LP+ / LPB+ Value Line

economic and multi-talented

2006 - I

alpha

a WITTENSTEIN AG company

LP+ / LPB+ Value Line

A winning team and right on course

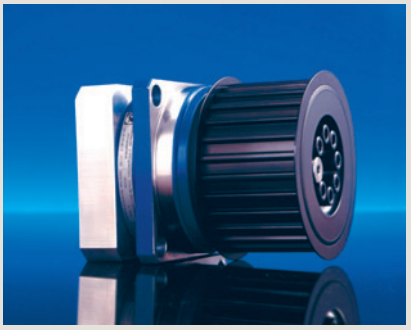
The finest clipper-vessel is nothing without an expert crew – and the success of every production process depends on an impeccable mechanical support “team”.

The highly efficient gearheads in the **LP+/LPB+ Value Line** are your “crew”. Their job is to make sure your production process rides every wave with ease.

Breathtaking performance combined with maximum cost efficiency – these are the hallmarks of the **LP+/LPB+ Value Line**. Our low-backlash planetary gearheads are ideal for all applications in handling systems, packaging technology and mechanical engineering in general.

Two series

This product line offers a choice between two distinct series. **LP+** – the basic version – is our versatile performer for a broad spectrum of applications, while the modified **LPB+** series assures smooth sailing of timing belt systems.
And of course, the **LPB+ Value Line** integrates all the familiar characteristics of the **LP+ Value Line**.



LP+ / LPB+ Value Line
for economical solutions

Maximum efficiency

LP+/LPB+ Value Line gearheads are economical to purchase, unbeatably efficient in operation and – thanks to a unique lubrication concept – absolutely maintenance-free throughout their entire service life.

Total reliability

The stamina of a top athlete: **LP+/LPB+ Value Line** gearheads are renowned for their endurance – in cyclic or continuous duty.

Any installation position

It makes no difference to **LP+/LPB+ Value Line** whether you mount it vertically or horizontally or with the output on top or on the bottom. You get all the design freedom you require.

Maximum power density

Although the predecessor gearhead already offers excellent performance, we have succeeded in increasing the torques of the **LP+/LPB+ Value Line** – with peak values of up to 12 %.

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, supported by our competent engineering services, several hundred employees worldwide are committed to our cause with operations in the US, UK, France, Italy, Belgium and Japan. alpha's headquarters are on the "Romantic Road" in Igersheim / Germany.

alpha is a member of the **WITTENSTEIN AG** Group 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.

High efficiency

LP⁺/LPB⁺ Value Line gearheads achieve more than 95 % efficiency at full load.

Added flexibility

The gearheads in the **LPB⁺ Value Line** series can also be equipped with a timing belt pulley, with consistently high performance guaranteed. **LPB⁺** – the perfect solution for all timing belt applications.

LPB⁺ with belt pulley

LPB⁺ is equally impressive when it comes to the inside and outside centering of the gearheads. This unique drive concept avoids complicated connecting structures and cuts costs.

Powerful planetary gearhead

The two-stage gearhead restricts torsional backlash to less than 10 arcminutes, while the single-stage version offers under 8 arcminutes.

Leaders of the pack

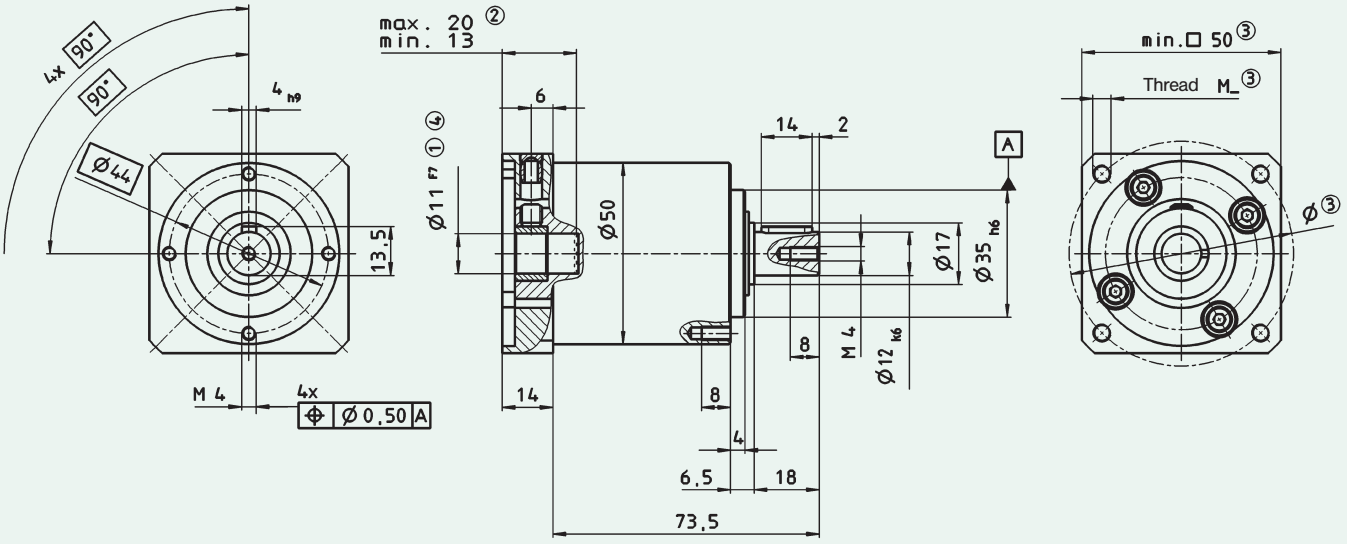
We are driven by a desire to enhance our customers' success with products and systems from alpha. We set benchmarks when it comes to precision, performance and durability. Our trailblazing technology gives our customers an edge in their respective market sectors. Place your trust in premium quality and 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:

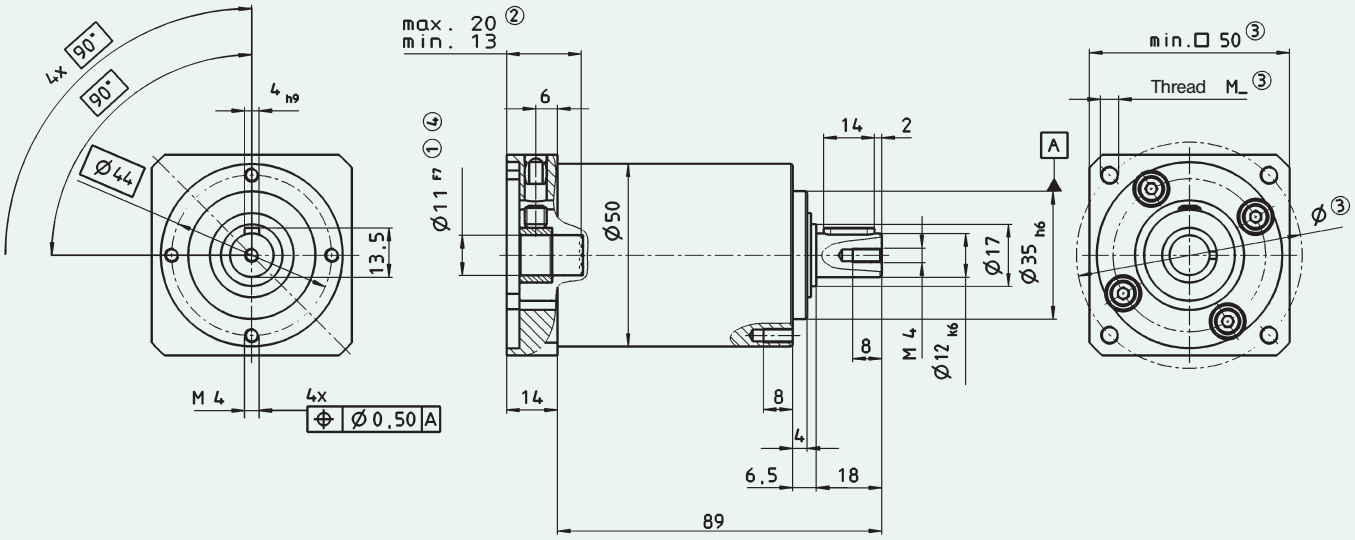
- **Record-breaking lifespan**
  Extremely long service life resulting from intelligent design, latest synthetic lubrication technology, exclusive sealing technology, and incredibly strong output bearings.
- **Motor mounting is almost foolproof**
  Simple and reliable mounting in a single step.
- **Top quality from alpha**
  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.

alpha

LP+ 1-stage gearhead:



LP+ 2-stage gearhead:



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 **LP+ 050**

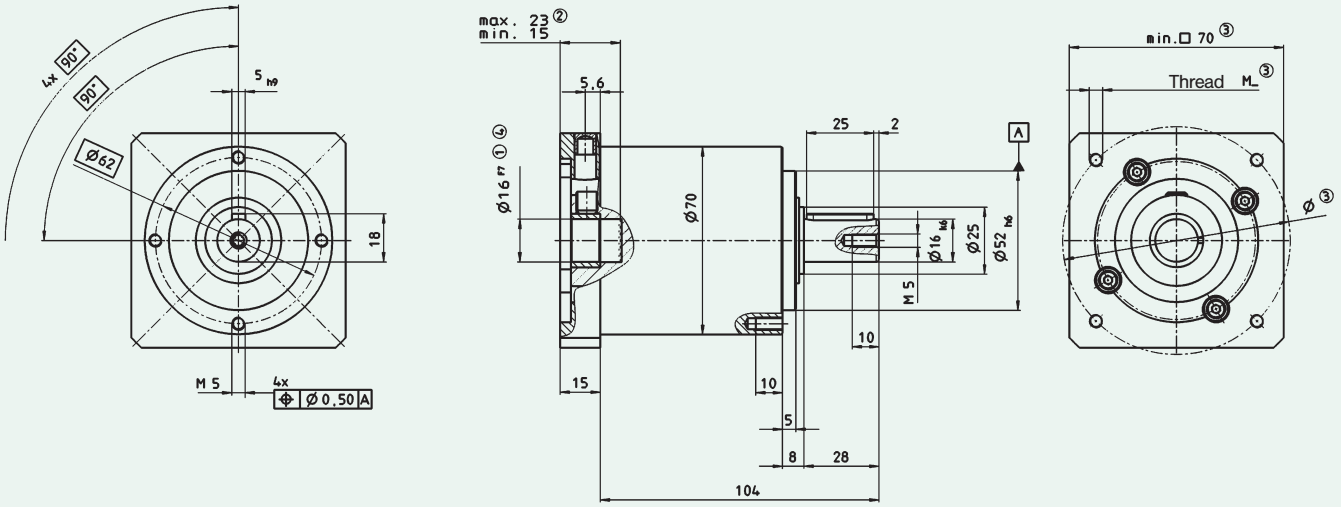
			1-stage		2-stage		
Ratio	**i**		**5**	**10**	**25**	**50**	**100**
Maximum acceleration torque (max. 1000 cycles per hour)	T_{2B}	Nm	12	11	12	12	11
Nominal output torque	T_{2N}	Nm	5.7	5.2	5.7	5.7	5.2
Emergency stop torque (Permissible 1000 times during the lifespan of the gearhead)	T_{2Not}	Nm	26	26	26	26	26
Nominal input speed (At 20 °C ambient temperature) *	n_{1N}	min^{-1}	4000	4000	4000	4000	4000
No-load running torque (n_1=3000 rpm) (At 20 °C gearhead temperature)	T_{012}	Nm	≤ 0.05	≤ 0.05	≤ 0.05	≤ 0.05	≤ 0.05
Maximum input speed	n_{1Max}	min^{-1}	8000	8000	8000	8000	8000
Torsional backlash	j_t	arcmin	Standard ≤ 12 / Reduced ≤ 10		Standard ≤ 15 / Reduced ≤ 13		
Torsional rigidity	C_{t21}	Nm/arcmin	1.2	0.85	1.2	1.2	0.85
Max. axial force **	F_{2AMax}	N	700		700		
Max. radial force **	F_{2RMax}	N	650		650		
Efficiency at full load	η	%	> 97		> 95		
Service life (For calculation, see alpha Technical Basics catalog)	L_h	h	20 000		20 000		
Weight (incl. adapter plate)	m	kg	0.75		0.95		
Noise level (n_1=3000 rpm)	L_{PA}	dB(A)	≤ 68				
Max. permissible housing temperature		°C	+90				
Ambient temperature		°C	0 up to +40				
Lubrication			Flow Grease				
Paint			Blue RAL 5002				
Type of protection			IP 64				
Mass moment of inertia (referring to the drive)	J_1	$kgcm^2$	0.055	0.055	0.055	0.055	0.055

* For higher ambient temperature, reduce nominal input speed n_{1N}.
** In reference to the center of the output shaft 100 min^{-1}.

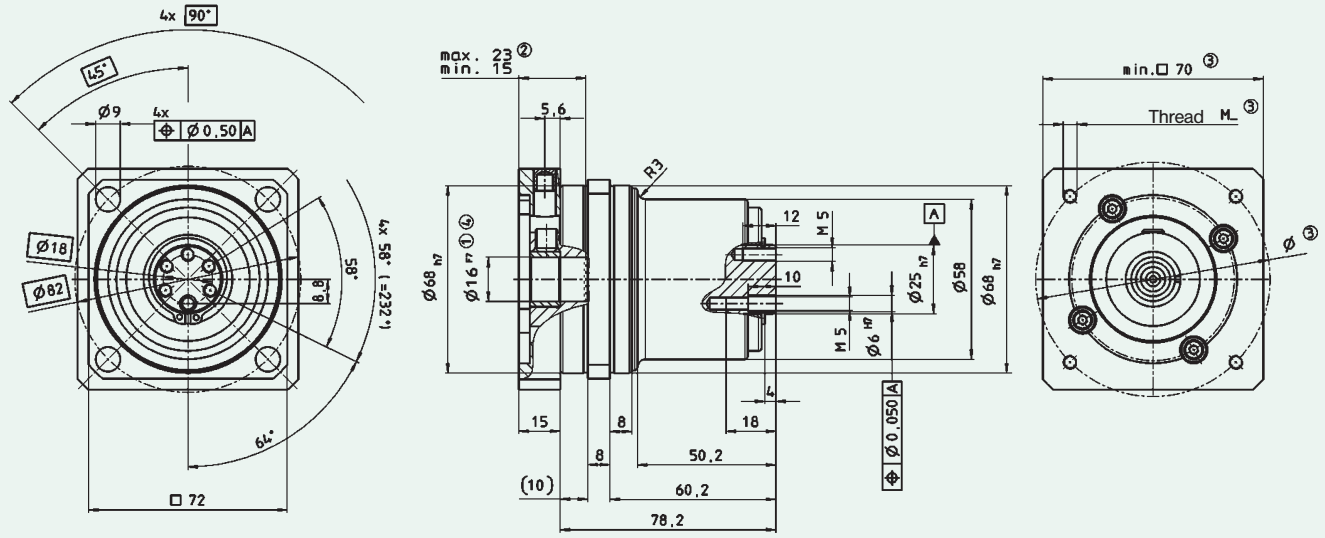
Conversion table

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

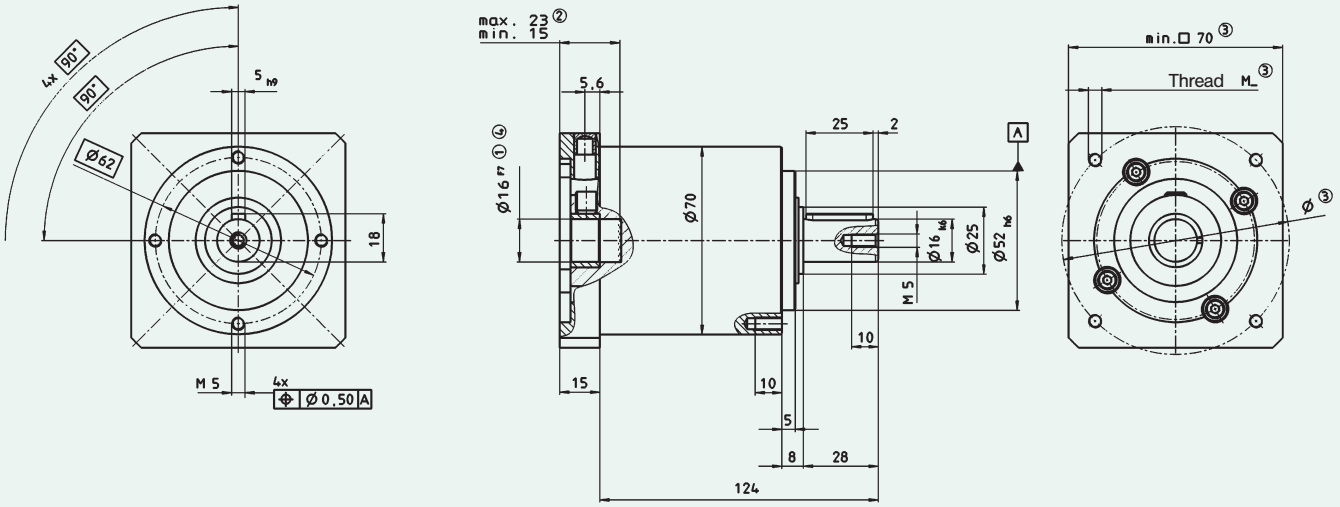
LP+ 1-stage gearhead:



LPB+ 1-stage gearhead:



LP+ 2-stage gearhead:



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.

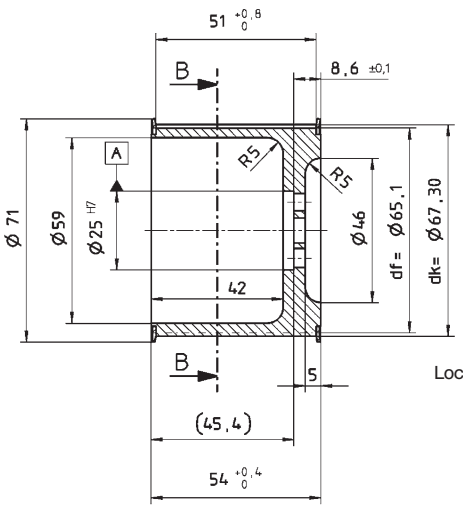
Technical Specifications **LP+/LPB+ 070**

				1-stage				2-stage				
Ratio*	**i**			**3**	**5**	**7**	**10**	**15**	**25**	**30**	**50**	**100**
Maximum acceleration torque (max. 1000 cycles per hour)	T_{2B}	Nm		32	35	35	32	32	35	32	35	32
Nominal output torque	T_{2N}	Nm		16.5	18	18	16.5	16.5	18	16.5	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
Nominal input speed (At 20 °C ambient temperature) **	n_{1N}	min^{-1}		3700	3700	3700	3700	3700	3700	3700	3700	3700
No-load running torque (n_1=3000 rpm) (At 20 °C gearhead temperature)	T_{012}	Nm		≤ 0.30	≤ 0.20	≤ 0.14	≤ 0.14	≤ 0.14	≤ 0.14	≤ 0.14	≤ 0.14	≤ 0.10
Maximum input speed	n_{1Max}	min^{-1}		6000	6000	6000	6000	6000	6000	6000	6000	6000
Torsional backlash	j_t	arcmin		Standard ≤ 12 / Reduced ≤ 8				Standard ≤ 15 / Reduced ≤ 10				
Torsional rigidity	C_{t21}	Nm/arcmin	LP	2.8	3.3	3.3	2.8	2.8	3.3	2.8	3.3	2.8
			LPB	-	-	-	-	-	-	-	-	-
Max. axial force ***	F_{2AMax}	N		1550				1550				
Max. radial force	F_{2RMax}	N	LP ***	1450				1450				
			LPB ****	3000				-				
Efficiency at full load	η	%		> 97				> 95				
Service life (For calculation, see alpha Technical Basics catalog)	L_h	h		> 20 000				> 20 000				
Weight (incl. adapter plate)	m	kg		LP+ 2.0 / LPB+ 1.6				LP+ 2.4				
Noise level (n_1=3000 rpm) ****	L_{PA}	dB(A)		≤ 70								
Max. permissible housing temperature		°C		+90								
Ambient temperature		°C		0 up to +40								
Lubrication				Flow Grease								
Paint				Blue RAL 5002								
Type of protection				IP 64								
Mass moment of inertia (referring to the drive)	J_1	$kgcm^2$	LP	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28
			LPB	0.28	0.28	-	0.28	-	-	-	-	-

* LPB is available for ratio 3, 5, 10.
** For higher ambient temperature, reduce nominal input speed n_{1N}.
*** In reference to the center of the output shaft 100 min^{-1}.
**** With assembled pulley at 100 min^{-1}

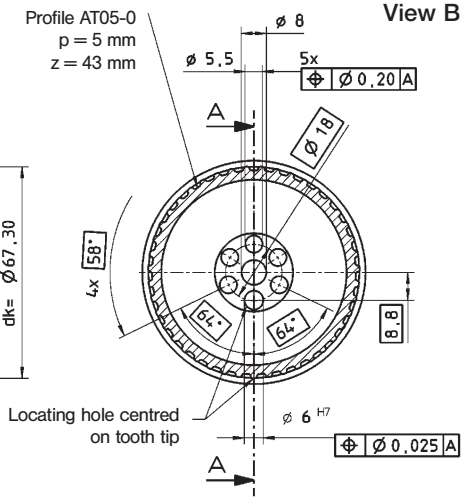
Optional: timing belt pulley **P LPB+**

View A



Profile AT05-0
p = 5 mm
z = 43 mm

View B

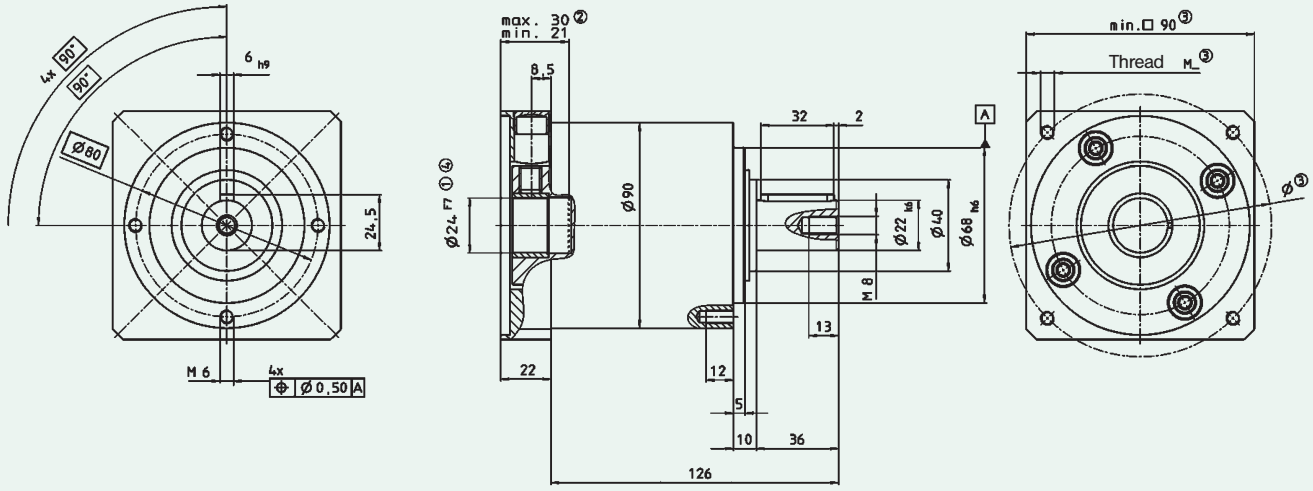


PCD pitch circle diameter			$d_o = \frac{z \cdot p}{\pi}$
Weight	m	kg	0.48
Mass moment of inertia of inertia	J_1	$kgcm^2$	3.86

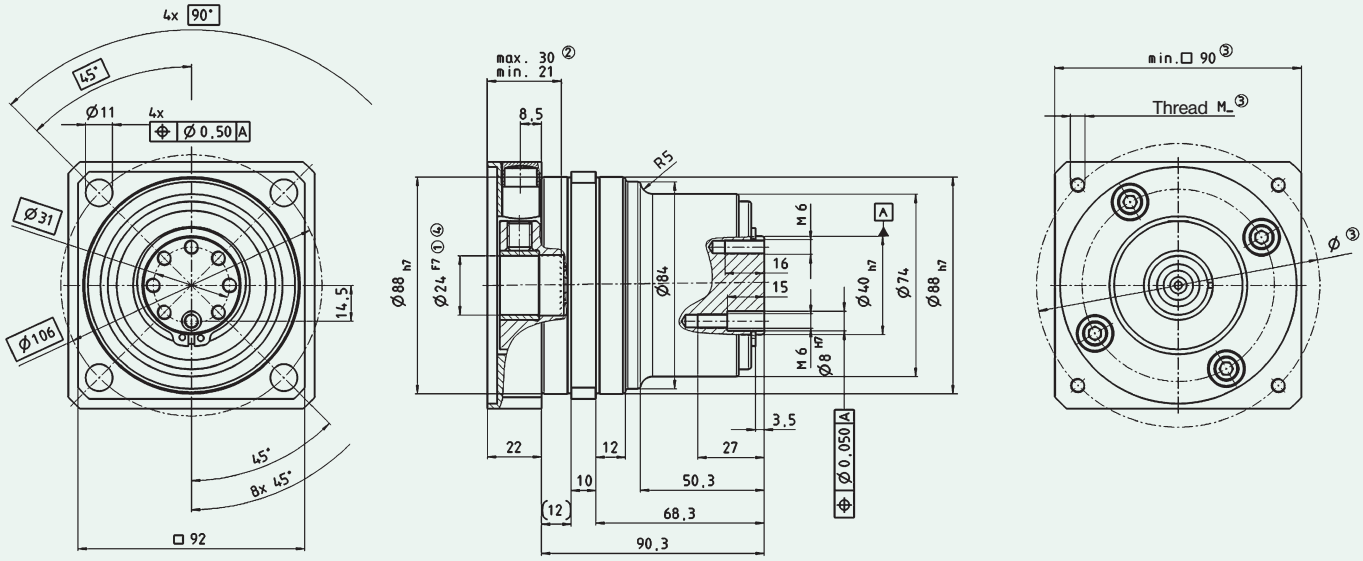
Conversion table

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

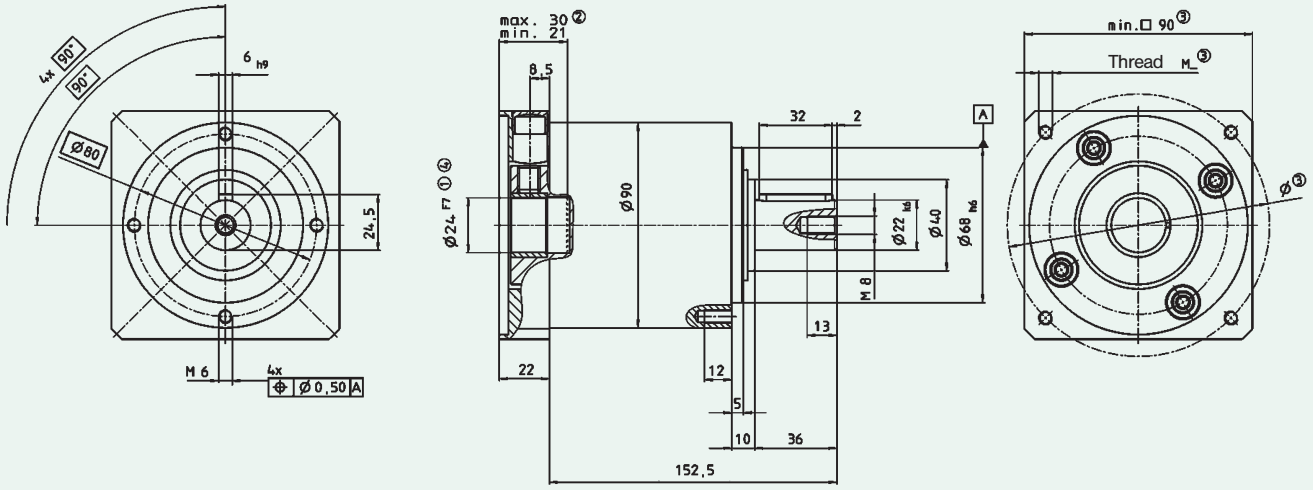
LP+ 1-stage gearhead:



LPB+ 1-stage gearhead:



LP+ 2-stage gearhead:



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.

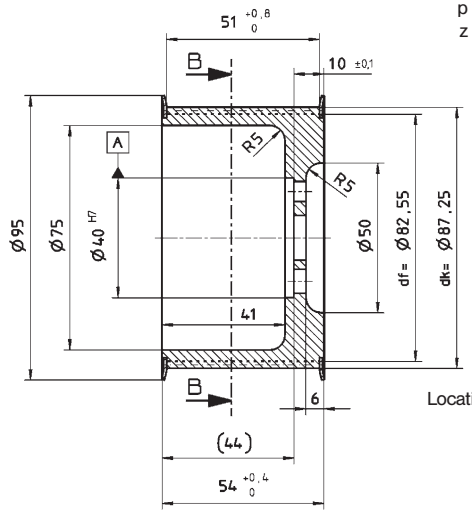
Technical Specifications **LP+/LPB+ 090**

				1-stage				2-stage				
Ratio *	**i**			**3**	**5**	**7**	**10**	**15**	**25**	**30**	**50**	**100**
Maximum acceleration torque (max. 1000 cycles per hour)	T_{2B}	Nm		80	90	90	80	80	90	80	90	80
Nominal output torque	T_{2N}	Nm		40	45	45	40	40	45	40	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
Nominal input speed (At 20 °C ambient temperature) **	n_{1N}	min^{-1}		3400	3400	3400	3400	3400	3400	3400	3400	3400
No-load running torque (n_1=3000 rpm) (At 20 °C gearhead temperature)	T_{012}	Nm		≤ 0.60	≤ 0.50	≤ 0.40	≤ 0.38	≤ 0.30	≤ 0.30	≤ 0.30	≤ 0.25	≤ 0.25
Maximum input speed	n_{1Max}	min^{-1}		6000	6000	6000	6000	6000	6000	6000	6000	6000
Torsional backlash	j_t	arcmin		Standard ≤ 12 / Reduced ≤ 8				Standard ≤ 15 / Reduced ≤ 10				
Torsional rigidity	C_{t21}	Nm/arcmin	LP	8.5	9.5	9.5	8.5	8.5	9.5	8.5	9.5	8.5
			LPB	-	-	-	-	-	-	-	-	-
Max. axial force ***	F_{2AMax}	N		1900				1900				
Max. radial force	F_{2RMax}	N	LP ***	2400				2400				
			LPB ****	4300				-				
Efficiency at full load	η	%		> 97				> 95				
Service life (For calculation, see alpha Technical Basics catalog)	L_h	h		> 20 000				> 20 000				
Weight (incl. adapter plate)	m	kg		LP+ 4.0 / LPB+ 3.3				LP+ 5.0				
Noise level (n_1=3000 rpm) ****	L_{PA}	dB(A)		≤ 72								
Max. permissible housing temperature		°C		+90								
Ambient temperature		°C		0 up to +40								
Lubrication				Flow Grease								
Paint				Blue RAL 5002								
Type of protection				IP 64								
Mass moment of inertia (referring to the drive)	J_1	$kgcm^2$	LP	1.77	1.77	1.77	1.77	1.77	1.77	1.77	1.77	1.77
			LPB	1.76	1.77	-	1.76	-	-	-	-	-

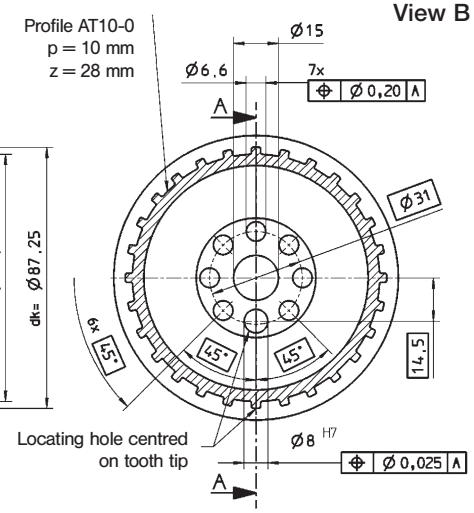
* LPB is available for ratio 3, 5, 10.
** For higher ambient temperature, reduce nominal input speed n_{1N}.
*** In reference to the center of the output shaft 100 min^{-1}.
**** With assembled pulley at 100 min^{-1}

Optional: timing belt pulley **P LPB+**

View A



Profile AT10-0
p = 10 mm
z = 28 mm



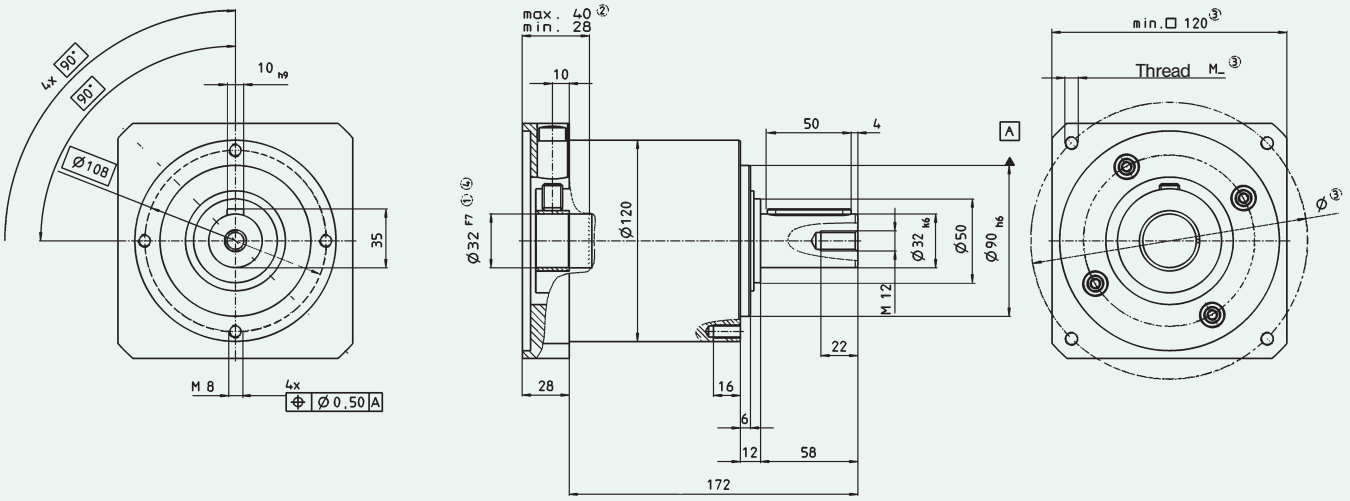
View B

PCD pitch circle diameter			$d_o = \frac{z \cdot p}{\pi}$
Weight	m	kg	0.82
Mass moment of inertia of inertia	J_1	$kgcm^2$	10.95

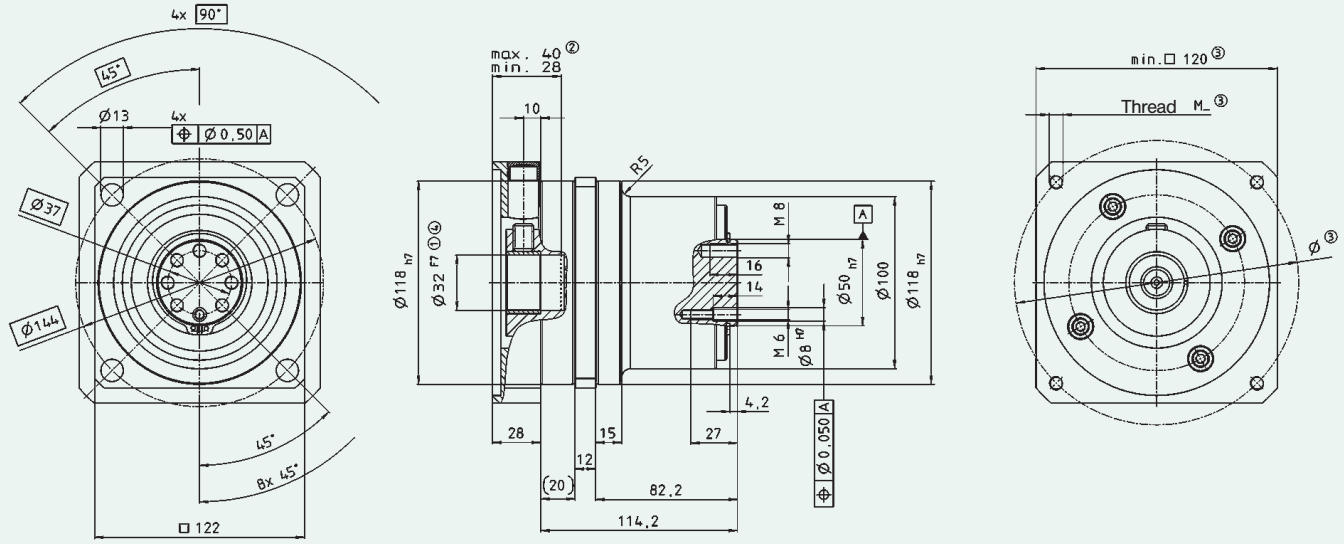
Conversion table

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

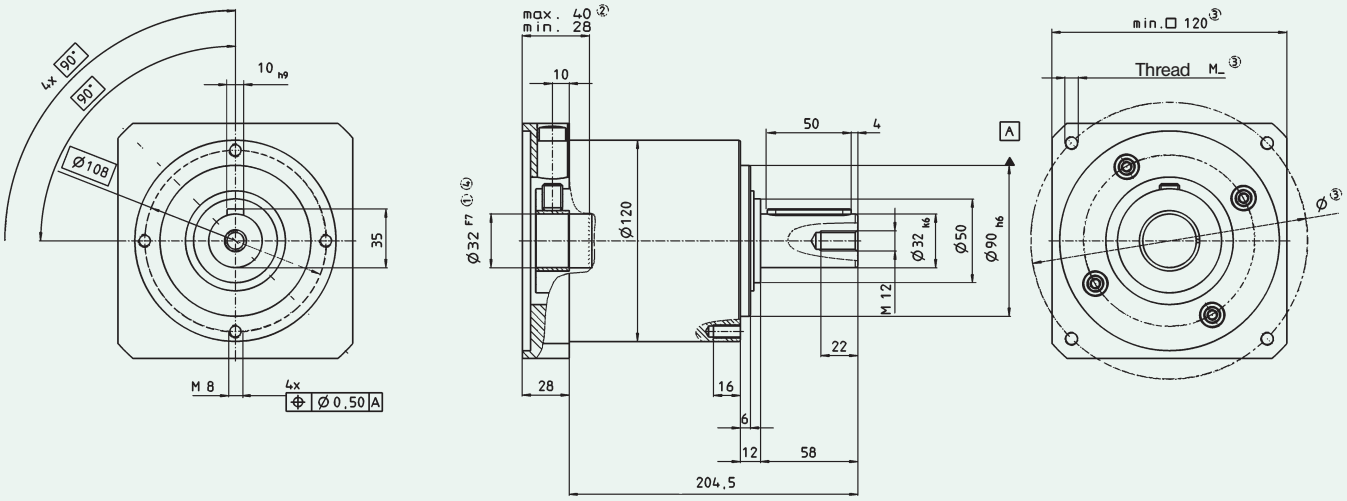
LP+ 1-stage gearhead:



LPB+ 1-stage gearhead:



LP+ 2-stage gearhead:



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.

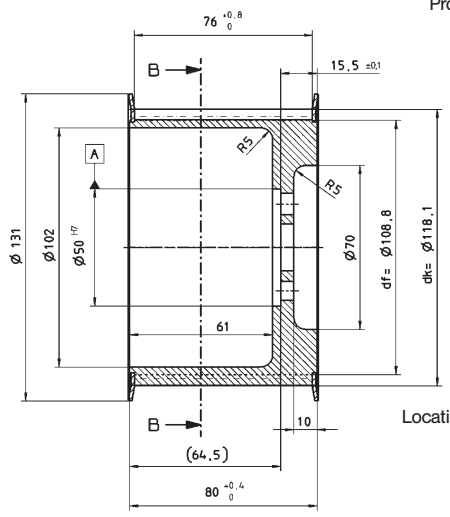
Technical Specifications **LP+/LPB+ 120**

				1-stage				2-stage				
Ratio *	**i**			**3**	**5**	**7**	**10**	**15**	**25**	**30**	**50**	**100**
Maximum acceleration torque (max. 1000 cycles per hour)	T_{2B}	Nm		200	220	220	200	200	220	200	220	200
Nominal output torque	T_{2N}	Nm		100	110	110	100	100	110	100	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
Nominal input speed (At 20 °C ambient temperature) **	n_{1N}	min^{-1}		2600	2600	2600	2600	2600	2600	2600	2600	2600
No-load running torque (n_1=3000 rpm) (At 20 °C gearhead temperature)	T_{012}	Nm		≤ 1.1	≤ 0.9	≤ 0.8	≤ 0.8	≤ 0.6	≤ 0.5	≤ 0.4	≤ 0.4	≤ 0.4
Maximum input speed	n_{1Max}	min^{-1}		4800	4800	4800	4800	4800	4800	4800	4800	4800
Torsional backlash	j_t	arcmin		Standard ≤ 12 / Reduced ≤ 8				Standard ≤ 15 / Reduced ≤ 10				
Torsional rigidity	C_{t21}	Nm/arcmin	LP	22	25	25	22	22	25	22	25	22
			LPB	-	-	-	-	-	-	-	-	-
Max. axial force ***	F_{2AMax}	N		4000				4000				
Max. radial force	F_{2RMax}	N	LP ***	4600				4600				
			LPB ****	9500				-				
Efficiency at full load	η	%		> 97				> 95				
Service life (For calculation, see alpha Technical Basics catalog)	L_h	h		> 20 000				> 20 000				
Weight (incl. adapter plate)	m	kg		LP+ 8.6 / LPB+ 7.3				LP+ 11.0				
Noise level (n_1=3000 rpm) ****	L_{PA}	dB(A)		≤ 74								
Max. permissible housing temperature		°C		+90								
Ambient temperature		°C		0 up to +40								
Lubrication				Flow Grease								
Paint				Blue RAL 5002								
Type of protection				IP 64								
Mass moment of inertia (referring to the drive)	J_1	$kgcm^2$	LP	5.42	5.42	5.42	5.42	5.49	5.49	5.49	5.49	5.49
			LPB	5.37	5.40	-	5.42	-	-	-	-	-

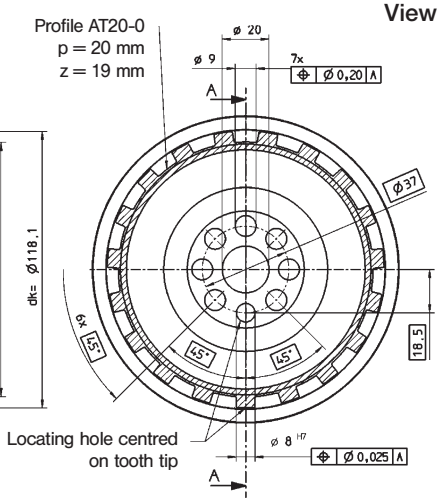
* LPB is available for ratio 3, 5, 10.
** For higher ambient temperature, reduce nominal input speed n_{1N}.
*** In reference to the center of the output shaft 100 min^{-1}.
**** With assembled pulley at 100 min^{-1}

Optional: timing belt pulley **P LPB+**

View A



Profile AT20-0
p = 20 mm
z = 19 mm



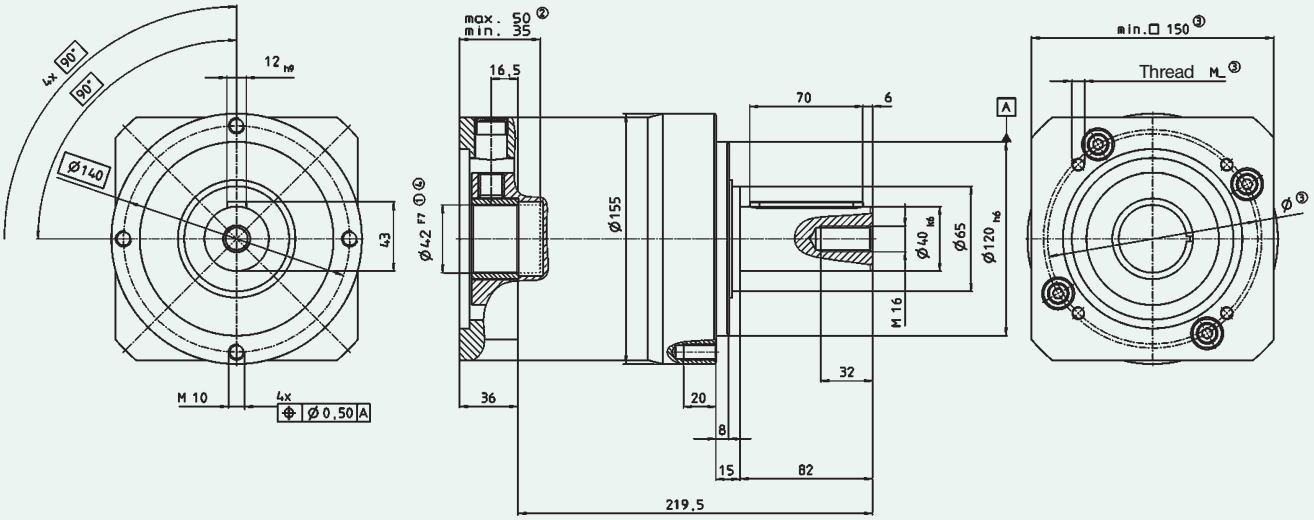
View B

PCD pitch circle diameter			$d_o = \frac{z \cdot p}{\pi}$
Weight	m	kg	2.61
Mass moment of inertia of inertia	J_1	$kgcm^2$	50.62

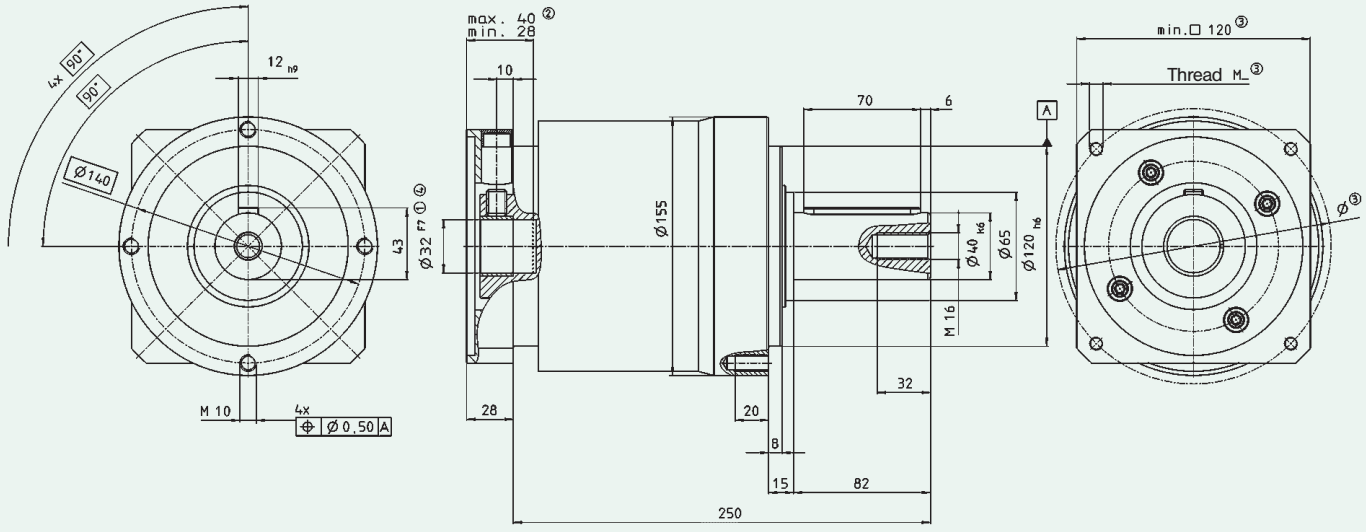
Conversion table

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

LP+ 1-stage gearhead:



LP+ 2-stage gearhead:



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 **LP+ 155**

			1-stage		2-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) *	n_{1N}	min^{-1}	2000	2000	2000	2000	2000
No-load running torque (n_1=3000 rpm) (At 20 °C gearhead temperature)	T_{012}	Nm	≤ 2.8	≤ 2.5	≤ 1.0	≤ 0.8	≤ 0.7
Maximum input speed	n_{1Max}	min^{-1}	3600	3600	3600	3600	3600
Torsional backlash	j_t	arcmin	Standard ≤ 12 / Reduced ≤ 8		Standard ≤ 15 / Reduced ≤ 10		
Torsional rigidity	C_{t21}	Nm/arcmin	55	44	55	55	44
Max. axial force **	F_{2AMax}	N	6000		6000		
Max. radial force **	F_{2RMax}	N	7500		7500		
Efficiency at full load	η	%	> 97		> 95		
Service life (For calculation, see alpha Technical Basics catalog)	L_h	h	> 20 000		> 20 000		
Weight (incl. adapter plate)	m	kg	17.0		21.0		
Noise level (n_1=3000 rpm)	L_{PA}	dB(A)	≤ 75				
Max. permissible housing temperature		°C	+90				
Ambient temperature		°C	0 up to +40				
Lubrication			Flow Grease				
Paint			Blue RAL 5002				
Type of protection			IP 64				
Mass moment of inertia (referring to the drive)	J_1	$kgcm^2$	25.73	25.73	5.60	5.60	5.60

* For higher ambient temperature, reduce nominal input speed n_{1N}.
** In reference to the center of the output shaft 100 min^{-1}.

Conversion table

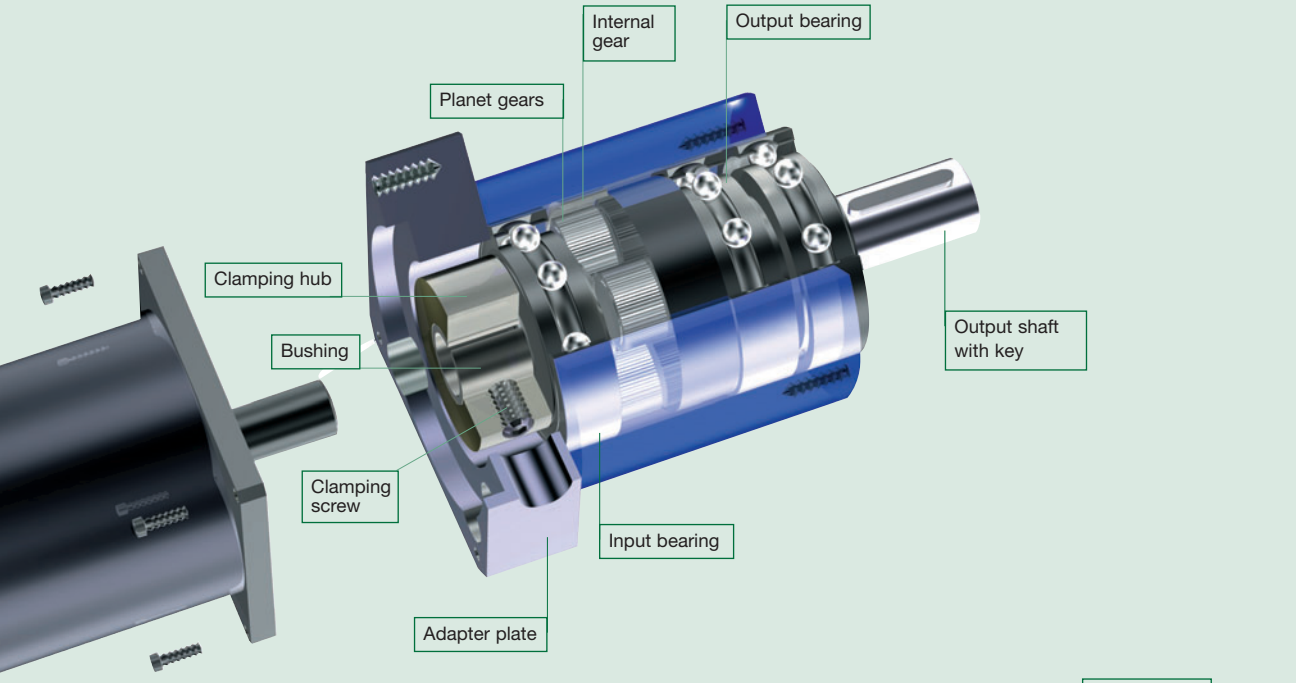
1 mm	= 0.039 in
1 Nm	= 8.85 in.lb
1 $kgcm^2$	= 8.85 x 10^{-4} in.lb.s^2
1 N	= 0.225 lb_f
1 kg	= 2.21 lb_m

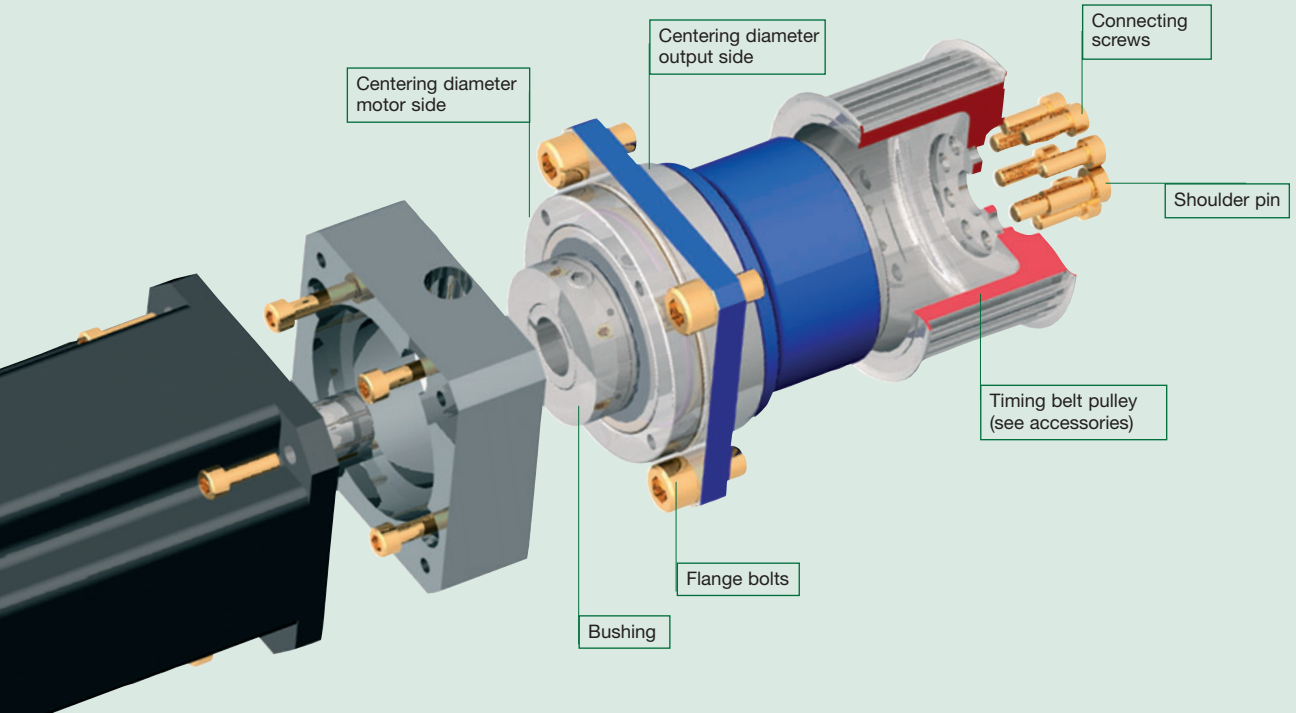
LP+ / LPB+ – robust design, low price, quick delivery!

Simple adapter kits allow the Value Line to be mounted to any motor in just two minutes.

A clamping hub connects the motor shaft to the input shaft of the gearhead.

The clamping screw in the clamping hub is tightened through an access hole in the adapter plate.





Symbols and indices

Symbol	Unit	Designation
c	Nm /arcmin	Rigidity
F	N	Force
i	-	Ratio
j	arcmin	Backlash
J	$kgcm^2$	Mass moment of inertia
L	h	Service life
M	Nm	Moment
n	min^{-1}	Speed
η	%	Efficiency
T	Nm	Torque
d_f	mm	circle of contact
d_k	mm	addendum circle

Index	
1	input
2	output
A/a	axial
B/b	acceleration
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.com) 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

   T_{MaxMot} [Nm]

2. Determine the maximum acceleration torque at the gearhead output T_{2b} [Nm]

   $T_{2b} = T_{MaxMot} \bullet i$

3. Compare the maximum acceleration torque T_{2b} [Nm] with the maximum permissible acceleration torque T_{2B} [Nm] at the gearhead output

   $T_{2b} \leq T_{2B}$

4. Compare the bore diameter of the clamping hub with the table on page 20

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

   T_{1NMot} [Nm]

3. Determine the nominal torque at the gearhead output T_{2n} [Nm]

   $T_{2n} = T_{1NMot} \bullet i$

4. Compare the nominal torque T_{2n} [Nm] with the permissible nominal torque T_{2N} [Nm] at the gearhead output

   $T_{2n} \leq T_{2N}$

5. Determine the input speed

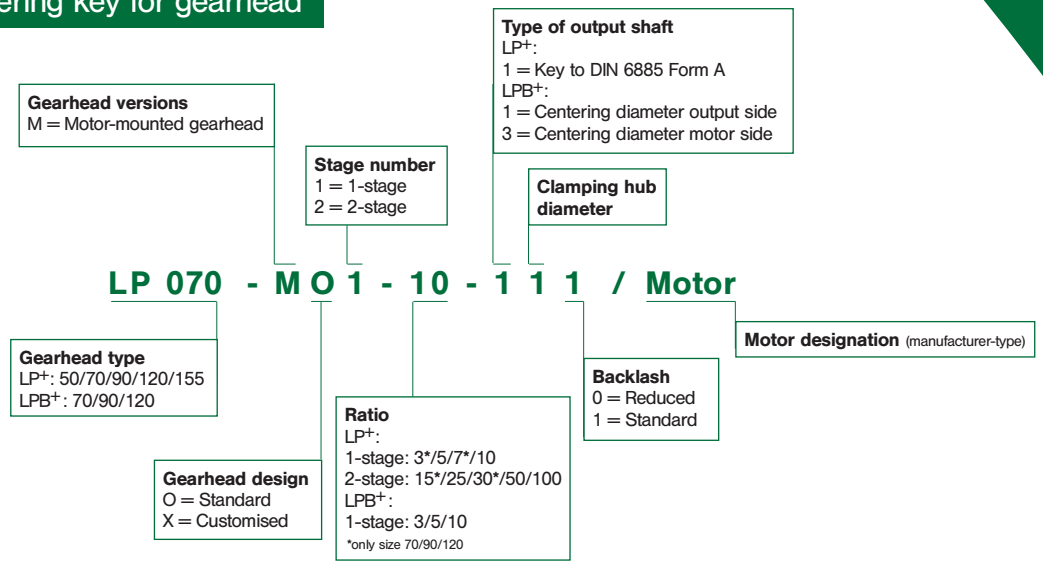
   n_{1n} [min^{-1}]

6. Compare the input speed n_{1n} [min-1] with the permissible nominal speed n_{1N} [min^{-1}]

   $n_{1n} \leq n_{1N}$

* Recommended by alpha. We will gladly assist if required: call +49 (0) 79 31 / 4 93-0

Ordering key for gearhead

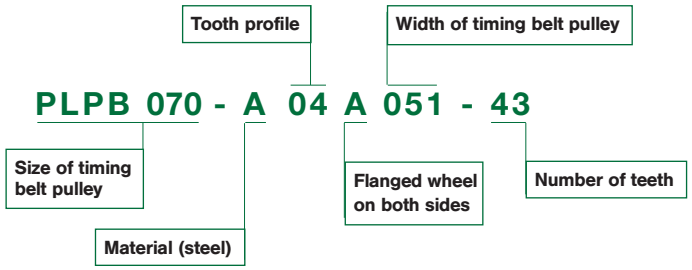


Ordering key for timing belt pulley

PLPB 070 - A 04A051 - 43 for LPB070

PLPB 090 - A 06A051 - 28 for LPB090

PLPB 120 - A 08A076 - 19 for LPB120

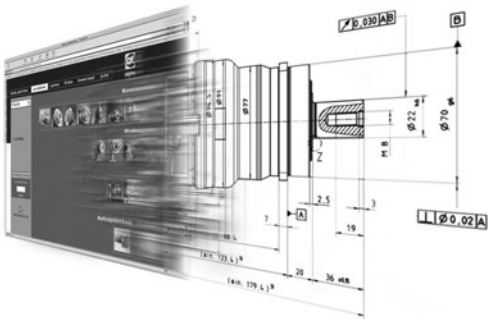


alpha's cymex® calculation software makes it easier than ever to design the most complex drive trains with just a few mouse clicks.

application – gearhead – motor

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

Use **cymex®**.
easy – quick – reliable



Additional **alpha** products

TP+ & TP HIGH TORQUE® – Compact Precision

Low-backlash planetary gear reducers with output flange. Torsional backlash ≤ 1 arcmin.
Acceleration torque up to 10.000 Nm.
TP HIGH TORQUE best qualified for highest positioning accuracy and high-dynamic cycle operation.

SP+® & SP+ HIGH SPEED® – The NEW Generation

Low-backlash planetary gear reducers with output shaft. Torsional backlash ≤ 1 arcmin.
Acceleration torque up to 3400 Nm.
SP+ HIGH SPEED best qualified for highest speed in continuous operation.

LP+ & LPB+ – Value Line

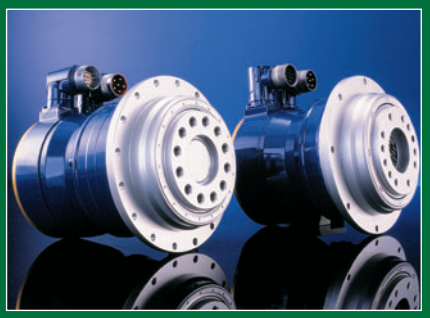
Low-backlash gear reducers with output shaft for economical servo applications.
Torsional backlash ≤ 10 arcmin.
Acceleration torque up to 450 Nm.
Optional available as LPB+, with geared pulley mount.

Hypoid Planetary Gear Reducer

Right-angle planetary gear reducer of highest precision and power density.
Torsional backlash ≤ 2 arcmin.
Acceleration torque up to 1600 Nm.
Output shaft variations: SPK+: smooth, keywayed, involute toothing to DIN 5480, TPK+: flange

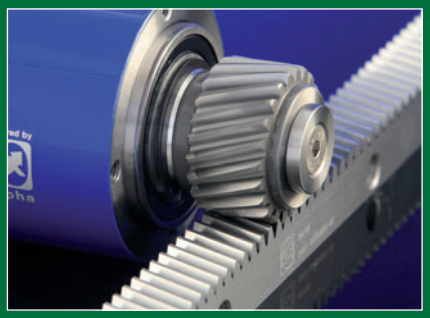
Hypoid Gear Reducer

Right-angle gear reducer of highest precision and compactness.
Torsional backlash ≤ 4 arcmin.
Acceleration torque up to 640 Nm.
Output shaft variations: SK+: smooth, keyway-ed, involute toothing to DIN 5480, TK+: flange
HG+: hollow shaft



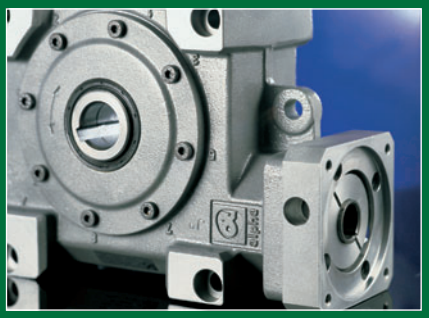
TPM & TPMA - Servoactuators

Ultra-compact and highly precise brushless gear motors featuring high dynamics, high torsional stiff-ness and a backlash of just 1 to 3 arcmin.
Acceleration torque up to 2600 Nm.
Up to 60% shorter overall length and much lower weight than conventional servomotor-gearhead designs.



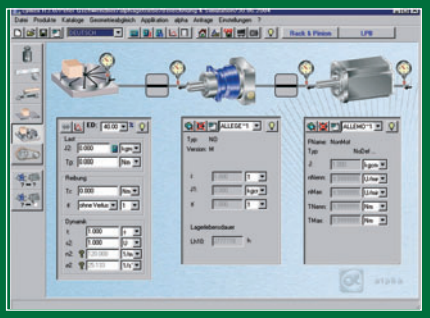
Rack & Pinion Systems

Precision Rack and Pinion solutions in 3 grades for individual servo applications.
Precision Class – for exact servo applications
Smart Class – for standard servo applications
Value Class – for economical servo applicca-tions



V - Drive®

Cyclic and continuous duty operations.
Torsional backlash ≤ 3 arcmin.
Acceleration torque up to 718 Nm.
Direct mounting to servo motor.



cymex® 3.0

The software for drive technology.
Design a complete drive train with a few mouse clicks.
Up to 80% time saving.

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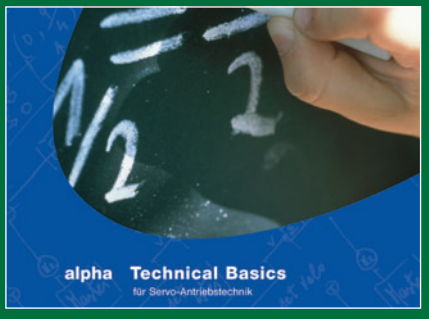

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