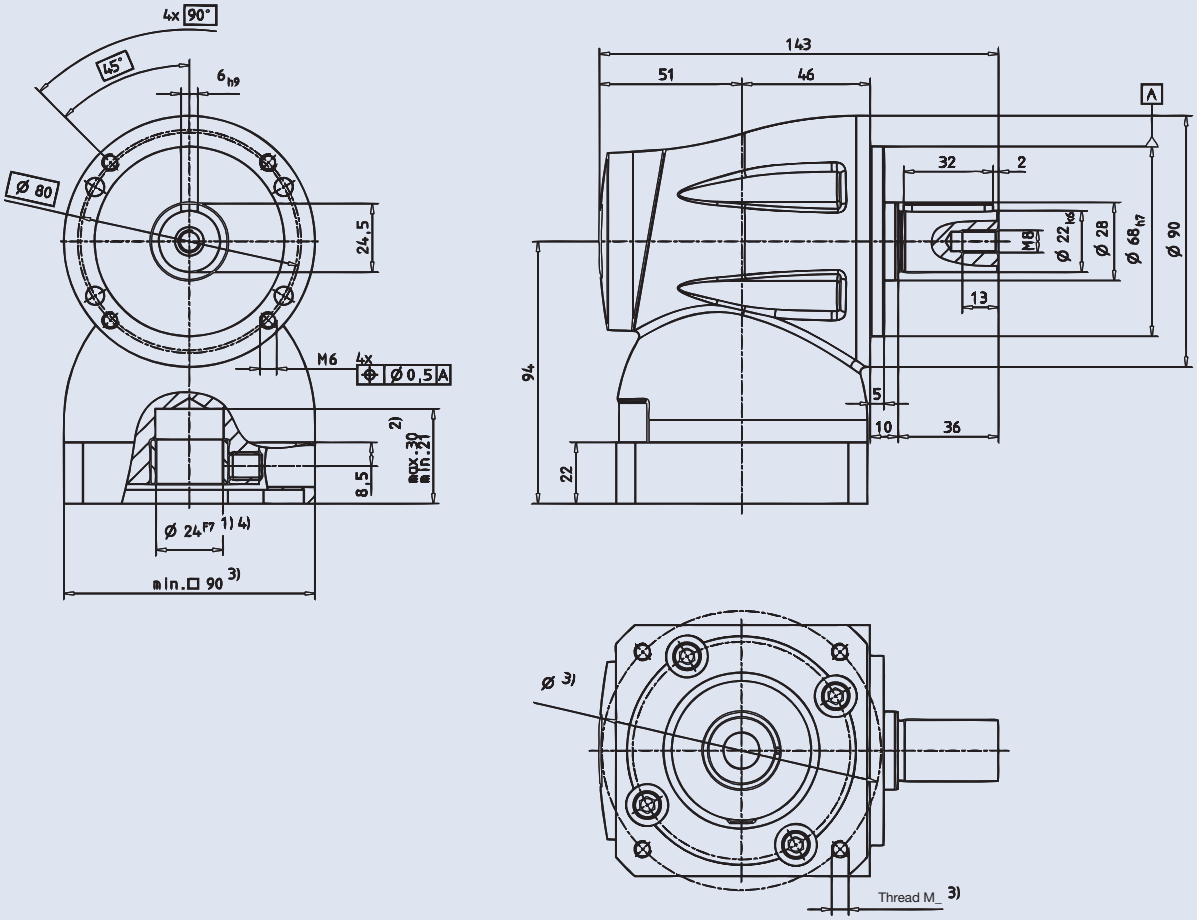
Technical Specifications LK+ 070			1-stage
Ratio	i		1
Maximum acceleration torque (max. 1000 cycles per hour)	T_{2B}	Nm	7
Nominal output torque	T_{2N}	Nm	3.7
Emergency stop torque (Permissible 1000 times during the lifespan of the gearhead)	T_{2Not}	Nm	15
Nominal input speed (At 20 °C ambient temperature) [a]	n_{1N}	min^{-1}	3000
No-load running torque (At n_1=3000 min^{-1} and at 20 °C gearhead temperature)	T_{012}	Nm	≤ 0.3
Maximum input speed	n_{1Max}	min^{-1}	4500
Torsional backlash	j_t	arcmin	≤ 15
Torsional rigidity	C_{t21}	Nm/arcmin	–
Max. axial force [b]	F_{2AMax}	N	200
Max. radial force [b]	F_{2RMax}	Nm	1450
Efficiency at full load	η	%	> 95
Service life	L_h	h	> 20000
Weight incl. adapter plate	m	kg	1.9
Noise level (n_1=3000 min^{-1})	L_{PA}	dB(A)	–
Max. permissible housing temperature		°C	90
Ambient temperature		°C	0 up to +40
Lubrication			Flow Grease
Paint			without
Type of protection			IP 64
Mass moment of inertia (referring to the drive)	J_1	$kgcm^2$	0.73

Conversion table

1 mm	=	0.039 in
1 Nm	=	8.85 in.lb
1 $kgcm^2$	=	8.85 x 10^{-4} in.lb.s^2
1 N	=	0.225 lb_f
1 kg	=	2.21 lb_m

a) For higher ambient temperature, reduce nominal input speed n_{1N}.
b) In reference to centre of output shaft n_1 = 1000 min^{-1}.

1-stage



Non-toleranced dimensions ±1 mm
1) Check motor shaft fit.
2) Min./max. permissible motor shaft length. Longer motor shafts are possible on request: please contact alpha.
3) Dimensions depend on motor.
4) Smaller motor shaft diameters possible with bushing.

⚠ Motor mounting in accordance with Operating Manual.

The through bores are not meant for the machine mounting.
If you have any questions, please contact alpha.

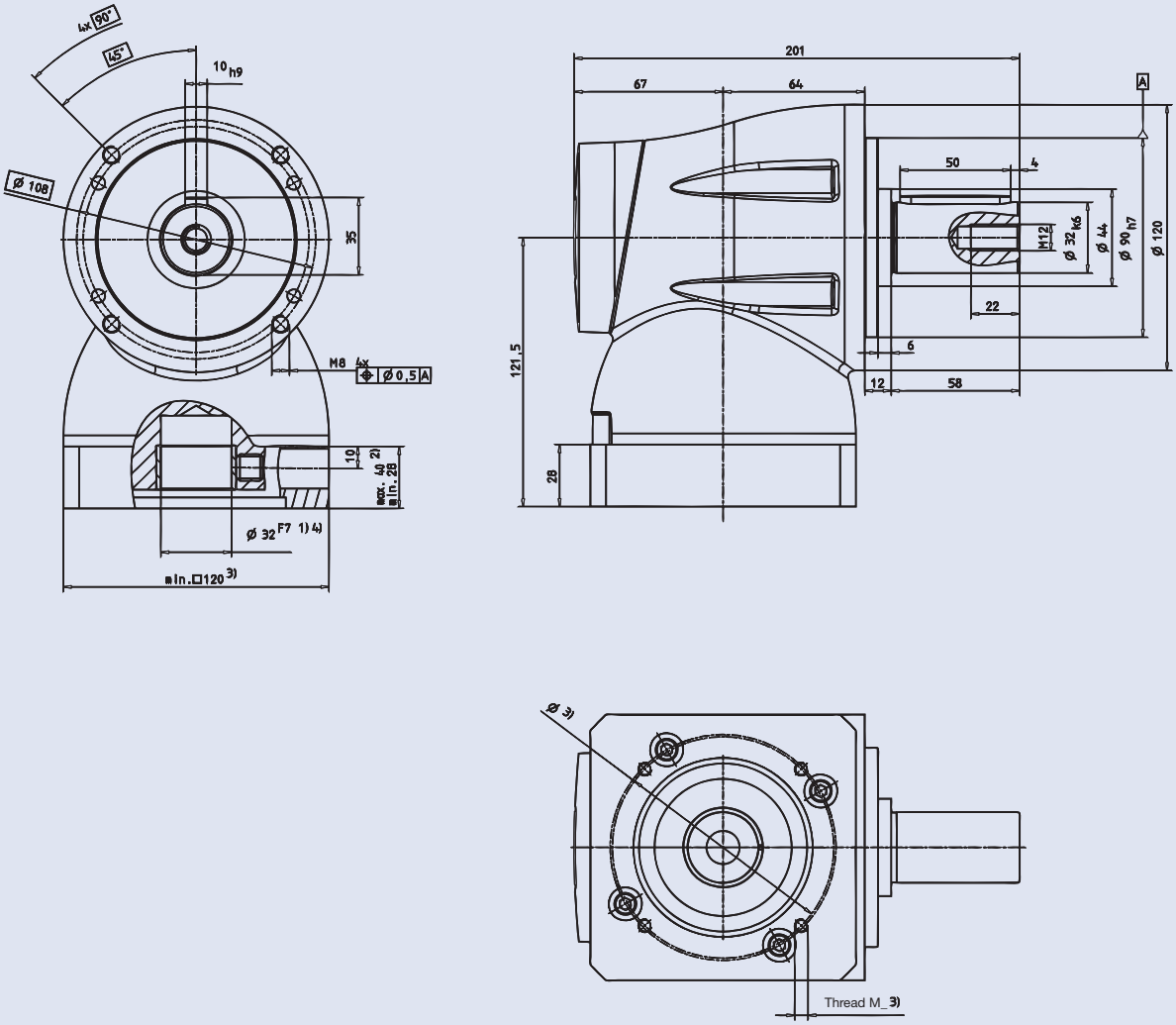
Technical Specifications LK+ 090			1-stage
Ratio	i		1
Maximum acceleration torque (max. 1000 cycles per hour)	T_{2B}	Nm	19
Nominal output torque	T_{2N}	Nm	9.3
Emergency stop torque (Permissible 1000 times during the lifespan of the gearhead)	T_{2Not}	Nm	37
Nominal input speed (At 20 °C ambient temperature) [a]	n_{1N}	min^{-1}	2700
No-load running torque (At n_1=3000 min^{-1} and at 20 °C gearhead temperature)	T_{012}	Nm	≤ 0.9
Maximum input speed	n_{1Max}	min^{-1}	4000
Torsional backlash	j_t	arcmin	≤ 15
Torsional rigidity	C_{t21}	Nm/arcmin	1.26
Max. axial force [b]	F_{2AMax}	N	450
Max. radial force [b]	F_{2RMax}	Nm	2400
Efficiency at full load	η	%	> 95
Service life	L_h	h	> 20000
Weight incl. adapter plate	m	kg	3.2
Noise level (n_1=3000 min^{-1})	L_{PA}	dB(A)	–
Max. permissible housing temperature		°C	90
Ambient temperature		°C	0 up to +40
Lubrication			Flow Grease
Paint			without
Type of protection			IP 64
Mass moment of inertia (referring to the drive)	J_1	$kgcm^2$	3.3

a) For higher ambient temperature, reduce nominal input speed n_{1N}.
b) In reference to centre of output shaft n_1 = 1000 min^{-1}.

Conversion table

1 mm	=	0.039 in
1 Nm	=	8.85 in.lb
1 $kgcm^2$	=	8.85 x 10^{-4} in.lb.s^2
1 N	=	0.225 lb_f
1 kg	=	2.21 lb_m

1-stage



Non-toleranced dimensions ±1 mm
1) Check motor shaft fit.
2) Min./max. permissible motor shaft length. Longer motor shafts are possible on request: please contact alpha.
3) Dimensions depend on motor.
4) Smaller motor shaft diameters possible with bushing.

⚠ Motor mounting in accordance with Operating Manual.

The through bores are not meant for the machine mounting.
If you have any questions, please contact alpha.

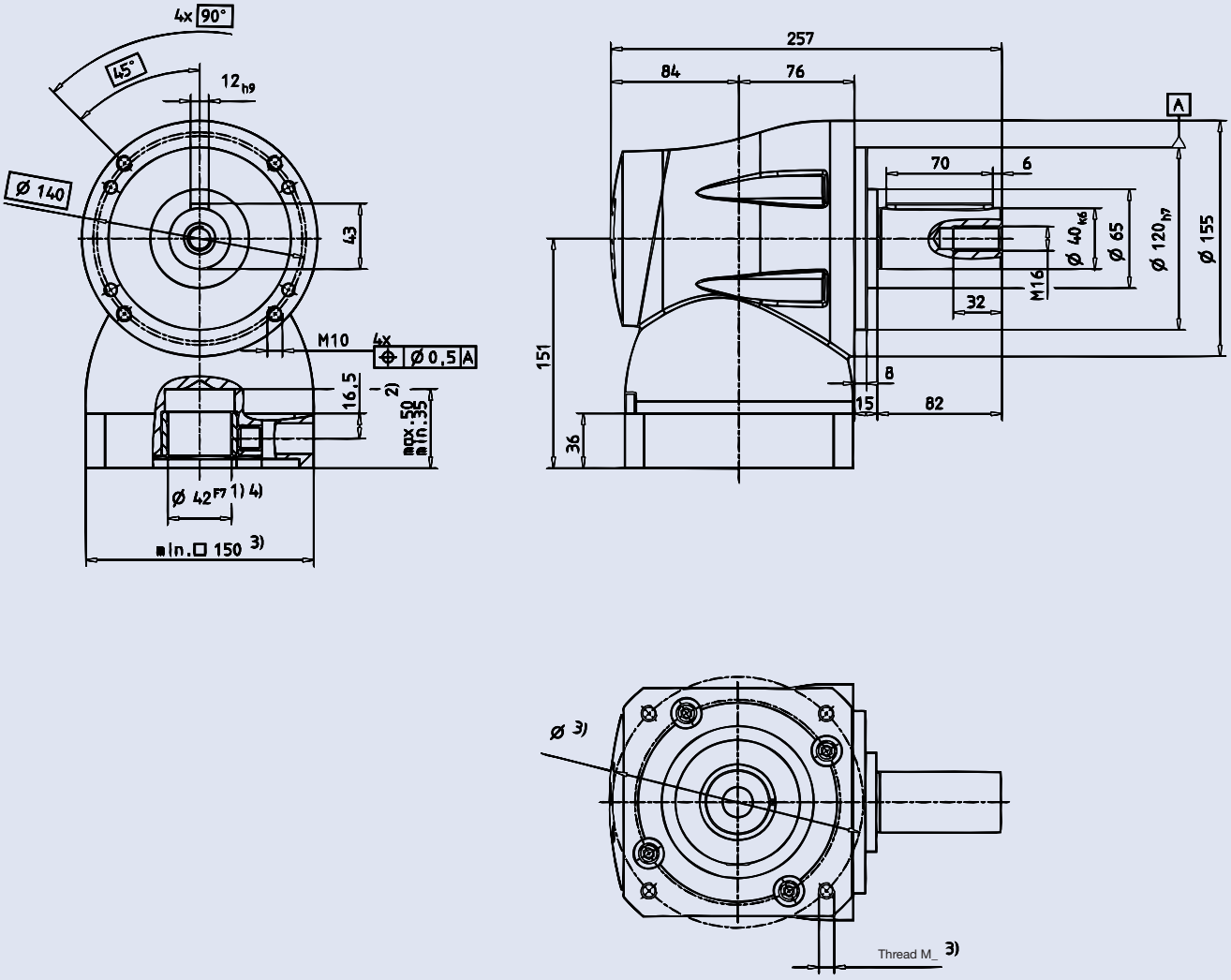
Technical Specifications LK+ 120			1-stage
Ratio	i		1
Maximum acceleration torque (max. 1000 cycles per hour)	T_{2B}	Nm	45
Nominal output torque	T_{2N}	Nm	23
Emergency stop torque (Permissible 1000 times during the lifespan of the gearhead)	T_{2Not}	Nm	93
Nominal input speed (At 20 °C ambient temperature) [a]	n_{1N}	min^{-1}	2100
No-load running torque (At n_1=3000 min^{-1} and at 20 °C gearhead temperature)	T_{012}	Nm	≤ 2.3
Maximum input speed	n_{1Max}	min^{-1}	3500
Torsional backlash	j_t	arcmin	≤ 15
Torsional rigidity	C_{t21}	Nm/arcmin	–
Max. axial force [b]	F_{2AMax}	N	750
Max. radial force [b]	F_{2RMax}	Nm	4600
Efficiency at full load	η	%	> 95
Service life	L_h	h	> 20000
Weight incl. adapter plate	m	kg	8.9
Noise level (n_1=3000 min^{-1})	L_{PA}	dB(A)	–
Max. permissible housing temperature		°C	90
Ambient temperature		°C	0 up to +40
Lubrication			Flow Grease
Paint			without
Type of protection			IP 64
Mass moment of inertia (referring to the drive)	J_1	$kgcm^2$	13.9

Conversion table

1 mm	=	0.039 in
1 Nm	=	8.85 in.lb
1 $kgcm^2$	=	8.85 x 10^{-4} in.lb.s^2
1 N	=	0.225 lb_f
1 kg	=	2.21 lb_m

a) For higher ambient temperature, reduce nominal input speed n_{1N}.
b) In reference to centre of output shaft n_1 = 1000 min^{-1}.

1-stage



Non-toleranced dimensions ±1 mm
1) Check motor shaft fit.
2) Min./max. permissible motor shaft length. Longer motor shafts are possible on request: please contact alpha.
3) Dimensions depend on motor.
4) Smaller motor shaft diameters possible with bushing.

⚠ Motor mounting in accordance with Operating Manual.

The through bores are not meant for the machine mounting.
If you have any questions, please contact alpha.

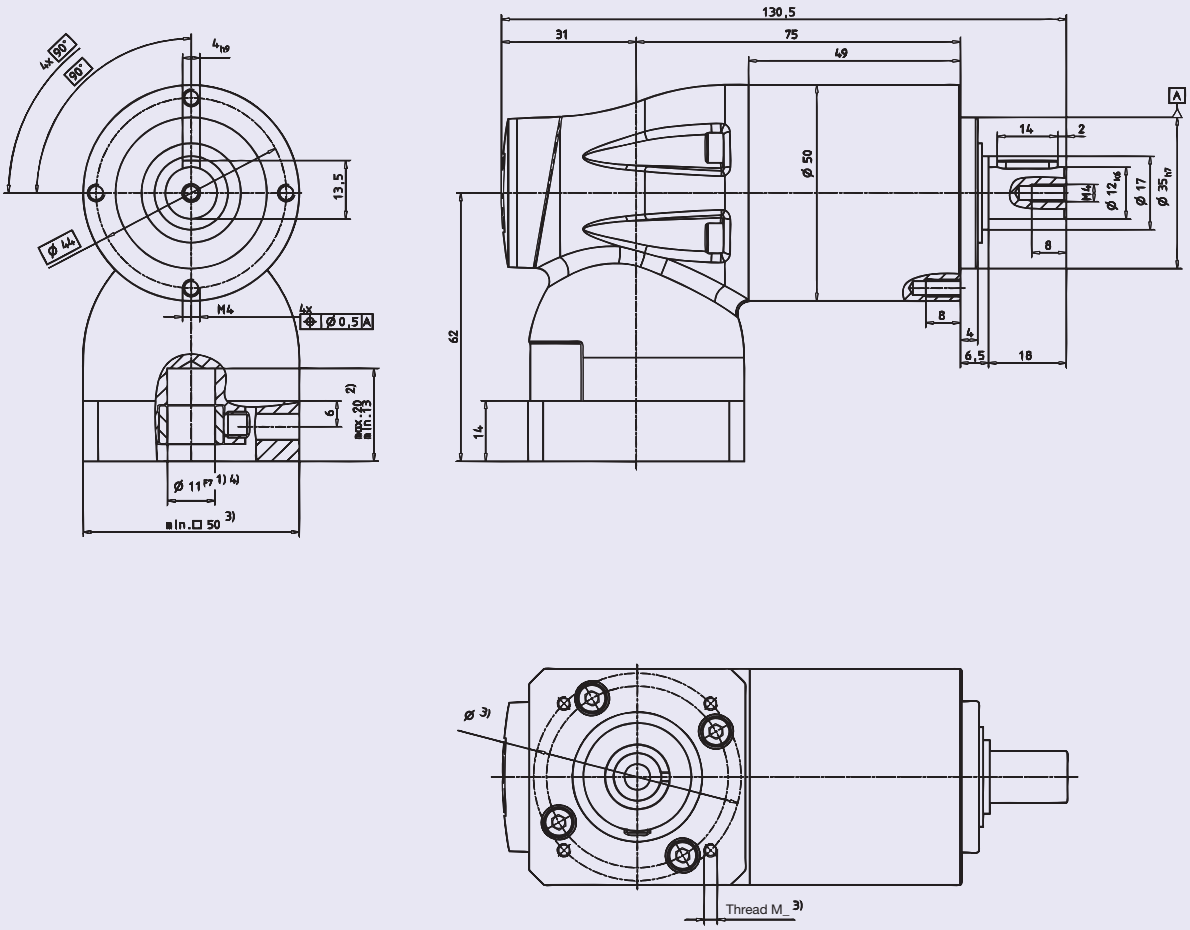
Technical Specifications LK+ 155			1-stage
Ratio	i		1
Maximum acceleration torque (max. 1000 cycles per hour)	T_{2B}	Nm	93
Nominal output torque	T_{2N}	Nm	66
Emergency stop torque (Permissible 1000 times during the lifespan of the gearhead)	T_{2Not}	Nm	194
Nominal input speed (At 20 °C ambient temperature) [a]	n_{1N}	min^{-1}	1600
No-load running torque (At n_1=3000 min^{-1} and at 20 °C gearhead temperature)	T_{012}	Nm	–
Maximum input speed	n_{1Max}	min^{-1}	3000
Torsional backlash	j_t	arcmin	≤ 15
Torsional rigidity	C_{t21}	Nm/arcmin	–
Max. axial force [b]	F_{2AMax}	N	1000
Max. radial force [b]	F_{2RMax}	Nm	7500
Efficiency at full load	η	%	> 95
Service life	L_h	h	> 20000
Weight incl. adapter plate	m	kg	18.9
Noise level (n_1=3000 min^{-1})	L_{PA}	dB(A)	–
Max. permissible housing temperature		°C	90
Ambient temperature		°C	0 up to +40
Lubrication			Flow Grease
Paint			without
Type of protection			IP 64
Mass moment of inertia (referring to the drive)	J_1	$kgcm^2$	57.1

Conversion table

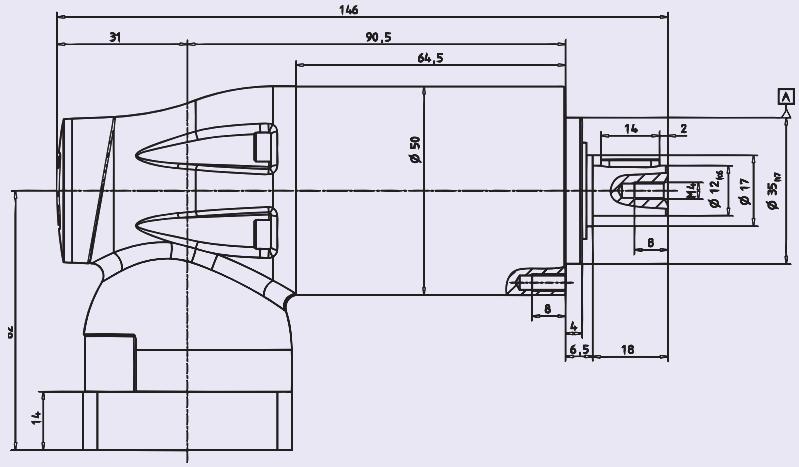
1 mm	=	0.039 in
1 Nm	=	8.85 in.lb
1 $kgcm^2$	=	8.85 x 10^{-4} in.lb.s^2
1 N	=	0.225 lb_f
1 kg	=	2.21 lb_m

a) For higher ambient temperature, reduce nominal input speed n_{1N}.
b) In reference to centre of output shaft n_1 = 1000 min^{-1}.

2-stage



3-stage



Non-toleranced dimensions ±1 mm
1) Check motor shaft fit.
2) Min./max. permissible motor shaft length. Longer motor shafts are possible on request: please contact alpha.
3) Dimensions depend on motor.
4) Smaller motor shaft diameters possible with bushing.

⚠ Motor mounting in accordance with Operating Manual.

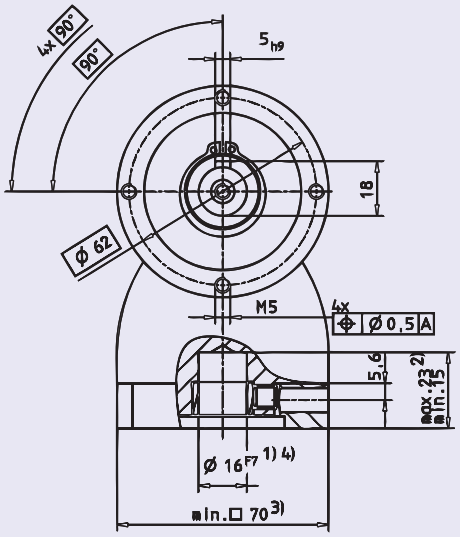
Technical Specifications LPK+ 050			2-stage		3-stage		
Ratio	i		5	10	25	50	100
Maximum acceleration torque (max. 1000 cycles per hour)	T_{2B}	Nm	12	11	12	12	11
Nominal output torque	T_{2N}	Nm	5.7	5.2	5.7	5.7	5.2
Emergency stop torque (Permissible 1000 times during the lifespan of the gearhead)	T_{2Not}	Nm	26	26	26	26	26
Nominal input speed (At 20 °C ambient temperature) a)	n_{1N}	min^{-1}	3200	3200	3200	3200	3200
No-load running torque (At n_1=3000 min^{-1} and at 20 °C gearhead temperature)	T_{012}	Nm	–	–	–	–	–
Maximum input speed	n_{1Max}	min^{-1}	5000	5000	5000	5000	5000
Torsional backlash	j_t	arcmin	≤ 13		≤ 15		
Torsional rigidity	C_{t21}	Nm/arcmin	–		–		
Max. axial force b)	F_{2AMax}	N	700		700		
Max. radial force b)	F_{2RMax}	Nm	650		650		
Efficiency at full load	η	%	92		90		
Service life	L_h	h	20000		20000		
Weight incl. adapter plate	m	kg	1.4		1.6		
Noise level (n_1=3000 min^{-1}) c)	L_{PA}	dB(A)	–				
Max. permissible housing temperature		°C	90				
Ambient temperature		°C	0 up to +40				
Lubrication			Flow Grease				
Paint (Unpainted right angle stage)			Blue RAL 5002				
Type of protection			IP 64				
Mass moment of inertia (referring to the drive)	J_1	$kgcm^2$	0.156	0.156	0.156	0.156	0.156

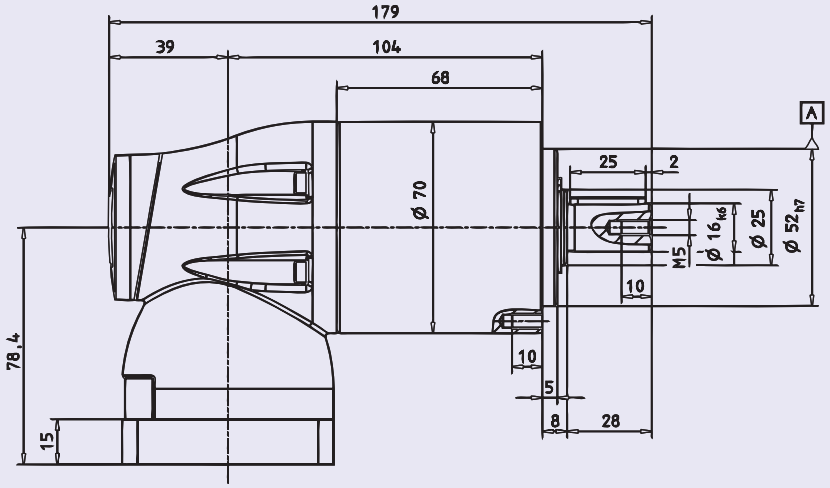
Conversion table

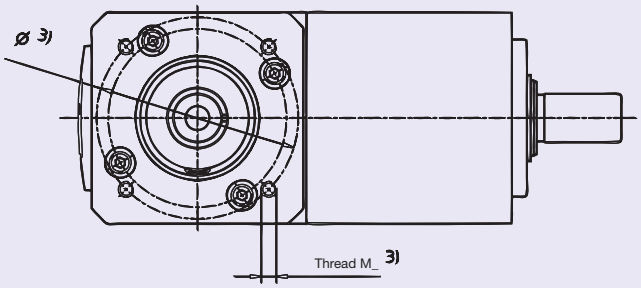
1 mm	=	0.039 in
1 Nm	=	8.85 in.lb
1 $kgcm^2$	=	8.85 x 10^{-4} in.lb.s^2
1 N	=	0.225 lb_f
1 kg	=	2.21 lb_m

a) For higher ambient temperature, reduce nominal input speed n_{1N}.
b) In reference to centre of output shaft n_2 = 100 min^{-1}.
c) Measured at ratio i = 10 (without load).

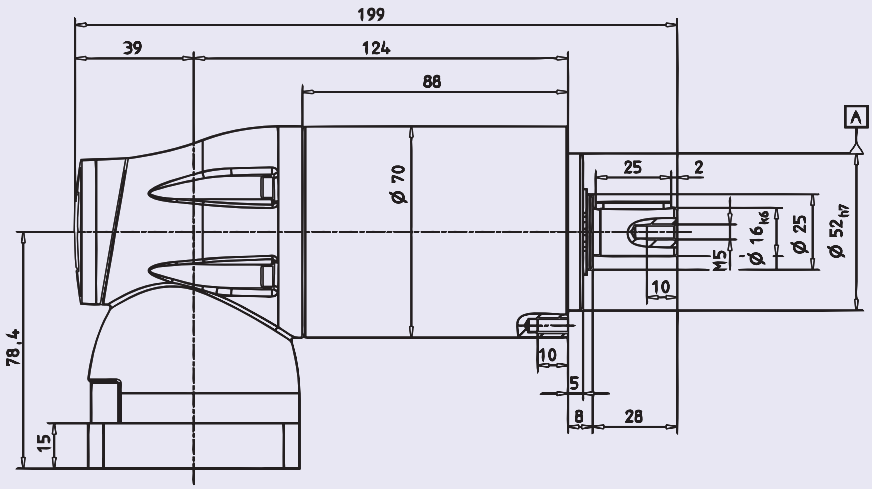
2-stage







3-stage



Non-toleranced dimensions ±1 mm
1) Check motor shaft fit.
2) Min./max. permissible motor shaft length. Longer motor shafts are possible on request: please contact alpha.
3) Dimensions depend on motor.
4) Smaller motor shaft diameters possible with bushing.

⚠ Motor mounting in accordance with Operating Manual.

Technical Specifications LPK+ 070			2-stage				3-stage					
Ratio [a]	i		3	5	7	10	15	25	30	50	70	100
Maximum acceleration torque (max. 1000 cycles per hour)	T_{2B}	Nm	22	35	35	32	32	35	32	35	35	32
Nominal output torque	T_{2N}	Nm	11	18	18	16.5	16.5	18	16.5	18	18	16.5
Emergency stop torque (Permissible 1000 times during the lifespan of the gearhead)	T_{2Not}	Nm	75	75	75	75	75	75	75	75	75	75
Nominal input speed (At 20 °C ambient temperature) [b]	n_{1N}	min^{-1}	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000
No-load running torque (At n_1=3000 min^{-1} and at 20 °C gearhead temperature)	T_{012}	Nm	≤ 0.6	≤ 0.5	≤ 0.44	≤ 0.44	≤ 0.44	≤ 0.44	≤ 0.44	≤ 0.44	≤ 0.44	≤ 0.4
Maximum input speed	n_{1Max}	min^{-1}	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500
Torsional backlash	j_t	arcmin	≤ 11				≤ 13					
Torsional rigidity	C_{t21}	Nm/arcmin	–				–					
Max. axial force [c]	F_{2AMax}	N	1550				1550					
Max. radial force [c]	F_{2RMax}	Nm	1450				1450					
Efficiency at full load	η	%	92				90					
Service life	L_h	h	20000				20000					
Weight incl. adapter plate	m	kg	3.8				4.2					
Noise level (n_1=3000 min^{-1}) [d]	L_{PA}	dB(A)	–									
Max. permissible housing temperature		°C	90									
Ambient temperature		°C	0 up to +40									
Lubrication			Flow Grease									
Paint (Unpainted right angle stage)			Blue RAL 5002									
Type of protection			IP 64									
Mass moment of inertia (referring to the drive)	J_1	$kgcm^2$	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85

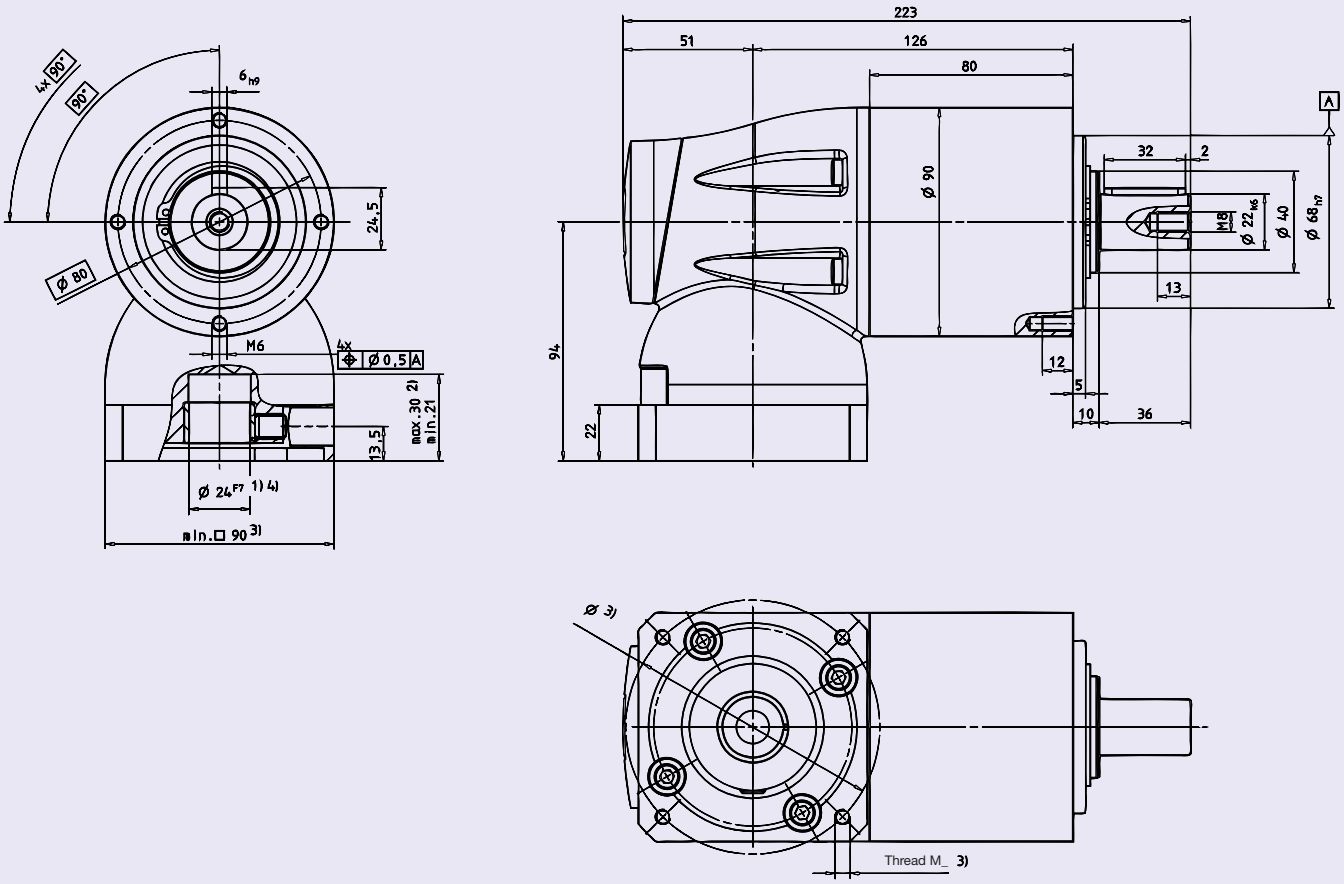
Conversion table

1 mm	=	0.039 in
1 Nm	=	8.85 in.lb
1 $kgcm^2$	=	8.85 x 10^{-4} in.lb.s^2
1 N	=	0.225 lb_f
1 kg	=	2.21 lb_m

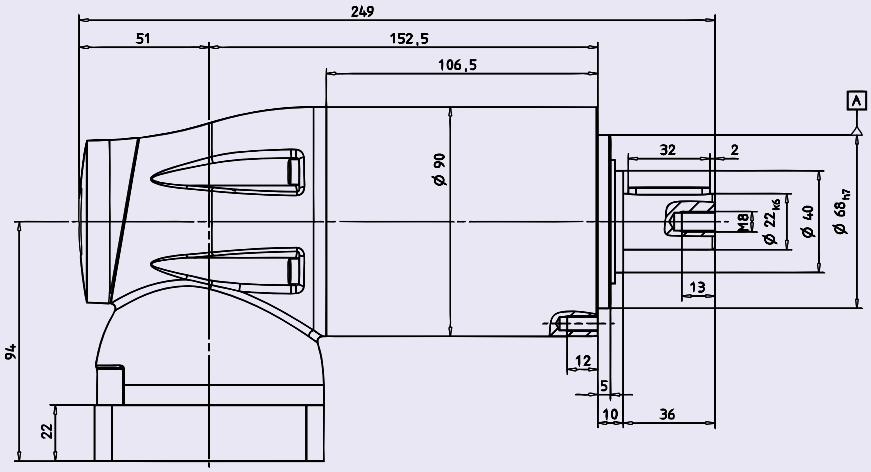
a) Other reduction ratios are optionally available. Please contact alpha.
b) For higher ambient temperature, reduce nominal input speed n_{1N}.
c) In reference to centre of output shaft n_2 = 100 min^{-1}.
d) Measured at ratio i = 10 (without load).

alpha

2-stage



3-stage



Non-toleranced dimensions ±1 mm
1) Check motor shaft fit.
2) Min./max. permissible motor shaft length. Longer motor shafts are possible on request: please contact alpha.
3) Dimensions depend on motor.
4) Smaller motor shaft diameters possible with bushing.

⚠ Motor mounting in accordance with Operating Manual.

Technical Specifications LPK+ 090			2-stage				3-stage					
Ratio [a]	i		3	5	7	10	15	25	30	50	70	100
Maximum acceleration torque (max. 1000 cycles per hour)	T_{2B}	Nm	56	90	90	80	80	90	80	90	90	80
Nominal output torque	T_{2N}	Nm	28	45	45	40	40	45	40	45	45	40
Emergency stop torque (Permissible 1000 times during the lifespan of the gearhead)	T_{2Not}	Nm	190	190	190	190	190	190	190	190	190	190
Nominal input speed (At 20 °C ambient temperature) [b]	n_{1N}	min^{-1}	2700	2700	2700	2700	2700	2700	2700	2700	2700	2700
No-load running torque (At n_1=3000 min^{-1} and at 20 °C gearhead temperature)	T_{012}	Nm	≤ 1.3	≤ 1.2	≤ 1.1	≤ 1.1	≤ 1.1	≤ 1.1	≤ 1.1	≤ 1.1	≤ 1.1	≤ 1.0
Maximum input speed	n_{1Max}	min^{-1}	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000
Torsional backlash	j_t	arcmin	≤ 11				≤ 13					
Torsional rigidity	C_{t21}	Nm/arcmin	8.5	9.5	9.5	8.5	8.5	9.5	8.5	9.5	9.5	8.5
Max. axial force [c]	F_{2AMax}	N	1900				1900					
Max. radial force [c]	F_{2RMax}	Nm	2400				2400					
Efficiency at full load	η	%	92				90					
Service life	L_h	h	20000				20000					
Weight incl. adapter plate	m	kg	6.9				7.9					
Noise level (n_1=3000 min^{-1}) [d]	L_{PA}	dB(A)	–									
Max. permissible housing temperature		°C	90									
Ambient temperature		°C	0 up to +40									
Lubrication			Flow Grease									
Paint (Unpainted right angle stage)			Blue RAL 5002									
Type of protection			IP 64									
Mass moment of inertia (referring to the drive)	J_1	$kgcm^2$	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1

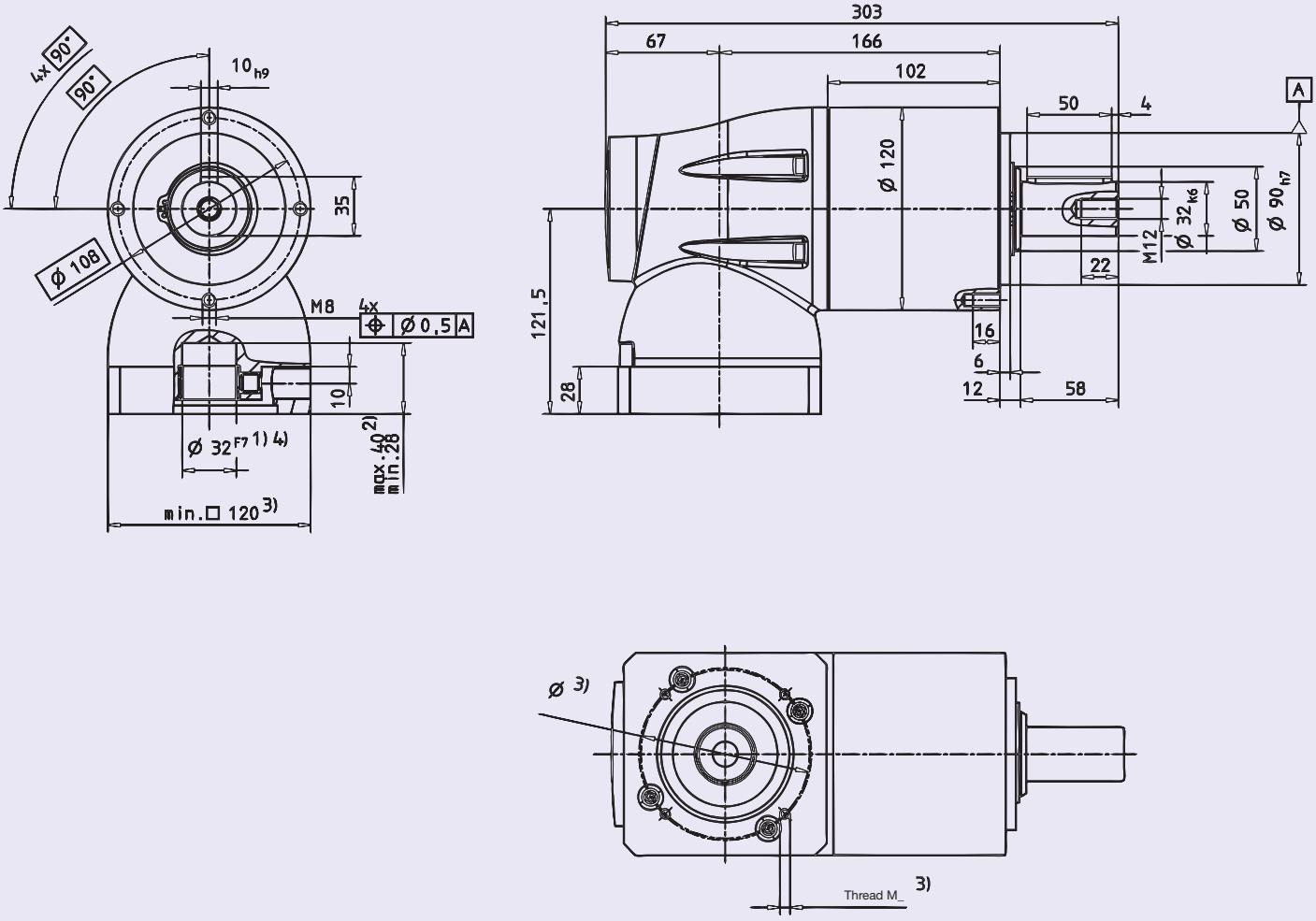
Conversion table

1 mm	=	0.039 in
1 Nm	=	8.85 in.lb
1 $kgcm^2$	=	8.85 x 10^{-4} in.lb.s^2
1 N	=	0.225 lb_f
1 kg	=	2.21 lb_m

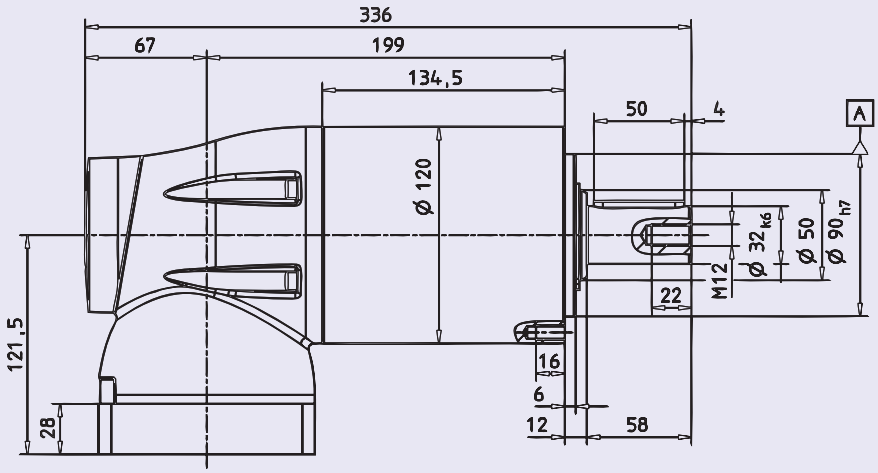
a) Other reduction ratios are optionally available. Please contact alpha.
b) For higher ambient temperature, reduce nominal input speed n_{1N}.
c) In reference to centre of output shaft n_2 = 100 min^{-1}.
d) Measured at ratio i = 10 (without load).

alpha

2-stage



3-stage



Non-toleranced dimensions ±1 mm
1) Check motor shaft fit.
2) Min./max. permissible motor shaft length. Longer motor shafts are possible on request: please contact alpha.
3) Dimensions depend on motor.
4) Smaller motor shaft diameters possible with bushing.

⚠ Motor mounting in accordance with Operating Manual.

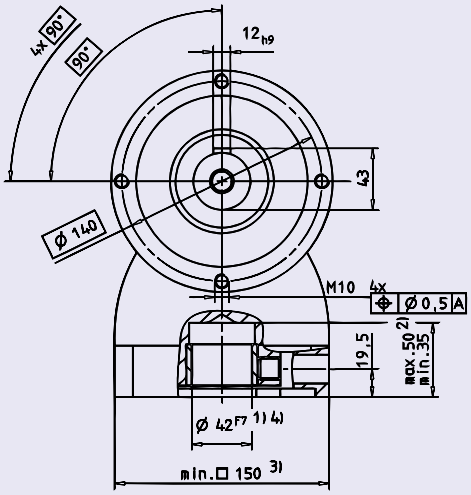
Technical Specifications LPK+ 120			2-stage				3-stage					
Ratio [a]	i		3	5	7	10	15	25	30	50	70	100
Maximum acceleration torque (max. 1000 cycles per hour)	T_{2B}	Nm	136	220	220	200	200	220	200	220	220	200
Nominal output torque	T_{2N}	Nm	68	110	110	100	100	110	100	110	110	100
Emergency stop torque (Permissible 1000 times during the lifespan of the gearhead)	T_{2Not}	Nm	480	480	480	480	480	480	480	480	480	480
Nominal input speed (At 20 °C ambient temperature) [b]	n_{1N}	min^{-1}	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
No-load running torque (At n_1=3000 min^{-1} and at 20 °C gearhead temperature)	T_{012}	Nm	≤ 3.5	≤ 3.2	≤ 3.1	≤ 3.1	≤ 2.9	≤ 2.8	≤ 2.7	≤ 2.7	≤ 2.7	≤ 2.7
Maximum input speed	n_{1Max}	min^{-1}	3500	3500	3500	3500	3500	3500	3500	3500	3500	3500
Torsional backlash	j_t	arcmin	≤ 11				≤ 13					
Torsional rigidity	C_{t21}	Nm/arcmin	–				–					
Max. axial force [c]	F_{2AMax}	N	4000				4000					
Max. radial force [c]	F_{2RMax}	Nm	4600				4600					
Efficiency at full load	η	%	92				90					
Service life	L_h	h	20000				20000					
Weight incl. adapter plate	m	kg	16.8				19.2					
Noise level (n_1=3000 min^{-1}) [d]	L_{PA}	dB(A)	–									
Max. permissible housing temperature		°C	90									
Ambient temperature		°C	0 up to +40									
Lubrication			Flow Grease									
Paint (Unpainted right angle stage)			Blue RAL 5002									
Type of protection			IP 64									
Mass moment of inertia (referring to the drive)	J_1	$kgcm^2$	16.59	16.59	16.59	16.59	16.66	16.66	16.66	16.66	16.66	16.66

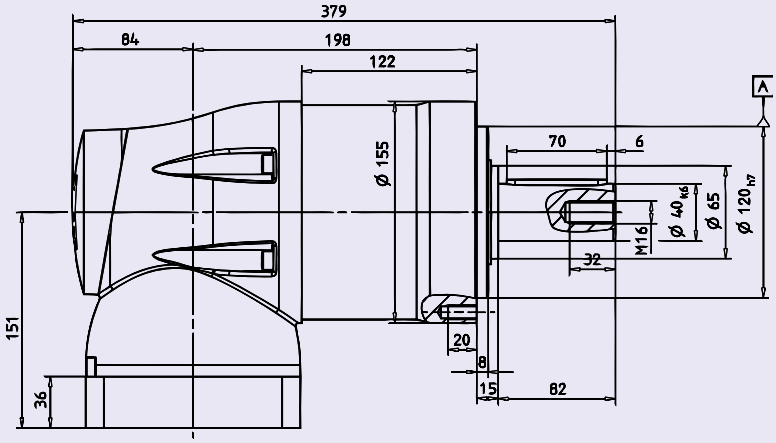
Conversion table

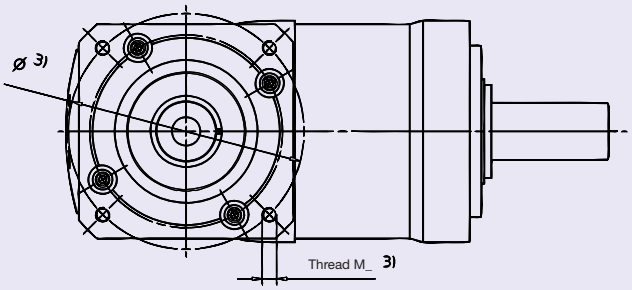
1 mm	=	0.039 in
1 Nm	=	8.85 in.lb
1 $kgcm^2$	=	8.85 x 10^{-4} in.lb.s^2
1 N	=	0.225 lb_f
1 kg	=	2.21 lb_m

a) Other reduction ratios are optionally available. Please contact alpha.
b) For higher ambient temperature, reduce nominal input speed n_{1N}.
c) In reference to centre of output shaft n_2 = 100 min^{-1}.
d) Measured at ratio i = 10 (without load).

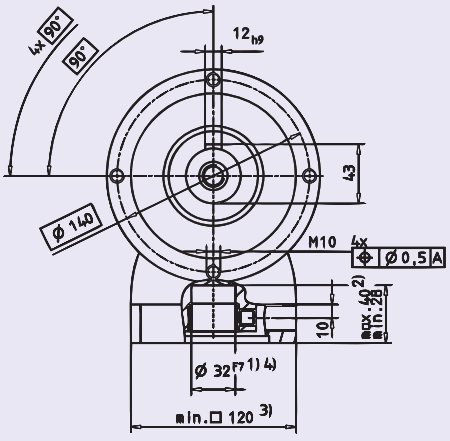
2-stage

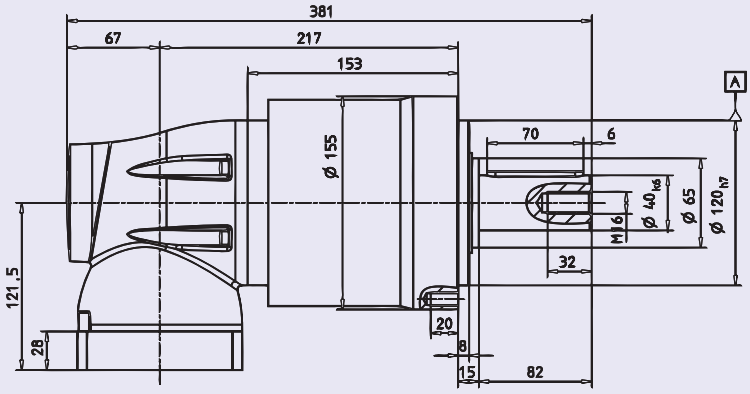






3-stage





Non-toleranced dimensions ±1 mm
1) Check motor shaft fit.
2) Min./max. permissible motor shaft length. Longer motor shafts are possible on request: please contact alpha.
3) Dimensions depend on motor.
4) Smaller motor shaft diameters possible with bushing.

⚠ Motor mounting in accordance with Operating Manual.

Technical Specifications LPK+ 155			2-stage		3-stage		
Ratio	i		5	10	25	50	100
Maximum acceleration torque (max. 1000 cycles per hour)	T_{2B}	Nm	450	350	450	450	350
Nominal output torque	T_{2N}	Nm	320	190	320	320	190
Emergency stop torque (Permissible 1000 times during the lifespan of the gearhead)	T_{2Not}	Nm	1000	1000	1000	1000	1000
Nominal input speed (At 20 °C ambient temperature) a)	n_{1N}	min^{-1}	1600	1600	1600	1600	1600
No-load running torque (At n_1=3000 min^{-1} and at 20 °C gearhead temperature)	T_{012}	Nm	–	–	–	–	–
Maximum input speed	n_{1Max}	min^{-1}	3000	3000	3000	3000	3000
Torsional backlash	j_t	arcmin	≤ 11		≤ 13		
Torsional rigidity	C_{t21}	Nm/arcmin	–		–		
Max. axial force b)	F_{2AMax}	N	6000		6000		
Max. radial force b)	F_{2RMax}	Nm	7500		7500		
Efficiency at full load	η	%	92		90		
Service life	L_h	h	20000		20000		
Weight incl. adapter plate	m	kg	34.7		38.7		
Noise level (n_1=3000 min^{-1}) c)	L_{PA}	dB(A)	–				
Max. permissible housing temperature		°C	90				
Ambient temperature		°C	0 up to +40				
Lubrication			Flow Grease				
Paint (Unpainted right angle stage)			Blue RAL 5002				
Type of protection			IP 64				
Mass moment of inertia (referring to the drive)	J_1	$kgcm^2$	75.1	75.1	16.77	16.77	16.77

Conversion table

1 mm	=	0.039 in
1 Nm	=	8.85 in.lb
1 $kgcm^2$	=	8.85 x 10^{-4} in.lb.s^2
1 N	=	0.225 lb_f
1 kg	=	2.21 lb_m

a) For higher ambient temperature, reduce nominal input speed n_{1N}.
b) In reference to centre of output shaft n_2 = 1000 min^{-1}.
c) Measured at ratio i = 10 (without load).

LK+/LPK+ – efficient angle precision

Best of its category!
efficient – precise – quickly available

LK+/LPK+ is available with the system components, alpha coupling and alpha rack and pinion system.

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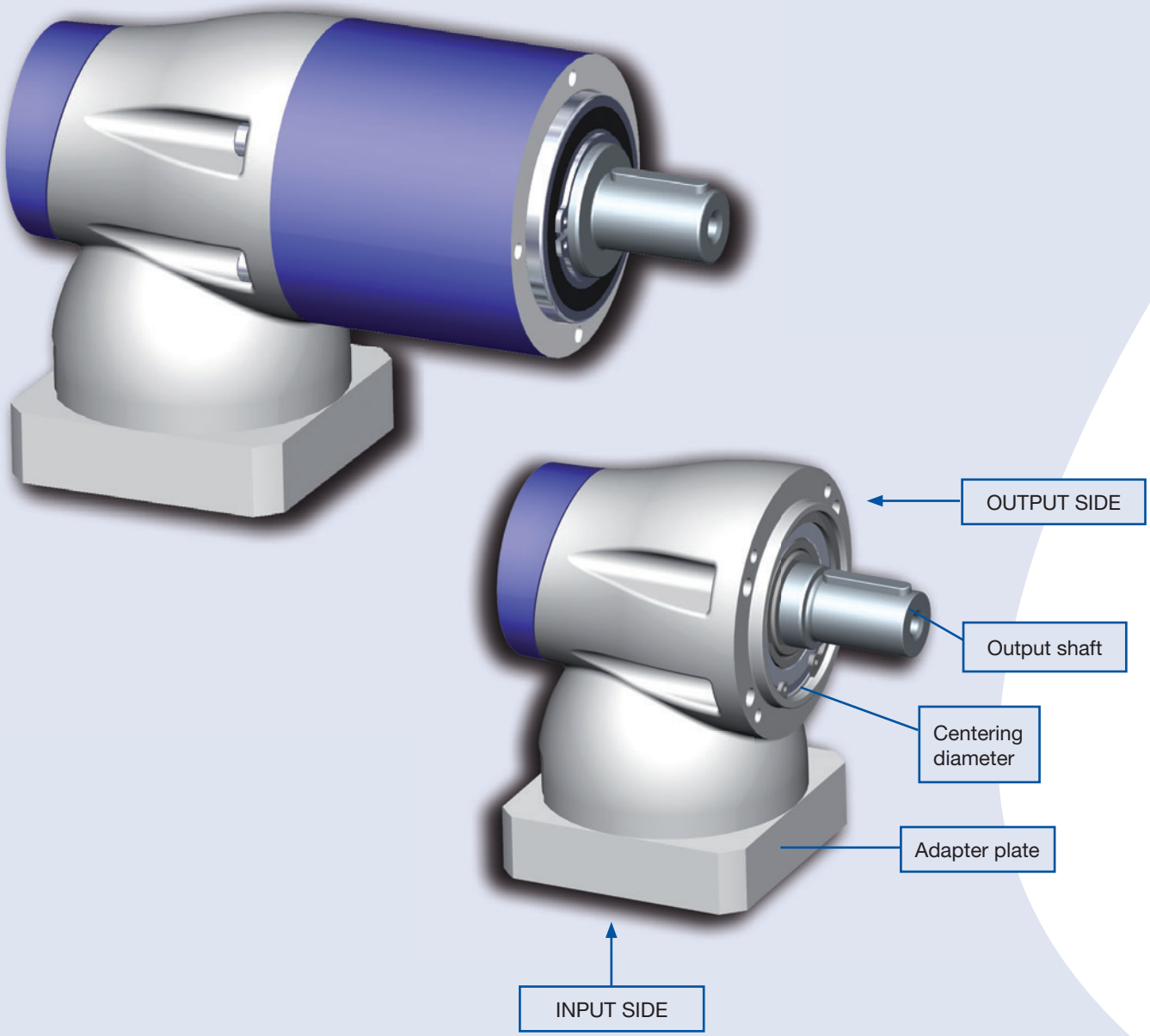

Symbols and indices

Symbol	Unit	Designation
c	Nm/arcmin	Rigidity
F	N	Force
i	-	Ratio
j	arcmin	Backlash
J	kgcm²	Mass moment of inertia
L	h	Service life
M	Nm	Moment
n	min⁻¹	Speed
η	%	Efficiency
T	Nm	Torque

Indicies	
1	input
2	output
A/a	axial
B/b	acceleration
Brake	Brake
h	hours
K/k	tilt
m	mean
Max/max	maximum
Mot	motor
N	nominal
not/not	emergency stop
0	no-load running
R/r	radial
t	torsional
capital letters	permissible values
small letters	actual values

Quick selection

The following chart can be used to quickly select a gearhead. However, for best results, we recommend that you utilise the gearhead selection charts in the alpha Technical Basics catalogue (can be downloaded from www.alphagetriebe.de) or use alpha's cymex® 3.0 servo/ gearhead sizing software to design your drive train.

Cyclic operation S5 Applies to ≤ 1000 cycles / hour Duty cycle < 60 % and < 20 min.*	1. Determine the maximum motor acceleration torque from the motor ratings $\mathbf{T_{MaxMot}}$ **[Nm]** 2. Determine the maximum acceleration torque at the gearhead output T_{2b} [Nm] $\mathbf{T_{2b} = T_{MaxMot} \bullet i}$ 3. Compare the maximum acceleration torque T_{2b} [Nm] with the maximum permissible acceleration torque T_{2b} [Nm] at the gearhead output $\mathbf{T_{2b} \leq T_{2B}}$	4. Compare the bore diameter of the clamping hub with the table on page 26. 5. Compare the motor shaft length L_{Mot} [mm] with the minimum and maximum dimensions in the relevant dimension drawing
Continuous operation S1 Duty cycle ≥ 60 % or ≥ 20 min.*	1. Select as described for cyclic operation S5 2. Determine the motor nominal torque $\mathbf{T_{1NMot}}$ **[Nm]** 3. Determine the nominal torque at the gearhead output T_{2n} [Nm] $\mathbf{T_{2n} = T_{1NMot} \bullet i}$	4. Compare the nominal torque T_{2n} [Nm] with the permissible nominal torque T_{2N} [Nm] at the gearhead output $\mathbf{T_{2n} \leq T_{2N}}$ 5. Determine the input speed $\mathbf{n_{1n}}$ **[min⁻¹]** 6. Compare the input speed n_{1n} [min⁻¹] with the permissible nominal speed n_{1N} [min⁻¹] $\mathbf{n_{1n} \leq n_{1N}}$

* Recommended by alpha. We will gladly assist if required: call +49 7931 493-0

Ordering key

Stage number
1 = 1-stage
2 = 2-stage
3 = 3-stage

Type of output shaft
1 = Shaft with key DIN 6885 Form A
0 = Smooth shaft (only LPK⁺)

Gearhead version
M = Motor-mounted gearhead

Backlash
1 = Standard

LPK 090 S - MO3 - 100 - 1G1 / Motor

Motor designation
(manufacturer-typ)

Gearhead typ

Bore diameter of clamping hub
(see table)

Gearhead design
O = Standard

Ratio
LK⁺: 1-stage: **1**
LPK⁺: 2-stage: 3*/**5/7*/10**
3-stufig: 15*/**25/30*/50/70*/100**

* not at LPK⁺ 050 and LPK⁺ 155

Clamping hub with bushing

	LK⁺					LPK⁺				
Gearhead stages	1	1	1	1	1	2 / 3	2 / 3	2 / 3	2 / 3	2 / 3
Motor shaft diameter (mm)*	050	070	090	120	155	050	070	090	120	155
11	B	-	-	-	-	B	-	-	-	-
16	+	D	-	-	-	+	D	-	-	-
24	+	+	G	-	-	+	+	G	-	-
32	+	+	+	I	-	+	+	+	I	- / I
42	+	+	+	+	L	+	+	+	+	L / +

\- Select next higher letter
\+ Select next larger gearhead

Bushing

A bushing is always needed.
Adaption for smaller motor shaft diameters with a bushing.

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application – gearhead – motor

cymex® simplifies technical documentation, and customised engineering designs are possible at any time thanks to data in CAD format.

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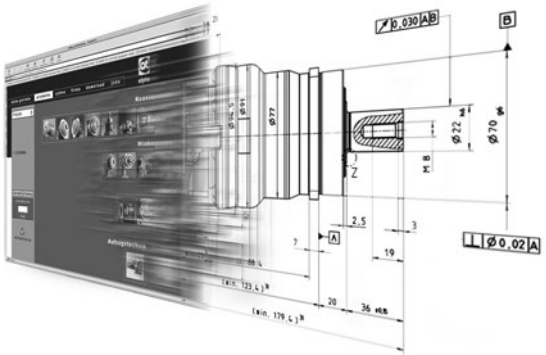
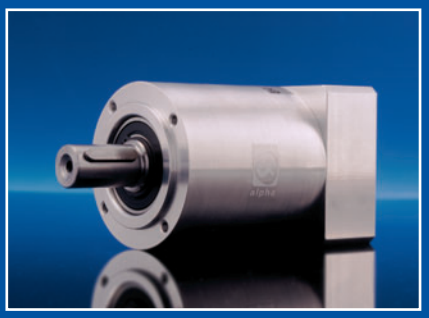


Additional **alpha** products

SP+® & SP+ HIGH SPEED®
The NEW Generation
Low-backlash planetary gear reducers with output shaft.
SP+ HIGH SPEED best qualified for highest speed in continuous operation.
Torsional backlash ≤ 1 arcmin.
Acceleration torque up to 4500 Nm.

TP+ & TP+ HIGH TORQUE® – Compact Precision
Low-backlash planetary gear reducers with output flange.Qualified for highest positioning accuracy and high-dynamic cycle operation.
High torsional and tilting rigidity.
Torsional backlash < 1 arcmin.
Acceleration torque up to 10.000 Nm.



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For stepper and basic server applications.
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Right-Angle Gearhead of highest precision and compactness. Torsional backlash < 4 arcmin.
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TK+: flange
HG+: hollow shaft

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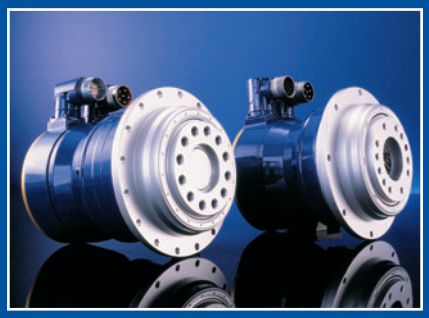
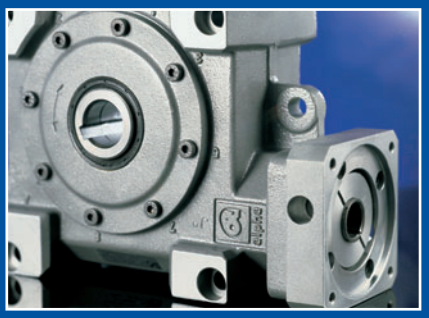
PRECISION SYSTEM – For exacting dynamics and precision requirements in high-end applications
SMART SYSTEM – For flexible mounting with more degrees of freedom in mid-range applications
ECONOMY SYSTEM – For standard linear tasks in economy applications



TPM & TPMA - Servoactuators
Ultra-compact and highly precise brushless gear motors featuring high dynamics, high torsional stiffness and a torsional backlash of just < 1 arcmin.
Acceleration torque up to 2600 Nm.
Up to 40 % shorter overall length and much lower weight than conventional servomotor-gearhead designs.

Coupling – TL / BC / EC
Patented, backlash-free, compact and torsionally stiff metal bellows and safety couplings. Acceleration torque up to 10,000 Nm
Disengagement in 1 – 3 ms
Belt tension 100 – 12.000 N.
Self-adjusting



V - Drive®
Right-Angle Gearhead – short and compact.
Torsional backlash < 3 arcmin.
Acceleration torque up to 1469 Nm.
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VDT: flange
VDH: hollow shaft, smooth or keywayed

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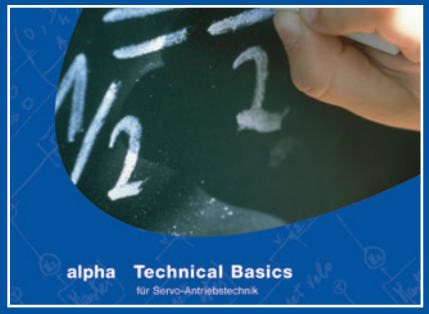

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