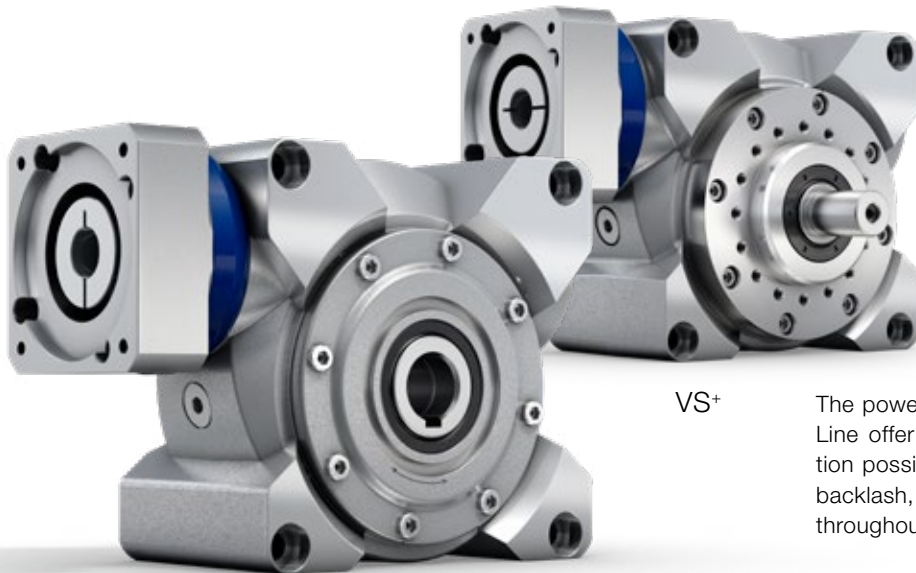


VH⁺ / VS⁺ / VT⁺ – Precision worm gearboxes



VS⁺

The powerful V-Drive worm gears of the alpha Advanced Line offer flexible output shapes and countless application possibilities. With high-quality toothing and constant backlash, the gearboxes remain exceptionally efficient throughout their entire service life.

VH⁺

V-Drive Advanced compared to the industry standard

Product highlights

Max. torsional backlash [arcmin] ≤ 3 (Standard)
≤ 2 (Reduced)

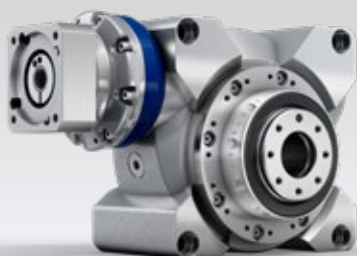
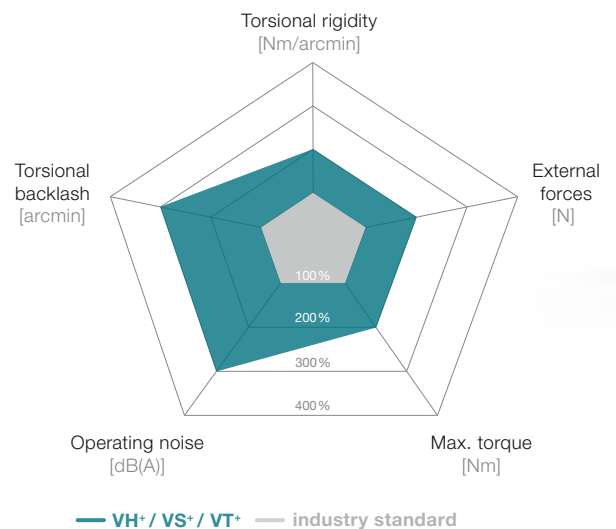
Constant, low torsional backlash
consistently high quality and high positioning accuracy
guaranteed throughout its lifespan

No stick-slip effect
owing to the enhanced hollow-flank teeth

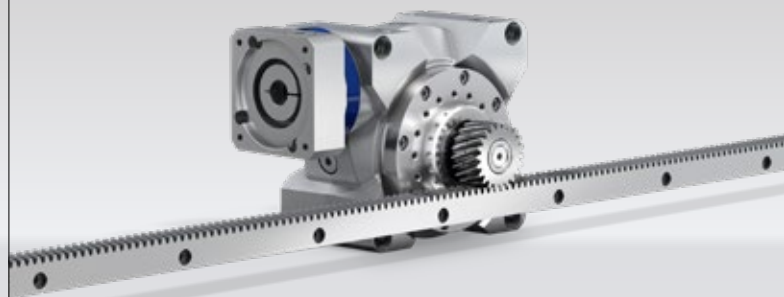
Optimally sized output bearing for absorbing high axial
and radial forces in cyclic or continuous operation

Hollow-flank teeth with high overload capacity
owing to the low specific tooth pressure

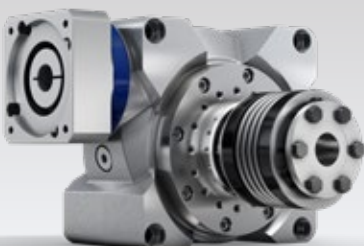
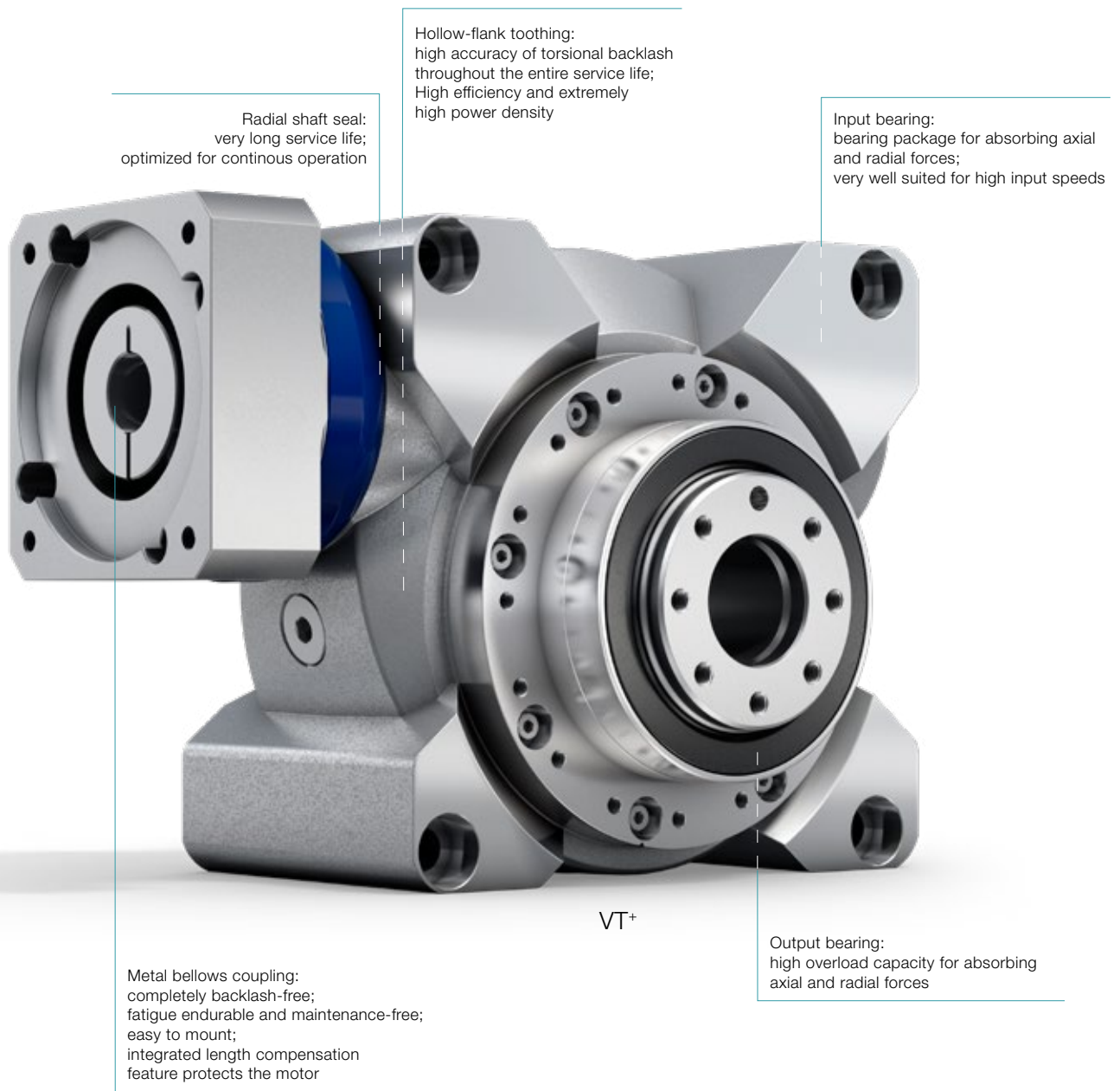
Multiple output configurations for greater flexibility
Smooth shaft, shaft with key, splined shaft (DIN 5480),
Hollow shaft interface, Keyed hollow shaft, Flanged hollow
shaft, Flange, System output, Output on both sides



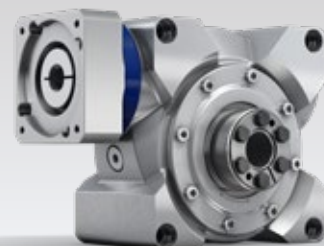
VT⁺ with integrated planetary input stage for higher ratios



VS⁺ in linear system



VS+ with metal bellows coupling BC3



VH+ with shrink disk

VH⁺ 040 MF 1-/2-stage

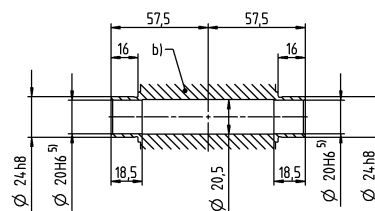
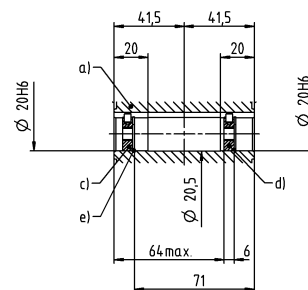
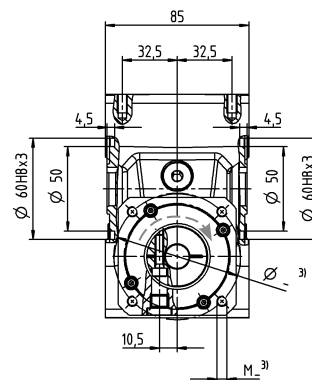
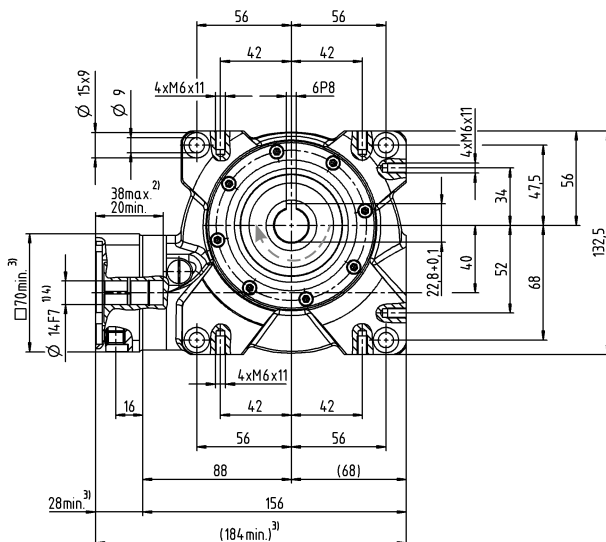
				1-stage							2-stage								
Ratio			<i>i</i>		4	7	10	16	28	40	50	70	100	140	200	280	400		
Max. torque ^{a) b)} (at <i>n</i> ₁ = 500 rpm)			<i>T</i> _{2a}	<i>Nm</i>	74	82	98	101	106	98	98	82	98	106	98	106	98		
				<i>in.lb</i>	655	726	867	894	938	867	867	726	867	938	867	938	867		
Torque for constant backlash (over the lifetime)			<i>T</i> _{2Servo}	<i>Nm</i>	17	24	25	26	29	25	25	24	25	29	25	29	25		
				<i>in.lb</i>	150	212	221	230	257	221	221	212	221	257	221	257	221		
Emergency stop torque ^{a) b)} (permitted 1000 times during the service life of the gearbox)			<i>T</i> _{2Not}	<i>Nm</i>	118	126	125	129	134	122	125	126	125	134	122	134	122		
				<i>in.lb</i>	1044	1115	1106	1142	1186	1080	1106	1115	1106	1186	1080	1186	1080		
Permitted average input speed (at 20 °C ambient temperature) ^{d)}			<i>n</i> _{1N}	<i>rpm</i>	4000							4400							
Max. input speed			<i>n</i> _{1Max}	<i>rpm</i>	6000														
Mean no load running torque ^{b)} (at <i>n</i> ₁ = 3000 rpm and 20 °C gearbox temperature)			<i>T</i> ₀₁₂	<i>Nm</i>	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		
				<i>in.lb</i>	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. backlash			<i>j</i> _t	<i>arcmin</i>	≤ 3	Standard ≤ 3 / Reduced ≤ 2							Standard ≤ 4 / Reduced ≤ 3						
Torsional rigidity ^{b)}			<i>C</i> _{t21}	<i>Nm/arcmin</i>	4.5							5							
				<i>in.lb/arcmin</i>	40							40							
Max. axial force ^{c)}			<i>F</i> _{2AMax}	<i>N</i>	3000														
				<i>lb_f</i>	675														
Max. lateral force ^{c)}			<i>F</i> _{2QMax}	<i>N</i>	2400														
				<i>lb_f</i>	540														
Max. tilting moment			<i>M</i> _{2KMax}	<i>Nm</i>	205														
				<i>in.lb</i>	1814														
Efficiency at full load (at <i>n</i> ₁ = 500 rpm)			<i>η</i>	%	93	90	88	82	73	67	86	88	86	71	65	71	65		
Service life ^{f)}			<i>L</i> _h	<i>h</i>	> 20000														
Weight (incl. standard adapter plate)			<i>m</i>	<i>kg</i>	5.0							5.6							
				<i>lb_m</i>	11.1							12.0							
Operating noise (at reference ratio and reference speed – ratio-specific values available in cymex [®])			<i>L</i> _{PA}	<i>dB(A)</i>	≤ 54							≤ 58							
Max. permitted housing temperature				°C	+90														
				<i>F</i>	194														
Ambient temperature				°C	-15 to +40														
				<i>F</i>	5 to 104														
Lubrication					Lubricated for life														
Direction of rotation					In- and output same direction														
Protection class					IP 65														
Shrink disc (Standard version)					SD 024x050 S2														
Max. torque (without axial force)			<i>T</i> _{max}	<i>Nm</i>	250														
Mass moment of inertia (relates to the drive) Clamping hub diameter [mm]			C	14	<i>J</i> ₁	<i>kgcm²</i>	0.56	0.42	0.39	0.37	0.36	0.35	0.16	0.15	0.15	0.16	0.16	0.15	0.15
						<i>10⁻³ in.lb.s²</i>	0.5	0.37	0.35	0.33	0.32	0.31	0.14	0.13	0.13	0.14	0.14	0.13	0.13
			E	19	<i>J</i> ₁	<i>kgcm²</i>	0.88	0.74	0.7	0.68	0.68	0.67	0.53	0.52	0.52	0.53	0.53	0.52	0.52
<i>10⁻³ in.lb.s²</i>	0.78	0.65				0.62	0.6	0.6	0.59	0.47	0.46	0.46	0.47	0.47	0.46	0.46			

Please use our sizing software cymex[®] for a detailed sizing – www.wittenstein-cymex.com
Please contact us for optimum sizing at S1 conditions (Continuous operation).

- ^{a)} At max. 10 % F_{20Max}
- ^{b)} Valid for standard clamping hub diameter
- ^{c)} Refers to center of the output shaft or flange
- ^{d)} Please reduce input speed at higher ambient temperatures
- ^{f)} Please contact us to discuss application-specific service lifetimes

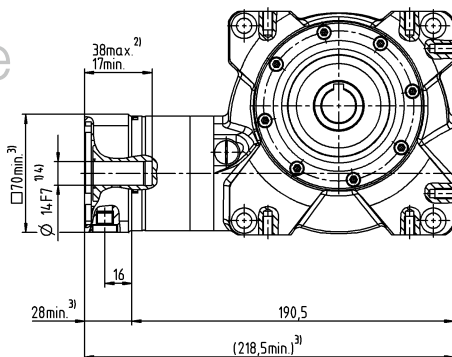
1-stage

up to 14/19⁴⁾
(C⁶⁾/E) clamping
hub diameter



2-stage

up to 14/19⁴⁾
(C⁶⁾/E) clamping
hub diameter



- 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

c) - e): Already included in the scope of delivery of the gearbox

See technical data sheet for available clamping hub diameters (mass moment of inertia). Dimensions available on request.

Non-tolerated dimensions are nominal dimensions

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 wall thickness of 1 mm.

⁵⁾ Tolerance h6 for mounted shaft.

⁶⁾ Standard clamping hub diameter

Motor shaft diameter [mm]

Worm gearboxes

VH+

VH⁺ 050 MF 1-/2-stage

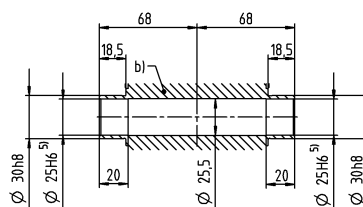
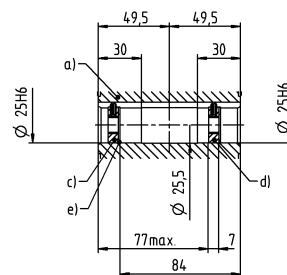
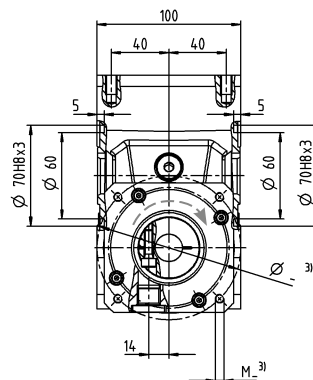
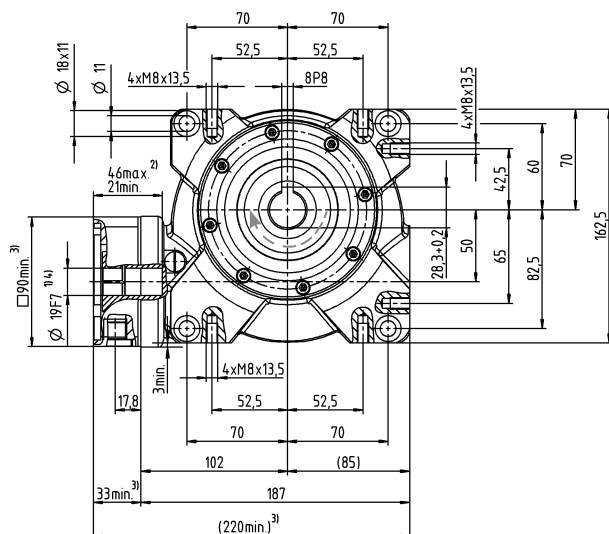
			1-stage							2-stage							
Ratio			<i>i</i>		4	7	10	16	28	40	50	70	100	140	200	280	400
Max. torque ^{a) b)} (at <i>n</i> ₁ = 500 rpm)			<i>T</i> _{2a}	<i>Nm</i>	165	180	182	193	204	183	182	180	182	204	183	204	183
				<i>in.lb</i>	1460	1593	1611	1708	1805	1620	1611	1593	1611	1805	1620	1805	1620
Torque for constant backlash (over the lifetime)			<i>T</i> _{2Servo}	<i>Nm</i>	54	71	74	81	90	74	74	71	74	90	74	90	74
				<i>in.lb</i>	478	628	655	717	797	655	655	628	655	797	655	797	655
Emergency stop torque ^{a) b)} (permitted 1000 times during the service life of the gearbox)			<i>T</i> _{2Not}	<i>Nm</i>	230	242	242	250	262	236	242	242	242	262	236	262	236
				<i>in.lb</i>	2036	2142	2142	2213	2319	2089	2142	2142	2142	2319	2089	2319	2089
Permitted average input speed (at 20 °C ambient temperature) ^{d)}			<i>n</i> _{1N}	<i>rpm</i>	4000							3500					
Max. input speed			<i>n</i> _{1Max}	<i>rpm</i>	6000												
Mean no load running torque ^{b)} (at <i>n</i> ₁ = 3000 rpm and 20 °C gearbox temperature)			<i>T</i> ₀₁₂	<i>Nm</i>	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
				<i>in.lb</i>	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. backlash			<i>j</i> _t	<i>arcmin</i>	≤ 3	Standard ≤ 3 / Reduced ≤ 2					Standard ≤ 4 / Reduced ≤ 3						
Torsional rigidity ^{b)}			<i>C</i> _{t21}	<i>Nm/arcmin</i>	8												
				<i>in.lb/arcmin</i>	71												
Max. axial force ^{c)}			<i>F</i> _{2AMax}	<i>N</i>	5000												
				<i>lb_f</i>	1125												
Max. lateral force ^{c)}			<i>F</i> _{2QMax}	<i>N</i>	3800												
				<i>lb_f</i>	855												
Max. tilting moment			<i>M</i> _{2KMax}	<i>Nm</i>	409												
				<i>in.lb</i>	3620												
Efficiency at full load (at <i>n</i> ₁ = 500 rpm)			<i>η</i>	%	92	89	86	82	72	64	84	87	84	70	62	70	62
Service life ¹⁾			<i>L</i> _h	<i>h</i>	> 20000												
Weight (incl. standard adapter plate)			<i>m</i>	<i>kg</i>	8.0							8.7					
				<i>lb_m</i>	17.7							19.0					
Operating noise (at reference ratio and reference speed – ratio-specific values available in cymex [®])			<i>L</i> _{PA}	<i>dB(A)</i>	≤ 62												
Max. permitted housing temperature				°C	+90												
				<i>F</i>	194												
Ambient temperature				°C	-15 to +40												
				<i>F</i>	5 to 104												
Lubrication					Lubricated for life												
Direction of rotation					In- and output same direction												
Protection class					IP 65												
Shrink disc (Standard version)					SD 030x060 S2V												
Max. torque (without axial force)			<i>T</i> _{max}	<i>Nm</i>	550												
Mass moment of inertia (relates to the drive) Clamping hub diameter [mm]	C	14	<i>J</i> ₁	<i>kgcm²</i>	-	-	-	-	-	-	0.21	0.16	0.16	0.2	0.21	0.16	0.16
				<i>10⁻³ in.lb.s²</i>	-	-	-	-	-	-	0.19	0.14	0.14	0.18	0.19	0.14	0.14
	E	19	<i>J</i> ₁	<i>kgcm²</i>	1.5	1.2	1.1	1.0	0.97	1.0	0.57	0.53	0.53	0.57	0.57	0.53	0.53
				<i>10⁻³ in.lb.s²</i>	1.0	1.0	0.97	0.89	0.86	0.89	0.5	0.47	0.47	0.5	0.5	0.47	0.47
	G	24	<i>J</i> ₁	<i>kgcm²</i>	1.6	1.3	1.2	1.1	1.1	1.2	-	-	-	-	-	-	-
				<i>10⁻³ in.lb.s²</i>	1.0	1.0	1.0	0.97	0.97	1.0	-	-	-	-	-	-	-

Please use our sizing software cymex[®] for a detailed sizing – www.wittenstein-cymex.com
Please contact us for optimum sizing at S1 conditions (Continuous operation).

- ^{a)} At max. 10 % *F*_{2QMax}
- ^{b)} Valid for standard clamping hub diameter
- ^{c)} Refers to center of the output shaft or flange
- ^{d)} Please reduce input speed at higher ambient temperatures
- ¹⁾ Please contact us to discuss application-specific service lifetimes

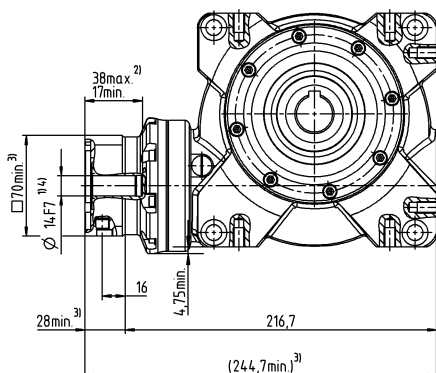
1-stage

up to 19/24⁴⁾
(E⁶⁾/G) clamping
hub diameter



2-stage

up to 14/19⁴⁾
(C⁶⁾/E) clamping
hub diameter



- 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

c) - e): Already included in the scope of delivery of the gearbox

See technical data sheet for available clamping hub diameters (mass moment of inertia). Dimensions available on request.

Non-tolerated dimensions are nominal dimensions

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 wall thickness of 1 mm.

⁵⁾ Tolerance h6 for mounted shaft.

⁶⁾ Standard clamping hub diameter

VH⁺ 063 MF 1-/2-stage

			1-stage							2-stage								
Ratio			i		4	7	10	16	28	40	50	70	100	140	200	280	400	
Max. torque ^{a) b)} (at n ₁ = 500 rpm)			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	
Torque for constant backlash (over the lifetime)			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	
Emergency stop torque ^{a) b)} (permitted 1000 times during the service life of the gearbox)			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	
Permitted average input speed (at 20 °C ambient temperature) ^{d)}			n _{1N}	rpm	4000							3100						
Max. input speed			n _{1Max}	rpm	4500													
Mean no load running torque ^{b)} (at n ₁ = 3000 rpm and 20 °C gearbox temperature)			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. backlash			j _t	arcmin	≤ 3	Standard ≤ 3 / Reduced ≤ 2					Standard ≤ 4 / Reduced ≤ 3							
Torsional rigidity ^{b)}			C _{t21}	Nm/arcmin	28													
				in.lb/arcmin	248													
Max. axial force ^{c)}			F _{2AMax}	N	8250													
				lb _f	1856													
Max. lateral force ^{c)}			F _{2QMax}	N	6000													
				lb _f	1350													
Max. tilting moment			M _{2KMax}	Nm	843													
				in.lb	7461													
Efficiency at full load (at n ₁ = 500 rpm)			η	%	93	91	88	83	74	68	86	89	86	72	66	72	66	
Service life ¹⁾			L _h	h	> 20000													
Weight (incl. standard adapter plate)			m	kg	13.0							13.7						
				lb _m	28.7							30.0						
Operating noise (at reference ratio and reference speed – ratio-specific values available in cymex [®])			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													
Direction of rotation					In- and output same direction													
Protection class					IP 65													
Shrink disc (Standard version)					SD 036x072 S2V													
Max. torque (without axial force)			T _{max}	Nm	640													
Mass moment of inertia (relates to the drive) Clamping hub diameter [mm]	E	19	J ₁	kgcm ²	-	-	-	-	-	-	0.75	0.59	0.58	0.75	0.75	0.58	0.58	
				10 ⁻³ in.lb.s ²	-	-	-	-	-	-	0.66	0.52	0.51	0.66	0.66	0.51	0.51	
	G	24	J ₁	kgcm ²	-	-	-	-	-	-	2.3	2.2	2.2	2.3	2.3	2.2	2.2	
				10 ⁻³ in.lb.s ²	-	-	-	-	-	-	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
	H	28	J ₁	kgcm ²	4.9	4.0	3.8	3.7	3.6	3.6	-	-	-	-	-	-	-	
				10 ⁻³ in.lb.s ²	4.3	3.5	3.4	3.3	3.2	3.2	-	-	-	-	-	-	-	

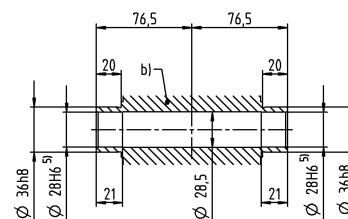
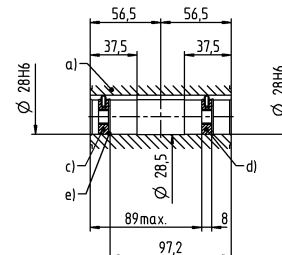
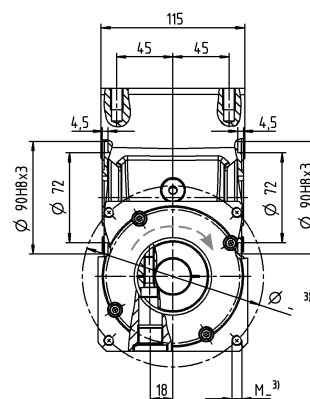
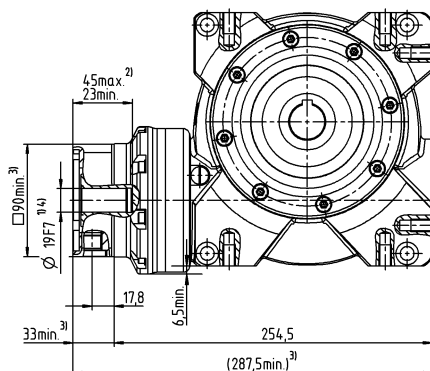
Please use our sizing software cymex[®] for a detailed sizing – www.wittenstein-cymex.com
Please contact us for optimum sizing at S1 conditions (Continuous operation).

- ^{a)} At max. 10 % *F*_{2QMax}
- ^{b)} Valid for standard clamping hub diameter
- ^{c)} Refers to center of the output shaft or flange
- ^{d)} Please reduce input speed at higher ambient temperatures
- ¹⁾ Please contact us to discuss application-specific service lifetimes

Motor shaft diameter [mm]

2-stage

Technical drawing of a 4-port hydraulic valve, view A. The drawing shows a cross-section of the valve body with four ports. Key dimensions include: overall width 100mm, port diameter 18x11mm, port spacing 62.5mm, and overall height 203mm. The valve is labeled '4xM10x17' and '8P8'. A note indicates '58 max. 28 min.' for a specific dimension. A note at the bottom indicates '(253.5 min.)' for the overall length.



VH⁺ 080 MF 1-/2-stage

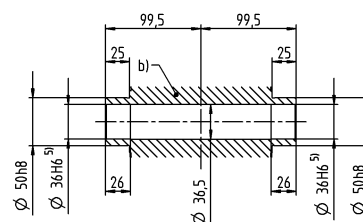
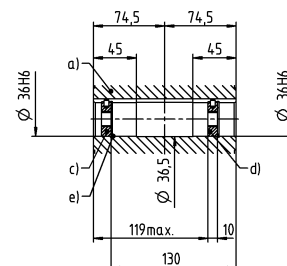
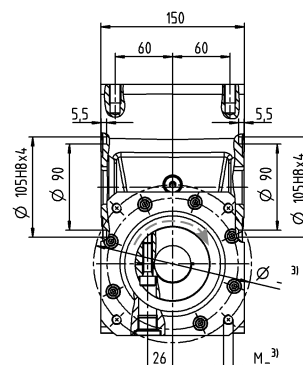
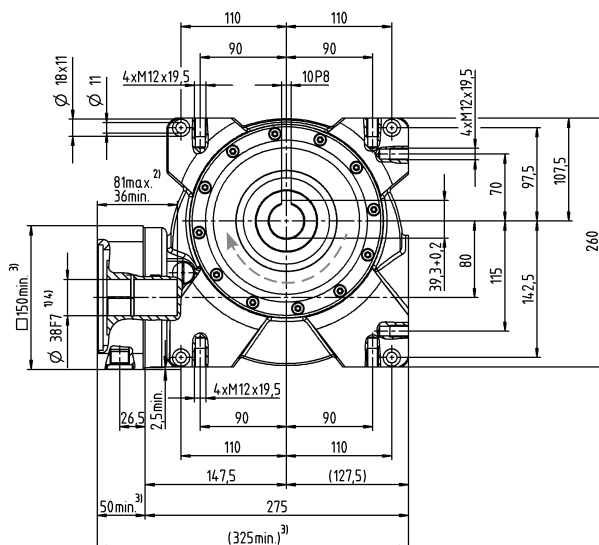
			1-stage							2-stage								
Ratio			i		4	7	10	16	28	40	50	70	100	140	200	280	400	
Max. torque ^{a) b)} (at n ₁ = 500 rpm)			T _{2a}	Nm	578	646	672	702	785	676	672	646	672	785	676	785	676	
				in.lb	5115	5717	5947	6213	6947	5983	5947	5717	5947	6947	5983	6947	5983	
Torque for constant backlash (over the lifetime)			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	
Emergency stop torque ^{a) b)} (permitted 1000 times during the service life of the gearbox)			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	
Permitted average input speed (at 20 °C ambient temperature) ^{d)}			n _{1N}	rpm	3500							2900						
Max. input speed			n _{1Max}	rpm	4000							4500						
Mean no load running torque ^{b)} (at n ₁ = 3000 rpm and 20 °C gearbox temperature)			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. backlash			j _t	arcmin	≤ 3	Standard ≤ 3 / Reduced ≤ 2					Standard ≤ 4 / Reduced ≤ 3							
Torsional rigidity ^{b)}			C _{t21}	Nm/arcmin	78													
				in.lb/arcmin	690													
Max. axial force ^{c)}			F _{2AMax}	N	13900													
				lb _f	3128													
Max. lateral force ^{c)}			F _{2QMax}	N	9000													
				lb _f	2025													
Max. tilting moment			M _{2KMax}	Nm	1544													
				in.lb	13664													
Efficiency at full load (at n ₁ = 500 rpm)			η	%	94	92	89	86	77	70	87	90	87	75	68	75	68	
Service life ^{f)}			L _h	h	> 20000													
Weight (incl. standard adapter plate)			m	kg	27.0							29.5						
				lb _m	59.7							68.0						
Operating noise (at reference ratio and reference speed – ratio-specific values available in cymex [®])			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													
Direction of rotation					In- and output same direction													
Protection class					IP 65													
Shrink disc (Standard version)					SD 050x090 S2V													
Max. torque (without axial force)			T _{max}	Nm	1400													
Mass moment of inertia (relates to the drive) Clamping hub diameter [mm]	G	24	J _i	kgcm ²	-	-	-	-	-	-	3.0	2.4	2.4	3.0	3.0	2.4	2.4	
				10 ⁻³ in.lb.s ²	-	-	-	-	-	-	2.7	2.1	2.1	2.7	2.7	2.1	2.1	
		K	38	J _i	kgcm ²	19.8	16.3	16.3	14.9	14.8	15.4	10.2	9.5	9.5	10.1	10.2	9.5	9.5
				10 ⁻³ in.lb.s ²	17.5	14.4	14.4	13.2	13.1	13.6	9.0	8.4	8.4	8.9	9.0	8.4	8.4	

Please use our sizing software cymex[®] for a detailed sizing – www.wittenstein-cymex.com
Please contact us for optimum sizing at S1 conditions (Continuous operation).

- ^{a)} At max. 10 % *F*_{2QMax}
- ^{b)} Valid for standard clamping hub diameter
- ^{c)} Refers to center of the output shaft or flange
- ^{d)} Please reduce input speed at higher ambient temperatures
- ^{f)} Please contact us to discuss application-specific service lifetimes

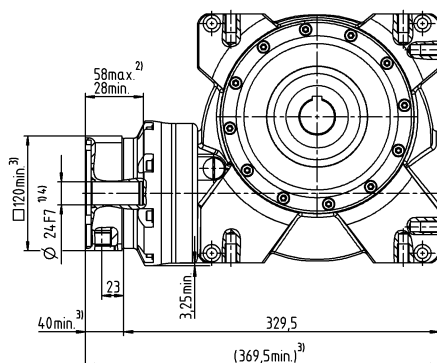
1-stage

up to 38⁴⁾ (K)⁶⁾
clamping hub
diameter



2-stage

up to 24/38⁴⁾
(G⁶⁾/K) clamping
hub diameter



- 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

c) - e): Already included in the scope of delivery of the gearbox

See technical data sheet for available clamping hub diameters (mass moment of inertia). Dimensions available on request.

Non-tolerated dimensions are nominal dimensions

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 wall thickness of 1 mm.

⁵⁾ Tolerance h6 for mounted shaft.

⁶⁾ Standard clamping hub diameter

Motor shaft diameter [mm]

Worm gearboxes

VH+

VH+ 100 MF 1-/2-stage

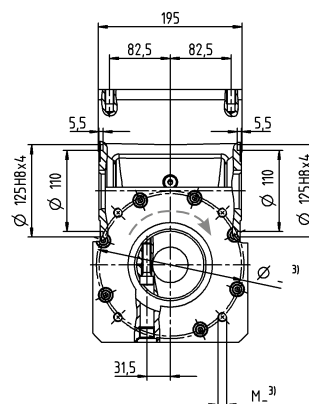
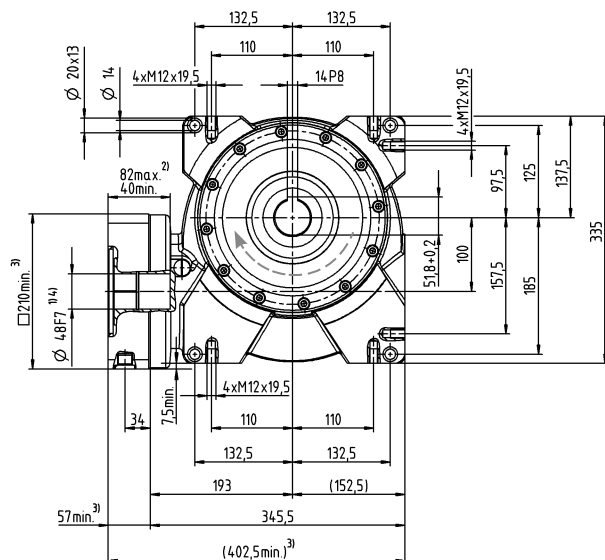
				1-stage						2-stage								
Ratio			<i>i</i>		4	7	10	16	28	40	50	70	100	140	200	280	400	
Max. torque ^{a) b)} (at <i>n</i> ₁ = 500 rpm)			<i>T</i> _{2a}	<i>Nm</i>	1184	1336	1377	1392	1505	1376	1377	1336	1377	1505	1376	1505	1376	
				<i>in.lb</i>	10478	11824	12186	12319	13319	12178	12186	11825	12186	13319	12178	13319	12178	
Torque for constant backlash (over the lifetime)			<i>T</i> _{2Servo}	<i>Nm</i>	1155	1304	1343	1359	1469	1343	1343	1304	1343	1469	1343	1469	1343	
				<i>in.lb</i>	10222	11540	11886	12027	13001	11886	11886	11541	11886	13001	11886	13001	11886	
Emergency stop torque ^{a) b)} (permitted 1000 times during the service life of the gearbox)			<i>T</i> _{2Not}	<i>Nm</i>	1819	1932	1940	1955	2073	1856	1940	1940	1940	2073	1856	2073	1856	
				<i>in.lb</i>	16098	17098	17169	17302	18346	16426	17169	17169	17169	18346	16426	18346	16426	
Permitted average input speed (at 20 °C ambient temperature) ^{d)}			<i>n</i> _{1N}	<i>rpm</i>	3000						2700							
Max. input speed			<i>n</i> _{1Max}	<i>rpm</i>	3500						4000							
Mean no load running torque ^{b)} (at <i>n</i> ₁ = 3000 rpm and 20 °C gearbox temperature)			<i>T</i> ₀₁₂	<i>Nm</i>	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	
				<i>in.lb</i>	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. backlash			<i>j</i> _t	<i>arcmin</i>	≤ 3	Standard ≤ 3 / Reduced ≤ 2					Standard ≤ 4 / Reduced ≤ 3							
Torsional rigidity ^{b)}			<i>C</i> _{t21}	<i>Nm/arcmin</i>	153													
				<i>in.lb/arcmin</i>	1354													
Max. axial force ^{c)}			<i>F</i> _{2AMax}	<i>N</i>	19500													
				<i>lb_f</i>	4388													
Max. lateral force ^{c)}			<i>F</i> _{2QMax}	<i>N</i>	14000													
				<i>lb_f</i>	3150													
Max. tilting moment			<i>M</i> _{2KMax}	<i>Nm</i>	3059													
				<i>in.lb</i>	27072													
Efficiency at full load (at <i>n</i> ₁ = 500 rpm)			<i>η</i>	%	95	93	91	87	80	76	89	89	89	78	74	78	74	
Service life ^{f)}			<i>L</i> _h	<i>h</i>	> 20000													
Weight (incl. standard adapter plate)			<i>m</i>	<i>kg</i>	51.0						53.6							
				<i>lb_m</i>	112.7						118.0							
Operating noise (at reference ratio and reference speed – ratio-specific values available in cymex®)			<i>L</i> _{PA}	<i>dB(A)</i>	≤ 70													
Max. permitted housing temperature				°C	+90													
				<i>F</i>	194													
Ambient temperature				°C	-15 to +40													
				<i>F</i>	5 to 104													
Lubrication					Lubricated for life													
Direction of rotation					In- and output same direction													
Protection class					IP 65													
Shrink disc (Standard version)					SD 062x110 S2V													
Max. torque (without axial force)			<i>T</i> _{max}	<i>Nm</i>	2300													
Mass moment of inertia (relates to the drive) Clamping hub diameter [mm]			K	38	<i>J</i> ₁	<i>kgcm²</i>	-	-	-	-	-	11.9	10.0	10.0	11.8	11.8	10.0	10.0
						<i>10⁻³ in.lb.s²</i>	-	-	-	-	-	10.5	8.9	8.9	10.4	10.4	8.9	8.9
			M	48	<i>J</i> ₁	<i>kgcm²</i>	53.4	43.8	41.9	42.7	40.3	40.6	26.9	25.1	25.0	26.8	26.9	25.0
<i>10⁻³ in.lb.s²</i>	47.3	38.8				27.1	37.8	35.7	35.9	23.8	22.2	22.1	23.7	23.8	22.1	22.1		

Please use our sizing software cymex® for a detailed sizing – www.wittenstein-cymex.com
Please contact us for optimum sizing at S1 conditions (Continuous operation).

- ^{a)} At max. 10 % F_{2QMax}
- ^{b)} Valid for standard clamping hub diameter
- ^{c)} Refers to center of the output shaft or flange
- ^{d)} Please reduce input speed at higher ambient temperatures
- ^{f)} Please contact us to discuss application-specific service lifetimes

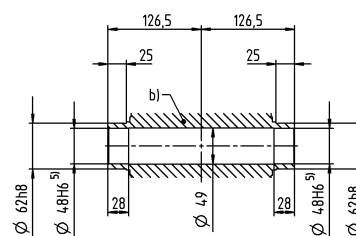
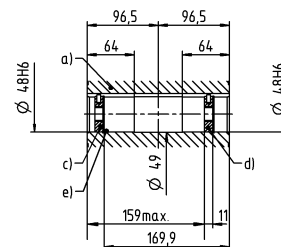
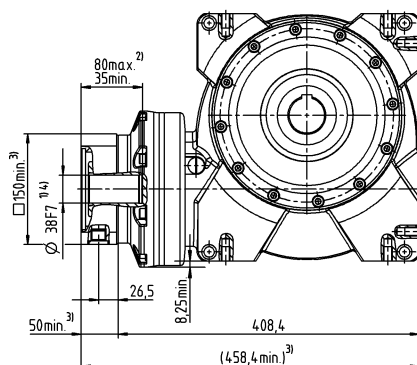
1-stage

up to 48 ⁴⁾ (M) ⁶⁾
clamping hub
diameter



2-stage

up to 38/48 ⁴⁾
(K⁶⁾/M) clamping
hub diameter



- 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

c) - e): Already included in the scope of delivery of the gearbox

See technical data sheet for available clamping hub diameters (mass moment of inertia). Dimensions available on request.

Non-tolerated dimensions are nominal dimensions

- 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 wall thickness of 1 mm.

⁵⁾ Tolerance h6 for mounted shaft.⁶⁾ Standard clamping hub diameter

VS+ 050 MF 1-/2-stage

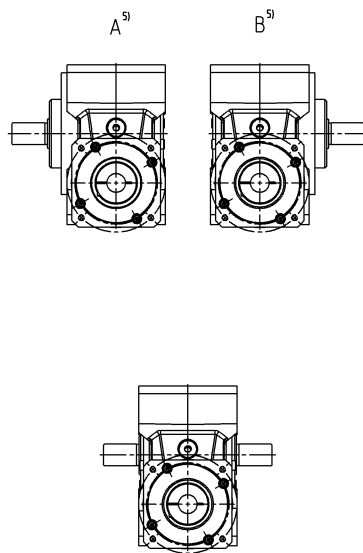
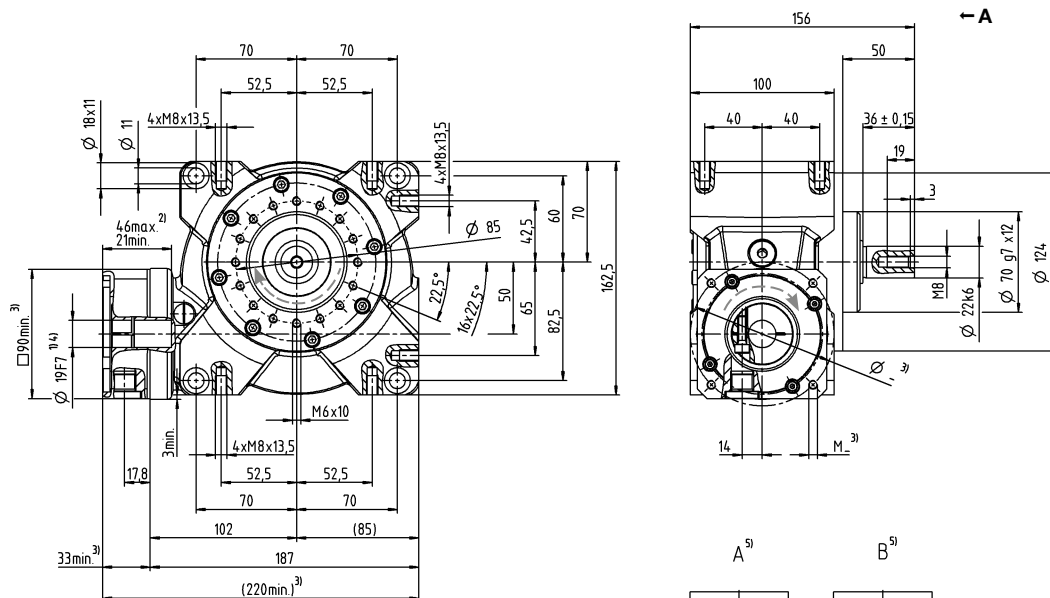
			1-stage							2-stage								
Ratio			i		4	7	10	16	28	40	50	70	100	140	200	280	400	
Max. torque ^{a) b) e)} (at n ₁ = 500 rpm)			T _{2a}	Nm	165	180	182	193	204	183	182	180	182	204	183	204	183	
				in.lb	1460	1593	1611	1708	1805	1620	1611	1593	1611	1805	1620	1805	1620	
Torque for constant backlash (over the lifetime)			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	
Emergency stop torque ^{a) b) e)} (permitted 1000 times during the service life of the gearbox)			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	
Permitted average input speed (at 20 °C ambient temperature) ^{d)}			n _{1N}	rpm	4000							3500						
Max. input speed			n _{1Max}	rpm	6000													
Mean no load running torque ^{b)} (at n ₁ = 3000 rpm and 20 °C gearbox temperature)			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. backlash			j _t	arcmin	≤ 3	Standard ≤ 3 / Reduced ≤ 2					Standard ≤ 4 / Reduced ≤ 3							
Torsional rigidity ^{b)}			C _{t21}	Nm/arcmin	8													
				in.lb/arcmin	71													
Max. axial force ^{c)}			F _{2AMax}	N	5000													
				lb _f	1125													
Max. lateral force ^{c)}			F _{2QMax}	N	3800													
				lb _f	855													
Max. tilting moment			M _{2KMax}	Nm	409													
				in.lb	3620													
Efficiency at full load (at n ₁ = 500 rpm)			η	%	92	89	86	82	72	64	84	87	84	70	62	70	62	
Service life ^{f)}			L _h	h	> 20000													
Weight (incl. standard adapter plate)			m	kg	9.0							9.7						
				lb _m	19.9							21.0						
Operating noise (at reference ratio and reference speed – ratio-specific values available in cymex®)			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													
Direction of rotation					In- and output same direction													
Protection class					IP 65													
Metal bellows coupling (recommended product type – validate sizing with cymex®)					BC3 - 00200A - 022.000 - X													
Bore diameter of coupling on the application side				mm	X = 015.000 - 044.000													
Mass moment of inertia (relates to the drive) Clamping hub diameter [mm]	C	14	J ₁	kgcm ²	-	-	-	-	-	-	0.21	0.16	0.16	0.2	0.21	0.16	0.16	
				10 ⁻³ in.lb.s ²	-	-	-	-	-	-	0.19	0.14	0.14	0.18	0.19	0.14	0.14	
	E	19	J ₁	kgcm ²	1.5	1.2	1.1	1.0	0.97	1.0	0.57	0.53	0.53	0.57	0.57	0.53	0.53	
				10 ⁻³ in.lb.s ²	1.3	1.1	0.97	0.89	0.86	0.89	0.5	0.47	0.47	0.5	0.5	0.47	0.47	
	G	24	J ₁	kgcm ²	1.6	1.3	1.2	1.1	1.1	1.2	-	-	-	-	-	-	-	
				10 ⁻³ in.lb.s ²	1.4	1.2	1.1	0.97	0.97	1.1	-	-	-	-	-	-	-	

Please use our sizing software cymex® for a detailed sizing – www.wittenstein-cymex.com
Please contact us for optimum sizing at S1 conditions (Continuous operation).

- ^{a)} At max. 10 % F_{2QMax}
- ^{b)} Valid for standard clamping hub diameter
- ^{c)} Refers to center of the output shaft or flange
- ^{d)} Please reduce input speed at higher ambient temperatures
- ^{e)} Smooth shaft
- ^{f)} Please contact us to discuss application-specific service lifetimes

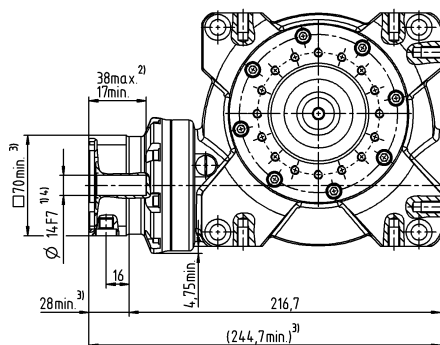
1-stage

up to 19/24 ⁴⁾
(E⁶)/G) clamping
hub diameter



2-stage

up to 14/19 ⁴⁾
(C⁶)/E) clamping
hub diameter

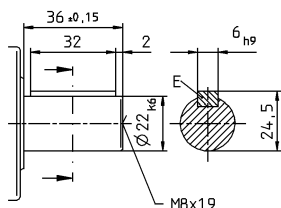


Optional dual-shaft output. Drawings available upon request.
Involute gearing is not possible.

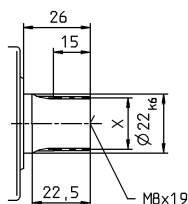
 VS^+

Other output variants

Shaft with key



Splined shaft (DIN 5480)



See technical data sheet for available clamping hub diameters (mass moment of inertia). Dimensions available on request.

Non-tolerated dimensions are nominal dimensions

- 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 wall thickness of 1 mm.

5) Output side

⁶⁾ Standard clamping hub diameter

VS+ 063 MF 1-/2-stage

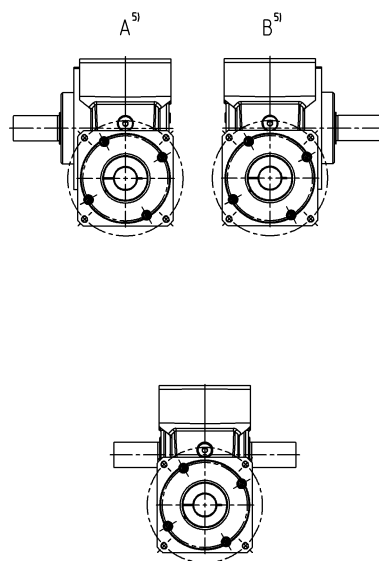
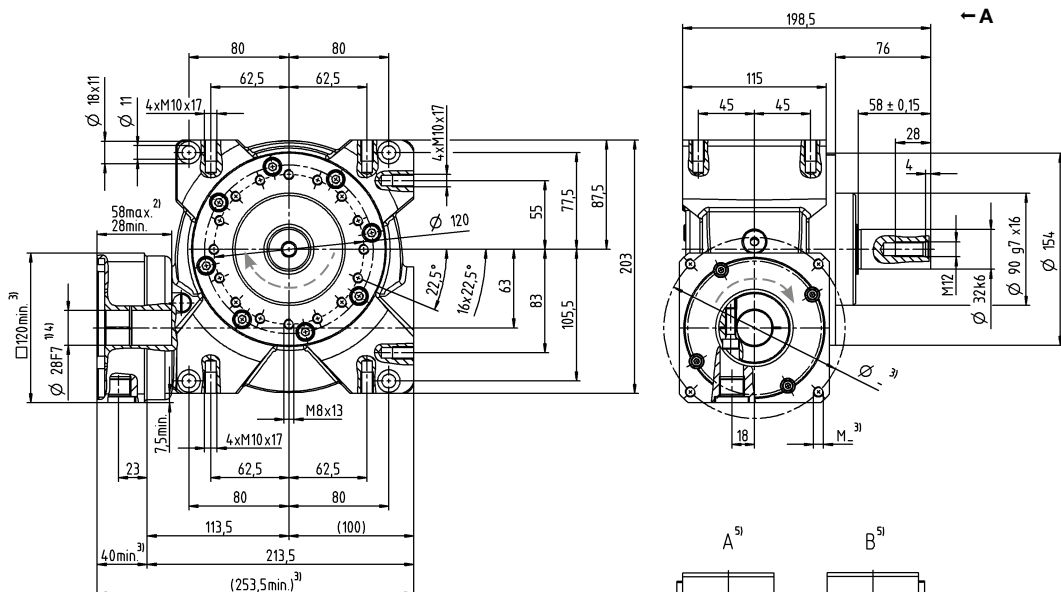
				1-stage							2-stage							
Ratio			<i>i</i>		4	7	10	16	28	40	50	70	100	140	200	280	400	
Max. torque ^{a) b) e)} (at <i>n</i> ₁ = 500 rpm)			<i>T</i> _{2a}	<i>Nm</i>	319	353	364	372	392	363	364	353	364	392	363	392	363	
				<i>in.lb</i>	2823	3124	3221	3292	3469	3213	3221	3124	3221	3469	3213	3469	3213	
Torque for constant backlash (over the lifetime)			<i>T</i> _{2Servo}	<i>Nm</i>	198	210	225	221	229	226	225	210	225	229	226	229	226	
				<i>in.lb</i>	1752	1859	1991	1956	2027	2000	1991	1859	1991	2027	2000	2027	2000	
Emergency stop torque ^{a) b) e)} (permitted 1000 times during the service life of the gearbox)			<i>T</i> _{2Not}	<i>Nm</i>	460	484	491	494	518	447	491	484	494	518	447	518	447	
				<i>in.lb</i>	4071	4283	4345	4372	4584	3956	4345	4283	4372	4584	3956	4584	3956	
Permitted average input speed (at 20 °C ambient temperature) ^{d)}			<i>n</i> _{1N}	<i>rpm</i>	4000							3100						
Max. input speed			<i>n</i> _{1Max}	<i>rpm</i>	4500													
Mean no load running torque ^{b)} (at <i>n</i> ₁ = 3000 rpm and 20 °C gearbox temperature)			<i>T</i> ₀₁₂	<i>Nm</i>	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	
				<i>in.lb</i>	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. backlash			<i>j</i> _t	<i>arcmin</i>	≤ 3	Standard ≤ 3 / Reduced ≤ 2					Standard ≤ 4 / Reduced ≤ 3							
Torsional rigidity ^{b)}			<i>C</i> _{t21}	<i>Nm/arcmin</i>	28													
				<i>in.lb/arcmin</i>	248													
Max. axial force ^{c)}			<i>F</i> _{2AMax}	<i>N</i>	8250													
				<i>lb_f</i>	1856													
Max. lateral force ^{c)}			<i>F</i> _{2QMax}	<i>N</i>	6000													
				<i>lb_f</i>	1350													
Max. tilting moment			<i>M</i> _{2KMax}	<i>Nm</i>	843													
				<i>in.lb</i>	7461													
Efficiency at full load (at <i>n</i> ₁ = 500 rpm)			<i>η</i>	%	93	91	88	83	74	68	86	89	86	72	66	72	66	
Service life ^{f)}			<i>L</i> _h	<i>h</i>	> 20000													
Weight (incl. standard adapter plate)			<i>m</i>	<i>kg</i>	16.0							16.7						
				<i>lb_m</i>	35.4							37.0						
Operating noise (at reference ratio and reference speed – ratio-specific values available in cymex®)			<i>L</i> _{PA}	<i>dB(A)</i>	≤ 64													
Max. permitted housing temperature				°C	+90													
				<i>F</i>	194													
Ambient temperature				°C	-15 to +40													
				<i>F</i>	5 to 104													
Lubrication					Lubricated for life													
Direction of rotation					In- and output same direction													
Protection class					IP 65													
Metal bellows coupling (recommended product type – validate sizing with cymex®)					BC3 - 00500A - 032.000 - X													
Bore diameter of coupling on the application side				<i>mm</i>	X = 024.000 - 056.000													
Mass moment of inertia (relates to the drive) Clamping hub diameter [mm]	E	19	<i>J</i> ₁	<i>kgcm²</i>	-	-	-	-	-	-	0.75	0.59	0.58	0.75	0.75	0.58	0.58	
				<i>10⁻³ in.lb.s²</i>	-	-	-	-	-	-	0.66	0.52	0.51	0.66	0.66	0.51	0.51	
	G	24	<i>J</i> ₁	<i>kgcm²</i>	-	-	-	-	-	-	2.3	2.2	2.2	2.3	2.3	2.2	2.2	
				<i>10⁻³ in.lb.s²</i>	-	-	-	-	-	-	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
	H	28	<i>J</i> ₁	<i>kgcm²</i>	4.9	4.0	3.8	3.7	3.6	3.6	-	-	-	-	-	-	-	
				<i>10⁻³ in.lb.s²</i>	4.3	3.5	3.4	3.3	3.2	3.2	-	-	-	-	-	-	-	

Please use our sizing software cymex® for a detailed sizing – www.wittenstein-cymex.com
Please contact us for optimum sizing at S1 conditions (Continuous operation).

- ^{a)} At max. 10 % F_{2QMax}
- ^{b)} Valid for standard clamping hub diameter
- ^{c)} Refers to center of the output shaft or flange
- ^{d)} Please reduce input speed at higher ambient temperatures
- ^{e)} Smooth shaft
- ^{f)} Please contact us to discuss application-specific service lifetimes

1-stage

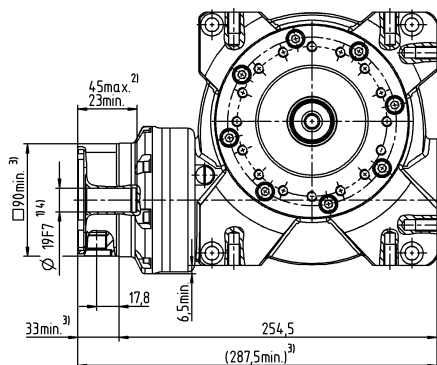
up to 28 ⁴⁾ (H) ⁶⁾
clamping hub
diameter



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

2-stage

up to 19/24 ⁴⁾
(E⁶)/G) clamping
hub diameter

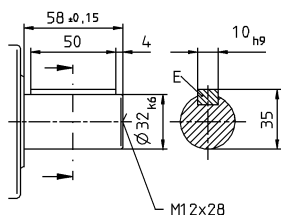


Motor shaft diameter [mm]

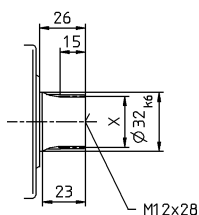
VS⁺

Other output variants

Shaft with key



Splined shaft (DIN 5480)



See technical data sheet for available clamping hub diameters (mass moment of inertia). Dimensions available on request.

Non-tolerated dimensions are nominal dimensions

- 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 wall thickness of 1 mm.

5) Output side

⁶⁾ Standard clamping hub diameter

VS+ 080 MF 1-/2-stage

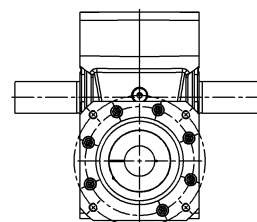
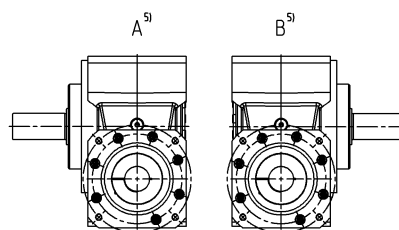
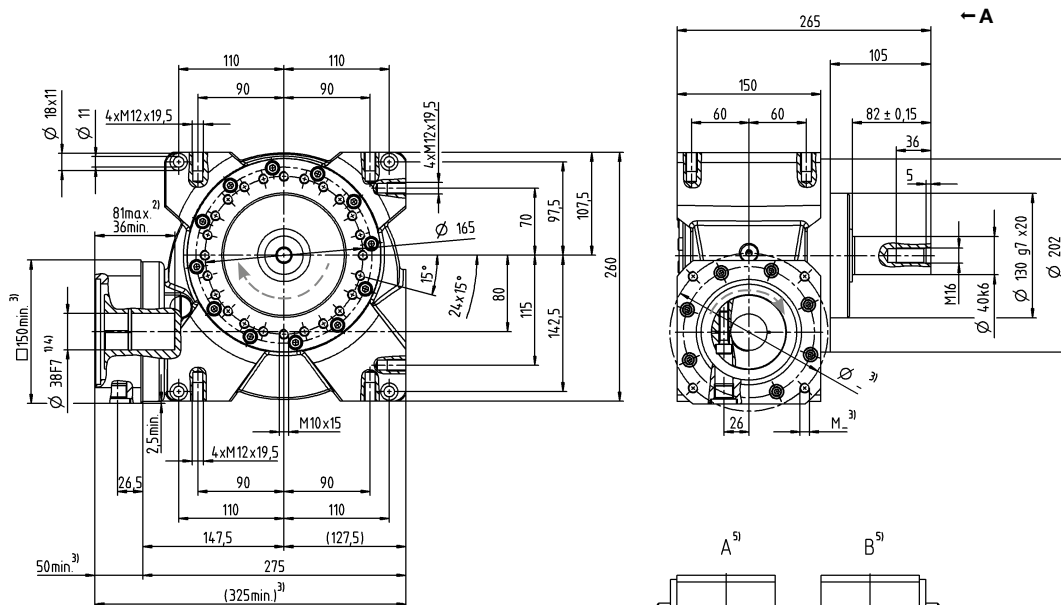
			1-stage							2-stage								
Ratio			i		4	7	10	16	28	40	50	70	100	140	200	280	400	
Max. torque ^{a) b) e)} (at n ₁ = 500 rpm)			T _{2a}	Nm	578	646	672	702	785	676	672	646	672	785	676	785	676	
				in.lb	5115	5717	5947	6213	6947	5983	5947	5717	5947	6947	5983	6947	5983	
Torque for constant backlash (over the lifetime)			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	
Emergency stop torque ^{a) b) e)} (permitted 1000 times during the service life of the gearbox)			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	
Permitted average input speed (at 20 °C ambient temperature) ^{d)}			n _{1N}	rpm	3500							2900						
Max. input speed			n _{1Max}	rpm	4000							4500						
Mean no load running torque ^{b)} (at n ₁ = 3000 rpm and 20 °C gearbox temperature)			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. backlash			j _t	arcmin	≤ 3	Standard ≤ 3 / Reduced ≤ 2					Standard ≤ 4 / Reduced ≤ 3							
Torsional rigidity ^{b)}			C _{t21}	Nm/arcmin	78													
				in.lb/arcmin	690													
Max. axial force ^{c)}			F _{2AMax}	N	13900													
				lb _f	3128													
Max. lateral force ^{c)}			F _{2QMax}	N	9000													
				lb _f	2025													
Max. tilting moment			M _{2KMax}	Nm	1544													
				in.lb	13664													
Efficiency at full load (at n ₁ = 500 rpm)			η	%	94	92	89	86	77	70	87	90	87	75	68	75	68	
Service life ^{f)}			L _h	h	> 20000													
Weight (incl. standard adapter plate)			m	kg	33.0							35.5						
				lb _m	72.9							78.0						
Operating noise (at reference ratio and reference speed – ratio-specific values available in cymex®)			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													
Direction of rotation					In- and output same direction													
Protection class					IP 65													
Metal bellows coupling (recommended product type – validate sizing with cymex®)					BC3 - 00800A - 040.000 - X													
Bore diameter of coupling on the application side				mm	X = 030.000 - 060.000													
Mass moment of inertia (relates to the drive) Clamping hub diameter [mm]	G	24	J _I	kgcm ²	-	-	-	-	-	-	3.0	2.4	2.4	3.0	3.0	2.4	2.4	
				10 ⁻³ in.lb.s ²	-	-	-	-	-	-	2.0	2.1	2.1	2.7	2.7	2.1	2.1	
		K	38	J _I	kgcm ²	19.8	16.3	16.3	14.9	14.8	15.4	10.2	9.5	9.5	10.1	10.2	9.5	9.5
	10 ⁻³ in.lb.s ²				17.5	14.4	14.4	13.2	13.1	13.6	9.0	8.4	8.4	8.9	9.0	8.4	8.4	

Please use our sizing software cymex® for a detailed sizing – www.wittenstein-cymex.com
Please contact us for optimum sizing at S1 conditions (Continuous operation).

- ^{a)} At max. 10 % F_{2QMax}
- ^{b)} Valid for standard clamping hub diameter
- ^{c)} Refers to center of the output shaft or flange
- ^{d)} Please reduce input speed at higher ambient temperatures
- ^{e)} Smooth shaft
- ^{f)} Please contact us to discuss application-specific service lifetimes

1-stage

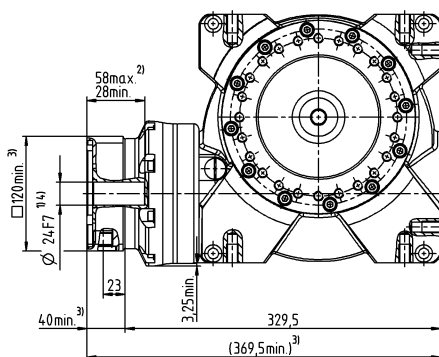
up to 38⁴⁾ (K)⁶⁾
clamping hub
diameter



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

2-stage

up to 24/38 ⁴⁾
(G⁶/K) clamping
hub diameter

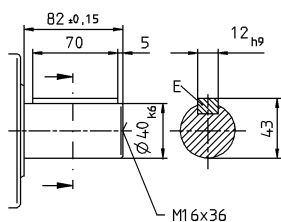


Motor shaft diameter [mm]

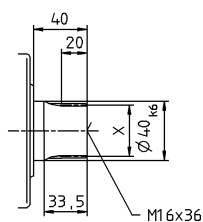
VS⁺

Other output variants

Shaft with key



Splined shaft (DIN 5480)



See technical data sheet for available clamping hub diameters (mass moment of inertia). Dimensions available on request.

Non-tolerated dimensions are nominal dimensions

- 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 wall thickness of 1 mm.

5) Output side

⁶⁾ Standard clamping hub diameter

VS+ 100 MF 1-/2-stage

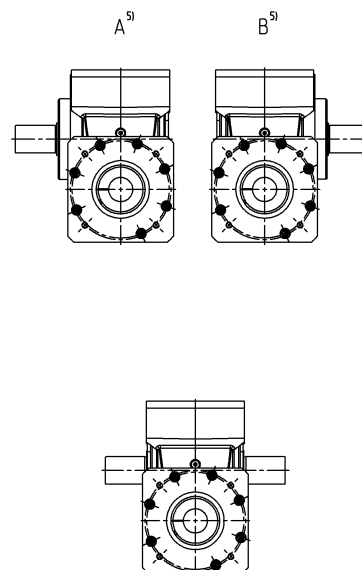
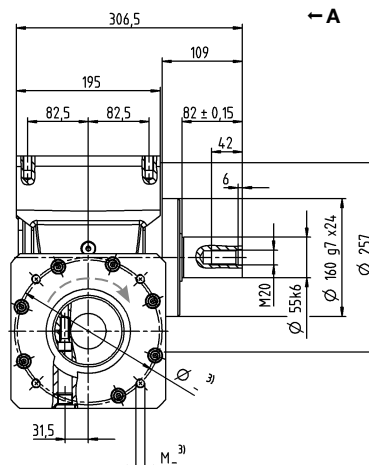
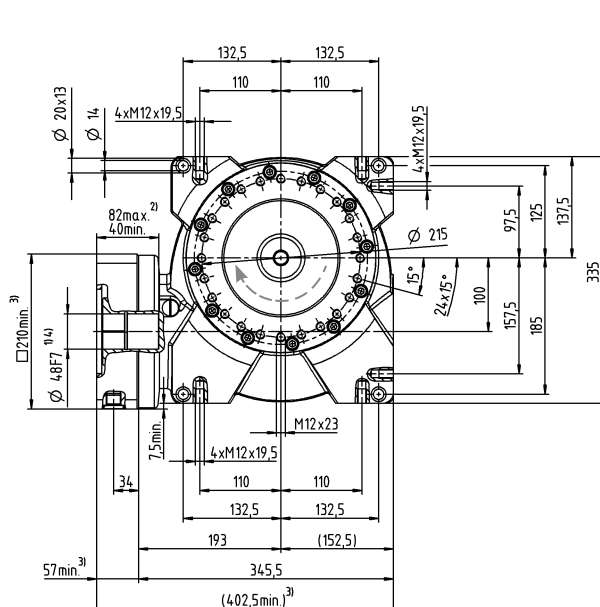
				1-stage						2-stage								
Ratio			<i>i</i>		4	7	10	16	28	40	50	70	100	140	200	280	400	
Max. torque ^{a) b) e)} (at <i>n</i> ₁ = 500 rpm)			<i>T</i> _{2a}	<i>Nm</i>	1184	1336	1377	1392	1505	1376	1377	1336	1377	1505	1376	1505	1376	
				<i>in.lb</i>	10478	11824	12186	12319	13319	12178	12186	11825	12186	13319	12178	13319	12178	
Torque for constant backlash (over the lifetime)			<i>T</i> _{2Servo}	<i>Nm</i>	1155	1304	1343	1359	1469	1343	1343	1304	1343	1469	1343	1469	1343	
				<i>in.lb</i>	10222	11540	11886	12027	13001	11886	11886	11541	11886	13001	11886	13001	11886	
Emergency stop torque ^{a) b) e)} (permitted 1000 times during the service life of the gearbox)			<i>T</i> _{2Not}	<i>Nm</i>	1819	1932	1940	1955	2073	1856	1940	1940	1940	2073	1856	2073	1856	
				<i>in.lb</i>	16098	17098	17169	17302	18346	16426	17169	17169	17169	18346	16426	18346	16426	
Permitted average input speed (at 20 °C ambient temperature) ^{d)}			<i>n</i> _{1N}	<i>rpm</i>	3000						2700							
Max. input speed			<i>n</i> _{1Max}	<i>rpm</i>	3500						4000							
Mean no load running torque ^{b)} (at <i>n</i> ₁ = 3000 rpm and 20 °C gearbox temperature)			<i>T</i> ₀₁₂	<i>Nm</i>	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	
				<i>in.lb</i>	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. backlash			<i>j</i> _t	<i>arcmin</i>	≤ 3	Standard ≤ 3 / Reduced ≤ 2					Standard ≤ 4 / Reduced ≤ 3							
Torsional rigidity ^{b)}			<i>C</i> _{t21}	<i>Nm/arcmin</i>	153													
				<i>in.lb/arcmin</i>	1354													
Max. axial force ^{c)}			<i>F</i> _{2AMax}	<i>N</i>	19500													
				<i>lb_f</i>	4388													
Max. lateral force ^{c)}			<i>F</i> _{2QMax}	<i>N</i>	14000													
				<i>lb_f</i>	3150													
Max. tilting moment			<i>M</i> _{2KMax}	<i>Nm</i>	3059													
				<i>in.lb</i>	27072													
Efficiency at full load (at <i>n</i> ₁ = 500 rpm)			<i>η</i>	%	95	93	91	87	80	76	89	89	89	78	74	78	74	
Service life ^{f)}			<i>L</i> _h	<i>h</i>	> 20000													
Weight (incl. standard adapter plate)			<i>m</i>	<i>kg</i>	62.0						64.6							
				<i>lb_m</i>	137.0						143.0							
Operating noise (at reference ratio and reference speed – ratio-specific values available in cymex®)			<i>L</i> _{PA}	<i>dB(A)</i>	≤ 70													
Max. permitted housing temperature				°C	+90													
				<i>F</i>	194													
Ambient temperature				°C	-15 to +40													
				<i>F</i>	5 to 104													
Lubrication					Lubricated for life													
Direction of rotation					In- and output same direction													
Protection class					IP 65													
Metal bellows coupling (recommended product type – validate sizing with cymex®)					BC3 - 01500A - 055.000 - X													
Bore diameter of coupling on the application side				<i>mm</i>	X = 035.000 - 070.000													
Mass moment of inertia (relates to the drive) Clamping hub diameter [mm]			K	38	<i>J</i> ₁	<i>kgcm²</i>	-	-	-	-	-	11.9	10.0	10.0	11.8	11.8	10.0	10.0
						<i>10⁻³ in.lb.s²</i>	-	-	-	-	-	10.5	8.9	8.9	10.4	10.4	8.9	8.9
			M	48	<i>J</i> ₁	<i>kgcm²</i>	53.4	43.8	41.9	42.7	40.3	40.6	26.9	25.1	25.0	26.8	26.9	25.0
<i>10⁻³ in.lb.s²</i>	47.3	38.8				37.1	37.8	35.7	35.9	23.8	22.2	22.1	23.7	23.8	22.1	22.1		

Please use our sizing software cymex® for a detailed sizing – www.wittenstein-cymex.com
Please contact us for optimum sizing at S1 conditions (Continuous operation).

- ^{a)} At max. 10 % F_{2QMax}
- ^{b)} Valid for standard clamping hub diameter
- ^{c)} Refers to center of the output shaft or flange
- ^{d)} Please reduce input speed at higher ambient temperatures
- ^{e)} Smooth shaft
- ^{f)} Please contact us to discuss application-specific service lifetimes

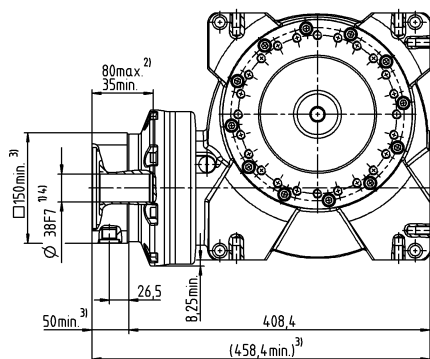
1-stage

up to 48 ⁴⁾ (M) ⁶⁾
clamping hub
diameter



2-stage

up to 38/48 ⁴⁾
(K⁶⁾/M) clamping
hub diameter



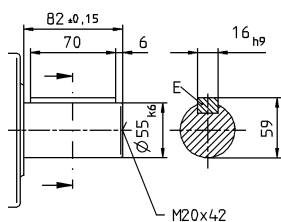
Motor shaft diameter [mm]

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

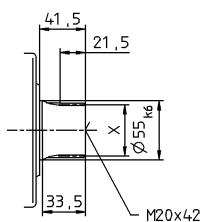
 VS^+

Other output variants

Shaft with key



Splined shaft (DIN 5480)



See technical data sheet for available clamping hub diameters (mass moment of inertia). Dimensions available on request.

Non-tolerated dimensions are nominal dimensions

- 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 wall thickness of 1 mm.

5) Output side

⁶⁾ Standard clamping hub diameter

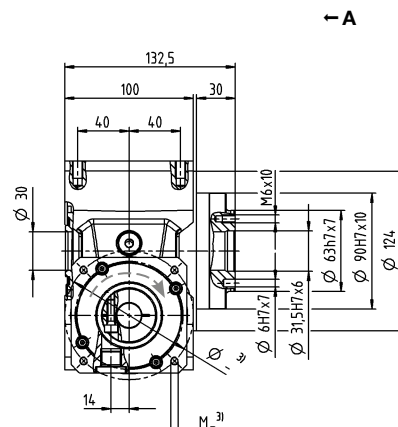
VT+ 050 MF 1-/2-stage

				1-stage						2-stage							
Ratio			<i>i</i>		4	7	10	16	28	40	50	70	100	140	200	280	400
Max. torque ^{a) b)} (at <i>n</i> ₁ = 500 rpm)			<i>T</i> _{2a}	<i>Nm</i>	165	180	182	193	204	183	182	180	182	204	183	204	183
				<i>in.lb</i>	1460	1593	1611	1708	1805	1620	1611	1593	1611	1805	1620	1805	1620
Torque for constant backlash (over the lifetime)			<i>T</i> _{2Servo}	<i>Nm</i>	54	71	74	81	90	74	74	71	74	90	74	90	74
				<i>in.lb</i>	478	628	655	717	797	655	655	628	655	797	655	797	655
Emergency stop torque ^{a) b)} (permitted 1000 times during the service life of the gearbox)			<i>T</i> _{2Not}	<i>Nm</i>	230	242	242	250	262	236	242	242	242	262	236	262	236
				<i>in.lb</i>	2036	2142	2142	2213	2319	2089	2142	2142	2142	2319	2089	2319	2089
Permitted average input speed (at 20 °C ambient temperature) ^{a)}			<i>n</i> _{1N}	<i>rpm</i>	4000						3500						
Max. input speed			<i>n</i> _{1Max}	<i>rpm</i>	6000												
Mean no load running torque ^{b)} (at <i>n</i> ₁ = 3000 rpm and 20 °C gearbox temperature)			<i>T</i> ₀₁₂	<i>Nm</i>	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
				<i>in.lb</i>	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. backlash			<i>j</i> _t	<i>arcmin</i>	≤ 3	Standard ≤ 3 / Reduced ≤ 2					Standard ≤ 4 / Reduced ≤ 3						
Torsional rigidity ^{b)}			<i>C</i> _{t21}	<i>Nm/arcmin</i>	17						17						
				<i>in.lb/arcmin</i>	150						150						
Max. axial force ^{c)}			<i>F</i> _{2AMax}	<i>N</i>	5000												
				<i>lb_f</i>	1125												
Max. tilting moment			<i>M</i> _{2KMax}	<i>Nm</i>	409												
				<i>in.lb</i>	3620												
Efficiency at full load (at <i>n</i> ₁ = 500 rpm)			<i>η</i>	%	92	89	86	82	72	64	84	87	84	70	62	70	62
Tilting rigidity			<i>C</i> _{2K}	<i>Nm/arcmin</i>	504												
				<i>in.lb/arcmin</i>	4460												
Service life ^{f)}			<i>L</i> _h	<i>h</i>	> 20000												
Weight (incl. standard adapter plate)			<i>m</i>	<i>kg</i>	9.0						9.5						
				<i>lb_m</i>	19.9						21.0						
Operating noise (at reference ratio and reference speed – ratio-specific values available in cymex®)			<i>L</i> _{PA}	<i>dB(A)</i>	≤ 62												
Max. permitted housing temperature				°C	+90												
				<i>F</i>	194												
Ambient temperature				°C	-15 to +40												
				<i>F</i>	5 to 104												
Lubrication					Lubricated for life												
Direction of rotation					In- and output same direction												
Protection class					IP 65												
Metal bellows coupling (recommended product type – validate sizing with cymex®)					BCT-00060AAX-050.000												
Bore diameter of coupling on the application side				<i>mm</i>	X = 014.000 - 035.000												
Mass moment of inertia (relates to the drive) Clamping hub diameter [mm]	C	14	<i>J</i> ₁	<i>kgcm²</i>	-	-	-	-	-	-	0.21	0.16	0.29	0.2	0.21	0.16	0.16
				<i>10⁻³ in.lb.s²</i>	-	-	-	-	-	-	0.19	0.14	0.26	0.18	0.19	0.14	0.14
	E	19	<i>J</i> ₁	<i>kgcm²</i>	1.8	1.3	1.1	1.0	1.0	1.0	0.58	0.53	0.53	0.57	0.57	0.53	0.53
				<i>10⁻³ in.lb.s²</i>	1.6	1.2	0.97	0.89	0.89	0.89	0.51	0.47	0.47	0.5	0.5	0.47	0.47
	G	24	<i>J</i> ₁	<i>kgcm²</i>	1.9	1.4	1.3	1.1	1.1	1.1	-	-	-	-	-	-	-
				<i>10⁻³ in.lb.s²</i>	1.7	1.2	1.2	0.97	0.97	0.97	-	-	-	-	-	-	-

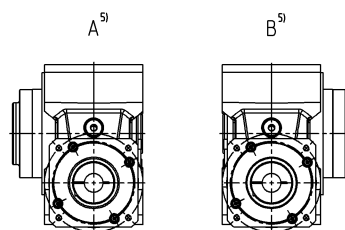
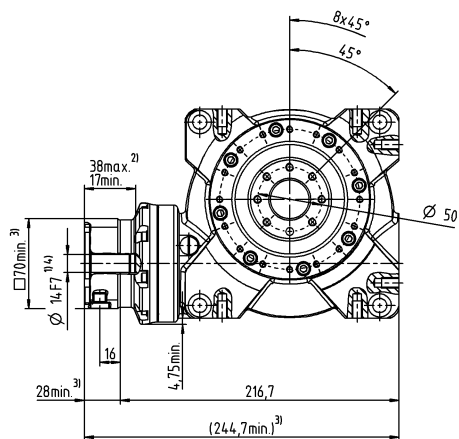
Please use our sizing software cymex® for a detailed sizing – www.wittenstein-cymex.com
Please contact us for optimum sizing at S1 conditions (Continuous operation).

- ^{a)} At max. 10 % M_{2KMax}
- ^{b)} Valid for standard clamping hub diameter
- ^{c)} Refers to center of the output shaft or flange
- ^{d)} Please reduce input speed at higher ambient temperatures
- ^{f)} Please contact us to discuss application-specific service lifetimes

up to 19/24 ⁴⁾
(E⁶)/G) clamping
hub diameter



up to 14/19 ⁴⁾
(C⁶)/E) clamping
hub diameter



Motor shaft diameter [mm]

⁶⁾ Standard clamping hub diameter

VT⁺ 063 MF 1-/2-stage

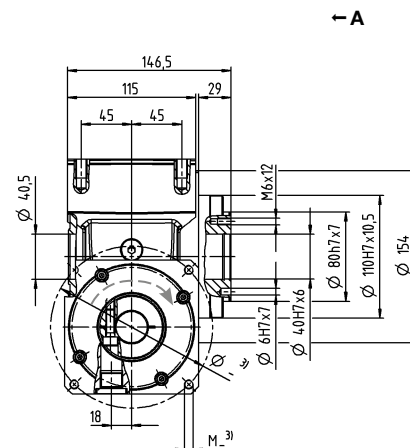
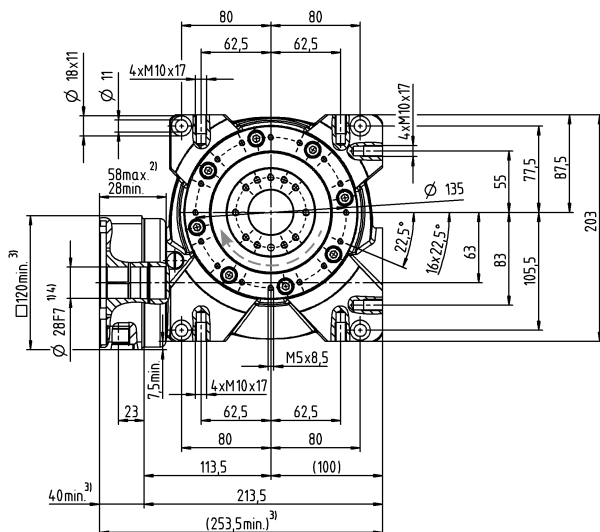
			1-stage							2-stage							
Ratio			<i>i</i>		4	7	10	16	28	40	50	70	100	140	200	280	400
Max. torque ^{a) b)} (at <i>n</i> ₁ = 500 rpm)			<i>T</i> _{2a}	<i>Nm</i>	319	353	364	372	392	363	364	353	364	392	363	392	363
				<i>in.lb</i>	2823	3124	3221	3292	3469	3213	3221	3124	3221	3469	3213	3469	3213
Torque for constant backlash (over the lifetime)			<i>T</i> _{2Servo}	<i>Nm</i>	198	210	225	221	229	226	225	210	225	229	226	229	226
				<i>in.lb</i>	1752	1859	1991	1956	2027	2000	1991	1859	1991	2027	2000	2027	2000
Emergency stop torque ^{a) b)} (permitted 1000 times during the service life of the gearbox)			<i>T</i> _{2Not}	<i>Nm</i>	460	484	491	494	518	447	491	484	494	518	447	518	447
				<i>in.lb</i>	4071	4283	4345	4372	4584	3956	4345	4283	4372	4584	3956	4584	3956
Permitted average input speed (at 20 °C ambient temperature) ^{d)}			<i>n</i> _{1N}	<i>rpm</i>	4000							3100					
Max. input speed			<i>n</i> _{1Max}	<i>rpm</i>	4500												
Mean no load running torque ^{b)} (at <i>n</i> ₁ = 3000 rpm and 20 °C gearbox temperature)			<i>T</i> ₀₁₂	<i>Nm</i>	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
				<i>in.lb</i>	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. backlash			<i>j</i> _t	<i>arcmin</i>	≤ 3	Standard ≤ 3 / Reduced ≤ 2					Standard ≤ 4 / Reduced ≤ 3						
Torsional rigidity ^{b)}			<i>C</i> _{t21}	<i>Nm/arcmin</i>	50					50							
				<i>in.lb/arcmin</i>	443					443							
Max. axial force ^{c)}			<i>F</i> _{2AMax}	<i>N</i>	8250												
				<i>lb_f</i>	1856												
Max. tilting moment			<i>M</i> _{2KMax}	<i>Nm</i>	843												
				<i>in.lb</i>	7461												
Efficiency at full load (at <i>n</i> ₁ = 500 rpm)			<i>η</i>	%	93	91	88	83	74	68	86	89	86	72	66	72	66
Tilting rigidity			<i>C</i> _{2K}	<i>Nm/arcmin</i>	603												
				<i>in.lb/arcmin</i>	5337												
Service life ¹⁾			<i>L</i> _h	<i>h</i>	> 20000												
Weight (incl. standard adapter plate)			<i>m</i>	<i>kg</i>	15.0					15.2							
				<i>lb_m</i>	33					34.0							
Operating noise (at reference ratio and reference speed – ratio-specific values available in cymex®)			<i>L</i> _{PA}	<i>dB(A)</i>	≤ 64												
Max. permitted housing temperature				°C	+90												
				<i>F</i>	194												
Ambient temperature				°C	-15 to +40												
				<i>F</i>	5 to 104												
Lubrication					Lubricated for life												
Direction of rotation					In- and output same direction												
Protection class					IP 65												
Metal bellows coupling (recommended product type – validate sizing with cymex®)					BCT-00150AAX-063.000												
Bore diameter of coupling on the application side				<i>mm</i>	X = 019.000 - 042.000												
Mass moment of inertia (relates to the drive) Clamping hub diameter [mm]	E	19	<i>J</i> ₁	<i>kgcm</i> ²	-	-	-	-	-	-	0.76	0.59	0.59	0.75	0.75	0.58	0.58
				<i>10⁻³ in.lb.s²</i>	-	-	-	-	-	-	0.67	0.52	0.52	0.66	0.66	0.51	0.51
	G	24	<i>J</i> ₁	<i>kgcm</i> ²	-	-	-	-	-	-	2.3	2.2	2.2	2.3	2.3	2.2	2.2
				<i>10⁻³ in.lb.s²</i>	-	-	-	-	-	-	2.0	2.0	2.0	2.0	2.0	2.0	2.0
	H	28	<i>J</i> ₁	<i>kgcm</i> ²	5.7	4.2	3.9	3.7	3.6	3.6	-	-	-	-	-	-	-
				<i>10⁻³ in.lb.s²</i>	5.0	3.7	3.5	3.3	3.2	3.2	-	-	-	-	-	-	-

Please use our sizing software cymex® for a detailed sizing – www.wittenstein-cymex.com
Please contact us for optimum sizing at S1 conditions (Continuous operation).

- ^{a)} At max. 10 % M_{2KMax}
- ^{b)} Valid for standard clamping hub diameter
- ^{c)} Refers to center of the output shaft or flange
- ^{d)} Please reduce input speed at higher ambient temperatures
- ¹⁾ Please contact us to discuss application-specific service lifetimes

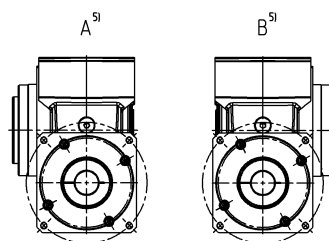
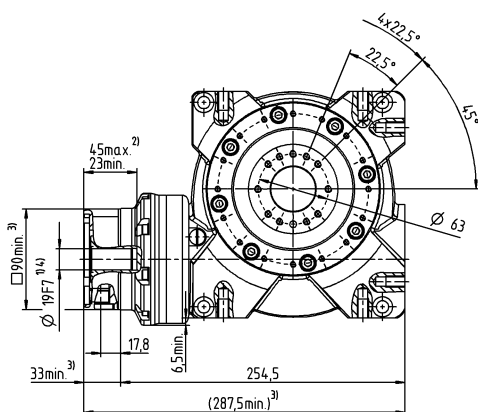
1-stage

up to 28 ⁴⁾ (H) ⁶⁾
clamping hub
diameter



2-stage

up to 19/24 ⁴⁾
(E⁶)/G) clamping
hub diameter



Motor shaft diameter [mm]

See technical data sheet for available clamping hub diameters (mass moment of inertia). Dimensions available on request.

Non-tolerated dimensions are nominal dimensions

- 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 wall thickness of 1 mm.

5) Output side

⁶⁾ Standard clamping hub diameter

VT+ 080 MF 1-/2-stage

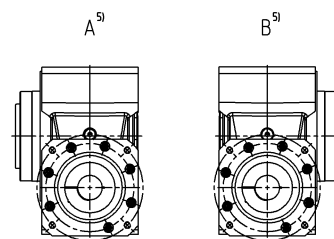
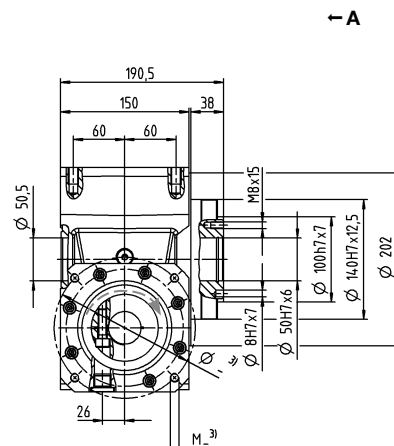
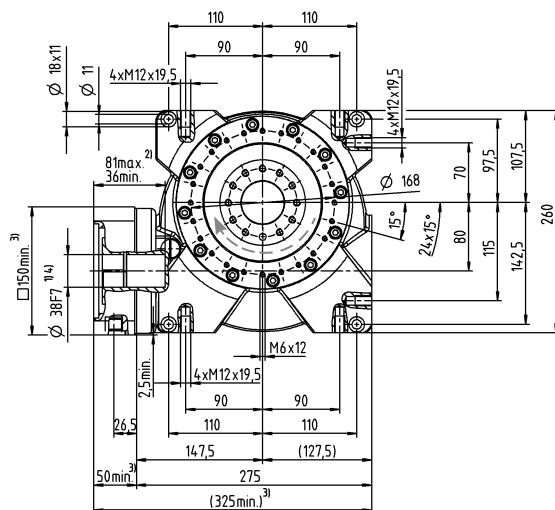
				1-stage						2-stage							
Ratio		<i>i</i>			4	7	10	16	28	40	50	70	100	140	200	280	400
Max. torque ^{a) b)} (at <i>n</i> ₁ = 500 rpm)		<i>T</i> _{2a}		Nm	578	646	672	702	785	676	672	646	672	785	676	785	676
				in.lb	5115	5717	5947	6213	6947	5983	5947	5717	5947	6947	5983	6947	5983
Torque for constant backlash (over the lifetime)		<i>T</i> _{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
Emergency stop torque ^{a) b)} (permitted 1000 times during the service life of the gearbox)		<i>T</i> _{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
Permitted average input speed (at 20 °C ambient temperature) ^{d)}		<i>n</i> _{1N}		rpm	3500						2900						
Max. input speed		<i>n</i> _{1Max}		rpm	4000						4500						
Mean no load running torque ^{b)} (at <i>n</i> ₁ = 3000 rpm and 20 °C gearbox temperature)		<i>T</i> 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. backlash		<i>j</i> _t		arcmin	≤ 3	Standard ≤ 3 / Reduced ≤ 2					Standard ≤ 4 / Reduced ≤ 3						
Torsional rigidity ^{b)}		<i>C</i> _{t21}		Nm/arcmin	113						113						
				in.lb/arcmin	1000						1000						
Max. axial force ^{c)}		<i>F</i> _{2AMax}		N	13900												
				lb _f	3128												
Max. tilting moment		<i>M</i> _{2KMax}		Nm	1544												
				in.lb	13664												
Efficiency at full load (at <i>n</i> ₁ = 500 rpm)		<i>η</i>		%	94	92	89	86	77	70	87	90	87	75	68	75	68
Tilting rigidity		<i>C</i> _{2K}		Nm/arcmin	1178												
				in.lb/arcmin	10425												
Service life ^{f)}		<i>L</i> _h		h	> 20000												
Weight (incl. standard adapter plate)		<i>m</i>		kg	32.0						33.5						
				lb _m	70.7						74.0						
Operating noise (at reference ratio and reference speed – ratio-specific values available in cymex®)		<i>L</i> _{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												
Direction of rotation					In- and output same direction												
Protection class					IP 65												
Metal bellows coupling (recommended product type – validate sizing with cymex®)					BCT-00300AAX-080.000												
				mm	X = 024.000 - 060.000												
Mass moment of inertia (relates to the drive)		G	24	<i>J</i> ₁	kgcm ²	-	-	-	-	-	3.1	2.4	2.4	3.0	3.0	2.4	2.4
					10 ⁻³ in.lb.s ²	-	-	-	-	-	2.7	2.1	2.1	2.7	2.7	2.1	2.1
Clamping hub diameter [mm]		K	38	<i>J</i> ₁	kgcm ²	22.5	17.1	16.7	15.1	14.8	15.5	10.2	9.5	9.5	10.2	10.2	9.5
					10 ⁻³ in.lb.s ²	19.9	15.1	14.8	13.4	13.1	13.7	9.0	8.4	8.4	9.0	9.0	8.4

Please use our sizing software cymex® for a detailed sizing – www.wittenstein-cymex.com
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- ^{a)} At max. 10 % M_{2KMax}
^{b)} Valid for standard clamping hub diameter
^{c)} Refers to center of the output shaft or flange
^{d)} Please reduce input speed at higher ambient temperatures
¹⁾ Please contact us to discuss application-specific service lifetimes

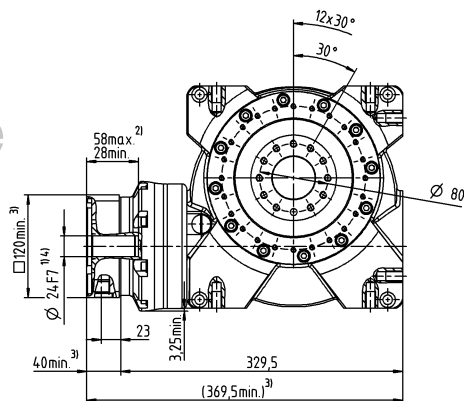
1-stage

up to 38⁴⁾ (K)⁶⁾
clamping hub
diameter



2-stage

up to 24/38⁴⁾
(G⁶⁾/K) clamping
hub diameter



Motor shaft diameter [mm]

Worm gearboxes

See technical data sheet for available clamping hub diameters (mass moment of inertia). Dimensions available on request.

Non-tolerated dimensions are nominal dimensions

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 wall thickness of 1 mm.

⁵⁾ Output side

⁶⁾ Standard clamping hub diameter

VT+

VT+ 100 MF 1-/2-stage

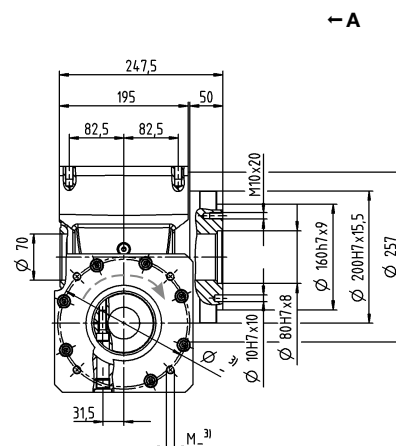
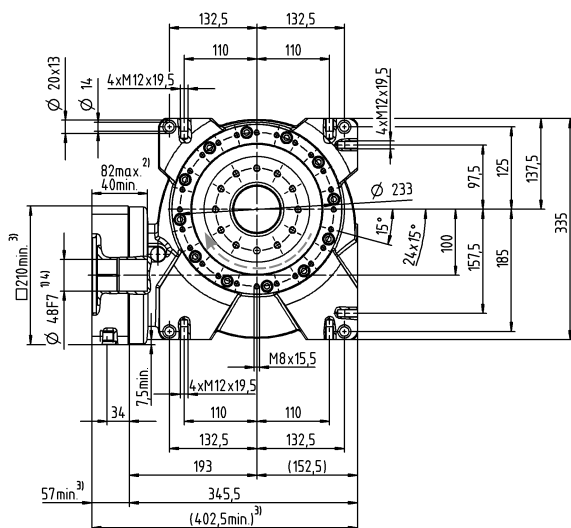
			1-stage							2-stage							
Ratio			i		4	7	10	16	28	40	50	70	100	140	200	280	400
Max. torque ^{a) b)} (at n ₁ = 500 rpm)			T _{2a}	Nm	1184	1336	1377	1392	1505	1376	1377	1336	1377	1505	1376	1505	1376
				in.lb	10478	11824	12186	12319	13319	12178	12186	11825	12186	13319	12178	13319	12178
Torque for constant backlash (over the lifetime)			T _{2Servo}	Nm	1155	1304	1343	1359	1469	1343	1343	1304	1343	1469	1343	1469	1343
				in.lb	10222	11540	11886	12027	13001	11886	11886	11541	11886	13001	11886	13001	11886
Emergency stop torque ^{a) b)} (permitted 1000 times during the service life of the gearbox)			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
Permitted average input speed (at 20 °C ambient temperature) ^{d)}			n _{1N}	rpm	3000							2700					
Max. input speed			n _{1Max}	rpm	3500							4000					
Mean no load running torque ^{b)} (at n ₁ = 3000 rpm and 20 °C gearbox temperature)			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. backlash			j _t	arcmin	≤ 3	Standard ≤ 3 / Reduced ≤ 2					Standard ≤ 4 / Reduced ≤ 3						
Torsional rigidity ^{b)}			C _{t21}	Nm/arcmin	213							213					
				in.lb/arcmin	1885							1885					
Max. axial force ^{c)}			F _{2AMax}	N	19500												
				lb _f	4388												
Max. tilting moment			M _{2KMax}	Nm	3059												
				in.lb	27072												
Efficiency at full load (at n ₁ = 500 rpm)			η	%	95	93	91	87	80	76	89	89	89	78	74	78	74
Tilting rigidity			C _{2K}	Nm/arcmin	2309												
				in.lb/arcmin	20435												
Service life ^{f)}			L _h	h	> 20000												
Weight (incl. standard adapter plate)			m	kg	63.0							64.6					
				lb _m	139.0							143.0					
Operating noise (at reference ratio and reference speed – ratio-specific values available in cymex®)			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												
Direction of rotation					In- and output same direction												
Protection class					IP 65												
Metal bellows coupling (recommended product type – validate sizing with cymex®)					BCT-01500AAX-125.000												
				mm	X = 050.000 - 080.000												
Mass moment of inertia (relates to the drive)	K	38	J ₁	kgcm ²	-	-	-	-	-	-	11,9	10,0	10,0	11,8	11,8	9,9	9,9
				10 ⁻³ in.lb.s ²	-	-	-	-	-	-	10,5	8,9	8,9	10,4	10,4	8,8	8,8
	Clamping hub diameter [mm]	M	48	J ₁	kgcm ²	67,6	48,5	44,2	43,6	40,6	40,7	27,0	25,1	25,1	26,8	26,9	25,0
10 ⁻³ in.lb.s ²					59,8	42,9	31,1	38,6	35,9	36,0	23,9	22,2	22,2	23,7	23,8	22,1	22,1

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- ^{a)} At max. 10 % M_{2KMax}
- ^{b)} Valid for standard clamping hub diameter
- ^{c)} Refers to center of the output shaft or flange
- ^{d)} Please reduce input speed at higher ambient temperatures
- ^{f)} Please contact us to discuss application-specific service lifetimes

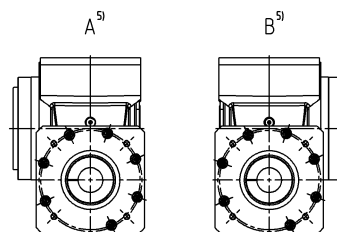
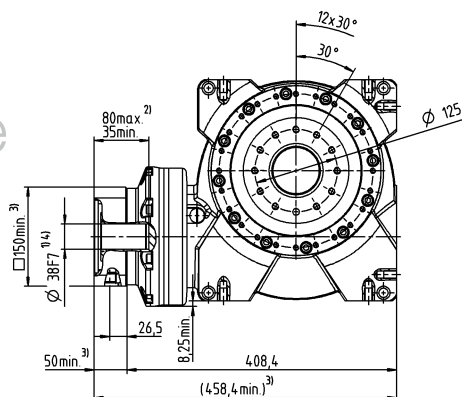
1-stage

up to 48 ⁴⁾ (M) ⁶⁾
clamping hub
diameter



2-stage

up to 38/48 ⁴⁾
(K⁶⁾/M) clamping
hub diameter



Motor shaft diameter [mm]

See technical data sheet for available clamping hub diameters (mass moment of inertia). Dimensions available on request.

Non-tolerated dimensions are nominal dimensions

- 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 wall thickness of 1 mm.

5) Output side

⁶⁾ Standard clamping hub diameter