WITTENSTEIN | alpha

alpha Value Line - NPL
Sizing and Technical Data

Efficient
Flexible
Reliable

efficiency engineering

alpha Value Line		NP	NPS	NPL	NPT	NPR
Ratios				3-100		
Torsional backlash [arcmin]				≤ 8		
Output type						
Smooth output shaft		•	•	•	–	•
Grooved output shaft		•	•	•	–	•
Output shaft with involute toothing		–	•	•	–	•
Output flange		–	–	–	•	–
Input type				**Motor attachment version**		
Application						
For high axial and radial forces		–	•	•	–	•
In continous operation		•	•	•	•	–
In cyclic operation		•	•	•	•	•
Options						
HIGH TORQUE version		•	•	•	•	•
Foodgrade lubrication		•	•	•	•	•
With coupling at output		•	•	•	•	•
As linear system		•	•	•	–	•
With mounted pinion at output		•	•	•	–	•
With screwed on B5 flange		•	–	–	–	–
Further technical data						
Max. torque T_{2a}	Nm	800	800	800	800	800
	in.lb	7100	7100	7100	7100	7100
Max. input speed	rpm	10000	8000	8000	10000	8000
Efficiency	%	97%	97%	97%	97%	97%
Max. radial force F_{2R}	N	8000	10000	10000	4800	10000
	lb_f	1800	2250	2250	1080	2250

WITTENSTEIN alpha adapted for any axis

The perfect drive solution whatever the requirements are

WITTENSTEIN alpha develops complete, single-supplier solutions for driving any axis. They can be used in virtually any application – from high-precision axes in machine tools and manufacturing systems to packaging machinery where maximum productivity is a must.

The name WITTENSTEIN alpha is synonymous with premium quality and optimal reliability, high precision and synchronization accuracy, maximum power density, a long lifetime and very simple motor mounting.
The alpha Value Line is a new product family that unites these characteristics – which are specially adapted for applications in the value segment or high-end secondary axes – in a class-appropriate way.

Benefits of the alpha Value Line:

- Rapid availability regardless of the batch size
- Optimal flexibility
- Ability to react promptly to changing customer requirements
- Assembly to order

Contents

WITTENSTEIN | alpha

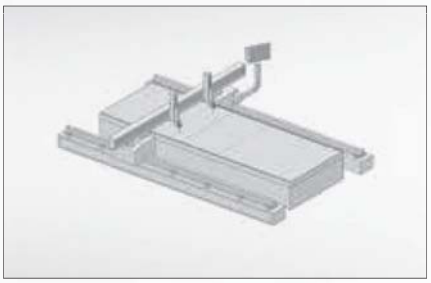
alpha Value Line
Efficient sizing

The new sizing method

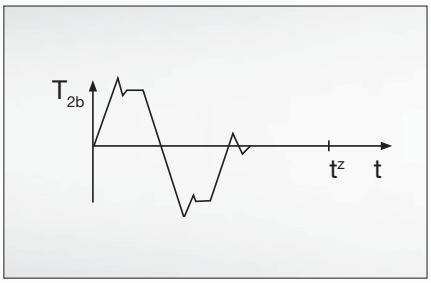
The new alpha Value Line from WITTENSTEIN alpha commits the cymex® sizing software to paper.
Using a quick select structure, you can define your drive train in just a few simple steps.

- Quick and easy gearhead selection based on your application.
- Maximum transmissible torque T_{2a} as the starting point for selecting the gearhead (definition $T_{2a} \neq T_{2B}$).
  No restriction on T_{2a} due to a maximum number of cycles per hour.
- Optional: Quick selection based on the maximum motor torque.

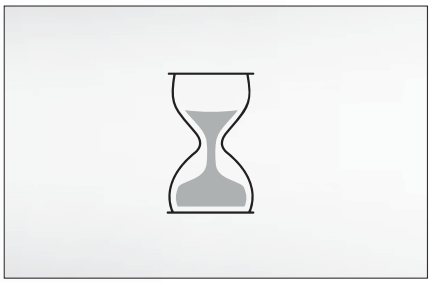
Your application

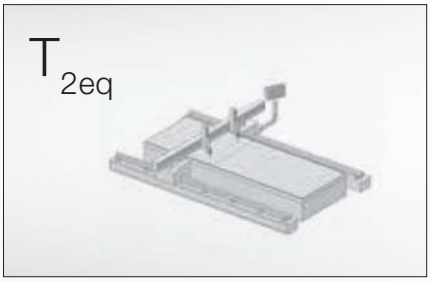


Determine application torque

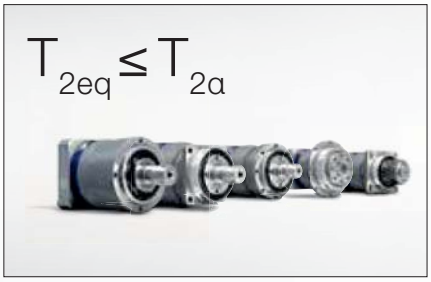


Define system utilization





Calculate equivalent application torque



Select gearhead

Your Benefits:

- Perfect-fit sizing of your drive
- Efficient and reliable gearhead selection
- Huge time saving
- Computational work for simple applications reduced to a minimum*
- Consideration of radial and axial forces if necessary

*We recommend our cymex® sizing software for complex applications

A: Simplified sizing for servo motors based on the maximum motor torque: $\mathbf{M_{max} * i \leq T_{2\alpha}}$

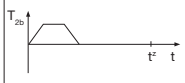
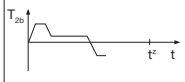
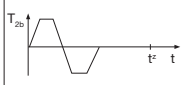
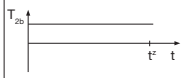
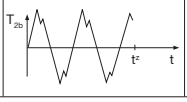
B: Sizing based on the application

Step 1:

Determine the maximum application torque: $\mathbf{T_{2b}}$= _____ **[Nm]**

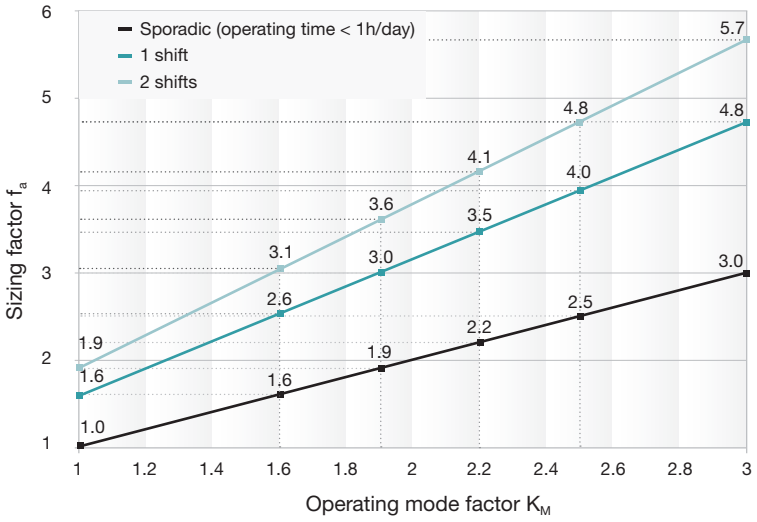
Step 2:

Determine the operating mode factor $\mathbf{K_M}$= _____

Typical applications	Cycle	Torque characteristic	Operating mode factor K_M
Format changing, e.g. in packaging machines, drives for processing equipment, actuators, etc.	**S5 operation:** Low duty cycle Small number of cycles Low dynamics		1.0
Tool changers with low dynamics, pick & place gantry axes, tire building machines, etc.	**S5 operation:** Medium duty cycle Small number of cycles Medium dynamics		1.6
Linear modules, linear axes in woodworking machines, ball screw drives, etc.	**S5 operations:** Medium duty circle Medium number of cycles Meduim dynamics		1.9
Roller drives in printing presses, star drives in rackers, etc.	**S1 operation:** High duty cycle		2.2
Linear axes in plasma, laser or water jet cutters, portals, tool changers with high dynamics	**S5 operation:** Medium duty circle Medium number of cycles High dynamics		2.5
SCARA robots, gantry robots, machining spindles, etc.	**S5 operation:** High duty cycle High number of cycles High dynamics		3.0

Step 3:

Determine the sizing factor with the operating mode factor K_M $\mathbf{f_a}$= _____



Step 4:

Compare the equivalent application torque with the maximum gearhead $\mathbf{T_{2\alpha}}$ (see table, Step 5)

$\mathbf{T_{2\_eq} = f_a * T_{2b} \leq T_{2\alpha}}$

$\mathbf{T_{2\_eq}}$ = _____ * _____ ≤ $\mathbf{T_{2\alpha}}$

$\mathbf{T_{2\_eq}}$ = _____ **[Nm]** ≤ _____ **[Nm]**

Step 5: Quick selection of the technical data

			1-stage	2-stage	1-stage	2-stage	1-stage	2-stage	1-stage	2-stage
Ratio [a]			3 - 10	12 - 100	3 - 10	9 - 100	3 - 10	9 - 100	5 - 10	15 - 100
Maximum torque [a]	$T_{2\alpha}$	Nm	51-64		128-160		320-408		640-800	
		in.lb	450-570		1130-1420		2830-3610		5660-7080	
Maximum torque [a]	$T_{2\alpha}$	Nm	62-88		184-200		432-488		-	
		in.lb	550-780		1490-1770		4250-4320		-	
Max. input speed	n_{1max}	min^{-1}	8000	10000	7000	8000	6000	7000	4000	6000
Nominal input speed	n_{1N}	min^{-1}	2900	3800	2700	3300	2000	2700	1800	2600
Max. radial force	F_{2RMax}	N	2800		4200		6600		9900	
		lb_f	630		950		1490		2200	
Mean operating noise	L_{PA}	dB(A)	58		60		63		66	
Paint			Paint Pearl dark grey – innovation blue							
Direction of rotation			Motor and gearhead same direction							
Protection class			IP 65							
Page			6		8		10		12	

[a] The maximum torques depend on the ratio

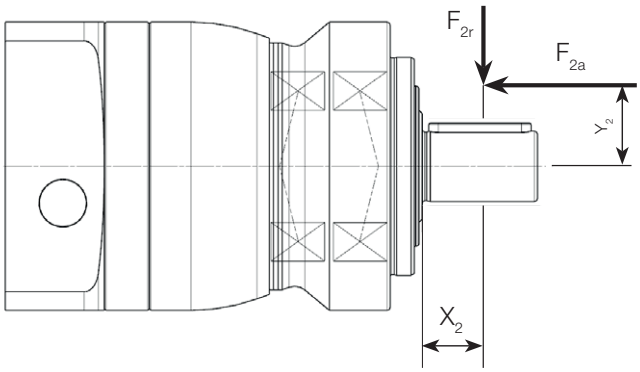
You can select a suitable adapter plate using the online configurator on **www.wittenstein-alpha.com**
For application-specific sizing with cymex®, see **www.cymex.com** Please refer to the product pages for detailed information on individual gearhead sizes

Account must be taken of the radial and axial forces at the output:

Please also carry out steps 6 and 7 if forces are present at the output (e.g. if timing belt pulleys, pinions or levers are mounted there).

Step 6 (if external forces are present):

Determine the forces acting on the output and check the boundary conditions



Radial force F_{2r} = _____ [N]
Radial force distance x_2 = _____ [mm]
Axial force F_{2a} = _____ [N]
Axial force distance y_2 = _____ [mm]
(required if F_{2a} is present)

Conditions if axial force F_{2a} is present:

1. $F_{2a} \leq 0.25 * F_{2r} \Rightarrow$ (_____ ≤ 0.25 * _____) ☐ **Met** ☐ **Not met:** Sizing with cymex®

2. $y_2 \leq x_2 \Rightarrow$ (_____ ≤ _____) ☐ **Met** ☐ **Not met:** Sizing with cymex®

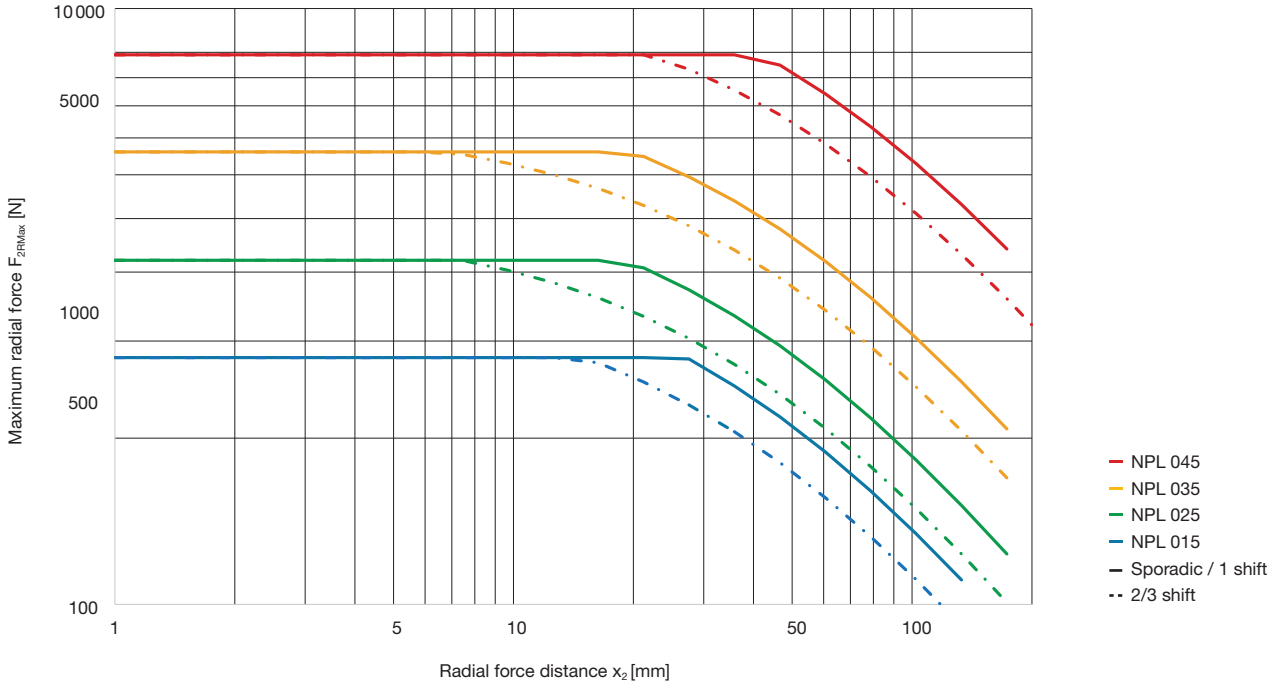
Step 7:

Determine the maximum equivalent force acting on the output F_{2_eq}

F_{2_eq} = F_{2r} + 0.25 * F_{2a} ≤ F_{2RMax} (F_{2RMax} can be determined from the diagram below)

F_{2_eq} = _____ + 0.25 * _____ ≤ _____

F_{2_eq} = _____ [N] ≤ _____ [N] ☐ **Met**



NPL 015S

			1-stage						2-stage													
Ratio [a]	**i**		**3**	**4**	**5**	**7**	**8**	**10**	**12**	**15**	**16**	**20**	**25**	**28**	**30**	**32**	**35**	**40**	**50**	**64**	**70**	**100**
Maximum torque **MF**	$T_{2\alpha}$	Nm	51	56	64	64	56	56	51	51	56	56	64	56	51	56	64	56	64	56	64	56
		in.lb	450	500	570	570	500	500	450	450	500	500	570	500	450	500	570	500	570	500	570	500
Maximum torque **HIGH TORQUE – MA**	$T_{2\alpha}$	Nm	88	67	-	-	-	-	62	67	67	67	-	67	62	-	-	67	-	-	-	-
		in.lb	780	590	-	-	-	-	550	590	590	590	-	590	550	-	-	590	-	-	-	-
Emergency stop torque [b]	T_{2Not}	Nm	75																			
		in.lb	660																			
Nominal input speed [c]	n_{1N}	min^{-1}	2900			3600			3800					4300								
Max. input speed	n_{1Max}	min^{-1}	8000						10000													
Max. torsional backlash	j_t	arcmin	Standard ≤ 8						Standard ≤ 10													
Max. axial force [d]	F_{2AMax}	N	2400																			
		lb_f	540																			
Max. radial force [d]	F_{2RMax}	N	2800																			
		lb_f	630																			
Weight incl. standard adapter plate [e]	m	kg	1.8 - 3						1.9 - 2.9													
		lb_m	4.0 - 6.6						4.2 - 6.4													
Operating noise [f]	L_{PA}	dB(A)	≤ 59						≤ 58													
Max. permitted housing temperature		°C	+90																			
		F	+194																			
Ambient temperature		°C	-15 to +40																			
		F	5 to 104																			
Lubrication			Lubricated for life																			
Paint			Housing: pearl dark grey / Drive-Side: Innovation Blue																			
Direction of rotation			Motor and gearhead same direction																			
Type of protection			IP 65																			
Moment of interia (related to the drive)		$kgcm^2$	0.13 to 0.55						0.02 to 0.14													
		10^{-3} in.lb.s^2	0.12 to 0.49						0.02 to 0.12													
Clamping hub diameter	Standard	mm	9(A) 11(B) 14(C)						8(Z) 9(A) 11(B)													
	big		16(D) 19(E)						14(C)													

[a] Other ratios available on request.
[b] Permitted 1000 times during the service life of the gearhead. If $T_{2\alpha} > T_{2Not}$, then T_{2Not} is the maximum permitted value.
[c] At T_{1N} and 20°C ambient temperature. Higher speeds possible if calculated using cymex®.
[d] Refers to the center of the output shaft at $n_2 = 150$ rpm.
[e] Depending on the clamping hub diameter and the selected adapter plate.
[f] At $i = 10$ and $n_1 = 3000$ rpm at no load.

You can select a suitable adapter plate using the online configurator on www.wittenstein-alpha.com

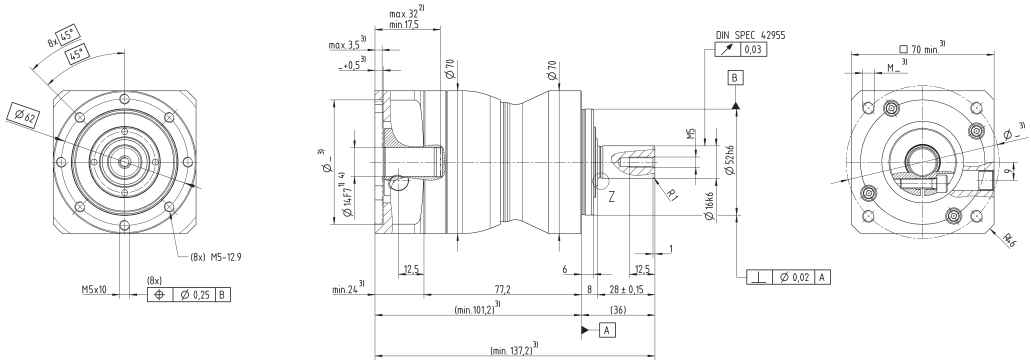
Quick gearhead selection based on the motor characteristic*:
Max. torque $T_{2\alpha} \geq T_{max\ motor} * i$
***Please refer to catalog pages 4 and 5 for detailed information on manual selection based on the application.**

For application-specific sizing with cymex®, see www.cymex.com

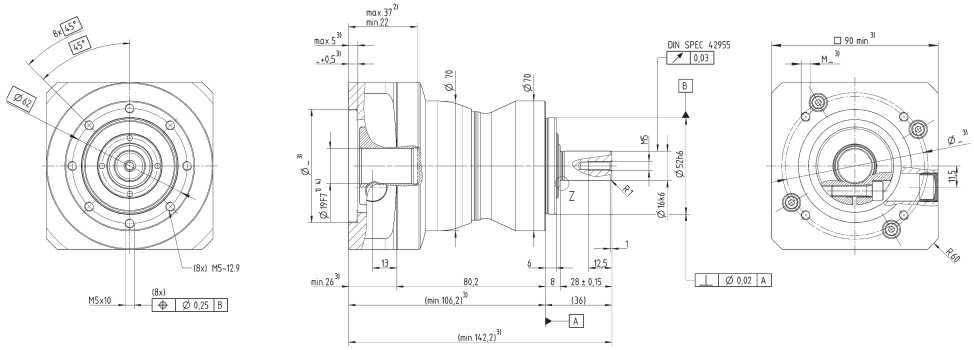
Motor shaft diameter [mm]

1-stage

Up to 14 [4] (C) clamping hub diameter

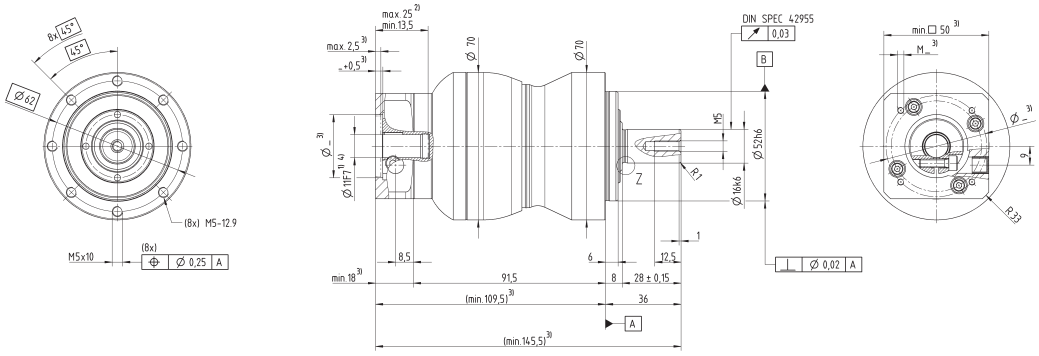


Up to 19 [4] (E) clamping hub diameter

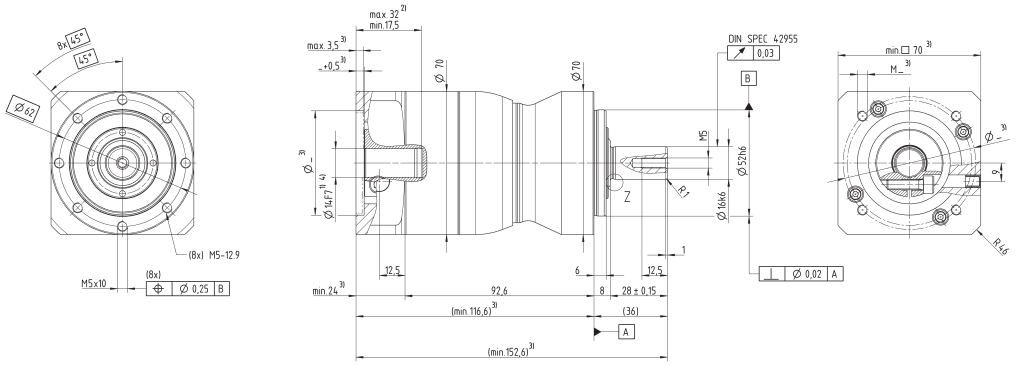


2-stage

Up to 11 [4] (B) clamping hub diameter

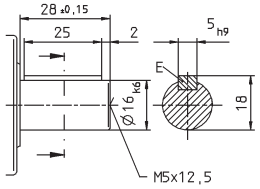


Up to 14 [4] (C) clamping hub diameter

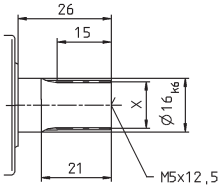


Alternatives: Output shaft variants

Output shaft with key
E = key as per DIN 6885, sheet 1, form A



Splined shaft
X = W 16 x 0.8 x 30 x 18 x 6m, DIN 5480



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 diameters are compensated by a bushing with a minimum thickness of 1 mm.

⚠ Motor mounting according to operating manual

NPL 025S

				1-stage						2-stage														
Ratio [a]		**i**		**3**	**4**	**5**	**7**	**8**	**10**	**9**	**12**	**15**	**16**	**20**	**25**	**28**	**30**	**32**	**35**	**40**	**50**	**64**	**70**	**100**
Maximum torque **MF**		$T_{2\alpha}$	Nm	128	152	160	160	144	144	128	128	128	152	152	160	152	128	152	160	152	160	144	160	144
			in.lb	1130	1350	1420	1420	1270	1270	1130	1130	1130	1350	1350	1420	1350	1130	1350	1420	1350	1420	1270	1420	1270
Maximum torque **HIGH TORQUE – MA**		$T_{2\alpha}$	Nm	200	184	-	-	-	-	200	200	192	184	184	-	184	168	-	-	184	-	-	-	-
			in.lb	1170	1630	-	-	-	-	1770	1770	1700	1630	1630	-	1630	1490	-	-	1630	-	-	-	-
Emergency stop torque [b]		T_{2Not}	Nm	190																				
			in.lb	1700																				
Nominal input speed [c]		n_{1N}	min^{-1}	2700			2900			3300						4000								
Max. input speed		n_{1Max}	min^{-1}	7000						8000														
Max. torsional backlash		j_t	arcmin	Standard ≤ 8						Standard ≤ 10														
Max. axial force [d]		F_{2AMax}	N	3350																				
			lb_f	750																				
Max. radial force [d]		F_{2RMax}	N	4200																				
			lb_f	950																				
Weight incl. standard adapter plate [e]		m	kg	3.6 - 5.9						4.1 - 5.9														
			lb_m	8.0 - 13.1						9.1 - 13.1														
Operating noise [f]		L_{PA}	dB(A)	≤ 61						≤ 59														
Max. permitted housing temperature			°C	+90																				
			F	+194																				
Ambient temperature			°C	-15 to +40																				
			F	5 to 104																				
Lubrication				Lubricated for life																				
Paint				Housing: pearl dark grey / Drive-Side: Innovation Blue																				
Direction of rotation				Motor and gearhead same direction																				
Type of protection				IP 65																				
Moment of interia (related to the drive)			$kgcm^2$	0.26 to 1.8						0.2 to 0.57														
			10^{-3} in.lb.s^2	0.23 to 1.6						0.18 to 0.5														
Clamping hub diameter	Standard		mm	14(C) 16(D) 19(E)						9(A) 11(B) 14(C)														
	big			24(G) 28(H)						16 (D) 19(E)														

[a] Other ratios available on request.
[b] Permitted 1000 times during the service life of the gearhead. If $T_{2\alpha} > T_{2Not}$, then T_{2Not} is the maximum permitted value.
[c] At T_{1N} and 20°C ambient temperature. Higher speeds possible if calculated using cymex®.
[d] Refers to the center of the output shaft at $n_2 = 150$ rpm.
[e] Depending on the clamping hub diameter and the selected adapter plate.
[f] At i = 10 and $n_1 = 3000$ rpm at no load.

You can select a suitable adapter plate using the online configurator on www.wittenstein-alpha.com

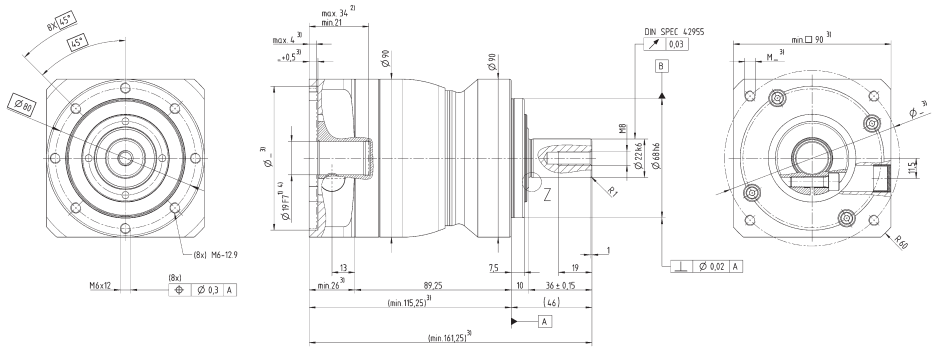
Quick gearhead selection based on the motor characteristic*:
Max. torque $T_{2\alpha} \geq T_{max\ motor} * i$
***Please refer to catalog pages 4 and 5 for detailed information on manual selection based on the application.**

For application-specific sizing with cymex®, see www.cymex.com

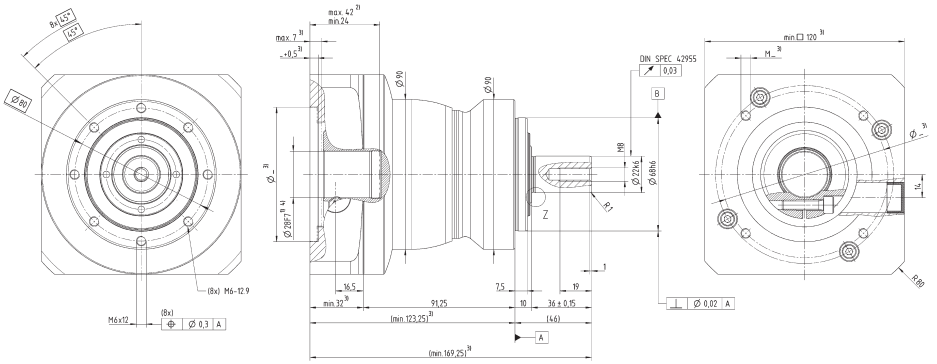
Motor shaft diameter [mm]

1-stage

Up to 19 [4] (E) clamping hub diameter

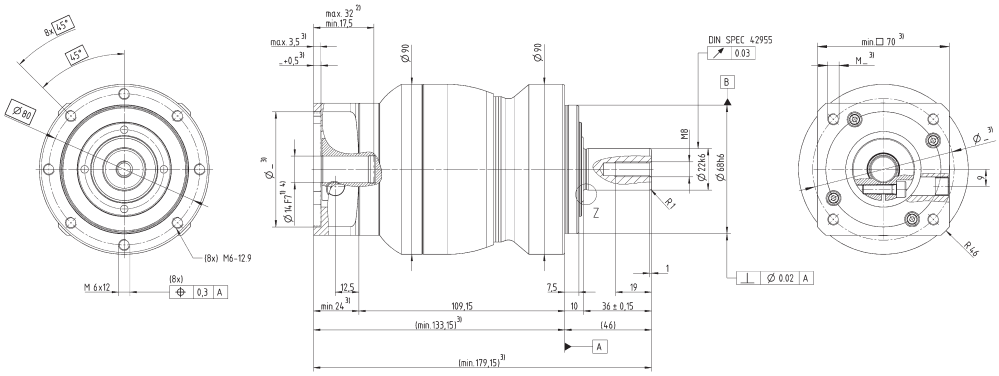


Up to 28 [4] (H) clamping hub diameter

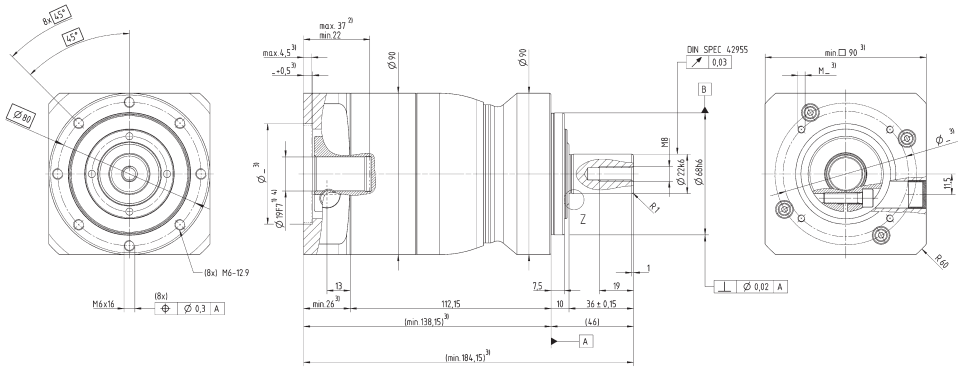


2-stage

Up to 14 [4] (C) clamping hub diameter

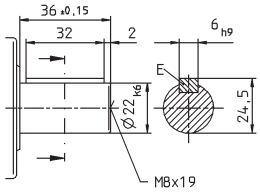


Up to 19 [4] (E) clamping hub diameter

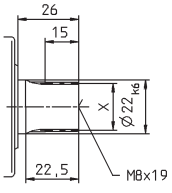


Alternatives: Output shaft variants

Output shaft with key
E = key as per DIN 6885, sheet 1, form A



Splined shaft
X = W 22 x 1.25 x 30 x 16 x 6m, DIN 5480



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 diameters are compensated by a bushing with a minimum thickness of 1 mm.

⚠ Motor mounting according to operating manual

NPL 035S

				1-stage						2-stage														
Ratio [a]		**i**		**3**	**4**	**5**	**7**	**8**	**10**	**9**	**12**	**15**	**16**	**20**	**25**	**28**	**30**	**32**	**35**	**40**	**50**	**64**	**70**	**100**
Maximum torque **MF**		$T_{2\alpha}$	Nm	320	408	400	400	352	352	320	320	320	408	408	400	408	320	408	400	408	400	352	400	352
			in.lb	2830	3610	3540	3540	3120	3120	2830	2830	2830	3610	3610	3540	3610	2830	3610	3540	3610	3540	3120	3540	3120
Maximum torque **HIGH TORQUE – MA**		$T_{2\alpha}$	Nm	488	488	-	-	-	-	488	488	480	488	488	-	488	432	-	-	488	-	-	-	-
			in.lb	4320	4320	-	-	-	-	4320	4320	4250	4320	4320	-	4320	3820	-	-	4320	-	-	-	-
Emergency stop torque [b]		T_{2Not}	Nm	480																				
			in.lb	4200																				
Nominal input speed [c]		n_{1N}	min^{-1}	2000			2500			2700						3600								
Max. input speed		n_{1Max}	min^{-1}	6000						7000														
Max. torsional backlash		j_t	arcmin	Standard ≤ 8						Standard ≤ 10														
Max. axial force [d]		F_{2AMax}	N	5650																				
			lb_f	1270																				
Max. radial force [d]		F_{2RMax}	N	6600																				
			lb_f	1490																				
Weight incl. standard adapter plate [e]		m	kg	8.4 - 14.3						8.8 - 13.9														
			lb_m	18.6 - 31.6						19.4 - 30.7														
Operating noise [f]		L_{PA}	dB(A)	≤ 65						≤ 61														
Max. permitted housing temperature			°C	+90																				
			F	+194																				
Ambient temperature			°C	-15 to +40																				
			F	5 to +104																				
Lubrication				Lubricated for life																				
Paint				Housing: pearl dark grey / Drive-Side: Innovation Blue																				
Direction of rotation				Motor and gearhead same direction																				
Type of protection				IP 65																				
Moment of interia (related to the drive)			$kgcm^2$	0.87 to 8.3						0.29 to 2.1														
			10^{-3} in.lb.s^2	0.77 to 7.4						0.26 to 1.9														
Clamping hub diameter	Standard		mm	19(E) 24(G) 28(H)						14(C) 16(D) 19(E)														
	big			32(I) 38(K)						24(G) 28(H)														

[a] Other ratios available on request.
[b] Permitted 1000 times during the service life of the gearhead. If $T_{2\alpha} > T_{2Not}$, then T_{2Not} is the maximum permitted value.
[c] At T_{1N} and 20°C ambient temperature. Higher speeds possible if calculated using cymex®.
[d] Refers to the center of the output shaft at $n_2 = 150$ rpm.
[e] Depending on the clamping hub diameter and the selected adapter plate.
[f] At $i = 10$ and $n_1 = 3000$ rpm at no load.

You can select a suitable adapter plate using the online configurator on www.wittenstein-alpha.com

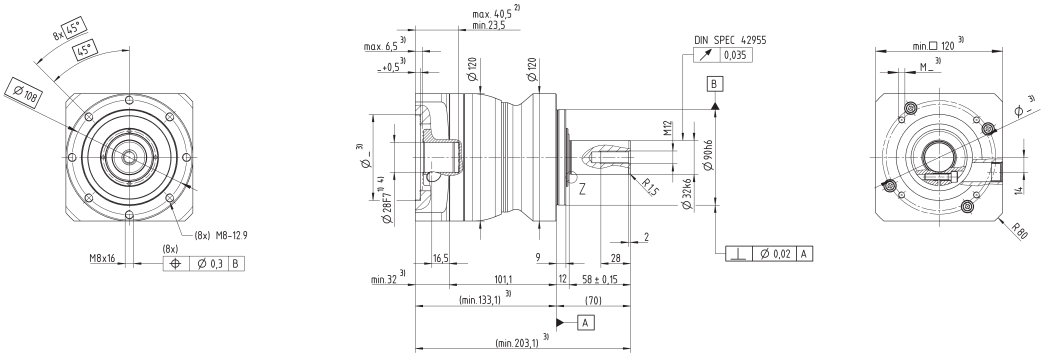
Quick gearhead selection based on the motor characteristic*:
Max. torque $T_{2\alpha} \geq T_{max\ motor} * i$
***Please refer to catalog pages 4 and 5 for detailed information on manual selection based on the application.**

For application-specific sizing with cymex®, see www.cymex.com

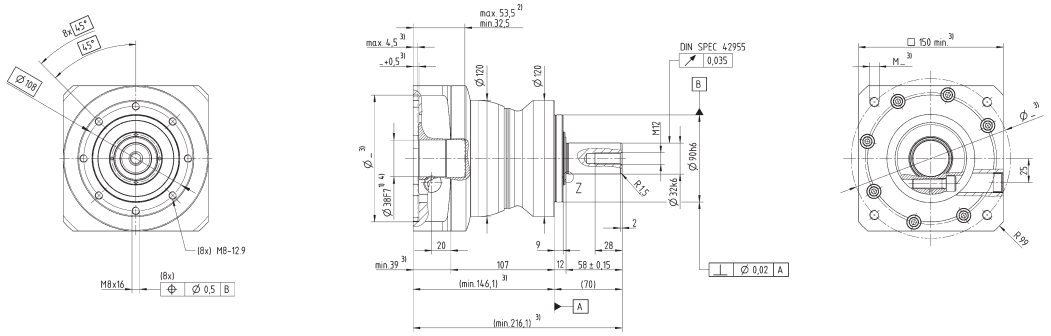
Motor shaft diameter [mm]

1-stage

Up to 28 [4] (H) clamping hub diameter

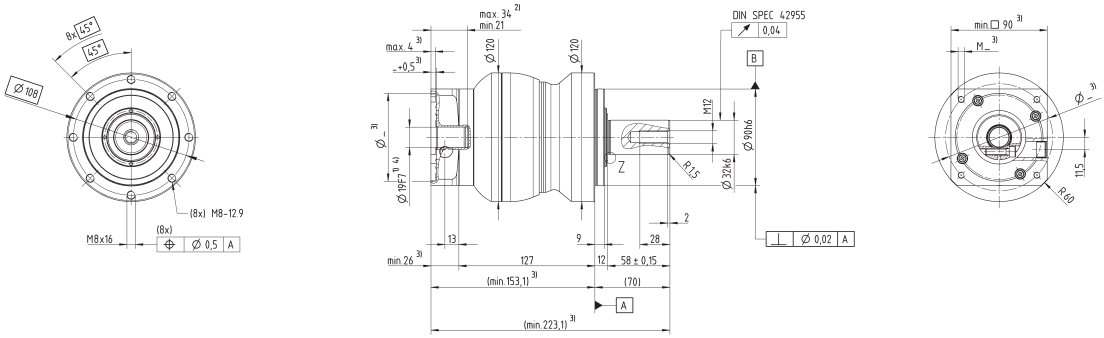


Up to 38 [4] (K) clamping hub diameter

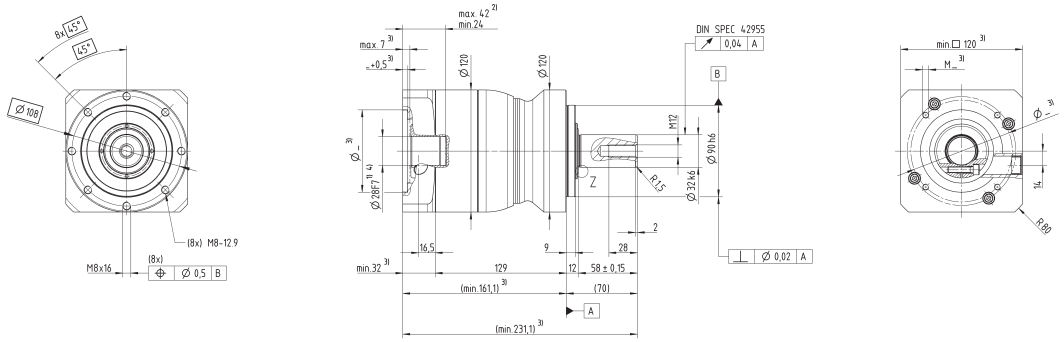


2-stage

Up to 19 [4] (E) clamping hub diameter

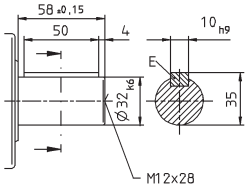


Up to 28 [4] (H) clamping hub diameter

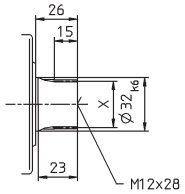


Alternatives: Output shaft variants

Output shaft with key
E = key as per DIN 6885, sheet 1, form A



Splined shaft
X = W 32 x 1.25 x 30 x 24 x 6m, DIN 5480



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 diameters are compensated by a bushing with a minimum thickness of 1 mm.

⚠ Motor mounting according to operating manual

NPL 045S

				1-stage			2-stage				
Ratio [a]		**i**		**5**	**8**	**10**	**25**	**32**	**50**	**64**	**100**
Maximum torque	**MF**	$T_{2\alpha}$	Nm	800	640	640	800	640	800	640	640
			in.lb	7080	5660	5660	7080	5660	7080	5660	5660
Emergency stop torque [b]		T_{2Not}	Nm	1000							
			in.lb	8900							
Nominal input speed [c]		n_{1N}	min^{-1}	1800	2000		2600				
Max. input speed		n_{1Max}	min^{-1}	4000			6000				
Max. torsional backlash		j_t	arcmin	Standard ≤ 8			Standard ≤ 10				
Max. axial force [d]		F_{2AMax}	N	9870							
			lb_f	2200							
Max. radial force [d]		F_{2RMax}	N	9900							
			lb_f	2200							
Weight incl. standard adapter plate [e]		m	kg	19 - 25			19 - 29				
			lb_m	42 - 55			42 - 64				
Operating noise [f]		L_{PA}	dB(A)	≤ 68			≤ 65				
Max. permitted housing temperature			°C	+90							
			F	+194							
Ambient temperature			°C	-15 to +40							
			F	5 to +104							
Lubrication				Lubricated for life							
Paint				Housing: pearl dark grey / Drive-Side: Innovation Blue							
Direction of rotation				Motor and gearhead same direction							
Type of protection				IP 65							
Moment of interia (related to the drive)			$kgcm^2$	7.2 to 8.7			1.6 to 7.5				
			10^{-3} in.lb.s^2	6.4 to 7.7			1.4 to 6.6				
Clamping hub diameter	Standard		mm	38(K)			19(E) 24(G) 28(H)				
	big			-			32(I) 38(K)				

[a] Other ratios available on request.
[b] Permitted 1000 times during the service life of the gearhead. If $T_{2\alpha} > T_{2Not}$, then T_{2Not} is the maximum permitted value.
[c] At T_{1N} and 20°C ambient temperature. Higher speeds possible if calculated using cymex®.
[d] Refers to the center of the output shaft at $n_2 = 150$ rpm.
[e] Depending on the clamping hub diameter and the selected adapter plate.
[f] At $i = 10$ and $n_1 = 3000$ rpm at no load.

You can select a suitable adapter plate using the online configurator on www.wittenstein-alpha.com

Quick gearhead selection based on the motor characteristic*:
Max. torque $T_{2\alpha} \geq T_{max\ motor} * i$
***Please refer to catalog pages 4 and 5 for detailed information on manual selection based on the application.**

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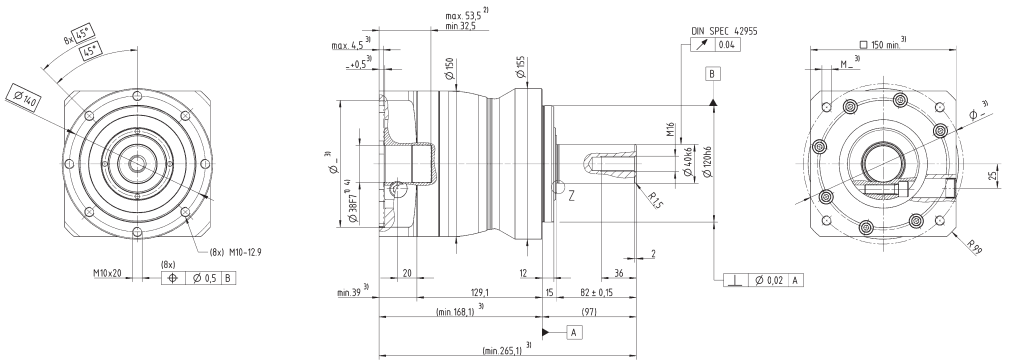
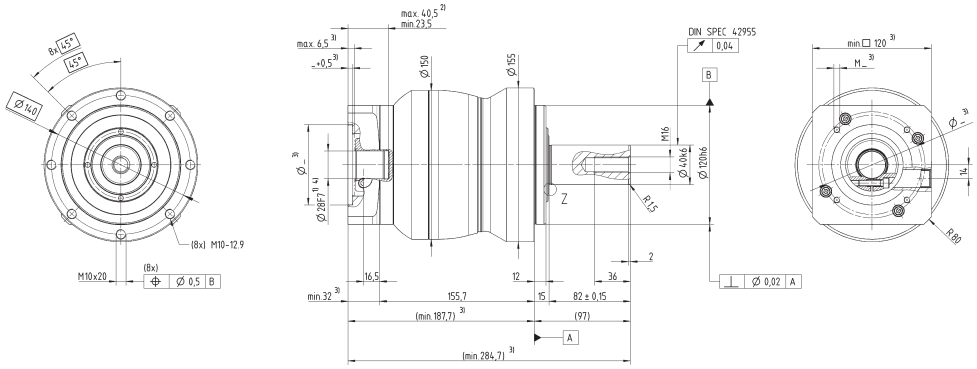
Motor shaft diameter [mm]

1-stage

Up to 38 [4] (K) clamping hub diameter

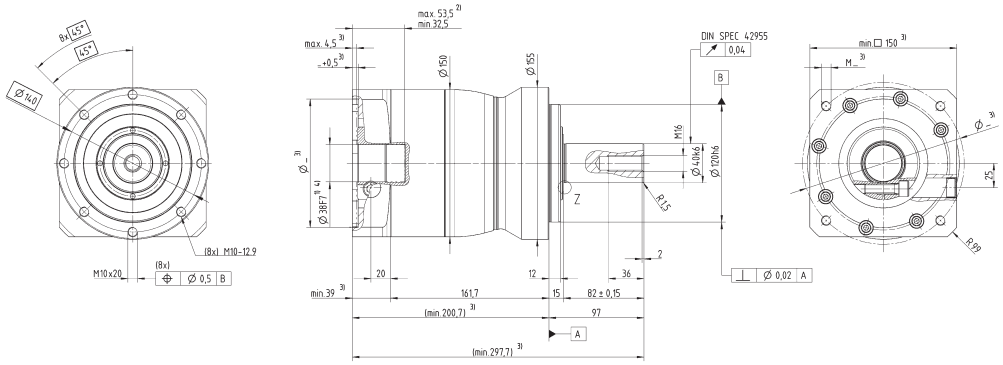


Up to 28 [4] (H) clamping hub diameter



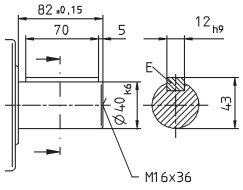
2-stage

Up to 38 [4] (K) clamping hub diameter

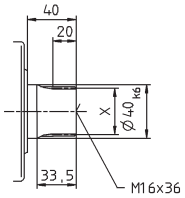


Alternatives: Output shaft variants

Output shaft with key
E = key as per DIN 6885, sheet 1, form A



Splined shaft
X = W 40 x 2 x 30 x 18 x 6m, DIN 5480



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 diameters are compensated by a bushing with a minimum thickness of 1 mm.

⚠ Motor mounting according to operating manual

Glossary

Equivalent force at the output (F_{2_eq})

The equivalent force F_{2_eq} at the output describes the decisive forces for gearhead selection

Equivalent application torque (T_{2_eq})

The equivalent application torque T_{2_eq} describes the decisive torque for gearhead selection.

Sizing factor (f_a)

The sizing factor f_a describes the influence of the daily operating time and the operating mode factor on the application torque.

Operating mode factor (K_M)

The operating mode factor K_M describes the influence of the duty cycle, the number of cycles and the dynamics on the application torque.

Moment of inertia (relates to the drive) (J)

The mass moment of inertia J is a measure of the effort applied by an object to maintain its momentary condition (at rest or moving).

Operating noise (L_{PA})

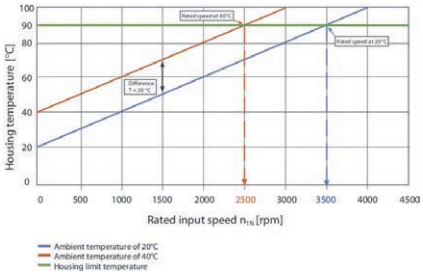
Low noise level L_{PA} is a factor of growing importance for environmental and health reasons. The gear ratio and speed both affect the noise level.
General rule:
A higher speed means a higher noise level, while a higher ratio means a lower noise level. The values specified in our catalog relate to gearheads with a ratio i = 10/100 at a speed n = 3000 rpm

Max. radial force (F_{2R})

The radial force F_{2R} is the force component acting at right angles to the output shaft with the NP, NPS, NPR and NPL or parallel to the output flange with the NPT. It acts perpendicular to the axial force and can assume an axial distance of x_2 in relation to the shaft shoulder with the NP, NPS, NPR and NPL or to the shaft flange with the NPT, which acts as a lever arm. The lateral force produces a bending moment.

Max. input speed (n_{1max}) and nominal input speed (n_{1N})

Two speeds are of relevance when sizing a gearhead: the maximum speed and the nominal speed at the input. The maximum permissible speed n_{1Max} must not be exceeded because it serves as the basis for sizing ⟶ cyclic operation. The nominal speed n_{1N} must not be exceeded in ⟶ continuous operation. The housing temperature limits the nominal speed, which must not exceed 90°C. The nominal input speed specified in the catalogue applies to an ambient temperature of 20°C. As can be seen in the diagram below, the temperature limit is reached more quickly in the presence of an elevated outside temperature, in other words the nominal input speed must be reduced if the ambient temperature is high. The values applicable to your gearhead are available from WITTENSTEIN alpha on request.



Max. output torque ($T_{2\alpha}$)

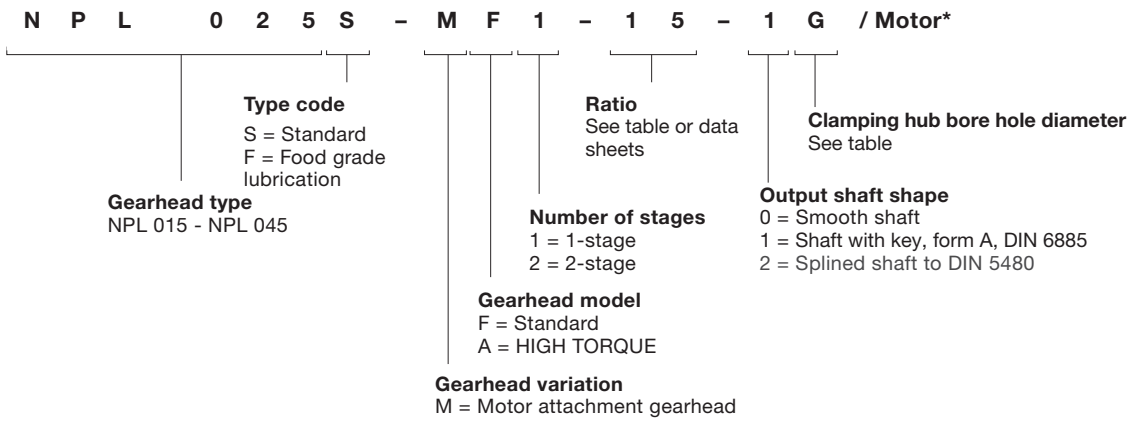
$T_{2\alpha}$ is the maximum torque which can be transmitted by the gearhead. This value may be lower, depending on the specific boundary conditions of the application.

Emergency stop torque (T_{2Not})

The emergency stop torque [Nm] T_{2Not} is the maximum permissible torque at the gearhead output and must not be reached more than 1000 times during the life of the gearhead. It must never be exceeded.

Further information can be found in the glossary of our current product catalog

Order codes for the alpha Value Line – NPL



*Full motor designation only required for determining attached gearhead components!

Ratio and clamping hub diameter table

Size	Stages	Ratios	Clamping hub diameters* [mm]
005	1 stage	4, 5, 7, 8, 10	8 (Z), 9 (A), 11 (B), 14 (C)
	2 stage	16, 20, 25, 28, 35, 40, 50, 64, 70, 100	8 (Z), 9 (A), 11 (B), 14 (C)
015	1 stage	3, 4, 5, 7, 8, 10	9 (A), 11 (B), 14 (C), 16 (D), 19 (E)
	2 stage	12, 15, 16, 20, 25, 28, 30, 32, 35, 40, 50, 64, 70, 100	8 (Z), 9 (A), 11 (B), 14 (C)
025	1 stage	3, 4, 5, 7, 8, 10	14 (C), 16 (D), 19 (E), 24 (G), 28 (H)
	2 stage	9, 12, 15, 16, 20, 25, 28, 30, 32, 35, 40, 50, 64, 70, 100	9 (A), 11 (B), 14 (C), 16 (D), 19 (E)
035	1 stage	3, 4, 5, 7, 8, 10	19 (E), 24 (G), 28 (H), 32 (I), 38 (K)
	2 stage	9, 12, 15, 16, 20, 25, 28, 30, 32, 35, 40, 50, 64, 70, 100	14 (C), 16 (D), 19 (E), 24 (G), 28 (H)
045	1 stage	5, 8, 10	38 (K)
	2 stage	25, 32, 50, 64, 100	19 (E), 24 (G), 28 (H), 32 (I), 38 (K)

*Intermediate diameters are possible in combination with a bushing with a minimum thickness of 1 mm.

WITTENSTEIN | alpha

WITTENSTEIN alpha · 1249 Humbracht Circle · Bartlett, IL 60103, USA · Tel. +1 630 540-5300 · info@wittenstein-us.com

WITTENSTEIN alpha – intelligent drive systems

www.wittenstein-alpha.com/alpha-value-line