



















NEUGART	Alpha
History	
Established in 1928 - products : precision gears, clocks, fine measuring instruments, later custom precision gears for various industries printing machines etc. First planetary gearhead supplied 1960's for stepper-motors	Established 1980's First planetary gearhead introduced in 1984
Neugart: longest track record of excellence and reliability	

Currently offered servo gearhead product line			
	PLS and PLS-HP -series High Precision inline planetary	SP(SP+) -series High Precision inline planetary	
	WPLS -series High Precision right-angle bevel-planetary	SPK -series High Precision right-angle bevel-planetary	
	PLE - high Economy Value inline planetary	LP - high Economy Value inline planetary	
	WPLE - high Economy Value right-angle bevel-planetary	- No offering -	-
	PLF-HP – high precision planetary with rotating flange (Disc) output	TP – high precision planetary with rotating flange (Disc) output	
-	W-PLF-HP not a standard product line available upon special request	TP-K high precision right angle with rotating flange (Disc) output	
	PLFE – value line planetary with rotating flange (Disc) output	- No offering -	-
	WGE – value line planetary right-angle 1:1 gearhead	- No offering -	-
-	Available in cooperation with the company ATLANTA	V - series precision right angle worm	
	Pre-engineered rack and pinion drive packages	Pre-engineered rack and pinion drive packages	
	Integrated custom geared solutions	- No offering -	
Neugart: most comprehensive product offering			

NEUGART	Alpha
Inline planetary high precision product comparison	

	PLE series high value economy inline planetary servo gearhead		LP series high value economy inline planetary servo gearhead
All gears case hardened		Un-hardened soft ring-gear	
4 planet gears in the high torque output stage on all 2 an 3stage units		3 planet-gear design	
Dedicated output shaft housing wit fully seated bearings		Output shaft bearing is only partially seated protruding from the housing as centering pilot	
High density fully packed needle roller bearings 30 0000 hrs life		Standard needle bearings 10 000 to 20 000 hrs life	
Torque rating: continuous duty rated torque clearly defined at 100 output shaft rpm @ L10 30 000 hrs		Listing 4 - ill defined toque ratings per each size / ratio (accel torque MF, accel torque MC Nominal Torque MF, nominal Torque MC)	
Gearhead designed L10 service life 30 000 hrs @ rated torque		Gearhead designed L10 service life 10 000 -20 000 hrs / 30 000 hrs not clearly defined	
Patented 5 slot precision clamping device		Standard 2 slotted clamping device	
22 standard ratios (3:1 to 512 :1)		8 standard ratios (3:1 to 100:1)	

Type code	Geom. size mm	Torque rating Nm @ 25:1 and 5:1 ratio	Torque density T / Ø x10 *	Peak input rpm	Torque / \$ X 100 *	Type code	Geom. size mm	Torque rating Nm @ 25:1 and 5:1 ratio	Torque density T/ Ø x10 *	Peak input rpm	Torque / \$ x 100 *
PLE						LP					
40	Ø 40	18 / 6	4.5	18 000	5	050	Ø 50	5.7 / 5.7	1.1	8000	0.66
60	Ø 60	40 / 16	6.6	13000	8.9	070	Ø 70	16 / 16	2.2	6000	1.75
80	Ø 80	110 / 50	13.7	7000	20.3	090	Ø 90	40 / 40	4.4	6000	3.9
120	Ø 120	230 / 110	19	6500	22.9	120	Ø 120	100 / 100	8.3	4800	7.9
160	Ø 160	700 / 450	43	6500	28.3	155	Ø 155	290 / 290	18.7	3600	18.4

* Calculated for 2 stage 25:1 ratio

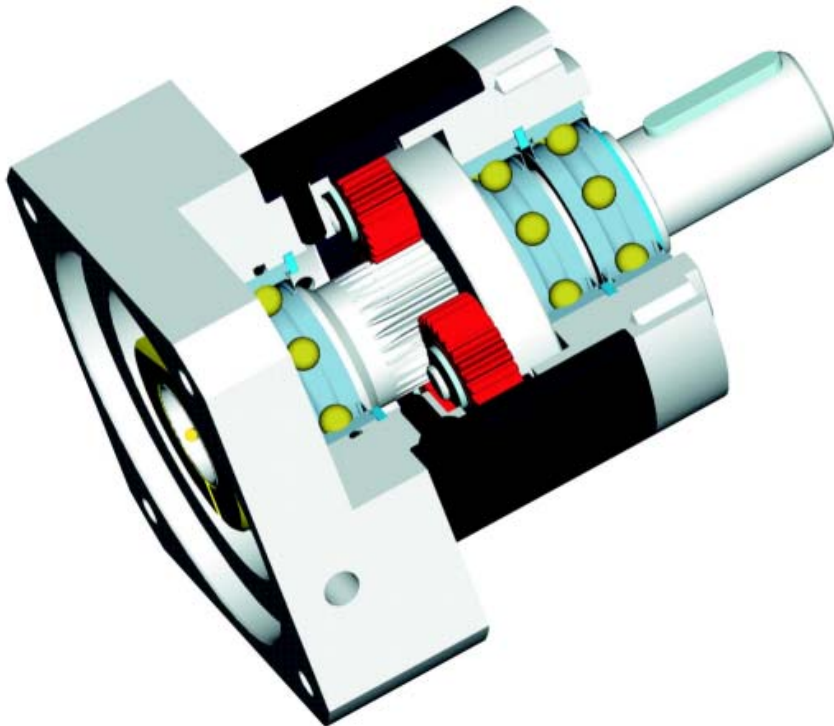
Neugart : Substantially higher torque density, more compact, longer life, far more ratios, higher input speeds without torque de-rating, far better overall value

Alpha LP Overall design:

NEUGART PLE

Very high torque density, best value
Simple, streamlined and optimized
design avoiding
a small sun gear.
Up to 5 Planets in Output stage

5 sizes 22 ratios /size

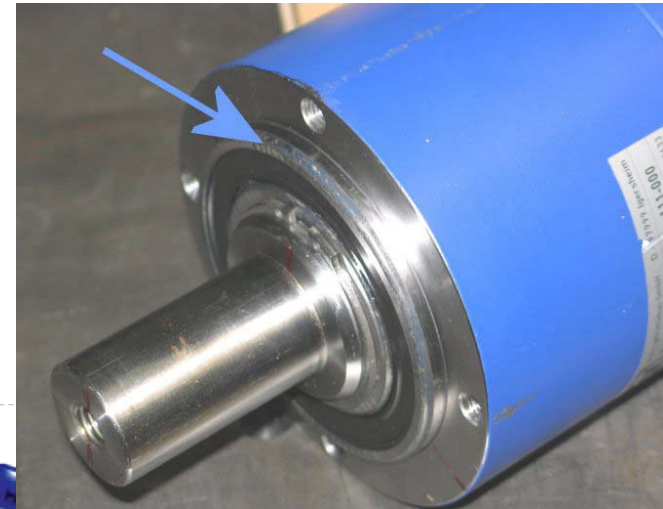


Alpha LP

Significantly lower torque density

“Cheap design” Bearing protruding from housing
serving as pilot ,

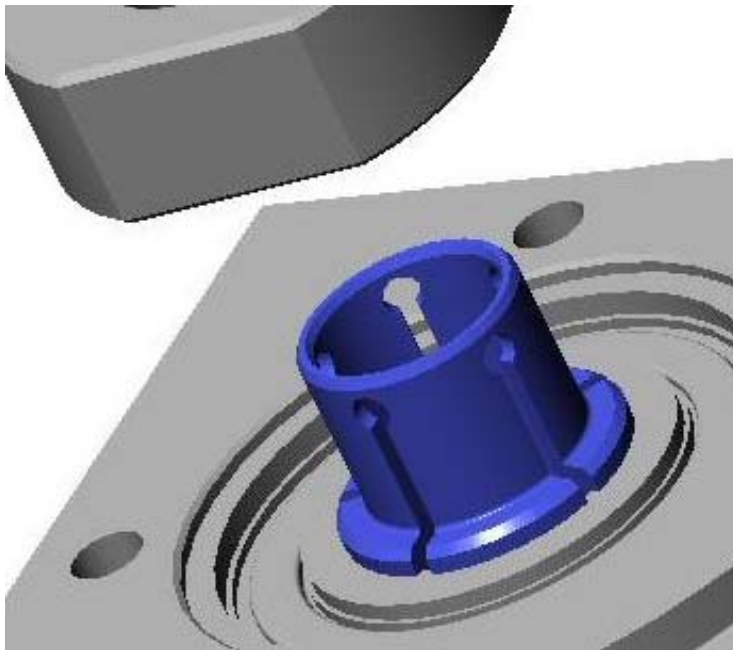
5 sizes 8 ratios / size



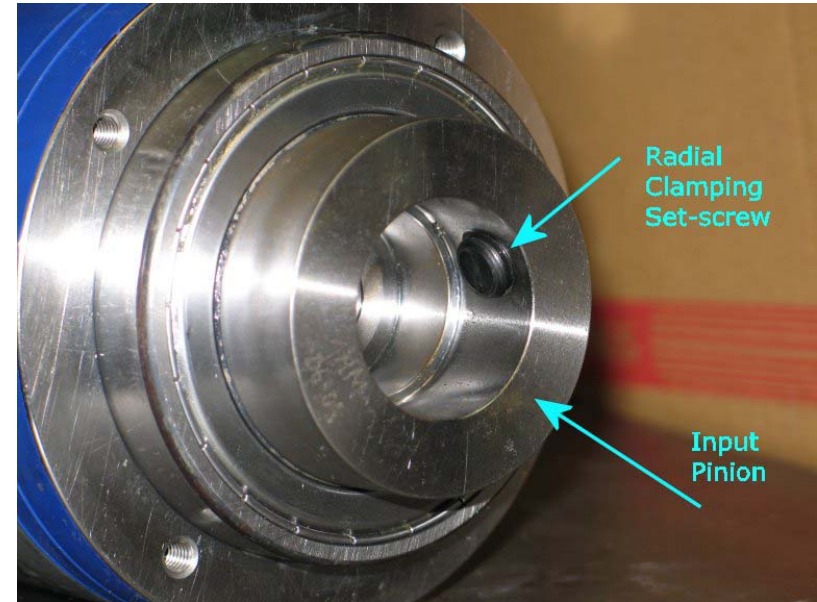
alpha LP

NEUGART PLE

PCS patented precision clamping system run out free reliable high torque ability motor shaft mounting



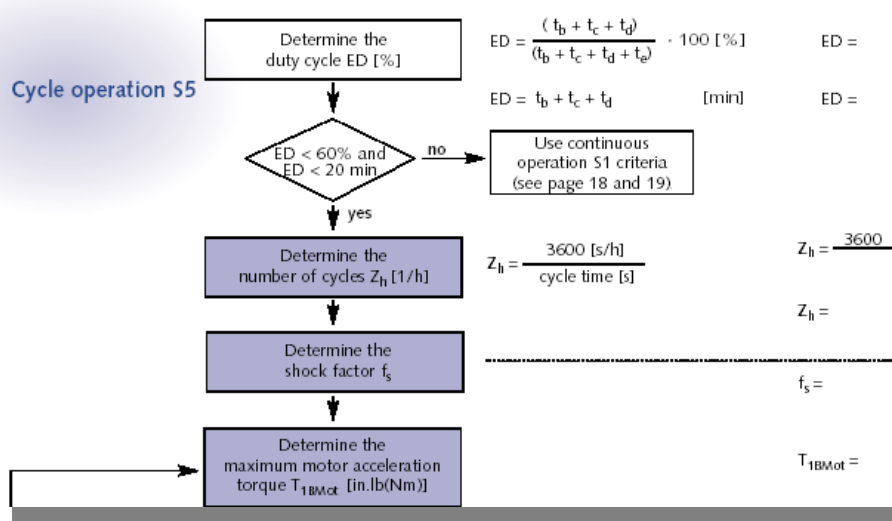
Alpha LP



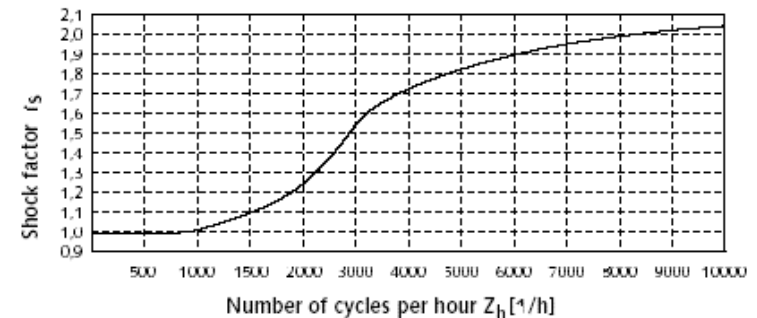
Radial setscrew

→ susceptible to slippage, uneven mounting with run out,

Alpha LP Rating / Sizing / Selection:



Rapid reversals in combination with short acceleration times may cause vibration within the drive assembly. The resulting overloads should be calculated using the shock factor f_s .



Alpha LP ratings and sizing not in line with standard practice, Nominal torque rating not clear defined, No transparent L10 life calculation possible.

Comparing Neugart real continuous duty rating to Alpha Nominal torque rating
 Neugart torque density is 25 % higher on one stage up to 100% higher on 2 and 3 stage units

Practical applications show, alpha SP units can be replaced by:

Alpha LP050 → Neugart PLE40,



Alpha LP 070 → Neugart PLE 60,

Alpha LP90 → Neugart PLE 80,

Alpha LP 120 → Neugart PLE 120

Alpha SP155 → Neugart PLE 120 or PLE160

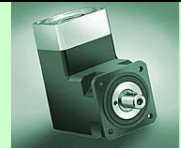

NEUGART	Alpha
Inline planetary, high economy value product line comparison	

	PLS and PLS-HP-series High Precision inline planetary	SP (SP+) -series High Precision inline planetary (SP-high speed ,Alphano)	
All gears case hardened All gears are honed		Ring-gear is not hardened Gears are not honed	
Torque rating: continuous duty rated torque clearly defined at 100 output shaft rpm @ L10 20 000 hrs		Listing 4 - ill defined toque ratings per each size / ratio (accel torque MF, accel torque MC Nominal Torque MF, nominal Torque MC)	
Gearhead designed L10 service life 20 000 hrs at full rated torque 30 000 hrs 88 % of rated torque		Gearhead designed L10 service life 20 000 hrs / 30 000 hrs not clearly defined under what conditions rated	
Output shaft bearing PLS - preloaded angular contact PLS-HP taper roller bearings on both sides of the planet carrier		Output shaft bearing Taper roller bearings on one side of the planet carrier	
Patented 5 precision clamping device		Standard 2 slotted clamping device	
Integrated Expansion Chamber NIEC For highest input speed eliminating pressure rise PLS-HP integrated NIEC PLS Optional NIEC		Not available	

Type code	Geom. size mm	Torque rating Nm 5:1 ratio	Torque density T/ \square x10	Max input rpm	Torque / \$ X 100	Type code	Geom. size mm	Torque rating Nm 5:1 ratio	Torque density T/ \square x10	Max input rpm	Torque / \$ x 100
PLS						SP+					
						60	Ø 61.5	25	4	6000	2.6
70	70x70	50	7	14000	5.2	75	Ø 82	41	5	6000	3.8
90	90x90	110	12	10000	9.3	100	Ø 106	105	10	6000	6.5
115	115x115	210	18	8500	14.7	140	Ø 140	205	14	6000	10
142	142x142	700	49	6500	29	180	Ø 193	255	13	6000	8.6
190	190x190	1600	84	6000	42	210	Ø 212	1000	47	6000	22
						240	Ø 242	1700	70	6000	29
PLS-HP											
64	70x70	110	15	16000	7.9	75	Ø 82	41	5	6000	
90	90x90	220	24	12000	13	100	Ø 106	105	10	6000	
110	115x115	520	45	10000	27	140	Ø 140	205	14	6000	
140	142x142	1000	70	8000	36	180	Ø 193	255	13	6000	

Neugart : Higher torque density, more compact, longer life, better value

NEUGART	Alpha
Right-angle bevel-planetary high precision product comparison	

	WPLS series High Precision right angle bevel planetary	SPK -series High Precision right angle bevel planetary	
All gears case hardened All planet gears are honed; bevel lapped		Ring-gear is not hardened Gears are not honed	
Torque rating: continuous duty rated torque clearly defined at 100 output shaft rpm @ L10 20 000 hrs		Listing 4 - ill defined torque ratings per each size / ratio (accel torque MF, accel torque MC Nominal Torque MF, nominal Torque MC)	
Gearhead designed L10 service life 20 000 hrs at full rated torque 30 000 hrs 88 % of rated torque		Gearhead designed L10 service life 20 000 hrs / 30 000 hrs not clearly defined under what conditions rated	
Output shaft bearing PLS - preloaded angular contact PLS-HP taper roller bearings on both sides of the planet carrier		Output shaft bearing Taper roller bearings on one side of the planet carrier	
Patented 5 precision clamping device		Standard 2 slotted clamping device	
Integrated Expansion Chamber NIEC For highest input speed eliminating pressure rise PLS-HP integrated NIEC PLS- NIEC Optional		Not available	

Type code	Geom. size mm	Torque rating Nm 5:1 ratio	Torque density T/Øx10	Max input rpm	Torque / \$ X 100	Type code	Geom. size mm	Torque rating Nm 5:1 ratio	Torque density T/ Ø x10	Max input rpm	Torque / \$ x 100
WPL S						SPK					
70	70x70	50	7	14000	3.3	60	Ø 61.5	25	4	6000	1.2
90	90x90	110	12	10000	6.1	75	Ø 82	70	5	6000	3.1
115	115x115	210	18	8500	9.5	100	Ø 106	170	10	6000	7
142	142x142	700	49	6500	20	140	Ø 140	360	14	6000	12
190	190x190	1600	84	6000	28	180	Ø 193	550	13	6000	12
210											

Neugart : Higher torque density, more compact, longer life, better value

Alpha SP Overall design:

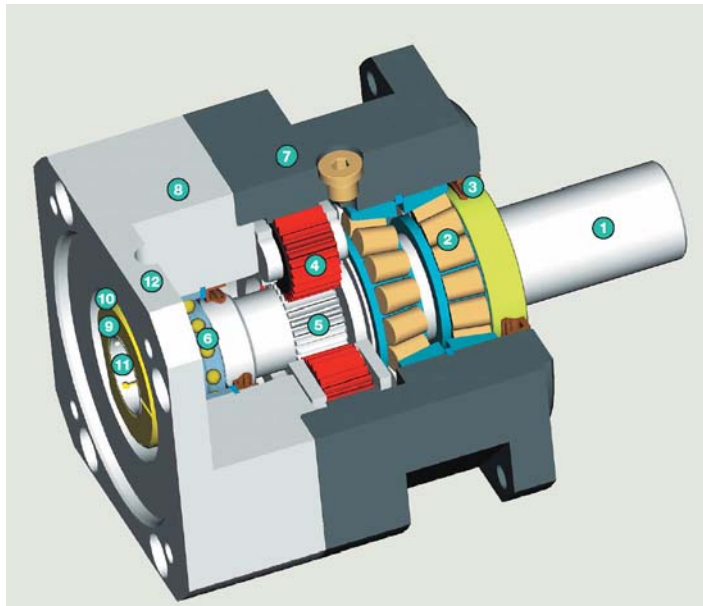
NEUGART PLS

Simple, streamlined and optimized design supporting evenly load distribution.

Output –shaft (carrier) supported in preloaded angular contact bearings.

Planets “fully-packed” (cage less) needle roller bearings

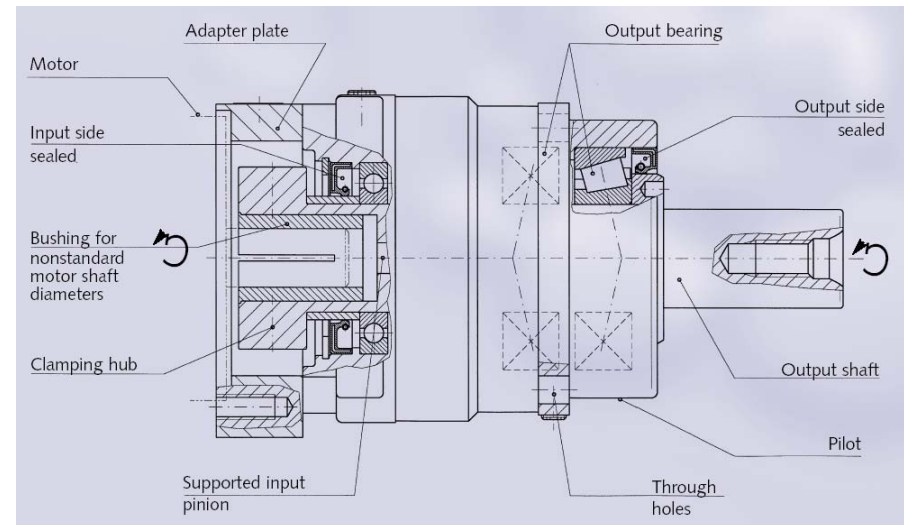
5 sizes 15 ratios / size



Alpha SP

Similar design to the Neugart PLS designed, Taper roller bearings supported output shaft
Planets supported in standard needle roller bearings

7 sizes 11 ratios / size



Alpha SP Overall design:

NEUGART PLS

All gears with zero helix angle

→ do not create unbalanced forces in the inherently balanced planetary system

All gears case hardened

All gears precision honed after hardening (hard finished)

→ No significant wear no backlash increase, high surface durability, long life, no lubricant contamination with wear in particles, low noise

Alpha SP

All gears with zero helix angle

→ do not create unbalanced forces in the inherently balanced planetary system

All gears case hardened

Planet and sun gear Ground (hard finished)

Ring gear not hardened and not hard finished.

→ More wear in,

Alpha SP Overall design:

NEUGART PLS

Backlash guaranteed to be smaller than the catalog value. (< x.x arc min) Catalog value corresponds to the worst case tolerances

The actual (average) backlash is about 25% to 45% smaller

Patented precision motor shaft clamping device

→ run out free mounting

NIEC Integrated Expansion Chamber option

→ no torque de-rating at higher speeds

Alpha SP

Backlash and its definition is comparable to Neugart PLS

2 slot / 2 bolt clamping system

→ susceptible to uneven mounting with possible run out.

No expansion chamber at higher speeds

→ Significant torque de-rating

Alpha SP Rating, Sizing, Selection:

NEUGART PLS

Clearly defined rating based on strict physical facts and documented widely recognized rating rules - fatigue strength surface durability and L10 life.

Listed torque ratings are continuous duty ratings; 20 000 hrs L10 bearing life at the rated torque and clearly defined speed of 100 rpm on output

Every ratio has an exact defined rating

Sizing & Selection based on clearly defined gear rated torque;

Reliable sizing / selection based on physical model and recognized standards

Emergency stop torque 2 x rated torque

Alpha SP

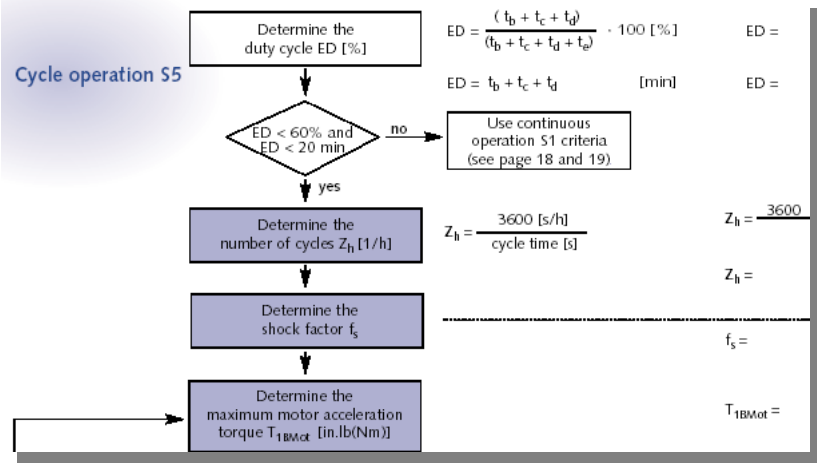
Not clearly defined torque rating does not follow recognized standard procedure introduces ill defined accel. torque

Is not defined which rating is based on fatigue or continuous duty

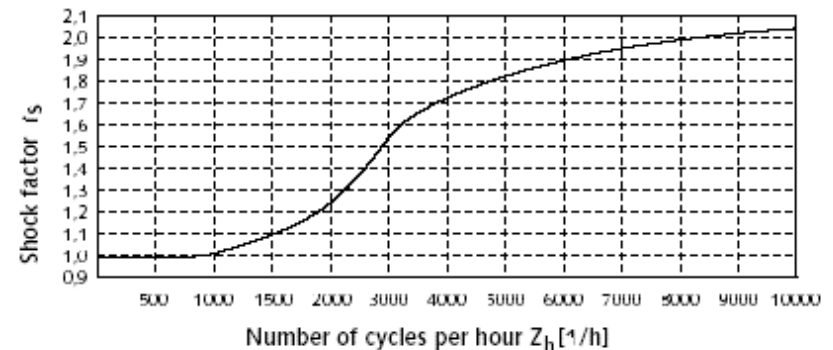
Method using the nonstandard torque ratings and factors based on % ED (Duty Cycle) accel. torque and shock factor based on number of cycles per hour (frequency of cycles)

Emergency stop torque about 2.5 x Nominal torque - 1000 times during the gearhead service life

Alpha SP Rating / Sizing / Selection:



Rapid reversals in combination with short acceleration times may cause vibration within the drive assembly. The resulting overloads should be calculated using the shock factor f_s .



Comparing Neugart real continuous duty rating to Alpha Nominal torque rating
 Neugart torque density is 15 to 25% higher (Here Torque density defined as
 Torque / unit square or diameter)

Practical applications show, alpha SP units can be replaced by:

Alpha SP075 → Neugart PLS 70, Alpha SP0100 → Neugart PLS 90,

Alpha SP140 → Neugart PLS 115 or PLS142, Alpha SP180 → Neugart PLS 190

Alpha SP210 → Neugart PLS 190,