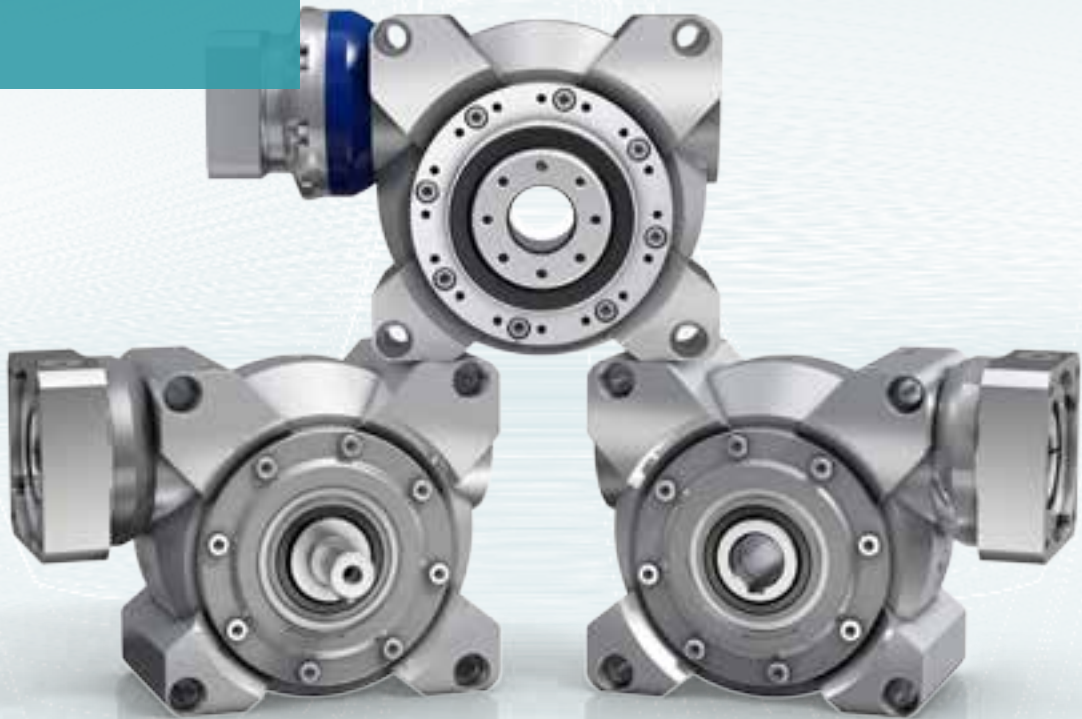
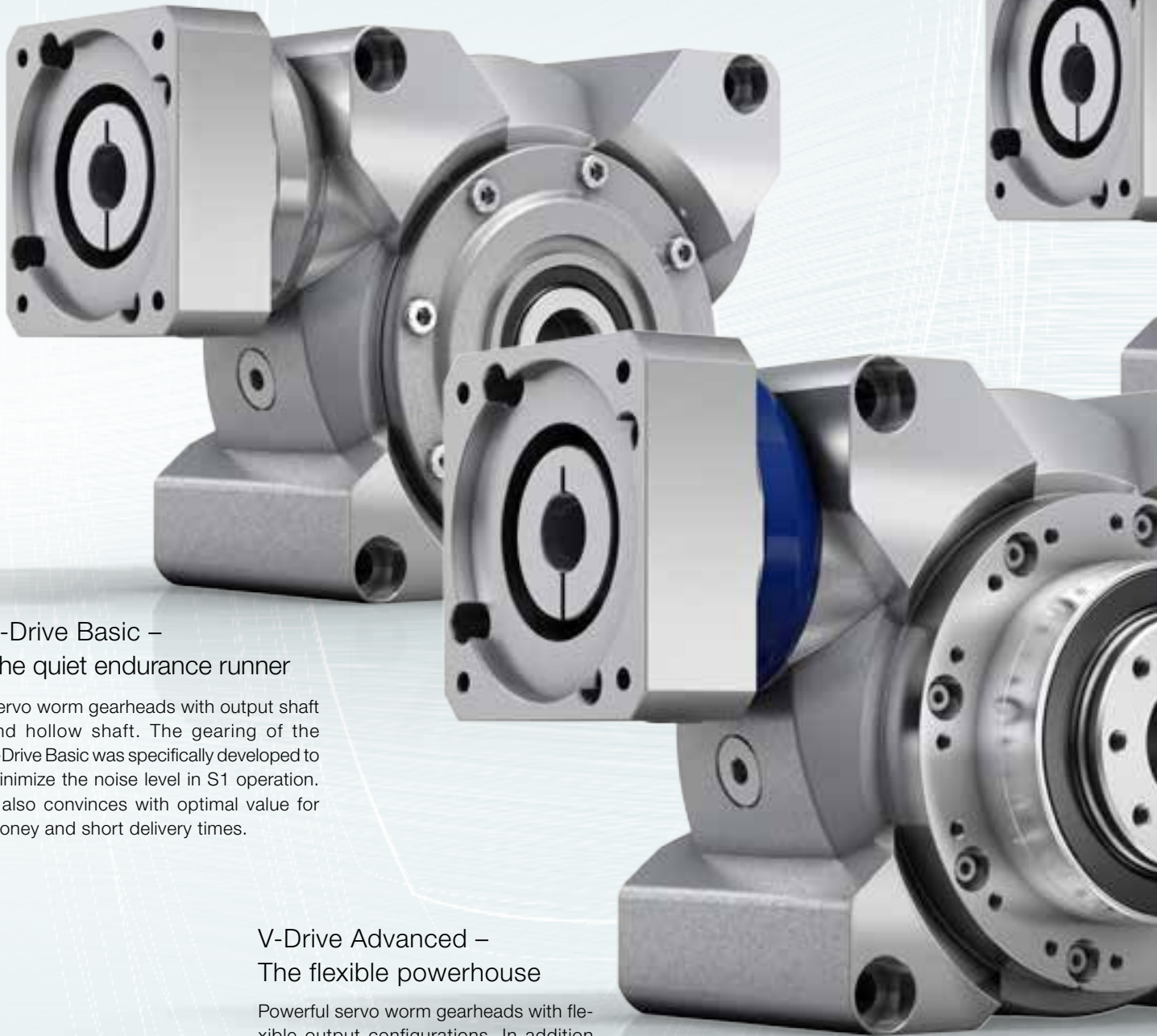


V-Drive

Technical brochure

Maximum power density
Constant torsional backlash
Supreme smooth running



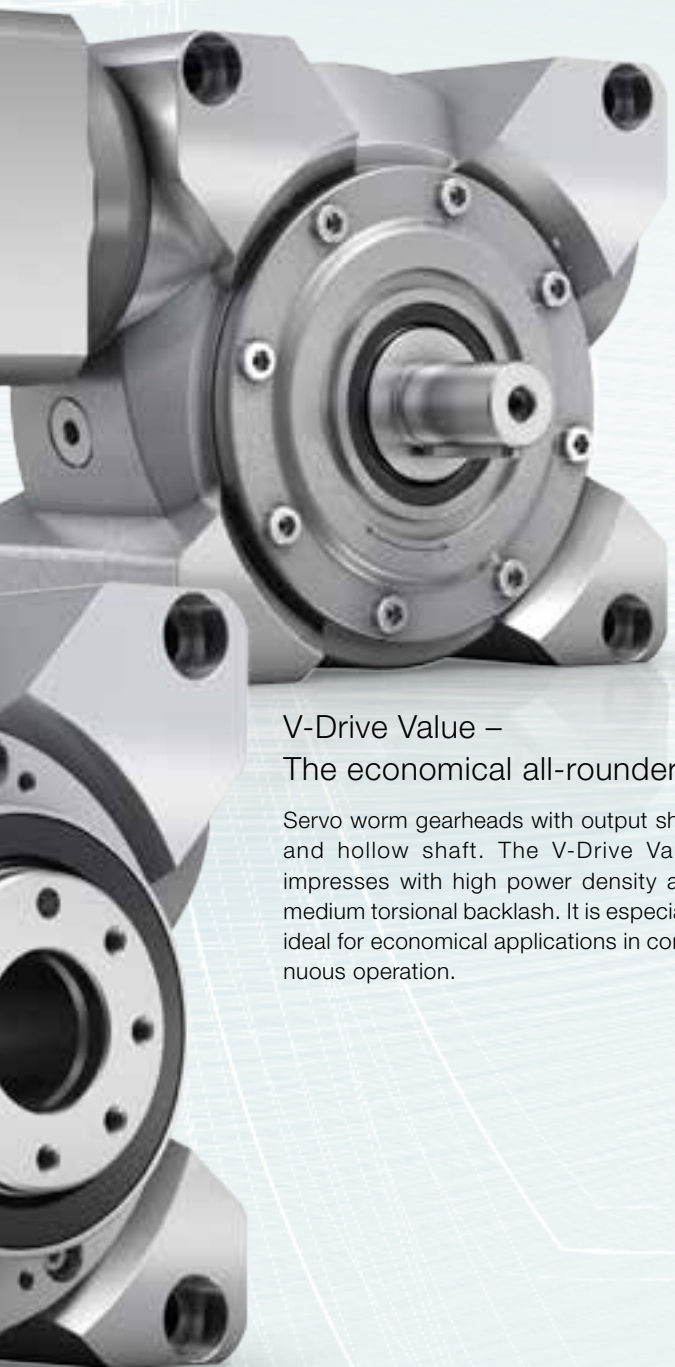


V-Drive Basic – The quiet endurance runner

Servo worm gearheads with output shaft and hollow shaft. The gearing of the V-Drive Basic was specifically developed to minimize the noise level in S1 operation. It also convinces with optimal value for money and short delivery times.

V-Drive Advanced – The flexible powerhouse

Powerful servo worm gearheads with flexible output configurations. In addition to a very high power density, the V-Drive Advanced achieves a constant, low torsional backlash throughout its lifespan. It is suitable for both cyclic and continuous duty applications.



V-Drive Value – The economical all-rounder

Servo worm gearheads with output shaft and hollow shaft. The V-Drive Value impresses with high power density and medium torsional backlash. It is especially ideal for economical applications in continuous operation.

Contents

We drive the Performance	4
Gearhead overview	5
Typical applications	6
Flexible output versions	7
The V-Drive in detail	8
Sizing of the V-Drive	10
V-Drive Basic	12
CVH	14
CVS	20
V-Drive Value	26
NVH	28
NVS	34
V-Drive Advanced	40
VH ⁺	42
VS ⁺	52
VT ⁺	60
V-Drive in a linear system	68
Helical-toothed pinion	69
Straight-toothed pinion	69
Shrink discs	70
Couplings	71
Services	72
Glossary	74
Order codes	75

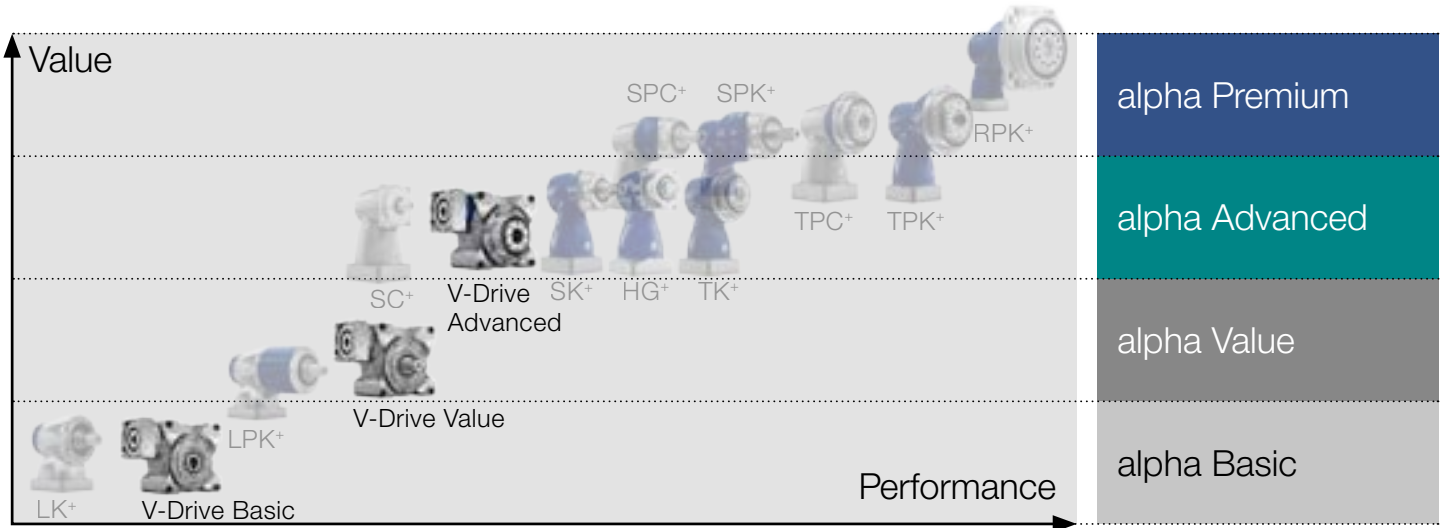
We drive the Performance

V-Drive servo worm gearheads

WITTENSTEIN alpha's worm gearhead family has been given a thorough facelift: apart from a new look, the gearheads also impress with maximum performance in a very small space – and are fully compatible with the existing series.

The newly developed **V-Drive Basic** complements the **V-Drive Advanced** and the **V-Drive Value**, rounding off our extensive and flexible portfolio for all performance ranges.

High-performance worm gearheads: the V-Drive series



Best-in-class precision

Tailored precision up to ≤ 2 arcminutes for a variety of applications.

Rapid availability

Short delivery times due to new standards - even with high volumes.

Optimal reliability

Perfect for continuous operation – premium quality made by WITTENSTEIN.

Extremely smooth running

Supreme smooth running and synchronization quality thanks to superior gearing technology.

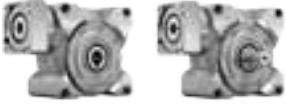


Maximum economy

Maximum economy throughout a life-span of more than 20,000 hours.

High efficiency

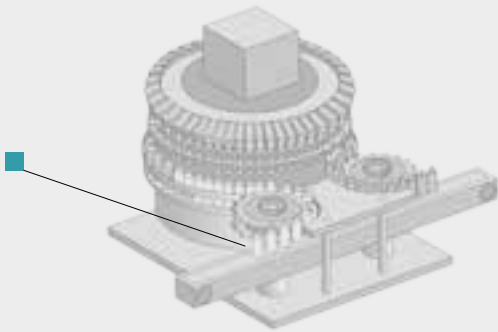
Ideal contact conditions and high quality lubricants guarantee more than 95% efficiency at full load.

Gearhead overview

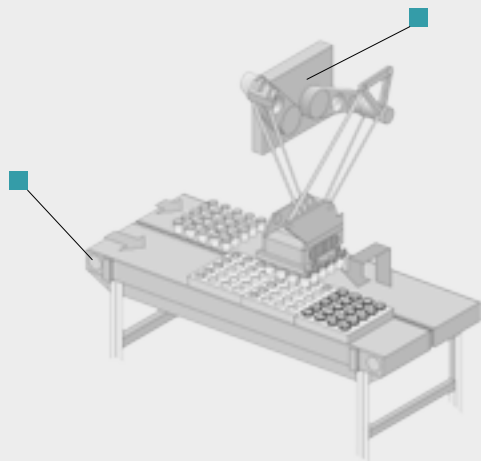
		V-Drive Basic		V-Drive Value		V-Drive Advanced			
									
Products		CVH	CVS	NVH	NVS	VH ⁺	VS ⁺	VT ⁺	
Power density		•		••		•••			
Positioning accuracy		•		••		•••			
Torsional rigidity		••		•••		•••			
Absorption of external forces		••		•••		•••			
Smooth-running		••		•••		•••			
Sizes	040	•	•	•	•	•			
	050	•	•	•	•	•	•	•	
	063	•	•	•	•	•	•	•	
	080					•	•	•	
	100					•	•	•	
Ratio	one stage	7 - 40		4 - 40		4 - 40			
	with pre-stage	-		12 - 400		12 - 400			
Max. torsional backlash [arcmin]	standard	≤ 15		≤ 6		≤ 3			
	reduced	-		-		≤ 2			
Max. torque	from	Nm	68	68	74	63	74	165	165
		in.lb	602	602	655	558	655	1460	1460
	to	Nm	301	301	365	365	1505	1505	1505
		in.lb	2664	2664	3231	3231	13320	13320	13320
Max. input speed [rpm]		6000		6000		6000			
Service life [h]		> 15000		> 20000		> 20000			
Output type									
Smooth shaft			•		•		•		
Shaft with key			•		•		•		
Splined shaft (DIN 5480)							•		
Hollow shaft interfaces on both sides		•		•		•			
Hollow shaft, keyed on both sides		•		•		•			
Flanged hollow shaft								•	
Smooth shaft on both sides			•		•		•		
Shaft with key on both sides			•		•		•		
Type									
Food-grade lubrication		•	•	•	•	•	•	•	
Corrosion resistant				•	•	•	•	•	

Typical applications

Food processing and packaging machinery

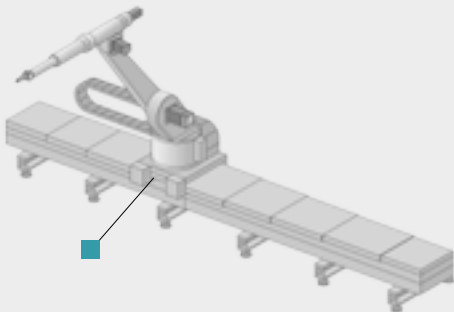


- Transport axes (belt and chain drives)
- Star drives
- Product feedings
- Swivel conveyors
- Carton feedings and erectings



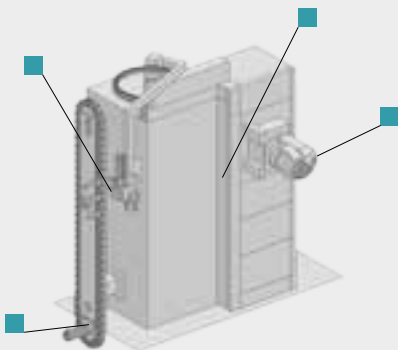
Materials handling

- Transport axes (belt and chain drives)
- Two-axis handling modules
- Loading systems in transfer axes



Robotics and automation

- Linear motions in the 7th axis
- Rotary and swivel axes
- Feed axes



Machine tools

- Tool changers
- Turntables

Flexible output versions

V-Drive Basic



Hollow shaft inter-
faces on both sides



Hollow shaft,
keyed on both sides



Smooth shaft



Shaft with key



V-Drive Value



Hollow shaft inter-
faces on both sides



Hollow shaft,
keyed on both sides



Smooth shaft



Shaft with key

V-Drive Advanced



Hollow shaft inter-
faces on both sides



Hollow shaft,
keyed on both sides



Smooth shaft



Shaft with key



Flanged hollow shaft



V-Drive Value optionally with integral
planetary input stage

V-Drive Advanced optionally with integral
planetary input stage

V-Drive Advanced and V-Drive Value optionally with integral planetary input stage

Ideal for space-saving applications involving high input speeds or reduction ratios $i = 12 - 400$.

Benefits for you

- Higher input speeds
- Higher ratios
- Compact design

The V-Drive in detail

Three series available

- **Basic** ≤ 15 arcmin
- **Value** ≤ 6 arcmin
- **Advanced** ≤ 3 arcmin

Input bearing

- Bearing package for absorbing axial and radial forces
- Very well suited for high input speeds

Involute toothing (V-Drive Basic)

- Perfected for S1 operation and high torques
- Smooth running
- High power density

Hollow-flank toothing (V-Drive Value / V-Drive Advanced)

- Constant low torsional backlash throughout its lifetime
- High efficiency
- Very high power density

Output bearing (V-Drive Basic)

- High overload capacity for radial forces, optionally also for axial forces

Output bearing (V-Drive Value / V-Drive Advanced)

- High overload capacity for absorbing axial and radial forces





Plug
can be replaced with a **vent screw**
in continuous operation

- Ensures pressure compensation
- Protection against leakage

Radial shaft seal

- Very long service life
- Optimized for continuous operation

Metal bellows coupling

- Completely backlash-free
- Fatigue endurable and maintenance-free
- Easy to mount
- Integrated length compensation feature protects the motor

Aluminum housing

- Ultra-lightweight design
- Good thermal conductivity
- 5 sizes
- Flexible mounting options

3 output types

- Hollow shaft
- Solid shaft
- Flanged hollow shaft

Sizing of the V-Drive

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

B: Sizing based on the application

Step 1:

Determine the application data

$$T_{2b} = \text{_____ [Nm]} \quad n_{1n} = \text{_____ [min}^{-1}\text{]}$$

Step 2:

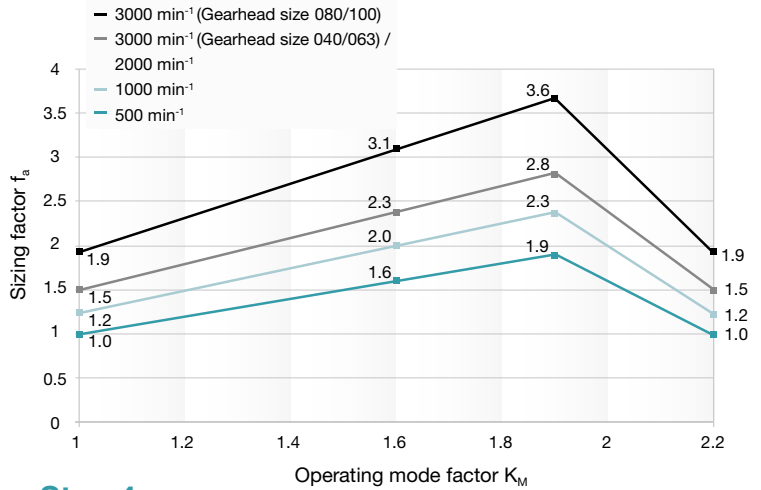
Determine the operating mode factor $K_M = \text{_____}$

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 axes in plasma, laser or water jet cutters, portals, tool changers with high dynamics	S5 operation: Medium duty cycle Medium number of cycles High dynamics		1,9
Roller drives in printing presses, star drives in rackers etc.	S1 operation: High duty cycle		2,2

cymex® 5 also allows sizing calculations for other applications / cycles!

Step 3:

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



Step 4:

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

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

$$T_{2_eq} = \text{_____} * \text{_____} \leq T_{2\alpha}$$

$$T_{2_eq} = \text{_____ [Nm]} \leq \text{_____ [Nm]}$$

We recommend using a vent screw for duty cycles $\geq 60\%$, longer than 20 min (S1 operation) and $n_{1N} \geq 3000$ rpm.

Step 5: Quick selection of the technical data

			V-Drive Basic			V-Drive Value			V-Drive Advanced				
			040	050	063	040	050	063	040	050	063	080	100
Ratio	i		7 - 40			4 - 400			4 - 400				
Maximum torque ^{a)}	$T_{2\alpha}$	Nm	68-82	116-140	265-301	74-98	141-167	303-365	74-106	165-204	319-372	578-785	1184-1505
		in.lb	602-726	1106-1239	2345-2664	655-867	1248-1478	2682-3230	655-938	1460-1805	2823-3292	5115-6947	10478-13319
Max. input speed	n_{1max}	min ⁻¹	6000	6000	4500	6000	6000	4500	6000	6000	4500	4000 / 4500 ^{b)}	3500 / 4000 ^{b)}
Max. radial force	F_{2RMmax}	N	1000 / 2400 ^{b)}	1200 / 3800 ^{b)}	2000 / 6000 ^{b)}	2400	3800	6000	2400	3800	6000	9000	14000
		lb _f	225 / 540 ^{b)}	270 / 855 ^{b)}	450 / 1350 ^{b)}	540	855	1350	540	855	1350	2025	3150
Operating noise (with $n_1 = 3000$ rpm no load)	L_{PA}	dB(A)	≤ 54	≤ 62	≤ 64	≤ 54	≤ 62	≤ 64	≤ 54	≤ 62	≤ 64	≤ 66	≤ 70
Max. torsional backlash	i_t	arcmin	≤ 15	≤ 15	≤ 15	≤ 6	≤ 6	≤ 6	≤ 3	≤ 3	≤ 3	≤ 3	≤ 3
Service life (For calculation see "Information")	L_h	h	> 15000	> 15000	> 15000	> 20000	> 20000	> 20000	> 20000	> 20000	> 20000	> 20000	> 20000

^{a)} The maximum torques depend on the ratio.

^{b)} Referred to the shaft or flange center at the output
First value for MF version (standard), second value for MT version (stronger bearings).

^{c)} First value for single-stage version, second value for two-stage version.

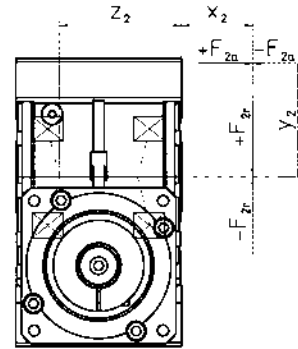
Account must be taken of the radial and axial forces at the output:

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 $F_{2r} = \underline{\hspace{2cm}}$ [N]
 Radial force distance $x_2 = \underline{\hspace{2cm}}$ [mm]
 Axial force $F_{2a} = \underline{\hspace{2cm}}$ [N]
 Axial force distance $y_2 = \underline{\hspace{2cm}}$ [mm]
 (required if F_{2a} is present)



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

1. $F_{2a} \leq 0.25 * F_{2r} \Rightarrow (\underline{\hspace{2cm}} \leq 0.25 * \underline{\hspace{2cm}})$ Met Not met: Sizing with cymex® 5
2. $y_2 \leq x_2 \Rightarrow (\underline{\hspace{2cm}} \leq \underline{\hspace{2cm}})$ Met Not met: Sizing with cymex® 5

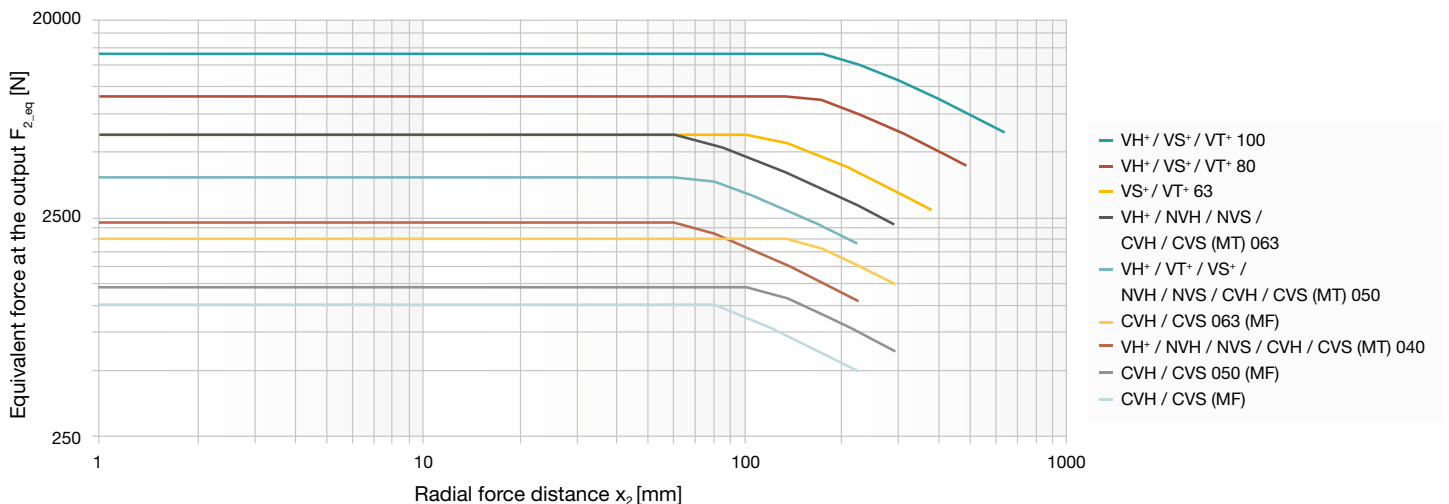
Step 7:

Determine the maximum equivalent force acting on the output $F_{2,eq}$

$$F_{2,eq} = F_{2r} + 0.25 * F_{2a} \leq F_{2RMax} \quad (F_{2RMax} \text{ can be determined from the diagram below})$$

$$F_{2,eq} = \underline{\hspace{2cm}} + 0.25 * \underline{\hspace{2cm}} \leq \underline{\hspace{2cm}}$$

$$F_{2,eq} = \underline{\hspace{2cm}} \text{ [N]} \leq \underline{\hspace{2cm}} \text{ [N]} \quad \input type="checkbox"/> \text{ Met} \quad \input type="checkbox"/> \text{ Not met: Sizing with cymex® 5}$$



V-Drive Basic – The quiet endurance runner



CVH

Servo worm gearheads with output shaft and hollow shaft. The gearing of the V-Drive Basic was specifically developed to minimize the noise level in S1 operation. It also convinces with optimal value for money and short delivery times.



CVS

Product highlights

Optimized output bearings
adapted to a wide range of applications.

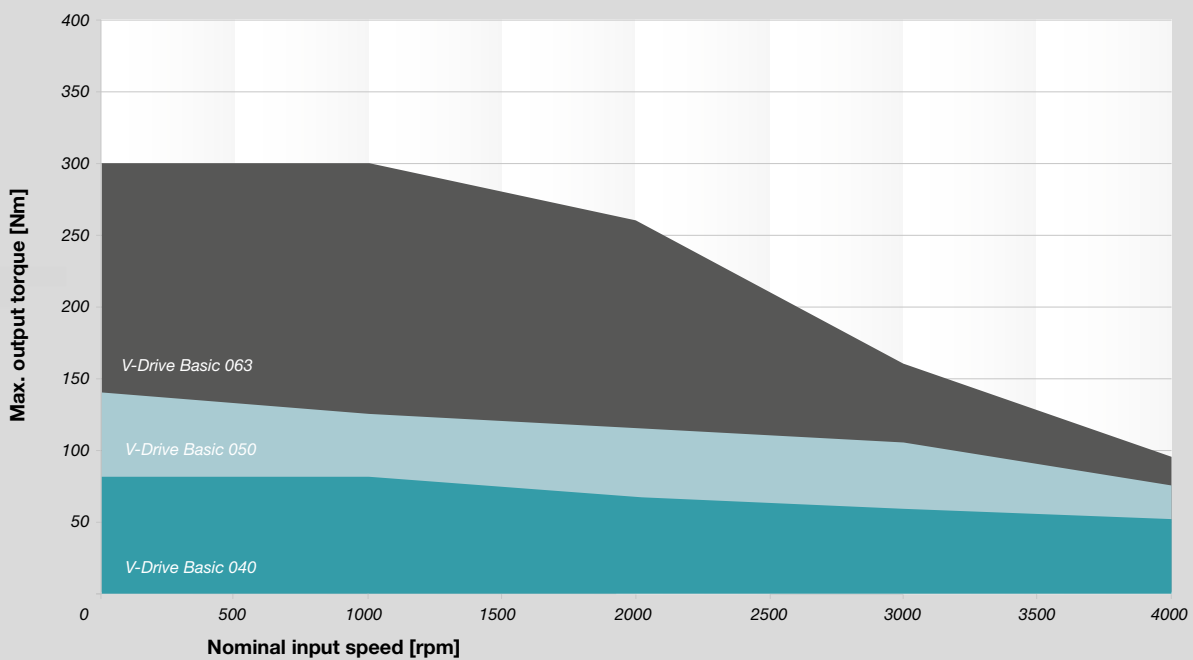
Specifically developed gearing
minimizes the noise level in S1 operation.

Optimal value for money
short delivery times and quality "made in Germany".

Quick size selection

V-Drive Basic (example for $i = 28$)

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



			1-stage						
Ratio	i		7	10	16	28	40		
Max. torque	T_{2a}	Nm	68	76	78	82	76		
		in.lb	602	673	690	726	673		
Efficiency at full load	η	%	89	87	81	72	66		
Emergency stop torque	T_{2Not}	Nm	126	125	129	134	122		
		in.lb	1115	1106	1142	1186	1080		
Nominal input speed <small>(with 20°C ambient temperature)^{a)}</small>	n_{1N}	min ⁻¹	4000						
Max. input speed	n_{1Max}	rpm	6000						
Mean no load running torque ^{a)} <small>(With $n_1=3000$ min⁻¹ and 20° C gear temperature)</small>	T_{012}	Nm	0.7	0.6	0.5	0.4	0.4		
		in.lb	6.2	5.3	4.4	3.5	3.5		
Max. torsional backlash	j_t	arcmin	≤ 15						
Torsional rigidity	C_{t21}	Nm/arcmin	3.5						
		in.lb/arcmin	31						
Max. axial force ^{b)}	F_{2AMax}	N	1200 / 3000 ^{b)}						
		lb _f	270 / 675 ^{b)}						
Max. radial force ^{b)}	F_{2RMax}	N	1000 / 2400 ^{b)}						
		lb _f	225 / 540 ^{b)}						
Max. tilting moment ^{b)}	M_{2KMax}	Nm	97 / 205 ^{b)}						
		in.lb	858 / 1814 ^{b)}						
Service life	L_h	h	> 15000						
Weight incl. standard adapter plate	m	kg	4.5						
		lb _m	10.0						
Operating noise <small>(with $n_1=3000$ rpm no load)</small>	L_{PA}	dB(A)	≤ 54						
Max. permitted housing temperature			°C	+90					
			F	194					
Ambient temperature			°C	-15 to +40					
			F	5 to 104					
Lubrication			Lubricated for life						
Paint			None						
Direction of rotation			See drawing						
Protection class			IP 65						
Moment of inertia <small>(relates to the drive) Clamping hub diameter [mm]</small>	C	14	J_1	kgcm ²	0.38	0.38	0.34	0.32	0.31
				10 ⁻³ in.lb.s ²	0.34	0.34	0.30	0.28	0.27
	E	19	J_1	kgcm ²	0.40	0.37	0.35	0.34	0.33
				10 ⁻³ in.lb.s ²	0.35	0.33	0.31	0.30	0.29

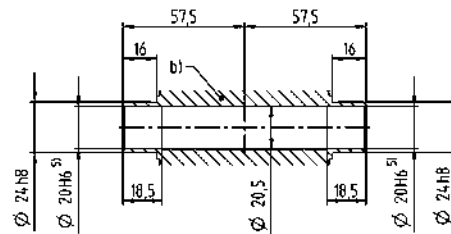
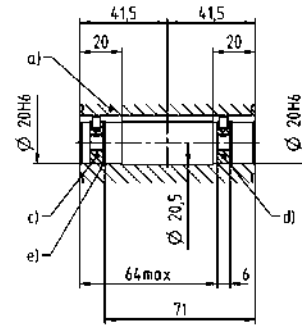
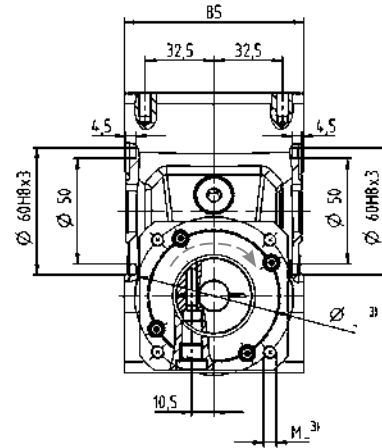
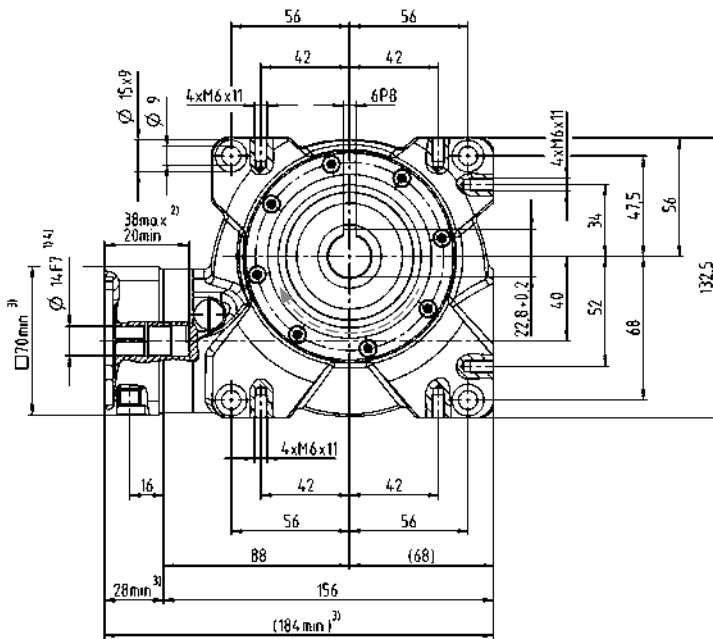
Please contact us for information on the best configuration for S1 conditions of use (continuous operation).
Please use our cymex® 5 sizing tool to obtain a more detailed design – www.wittenstein-cymex.com

^{a)} Idling torques decrease during operation

^{b)} Refers to center of output shaft or flange
at $n_2 = 300$ rpm
First value for MF-version (standard),
second value for MT-version (HIGH FORCES).

^{c)} Note the reduced torque depending on the design


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




- a) Hollow shaft, keywayed
- b) Hollow shaft, smooth
- c) End disc for screw M6
- d) End disc as forcing washer for screw M8
- e) Locking ring – DIN 472

Non-tolerated dimensions ± 1 mm

- 1) Check motor shaft fit.
- 2) Min./Max. permissible motor shaft length.
Longer motor shafts are adaptable, please contact us.
- 3) The dimensions depend on the motor.
- 4) Smaller motor shaft diameter is compensated by a bushing with a minimum thickness of 1 mm. Motor shaft diameters up to 19 mm available – please contact WITTENSTEIN alpha.
- 5) Tolerance h6 for mounted shaft.

 CAD data is available under www.wittenstein-alpha.com

 Motor mounting according to operating manual

			1-stage						
Ratio	i		7	10	16	28	40		
Max. torque	T_{2a}	Nm	125	127	131	140	116		
		in.lb	1106	1124	1159	1239	1027		
Efficiency at full load	η	%	89	85	80	70	63		
Emergency stop torque	T_{Not}	Nm	242	242	250	262	236		
		in.lb	2142	2142	2213	2319	2089		
Nominal input speed <small>(with 20°C ambient temperature)^{d,e}</small>	n_{1N}	min ⁻¹	4000						
Max. input speed	n_{1Max}	rpm	6000						
Mean no load running torque ^{a)} <small>(With $n_1=3000$ min⁻¹ and 20° C gear temperature)</small>	T_{012}	Nm	2.2	1.6	1.5	1.2	1.1		
		in.lb	19.5	14.2	13.3	10.6	9.7		
Max. torsional backlash	j_t	arcmin	≤ 15						
Torsional rigidity	C_{t21}	Nm/arcmin	5.5						
		in.lb/arcmin	49						
Max. axial force ^{b)}	F_{2AMax}	N	1500 / 5000 ^b						
		lb _f	337.5 / 1125 ^b						
Max. radial force ^{b)}	F_{2RMax}	N	1200 / 3800 ^b						
		lb _f	270 / 855 ^b						
Max. tilting moment ^{b)}	M_{2KMMax}	Nm	130 / 409 ^b						
		in.lb	1150 / 3620 ^b						
Service life	L_h	h	> 15000						
Weight incl. standard adapter plate	m	kg	8.0						
		lb _m	18.0						
Operating noise <small>(with $n_1=3000$ rpm no load)</small>	L_{PA}	dB(A)	≤ 62						
Max. permitted housing temperature	°C		+90						
	F		194						
Ambient temperature	°C		-15 to +40						
	F		5 to 104						
Lubrication	Lubricated for life								
Paint	None								
Direction of rotation	See drawing								
Protection class	IP 65								
Moment of inertia <small>(relates to the drive) Clamping hub diameter [mm]</small>	E	19	J_1	kgcm ²	1.22	1.17	1.06	1.05	1.01
				10 ⁻³ in.lb.s ²	1.08	1.04	0.94	0.93	0.89

Please contact us for information on the best configuration for S1 conditions of use (continuous operation).

Please use our cymex[®] 5 sizing tool to obtain a more detailed design – www.wittenstein-cymex.com

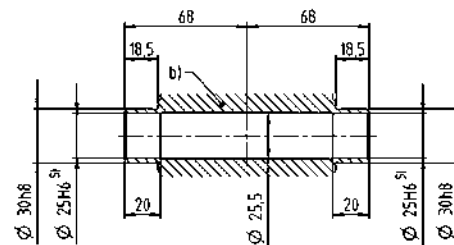
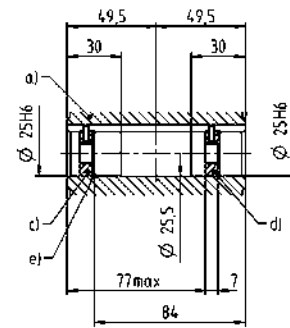
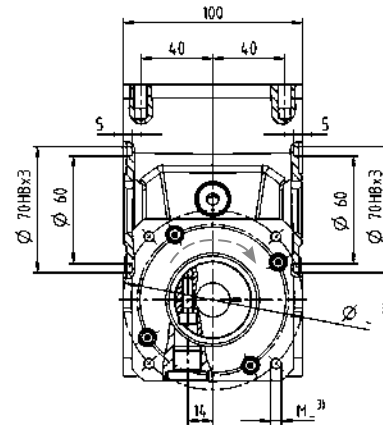
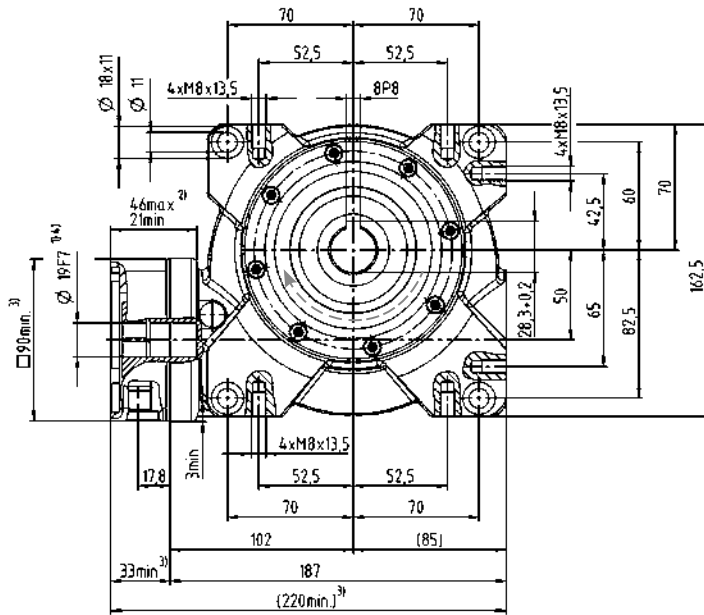
^{a)} Idling torques decrease during operation

^{b)} Refers to center of output shaft or flange at $n_2 = 300$ rpm

First value for MF-version (standard), second value for MT-version (HIGH FORCES).

^{d)} Note the reduced torque depending on the design


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




- a) Hollow shaft, keywayed
- b) Hollow shaft, smooth
- c) End disc for screw M10 (on request)
- d) End disc as forcing washer for screw M12 (on request)
- e) Locking ring – DIN 472 (on request)

Non-tolerated dimensions ± 1 mm

- 1) Check motor shaft fit.
- 2) Min./Max. permissible motor shaft length.
Longer motor shafts are adaptable, please contact us.
- 3) The dimensions depend on the motor.
- 4) Smaller motor shaft diameter is compensated by a bushing with a minimum thickness of 1 mm.
- 5) Tolerance h6 for mounted shaft.

 CAD data is available under www.wittenstein-alpha.com

 Motor mounting according to operating manual

			1-stage						
Ratio	i		7	10	16	28	40		
Max. torque	T_{2a}	Nm	265	270	280	301	282		
		in.lb	2345	2390	2478	2664	2496		
Efficiency at full load	η	%	90	87	82	73	67		
Emergency stop torque	T_{2Not}	Nm	484	491	494	518	447		
		in.lb	4283	4345	4372	4584	3956		
Nominal input speed <small>(with 20°C ambient temperature)^{d,e}</small>	n_{1N}	min ⁻¹	4000						
Max. input speed	n_{1Max}	rpm	4500						
Mean no load running torque ^{a)} <small>(With $n_1=3000$ min⁻¹ and 20° C gear temperature)</small>	T_{012}	Nm	3.1	3	2.4	2.3	2.2		
		in.lb	27.4	26.6	21.2	20.4	19.5		
Max. torsional backlash	j_t	arcmin	≤ 15						
Torsional rigidity	C_{t21}	Nm/arcmin	23						
		in.lb/arcmin	204						
Max. axial force ^{b)}	F_{2AMax}	N	2000 / 8250 ^b						
		lb _f	450 / 1856 ^b						
Max. radial force ^{b)}	F_{2RMMax}	N	2000 / 6000 ^b						
		lb _f	450 / 1350 ^b						
Max. tilting moment ^{b)}	M_{2KMMax}	Nm	281 / 843 ^b						
		in.lb	2487 / 7461 ^b						
Service life	L_h	h	> 15000						
Weight incl. standard adapter plate	m	kg	13.0						
		lb _m	29.0						
Operating noise <small>(with $n_1=3000$ rpm no load)</small>	L_{PA}	dB(A)	≤ 64						
Max. permitted housing temperature			°C						
			°F						
Ambient temperature			°C						
			°F						
Lubrication	Lubricated for life								
Paint	None								
Direction of rotation	See drawing								
Protection class	IP 65								
Moment of inertia <small>(relates to the drive) Clamping hub diameter [mm]</small>	H	28	J_1	kgcm ²	3.75	3.61	3.52	3.48	3.36
				10 ⁻⁴ in.lb.s ²	3.32	3.19	3.12	3.08	2.97

Please contact us for information on the best configuration for S1 conditions of use (continuous operation).

Please use our cymex[®] 5 sizing tool to obtain a more detailed design – www.wittenstein-cymex.com

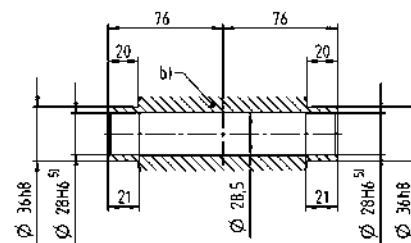
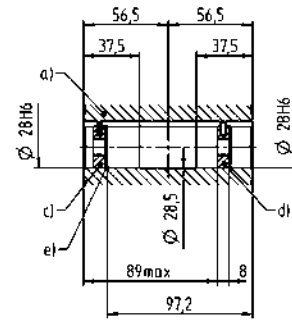
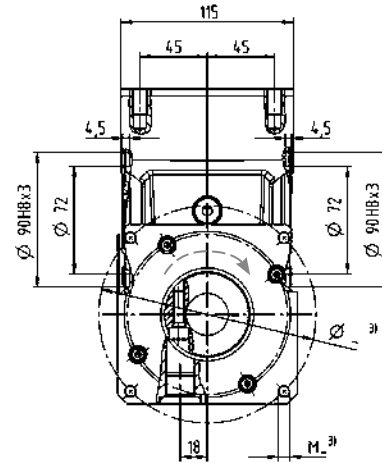
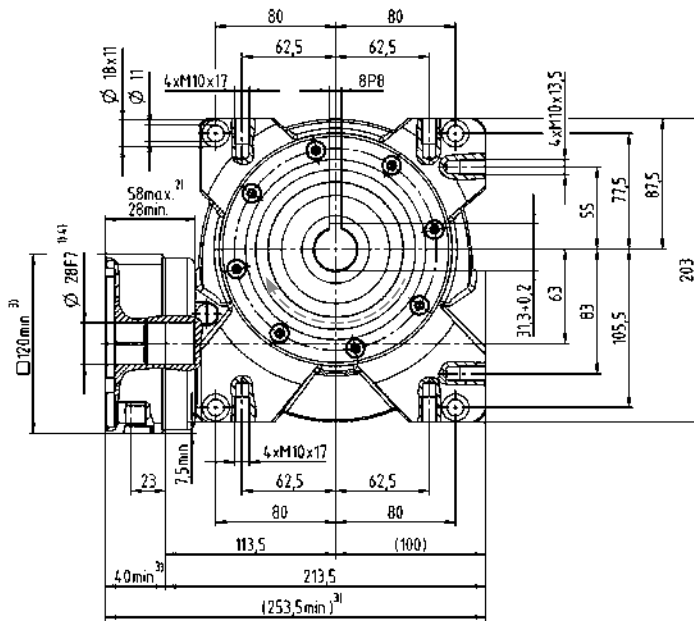
^{a)} Idling torques decrease during operation

^{b)} Refers to center of output shaft or flange at $n_2 = 300$ rpm

First value for MF-version (standard), second value for MT-version (HIGH FORCES).

^{d)} Note the reduced torque depending on the design


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




- a) Hollow shaft, keywayed
- b) Hollow shaft, smooth
- c) End disc for screw M10 (on request)
- d) End disc as forcing washer for screw M12 (on request)
- e) Locking ring – DIN 472 (on request)

Non-tolerated dimensions ± 1 mm

- 1) Check motor shaft fit.
- 2) Min./Max. permissible motor shaft length.
Longer motor shafts are adaptable, please contact us.
- 3) The dimensions depend on the motor.
- 4) Smaller motor shaft diameter is compensated by a bushing with a minimum thickness of 1 mm.
- 5) Tolerance h6 for mounted shaft.

 CAD data is available under www.wittenstein-alpha.com

 Motor mounting according to operating manual

			1-stage						
Ratio	i		7	10	16	28	40		
Max. torque	T_{2a}	Nm	68	76	78	82	76		
		in.lb	602	673	690	726	673		
Efficiency at full load	η	%	89	87	81	72	66		
Emergency stop torque	T_{2Not}	Nm	126	125	129	134	122		
		in.lb	1115	1106	1142	1186	1080		
Nominal input speed <small>(with 20°C ambient temperature)^{a)}</small>	n_{1N}	min ⁻¹	4000						
Max. input speed	n_{1Max}	rpm	6000						
Mean no load running torque ^{a)} <small>(With $n_1=3000$ min⁻¹ and 20° C gear temperature)</small>	T_{012}	Nm	0.7	0.6	0.5	0.4	0.4		
		in.lb	6.2	5.3	4.4	3.5	3.5		
Max. torsional backlash	j_t	arcmin	≤ 15						
Torsional rigidity	C_{t21}	Nm/arcmin	3.5						
		in.lb/arcmin	31						
Max. axial force ^{b)}	F_{2AMax}	N	1200 / 3000 ^{b)}						
		lb _f	270 / 675 ^{b)}						
Max. radial force ^{b)}	F_{2RMMax}	N	1000 / 2400 ^{b)}						
		lb _f	225 / 540 ^{b)}						
Max. tilting moment ^{b)}	M_{2KMax}	Nm	97 / 205 ^{b)}						
		in.lb	858 / 1814 ^{b)}						
Service life	L_h	h	> 15000						
Weight incl. standard adapter plate	m	kg	4.5						
		lb _m	10.0						
Operating noise <small>(with $n_1=3000$ rpm no load)</small>	L_{PA}	dB(A)	≤ 54						
Max. permitted housing temperature			°C	+90					
			F	194					
Ambient temperature			°C	-15 to +40					
			F	5 to 104					
Lubrication			Lubricated for life						
Paint			None						
Direction of rotation			See drawing						
Protection class			IP 65						
Moment of inertia <small>(relates to the drive) Clamping hub diameter [mm]</small>	C	14	J_1	kgcm ²	0.38	0.38	0.34	0.32	0.31
				10 ⁻³ in.lb.s ²	0.34	0.34	0.30	0.28	0.27
	E	19	J_1	kgcm ²	0.40	0.37	0.35	0.34	0.33
				10 ⁻³ in.lb.s ²	0.35	0.33	0.31	0.30	0.29

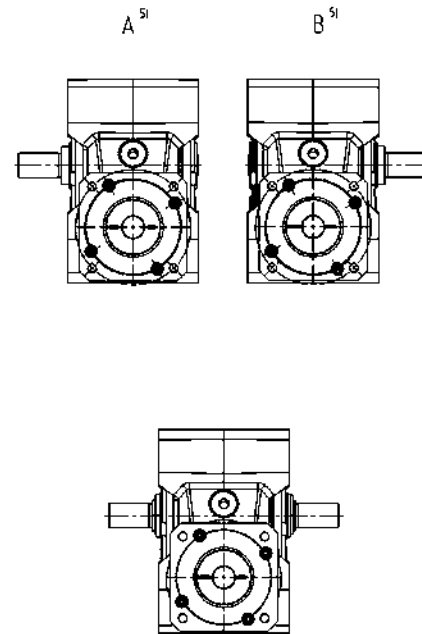
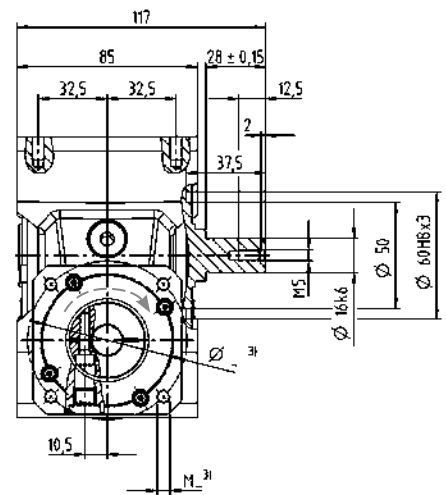
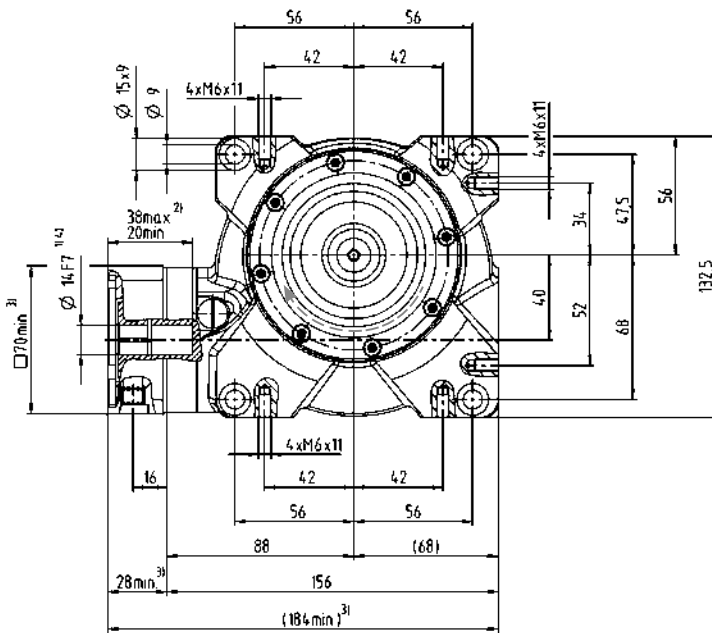
Please contact us for information on the best configuration for S1 conditions of use (continuous operation).
Please use our cymex[®] 5 sizing tool to obtain a more detailed design – www.wittenstein-cymex.com

^{a)} Idling torques decrease during operation

^{b)} Refers to center of output shaft or flange
at $n_2 = 300$ rpm
First value for MF-version (standard),
second value for MT-version (HIGH FORCES).

^{c)} Note the reduced torque depending on the design

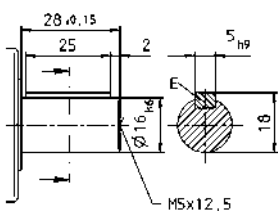
^{d)} For higher ambient temperatures, please reduce input speed



Optional dual-shaft output. Drawings available upon request.


Alternatives: Output shaft variants


Keywayed output shaft in mm
E = key as per DIN 6885, sheet 1, form A



Non-tolerated dimensions ± 1 mm

- 1) Check motor shaft fit.
- 2) Min./Max. permissible motor shaft length.
Longer motor shafts are adaptable, please contact us.
- 3) The dimensions depend on the motor.
- 4) Smaller motor shaft diameter is compensated by a bushing with a minimum thickness of 1 mm. Motor shaft diameters up to 19 mm available – please contact WITTENSTEIN alpha.
- 5) Output side

 CAD data is available under www.wittenstein-alpha.com

 Motor mounting according to operating manual

			1-stage						
Ratio	i		7	10	16	28	40		
Max. torque	T_{2a}	Nm	125	127	131	140	116		
		in.lb	1106	1124	1159	1239	1027		
Efficiency at full load	η	%	89	85	80	70	63		
Emergency stop torque	T_{Not}	Nm	242	242	250	262	236		
		in.lb	2142	2142	2213	2319	2089		
Nominal input speed <small>(with 20°C ambient temperature)^{d,e}</small>	n_{1N}	min ⁻¹	4000						
Max. input speed	n_{1Max}	rpm	6000						
Mean no load running torque ^{a)} <small>(With $n_2=3000$ min⁻¹ and 20° C gear temperature)</small>	T_{012}	Nm	2.2	1.6	1.5	1.2	1.1		
		in.lb	19.5	14.2	13.3	10.6	9.7		
Max. torsional backlash	j_t	arcmin	≤ 15						
Torsional rigidity	C_{t21}	Nm/arcmin	5.5						
		in.lb/arcmin	49						
Max. axial force ^{b)}	F_{2AMax}	N	1500 / 5000 ^b						
		lb _f	337.5 / 1125 ^b						
Max. radial force ^{b)}	F_{2RMMax}	N	1200 / 3800 ^b						
		lb _f	270 / 855 ^b						
Max. tilting moment ^{b)}	M_{2KMMax}	Nm	130 / 409 ^b						
		in.lb	1150 / 3620 ^b						
Service life	L_h	h	> 15000						
Weight incl. standard adapter plate	m	kg	8.0						
		lb _m	18.0						
Operating noise <small>(with $n_1=3000$ rpm no load)</small>	L_{PA}	dB(A)	≤ 62						
Max. permitted housing temperature	°C		+90						
	F		194						
Ambient temperature	°C		-15 to +40						
	F		5 to 104						
Lubrication	Lubricated for life								
Paint	None								
Direction of rotation	See drawing								
Protection class	IP 65								
Moment of inertia <small>(relates to the drive) Clamping hub diameter [mm]</small>	E	19	J_1	kgcm ²	1.22	1.17	1.06	1.05	1.01
				10 ⁻³ in.lb.s ²	1.08	1.04	0.94	0.93	0.89

Please contact us for information on the best configuration for S1 conditions of use (continuous operation).

Please use our cymex® 5 sizing tool to obtain a more detailed design – www.wittenstein-cymex.com

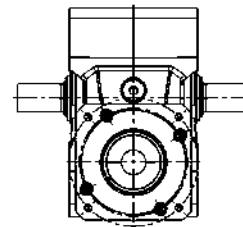
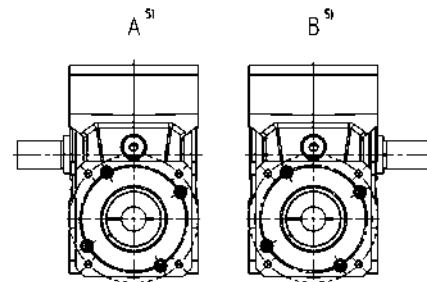
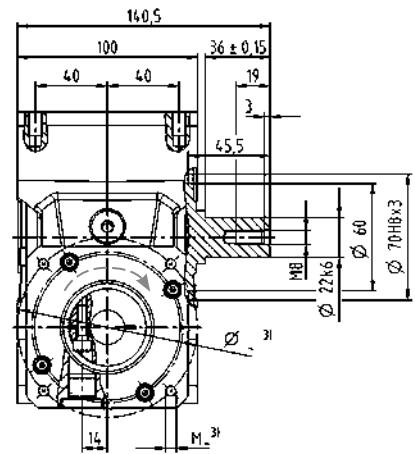
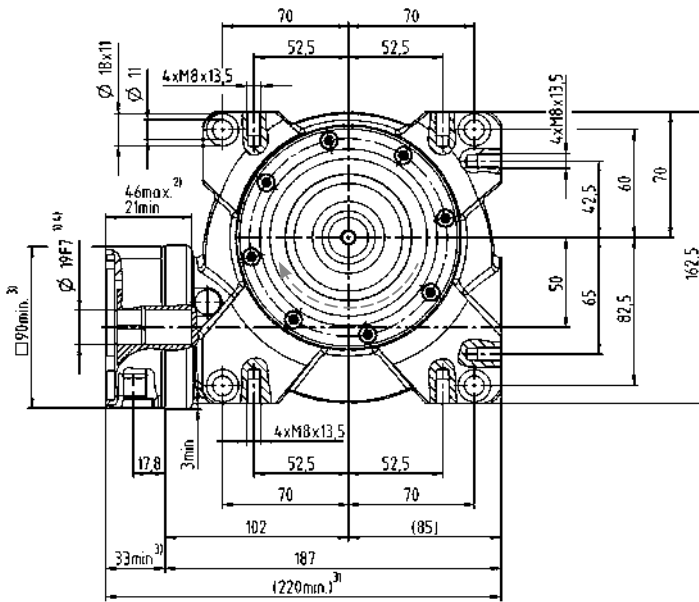
^{a)} Idling torques decrease during operation

^{b)} Refers to center of output shaft or flange at $n_2 = 300$ rpm

First value for MF-version (standard), second value for MT-version (HIGH FORCES).

^{d)} Note the reduced torque depending on the design

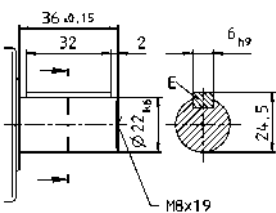
^{e)} For higher ambient temperatures, please reduce input speed



Optional dual-shaft output. Drawings available upon request.


Alternatives: Output shaft variants


Keywayed output shaft in mm
E = key as per DIN 6885, sheet 1, form A



Non-tolerated dimensions ± 1 mm

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

 CAD data is available under www.wittenstein-alpha.com

 Motor mounting according to operating manual

			1-stage						
Ratio	i		7	10	16	28	40		
Max. torque	T_{2a}	Nm	265	270	280	301	282		
		in.lb	2345	2390	2478	2664	2496		
Efficiency at full load	η	%	90	87	82	73	67		
Emergency stop torque	T_{2Not}	Nm	484	491	494	518	447		
		in.lb	4283	4345	4372	4584	3956		
Nominal input speed <small>(with 20°C ambient temperature)^{d,e}</small>	n_{1N}	min ⁻¹	4000						
Max. input speed	n_{1Max}	rpm	4500						
Mean no load running torque ^{a)} <small>(With $n_1=3000$ min⁻¹ and 20° C gear temperature)</small>	T_{012}	Nm	3.1	3	2.4	2.3	2.2		
		in.lb	27.4	26.6	21.2	20.4	19.5		
Max. torsional backlash	j_t	arcmin	≤ 15						
Torsional rigidity	C_{t21}	Nm/arcmin	23						
		in.lb/arcmin	204						
Max. axial force ^{b)}	F_{2AMax}	N	2000 / 8250 ^b						
		lb _f	450 / 1856 ^b						
Max. radial force ^{b)}	F_{2RMMax}	N	2000 / 6000 ^b						
		lb _f	450 / 1350 ^b						
Max. tilting moment ^{b)}	M_{2KMMax}	Nm	281 / 843 ^b						
		in.lb	2487 / 7461 ^b						
Service life	L_h	h	> 15000						
Weight incl. standard adapter plate	m	kg	13.0						
		lb _m	29.0						
Operating noise <small>(with $n_1=3000$ rpm no load)</small>	L_{PA}	dB(A)	≤ 64						
Max. permitted housing temperature			°C		+90				
			F		194				
Ambient temperature			°C		-15 to +40				
			F		5 to 104				
Lubrication	Lubricated for life								
Paint	None								
Direction of rotation	See drawing								
Protection class	IP 65								
Moment of inertia <small>(relates to the drive) Clamping hub diameter [mm]</small>	H	28	J_1	kgcm ²	3.75	3.61	3.52	3.48	3.36
				10 ⁴ in.lb.s ²	3.32	3.19	3.12	3.08	2.97

Please contact us for information on the best configuration for S1 conditions of use (continuous operation).

Please use our cymex® 5 sizing tool to obtain a more detailed design – www.wittenstein-cymex.com

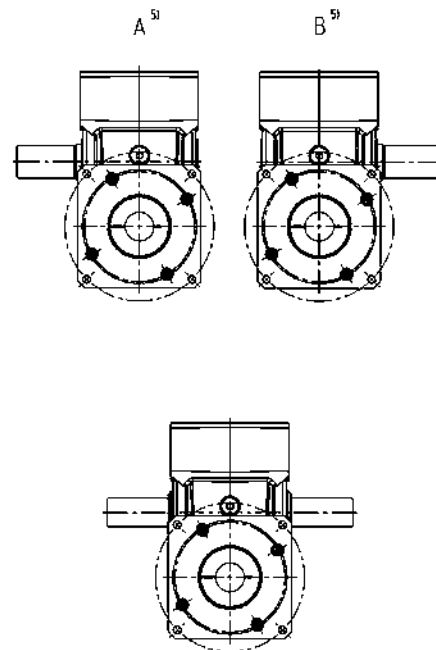
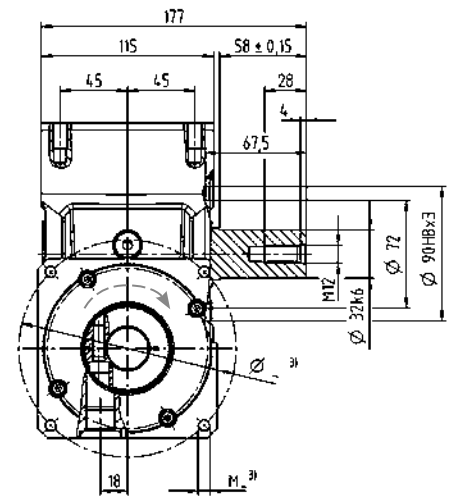
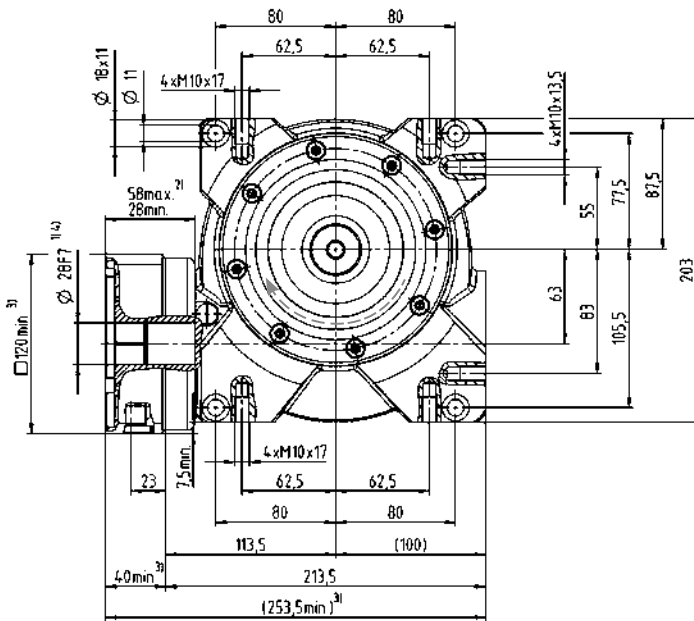
^{a)} Idling torques decrease during operation

^{b)} Refers to center of output shaft or flange at $n_2 = 300$ rpm

First value for MF-version (standard), second value for MT-version (HIGH FORCES).

^{d)} Note the reduced torque depending on the design

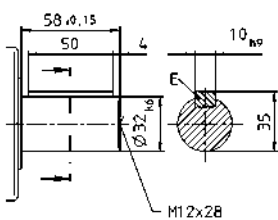
^{e)} For higher ambient temperatures, please reduce input speed



Optional dual-shaft output. Drawings available upon request.

Alternatives: Output shaft variants

Keywayed output shaft in mm
E = key as per DIN 6885, sheet 1, form A



Non-tolerated dimensions ± 1 mm

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

CAD data is available under www.wittenstein-alpha.com

Motor mounting according to operating manual

V-Drive Value – The economical all-rounder



NVH

Low backlash servo worm gearheads with output shaft and hollow shaft. The V-Drive Value impresses with its high power density and medium torsional backlash. It is especially suitable for economical applications in continuous operation.



NVS

Product highlights

Strong performance

for economical standard applications in cyclic or continuous operation.

High power density

medium torsional backlash throughout its lifespan.

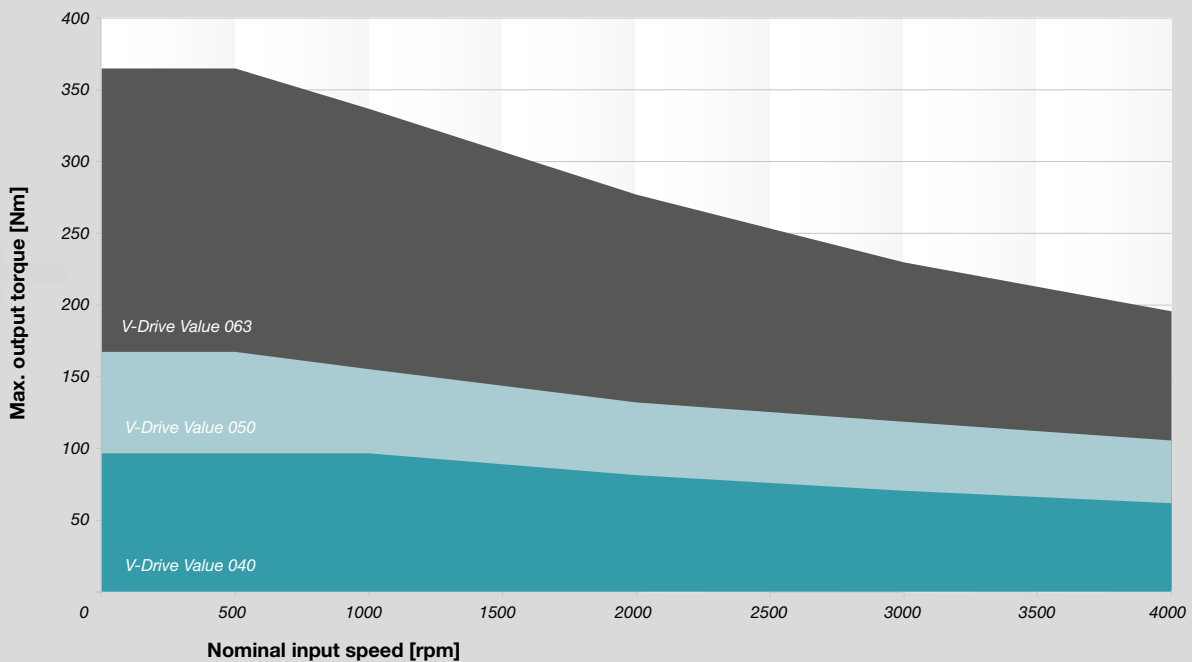
No stick-slip effect

owing to the optimized hollow-flank teeth.

Quick size selection

V-Drive Value (example for $i = 28$)

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



			1-stage						2-stage [ⓐ]								
Ratio	i		4	7	10	16	28	40	50	70	100	140	200	280	400		
Max. torque	T_{2a}	Nm	74	82	91	94	98	91	91	82	91	98	91	98	91		
		in.lb	655	726	805	832	867	805	805	726	805	867	805	867	805		
Efficiency at full load	η	%	93	90	88	82	73	67	86	88	86	71	65	71	65		
Emergency stop torque	T_{2Not}	Nm	118	126	125	129	134	122	125	126	125	134	122	134	122		
		in.lb	1044	1115	1106	1142	1186	1080	1106	1115	1106	1186	1080	1186	1080		
Nominal input speed <small>(with 20°C ambient temperature)^{ⓐ,ⓑ}</small>	n_{1N}	min ⁻¹	4000						6000								
Max. input speed	n_{1Max}	rpm	6000														
Mean no load running torque [ⓐ] <small>(With $n_1=3000$ min⁻¹ and 20° C gear temperature)</small>	T_{012}	Nm	0.8	0.7	0.6	0.5	0.4	0.4	0.4	0.2	0.2	0.4	0.4	0.3	0.2		
		in.lb	7.1	6.2	5.3	4.4	3.5	3.5	3.5	1.8	1.8	3.5	3.5	2.7	1.8		
Max. torsional backlash	j_t	arcmin	≤ 6						≤ 7								
Torsional rigidity	C_{t21}	Nm/arcmin	4.5														
		in.lb/arcmin	40														
Max. axial force [ⓑ]	F_{2AMax}	N	3000														
		lb _f	675														
Max. radial force [ⓑ]	F_{2RMMax}	N	2400														
		lb _f	540														
Max. tilting moment	M_{2KMax}	Nm	205														
		in.lb	1814														
Service life	L_h	h	> 20000														
Weight incl. standard adapter plate	m	kg	5.0						5.6								
		lb _m	11.1						12.0								
Operating noise <small>(with $n_1=3000$ rpm no load)</small>	L_{PA}	dB(A)	< 54						< 58								
Max. permitted housing temperature	°C		+90														
	F		194														
Ambient temperature	°C		-15 to +40														
	F		5 to 104														
Lubrication	Lubricated for life																
Paint	Pearl dark grey																
Direction of rotation	See drawing																
Protection class	IP 65																
Moment of inertia <small>(relates to the drive)</small> Clamping hub diameter [mm]	C	14	J_1	kgcm ²	0.53	0.38	0.35	0.32	0.32	0.32	0.25	0.28	0.24	0.23	0.19	0.18	0.18
				10 ⁻³ in.lb.s ²	0.47	0.34	0.31	0.28	0.28	0.34	0.22	0.25	0.21	0.20	0.17	0.16	0.16
	E	19	J_1	kgcm ²	0.55	0.41	0.38	0.35	0.34	0.33	0.40	0.40	0.36	0.34	0.30	0.30	0.30
				10 ⁻³ in.lb.s ²	0.49	0.36	0.34	0.31	0.30	0.29	0.35	0.35	0.32	0.30	0.27	0.27	0.27

Please contact us for information on the best configuration for S1 conditions of use (continuous operation).

Please use our cymex[®] 5 sizing tool to obtain a more detailed design – www.wittenstein-cymex.com

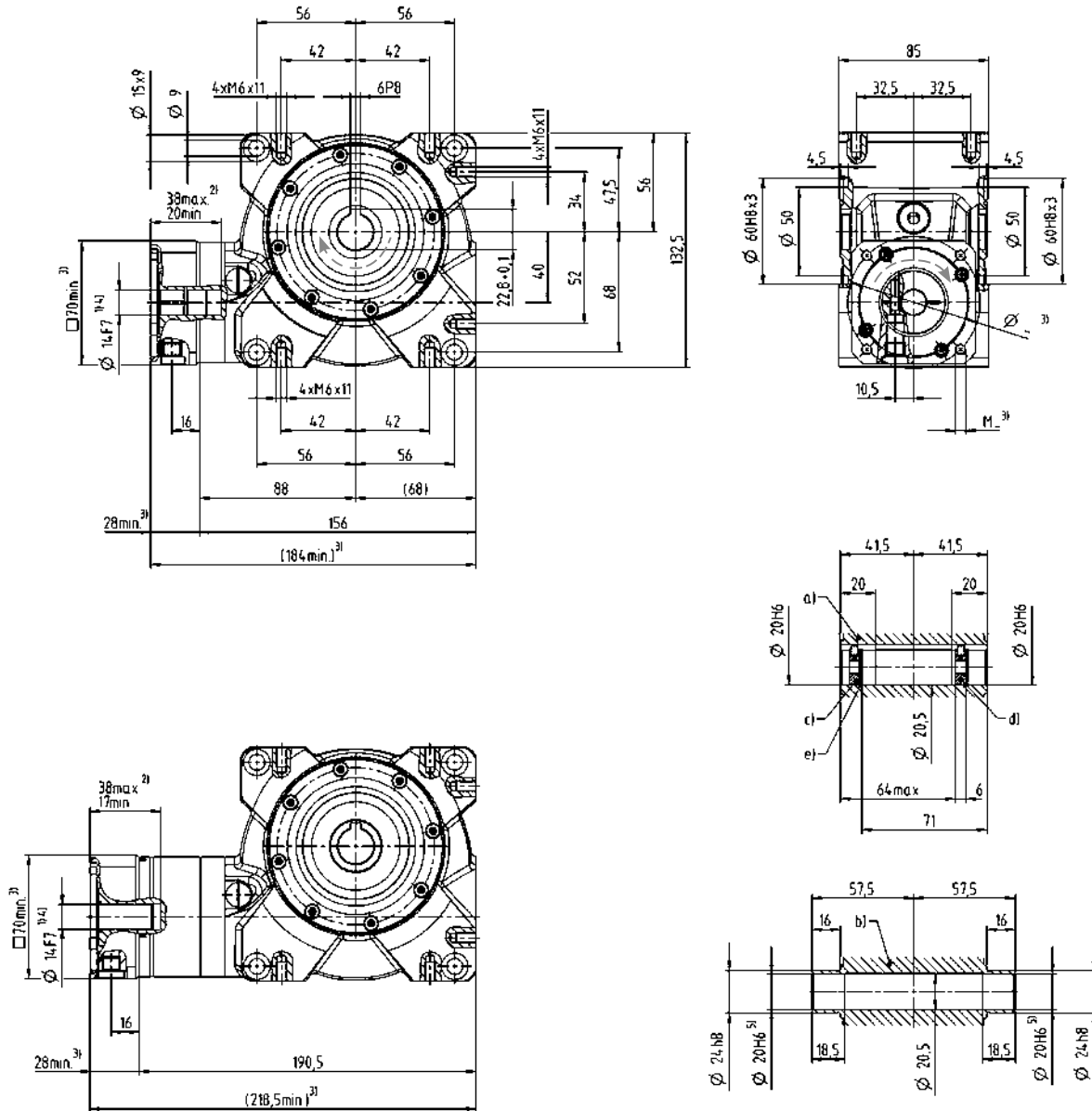
[ⓐ] Idling torques decrease during operation

[ⓑ] Refers to center of output shaft or flange at $n_2 = 300$ rpm

[ⓒ] Other ratios available on request

[ⓓ] Note the reduced torque depending on the design


[ⓔ] For higher ambient temperatures, please reduce input speed




- a) Hollow shaft, keywayed
- b) Hollow shaft, smooth
- c) End disc for screw M6
- d) End disc as forcing washer for screw M8
- e) Locking ring – DIN 472

Non-tolerated dimensions ± 1 mm

- 1) Check motor shaft fit.
- 2) Min./Max. permissible motor shaft length.
Longer motor shafts are adaptable, please contact us.
- 3) The dimensions depend on the motor.
- 4) Smaller motor shaft diameter is compensated by a bushing with a minimum thickness of 1 mm. Motor shaft diameters up to 19 mm available – please contact WITTENSTEIN alpha.
- 5) Tolerance h6 for mounted shaft.

 CAD data is available under www.wittenstein-alpha.com

 Motor mounting according to operating manual

			1-stage						2-stage [ⓐ]									
Ratio	i		4	7	10	16	28	40	50	70	100	140	200	280	400			
Max. torque	T_{2a}	Nm	-	150	153	157	167	141	153	150	153	167	141	167	141			
		in.lb	-	1328	1354	1389	1478	1248	1354	1328	1354	1478	1248	1478	1248			
Efficiency at full load	η	%	-	89	86	82	72	64	84	87	84	70	62	70	62			
Emergency stop torque	T_{2Not}	Nm	-	242	242	250	262	236	242	242	242	262	236	262	236			
		in.lb	-	2142	2142	2213	2319	2089	2142	2142	2142	2319	2089	2319	2089			
Nominal input speed <small>(with 20°C ambient temperature)^{ⓐ,ⓑ}</small>	n_{1N}	min ⁻¹	4000						6000									
Max. input speed	n_{1Max}	rpm	6000															
Mean no load running torque [ⓐ] <small>(With $n_1=3000$ min⁻¹ and 20° C gear temperature)</small>	T_{012}	Nm	-	2.2	1.6	1.5	1.2	1.1	0.7	0.5	0.4	0.6	0.6	0.4	0.4			
		in.lb	-	19.5	14.2	13.3	10.6	9.7	6.2	4.4	3.5	5.3	5.3	3.5	3.5			
Max. torsional backlash	j_t	arcmin	≤ 6						≤ 7									
Torsional rigidity	C_{t21}	Nm/arcmin	8															
		in.lb/arcmin	71															
Max. axial force [ⓑ]	F_{2AMax}	N	5000															
		lb _f	1125															
Max. radial force [ⓑ]	F_{2RMax}	N	3800															
		lb _f	855															
Max. tilting moment	M_{2KMax}	Nm	409															
		in.lb	3620															
Service life	L_h	h	> 20000															
Weight incl. standard adapter plate	m	kg	8.0						8.7									
		lb _m	17.7						19.0									
Operating noise <small>(with $n_1=3000$ rpm no load)</small>	L_{PA}	dB(A)	≤ 62															
Max. permitted housing temperature	°C		+90															
	F		194															
Ambient temperature	°C		-15 to +40															
	F		5 to 104															
Lubrication	Lubricated for life																	
Paint	Pearl dark grey																	
Direction of rotation	See drawing																	
Protection class	IP 65																	
Moment of inertia <small>(relates to the drive) Clamping hub diameter [mm]</small>	C	14	J_1	kgcm ²	-	-	-	-	-	-	0.80	0.80	0.80	0.70	0.70	0.70	0.70	
				10 ⁻¹ in.lb.s ²	-	-	-	-	-	-	0.71	0.71	0.71	0.62	0.62	0.62	0.62	0.62
	E	19	J_1	kgcm ²	-	1.21	1.12	1.03	1.00	1.05	1.20	1.30	1.20	1.10	1.10	1.10	1.10	1.10
				10 ⁻¹ in.lb.s ²	-	1.07	0.99	0.91	0.89	0.93	1.06	1.15	1.06	0.97	0.97	0.97	0.97	0.97

Please contact us for information on the best configuration for S1 conditions of use (continuous operation).

Please use our cymex[®] 5 sizing tool to obtain a more detailed design – www.wittenstein-cymex.com

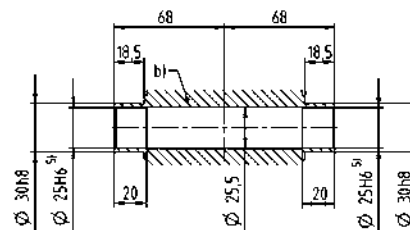
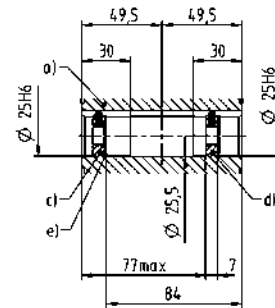
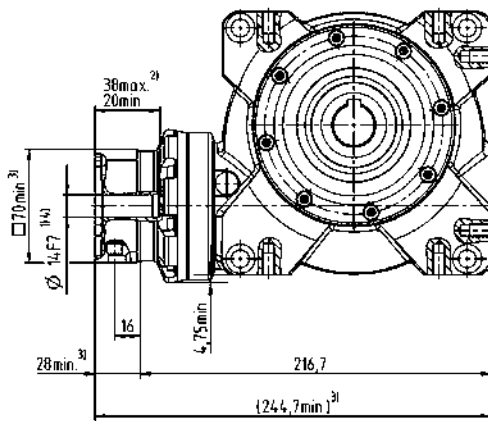
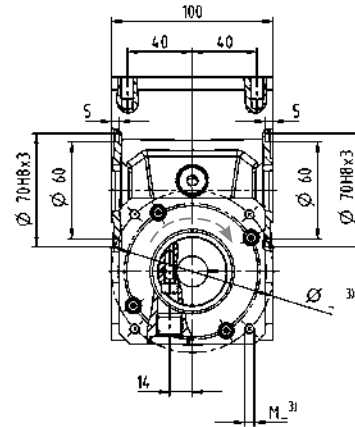
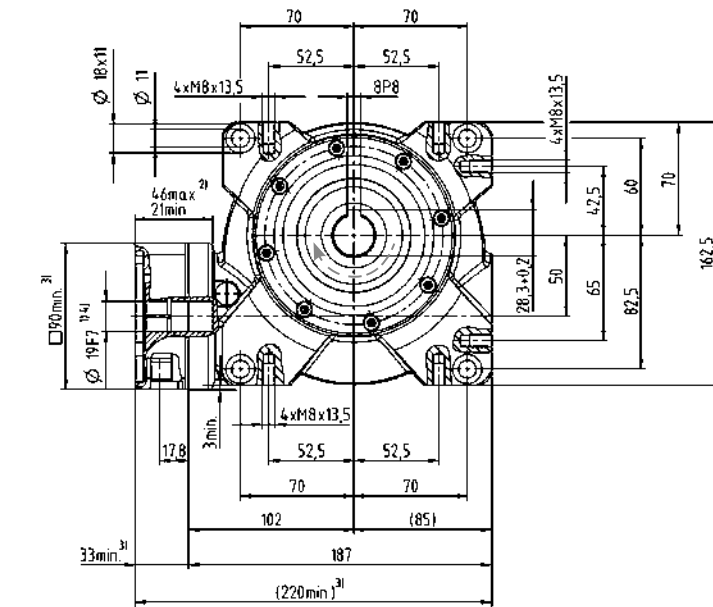
[ⓐ] Idling torques decrease during operation

[ⓑ] Refers to center of output shaft or flange at $n_2 = 300$ rpm

[ⓒ] Other ratios available on request

[ⓓ] Note the reduced torque depending on the design


[ⓔ] For higher ambient temperatures, please reduce input speed




- a) Hollow shaft, keywayed
- b) Hollow shaft, smooth
- c) End disc for screw M10 (on request)
- d) End disc as forcing washer for screw M12 (on request)
- e) Locking ring – DIN 472 (on request)

Non-tolerated dimensions ± 1 mm

- 1) Check motor shaft fit.
- 2) Min./Max. permissible motor shaft length.
Longer motor shafts are adaptable, please contact us.
- 3) The dimensions depend on the motor.
- 4) Smaller motor shaft diameter is compensated by a bushing with a minimum thickness of 1 mm.
- 5) Tolerance h6 for mounted shaft.

 CAD data is available under www.wittenstein-alpha.com

 Motor mounting according to operating manual

			1-stage						2-stage ^{o1}								
Ratio	i		4	7	10	16	28	40	50	70	100	140	200	280	400		
Max. torque	T_{2a}	Nm	-	303	319	331	365	321	319	303	319	365	321	365	321		
		in.lb	-	2682	2823	2929	3230	2841	2823	2682	2823	3230	2841	3230	2841		
Efficiency at full load	η	%	-	91	88	83	74	68	86	89	86	72	66	72	66		
Emergency stop torque	T_{2Not}	Nm	-	484	491	494	518	447	491	484	494	518	447	518	447		
		in.lb	-	4283	4345	4372	4584	3956	4345	4283	4372	4584	3956	4584	3956		
Nominal input speed <small>(with 20°C ambient temperature) ^{o4}</small>	n_{1N}	min ⁻¹	4000						4500								
Max. input speed	n_{1Max}	rpm	4500														
Mean no load running torque ^{a1} <small>(With $n_1=3000$ min⁻¹ and 20°C gear temperature)</small>	T_{012}	Nm	-	3.1	3	2.4	2.3	2.2	1.2	0.7	0.7	1.1	1.1	0.8	0.6		
		in.lb	-	27.4	26.6	21.2	20.4	19.5	10.6	6.2	6.2	9.7	9.7	7.1	5.3		
Max. torsional backlash	j_t	arcmin	≤ 6						≤ 7								
Torsional rigidity	C_{t21}	Nm/arcmin	28														
		in.lb/arcmin	248														
Max. axial force ^{b1}	F_{2AMax}	N	8250														
		lb _f	1856														
Max. radial force ^{b1}	F_{2RMax}	N	6000														
		lb _f	1350														
Max. tilting moment	M_{2KMax}	Nm	843														
		in.lb	7461														
Service life	L_h	h	> 20000														
Weight incl. standard adapter plate	m	kg	13.0						13.7								
		lb _m	28.7						30.0								
Operating noise <small>(with $n_1=3000$ rpm no load)</small>	L_{PA}	dB(A)	≤ 64														
Max. permitted housing temperature	°C		+90														
	F		194														
Ambient temperature	°C		-15 to +40														
	F		5 to 104														
Lubrication	Lubricated for life																
Paint	Pearl dark grey																
Direction of rotation	See drawing																
Protection class	IP 65																
Moment of inertia <small>(relates to the drive) Clamping hub diameter [mm]</small>	E	19	J_t	kgcm ²	-	-	-	-	-	-	2.60	2.80	2.50	2.40	2.40	2.30	
				10 ⁻³ in.lb.s ²	-	-	-	-	-	-	2.30	2.48	2.21	2.12	2.12	2.12	2.04
	G	24	J_t	kgcm ²	-	-	-	-	-	-	4.10	4.30	4.10	4.00	4.00	3.90	3.90
				10 ⁻³ in.lb.s ²	-	-	-	-	-	-	3.63	3.81	3.63	3.54	3.54	3.45	3.45
	H	28	J_t	kgcm ²	-	3.89	3.65	3.56	3.52	3.47	-	-	-	-	-	-	-
				10 ⁻³ in.lb.s ²	-	3.44	3.23	3.15	3.12	3.07	-	-	-	-	-	-	-

Please contact us for information on the best configuration for S1 conditions of use (continuous operation).

Please use our cymex[®] 5 sizing tool to obtain a more detailed design – www.wittenstein-cymex.com

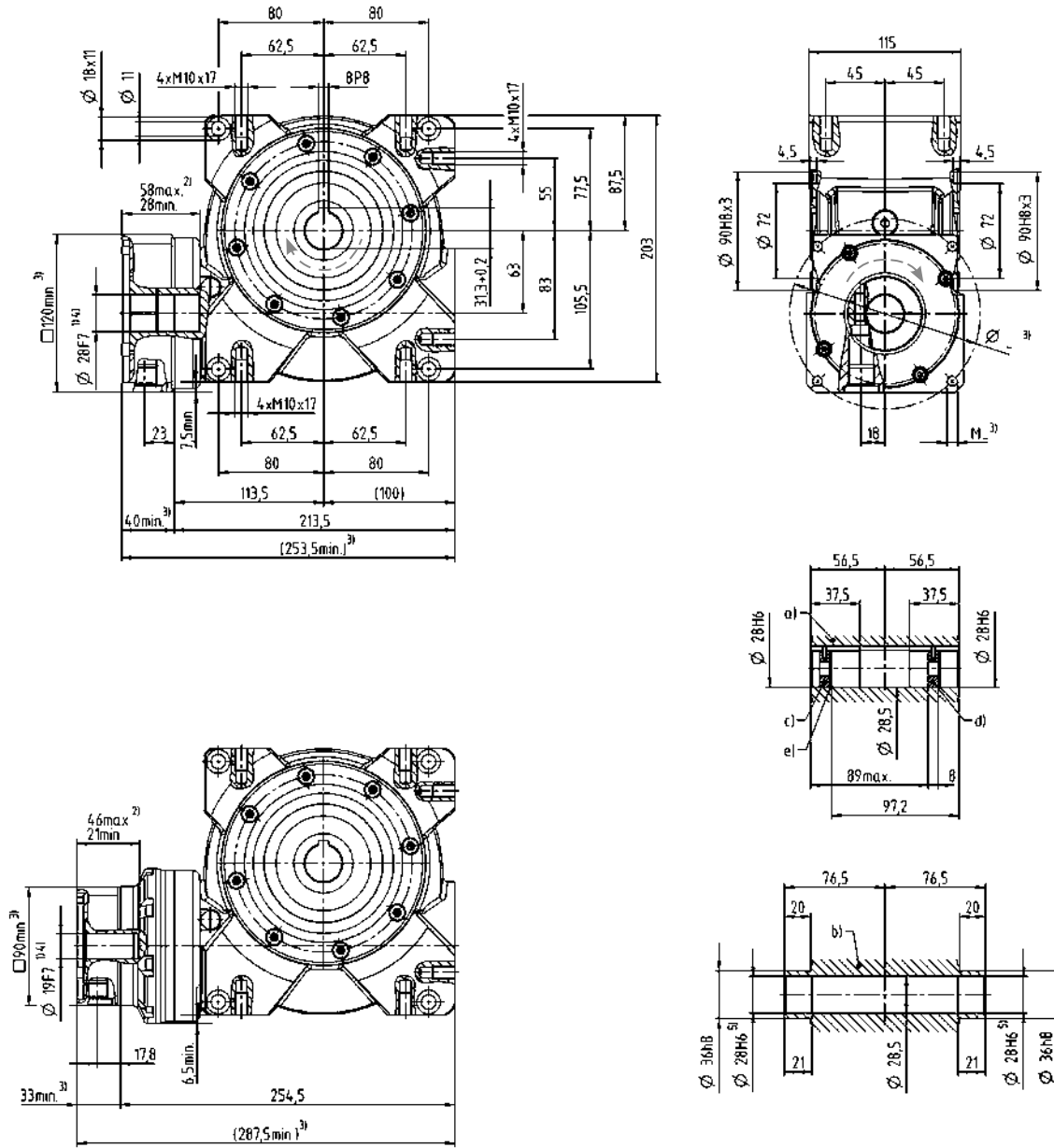
^{a1} Idling torques decrease during operation

^{b1} Refers to center of output shaft or flange
at $n_2 = 300$ rpm

^{o1} Other ratios available on request

^{o2} Note the reduced torque depending on the design


^{o3} For higher ambient temperatures, please reduce input speed




- a) Hollow shaft, keywayed
- b) Hollow shaft, smooth
- c) End disc for screw M10 (on request)
- d) End disc as forcing washer for screw M12 (on request)
- e) Locking ring – DIN 472 (on request)

Non-tolerated dimensions ± 1 mm

- 1) Check motor shaft fit.
- 2) Min./Max. permissible motor shaft length.
Longer motor shafts are adaptable, please contact us.
- 3) The dimensions depend on the motor.
- 4) Smaller motor shaft diameter is compensated by a bushing with a minimum thickness of 1 mm.
- 5) Tolerance h6 for mounted shaft.

 CAD data is available under www.wittenstein-alpha.com

 Motor mounting according to operating manual

			1-stage						2-stage [ⓐ]								
Ratio	i		4	7	10	16	28	40	50	70	100	140	200	280	400		
Max. torque	T_{2a}	Nm	63	73	87	89	96	84	91	82	91	98	91	98	91		
		in.lb	558	646	770	788	850	743	805	726	805	867	805	867	805		
Efficiency at full load	η	%	93	90	88	82	73	67	86	88	86	71	65	71	65		
Emergency stop torque	T_{2Not}	Nm	118	126	125	129	134	122	125	126	125	134	122	134	122		
		in.lb	1044	1115	1106	1142	1186	1080	1106	1115	1106	1186	1080	1186	1080		
Nominal input speed <small>(with 20°C ambient temperature)^{ⓐ,ⓑ}</small>	n_{1N}	min ⁻¹	4000						6000								
Max. input speed	n_{1Max}	rpm	6000														
Mean no load running torque [ⓐ] <small>(With $n_1=3000$ min⁻¹ and 20° C gear temperature)</small>	T_{012}	Nm	0.8	0.7	0.6	0.5	0.4	0.4	0.4	0.2	0.2	0.4	0.4	0.3	0.2		
		in.lb	7.1	6.2	5.3	4.4	3.5	3.5	3.5	1.8	1.8	3.5	3.5	2.7	1.8		
Max. torsional backlash	j_t	arcmin	≤ 6						≤ 7								
Torsional rigidity	C_{t21}	Nm/arcmin	4.5														
		in.lb/arcmin	40														
Max. axial force [ⓑ]	F_{2AMax}	N	3000														
		lb _f	675														
Max. radial force [ⓑ]	F_{2RMMax}	N	2400														
		lb _f	540														
Max. tilting moment	M_{2KMax}	Nm	205														
		in.lb	1814														
Service life	L_h	h	> 20000														
Weight incl. standard adapter plate	m	kg	5.0						5.6								
		lb _m	11.1						12.0								
Operating noise <small>(with $n_1=3000$ rpm no load)</small>	L_{PA}	dB(A)	≤ 54						≤ 58								
Max. permitted housing temperature	°C		+90														
	F		194														
Ambient temperature	°C		-15 to +40														
	F		5 to 104														
Lubrication	Lubricated for life																
Paint	Pearl dark grey																
Direction of rotation	See drawing																
Protection class	IP 65																
Moment of inertia <small>(relates to the drive)</small> Clamping hub diameter [mm]	C	14	J_1	kgcm ²	0.53	0.38	0.35	0.33	0.32	0.32	0.25	0.28	0.24	0.23	0.19	0.18	0.18
				10 ⁻⁴ in.lb.s ²	0.47	0.34	0.31	0.29	0.28	0.28	0.22	0.25	0.21	0.20	0.17	0.16	0.16
	E	19	J_1	kgcm ²	0.55	0.41	0.38	0.35	0.34	0.34	0.36	0.40	0.36	0.34	0.30	0.30	0.30
				10 ⁻⁴ in.lb.s ²	0.49	0.36	0.34	0.31	0.30	0.30	0.32	0.35	0.32	0.30	0.27	0.27	0.27

Please contact us for information on the best configuration for S1 conditions of use (continuous operation).

Please use our cymex[®] 5 sizing tool to obtain a more detailed design – www.wittenstein-cymex.com

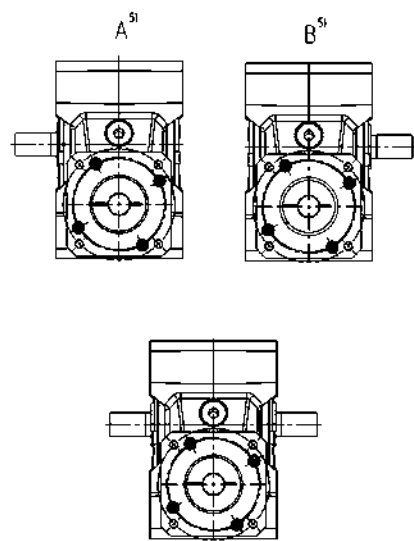
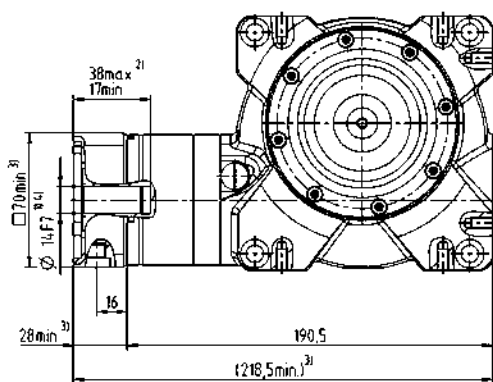
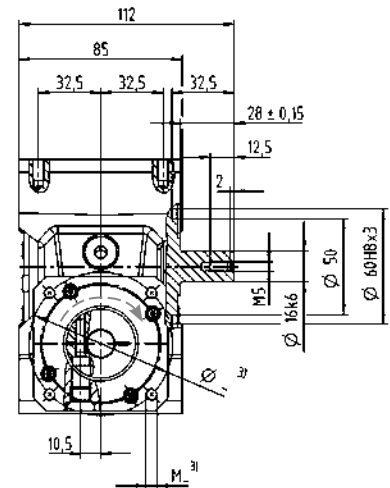
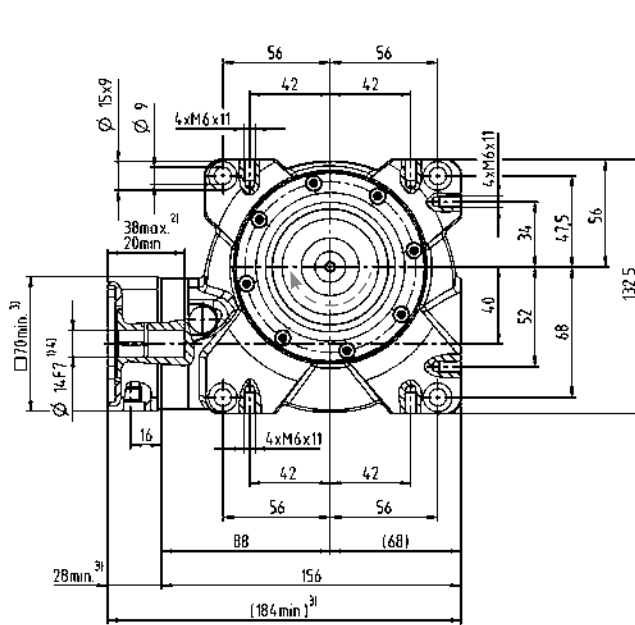
[ⓐ] Idling torques decrease during operation

[ⓑ] Refers to center of output shaft or flange at $n_2 = 300$ rpm

[ⓐ] Other ratios available on request

[ⓐ] Note the reduced torque depending on the design

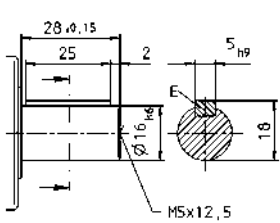
[ⓐ] For higher ambient temperatures, please reduce input speed



Optional dual-shaft output. Drawings available upon request.

Alternatives: Output shaft variants

Keywayed output shaft in mm
 E = key as per DIN 6885, sheet 1, form A



- Non-tolerated dimensions ± 1 mm
- 1) Check motor shaft fit.
 - 2) Min./Max. permissible motor shaft length.
 Longer motor shafts are adaptable, please contact us.
 - 3) The dimensions depend on the motor.
 - 4) Smaller motor shaft diameter is compensated by a bushing with a minimum thickness of 1 mm. Motor shaft diameters up to 19 mm available – please contact WITTENSTEIN alpha.
 - 5) Output side

CAD data is available under www.wittenstein-alpha.com

Motor mounting according to operating manual

			1-stage						2-stage [ⓐ]									
Ratio	i		4	7	10	16	28	40	50	70	100	140	200	280	400			
Max. torque	T_{2a}	Nm	-	150	153	157	167	141	153	150	153	167	141	167	141			
		in.lb	-	1328	1354	1389	1478	1248	1354	1328	1354	1478	1248	1478	1248			
Efficiency at full load	η	%	-	89	86	82	72	64	84	87	84	70	62	70	62			
Emergency stop torque	T_{Not}	Nm	-	242	242	250	262	236	242	242	242	262	236	262	236			
		in.lb	-	2142	2142	2213	2319	2089	2142	2142	2142	2319	2089	2319	2089			
Nominal input speed <small>(with 20°C ambient temperature)^{ⓐ,ⓑ}</small>	n_{1N}	min ⁻¹	4000						6000									
Max. input speed	n_{1Max}	rpm	6000															
Mean no load running torque [ⓐ] <small>(With $n_1=3000$ min⁻¹ and 20°C gear temperature)</small>	T_{012}	Nm	-	2.2	1.6	1.5	1.2	1.1	0.7	0.5	0.4	0.6	0.6	0.4	0.4			
		in.lb	-	19.5	14.2	13.3	10.6	9.7	6.2	4.4	3.5	5.3	5.3	3.5	3.5			
Max. torsional backlash	j_t	arcmin	≤ 6						≤ 7									
Torsional rigidity	C_{t21}	Nm/arcmin	8															
		in.lb/arcmin	71															
Max. axial force [ⓑ]	F_{2AMax}	N	5000															
		lb _f	1125															
Max. radial force [ⓑ]	F_{2RMax}	N	3800															
		lb _f	855															
Max. tilting moment	M_{2KMax}	Nm	409															
		in.lb	3620															
Service life	L_h	h	> 20000															
Weight incl. standard adapter plate	m	kg	8.0						8.7									
		lb _m	17.7						19.0									
Operating noise <small>(with $n_1=3000$ rpm no load)</small>	L_{PA}	dB(A)	≤ 62															
Max. permitted housing temperature	°C		+90															
	F		194															
Ambient temperature	°C		-15 to +40															
	F		5 to 104															
Lubrication	Lubricated for life																	
Paint	Pearl dark grey																	
Direction of rotation	See drawing																	
Protection class	IP 65																	
Moment of inertia <small>(relates to the drive)</small> Clamping hub diameter [mm]	C	14	J_1	kgcm ²	-	-	-	-	-	-	0.80	0.80	0.80	0.70	0.70	0.70	0.70	
				10 ⁻¹ in.lb.s ²	-	-	-	-	-	-	0.71	0.71	0.71	0.62	0.62	0.62	0.62	0.62
	E	19	J_1	kgcm ²	-	1.21	1.12	1.03	1.00	1.05	1.20	1.30	1.20	1.10	1.10	1.10	1.10	1.10
				10 ⁻¹ in.lb.s ²	-	1.07	0.99	0.91	0.89	0.93	1.06	1.15	1.06	0.97	0.97	0.97	0.97	0.97

Please contact us for information on the best configuration for S1 conditions of use (continuous operation).

Please use our cymex[®] 5 sizing tool to obtain a more detailed design – www.wittenstein-cymex.com

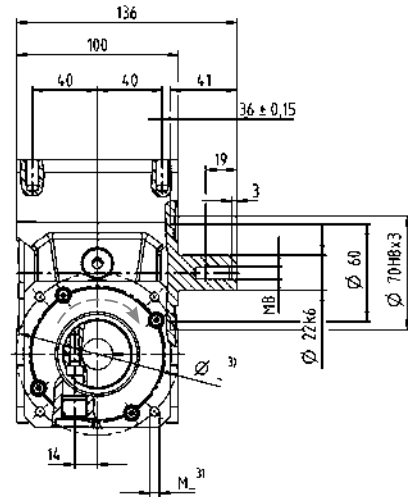
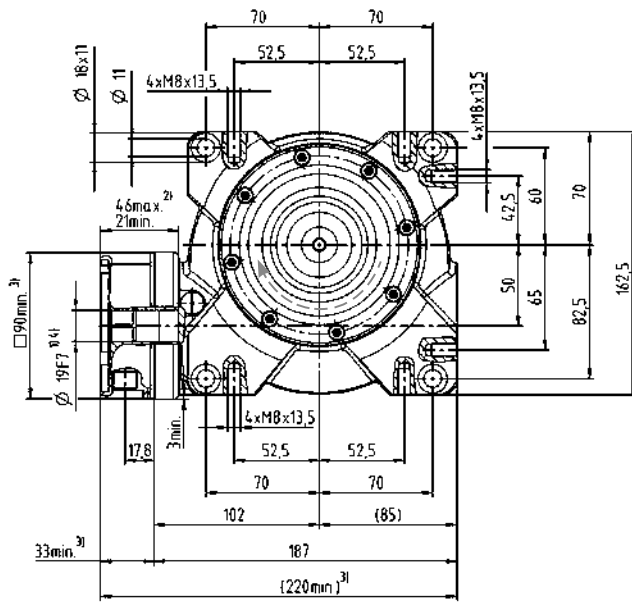
[ⓐ] Idling torques decrease during operation

[ⓑ] Refers to center of output shaft or flange at $n_2 = 300$ rpm

[ⓒ] Other ratios available on request

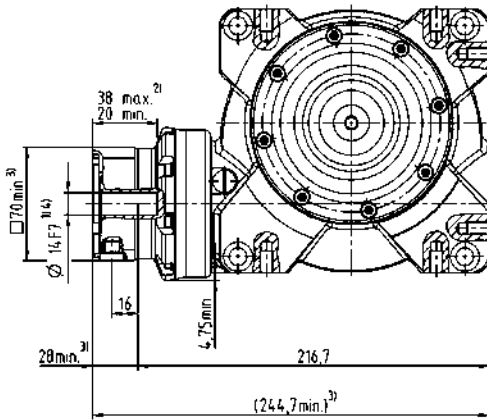
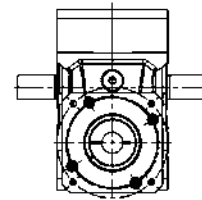
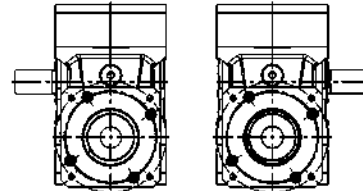
[ⓓ] Note the reduced torque depending on the design

[ⓔ] For higher ambient temperatures, please reduce input speed



A⁵¹

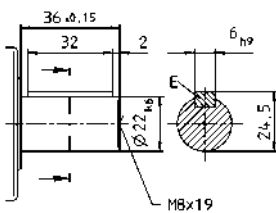
B⁵¹



Optional dual-shaft output. Drawings available upon request.


Alternatives: Output shaft variants


Keywayed output shaft in mm
E = key as per DIN 6885, sheet 1, form A



Non-tolerated dimensions ± 1 mm

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

 CAD data is available under www.wittenstein-alpha.com

 Motor mounting according to operating manual

			1-stage						2-stage ^{o)}								
Ratio	i		4	7	10	16	28	40	50	70	100	140	200	280	400		
Max. torque	T_{2a}	Nm	-	303	319	331	365	321	319	303	319	365	321	365	321		
		in.lb	-	2682	2823	2929	3230	2841	2823	2682	2823	3230	2841	3230	2841		
Efficiency at full load	η	%	-	91	88	83	74	68	86	89	86	72	66	72	66		
Emergency stop torque	T_{2Not}	Nm	-	484	491	494	518	447	491	484	494	518	447	518	447		
		in.lb	-	4283	4345	4372	4584	3956	4345	4283	4372	4584	3956	4584	3956		
Nominal input speed <small>(with 20°C ambient temperature) ^{a)}</small>	n_{1N}	min ⁻¹	4000						4500								
Max. input speed	n_{1Max}	rpm	4500						4500								
Mean no load running torque ^{a)} <small>(With $n_1=3000$ min⁻¹ and 20°C gear temperature)</small>	T_{012}	Nm	-	3.1	3	2.4	2.3	2.2	1.2	0.7	0.7	1.1	1.1	0.8	0.6		
		in.lb	-	27.4	26.6	21.2	20.4	19.5	10.6	6.2	6.2	9.7	9.7	7.1	5.3		
Max. torsional backlash	j_t	arcmin	≤ 6						≤ 7								
Torsional rigidity	C_{t21}	Nm/arcmin	28														
		in.lb/arcmin	248														
Max. axial force ^{b)}	F_{2AMax}	N	8250														
		lb _f	1856														
Max. radial force ^{b)}	F_{2RMax}	N	6000														
		lb _f	1350														
Max. tilting moment	M_{2KMax}	Nm	843														
		in.lb	7461														
Service life	L_h	h	> 20000														
Weight incl. standard adapter plate	m	kg	13.0						13.7								
		lb _m	28.7						30.0								
Operating noise <small>(with $n_1=3000$ rpm no load)</small>	L_{PA}	dB(A)	≤ 64														
Max. permitted housing temperature	°C		+90														
	F		194														
Ambient temperature	°C		-15 to +40														
	F		5 to 104														
Lubrication	Lubricated for life																
Paint	Pearl dark grey																
Direction of rotation	See drawing																
Protection class	IP 65																
Moment of inertia <small>(relates to the drive)</small> Clamping hub diameter [mm]	E	19	J_t	kgcm ²	-	-	-	-	-	-	2.60	2.80	2.50	2.40	2.40	2.40	2.30
				10 ⁻³ in.lb.s ²	-	-	-	-	-	-	2.30	2.48	2.21	2.12	2.12	2.12	2.12
	G	24	J_t	kgcm ²	-	-	-	-	-	-	4.10	4.30	4.10	4.00	4.00	3.90	3.90
				10 ⁻³ in.lb.s ²	-	-	-	-	-	-	3.63	3.81	3.63	3.54	3.54	3.45	3.45
	H	28	J_t	kgcm ²	-	3.89	3.65	3.56	3.52	3.47	-	-	-	-	-	-	-
				10 ⁻³ in.lb.s ²	-	3.44	3.23	3.15	3.12	3.07	-	-	-	-	-	-	-

Please contact us for information on the best configuration for S1 conditions of use (continuous operation).

Please use our cymex[®] 5 sizing tool to obtain a more detailed design – www.wittenstein-cymex.com

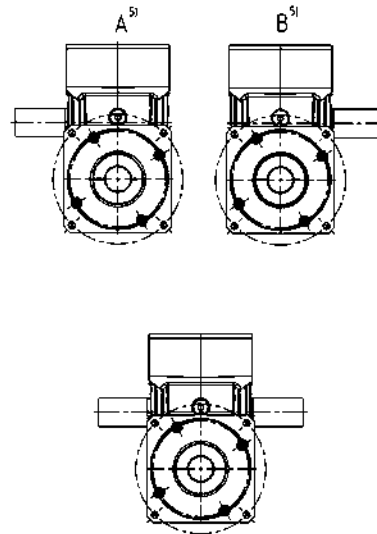
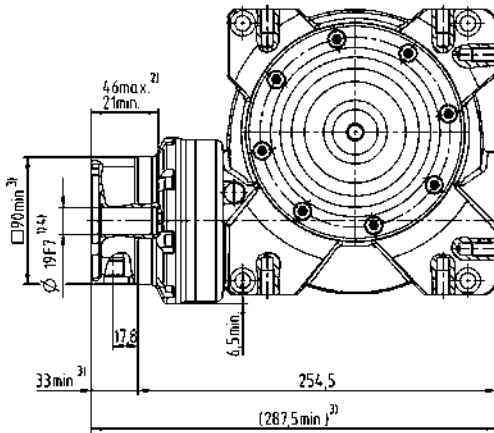
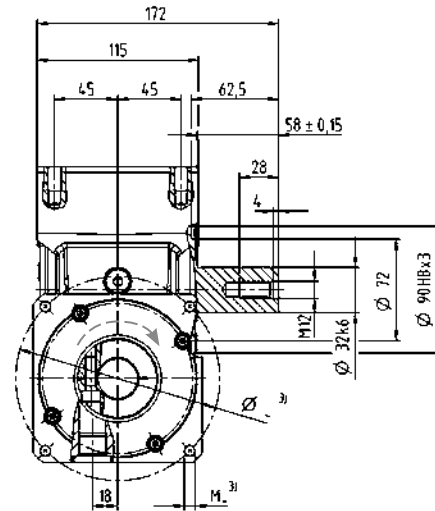
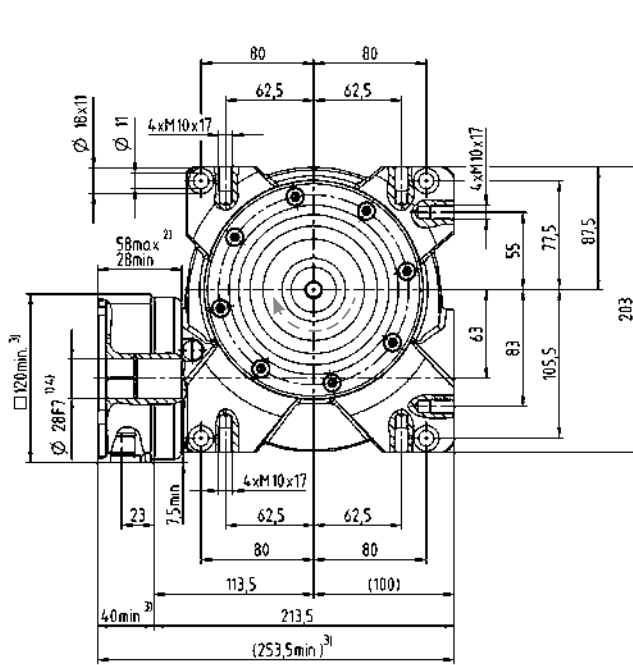
^{a)} Idling torques decrease during operation

^{b)} Refers to center of output shaft or flange
at $n_2 = 300$ rpm

^{c)} Other ratios available on request

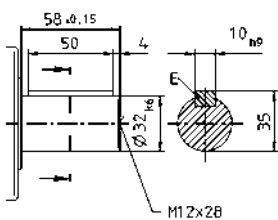
^{d)} Note the reduced torque depending on the design

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



Alternatives: Output shaft variants

Keywayed output shaft in mm
E = key as per DIN 6885, sheet 1, form A



Non-tolerated dimensions ± 1 mm

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

CAD data is available under www.wittenstein-alpha.com

Motor mounting according to operating manual

V-Drive Advanced – The flexible powerhouse



VS+

VH+

Servo worm gearheads with the solid shaft, hollow shaft and flanged hollow shaft types. The V-Drive Advanced impresses with its high power density and low torsional backlash. It is especially suitable for continuous duty applications.



VT+

Product highlights

Constant, low torsional backlash

consistently high quality and high positioning accuracy guaranteed throughout its lifespan.

Optimally sized output bearing

for absorbing high axial and radial forces in cyclic or continuous operation.

No stick-slip effect

owing to the enhanced hollow-flank teeth.

Top performance

Optimized hollow-flank teeth guarantee high efficiency and minimal wear with very high power density.

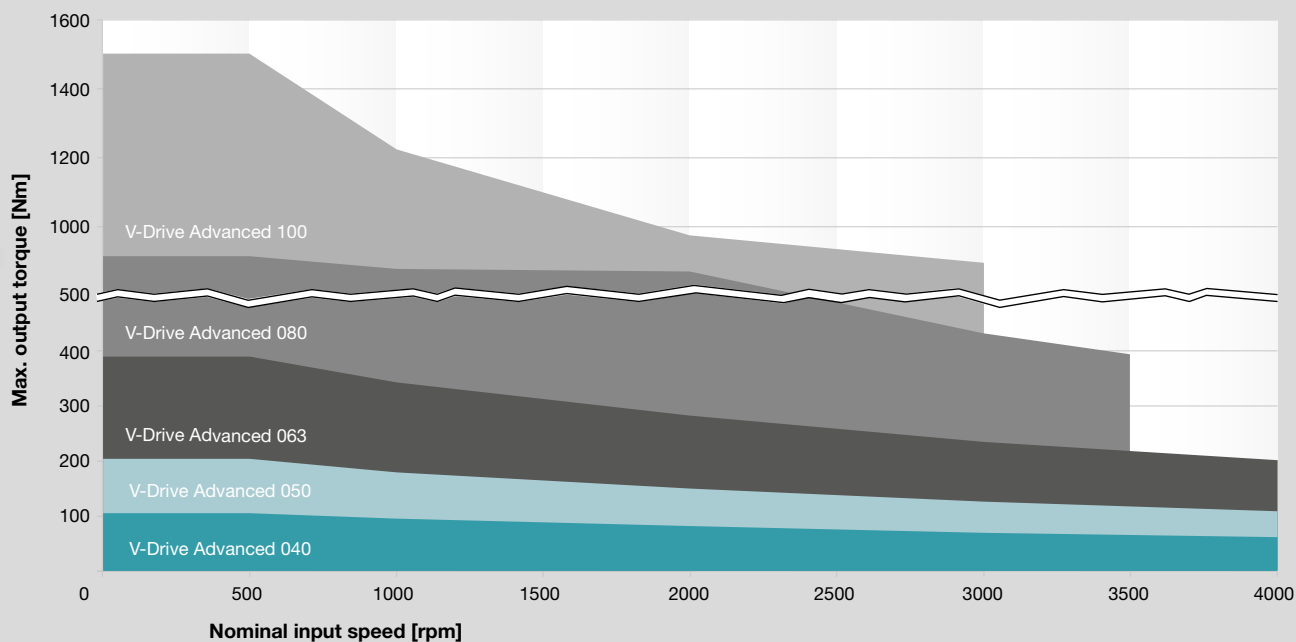
Hollow-flank teeth with high overload capacity

owing to the low specific tooth pressure.

Quick size selection

V-Drive Advanced (example for $i = 28$)

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



			1-stage						2-stage ^{o)}								
Ratio	i		4	7	10	16	28	40	50	70	100	140	200	280	400		
Max. torque	T_{2a}	Nm	74	82	98	101	106	98	98	82	98	106	98	106	98		
		in.lb	655	726	867	894	938	867	867	726	867	938	867	938	867		
Constant torsional backlash throughout its lifespan	T_{2Servo}	Nm	17	24	25	26	29	25	25	24	25	29	25	29	25		
		in.lb	150	212	221	230	257	221	221	212	221	257	221	257	221		
Efficiency at full load	η	%	93	90	88	82	73	67	86	88	86	71	65	71	65		
Emergency stop torque	T_{2Not}	Nm	118	126	125	129	134	122	125	126	125	134	122	134	122		
		in.lb	1044	1115	1106	1142	1186	1080	1106	1115	1106	1186	1080	1186	1080		
Nominal input speed <small>(with 20°C ambient temperature)^{o),e)}</small>	n_{1N}	min ⁻¹	4000						6000								
Max. input speed	n_{1Max}	rpm	6000														
Mean no load running torque ^{a)} <small>(With $n_2=3000$ min⁻¹ and 20° C gear temperature)</small>	T_{012}	Nm	0.8	0.7	0.6	0.5	0.4	0.4	0.4	0.2	0.2	0.4	0.4	0.3	0.2		
		in.lb	7.1	6.2	5.3	4.4	3.5	3.5	3.5	1.8	1.8	3.5	3.5	2.7	1.8		
Max. torsional backlash	j_t	arcmin	Standard ≤ 3 / Reduced ≤ 2						Standard ≤ 4 / Reduced ≤ 3								
Torsional rigidity	C_{121}	Nm/arcmin	4.5						5								
		in.lb/arcmin	40						40								
Max. axial force ^{b)}	F_{2AMax}	N	3000														
		lb _f	675														
Max. radial force ^{b)}	F_{2RMax}	N	2400														
		lb _f	540														
Max. tilting moment	M_{2KMax}	Nm	205														
		in.lb	1814														
Service life	L_h	h	> 20000														
Weight incl. standard adapter plate	m	kg	5.0						5.6								
		lb _m	11.1						12.0								
Operating noise <small>(with $n_1=3000$ rpm no load)</small>	L_{PA}	dB(A)	≤ 54						≤ 58								
Max. permitted housing temperature			°C						+90								
			F						194								
Ambient temperature			°C						-15 to +40								
			F						5 to 104								
Lubrication			Lubricated for life														
Paint			Innovation blue														
Direction of rotation			See drawing														
Protection class			IP 65														
Moment of inertia <small>(relates to the drive)</small> <small>Clamping hub diameter [mm]</small>	C	14	J_i	kgcm ²	0.52	0.38	0.34	0.32	0.32	0.31	0.25	0.28	0.24	0.23	0.19	0.18	0.18
				10 ⁻³ in.lb.s ²	0.46	0.34	0.30	0.28	0.28	0.27	0.22	0.25	0.21	0.20	0.17	0.16	0.16
	E	19	J_i	kgcm ²	0.54	0.40	0.37	0.35	0.34	0.33	0.36	0.40	0.36	0.34	0.30	0.30	0.30
				10 ⁻³ in.lb.s ²	0.48	0.35	0.33	0.31	0.30	0.29	0.32	0.35	0.32	0.30	0.27	0.27	0.27

Please contact us for information on the best configuration for S1 conditions of use (continuous operation).

Please use our cymex® 5 sizing tool to obtain a more detailed design – www.wittenstein-cymex.com

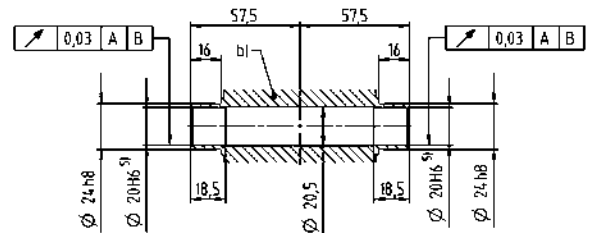
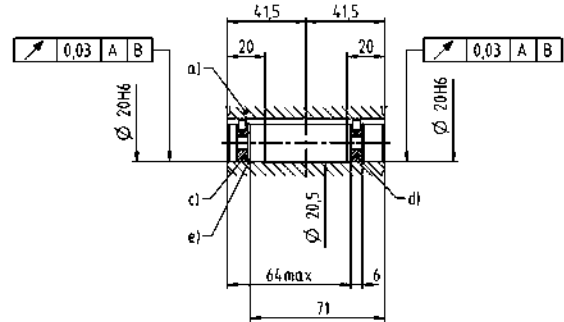
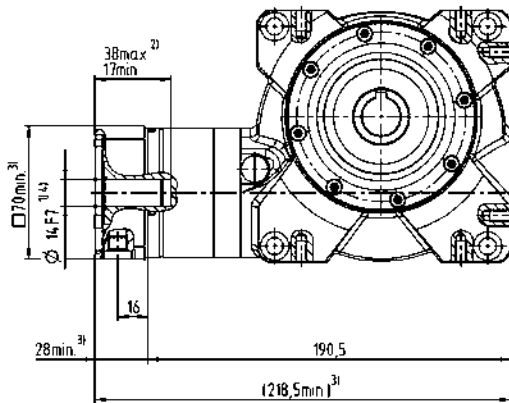
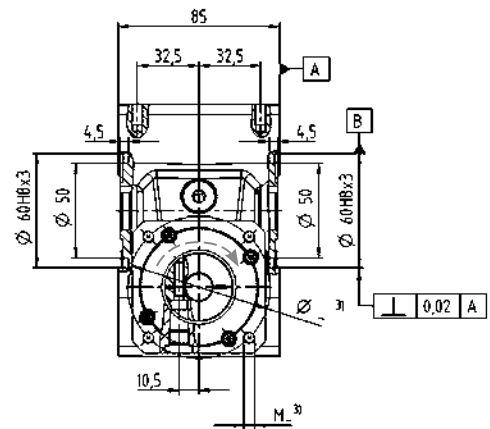
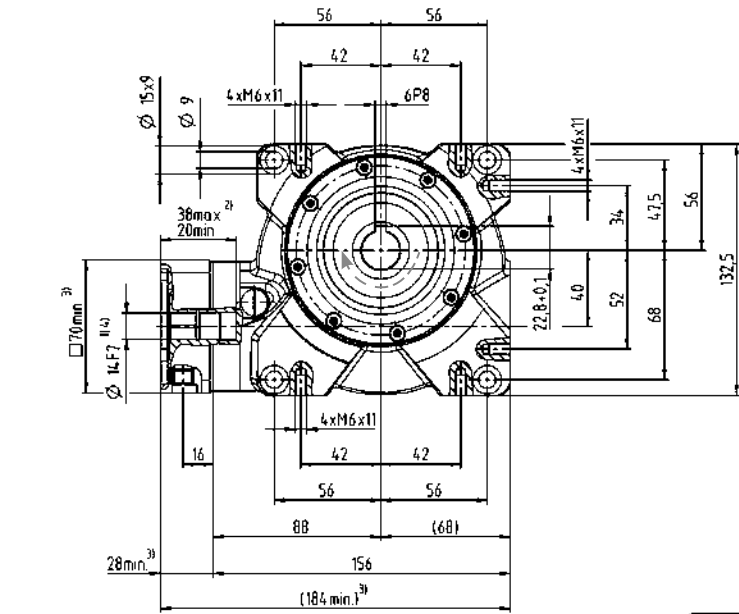
^{a)} Idling torques decrease during operation

^{b)} Refers to center of output shaft or flange at $n_2 = 300$ rpm

^{c)} Other ratios available on request

^{d)} Note the reduced torque depending on the design


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




- a) Hollow shaft, keywayed
- b) Hollow shaft, smooth
- c) End disc for screw M6
- d) End disc as forcing washer for screw M8
- e) Locking ring – DIN 472

Non-tolerated dimensions ± 1 mm

- 1) Check motor shaft fit.
- 2) Min./Max. permissible motor shaft length.
Longer motor shafts are adaptable, please contact us.
- 3) The dimensions depend on the motor.
- 4) Smaller motor shaft diameter is compensated by a bushing with a minimum thickness of 1 mm. Motor shaft diameters up to 19 mm available – please contact WITTENSTEIN alpha.
- 5) Tolerance h6 for mounted shaft.

 CAD data is available under www.wittenstein-alpha.com

 Motor mounting according to operating manual

			1-stage						2-stage ^{o)}								
Ratio	i		4	7	10	16	28	40	50	70	100	140	200	280	400		
Max. torque	T_{2a}	Nm	165	180	182	193	204	183	182	180	182	204	183	204	183		
		in.lb	1460	1593	1611	1708	1805	1620	1611	1593	1611	1805	1620	1805	1620		
Constant torsional backlash throughout its lifespan	T_{2Servo}	Nm	54	71	74	81	90	74	74	71	74	90	74	90	74		
		in.lb	478	628	655	717	797	655	655	628	655	797	655	797	655		
Efficiency at full load	η	%	92	89	86	82	72	64	84	87	84	70	62	70	62		
Emergency stop torque	T_{2Not}	Nm	230	242	242	250	262	236	242	242	242	262	236	262	236		
		in.lb	2036	2142	2142	2213	2319	2089	2142	2142	2142	2319	2089	2319	2089		
Nominal input speed <small>(with 20°C ambient temperature)^{o),e)}</small>	n_{1N}	min ⁻¹	4000						6000								
Max. input speed	n_{1Max}	rpm	6000														
Mean no load running torque ^{a)} <small>(With $n_2=3000$ min⁻¹ and 20° C gear temperature)</small>	T_{012}	Nm	2.3	2.2	1.6	1.5	1.2	1.1	0.7	0.5	0.4	0.6	0.6	0.4	0.4		
		in.lb	20.4	19.5	14.2	13.3	10.6	9.7	6.2	4.4	3.5	5.3	5.3	3.5	3.5		
Max. torsional backlash	j_t	arcmin	Standard ≤ 3 / Reduced ≤ 2						Standard ≤ 4 / Reduced ≤ 3								
Torsional rigidity	C_{121}	Nm/arcmin	8														
		in.lb/arcmin	71														
Max. axial force ^{b)}	F_{2AMax}	N	5000														
		lb _f	1125														
Max. radial force ^{b)}	F_{2RMax}	N	3800														
		lb _f	855														
Max. tilting moment	M_{2KMax}	Nm	409														
		in.lb	3620														
Service life	L_h	h	> 20000														
Weight incl. standard adapter plate	m	kg	8.0						8.7								
		lb _m	17.7						19.0								
Operating noise <small>(with $n_2 = 3000$ rpm no load)</small>	L_{PA}	dB(A)	≤ 62														
Max. permitted housing temperature	°C		+90														
	F		194														
Ambient temperature	°C		-15 to +40														
	F		5 to 104														
Lubrication			Lubricated for life														
Paint			Innovation blue														
Direction of rotation			See drawing														
Protection class			IP 65														
Moment of inertia <small>(relates to the drive)</small> <small>Clamping hub diameter [mm]</small>	C	14	J_i	kgcm ²	-	-	-	-	-	-	0.80	0.80	0.80	0.70	0.70	0.70	0.70
				10 ⁻³ in.lb.s ²	-	-	-	-	-	-	0.71	0.71	0.71	0.62	0.62	0.62	0.62
	E	19	J_i	kgcm ²	1.50	1.21	1.12	1.03	1.00	1.05	1.20	1.30	1.20	1.10	1.10	1.10	1.10
				10 ⁻³ in.lb.s ²	1.33	1.07	0.99	0.91	0.89	0.93	1.06	1.15	1.06	0.97	0.97	0.97	0.97

Please contact us for information on the best configuration for S1 conditions of use (continuous operation).

Please use our cymex® 5 sizing tool to obtain a more detailed design – www.wittenstein-cymex.com

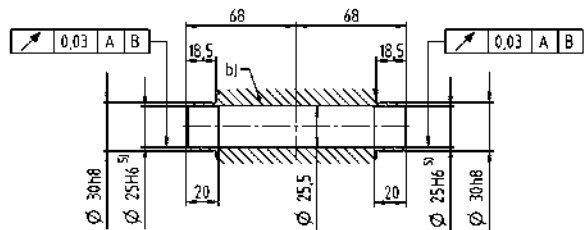
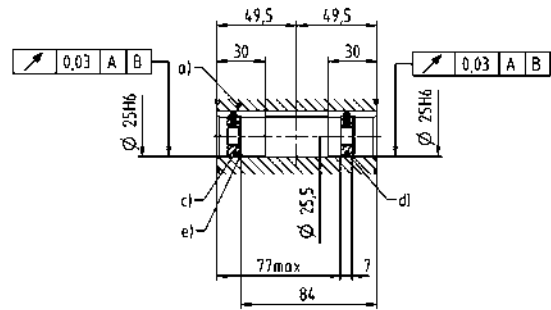
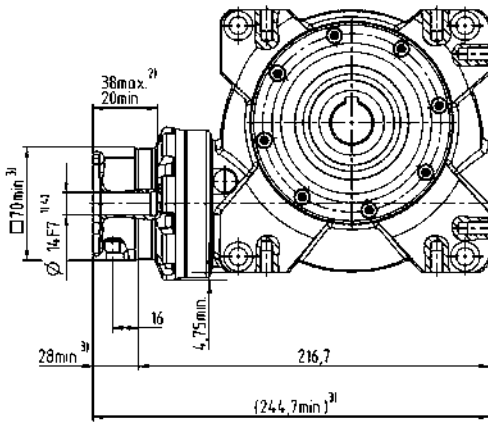
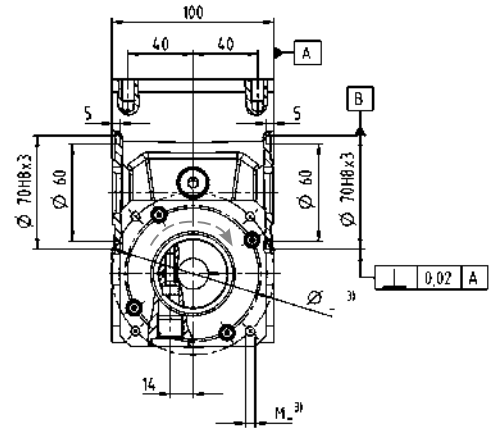
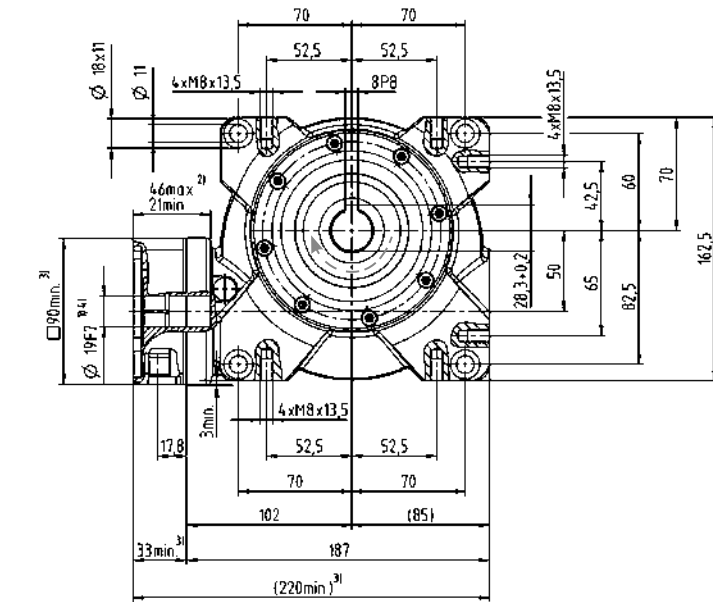
^{a)} Idling torques decrease during operation

^{b)} Refers to center of output shaft or flange at $n_2 = 300$ rpm

^{c)} Other ratios available on request

^{d)} Note the reduced torque depending on the design


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




- a) Hollow shaft, keywayed
- b) Hollow shaft, smooth
- c) End disc for screw M10
- d) End disc as forcing washer for screw M12
- e) Locking ring – DIN 472

Non-tolerated dimensions ± 1 mm

- 1) Check motor shaft fit.
- 2) Min./Max. permissible motor shaft length.
Longer motor shafts are adaptable, please contact us.
- 3) The dimensions depend on the motor.
- 4) Smaller motor shaft diameter is compensated by a bushing with a minimum thickness of 1 mm.
- 5) Tolerance h6 for mounted shaft.

 CAD data is available under www.wittenstein-alpha.com

 Motor mounting according to operating manual

			1-stage						2-stage [ⓐ]								
Ratio	i		4	7	10	16	28	40	50	70	100	140	200	280	400		
Max. torque	T_{2a}	Nm	319	353	364	372	392	363	364	353	364	392	363	392	363		
		in.lb	2823	3124	3221	3292	3469	3213	3221	3124	3221	3469	3213	3469	3213		
Constant torsional backlash throughout its lifespan	T_{2Servo}	Nm	198	210	225	221	229	226	225	210	225	229	226	229	226		
		in.lb	1752	1859	1991	1956	2027	2000	1991	1859	1991	2027	2000	2027	2000		
Efficiency at full load	η	%	93	91	88	83	74	68	86	89	86	72	66	72	66		
Emergency stop torque	T_{2Not}	Nm	460	484	491	494	518	447	491	484	494	518	447	518	447		
		in.lb	4071	4283	4345	4372	4584	3956	4345	4283	4372	4584	3956	4584	3956		
Nominal input speed <small>(with 20°C ambient temperature)^{ⓐⓑ}</small>	n_{1N}	min ⁻¹	4000						4500								
Max. input speed	n_{1Max}	rpm	4500														
Mean no load running torque [ⓐ] <small>(With $n_1=3000$ min⁻¹ and 20° C gear temperature)</small>	T_{012}	Nm	4.2	3.1	3	2.4	2.3	2.2	1.2	0.7	0.7	1.1	1.1	0.8	0.6		
		in.lb	37.2	27.4	26.6	21.2	20.4	19.5	10.6	6.2	6.2	9.7	9.7	7.1	5.3		
Max. torsional backlash	j_t	arcmin	Standard ≤ 3 / Reduced ≤ 2						Standard ≤ 4 / Reduced ≤ 3								
Torsional rigidity	C_{t21}	Nm/arcmin	28														
		in.lb/arcmin	248														
Max. axial force [ⓑ]	F_{2AMax}	N	8250														
		lb _f	1856														
Max. radial force [ⓑ]	F_{2RMax}	N	6000														
		lb _f	1350														
Max. tilting moment	M_{2KMax}	Nm	843														
		in.lb	7461														
Service life	L_h	h	> 20000														
Weight incl. standard adapter plate	m	kg	13.0						13.7								
		lb _m	28.7						30.0								
Operating noise <small>(with $n_1=3000$ rpm no load)</small>	L_{PA}	dB(A)	≤ 64														
Max. permitted housing temperature	°C		+90														
	F		194														
Ambient temperature	°C		-15 to +40														
	F		5 to 104														
Lubrication			Lubricated for life														
Paint			Innovation blue														
Direction of rotation			See drawing														
Protection class			IP 65														
Moment of inertia <small>(relates to the drive)</small> <small>Clamping hub diameter [mm]</small>	E	19	J_t	kgcm ²	-	-	-	-	-	-	2.60	2.80	2.50	2.40	2.40	2.30	
				10 ⁻⁴ in.lb.s ²	-	-	-	-	-	-	2.30	2.48	2.21	2.12	2.12	2.12	2.04
	G	24	J_t	kgcm ²	-	-	-	-	-	-	4.10	4.30	4.10	4.00	4.00	3.90	3.90
				10 ⁻⁴ in.lb.s ²	-	-	-	-	-	-	3.63	3.81	3.63	3.54	3.54	3.45	3.45
	H	28	J_t	kgcm ²	4.80	3.89	3.65	3.56	3.52	3.47	-	-	-	-	-	-	-
				10 ⁻⁴ in.lb.s ²	4.25	3.44	3.23	3.15	3.12	3.07	-	-	-	-	-	-	-

Please contact us for information on the best configuration for S1 conditions of use (continuous operation).

Please use our cymex[®] 5 sizing tool to obtain a more detailed design – www.wittenstein-cymex.com

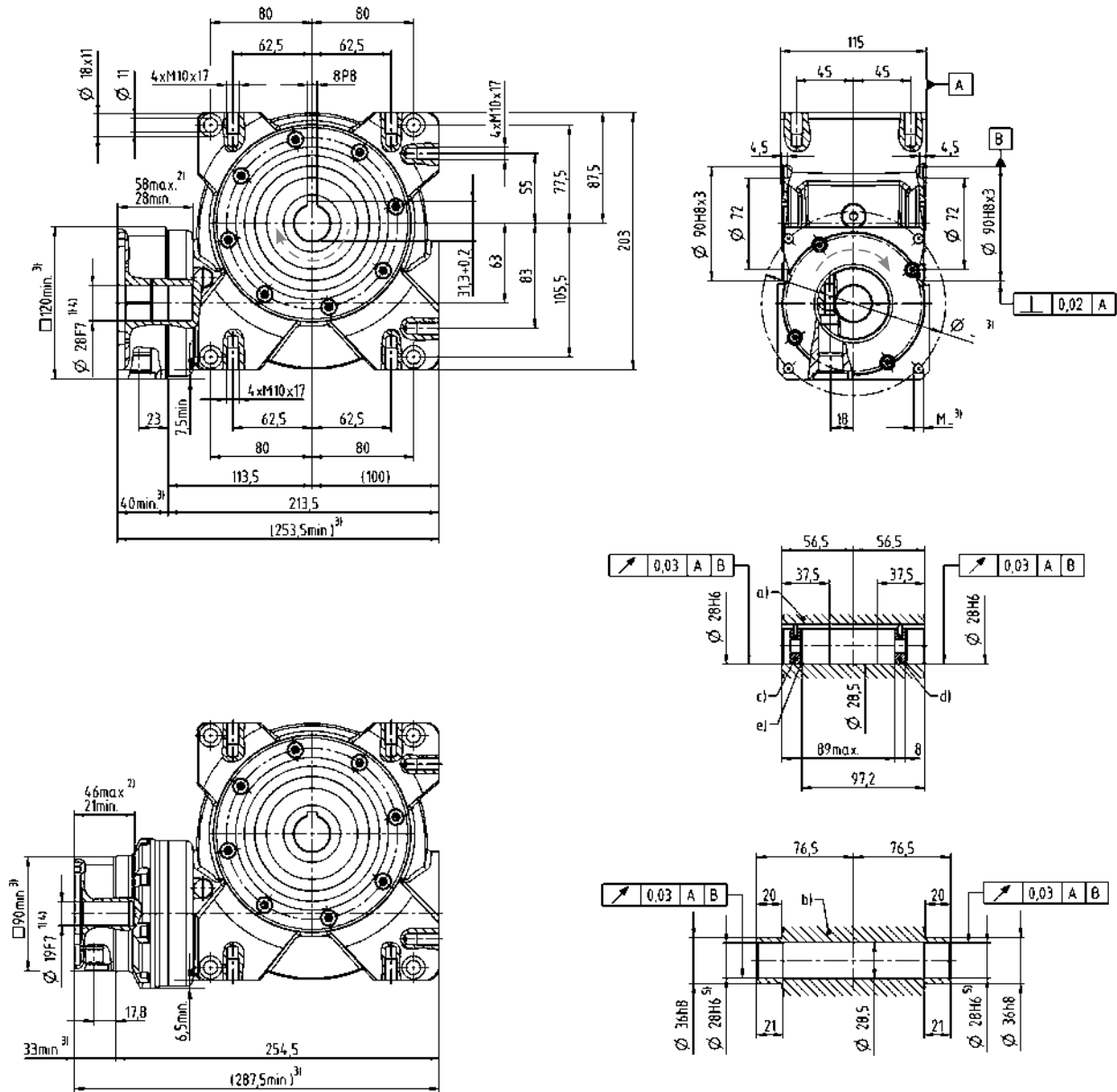
[ⓐ] Idling torques decrease during operation

[ⓑ] Refers to center of output shaft or flange at $n_2 = 300$ rpm

[ⓒ] Other ratios available on request

[ⓓ] Note the reduced torque depending on the design


[ⓔ] For higher ambient temperatures, please reduce input speed




- a) Hollow shaft, keywayed
- b) Hollow shaft, smooth
- c) End disc for screw M10
- d) End disc as forcing washer for screw M12
- e) Locking ring – DIN 472

Non-tolerated dimensions ± 1 mm

- 1) Check motor shaft fit.
- 2) Min./Max. permissible motor shaft length.
Longer motor shafts are adaptable, please contact us.
- 3) The dimensions depend on the motor.
- 4) Smaller motor shaft diameter is compensated by a bushing with a minimum thickness of 1 mm.
- 5) Tolerance h6 for mounted shaft.

 CAD data is available under www.wittenstein-alpha.com

 Motor mounting according to operating manual

			1-stage						2-stage ^{o)}								
Ratio	i		4	7	10	16	28	40	50	70	100	140	200	280	400		
Max. torque	T_{2a}	Nm	578	646	672	702	785	676	672	646	672	785	676	785	676		
		in.lb	5115	5717	5947	6213	6947	5983	5947	5717	5947	6947	5983	6947	5983		
Constant torsional backlash throughout its lifespan	T_{2Servo}	Nm	469	601	613	677	764	631	613	601	613	764	631	764	631		
		in.lb	4151	5319	5425	5991	6761	5584	5425	5319	5425	6761	5584	6761	5584		
Efficiency at full load	η	%	94	92	89	86	77	70	87	90	87	75	68	75	68		
Emergency stop torque	T_{2Not}	Nm	938	993	963	1005	1064	941	963	993	963	1064	941	1064	941		
		in.lb	8301	8788	8523	8894	9416	8328	8523	8788	8523	9416	8328	9416	8328		
Nominal input speed <small>(with 20°C ambient temperature)^{o),e)}</small>	n_{1N}	min ⁻¹	3500						4500								
Max. input speed	n_{1Max}	rpm	4000						4500								
Mean no load running torque ^{a)} <small>(With $n_2=3000$ min⁻¹ and 20° C gear temperature)</small>	T_{012}	Nm	7.2	7.1	6.5	5	4.8	4.5	2.8	1.6	1.5	2.4	2.4	1.8	1.3		
		in.lb	63.7	62.8	57.5	44.3	42.5	39.8	24.8	14.2	13.3	21.2	21.2	15.9	11.5		
Max. torsional backlash	j_t	arcmin	Standard ≤ 3 / Reduced ≤ 2						Standard ≤ 4 / Reduced ≤ 3								
Torsional rigidity	C_{121}	Nm/arcmin	78						78								
		in.lb/arcmin	690						690								
Max. axial force ^{b)}	F_{2AMax}	N	13900						13900								
		lb _f	3128						3128								
Max. radial force ^{b)}	F_{2RMax}	N	9000						9000								
		lb _f	2025						2025								
Max. tilting moment	M_{2KMax}	Nm	1544						1544								
		in.lb	13664						13664								
Service life	L_h	h	> 20000						> 20000								
Weight incl. standard adapter plate	m	kg	27.0						29.5								
		lb _m	59.7						68.0								
Operating noise <small>(with $n_2 = 3000$ rpm no load)</small>	L_{PA}	dB(A)	≤ 66						≤ 68								
Max. permitted housing temperature	°C		+90						+90								
	F		194						194								
Ambient temperature	°C		-15 to +40						-15 to +40								
	F		5 to 104						5 to 104								
Lubrication			Lubricated for life						Lubricated for life								
Paint			Innovation blue						Innovation blue								
Direction of rotation			See drawing						See drawing								
Protection class			IP 65						IP 65								
Moment of inertia <small>(relates to the drive)</small> <small>Clamping hub diameter [mm]</small>	G	24	J_i	kgcm ²	-	-	-	-	-	-	10.40	10.10	10.10	8.80	9.50	9.40	9.30
				10 ⁻³ in.lb.s ²	-	-	-	-	-	-	-	-	9.20	8.94	8.94	7.79	8.41
	K	38	J_i	kgcm ²	20.30	16.75	16.79	15.37	15.26	15.90	17.30	17.00	17.10	15.80	16.40	16.30	16.20
				10 ⁻³ in.lb.s ²	17.97	14.82	14.86	13.60	13.51	14.07	15.31	15.05	15.13	13.98	14.51	14.43	14.34

Please contact us for information on the best configuration for S1 conditions of use (continuous operation).

Please use our cymex® 5 sizing tool to obtain a more detailed design – www.wittenstein-cymex.com

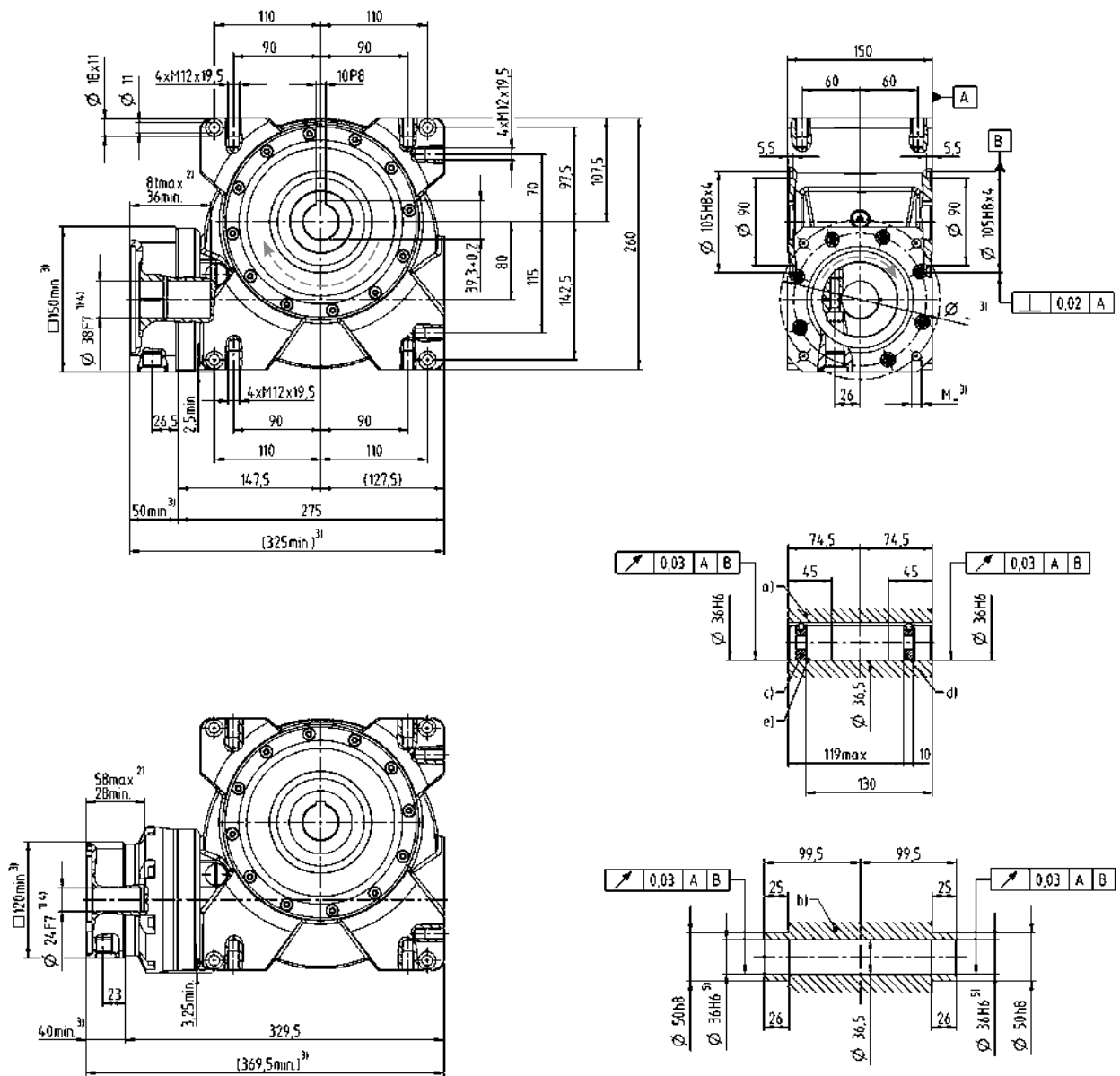
^{a)} Idling torques decrease during operation

^{b)} Refers to center of output shaft or flange at $n_2 = 300$ rpm

^{c)} Other ratios available on request

^{d)} Note the reduced torque depending on the design


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




- a) Hollow shaft, keywayed
- b) Hollow shaft, smooth
- c) End disc for screw M12
- d) End disc as forcing washer for screw M16
- e) Locking ring – DIN 472

Non-tolerated dimensions ± 1 mm

- 1) Check motor shaft fit.
- 2) Min./Max. permissible motor shaft length.
Longer motor shafts are adaptable, please contact us.
- 3) The dimensions depend on the motor.
- 4) Smaller motor shaft diameter is compensated by a bushing with a minimum thickness of 1 mm.
- 5) Tolerance h6 for mounted shaft.

 CAD data is available under www.wittenstein-alpha.com

 Motor mounting according to operating manual

			1-stage						2-stage ^{o)}								
Ratio	i		4	7	10	16	28	40	50	70	100	140	200	280	400		
Max. torque	T_{2a}	Nm	1184	1336	1377	1392	1505	1376	1377	1377	1377	1505	1376	1505	1376		
		in.lb	10478	11824	12186	12319	13319	12178	12186	12186	12186	13319	12178	13319	12178		
Constant torsional backlash throughout its lifespan	T_{2Servo}	Nm	1155	1304	1343	1359	1469	1343	1343	1343	1343	1469	1343	1469	1343		
		in.lb	10222	11540	11886	12027	13001	11886	11886	11886	11886	13001	11886	13001	11886		
Efficiency at full load	η	%	95	93	91	87	80	76	89	89	89	78	74	78	74		
Emergency stop torque	T_{2Not}	Nm	1819	1932	1940	1955	2073	1856	1940	1940	1940	2073	1856	2073	1856		
		in.lb	16098	17098	17169	17302	18346	16426	17169	17169	17169	18346	16426	18346	16426		
Nominal input speed <small>(with 20°C ambient temperature)^{o),e)}</small>	n_{1N}	min ⁻¹	3000						4000								
Max. input speed	n_{1Max}	rpm	3500						4000								
Mean no load running torque ^{a)} <small>(With $n_1=3000$ min⁻¹ and 20° C gear temperature)</small>	T_{012}	Nm	12.2	10.5	9.8	9.1	8.2	7.2	4.1	2.3	2.2	3.8	3.6	2.6	2		
		in.lb	108.0	92.9	86.7	80.5	72.6	63.7	36.3	20.4	19.5	33.6	31.9	23.0	17.7		
Max. torsional backlash	j_t	arcmin	Standard ≤ 3 / Reduced ≤ 2						Standard ≤ 4 / Reduced ≤ 3								
Torsional rigidity	C_{121}	Nm/arcmin	153						153								
		in.lb/arcmin	1354						1354								
Max. axial force ^{b)}	F_{2AMax}	N	19500						19500								
		lb _f	4388						4388								
Max. radial force ^{b)}	F_{2RMax}	N	14000						14000								
		lb _f	3150						3150								
Max. tilting moment	M_{2KMax}	Nm	3059						3059								
		in.lb	27072						27072								
Service life	L_h	h	> 20000						> 20000								
Weight incl. standard adapter plate	m	kg	51.0						53.6								
		lb _m	112.7						118.0								
Operating noise <small>(with $n_1=3000$ rpm no load)</small>	L_{PA}	dB(A)	≤ 70						≤ 70								
Max. permitted housing temperature	°C		+90						+90								
	F		194						194								
Ambient temperature	°C		-15 to +40						-15 to +40								
	F		5 to 104						5 to 104								
Lubrication			Lubricated for life						Lubricated for life								
Paint			Innovation blue						Innovation blue								
Direction of rotation			See drawing						See drawing								
Protection class			IP 65						IP 65								
Moment of inertia <small>(relates to the drive)</small> <small>Clamping hub diameter [mm]</small>	K	38	J_t	kgcm ²	-	-	-	-	-	-	31.70	33.00	31.10	30.10	30.40	30.00	29.80
				10 ⁻³ in.lb.s ²	-	-	-	-	-	-	-	-	28.05	29.21	27.52	26.64	26.90
	M	48	J_t	kgcm ²	50.25	40.70	38.77	39.62	37.15	37.47	46.40	47.70	45.80	44.80	45.10	44.70	44.50
				10 ⁻³ in.lb.s ²	44.47	36.02	34.31	35.06	32.88	33.16	41.06	42.21	40.53	39.65	39.91	39.56	39.38

Please contact us for information on the best configuration for S1 conditions of use (continuous operation).

Please use our cymex® 5 sizing tool to obtain a more detailed design – www.wittenstein-cymex.com

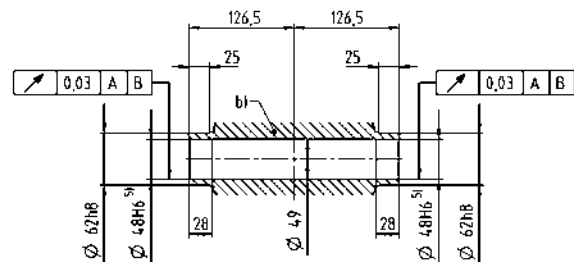
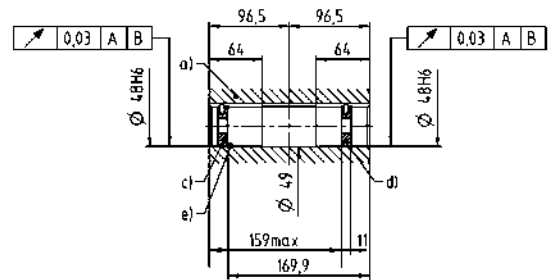
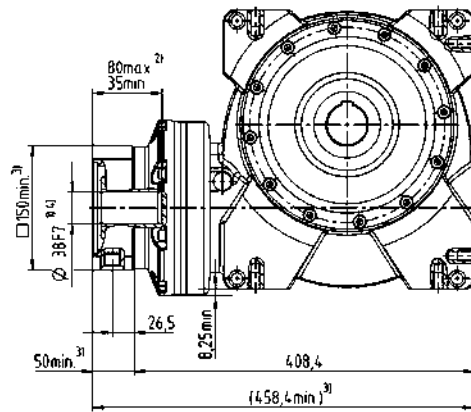
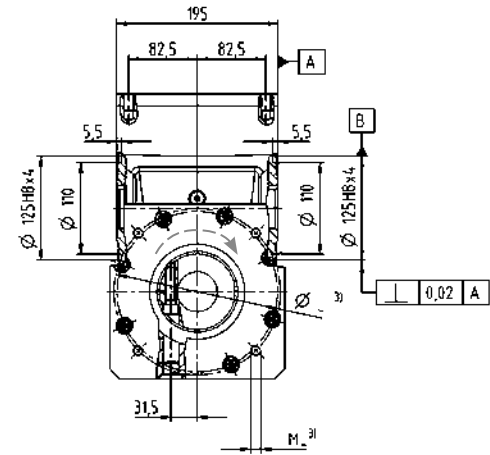
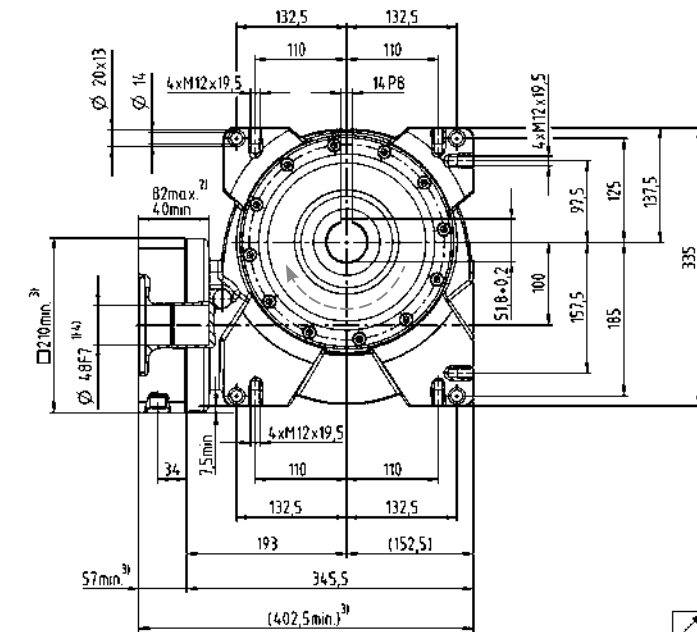
^{a)} Idling torques decrease during operation

^{b)} Refers to center of output shaft or flange at $n_2 = 300$ rpm

^{c)} Other ratios available on request

^{d)} Note the reduced torque depending on the design


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




- a) Hollow shaft, keywayed
- b) Hollow shaft, smooth
- c) End disc for screw M16
- d) End disc as forcing washer for screw M20
- e) Locking ring – DIN 472

Non-tolerated dimensions ± 1 mm

- 1) Check motor shaft fit.
- 2) Min./Max. permissible motor shaft length.
Longer motor shafts are adaptable, please contact us.
- 3) The dimensions depend on the motor.
- 4) Smaller motor shaft diameter is compensated by a bushing with a minimum thickness of 1 mm.
- 5) Tolerance h6 for mounted shaft.

 CAD data is available under www.wittenstein-alpha.com

 Motor mounting according to operating manual

			1-stage						2-stage ^{c)}								
Ratio	i		4	7	10	16	28	40	50	70	100	140	200	280	400		
Max. torque	T_{2a}	Nm	165	180	182	193	204	183	182	180	182	204	183	204	183		
		in.lb	1460	1593	1611	1708	1805	1620	1611	1593	1611	1805	1620	1805	1620		
Constant torsional backlash throughout its lifespan	T_{2Servo}	Nm	54	71	74	81	90	74	74	71	74	90	74	90	74		
		in.lb	478	628	655	717	797	655	655	628	655	797	655	797	655		
Efficiency at full load	η	%	92	89	86	82	72	64	84	87	84	70	62	70	62		
Emergency stop torque	T_{2Not}	Nm	230	242	242	250	262	236	242	242	242	262	236	262	236		
		in.lb	2036	2142	2142	2213	2319	2089	2142	2142	2142	2319	2089	2319	2089		
Nominal input speed <small>(with 20°C ambient temperature)^{d),e)}</small>	n_{1N}	min ⁻¹	4000						6000								
Max. input speed	n_{1Max}	rpm	6000														
Mean no load running torque ^{a)} <small>(With $n_2=3000$ min⁻¹ and 20° C gear temperature)</small>	T_{012}	Nm	2.3	2.2	1.6	1.5	1.2	1.1	0.7	0.5	0.4	0.6	0.6	0.4	0.4		
		in.lb	20.4	19.5	14.2	13.3	10.6	9.7	6.2	4.4	3.5	5.3	5.3	3.5	3.5		
Max. torsional backlash	j_t	arcmin	Standard ≤ 3 / Reduced ≤ 2						Standard ≤ 4 / Reduced ≤ 3								
Torsional rigidity	C_{121}	Nm/arcmin	8														
		in.lb/arcmin	71														
Max. axial force ^{b)}	F_{2AMax}	N	5000														
		lb _f	1125														
Max. radial force ^{b)}	F_{2RMax}	N	3800														
		lb _f	855														
Max. tilting moment	M_{2KMax}	Nm	409														
		in.lb	3620														
Service life	L_h	h	> 20000														
Weight incl. standard adapter plate	m	kg	9.0						9.7								
		lb _m	19.9						21.0								
Operating noise <small>(with $n_2 = 3000$ rpm no load)</small>	L_{PA}	dB(A)	≤ 62														
Max. permitted housing temperature	°C		+90														
	F		194														
Ambient temperature	°C		-15 to +40														
	F		5 to 104														
Lubrication			Lubricated for life														
Paint			Innovation blue														
Direction of rotation			See drawing														
Protection class			IP 65														
Moment of inertia <small>(relates to the drive)</small> <small>Clamping hub diameter [mm]</small>	C	14	J_i	kgcm ²	-	-	-	-	-	-	0.80	0.80	0.80	0.70	0.70	0.70	0.70
				10 ⁻³ in.lb.s ²	-	-	-	-	-	-	0.71	0.71	0.71	0.62	0.62	0.62	0.62
	E	19	J_i	kgcm ²	1.50	1.21	1.12	1.03	1.00	1.05	1.20	1.30	1.20	1.10	1.10	1.10	1.10
				10 ⁻³ in.lb.s ²	1.33	1.07	0.99	0.91	0.89	0.93	1.06	1.15	1.06	0.97	0.97	0.97	0.97

Please contact us for information on the best configuration for S1 conditions of use (continuous operation).

Please use our cymex® 5 sizing tool to obtain a more detailed design – www.wittenstein-cymex.com

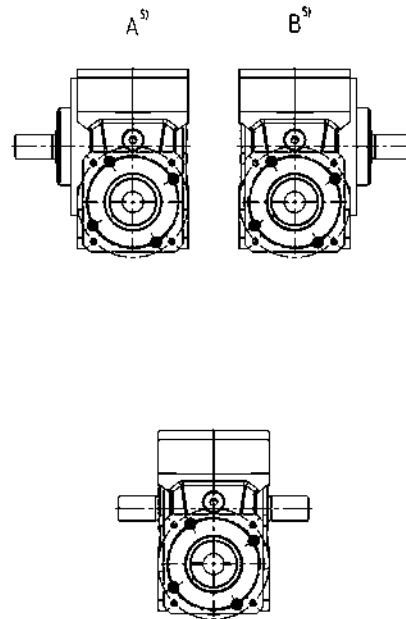
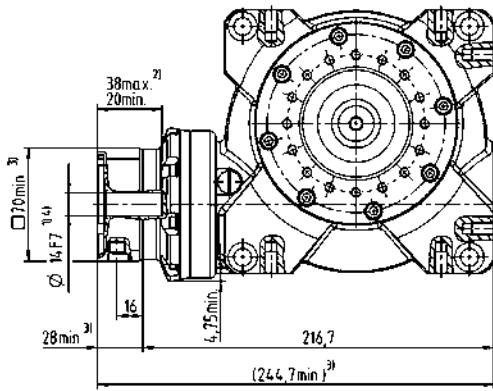
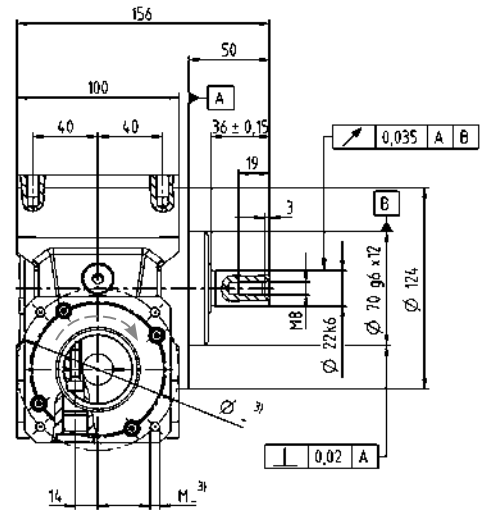
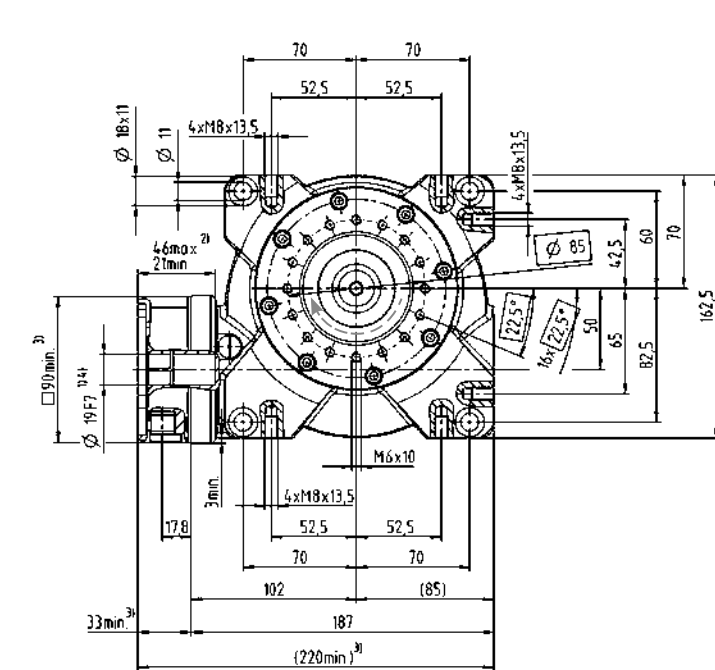
^{a)} Idling torques decrease during operation

^{b)} Refers to center of output shaft or flange at $n_2 = 300$ rpm

^{c)} Other ratios available on request

^{d)} Note the reduced torque depending on the design

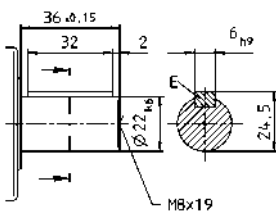
^{e)} For higher ambient temperatures, please reduce input speed



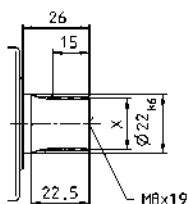
Optional dual-shaft output. Drawings available upon request.
Involute gearing is not possible.

Alternatives: Output shaft variants

Keywayed output shaft in mm
E = key as per DIN 6885, sheet 1, form A



Involute gearing DIN 5480 in mm
X = W 22 x 1.25 x 30 x 16 x 6 mm



Non-tolerated dimensions ± 1 mm

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

CAD data is available under www.wittenstein-alpha.com

Motor mounting according to operating manual

			1-stage						2-stage [ⓐ]								
Ratio	i		4	7	10	16	28	40	50	70	100	140	200	280	400		
Max. torque	T_{2a}	Nm	319	353	364	372	392	363	364	353	364	392	363	392	363		
		in.lb	2823	3124	3221	3292	3469	3213	3221	3124	3221	3469	3213	3469	3213		
Constant torsional backlash throughout its lifespan	T_{2Servo}	Nm	198	210	225	221	229	226	225	210	225	229	226	229	226		
		in.lb	1752	1859	1991	1956	2027	2000	1991	1859	1991	2027	2000	2027	2000		
Efficiency at full load	η	%	93	91	88	83	74	68	86	89	86	72	66	72	66		
Emergency stop torque	T_{2Not}	Nm	460	484	491	494	518	447	491	484	494	518	447	518	447		
		in.lb	4071	4283	4345	4372	4584	3956	4345	4283	4372	4584	3956	4584	3956		
Nominal input speed <small>(with 20°C ambient temperature)^{ⓐⓑ}</small>	n_{1N}	min ⁻¹	4000						4500								
Max. input speed	n_{1Max}	rpm	4500														
Mean no load running torque [ⓐ] <small>(With $n_1=3000$ min⁻¹ and 20° C gear temperature)</small>	T_{012}	Nm	4.2	3.1	3	2.4	2.3	2.2	1.2	0.7	0.7	1.1	1.1	0.8	0.6		
		in.lb	37.2	27.4	26.6	21.2	20.4	19.5	10.6	6.2	6.2	9.7	9.7	7.1	5.3		
Max. torsional backlash	j_t	arcmin	Standard ≤ 3 / Reduced ≤ 2						Standard ≤ 4 / Reduced ≤ 3								
Torsional rigidity	C_{121}	Nm/arcmin	28														
		in.lb/arcmin	248														
Max. axial force [ⓑ]	F_{2AMax}	N	8250														
		lb _f	1856														
Max. radial force [ⓑ]	F_{2RMax}	N	6000														
		lb _f	1350														
Max. tilting moment	M_{2KMax}	Nm	843														
		in.lb	7461														
Service life	L_h	h	> 20000														
Weight incl. standard adapter plate	m	kg	16.0						16.7								
		lb _m	35.4						37.0								
Operating noise <small>(with $n_1=3000$ rpm no load)</small>	L_{PA}	dB(A)	≤ 64														
Max. permitted housing temperature			°C														
			F														
Ambient temperature			°C														
			F														
Lubrication			Lubricated for life														
Paint			Innovation blue														
Direction of rotation			See drawing														
Protection class			IP 65														
Moment of inertia <small>(relates to the drive)</small> <small>Clamping hub diameter [mm]</small>	E	19	J_I	kgcm ²	-	-	-	-	-	-	2.60	2.80	2.50	2.40	2.40	2.30	
				10 ⁻⁴ in.lb.s ²	-	-	-	-	-	-	2.30	2.48	2.21	2.12	2.12	2.12	2.04
	G	24	J_I	kgcm ²	-	-	-	-	-	-	4.10	4.30	4.10	4.00	4.00	3.90	3.90
				10 ⁻⁴ in.lb.s ²	-	-	-	-	-	-	3.63	3.81	3.63	3.54	3.54	3.45	3.45
	H	28	J_I	kgcm ²	4.80	3.89	3.65	3.56	3.52	3.47	-	-	-	-	-	-	-
				10 ⁻⁴ in.lb.s ²	4.25	3.44	3.23	3.15	3.12	3.07	-	-	-	-	-	-	-

Please contact us for information on the best configuration for S1 conditions of use (continuous operation).

Please use our cymex[®] 5 sizing tool to obtain a more detailed design – www.wittenstein-cymex.com

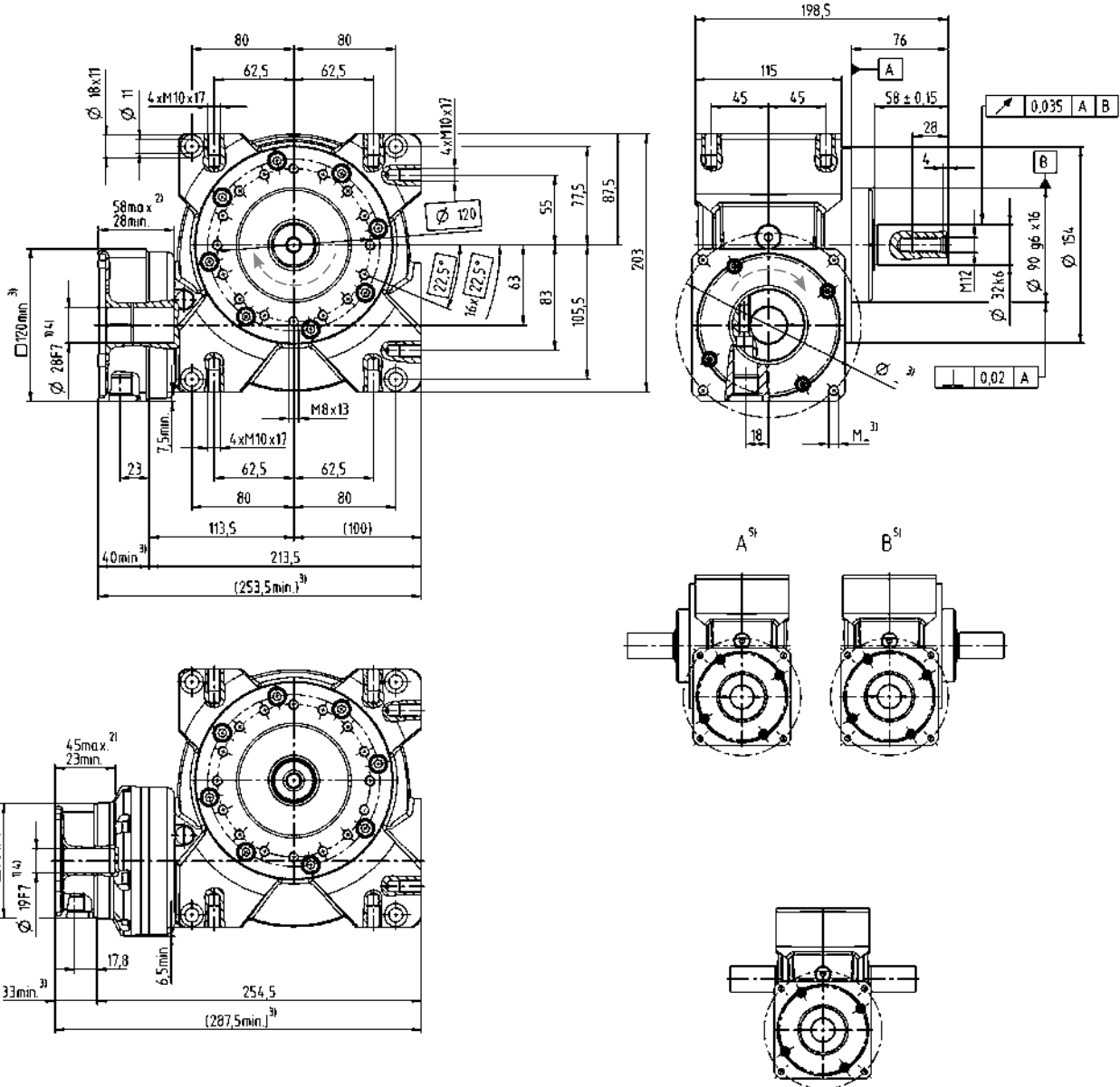
[ⓐ] Idling torques decrease during operation

[ⓑ] Refers to center of output shaft or flange at $n_2 = 300$ rpm

[ⓒ] Other ratios available on request

[ⓓ] Note the reduced torque depending on the design

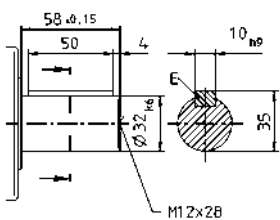
[ⓔ] For higher ambient temperatures, please reduce input speed



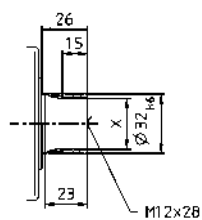
Optional dual-shaft output. Drawings available upon request.
Involute gearing is not possible.

Alternatives: Output shaft variants

Keywayed output shaft in mm
E = key as per DIN 6885, sheet 1, form A



Involute gearing DIN 5480
X = W 32 x 1.25 x 30 x 24 x 6m



Non-tolerated dimensions ± 1 mm

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

CAD data is available under www.wittenstein-alpha.com

Motor mounting according to operating manual

			1-stage						2-stage ^{o)}								
Ratio	i		4	7	10	16	28	40	50	70	100	140	200	280	400		
Max. torque	T_{2a}	Nm	578	646	672	702	785	676	672	646	672	785	676	785	676		
		in.lb	5115	5717	5947	6213	6947	5983	5947	5717	5947	6947	5983	6947	5983		
Constant torsional backlash throughout its lifespan	T_{2Servo}	Nm	469	601	613	677	764	631	613	601	613	764	631	764	631		
		in.lb	4151	5319	5425	5991	6761	5584	5425	5319	5425	6761	5584	6761	5584		
Efficiency at full load	η	%	94	92	89	86	77	70	87	90	87	75	68	75	68		
Emergency stop torque	T_{2Not}	Nm	938	993	963	1005	1064	941	963	993	963	1064	941	1064	941		
		in.lb	8301	8788	8523	8894	9416	8328	8523	8788	8523	9416	8328	9416	8328		
Nominal input speed <small>(with 20°C ambient temperature)^{d),e)}</small>	n_{1N}	min ⁻¹	3500						4500								
Max. input speed	n_{1Max}	rpm	4000						4500								
Mean no load running torque ^{a)} <small>(With $n_2=3000$ min⁻¹ and 20° C gear temperature)</small>	T_{012}	Nm	7.2	7.1	6.5	5	4.8	4.5	2.8	1.6	1.5	2.4	2.4	1.8	1.3		
		in.lb	63.7	62.8	57.5	44.3	42.5	39.8	24.8	14.2	13.3	21.2	21.2	15.9	11.5		
Max. torsional backlash	j_t	arcmin	Standard ≤ 3 / Reduced ≤ 2						Standard ≤ 4 / Reduced ≤ 3								
Torsional rigidity	C_{121}	Nm/arcmin	78						78								
		in.lb/arcmin	690						690								
Max. axial force ^{b)}	F_{2AMax}	N	13900						13900								
		lb _f	3128						3128								
Max. radial force ^{b)}	F_{2RMax}	N	9000						9000								
		lb _f	2025						2025								
Max. tilting moment	M_{2KMax}	Nm	1544						1544								
		in.lb	13664						13664								
Service life	L_h	h	> 20000						> 20000								
Weight incl. standard adapter plate	m	kg	33.0						35.5								
		lb _m	72.9						78.0								
Operating noise <small>(with $n_2 = 3000$ rpm no load)</small>	L_{PA}	dB(A)	≤ 66						≤ 68								
Max. permitted housing temperature			°C						+90								
			F						194								
Ambient temperature			°C						-15 to +40								
			F						5 to 104								
Lubrication			Lubricated for life														
Paint			Innovation blue														
Direction of rotation			See drawing														
Protection class			IP 65														
Moment of inertia <small>(relates to the drive)</small> <small>Clamping hub diameter [mm]</small>	G	24	J_i	kgcm ²	-	-	-	-	-	-	10.40	10.10	10.10	8.80	9.50	9.40	9.30
				10 ⁻³ in.lb.s ²	-	-	-	-	-	-	9.20	8.94	8.94	7.79	8.41	8.32	8.23
	K	38	J_i	kgcm ²	20.30	16.56	16.69	15.33	15.24	15.90	17.30	17.00	17.10	15.80	16.40	16.30	16.20
				10 ⁻³ in.lb.s ²	17.97	14.66	14.77	13.57	13.49	14.07	15.31	15.05	15.13	13.98	14.51	14.43	14.34

Please contact us for information on the best configuration for S1 conditions of use (continuous operation).

Please use our cymex® 5 sizing tool to obtain a more detailed design – www.wittenstein-cymex.com

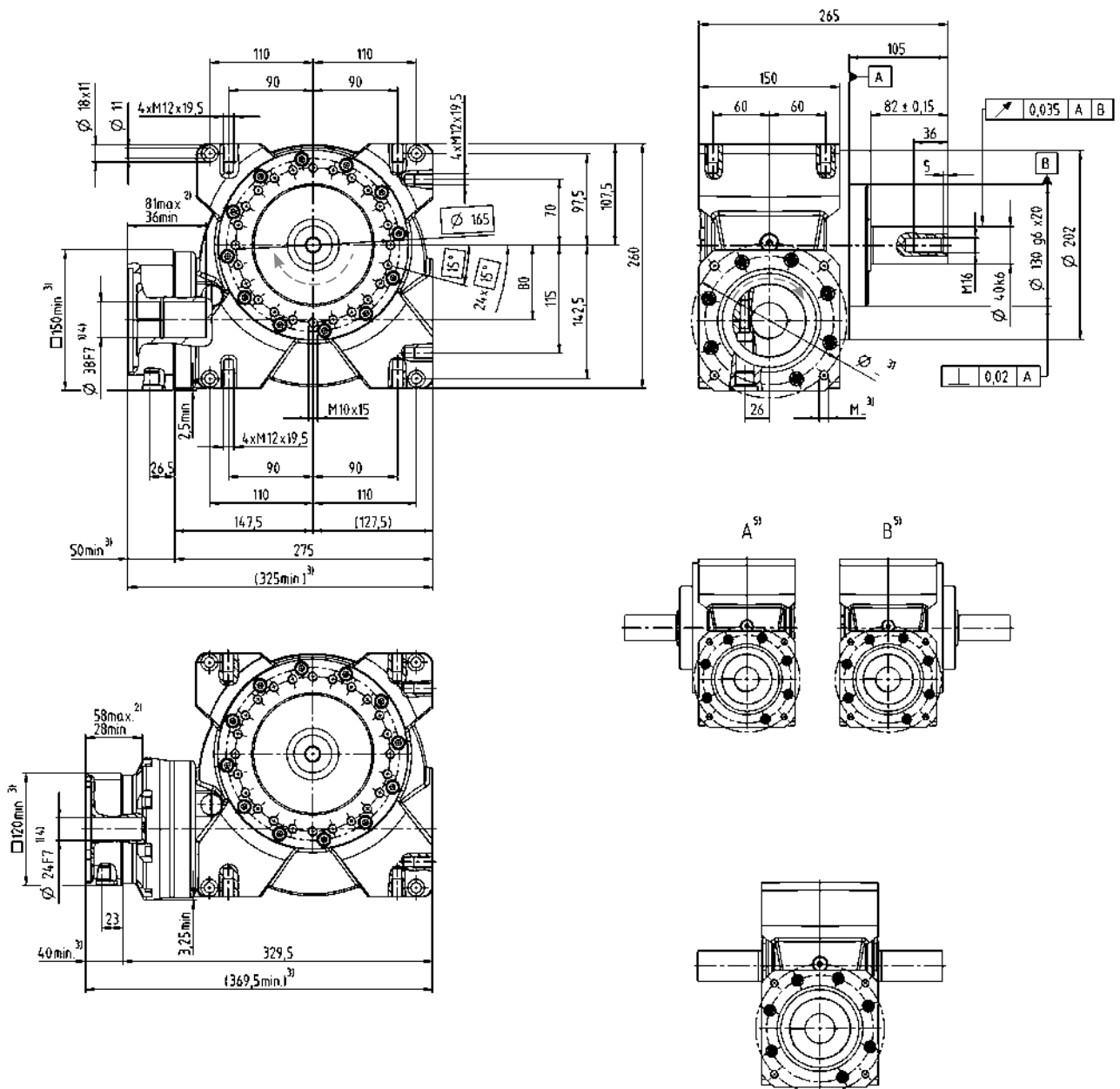
^{a)} Idling torques decrease during operation

^{b)} Refers to center of output shaft or flange at $n_2 = 300$ rpm

^{c)} Other ratios available on request

^{d)} Note the reduced torque depending on the design

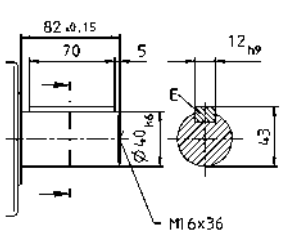
^{e)} For higher ambient temperatures, please reduce input speed



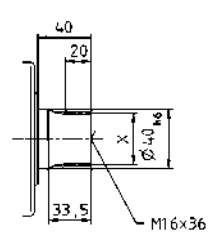
Optional dual-shaft output. Drawings available upon request.
Involute gearing is not possible.

Alternatives: Output shaft variants

Keywayed output shaft in mm
E = key as per DIN 6885, sheet 1, form A



Involute gearing DIN 5480
X = W 40 x 2 x 30 x 18 x 6m



- Non-tolerated dimensions ± 1 mm
- 1) Check motor shaft fit.
 - 2) Min./Max. permissible motor shaft length.
Longer motor shafts are adaptable, please contact us.
 - 3) The dimensions depend on the motor.
 - 4) Smaller motor shaft diameter is compensated by a bushing with a minimum thickness of 1 mm.
 - 5) Output side

CAD data is available under www.wittenstein-alpha.com

Motor mounting according to operating manual

			1-stage						2-stage ^{o)}								
Ratio	i		4	7	10	16	28	40	50	70	100	140	200	280	400		
Max. torque	T_{2a}	Nm	1184	1336	1377	1392	1505	1376	1377	1377	1377	1505	1376	1505	1376		
		in.lb	10478	11824	12186	12319	13319	12178	12186	12186	12186	13319	12178	13319	12178		
Constant torsional backlash throughout its lifespan	T_{2Servo}	Nm	1155	1304	1343	1359	1469	1343	1343	1343	1343	1469	1343	1469	1343		
		in.lb	10222	11540	11886	12027	13001	11886	11886	11886	11886	13001	11886	13001	11886		
Efficiency at full load	η	%	95	93	91	87	80	76	89	89	89	78	74	78	74		
Emergency stop torque	T_{2Not}	Nm	1819	1932	1940	1955	2073	1856	1940	1940	1940	2073	1856	2073	1856		
		in.lb	16098	17098	17169	17302	18346	16426	17169	17169	17169	18346	16426	18346	16426		
Nominal input speed <small>(with 20°C ambient temperature)^{o),e)}</small>	n_{1N}	min ⁻¹	3000						4000								
Max. input speed	n_{1Max}	rpm	3500						4000								
Mean no load running torque ^{a)} <small>(With $n_1=3000$ min⁻¹ and 20° C gear temperature)</small>	T_{012}	Nm	12.2	10.5	9.8	9.1	8.2	7.2	4.1	2.3	2.2	3.8	3.6	2.6	2		
		in.lb	108.0	92.9	86.7	80.5	72.6	63.7	36.3	20.4	19.5	33.6	31.9	23.0	17.7		
Max. torsional backlash	j_t	arcmin	Standard ≤ 3 / Reduced ≤ 2						Standard ≤ 4 / Reduced ≤ 3								
Torsional rigidity	C_{121}	Nm/arcmin							153								
		in.lb/arcmin							1354								
Max. axial force ^{b)}	F_{2AMax}	N							19500								
		lb _f							4388								
Max. radial force ^{b)}	F_{2RMax}	N							14000								
		lb _f							3150								
Max. tilting moment	M_{2KMax}	Nm							3059								
		in.lb							27072								
Service life	L_h	h							> 20000								
Weight incl. standard adapter plate	m	kg	62.0						64.6								
		lb _m	137.0						143.0								
Operating noise <small>(with $n_1=3000$ rpm no load)</small>	L_{PA}	dB(A)							≤ 70								
Max. permitted housing temperature			°C						+90								
			F						194								
Ambient temperature			°C						-15 to +40								
			F						5 to 104								
Lubrication									Lubricated for life								
Paint									Innovation blue								
Direction of rotation									See drawing								
Protection class									IP 65								
Moment of inertia <small>(relates to the drive)</small> <small>Clamping hub diameter [mm]</small>	K	38	J_i	kgcm ²	-	-	-	-	-	-	31.70	33.00	31.10	30.10	30.40	30.00	29.80
				10 ⁻³ in.lb.s ²	-	-	-	-	-	-	-	-	28.05	29.21	27.52	26.64	26.90
	M	48	J_i	kgcm ²	50.02	40.63	38.73	39.60	37.14	37.47	46.40	47.70	45.80	44.80	45.10	44.70	44.50
				10 ⁻³ in.lb.s ²	44.27	35.96	34.28	35.05	32.87	33.16	41.06	42.21	40.53	39.65	39.91	39.56	39.38

Please contact us for information on the best configuration for S1 conditions of use (continuous operation).

Please use our cymex® 5 sizing tool to obtain a more detailed design – www.wittenstein-cymex.com

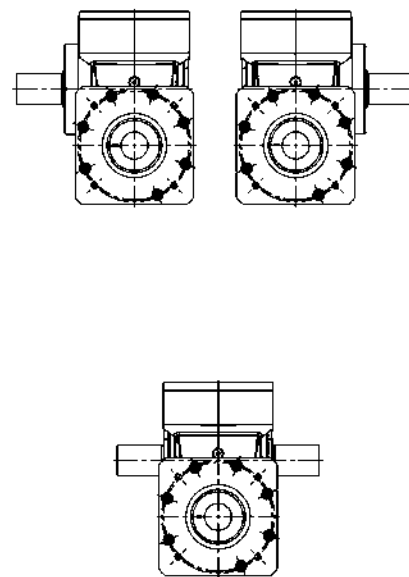
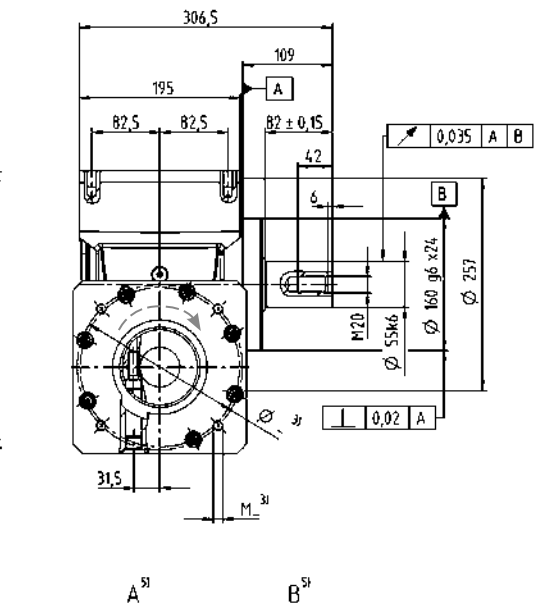
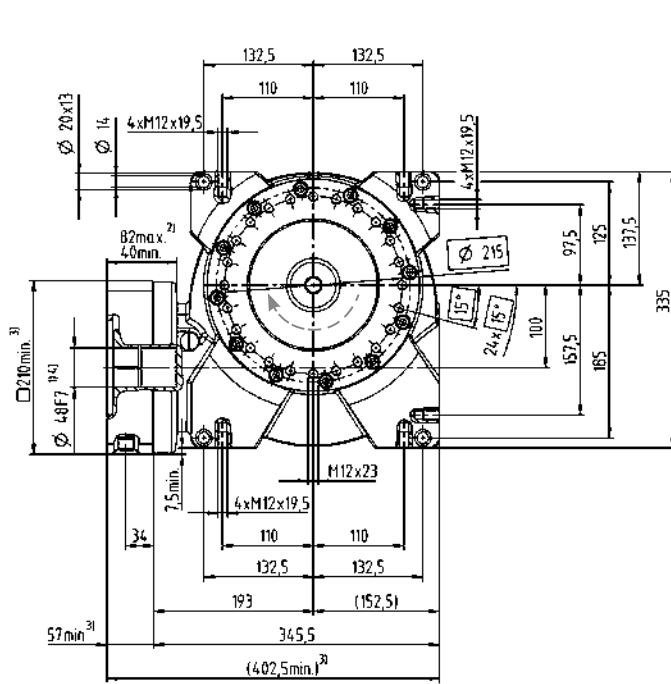
^{a)} Idling torques decrease during operation

^{b)} Refers to center of output shaft or flange at $n_2 = 300$ rpm

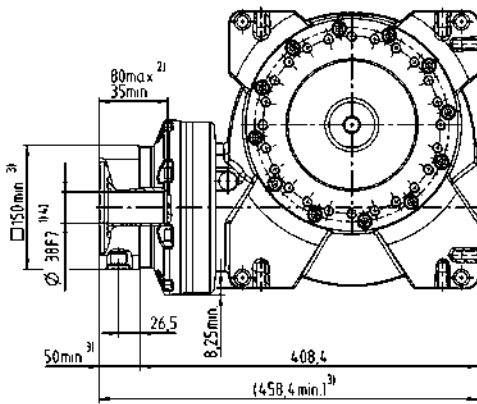
^{c)} Other ratios available on request

^{d)} Note the reduced torque depending on the design

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

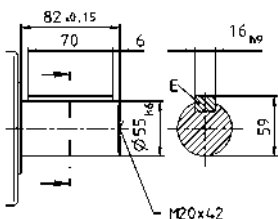


Optional dual-shaft output. Drawings available upon request.
Involute gearing is not possible.

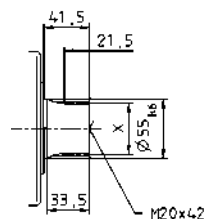


Alternatives: Output shaft variants

Keywayed output shaft in mm
E = key as per DIN 6885, sheet 1, form A



Involute gearing DIN 5480
X = W 55 x 2 x 30 x 26 x 6m



Non-tolerated dimensions ± 1 mm

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

CAD data is available under www.wittenstein-alpha.com

Motor mounting according to operating manual

			1-stage						2-stage [ⓐ]									
Ratio	i		4	7	10	16	28	40	50	70	100	140	200	280	400			
Max. torque	T_{2a}	Nm	165	180	182	193	204	183	182	180	182	204	183	204	183			
		in.lb	1460	1593	1611	1708	1805	1620	1611	1593	1611	1805	1620	1805	1620			
Constant torsional backlash throughout its lifespan	T_{2Servo}	Nm	54	71	74	81	90	74	74	71	74	90	74	90	74			
		in.lb	478	628	655	717	797	655	655	628	655	797	655	797	655			
Efficiency at full load	η	%	92	89	86	82	72	64	84	87	84	70	62	70	62			
Emergency stop torque	T_{2Not}	Nm	230	242	242	250	262	236	242	242	242	262	236	262	236			
		in.lb	2036	2142	2142	2213	2319	2089	2142	2142	2142	2319	2089	2319	2089			
Nominal input speed <small>(with 20°C ambient temperature)^{ⓐⓑ}</small>	n_{1N}	min ⁻¹	4000						6000									
Max. input speed	n_{1Max}	rpm	6000															
Mean no load running torque [ⓐ] <small>(With $n_1=3000$ min⁻¹ and 20° C gear temperature)</small>	T_{012}	Nm	2.3	2.2	1.6	1.5	1.2	1.1	0.7	0.5	0.4	0.6	0.6	0.4	0.4			
		in.lb	20.4	19.5	14.2	13.3	10.6	9.7	6.2	4.4	3.5	5.3	5.3	3.5	3.5			
Max. torsional backlash	j_t	arcmin	Standard ≤ 3 / Reduced ≤ 2						Standard ≤ 4 / Reduced ≤ 3									
Torsional rigidity	C_{121}	Nm/arcmin	17						8									
		in.lb/arcmin	150						71									
Max. axial force [ⓑ]	F_{2AMax}	N	5000															
		lb _f	1125															
Max. radial force [ⓑ]	F_{2RMax}	N	3800															
		lb _f	855															
Max. tilting moment	M_{2KMax}	Nm	409															
		in.lb	3620															
Tilting rigidity	C_{2K}	Nm/arcmin	504															
		in.lb/arcmin	4460															
Service life	L_h	h	> 20000															
Weight incl. standard adapter plate	m	kg	9.0						9.5									
		lb _m	19.9						21.0									
Operating noise <small>(with $n_1=3000$ rpm no load)</small>	L_{PA}	dB(A)	≤ 62															
Max. permitted housing temperature	°C		+90															
	F		194															
Ambient temperature	°C		-15 to +40															
	F		5 to 104															
Lubrication	Lubricated for life																	
Paint	Innovation blue																	
Direction of rotation	See drawing																	
Protection class	IP 65																	
Moment of inertia <small>(relates to the drive)</small> <small>Clamping hub diameter [mm]</small>	C	14	J_1	kgcm ²	-	-	-	-	-	-	0.80	0.80	0.80	0.70	0.70	0.70	0.70	
				10 ⁻² in.lb.s ²	-	-	-	-	-	-	0.71	0.71	0.71	0.62	0.62	0.62	0.62	
	E	19	J_1	kgcm ²	1.50	1.21	1.12	1.03	1.00	1.05	1.20	1.30	1.20	1.10	1.10	1.10	1.10	1.10
				10 ⁻² in.lb.s ²	1.33	1.07	0.99	0.91	0.89	0.93	1.06	1.15	1.06	0.97	0.97	0.97	0.97	

Please contact us for information on the best configuration for S1 conditions of use (continuous operation).

Please use our cymex[®] 5 sizing tool to obtain a more detailed design – www.wittenstein-cymex.com

[ⓐ] Idling torques decrease during operation

[ⓑ] Refers to center of output shaft or flange at $n_2 = 300$ rpm

[ⓒ] Other ratios available on request

[ⓓ] Note the reduced torque depending on the design

[ⓔ] For higher ambient temperatures, please reduce input speed

		1-stage						2-stage ^{o)}									
Ratio	i	4	7	10	16	28	40	50	70	100	140	200	280	400			
Max. torque	T_{2a}	Nm	319	353	364	372	392	363	364	353	364	392	363	392	363		
		in.lb	2823	3124	3221	3292	3469	3213	3221	3124	3221	3469	3213	3469	3213		
Constant torsional backlash throughout its lifespan	T_{2Servo}	Nm	198	210	225	221	229	226	225	210	225	229	226	229	226		
		in.lb	1752	1859	1991	1956	2027	2000	1991	1859	1991	2027	2000	2027	2000		
Efficiency at full load	η	%	93	91	88	83	74	68	86	89	86	72	66	72	66		
Emergency stop torque	T_{2Not}	Nm	460	484	491	494	518	447	491	484	494	518	447	518	447		
		in.lb	4071	4283	4345	4372	4584	3956	4345	4283	4372	4584	3956	4584	3956		
Nominal input speed <small>(with 20°C ambient temperature)^{o),e)}</small>	n_{1N}	min ⁻¹	4000						4500								
Max. input speed	n_{1Max}	rpm	4500														
Mean no load running torque ^{a)} <small>(With $n_2=3000$ min⁻¹ and 20°C gear temperature)</small>	T_{012}	Nm	4.2	3.1	3	2.4	2.3	2.2	1.2	0.7	0.7	1.1	1.1	0.8	0.6		
		in.lb	37.2	27.4	26.6	21.2	20.4	19.5	10.6	6.2	6.2	9.7	9.7	7.1	5.3		
Max. torsional backlash	j_t	arcmin	Standard ≤ 3 / Reduced ≤ 2						Standard ≤ 4 / Reduced ≤ 3								
Torsional rigidity	C_{121}	Nm/arcmin	50						28								
		in.lb/arcmin	443						248								
Max. axial force ^{b)}	F_{2AMax}	N	8250														
		lb _f	1856														
Max. radial force ^{b)}	F_{2RMax}	N	6000														
		lb _f	1350														
Max. tilting moment	M_{2KMax}	Nm	843														
		in.lb	7461														
Tilting rigidity	C_{2K}	Nm/arcmin	603														
		in.lb/arcmin	5337														
Service life	L_h	h	> 20000														
Weight incl. standard adapter plate	m	kg	15.0						15.2								
		lb _m	33						34.0								
Operating noise <small>(with $n_2=3000$ rpm no load)</small>	L_{PA}	dB(A)	≤ 64														
Max. permitted housing temperature		°C	+90														
		F	194														
Ambient temperature		°C	-15 to +40														
		F	5 to 104														
Lubrication			Lubricated for life														
Paint			Innovation blue														
Direction of rotation			See drawing														
Protection class			IP 65														
Moment of inertia <small>(relates to the drive)</small> <small>Clamping hub diameter [mm]</small>	E	19	J_i	kgcm ²	-	-	-	-	-	-	2.60	2.80	2.50	2.40	2.40	2.40	2.30
				10 ⁻³ in.lb.s ²	-	-	-	-	-	-	2.30	2.48	2.21	2.12	2.12	2.12	2.04
	G	24	J_i	kgcm ²	-	-	-	-	-	-	4.10	4.30	4.10	4.00	4.00	3.90	3.90
				10 ⁻³ in.lb.s ²	-	-	-	-	-	-	3.63	3.81	3.63	3.54	3.54	3.45	3.45
H	28	J_i	kgcm ²	4.80	3.89	3.65	3.56	3.52	3.47	-	-	-	-	-	-	-	
			10 ⁻³ in.lb.s ²	4.25	3.44	3.23	3.15	3.12	3.07	-	-	-	-	-	-	-	

Please contact us for information on the best configuration for S1 conditions of use (continuous operation).
Please use our cymex[®] 5 sizing tool to obtain a more detailed design - www.wittenstein-cymex.com

- ^{a)} Idling torques decrease during operation
- ^{b)} Refers to center of output shaft or flange at $n_2 = 300$ rpm
- ^{c)} Other ratios available on request
- ^{d)} Note the reduced torque depending on the design
- ^{e)} For higher ambient temperatures, please reduce input speed

			1-stage						2-stage [ⓐ]								
Ratio	i		4	7	10	16	28	40	50	70	100	140	200	280	400		
Max. torque	T_{2a}	Nm	578	646	672	702	785	676	672	646	672	785	676	785	676		
		in.lb	5115	5717	5947	6213	6947	5983	5947	5717	5947	6947	5983	6947	5983		
Constant torsional backlash throughout its lifespan	T_{2Servo}	Nm	469	601	613	677	764	631	613	601	613	764	631	764	631		
		in.lb	4151	5319	5425	5991	6761	5584	5425	5319	5425	6761	5584	6761	5584		
Efficiency at full load	η	%	94	92	89	86	77	70	87	90	87	75	68	75	68		
Emergency stop torque	T_{2Not}	Nm	938	993	963	1005	1064	941	963	993	963	1064	941	1064	941		
		in.lb	8301	8788	8523	8894	9416	8328	8523	8788	8523	9416	8328	9416	8328		
Nominal input speed <small>(with 20°C ambient temperature)^{ⓐⓑ}</small>	n_{1N}	min ⁻¹	3500						4500								
Max. input speed	n_{1Max}	rpm	4000						4500								
Mean no load running torque [ⓐ] <small>(With $n_1=3000$ min⁻¹ and 20° C gear temperature)</small>	T_{012}	Nm	7.2	7.1	6.5	5	4.8	4.5	2.8	1.6	1.5	2.4	2.4	1.8	1.3		
		in.lb	63.7	62.8	57.5	44.3	42.5	39.8	24.8	14.2	13.3	21.2	21.2	15.9	11.5		
Max. torsional backlash	j_t	arcmin	Standard ≤ 3 / Reduced ≤ 2						Standard ≤ 4 / Reduced ≤ 3								
Torsional rigidity	C_{121}	Nm/arcmin	113						78								
		in.lb/arcmin	1000						690								
Max. axial force [ⓑ]	F_{2AMax}	N	13900						13900								
		lb _f	3128						3128								
Max. radial force [ⓑ]	F_{2RMax}	N	9000						9000								
		lb _f	2025						2025								
Max. tilting moment	M_{2KMax}	Nm	1544						1544								
		in.lb	13664						13664								
Tilting rigidity	C_{2K}	Nm/arcmin	1178						1178								
		in.lb/arcmin	10425						10425								
Service life	L_h	h	> 20000						> 20000								
Weight incl. standard adapter plate	m	kg	32.0						33.5								
		lb _m	70.7						74.0								
Operating noise <small>(with $n_1=3000$ rpm no load)</small>	L_{PA}	dB(A)	≤ 66						≤ 68								
Max. permitted housing temperature			°C		+90						+90						
			F		194						194						
Ambient temperature			°C		-15 to +40						-15 to +40						
			F		5 to 104						5 to 104						
Lubrication			Lubricated for life														
Paint			Innovation blue														
Direction of rotation			See drawing														
Protection class			IP 65														
Moment of inertia <small>(relates to the drive)</small> <small>Clamping hub diameter [mm]</small>	G	24	J_1	kgcm ²	-	-	-	-	-	-	10.40	10.10	10.10	8.80	9.50	9.40	9.30
				10 ⁻² in.lb.s ²	-	-	-	-	-	-	9.20	8.94	8.94	7.79	8.41	8.32	8.23
	K	38	J_1	kgcm ²	20.30	16.56	16.69	15.33	15.24	15.90	17.30	17.00	17.10	15.80	16.40	16.30	16.20
				10 ⁻² in.lb.s ²	17.97	14.66	14.77	13.57	13.49	14.07	15.31	15.05	15.13	13.98	14.51	14.43	14.34

Please contact us for information on the best configuration for S1 conditions of use (continuous operation).

Please use our cymex[®] 5 sizing tool to obtain a more detailed design – www.wittenstein-cymex.com

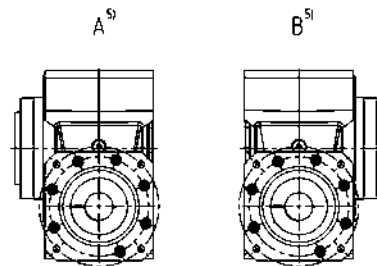
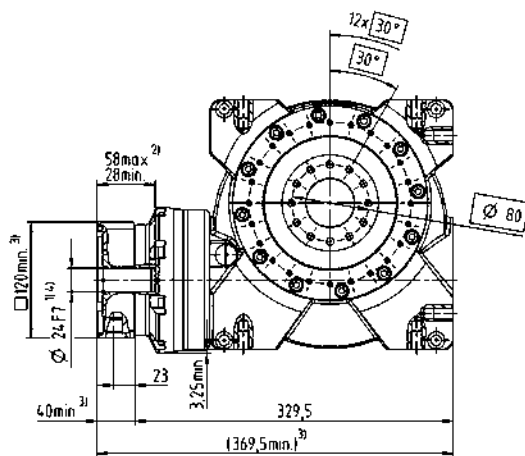
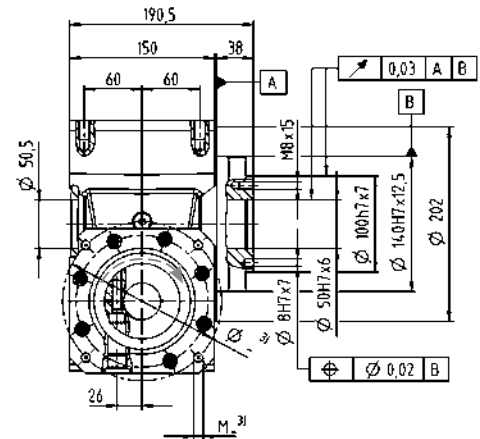
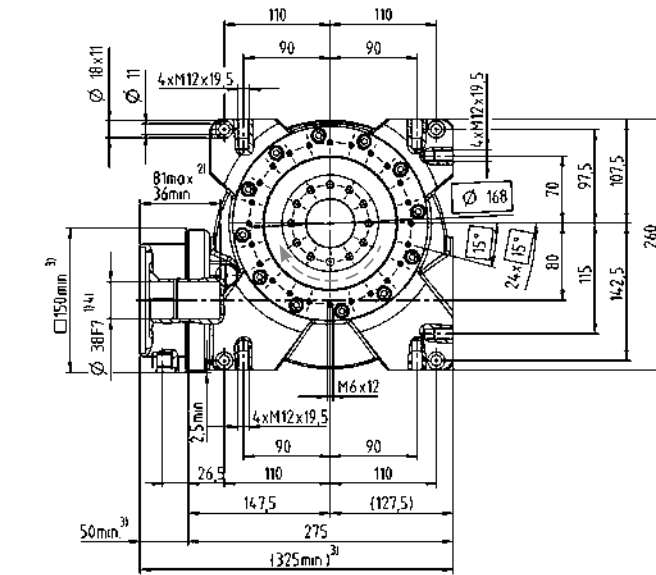
[ⓐ] Idling torques decrease during operation

[ⓑ] Refers to center of output shaft or flange at $n_2 = 300$ rpm

[ⓒ] Other ratios available on request


[ⓓ] Note the reduced torque depending on the design


[ⓔ] For higher ambient temperatures, please reduce input speed



Non-tolerated dimensions ± 1 mm

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

 CAD data is available under www.wittenstein-alpha.com

 Motor mounting according to operating manual

			1-stage						2-stage [ⓐ]								
Ratio	i		4	7	10	16	28	40	50	70	100	140	200	280	400		
Max. torque	T_{2a}	Nm	1184	1336	1377	1392	1505	1376	1377	1377	1377	1505	1376	1505	1376		
		in.lb	10478	11824	12186	12319	13319	12178	12186	12186	12186	13319	12178	13319	12178		
Constant torsional backlash throughout its lifespan	T_{2Servo}	Nm	1155	1304	1343	1359	1469	1343	1343	1343	1343	1469	1343	1469	1343		
		in.lb	10222	11540	11886	12027	13001	11886	11886	11886	11886	13001	11886	13001	11886		
Efficiency at full load	η	%	95	93	91	87	80	76	89	89	89	78	74	78	74		
Emergency stop torque	T_{2Not}	Nm	1819	1932	1940	1955	2073	1856	1940	1940	1940	2073	1856	2073	1856		
		in.lb	16098	17098	17169	17302	18346	16426	17169	17169	17169	18346	16426	18346	16426		
Nominal input speed <small>(with 20°C ambient temperature)^{ⓐⓑ}</small>	n_{1N}	min ⁻¹	3000						4000								
Max. input speed	n_{1Max}	rpm	3500						4000								
Mean no load running torque [ⓐ] <small>(With $n_1=3000$ min⁻¹ and 20° C gear temperature)</small>	T_{012}	Nm	12.2	10.5	9.8	9.1	8.2	7.2	4.1	2.3	2.2	3.8	3.6	2.6	2		
		in.lb	108.0	92.9	86.7	80.5	72.6	63.7	36.3	20.4	19.5	33.6	31.9	23.0	17.7		
Max. torsional backlash	j_t	arcmin	Standard ≤ 3 / Reduced ≤ 2						Standard ≤ 4 / Reduced ≤ 3								
Torsional rigidity	C_{121}	Nm/arcmin	213						153								
		in.lb/arcmin	1885						1354								
Max. axial force [ⓑ]	F_{2AMax}	N	19500						19500								
		lb _f	4388						4388								
Max. radial force [ⓑ]	F_{2RMax}	N	14000						14000								
		lb _f	3150						3150								
Max. tilting moment	M_{2KMax}	Nm	3059						3059								
		in.lb	27072						27072								
Tilting rigidity	C_{2K}	Nm/arcmin	2309						2309								
		in.lb/arcmin	20435						20435								
Service life	L_h	h	> 20000						> 20000								
Weight incl. standard adapter plate	m	kg	63.0						64.6								
		lb _m	139.0						143.0								
Operating noise <small>(with $n_1=3000$ rpm no load)</small>	L_{PA}	dB(A)	≤ 70						≤ 70								
Max. permitted housing temperature	°C		+90						+90								
	F		194						194								
Ambient temperature	°C		-15 to +40						-15 to +40								
	F		5 to 104						5 to 104								
Lubrication			Lubricated for life						Lubricated for life								
Paint			Innovation blue						Innovation blue								
Direction of rotation			See drawing						See drawing								
Protection class			IP 65						IP 65								
Moment of inertia <small>(relates to the drive)</small> <small>Clamping hub diameter [mm]</small>	K	38	J_1	kgcm ²	-	-	-	-	-	-	31.70	33.00	31.10	30.10	30.40	30.00	29.80
				10 ⁻³ in.lb.s ²	-	-	-	-	-	-	28.05	29.21	27.52	26.64	26.90	26.55	26.37
	M	48	J_1	kgcm ²	50.02	40.63	38.73	39.60	37.14	37.47	46.40	47.70	45.80	44.80	45.10	44.70	44.50
				10 ⁻³ in.lb.s ²	44.27	35.96	34.28	35.05	32.87	33.16	41.06	42.21	40.53	39.65	39.91	39.56	39.38

Please contact us for information on the best configuration for S1 conditions of use (continuous operation).

Please use our cymex[®] 5 sizing tool to obtain a more detailed design – www.wittenstein-cymex.com

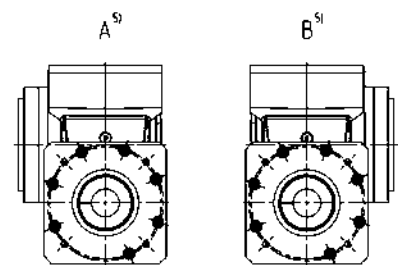
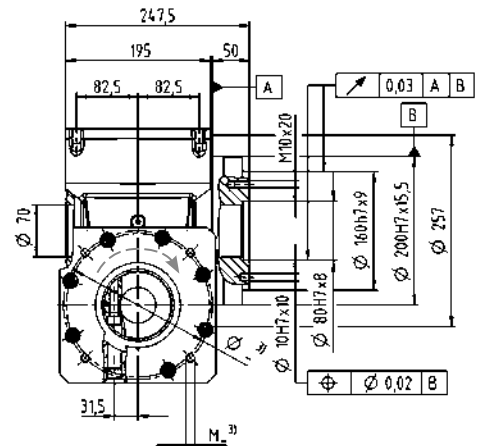
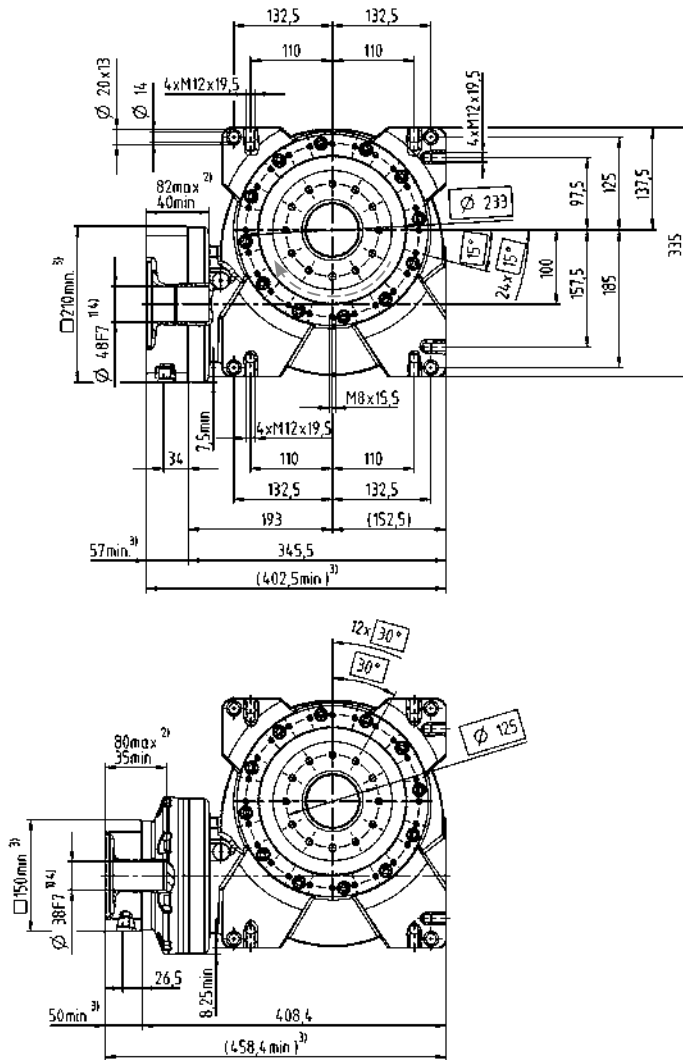
[ⓐ] Idling torques decrease during operation

[ⓑ] Refers to center of output shaft or flange at $n_2 = 300$ rpm


[ⓒ] Other ratios available on request

[ⓓ] Note the reduced torque depending on the design

[ⓔ] For higher ambient temperatures, please reduce input speed



- Non-tolerated dimensions ± 1 mm
- 1) Check motor shaft fit.
 - 2) Min./Max. permissible motor shaft length.
Longer motor shafts are adaptable, please contact us.
 - 3) The dimensions depend on the motor.
 - 4) Smaller motor shaft diameter is compensated by a bushing with a minimum thickness of 1 mm.
 - 5) Output side

 CAD data is available under www.wittenstein-alpha.com

 Motor mounting according to operating manual

V-Drive in a linear system

In addition to our proven planetary and right-angle gearhead series, our V-Drive worm gearheads can also be supplied as a linear system in combination with a rack and pinion.

Your benefits

- System design with our cymex® 5 sizing software
- Perfectly matched components
- Factory assembled pinions
- Compact mounting dimensions
- Extremely smooth running
- Individual consulting
- All from one source

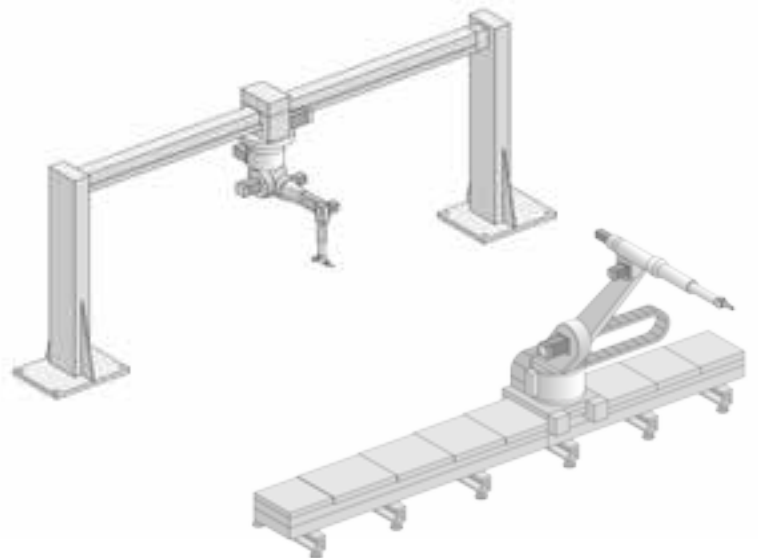


Possible applications

The V-Drive in a linear system is suitable for a wide range of applications. Owing to the rectangular mounting geometry, it can be used whenever special design requirements prevent standard right-angle gearheads. The V-Drive also convinces in all segments with its low noise level.

Applications

- Automation
e.g. in the 7th axis
of welding robots
- Wood processing machines
- Plasma cutters
- etc.





Further information on linear systems
can be found online at:
www.wittenstein-alpha.com



Please use our cymex® 5 sizing tool
for detailed sizing:
www.wittenstein-cymex.com

Helical-toothed pinion

	Pinion		V-Drive							Rack	
	Module	z	VS+ 050	VS+ 063	VS+ 080	VS+ 100	NVS 040*	NVS 050*	NVS 063*	Module	Length
 Pinion for shaft with key	2	18					2200			2	1000 mm
	2	22	3300					3520		2	1000 mm
	2	26		5550					5550	2	1000 mm
	3	24			7350					3	1000 mm
	2	18	3300							2	1000 mm
 Pinion for splined shaft	2	20	3300							2	1000 mm
	2	22	3300							2	1000 mm
	2	23		5550						2	1000 mm
	2	25		5550						2	1000 mm
	2	27		5550						2	1000 mm
	3	20		5550						3	1000 mm
	3	20			7850					3	1000 mm
	3	22			7850					3	1000 mm
	3	24			7850					3	1000 mm
	4	20				12900				4	1000 mm
Moving force F_{zT} [N]											

z = Number of teeth
 Please use cymex® 5 for detailed sizing
 – www.wittenstein-cymex.com
 * Can also be mounted to CVS

Straight-toothed pinion – not only for linear applications

RMK – Pinion for shaft with key
 Straight-toothed ($\beta = 0^\circ$):

	Module	z	x	m_{Pinion}
V-Drive	[mm]	[]	[]	[kg]
VS+ 040 / NVS 040	2	19	0.4	0.3
VS+ 050 / NVS 050	2	22	0	0.4
VS+ 063	3	22	0	0.7
VS+ 080	3	25	0	1.5
	4	20	0	1.9

z = Number of teeth
 x = Profile correction factor
 m_{Pinion} = Pinion mass

RMS – Pinion for splined shaft
 Straight-toothed ($\beta = 0^\circ$):

	Module	z	x	m_{Pinion}
V-Drive	[mm]	[]	[]	[kg]
VS+ 040	2	16	0.5	0.2
VS+ 050	2	19	0.4	0.3
VS+ 063	3	17	0.4	0.4
VS+ 080	3	22	0.2	0.9
	4	19	0.3	1.7
VS+ 100	4	22	0.2	1.4
	5	19	0.4	2.1

z = Number of teeth
 x = Profile correction factor
 m_{Pinion} = Pinion mass



Shrink discs – always well connected

The hollow shaft version of the V-Drive can be used in combination with a shrink disc for mounting directly on load shafts. Machines can then be designed to take up a minimum of installation space.

Product highlights

- Technically and geometrically matched to the gearhead
- Compact design
- High dynamism and accuracy
- Backlash-free, positive connection
- High true-running accuracy
- Extremely smooth running
- Two-part design
- Reliable and safe transmission

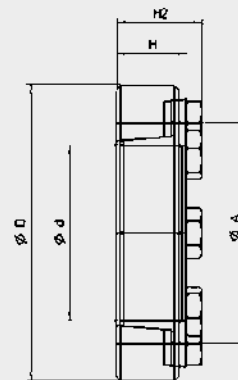


Your benefits

- Absolutely safe in an emergency
- Reliable performance
- Simple mounting and removal
- Huge installation space reduction
- Multiple reuse
- Corrosion resistant version available

Quick shrink disc selection

Technical drawing



V-Drive	Order code / Article code / T _{max}				d	D	A	H*	H2*	J [kgcm ²]
		Standard	Nickel plated	Stainless steel						
VH+ / NVH / CVH 040	Order code	SD 024x050 S2	SD 024x050 N2	SD 024x050 E2	24	50	36	18	22	0.729
	Article code	20001389	20047957	20043198						
	T _{max} [Nm]	250	136	136						
VH+ / NVH / CVH 050	Order code	SD 030x060 S2V	SD 030x060 N2	SD 030x060 E2	30	60	44	20	24	1.82
	Article code	20020687	20047934	20047885						
	T _{max} [Nm]	550	375	230						
VH+ / NVH / CVH 063	Order code	SD 036x072 S2V	SD 036x072 N2V	SD 036x072 E2	36	72	52	22	27,5	3.94
	Article code	20020688	20047530	20035055						
	T _{max} [Nm]	640	560	450						
VH+ 080	Order code	SD 050x090 S2V	SD 050x090 N2V	SD 050x090 E2	50	90	68	26	31,5	11.1
	Article code	20020689	20047935	20047937						
	T _{max} [Nm]	1400	950	900						
VH+ 100	Order code	SD 062x110 S2V	SD 062x110 N2	SD 062x110 E2	62	110	80	29	34,5	27
	Article code	20020690	20047927	20047860						
	T _{max} [Nm]	2300	1540	1000						

** Values when the shrink disc is released.
Mounting / operating manual at
www.wittenstein-alpha.com/operating-manuals

Recommendation for load shaft: Tolerance h6,
surface roughness ≤ Rz 16,
minimum yield strength Rp 0.2 ≥ 385 N/mm²

The shrink disc is not included with the gearhead.
It must therefore be ordered separately by means of the order code.

Couplings – securing – transmitting – equalizing



VS+ with metal bellows coupling BC3



NVS with elastomer coupling ELC



CVS with elastomer coupling ELC

Metal bellows couplings – Perfectionists you can count on

Metal bellows couplings are designed for the highest requirements in servo drive technology. The compact design ensures that installation space is kept to a minimum. High torsional rigidity enables precise results and dynamics.

- Compensation of shaft misalignment
- Completely backlash-free
- Compact and easy to mount
- Maintenance-free and fatigue endurable
- Corrosion resistant version available as an option

Elastomer couplings – Harmonious endurance runners

Elastomer couplings ensure precisely manufactured hubs and attachable intermediate elements for maximum true-running accuracy in the drive train. In addition, torque peaks and vibrations are damped to ensure superior smooth running.

- Compensation of shaft misalignment
- Completely backlash-free
- Choice of torsional rigidity / damping
- Compact design
- Extremely simple mounting (plug-in)
- Maintenance-free and fatigue endurable
- Ideal for connection to spindle drives, toothed belt drives or linear modules

Quick coupling selection

V-Drive	Size	Max. transmissible torque T_b [Nm]*	Coupling	Max. outer diameter [mm]	Overall length [mm]	Clamping hub bore hole diameter (application side)	
						From \varnothing to \varnothing H7	\varnothing H7 (recommended)
CVS	040	50	ELC00060B	\varnothing 57	58	16-32	\varnothing 16
	050	140	ELC00150B	\varnothing 68	62	22-36	\varnothing 22
	063	200	ELC00150B	\varnothing 68	62	32-36	\varnothing 32
NVS	040	50	ELC00060B	\varnothing 57	58	16-32	\varnothing 16
	050	140	ELC00150B	\varnothing 68	62	22-36	\varnothing 22
	063	350	ELC00300B	\varnothing 85	86	32-45	\varnothing 32
VS+	050	204	BC3-00200A	\varnothing 90	76	15-44	\varnothing 22
	063	392	BC3-00500A	\varnothing 124	96	24-56	\varnothing 32
	080	785	BC3-00800A	\varnothing 133	115	30-60	\varnothing 40
	100	1505	BC3-01500A	\varnothing 157	140	35-70	\varnothing 55

* Depending on the ratio and the clamping hub bore hole diameter
Other couplings available on request.

Services

- Ability to react promptly to changing customer requirements
- Individual support in all phases of interaction
- Pre- and after-sales services

Technical data / CAD data

Online sizing within seconds

Info & CAD Finder

The required information – simply and quickly.

With our Info & CAD Finder, you can find the product you are looking for in just a few clicks.

You will also find performance data, CAD data, operating instructions and motor mounting instructions for your product here. Using the intuitive menu, it is easy to configure your product and request the necessary data.

Your benefits

- Online comparison with motor geometry
- Transparent and simple selection
- Generation of an ordering code
- Documentation of your selection
- 3D file of the selected solution

SIZING ASSISTANT

The optimum gearhead within seconds

Our SIZING ASSISTANT suggests the most suitable gearhead from the WITTENSTEIN alpha portfolio based on your application data or the required motor.

Your benefits

- Efficient online sizing within seconds
- No need to log in
- Convenient and intuitive user interface
- Automatic comparison of the motor and gearhead geometry
- Dimension sheet and CAD data with a single click
- User friendly comparison function
- Direct request for nonbinding quotation after selection process



The Info & CAD Finder is available free of charge on our homepage:
www.wittenstein-alpha.com

The SIZING ASSISTANT is available online and free of charge at:
www.sizing-assistant.com

Sizing & consultation

Customized logistics solutions

After-sales services

cymex® 5

Sizing of the entire drive train

WITTENSTEIN alpha's engineers have fundamentally redesigned the cymex® sizing software. The result is a sizing tool that sets benchmarks in every respect.

Your benefits

- Enables precise simulations of motions and loads
- Defining any number of axes at once
- More than 14,000 motors from fifty leading manufacturers are stored in the sizing tool
- 90 percent less work compared to existing software solutions
- Uncompromisingly reliable
- A fundamentally new master-slave-function (available on request)
- Intuitive GUI
- 11 different languages
- Customers experiences served as valuable input
- Generating calculation documentation and data sheets

We handle the complete shipment for you

In time-critical situations, we ensure immediate and professional pick-up as well as the fastest possible delivery of drives in need of repair. Profit from our return service, which is also available for speedline® orders.

Your benefits

- Cost savings because downtime is minimized
- Professional logistics organization
- Reduced transport risks through customized, direct delivery

speedline®

Speedy deliveries

We offer you delivery of the V-Drive standard series within 72 hours ex works at attractive conditions.*

Your benefits

- Minimum re-stocking times and very fast response time in case of unplanned requirements
- Maximum reliability through transparent information flows and dependable processing



The download of cymex® 5 is available free of charge at:
www.wittenstein-cymex.com

Our service team can be contacted on:
Tel.+49 7931 493-12900 (International)

Our speedline® team can be contacted on:
Phone +49 7931 493-10333 (International)

*Non-binding delivery time depending upon part availability

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.

Max. output torque (T_{2a})

T_{2a} 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.

Constant torsional backlash throughout its lifespan (T_{2Servo})

T_{2Servo} is a special value for precision applications in which a minimum backlash must be guaranteed over the life of the gearbox. The increase in backlash seen in other worm gears is less due to the optimized hollow flank teeth.

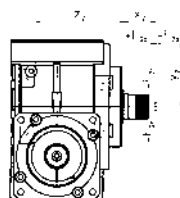
Max. radial force (F_{2RMax})

The radial force F_{2RMax} is the force component acting at right angles to the output shaft or parallel to the output flange. It acts perpendicular to the axial force and can assume an axial distance of x_2 in relation to the shaft shoulder or to the shaft flange, which acts as a lever arm.

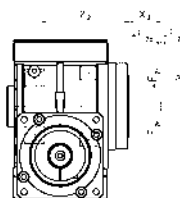
Axial force (F_{2AMax})

In the case of CVS, NVS and VS+ the axial force F_{2AMax} acting on a gearhead runs parallel to its output shaft. On a VT+, the force runs perpendicular to its output shaft. It may be applied with axial offset via a lever arm y_2 under certain circumstances, in which case it also generates a bending moment. If the axial force exceeds the permissible catalogue values, additional design features (e.g. axial bearings) must be implemented to absorb these forces.

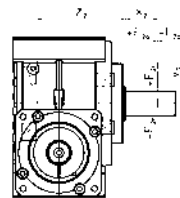
VS+ involute



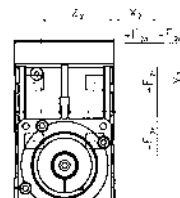
VT+



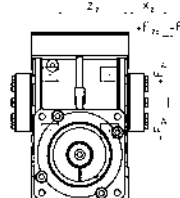
VS+ smooth, keywayed



VH+ / NVH / CVH keywayed



VH+ / NVH / CVH keywayed



Operating modes

(continuous operation **S1** and cyclic operation **S5**)

When selecting a gearhead, it is important to consider whether the motion profile is characterized by frequent acceleration and deceleration phases in cyclic operation (S5) as well as pauses, or whether it is designed for continuous operation (S1), i.e. with long phases of constant motion.

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.

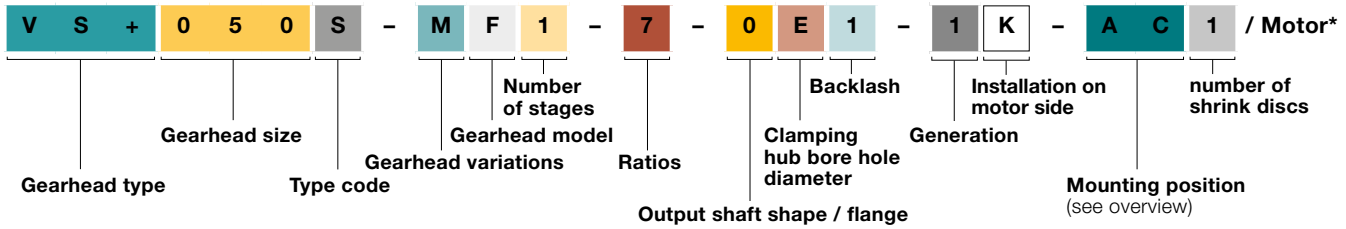
General rule:

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 an input speed of $n=3000$ rpm at no load.

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

Order codes

V-Drive



Gearhead type Basic CVH = hollow shaft CVS = shaft Value NVH = hollow shaft NVS = shaft Advanced VH+ = hollow shaft VS+ = shaft VT+ = flange	Gearhead size 040 050 063 080 100	Type code S = Standard F = Food-grade lubrication W = Corrosion resistant	Gearhead variations M = Motor attachment gearhead	Gearhead model F = Standard T = HIGH FORCES (V-Drive Basic)	Number of stages 1 = 1-stage 2 = 2-stage (V-Drive Value and V-Drive Advanced)	Ratios See table or data sheets
--	---	---	---	--	--	---

* Full motor designation only required for determining gearhead attached components!
X = Special model

Output shaft shape / flange 0 = Smooth shaft 1 = Hollow shaft, keyed on both sides / Shaft with key 2 = Splined shaft (DIN 5480) 4 = other 5 = Flanged hollow shaft 6 = Hollow shaft interfaces on both sides D = Smooth shaft on both sides H = Shaft with key on both sides	Clamping hub bore hole diameter See table or data sheets	Backlash 1 = Standard 0 = Reduced	Generation 1 = first generation	Installation on motor side S = Push-on sleeve K = Coupling	number of shrink discs 0 = no shrink disc 1 = one shrink disc 2 = two shrink discs
--	--	--	---	---	--

Mounting position

Output side A:
View of motor interface, Gear output left
Only valid for VS+, VT+, NVS and CVS

Output side B:
View of motor interface, Gear output right
Only valid for VS+, VT+, NVS and CVS

For CVH, CVS, NVH, NVS and VH+, VS+ with dual-shaft output or hollow shaft, A and B in the mounting position must be replaced with 0 (zero).
 Amount of oil required based on the selected mounting position.



WITTENSTEIN alpha GmbH · Walter-Wittenstein-Straße 1 · 97999 Igersheim · Tel. +49 7931 493-0 · info@wittenstein-alpha.com

WITTENSTEIN alpha – intelligent drive systems

www.wittenstein-alpha.com

