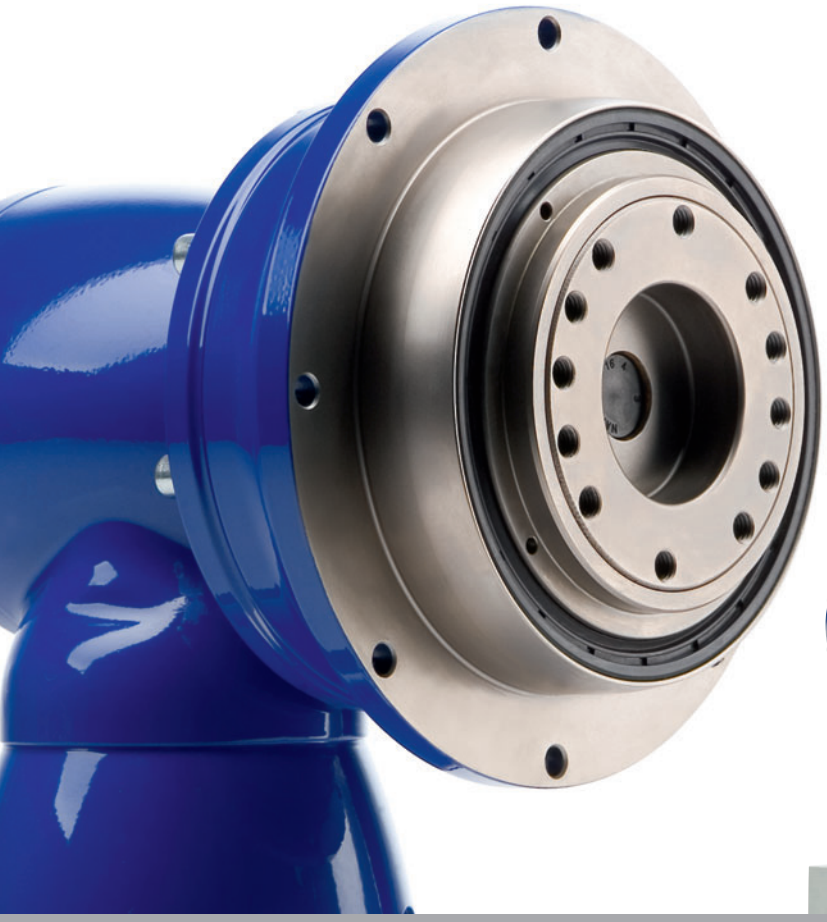
WITTENSTEIN

Wittenstein Servo Right-Angle Gearheads

Just around the corner – Servo right-angle systems for increased efficiency.

Manufacturers of flexible, high-quality machines with a wide range of functions are extremely demanding when it comes to drive systems: Maximum dynamics and performance density, minimal space and monitoring requirements, extremely smooth-running and robust, simple setup, maintenance-free are just some of the many requirements. Servo right-angle systems by WITTENSTEIN alpha fulfill all these expectations – and even go one step further: Sensational results and an excellent design.



TK+ **TPK+** **SK+**

Servo right-angle gearheads

Increased productivity

Do you need a machine that operates at maximum productivity? Your servo right-angle gearhead offers 200 % more torque, 100 % faster speeds than equivalent products and thus creates the perfect conditions for maximum manufacturing efficiency.

Simple and convenient

From an optimized design with our cymex® software to the classic, patented WITTENSTEIN alpha motor attachment and an oil volume adapted to each model – WITTENSTEIN alpha right-angle gearheads make your life so much easier.

Reliable and accurate

The low torsional backlash and high torsional rigidity of your WITTENSTEIN alpha right-angle gearhead assure maximum positioning accuracy of your drives and precision of your machines – even during highly dynamic operation up to 50,000 cycles/hour.

Maximum durability

Your WITTENSTEIN alpha right-angle gearhead is extremely reliable due to the overall design and 100 % WITTENSTEIN alpha inspections: **“fit it and forget it”**. A length compensation feature integrated in your WITTENSTEIN alpha right-angle gearhead as standard maximizes the lifespan of your servo motor during high-speed continuous operation.

TK+/TPK+ – The successor to our versatile hypoid gearhead with TP+ compatible output flange and hollow shaft, with optional planetary

TK+/TPK+

Details

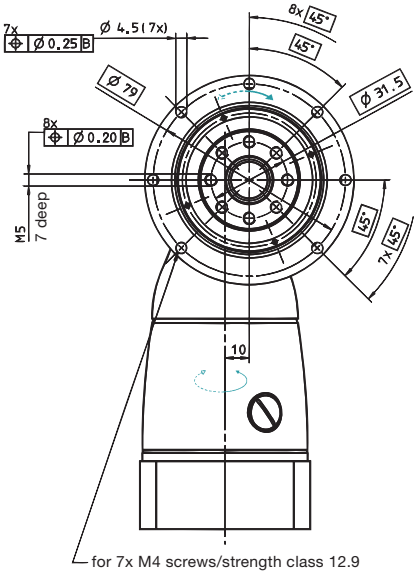
TK+ 004 1/2-stage

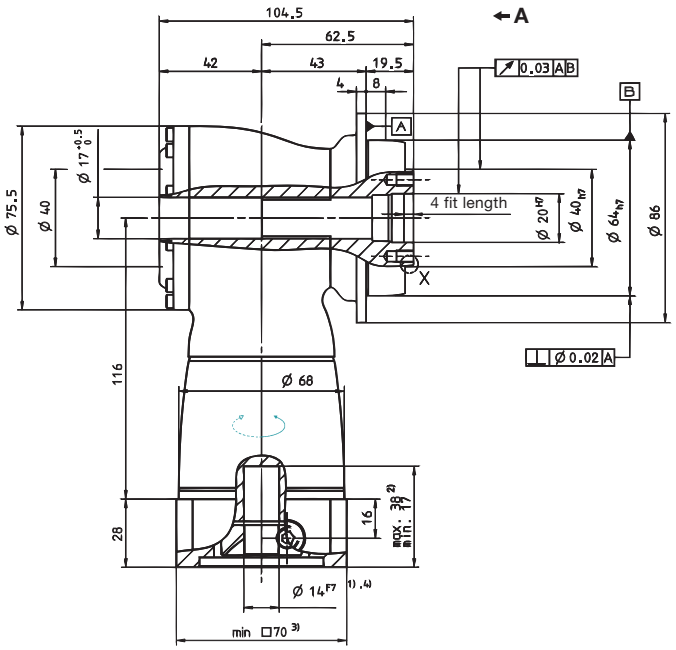
					1-stage					2-stage									
Ratio [a]			*i*		**3**	**4**	**5**	**7**	**10**	**12**	**16**	**20**	**25**	**28**	**35**	**40**	**50**	**70**	**100**
Max. acceleration torque (max. 1000 cycles per hour)			T_{2B}	Nm	30	30	30	25	20	30	30	30	30	30	30	30	30	25	20
				in.lb	266	266	266	221	177	266	266	266	266	266	266	266	266	221	177
Nominal output torque (with n_{1N})			T_{2N}	Nm	22	22	22	20	15	22	22	22	22	22	22	22	22	20	15
				in.lb	195	195	195	177	133	195	195	195	195	195	195	195	195	177	133
Emergency stop torque (permitted 1000 times during the service life of the gearhead)			T_{2Not}	Nm	40	50	50	45	40	50	50	50	50	50	50	50	50	45	40
				in.lb	354	443	443	398	354	443	443	443	443	443	443	443	443	398	354
Nominal input speed (with T_{2N} and 20°C ambient temperature) [b], [c]			n_{1N}	rpm	2200	2400	2700	2700	2700	4400	4400	4400	4400	4400	4400	4400	4800	5500	5500
Max. continuous speed (with 20 % T_{2N} and 20°C ambient temperature)			n_{1Ncym}	rpm	2700	3100	3600	3100	3100	For higher speeds, please contact us.									
Max. input speed			n_{1Max}	rpm	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000
Mean no load running torque (with n_1 = 3000 rpm and 20°C gearhead temperature) [d]			T_{012}	Nm	1.4	1.3	1.2	1.4	1.3	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1
				in.lb	12.4	11.5	10.6	12.4	11.5	1.8	1.8	1.8	1.8	1.8	1.8	0.9	0.9	0.9	0.9
Max. torsional backlash			j_t	arcmin	≤ 5														
Torsional rigidity			C_{t21}	Nm/ arcmin	2.6	2.8	3.0	2.6	2.3	2.8	2.8	2.8	2.8	2.8	2.8	2.8	3.0	2.6	2.3
				in.lb/ arcmin	23	25	26	23	20	25	25	25	25	25	25	25	26	23	20
Max. axial force [e]			F_{2AMax}	N	2400														
				lb_f	540														
Max. radial force [e]			F_{2RMax}	N	2700														
				lb_f	608														
Max. tilting moment			M_{2KMax}	Nm	251														
				in.lb	2220														
Efficiency at full load			η	%	96					94									
Service life (For calculation, see the Chapter "Information")			L_h	h	> 20000														
Weight incl. standard adapter plate			*m*	kg	2.9					3.2									
				lb_m	6.4					7.1									
Operating noise (with n_1 = 3000 rpm no load)			L_{PA}	dB(A)	≤ 64														
Max. permitted housing temperature				°C	+90														
				F	194														
Ambient temperature				°C	0 to +40														
				F	32 to 104														
Lubrication					Lubricated for life														
Paint					Blue RAL 5002														
Direction of rotation					Motor and gearhead opposite directions														
Protection class					IP 65														
Moment of inertia (relates to the drive) Clamping hub diameter [mm]	B	11	J_1	$kgcm^2$	–	–	–	–	–	0.09	0.09	0.08	0.07	0.06	0.06	0.06	0.06	0.06	0.06
				10^{-3} in.lb.s²						0.08	0.08	0.07	0.07	0.06	0.06	0.05	0.05	0.05	0.05
	C	14	J_1	$kgcm^2$	0.57	0.46	0.41	0.37	0.35	0.21	0.20	0.19	0.19	0.18	0.18	0.17	0.17	0.17	0.17
				10^{-3} in.lb.s²	0.50	0.41	0.36	0.33	0.31	0.18	0.18	0.17	0.17	0.16	0.16	0.15	0.15	0.15	0.15
	E	19	J_1	$kgcm^2$	0.92	0.82	0.76	0.72	0.70	–	–	–	–	–	–	–	–	–	–
				10^{-3} in.lb.s²	0.81	0.72	0.68	0.64	0.62										

[a] Other ratios available on request
[b] Higher speeds are possible if the nominal torque is reduced
[c] For higher ambient temperatures, please reduce input speed
[d] Idling torques decrease during operation
[e] Refers to center of the output shaft or flange

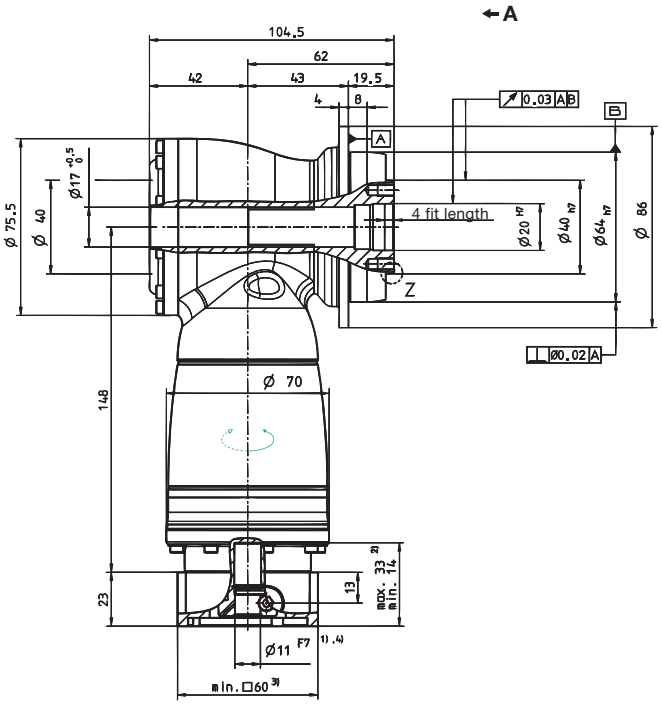
Please contact us for information on the best configuration for S1 conditions of use (continuous operation).

1-stage:

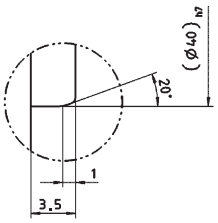




2-stage:



Z: Detail



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

⚠ Motor mounting according to operating manual

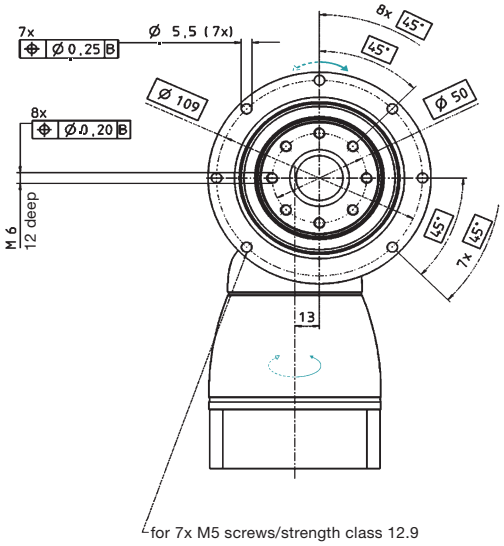
TK+ 010 1/2-stage

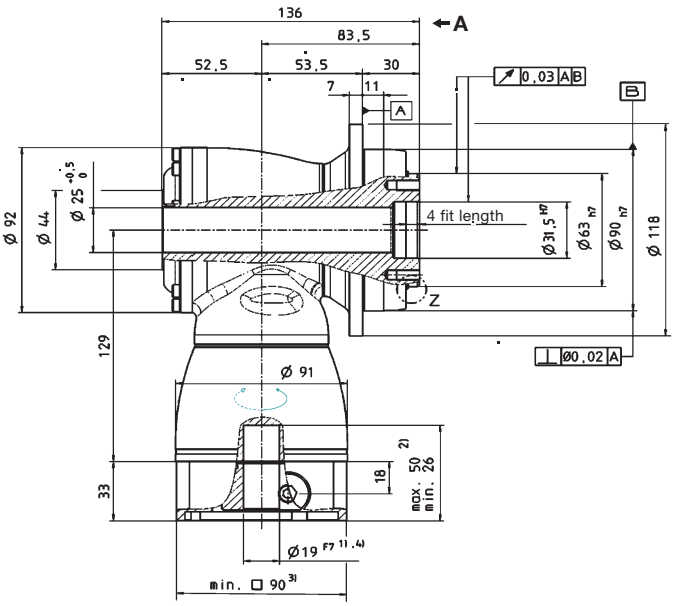
					1-stage					2-stage									
Ratio [a]			*i*		**3**	**4**	**5**	**7**	**10**	**12**	**16**	**20**	**25**	**28**	**35**	**40**	**50**	**70**	**100**
Max. acceleration torque (max. 1000 cycles per hour)			T_{2B}	Nm	70	70	70	60	50	70	70	70	70	70	70	70	70	60	50
				in.lb	620	620	620	531	443	620	620	620	620	620	620	620	620	531	443
Nominal output torque (with n_{1N})			T_{2N}	Nm	50	50	50	45	40	50	50	50	50	50	50	50	50	45	40
				in.lb	443	443	443	398	354	443	443	443	443	443	443	443	443	398	354
Emergency stop torque (permitted 1000 times during the service life of the gearhead)			T_{2Not}	Nm	95	115	115	110	100	115	115	115	115	115	115	115	115	110	100
				in.lb	841	1018	1018	974	885	1018	1018	1018	1018	1018	1018	1018	1018	974	885
Nominal input speed (with T_{2N} and 20°C ambient temperature) [b], [c]			n_{1N}	rpm	2100	2200	2500	2500	2500	3500	3500	3500	3500	3500	3500	3500	3800	4500	4500
Max. continuous speed (with 20 % T_{2N} and 20°C ambient temperature)			n_{1Ncym}	rpm	2700	3100	3600	3100	3100	For higher speeds, please contact us.									
Max. input speed			n_{1Max}	rpm	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000
Mean no load running torque (with n_1 = 3000 rpm and 20°C gearhead temperature) [d]			T_{012}	Nm	2.4	2.0	1.8	2.4	2.2	0.4	0.4	0.3	0.3	0.3	0.3	0.1	0.1	0.1	0.1
				in.lb	21	18	16	21	19	3.5	3.5	2.7	2.7	2.7	2.7	0.9	0.9	0.9	0.9
Max. torsional backlash			j_t	arcmin	≤ 4														
Torsional rigidity			C_{t21}	Nm/ arcmin	6.0	7.0	8.0	8.0	8.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	8.0	8.0	8.0
				in.lb/ arcmin	53	62	71	71	71	62	62	62	62	62	62	62	71	71	71
Max. axial force [e]			F_{2AMax}	N	3400														
				lb_f	765														
Max. radial force [e]			F_{2RMax}	N	4000														
				lb_f	900														
Max. tilting moment			M_{2KMax}	Nm	437														
				in.lb	3867														
Efficiency at full load			η	%	96					94									
Service life (For calculation, see the Chapter "Information")			L_h	h	> 20000														
Weight incl. standard adapter plate			*m*	kg	5.3					6.1									
				lb_m	11.7					13.5									
Operating noise (with n_1 = 3000 rpm no load)			L_{PA}	dB(A)	≤ 66														
Max. permitted housing temperature				°C	+90														
				F	194														
Ambient temperature				°C	0 to +40														
				F	32 to 104														
Lubrication					Lubricated for life														
Paint					Blue RAL 5002														
Direction of rotation					Motor and gearhead opposite directions														
Protection class					IP 65														
Moment of inertia (relates to the drive) Clamping hub diameter [mm]	C	14	J_1	kgcm²	–	–	–	–	–	0.31	0.28	0.24	0.23	0.21	0.20	0.19	0.18	0.18	0.18
				10^{-3} in.lb.s²						0.27	0.25	0.21	0.21	0.18	0.18	0.17	0.16	0.16	0.16
	E	19	J_1	kgcm²	1.81	1.39	1.18	1.02	0.93	0.75	0.72	0.68	0.68	0.63	0.63	0.63	0.63	0.63	0.63
				10^{-3} in.lb.s²	1.60	1.23	1.05	0.90	0.82	0.64	0.64	0.61	0.60	0.59	0.55	0.56	0.56	0.55	0.55
	H	28	J_1	kgcm²	3.22	2.80	2.60	2.43	2.34	–	–	–	–	–	–	–	–	–	–
				10^{-3} in.lb.s²	2.85	2.48	2.30	2.15	2.07										

[a] Other ratios available on request
[b] Higher speeds are possible if the nominal torque is reduced
[c] For higher ambient temperatures, please reduce input speed
[d] Idling torques decrease during operation
[e] Refers to center of the output shaft or flange

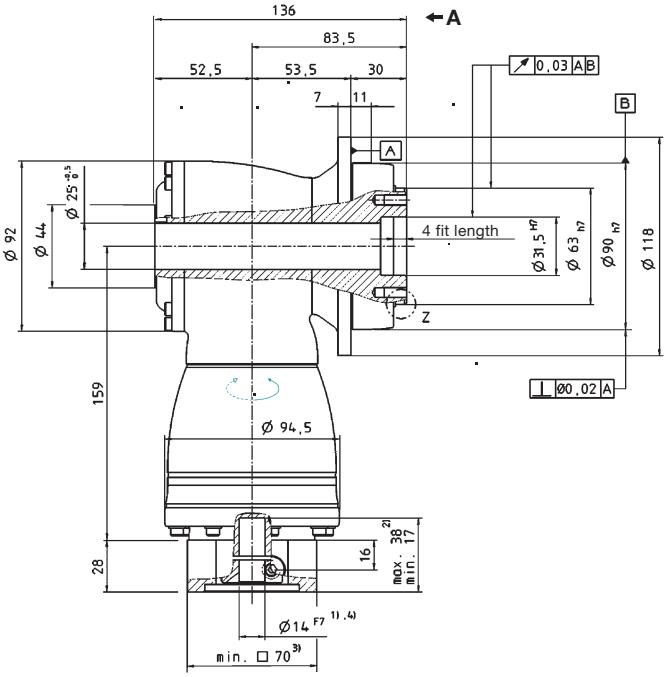
Please contact us for information on the best configuration for S1 conditions of use (continuous operation).

1-stage:

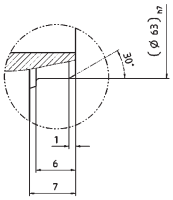




2-stage:



Z: Detail



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

⚠ Motor mounting according to operating manual

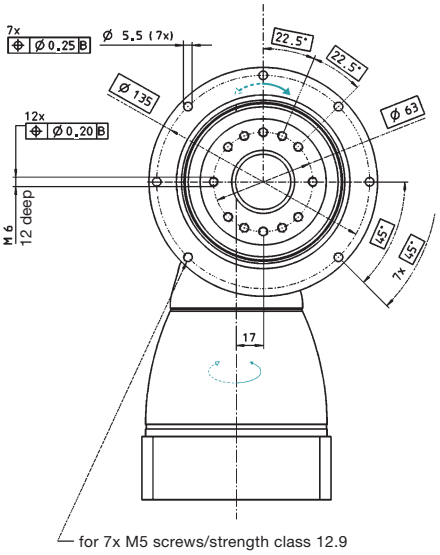
TK+ 025 1/2-stage

					1-stage					2-stage									
Ratio [a]			***i***		**3**	**4**	**5**	**7**	**10**	**12**	**16**	**20**	**25**	**28**	**35**	**40**	**50**	**70**	**100**
Max. acceleration torque (max. 1000 cycles per hour)			T_{2B}	Nm	170	170	170	145	125	170	170	170	170	170	170	170	170	145	125
				in.lb	1505	1505	1505	1283	1106	1505	1505	1505	1505	1505	1505	1505	1505	1283	1106
Nominal output torque (with n_{1N})			T_{2N}	Nm	100	100	100	90	80	100	100	100	100	100	100	100	100	90	80
				in.lb	885	885	885	797	708	885	885	885	885	885	885	885	885	797	708
Emergency stop torque (permitted 1000 times during the service life of the gearhead)			T_{2Not}	Nm	220	260	260	255	250	260	260	260	260	260	260	260	260	255	250
				in.lb	1947	2301	2301	2257	2213	2301	2301	2301	2301	2301	2301	2301	2301	2257	2213
Nominal input speed (with T_{2N} and 20°C ambient temperature) [b), c)]			n_{1N}	rpm	2000	2100	2400	2200	2200	3100	3100	3100	3100	3100	3100	3100	3500	4200	4200
Max. continuous speed (with 20 % T_{2N} and 20°C ambient temperature)			n_{1Ncym}	rpm	2700	3000	3400	3000	3000	For higher speeds, please contact us.									
Max. input speed			n_{1Max}	rpm	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500
Mean no load running torque (with n_1 = 3000 rpm and 20°C gearhead temperature) [d)]			T_{012}	Nm	4.6	3.6	2.8	4.2	3.4	0.7	0.7	0.6	0.5	0.5	0.4	0.2	0.2	0.2	0.2
				in.lb	41	32	25	37	30	6.2	6.2	5.3	4.4	4.4	3.5	1.8	1.8	1.8	1.8
Max. torsional backlash			j_t	arcmin	≤ 4														
Torsional rigidity			C_{t21}	Nm/ arcmin	12	13	16	16	16	13	13	13	13	13	13	13	16	16	16
				in.lb/ arcmin	106	115	142	142	142	115	115	115	115	115	115	115	142	142	142
Max. axial force [e)]			F_{2AMax}	N	5700														
				lb_f	1283														
Max. radial force [e)]			F_{2RMax}	N	6300														
				lb_f	1418														
Max. tilting moment			M_{2KMax}	Nm	833														
				in.lb	7370														
Efficiency at full load			η	%	96					94									
Service life (For calculation, see the Chapter "Information")			L_h	h	> 20000														
Weight incl. standardadapter plate			m	kg	8.9					10.6									
				lb_m	20					23									
Operating noise (with n_1 = 3000 rpm no load)			L_{PA}	dB(A)	≤ 66														
Max. permitted housing temperature				°C	+90														
				F	194														
Ambient temperature				°C	0 to +40														
				F	32 to 104														
Lubrication					Lubricated for life														
Paint					Blue RAL 5002														
Direction of rotation					Motor and gearhead opposite directions														
Protection class					IP 65														
Moment of inertia (relates to the drive) Clamping hub diameter [mm]	E	19	J_1	kgcm²	–	–	–	–	–	1.08	1.01	0.88	0.85	0.76	0.75	0.70	0.69	0.69	0.68
				10^{-3} in.lb.s²						0.96	0.89	0.78	0.75	0.67	0.66	0.62	0.66	0.61	0.60
	G	24	J_1	kgcm²	–	–	–	–	–	2.65	2.57	2.44	2.42	2.32	2.31	2.26	2.25	2.25	2.25
				10^{-3} in.lb.s²						2.34	2.28	2.16	2.14	2.06	2.05	2.00	2.00	1.99	1.99
	H	28	J_1	kgcm²	5.50	4.30	3.60	3.10	2.90	–	–	–	–	–	–	–	–	–	–
				10^{-3} in.lb.s²	4.83	3.77	3.22	2.77	2.54										
	K	38	J_1	kgcm²	12.7	11.5	10.9	10.4	10.1	–	–	–	–	–	–	–	–	–	–
				10^{-3} in.lb.s²	11.2	10.2	9.63	9.19	8.95										

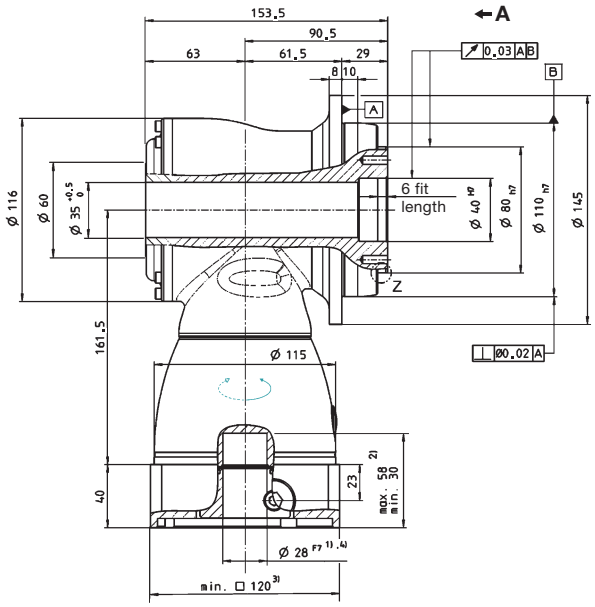
[a)] Other ratios available on request
[b)] Higher speeds are possible if the nominal torque is reduced
[c)] For higher ambient temperatures, please reduce input speed
[d)] Idling torques decrease during operation
[e)] Refers to center of the output shaft or flange

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

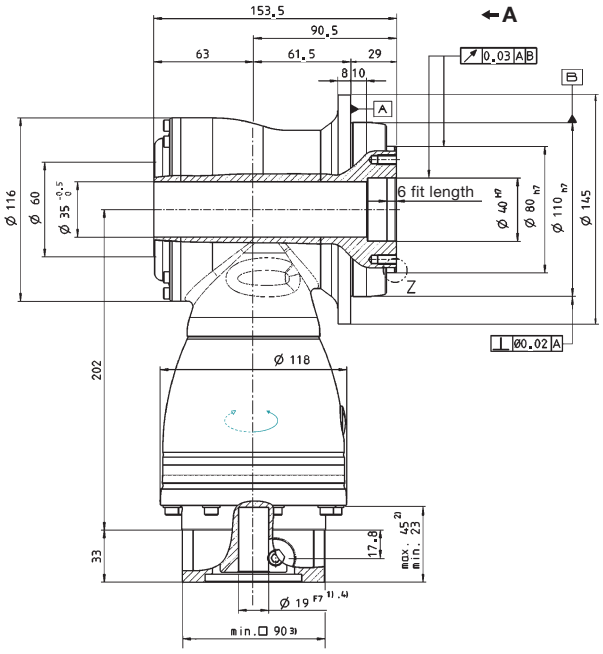
1-stage:



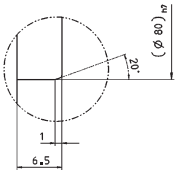
for 7x M5 screws/strength class 12.9



2-stage:



Z: Detail



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

⚠ Motor mounting according to operating manual

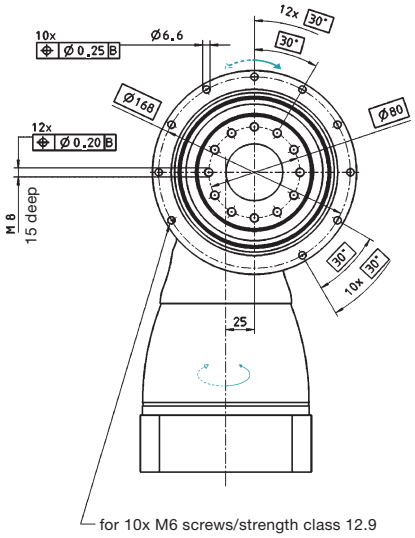
TK+ 050 1/2-stage

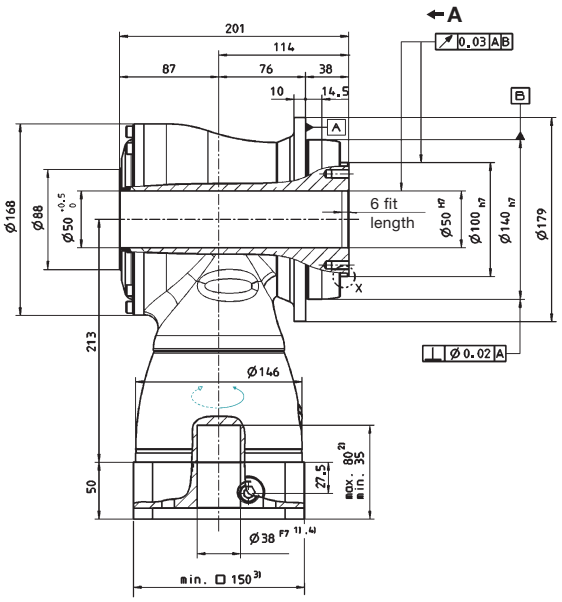
				1-stage					2-stage									
Ratio [a]			*i*	**3**	**4**	**5**	**7**	**10**	**12**	**16**	**20**	**25**	**28**	**35**	**40**	**50**	**70**	**100**
Max. acceleration torque (max. 1000 cycles per hour)			T_{2B} Nm	300	300	300	250	210	300	300	300	300	300	300	300	300	250	210
			T_{2B} in.lb	2655	2655	2655	2213	1859	2655	2655	2655	2655	2655	2655	2655	2655	2213	1859
Nominal output torque (with n_{1N})			T_{2N} Nm	190	190	190	175	160	190	190	190	190	190	190	190	190	175	160
			T_{2N} in.lb	1682	1682	1682	1549	1416	1682	1682	1682	1682	1682	1682	1682	1682	1549	1416
Emergency stop torque (permitted 1000 times during the service life of the gearhead)			T_{2Not} Nm	400	500	500	450	400	500	500	500	500	500	500	500	500	450	400
			T_{2Not} in.lb	3540	4425	4425	3983	3540	4425	4425	4425	4425	4425	4425	4425	4425	3983	3540
Nominal input speed (with T_{2N} and 20°C ambient temperature) [b), c)]			n_{1N} rpm	1700	1800	2000	1800	1800	2900	2900	2900	2900	2900	2900	2900	3200	3200	3900
Max. continuous speed (with 20 % T_{2N} and 20°C ambient temperature)			n_{1Ncym} rpm	2200	2500	2800	2500	2500	For higher speeds, please contact us.									
Max. input speed			n_{1Max} rpm	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500
Mean no load running torque (with n_1 = 3000 rpm and 20°C gearhead temperature) [d]			T_{012} Nm	8.4	6.2	5.4	9.0	6.6	1.7	1.1	0.8	0.6	0.6	0.5	0.5	0.4	0.4	0.4
			T_{012} in.lb	74	55	48	80	58	15.0	9.7	7.1	5.3	5.3	4.4	4.4	3.5	3.5	3.5
Max. torsional backlash			j_t arcmin	≤ 4														
Torsional rigidity			C_{t21} Nm/ arcmin	36	40	46	44	42	40	40	40	40	40	40	40	46	44	42
			C_{t21} in.lb/ arcmin	315	356	405	387	376	356	356	356	356	356	356	356	405	387	376
Max. axial force [e]			F_{2AMax} N	9900														
			F_{2AMax} lb_f	2228														
Max. radial force [e]			F_{2RMax} N	9500														
			F_{2RMax} lb_f	2138														
Max. tilting moment			M_{2KMax} Nm	1692														
			M_{2KMax} in.lb	14974														
Efficiency at full load			η %	96					94									
Service life (For calculation, see the Chapter "Information")			L_h h	> 20000														
Weight incl. standardadapter plate			m kg	22					26									
			m lb_m	49					57									
Operating noise (with n_1 = 3000 rpm no load)			L_{PA} dB(A)	≤ 68														
Max. permitted housing temperature			°C	+90														
			F	194														
Ambient temperature			°C	0 to +40														
			F	32 to 104														
Lubrication				Lubricated for life														
Paint				Blue RAL 5002														
Direction of rotation				Motor and gearhead opposite directions														
Protection class				IP 65														
Moment of inertia (relates to the drive) Clamping hub diameter [mm]	G	24	J_1 kgcm²	–	–	–	–	–	4.43	3.97	3.36	3.22	2.82	2.75	2.50	2.47	2.44	2.42
			J_1 10^{-3} in.lb.s²						3.92	3.51	2.97	2.85	2.50	2.44	2.22	2.18	2.16	2.14
	K	38	J_1 kgcm²	28.4	21.0	17.6	14.7	13.1	11.3	10.9	10.3	10.1	9.74	9.66	9.41	9.38	9.35	9.33
			J_1 10^{-3} in.lb.s²	25.1	18.6	15.5	13.0	11.6	10.0	9.63	9.09	8.96	8.62	8.55	8.33	8.30	8.28	8.26

[a] Other ratios available on request
[b] Higher speeds are possible if the nominal torque is reduced
[c] For higher ambient temperatures, please reduce input speed
[d] Idling torques decrease during operation
[e] Refers to center of the output shaft or flange

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

1-stage:





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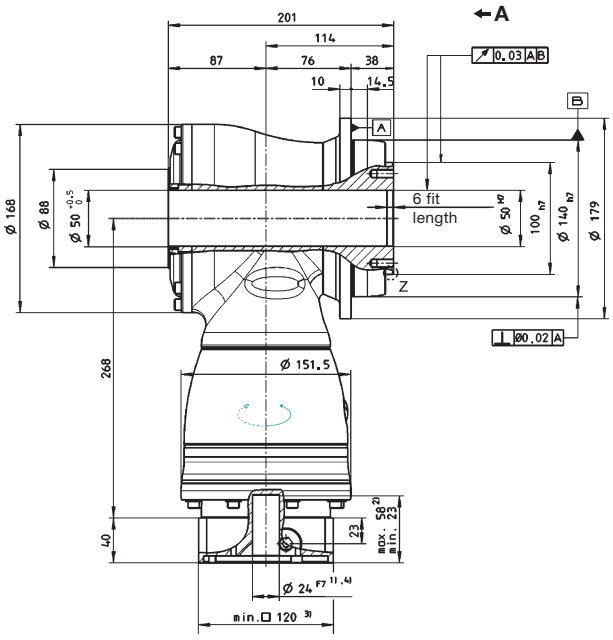

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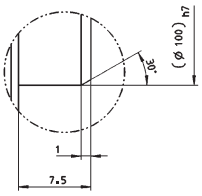


See technical data sheet for available clamping hub diameters (mass moment of inertia). Dimensions available on request.

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.

⚠ Motor mounting according to operating manual

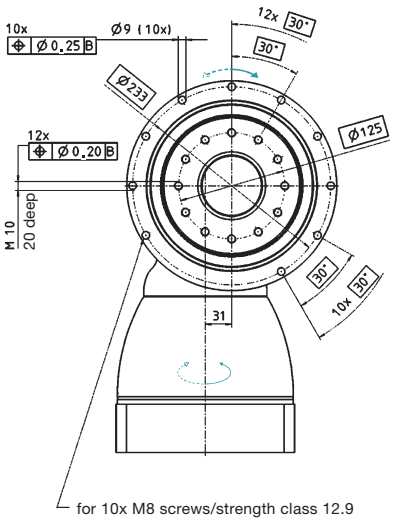
TK+ 110 1/2-stage

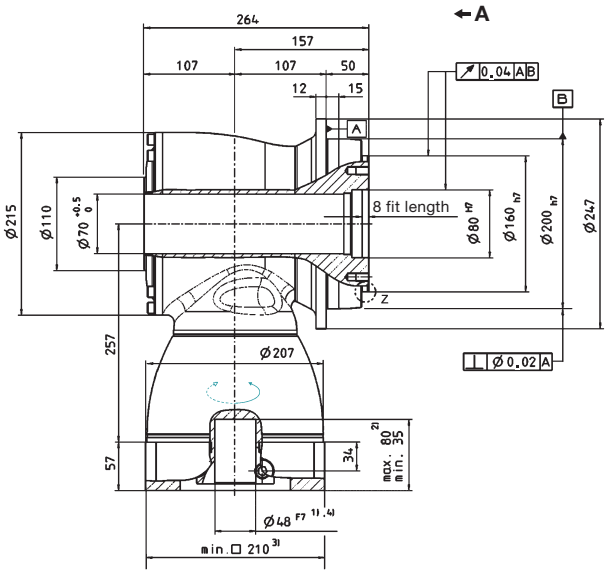
			1-stage					2-stage									
Ratio [a]	i		**3**	**4**	**5**	**7**	**10**	**12**	**16**	**20**	**25**	**28**	**35**	**40**	**50**	**70**	**100**
Max. acceleration torque (max. 1000 cycles per hour)	T_{2B}	Nm	640	640	640	550	470	640	640	640	640	640	640	640	640	550	470
		in.lb	5664	5664	5664	4868	4160	5664	5664	5664	5664	5664	5664	5664	5664	4868	4160
Nominal output torque (with n_{1N})	T_{2N}	Nm	400	400	400	380	360	400	400	400	400	400	400	400	400	380	360
		in.lb	3540	3540	3540	3363	3186	3540	3540	3540	3540	3540	3540	3540	3540	3363	3186
Emergency stop torque (permitted 1000 times during the service life of the gearhead)	T_{2Not}	Nm	900	1050	1050	970	900	1050	1050	1050	1050	1050	1050	1050	1050	970	900
		in.lb	7965	9293	9293	8585	7965	9293	9293	9293	9293	9293	9293	9293	9293	8585	7965
Nominal input speed (with T_{2N} and 20°C ambient temperature) [b], [c]	n_{1N}	rpm	1400	1600	1800	1600	1600	2700	2700	2700	2700	2700	2700	2700	2900	3200	3400
Max. continuous speed (with 20 % T_{2N} and 20°C ambient temperature)	n_{1Ncym}	rpm	1800	2100	2500	2200	2200	For higher speeds, please contact us.									
Max. input speed	n_{1Max}	rpm	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000
Mean no load running torque (with n_1 = 3000 rpm and 20°C gearhead temperature) [d]	T_{012}	Nm	17.5	14.5	12.0	18.0	15.0	3.6	2.8	2.2	1.9	1.6	1.4	1.1	1.1	1.1	1.1
		in.lb	155	128	106	159	133	31.9	24.8	19.5	16.8	14.2	12.4	9.7	9.7	9.7	9.7
Max. torsional backlash	j_t	arcmin	≤ 4														
Torsional rigidity	C_{t21}	Nm/ arcmin	76	87	99	97	96	87	87	87	87	87	87	87	99	97	96
		in.lb/ arcmin	676	766	874	860	847	356	766	766	766	766	766	766	874	860	847
Max. axial force [e]	F_{2AMax}	N	14200														
		lb_f	3195														
Max. radial force [e]	F_{2RMax}	N	14700														
		lb_f	3308														
Max. tilting moment	M_{2KMax}	Nm	3213														
		in.lb	28435														
Efficiency at full load	η	%	96					94									
Service life (For calculation, see the Chapter "Information")	L_h	h	> 20000														
Weight incl. standardadapter plate	m	kg	48					54									
		lb_m	106					119									
Operating noise (with n_1 = 3000 rpm no load)	L_{PA}	dB(A)	≤ 68														
Max. permitted housing temperature		°C	+90														
		F	194														
Ambient temperature		°C	0 to +40														
		F	32 to 104														
Lubrication			Lubricated for life														
Paint			Blue RAL 5002														
Direction of rotation			Motor and gearhead opposite directions														
Protection class			IP 65														
Moment of inertia (relates to the drive) Clamping hub diameter [mm]	K 38	J_1	kgcm²	–	–	–	–	–	16.8	14.8	12.9	12.3	11.2	10.9	10.3	10.1	10.0	9.93
			10^{-3} in.lb.s²						14.8	13.1	11.4	10.9	9.88	9.63	9.08	8.95	8.84	8.79
	M 48	J_1	kgcm²	96.5	64.6	50.5	38.2	31.8	31.5	29.5	27.6	27.0	25.9	25.6	25.0	24.8	24.7	24.6
			10^{-3} in.lb.s²	85.4	57.2	44.7	33.8	28.1	27.9	26.1	24.4	23.9	22.9	22.6	22.1	22.0	21.9	21.8

[a] Other ratios available on request
[b] Higher speeds are possible if the nominal torque is reduced
[c] For higher ambient temperatures, please reduce input speed
[d] Idling torques decrease during operation
[e] Refers to center of the output shaft or flange

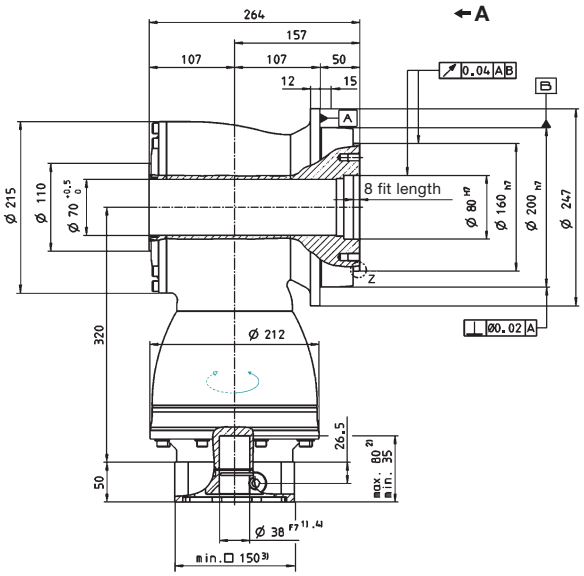
Please contact us for information on the best configuration for S1 conditions of use (continuous operation).

1-stage:





2-stage:



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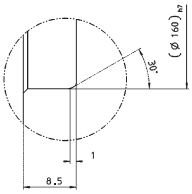

See technical data sheet for available clamping hub diameters (mass moment of inertia). Dimensions available on request.

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.

⚠ Motor mounting according to operating manual

				2-stage									
Ratio [a]			*i*	**12**	**16**	**20**	**25**	**28**	**35**	**40**	**50**	**70**	**100**
Max. acceleration torque (max. 1000 cycles per hour)			T_{2B} Nm	120	120	130	130	130	125	80	100	130	100
			T_{2B} in.lb	1062	1062	1151	1151	1151	1106	780	885	1151	885
Nominal output torque (with n_{1N})			T_{2N} Nm	75	75	75	75	75	75	60	75	75	60
			T_{2N} in.lb	664	664	664	664	531	664	531	664	664	531
Emergency stop torque (permitted 1000 times during the service life of the gearhead)			T_{2Not} Nm	160	160	200	200	250	175	120	150	210	200
			T_{2Not} in.lb	1416	1416	1770	1770	2213	1549	1062	1328	1859	1770
Nominal input speed (with T_{2N} and 20°C ambient temperature) [b], [c]			n_{1N} rpm	2000	2400	2400	2700	2400	2500	2500	2500	2500	2500
Max. continuous speed (with 20 % T_{2N} and 20°C ambient temperature)			n_{1Ncym} rpm	3000	3400	3400	3800	3400	3200	3200	3200	3200	3200
Max. input speed			n_{1Max} rpm	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000
Mean no load running torque (with n_1=3000 rpm and 20°C gearhead temperature) [d]			T_{012} Nm	1.5	1.3	1.2	1.2	1.2	1.3	1.3	1.3	1.3	1.3
			T_{012} in.lb	13.3	11.5	10.6	10.6	10.6	11.5	11.5	11.5	11.5	11.5
Max. torsional backlash			j_t arcmin	Standard ≤ 6 / Reduced ≤ 4									
Torsional rigidity			C_{t21} Nm/ arcmin	–	–	–	–	–	–	–	–	–	22
			C_{t21} in.lb/ arcmin										195
Max. axial force [e]			F_{2AMax} N	2150									
			F_{2AMax} lb_f	483.75									
Max. tilting moment			M_{2KMax} Nm	235									
			M_{2KMax} in.lb	2080									
Efficiency at full load			η %	94									
Service life (For calculation, see the Chapter "Information")			L_h h	> 20000									
Weight incl. standard adapter plate			*m* kg	5.2									
			m lb_m	11.5									
Operating noise (with n_1=3000 rpm no load)			L_{PA} dB(A)	≤ 66									
Max. permitted housing temperature			°C	+90									
			F	194									
Ambient temperature			°C	0 to +40									
			F	32 to 104									
Lubrication				Lubricated for life									
Paint				Blue RAL 5002									
Direction of rotation				Motor and gearhead opposite directions									
Protection class				IP 65									
Moment of inertia (relates to the drive) Clamping hub diameter [mm]	C	14	J_1 kgcm²	0.55	0.46	0.44	0.39	0.43	0.36	0.34	0.34	0.34	0.34
			J_1 10^{-3} in.lb.s²	0.49	0.40	0.39	0.35	0.38	0.32	0.30	0.30	0.30	0.30
	E	19	*J* kgcm²	0.90	0.81	0.79	0.75	0.78	0.71	0.70	0.70	0.69	0.69
			J 10^{-3} in.lb.s²	0.80	0.72	0.70	0.66	0.69	0.63	0.62	0.62	0.61	0.61

[a] Other ratios up to i=1000 available on request
[b] Higher speeds are possible if the nominal torque is reduced
[c] For higher ambient temperatures, please reduce input speed
[d] Idling torques decrease during operation
[e] Refers to center of the output shaft or flange

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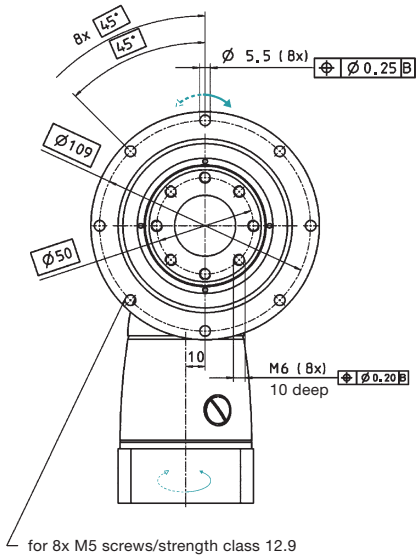
2-stage:



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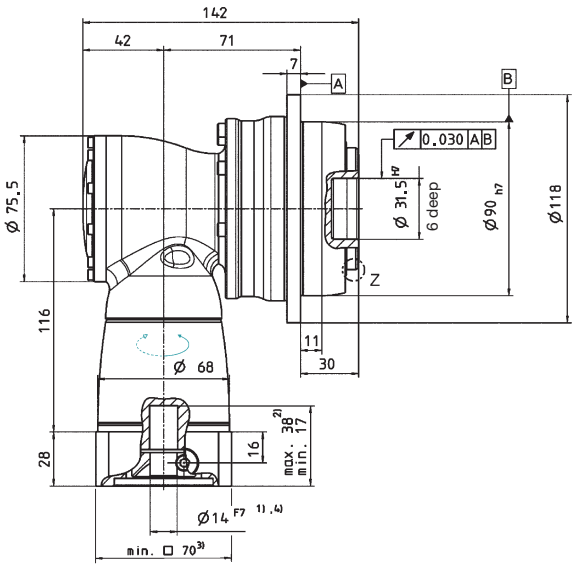
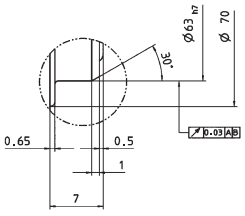


Z: Detail



See technical data sheet for available clamping hub diameters (mass moment of inertia). Dimensions available 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.
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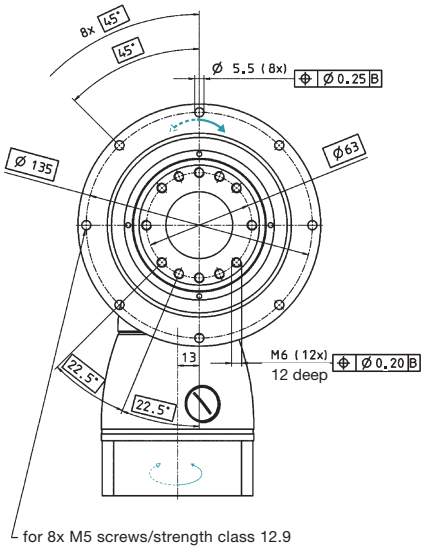
⚠ Motor mounting according to operating manual

				2-stage									
Ratio [a]			*i*	**12**	**16**	**20**	**25**	**28**	**35**	**40**	**50**	**70**	**100**
Max. acceleration torque (max. 1000 cycles per hour)			T_{2B} Nm	280	280	350	350	330	250	330	265	400	400
			T_{2B} in.lb	2478	2478	3098	3098	2920	2213	2921	2345	3540	3540
Nominal output torque (with n_{1N})			T_{2N} Nm	170	170	170	170	170	170	160	170	170	120
			T_{2N} in.lb	1505	1505	1505	1505	1505	1505	1505	1505	1505	1062
Emergency stop torque (permitted 1000 times during the service life of the gearhead)			T_{2Not} Nm	400	400	500	500	625	500	400	500	625	500
			T_{2Not} in.lb	3540	3540	4425	4425	5531	4425	3540	4425	5531	4425
Nominal input speed (with T_{2N} and 20°C ambient temperature) [b], [c]			n_{1N} rpm	2000	2400	2400	2700	2400	2500	2500	2500	2500	2500
Max. continuous speed (with 20 % T_{2N} and 20°C ambient temperature)			n_{1Ncym} rpm	3000	3400	3400	3800	3400	3200	3200	3200	3200	3200
Max. input speed			n_{1Max} rpm	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000
Mean no load running torque (with n_1 = 3000 rpm and 20°C gearhead temperature) [d]			T_{012} Nm	2.5	2.1	2.0	1.8	2.0	2.2	2.0	2.0	2.0	2.0
			T_{012} in.lb	22.1	18.6	17.7	15.9	17.7	19.5	17.7	17.7	17.7	17.7
Max. torsional backlash			j_t arcmin	Standard ≤ 4 / Reduced ≤ 2									
Torsional rigidity			C_{t21} Nm/ arcmin	–	–	–	–	–	–	–	–	–	–
			C_{t21} in.lb/ arcmin										
Max. axial force [e]			F_{2AMax} N	4150									
			F_{2AMax} lb_f	934									
Max. tilting moment			M_{2KMax} Nm	413									
			M_{2KMax} in.lb	3655									
Efficiency at full load			η %	94									
Service life (For calculation, see the Chapter "Information")			L_h h	> 20000									
Weight incl. standard adapter plate			m kg	9.0									
			m lb_m	19.9									
Operating noise (with n_1 = 3000 rpm no load)			L_{PA} dB(A)	≤ 68									
Max. permitted housing temperature			°C	+90									
			F	194									
Ambient temperature			°C	0 to +40									
			F	32 to 104									
Lubrication				Lubricated for life									
Paint				Blue RAL 5002									
Direction of rotation				Motor and gearhead opposite directions									
Protection class				IP 65									
Moment of inertia (relates to the drive) Clamping hub diameter [mm]	E	19	J_1 kgcm²	1.43	1.18	1.16	1.04	1.14	0.94	0.89	0.89	0.89	0.89
			J_1 10^{-3} in.lb.s²	1.27	1.04	1.02	0.92	1.01	0.83	0.79	0.79	0.79	0.78
	H	28	J_1 kgcm²	2.85	2.59	2.57	2.45	2.56	2.36	2.31	2.30	2.30	2.30
			J_1 10^{-3} in.lb.s²	2.52	2.29	2.27	2.17	2.26	2.08	2.04	2.04	2.04	2.04

[a] Other ratios up to i=1000 available on request
[b] Higher speeds are possible if the nominal torque is reduced
[c] For higher ambient temperatures, please reduce input speed
[d] Idling torques decrease during operation
[e] Refers to center of the output shaft or flange

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

2-stage:



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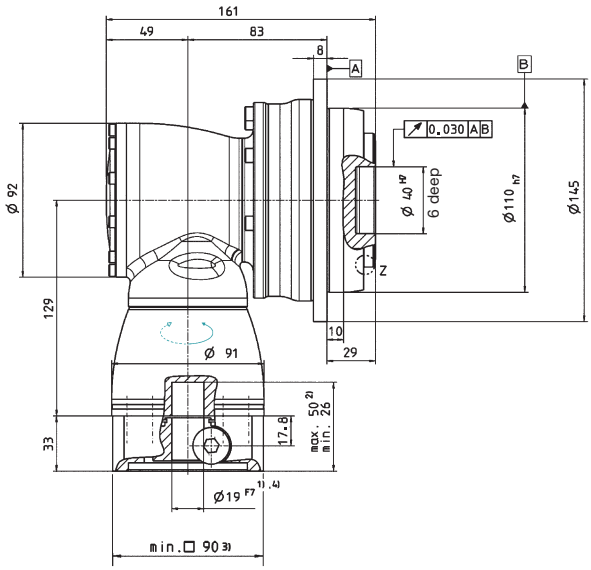
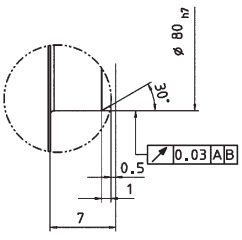


Z: Detail



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

⚠ Motor mounting according to operating manual

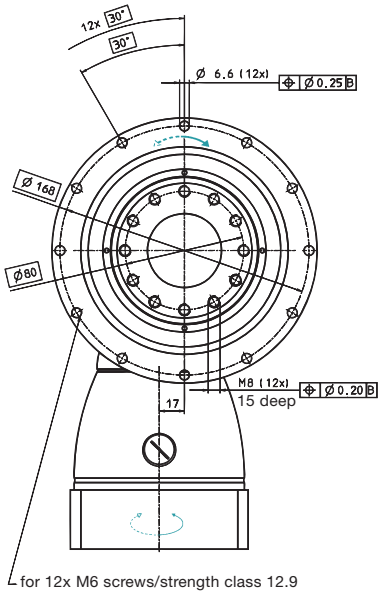
TPK+ 050 2-stage

				2-stage									
Ratio [a]			*i*	**12**	**16**	**20**	**25**	**28**	**35**	**40**	**50**	**70**	**100**
Max. acceleration torque (max. 1000 cycles per hour)			T_{2B} Nm	680	680	700	700	700	700	500	625	700	540
			T_{2B} in.lb	6018	6018	6195	6195	6195	6195	4425	5531	6195	4779
Nominal output torque (with n_{1N})			T_{2N} Nm	370	370	370	370	370	370	320	370	370	240
			T_{2N} in.lb	3275	3275	3275	3275	3275	3275	2832	3275	3275	2124
Emergency stop torque (permitted 1000 times during the service life of the gearhead)			T_{2Not} Nm	1000	1000	1250	1250	1250	1250	1000	1250	1250	1000
			T_{2Not} in.lb	8850	8850	11063	11063	11063	11063	8850	11063	11063	8850
Nominal input speed (with T_{2N} and 20°C ambient temperature) [b], [c]			n_{1N} rpm	1900	2300	2300	2600	2300	2300	2300	2300	2300	2300
Max. continuous speed (with 20 % T_{2N} and 20°C ambient temperature)			n_{1Ncym} rpm	2700	3100	3100	3500	3100	3000	3000	3000	3000	3000
Max. input speed			n_{1Max} rpm	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500
Mean no load running torque (with n_1 = 3000 rpm and 20°C gearhead temperature) [d]			T_{012} Nm	4.0	3.7	3.6	2.8	3.5	3.9	3.1	3.1	3.1	3.1
			T_{012} in.lb	35.4	32.7	31.9	24.8	31.0	34.5	27.4	27.4	27.4	27.4
Max. torsional backlash			j_t arcmin	Standard ≤ 4 / Reduced ≤ 2									
Torsional rigidity			C_{t21} Nm/ arcmin	–	–	–	–	–	–	–	–	–	124
			C_{t21} in.lb/ arcmin										1097
Max. axial force [e]			F_{2AMax} N	6130									
			F_{2AMax} lb_f	1379									
Max. tilting moment			M_{2KMax} Nm	1295									
			M_{2KMax} in.lb	11461									
Efficiency at full load			η %	94									
Service life (For calculation, see the Chapter "Information")			L_h h	> 20000									
Weight incl. standard adapter platee			*m* kg	17.0									
			m lb_m	38									
Operating noise (with n_1 = 3000 rpm no load)			L_{PA} dB(A)	≤ 68									
Max. permitted housing temperature			°C	+90									
			F	194									
Ambient temperature			°C	0 to +40									
			F	32 to 104									
Lubrication				Lubricated for life									
Paint				Blue RAL 5002									
Direction of rotation				Motor and gearhead opposite directions									
Protection class				IP 65									
Moment of inertia (relates to the drive) Clamping hub diameter [mm]	H	28	J_1 kgcm²	4.56	3.76	3.71	3.28	3.66	2.95	2.79	2.78	2.77	2.77
			J_1 10^{-3} in.lb.s²	4.04	3.32	3.28	2.90	3.24	2.61	2.47	2.46	2.45	2.45
	K	38	J_1 kgcm²	11.7	10.9	10.9	10.4	10.8	10.1	9.95	9.94	9.94	9.93
			J_1 10^{-3} in.lb.s²	10.4	9.67	9.62	9.24	9.58	8.96	8.81	8.80	8.80	8.79

[a] Other ratios up to i=1000 available on request
[b] Higher speeds are possible if the nominal torque is reduced
[c] For higher ambient temperatures, please reduce input speed
[d] Idling torques decrease during operation
[e] Refers to center of the output shaft or flange

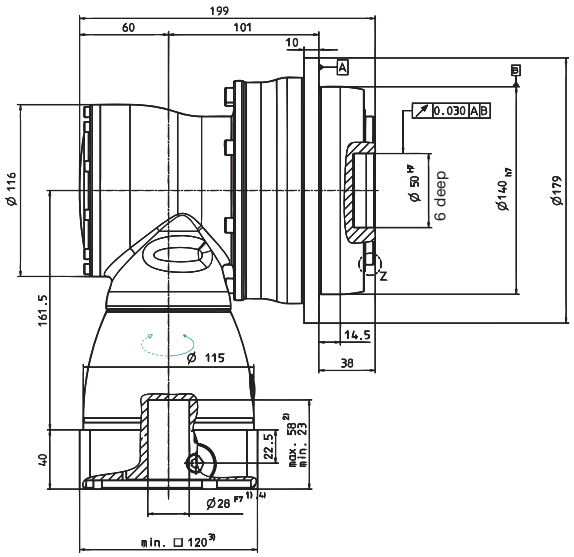
Please contact us for information on the best configuration for S1 conditions of use (continuous operation).

2-stage:

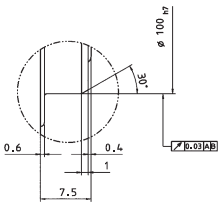


for 12x M6 screws/strength class 12.9

←A



Z: Detail



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

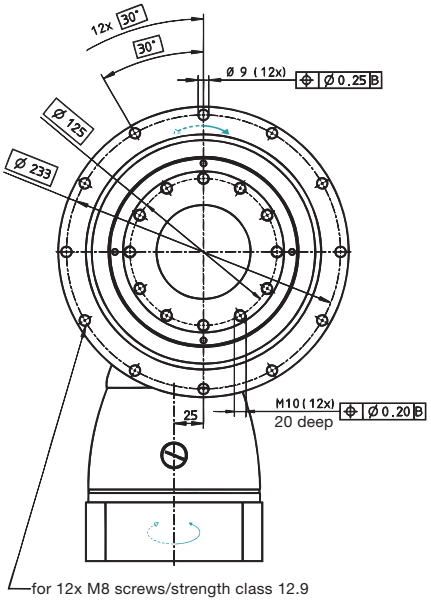
⚠ Motor mounting according to operating manual

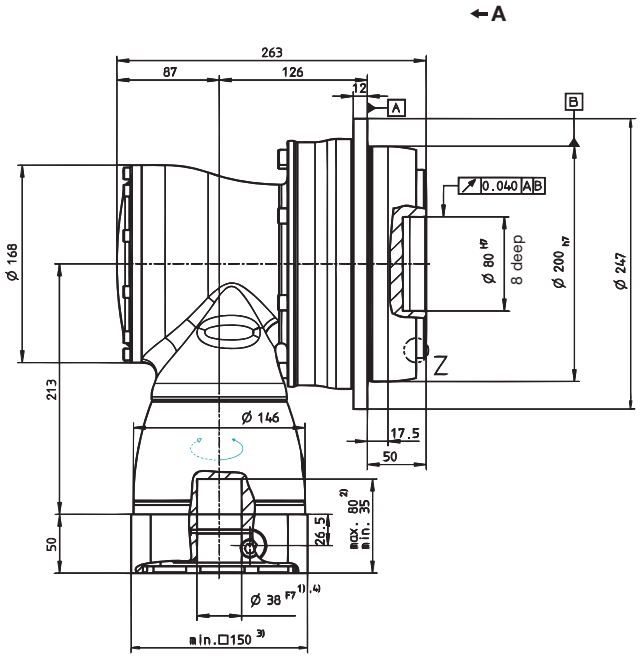
			2-stage									
Ratio [a]	i		**12**	**16**	**20**	**25**	**28**	**35**	**40**	**50**	**70**	**100**
Max. acceleration torque (max. 1000 cycles per hour)	T_{2B}	Nm	1200	1200	1500	1500	1600	1250	840	1050	1470	1400
		in.lb	10620	10620	13275	13275	14160	11063	7434	9293	13010	12390
Nominal output torque (with n_{1N})	T_{2N}	Nm	700	700	750	750	750	750	640	750	750	750
		in.lb	6195	6195	6638	6638	6638	6638	5664	6638	6638	6638
Emergency stop torque (permitted 1000 times during the service life of the gearhead)	T_{2Not}	Nm	1600	1600	2000	2000	2750	2000	1600	2000	2750	2200
		in.lb	14160	14160	17700	17700	24338	17700	14160	17700	24338	19470
Nominal input speed (with T_{2N} and 20°C ambient temperature) [b), c)]	n_{1N}	rpm	1600	1900	1900	2100	1900	2100	2100	2100	2100	2100
Max. continuous speed (with 20 % T_{2N} and 20°C ambient temperature)	n_{1Ncym}	rpm	2300	2600	2600	2800	2600	3000	3000	3000	3000	3000
Max. input speed	n_{1Max}	rpm	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500
Mean no load running torque (with n_1 = 3000 rpm and 20°C gearhead temperature) [d)]	T_{012}	Nm	9.0	6.5	6.5	5.5	6.0	8.0	6.0	6.0	6.0	6.0
		in.lb	79.7	57.5	57.5	48.7	53.1	70.8	53.1	53.1	53.1	53.1
Max. torsional backlash	j_t	arcmin	Standard ≤ 4 / Reduced ≤ 2									
Torsional rigidity	C_{t21}	Nm/ arcmin	–	–	–	–	–	–	–	–	–	–
		in.lb/ arcmin										
Max. axial force [e)]	F_{2AMax}	N	10050									
		lb_f	2261									
Max. tilting moment	M_{2KMax}	Nm	3064									
		in.lb	27116									
Efficiency at full load	η	%	94									
Service life (For calculation, see the Chapter "Information")	L_h	h	> 20000									
Weight incl. standard adapter plate	m	kg	41.0									
		lb_m	91									
Operating noise (with n_1 = 3000 rpm no load)	L_{PA}	dB(A)	≤ 70									
Max. permitted housing temperature		°C	+90									
		F	194									
Ambient temperature		°C	0 to +40									
		F	32 to 104									
Lubrication			Lubricated for life									
Paint			Blue RAL 5002									
Direction of rotation			Motor and gearhead opposite directions									
Protection class			IP 65									
Moment of inertia (relates to the drive) Clamping hub diameter [mm] K 38	J_1	$kgcm^2$	24.3	19.0	18.7	16.1	18.5	13.9	12.8	12.7	12.7	12.7
		10^{-3} in.lb.s^2	21.5	16.8	16.6	14.2	16.4	12.3	11.3	11.3	11.2	11.2

[a)] Other ratios up to i=1000 available on request
[b)] Higher speeds are possible if the nominal torque is reduced
[c)] For higher ambient temperatures, please reduce input speed
[d)] Idling torques decrease during operation
[e)] Refers to center of the output shaft or flange

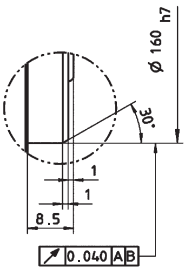
Please contact us for information on the best configuration for S1 conditions of use (continuous operation).

2-stage:





Z: Detail



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

⚠ Motor mounting according to operating manual

SK⁺/SPK⁺ – The successor to our versatile hypoid gearhead with SP⁺ compatible output shaft, also available with planetary stage

SK+/SPK+

Details

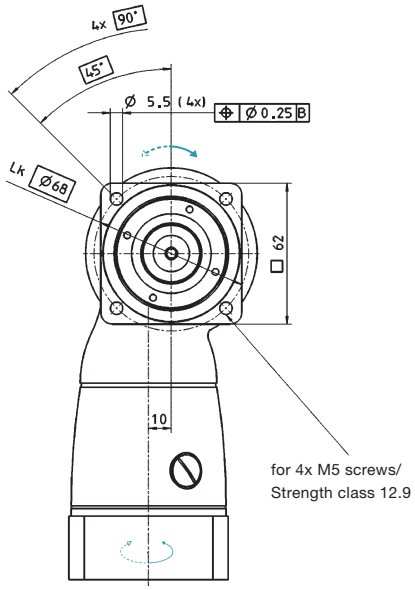
SK+ 060 1/2-stage

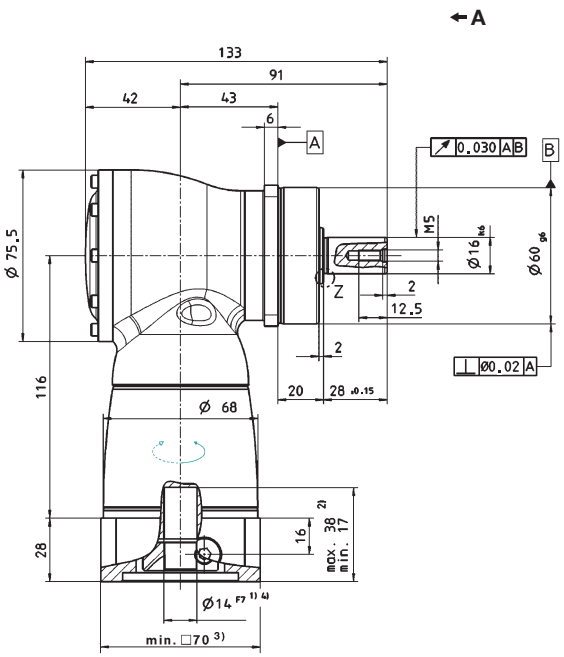
					1-stage					2-stage									
Ratio [a]			*i*		**3**	**4**	**5**	**7**	**10**	**12**	**16**	**20**	**25**	**28**	**35**	**40**	**50**	**70**	**100**
Max. acceleration torque (max. 1000 cycles per hour)			T_{2B}	Nm	30	30	30	25	20	30	30	30	30	30	30	30	30	25	20
				in.lb	266	266	266	221	177	266	266	266	266	266	266	266	266	221	177
Nominal output torque (with n_{1N})			T_{2N}	Nm	22	22	22	20	15	22	22	22	22	22	22	22	22	20	15
				in.lb	195	195	195	177	133	195	195	195	195	195	195	195	195	177	133
Emergency stop torque (permitted 1000 times during the service life of the gearhead)			T_{2Not}	Nm	40	50	50	45	40	50	50	50	50	50	50	50	50	45	40
				in.lb	354	443	443	398	354	443	443	443	443	443	443	443	443	398	354
Nominal input speed (with T_{2N} and 20°C ambient temperature) [b), c)]			n_{1N}	rpm	2500	2700	3000	3000	3000	4400	4400	4400	4400	4400	4400	4400	4800	5500	5500
Max. continuous speed (with 20% T_{2N} and 20°C ambient temperature)			n_{1Ncym}	rpm	3000	3500	4000	3500	3500	For higher speeds, please contact us.									
Max. input speed			n_{1Max}	rpm	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000
Mean no load running torque (with n_1 = 3000 rpm and 20°C gearhead temperature) [d)]			T_{012}	Nm	1.2	1.1	1.0	1.2	1.1	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1
				in.lb	10.6	9.7	8.9	10.6	9.7	1.8	1.8	1.8	1.8	1.8	1.8	0.9	0.9	0.9	0.9
Max. torsional backlash			j_t	arcmin	≤ 5														
Torsional rigidity			C_{t21}	Nm/ arcmin	2.0	2.1	2.2	2.0	1.8	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.0	1.8
				in.lb/ arcmin	18	19	19	18	16	19	19	19	19	19	19	19	19	18	16
Max. axial force [e)]			F_{2AMax}	N	2400														
				lb_f	540														
Max. radial force [e)]			F_{2RMax}	N	2700														
				lb_f	608														
Max. tilting moment			M_{2KMax}	Nm	251														
				in.lb	2220														
Efficiency at full load			η	%	96					94									
Service life (For calculation, see the Chapter "Information")			L_h	h	> 20000														
Weight incl. standard adapter plate			*m*	kg	2.9					3.2									
				lb_m	6.4					7.1									
Operating noise (with n_1 = 3000 rpm no load)			L_{PA}	dB(A)	≤ 64														
Max. permitted housing temperature				°C	+90														
				F	194														
Ambient temperature				°C	0 to +40														
				F	32 to 104														
Lubrication					Lubricated for life														
Paint					Blue RAL 5002														
Direction of rotation					Motor and gearhead opposite directions														
Protection class					IP 65														
Moment of inertia (relates to the drive) Clamping hub diameter [mm]	B	11	J_1	kgcm²	–	–	–	–	–	0.09	0.09	0.07	0.07	0.06	0.06	0.06	0.06	0.06	0.06
				10^{-3} in.lb.s²						0.08	0.08	0.07	0.06	0.06	0.06	0.05	0.05	0.05	0.05
	C	14	J_1	kgcm²	0.52	0.44	0.40	0.36	0.34	0.20	0.20	0.19	0.19	0.18	0.18	0.17	0.17	0.17	0.17
				10^{-3} in.lb.s²	0.46	0.39	0.35	0.32	0.30	0.18	0.18	0.17	0.16	0.16	0.16	0.15	0.15	0.15	0.15
	E	19	J_1	kgcm²	0.87	0.79	0.75	0.71	0.70	–	–	–	–	–	–	–	–	–	–
				10^{-3} in.lb.s²	0.77	0.70	0.66	0.63	0.62										

[a)] Other ratios available on request
[b)] Higher speeds are possible if the nominal torque is reduced
[c)] For higher ambient temperatures, please reduce input speed
[d)] Idling torques decrease during operation
[e)] Refers to center of the output shaft or flange

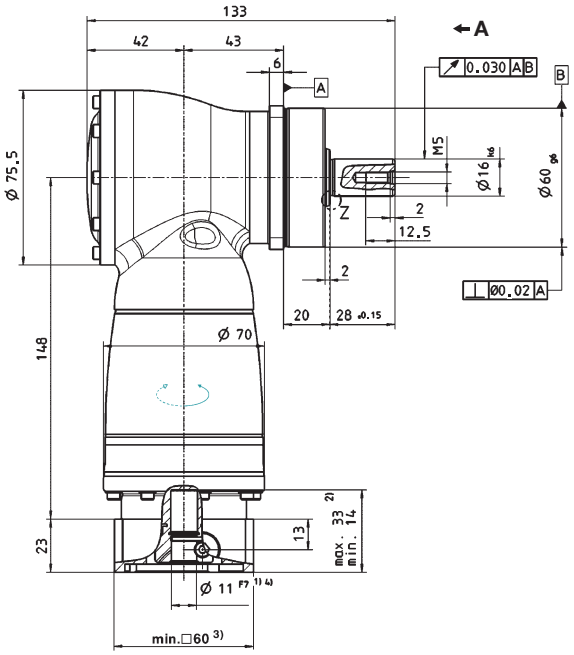
Please contact us for information on the best configuration for S1 conditions of use (continuous operation).

1-stage:

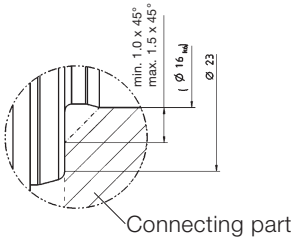




2-stage:

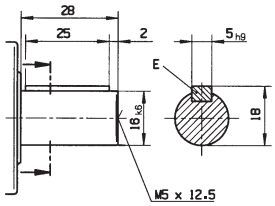


Z: Detail



Alternatives: Output shaft variants

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



Involute gearing DIN 5480 available as an option.

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

⚠ Motor mounting according to operating manual

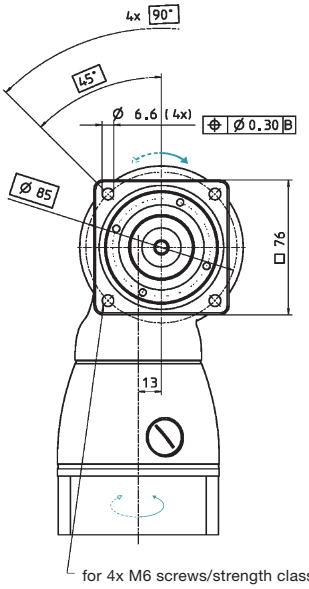
SK+ 075 1/2-stage

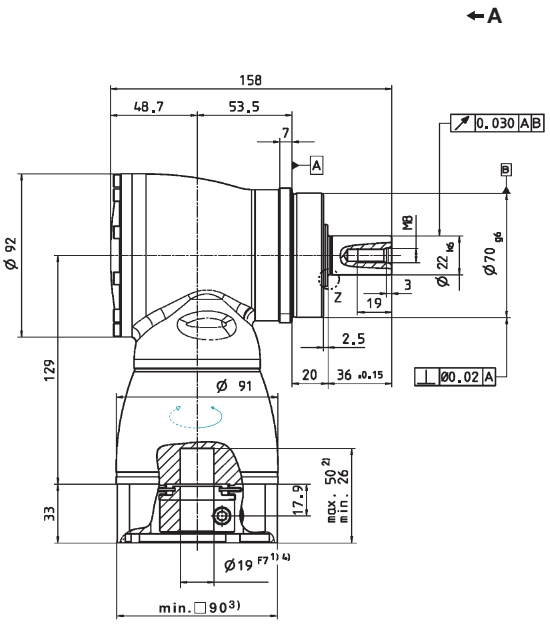
					1-stage					2-stage									
Ratio [a]			i		**3**	**4**	**5**	**7**	**10**	**12**	**16**	**20**	**25**	**28**	**35**	**40**	**50**	**70**	**100**
Max. acceleration torque (max. 1000 cycles per hour)			T_{2B}	Nm	70	70	70	60	50	70	70	70	70	70	70	70	70	60	50
				in.lb	620	620	620	531	443	620	620	620	620	620	620	620	620	531	443
Nominal output torque (with n_{1N})			T_{2N}	Nm	50	50	50	45	40	50	50	50	50	50	50	50	50	45	40
				in.lb	443	443	443	398	354	443	443	443	443	443	443	443	443	398	354
Emergency stop torque (permitted 1000 times during the service life of the gearhead)			T_{2Not}	Nm	95	115	115	110	100	115	115	115	115	115	115	115	115	110	100
				in.lb	841	1018	1018	974	885	1018	1018	1018	1018	1018	1018	1018	1018	974	885
Nominal input speed (with T_{2N} and 20°C ambient temperature) [b), c)]			n_{1N}	rpm	2300	2500	2800	2800	2800	3500	3500	3500	3500	3500	3500	3500	3800	4500	4500
Max. continuous speed (with 20% T_{2N} and 20°C ambient temperature)			n_{1Ncym}	rpm	3000	3500	4000	3500	3500	For higher speeds, please contact us.									
Max. input speed			n_{1Max}	rpm	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000
Mean no load running torque (with n_1 = 3000 rpm and 20°C gearhead temperature) [d)]			T_{012}	Nm	2.0	1.7	1.5	2.0	1.8	0.3	0.3	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1
				in.lb	18	15	13	18	16	2.7	2.7	1.8	1.8	1.8	1.8	0.9	0.9	0.9	0.9
Max. torsional backlash			j_t	arcmin	≤ 4														
Torsional rigidity			C_{t21}	Nm/ arcmin	5.0	5.5	6.0	6.0	6.0	5.5	5.5	5.5	5.5	5.5	5.5	5.5	6.0	6.0	6.0
				in.lb/ arcmin	44	49	53	53	53	49	49	49	49	49	49	49	53	53	53
Max. axial force [e)]			F_{2AMax}	N	3400														
				lb_f	765														
Max. radial force [e)]			F_{2RMax}	N	4000														
				lb_f	900														
Max. tilting moment			M_{2KMax}	Nm	437														
				in.lb	3867														
Efficiency at full load			η	%	96					94									
Service life (For calculation, see the Chapter "Information")			L_h	h	> 20000														
Weight incl. standard adapter plate			m	kg	4.8					5.4									
				lb_m	10.6					11.9									
Operating noise (with n_1 = 3000 rpm no load)			L_{PA}	dB(A)	≤ 66														
Max. permitted housing temperature				°C	+90														
				F	194														
Ambient temperature				°C	0 to +40														
				F	32 to 104														
Lubrication					Lubricated for life														
Paint					Blue RAL 5002														
Direction of rotation					Motor and gearhead opposite directions														
Protection class					IP 65														
Moment of inertia (relates to the drive) Clamping hub diameter [mm]	C	14	J_1	kgcm²	–	–	–	–	–	0.28	0.27	0.23	0.23	0.20	0.20	0.18	0.18	0.18	0.18
				10^{-3} in.lb.s²						0.25	0.24	0.21	0.20	0.18	0.18	0.16	0.16	0.16	0.16
	E	19	J_1	kgcm²	1.46	1.19	1.06	0.95	0.90	0.73	0.71	0.68	0.67	0.63	0.62	0.63	0.63	0.63	0.63
				10^{-3} in.lb.s²	1.29	1.05	0.94	0.84	0.79	0.64	0.63	0.60	0.59	0.55	0.55	0.56	0.55	0.55	0.55
	H	28	J_1	kgcm²	2.88	2.61	2.47	2.37	2.31	–	–	–	–	–	–	–	–	–	–
				10^{-3} in.lb.s²	2.55	2.31	2.19	2.10	2.04										

[a)] Other ratios available on request
[b)] Higher speeds are possible if the nominal torque is reduced
[c)] For higher ambient temperatures, please reduce input speed
[d)] Idling torques decrease during operation
[e)] Refers to center of the output shaft or flange

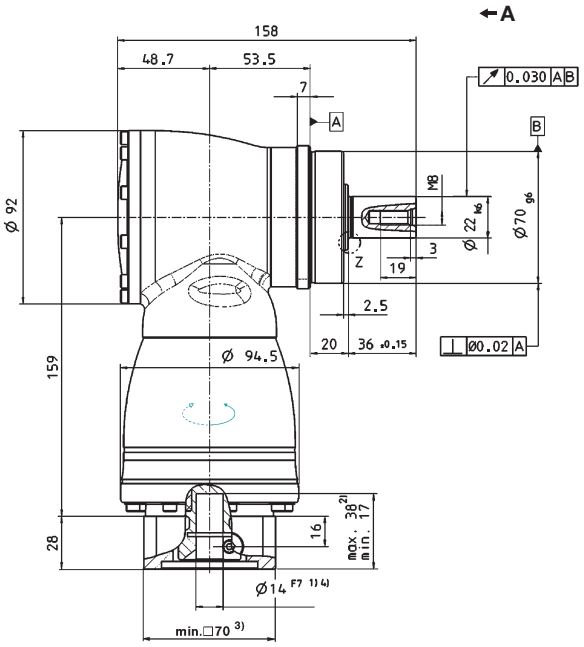
Please contact us for information on the best configuration for S1 conditions of use (continuous operation).

1-stage:

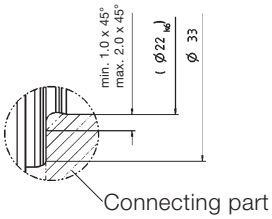




2-stage:

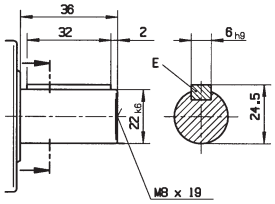


Z: Detail



Alternatives: Output shaft variants

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



Involute gearing DIN 5480 available as an option.

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

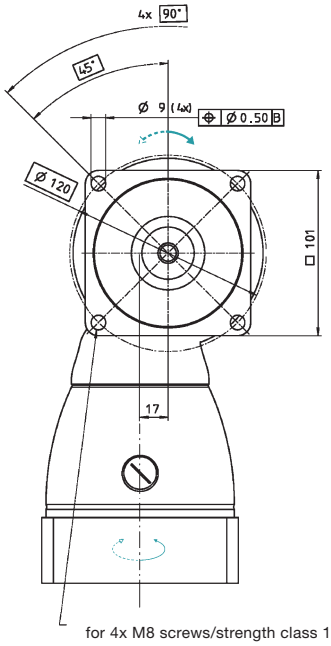
⚠ Motor mounting according to operating manual

					1-stage					2-stage									
Ratio [a]			i		**3**	**4**	**5**	**7**	**10**	**12**	**16**	**20**	**25**	**28**	**35**	**40**	**50**	**70**	**100**
Max. acceleration torque (max. 1000 cycles per hour)			T_{2B}	Nm	170	170	170	145	125	170	170	170	170	170	170	170	170	145	125
				in.lb	1505	1505	1505	1283	1106	1505	1505	1505	1505	1505	1505	1505	1505	1283	1106
Nominal output torque (with n_{1N})			T_{2N}	Nm	100	100	100	90	80	100	100	100	100	100	100	100	100	90	80
				in.lb	885	885	885	797	708	885	885	885	885	885	885	885	885	797	708
Emergency stop torque (permitted 1000 times during the service life of the gearhead)			T_{2Not}	Nm	220	260	260	255	250	260	260	260	260	260	260	260	260	255	250
				in.lb	1947	2301	2301	2257	2213	2301	2301	2301	2301	2301	2301	2301	2301	2257	2213
Nominal input speed (with T_{2N} and 20°C ambient temperature) [b], [c]			n_{1N}	rpm	2200	2400	2700	2500	2500	3100	3100	3100	3100	3100	3100	3100	3500	4200	4200
Max. continuous speed (with 20% T_{2N} and 20°C ambient temperature)			n_{1Ncym}	rpm	3000	3400	3800	3400	3400	For higher speeds, please contact us.									
Max. input speed			n_{1Max}	rpm	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500
Mean no load running torque (with n_1 = 3000 rpm and 20°C gearhead temperature) [d]			T_{012}	Nm	3.8	3.0	2.3	3.5	2.8	0.6	0.6	0.5	0.4	0.4	0.3	0.2	0.2	0.2	0.2
				in.lb	34	27	20	31	25	5.3	5.3	4.4	3.5	3.5	2.7	1.8	1.8	1.8	1.8
Max. torsional backlash			j_t	arcmin	≤ 4														
Torsional rigidity			C_{t21}	Nm/ arcmin	10	11	13	13	13	11	11	11	11	11	11	11	13	13	13
				in.lb/ arcmin	89	97	115	115	115	97	97	97	97	97	97	97	115	115	115
Max. axial force [e]			F_{2AMax}	N	5700														
				lb_f	1283														
Max. radial force [e]			F_{2RMax}	N	6300														
				lb_f	1418														
Max. tilting moment			M_{2KMax}	Nm	833														
				in.lb	7370														
Efficiency at full load			η	%	96					94									
Service life (For calculation, see the Chapter "Information")			L_h	h	> 20000														
Weight incl. standardadapter plate			m	kg	9.3					10.0									
				lb_m	21					22									
Operating noise (with n_1 = 3000 rpm no load)			L_{PA}	dB(A)	≤ 66														
Max. permitted housing temperature				°C	+90														
				F	194														
Ambient temperature				°C	0 to +40														
				F	32 to 104														
Lubrication					Lubricated for life														
Paint					Blue RAL 5002														
Direction of rotation					Motor and gearhead opposite directions														
Protection class					IP 65														
Moment of inertia (relates to the drive) Clamping hub diameter [mm]	E	19	J_1	kgcm²	–	–	–	–	–	1.02	0.97	0.86	0.84	0.75	0.74	0.69	0.69	0.68	0.68
				10^{-3} in.lb.s²						0.91	0.86	0.76	0.74	0.66	0.66	0.61	0.61	0.60	0.60
	G	24	J_1	kgcm²	–	–	–	–	–	2.59	2.54	2.42	2.40	2.31	2.30	2.26	2.25	2.25	2.25
				10^{-3} in.lb.s²						2.29	2.25	2.14	2.13	2.05	2.04	2.00	1.99	1.99	1.99
	H	28	J_1	kgcm²	4.64	3.80	3.34	2.98	2.79	–	–	–	–	–	–	–	–	–	–
				10^{-3} in.lb.s²	4.10	3.36	2.95	2.64	2.47										
	K	38	J_1	kgcm²	11.9	11.0	10.6	10.2	10.0	–	–	–	–	–	–	–	–	–	–
				10^{-3} in.lb.s²	10.5	9.77	9.37	9.05	8.89										

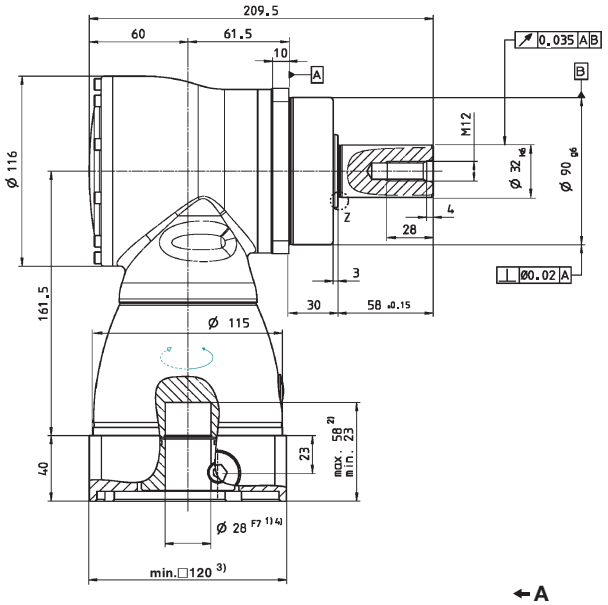
[a] Other ratios available on request
[b] Higher speeds are possible if the nominal torque is reduced
[c] For higher ambient temperatures, please reduce input speed
[d] Idling torques decrease during operation
[e] Refers to center of the output shaft or flange

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

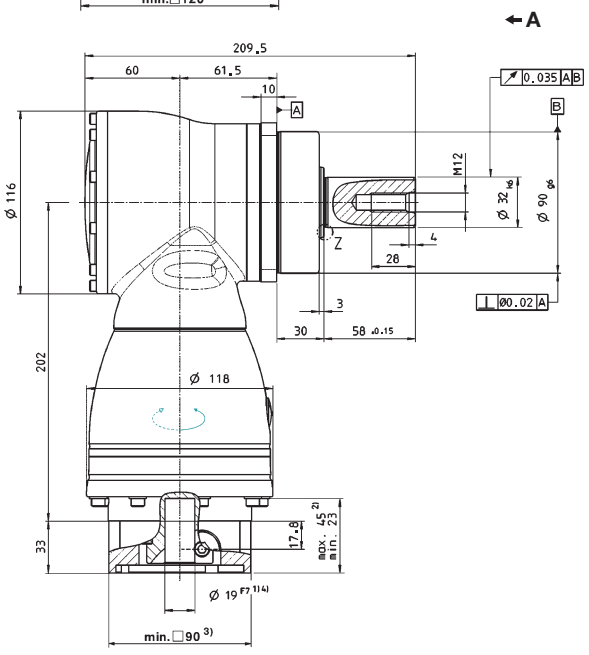
1-stage:



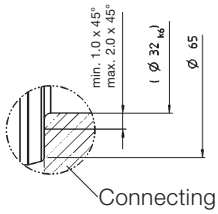
for 4x M8 screws/strength class 12.9



2-stage:

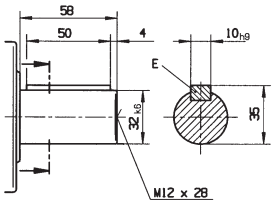


Z: Detail



Alternatives: Output shaft variants

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



Involute gearing DIN 5480 available as an option.

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

⚠ Motor mounting according to operating manual

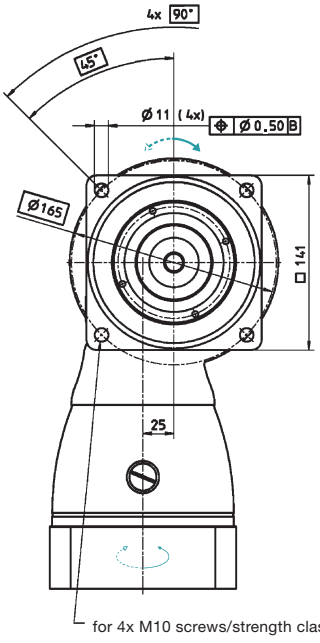
SK+ 140 1/2-stage

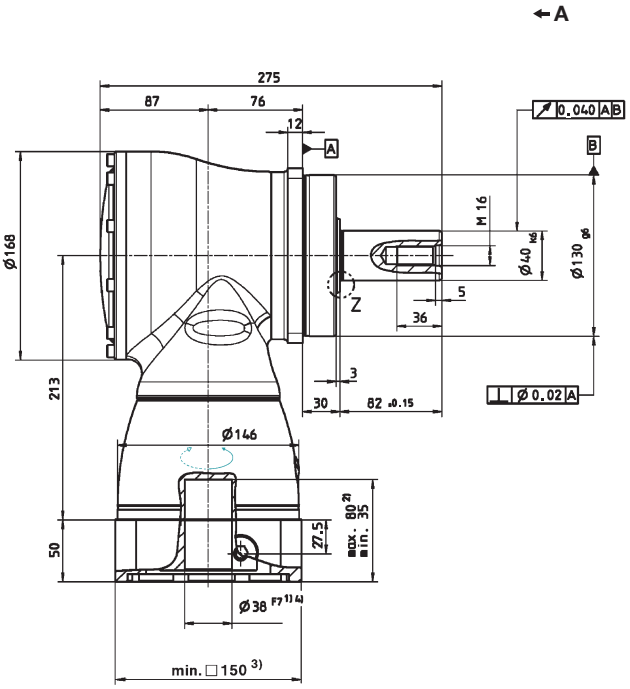
				1-stage					2-stage									
Ratio [a]			*i*	**3**	**4**	**5**	**7**	**10**	**12**	**16**	**20**	**25**	**28**	**35**	**40**	**50**	**70**	**100**
Max. acceleration torque (max. 1000 cycles per hour)			T_{2B} Nm	300	300	300	250	210	300	300	300	300	300	300	300	300	250	210
			in.lb	2655	2655	2655	2213	1859	2655	2655	2655	2655	2655	2655	2655	2655	2213	1859
Nominal output torque (with n_{1N})			T_{2N} Nm	190	190	190	175	160	190	190	190	190	190	190	190	190	175	160
			in.lb	1682	1682	1682	1549	1416	1682	1682	1682	1682	1682	1682	1682	1682	1549	1419
Emergency stop torque (permitted 1000 times during the service life of the gearhead)			T_{2Not} Nm	400	500	500	450	400	500	500	500	500	500	500	500	500	450	400
			in.lb	3540	4425	4425	3983	3540	4425	4425	4425	4425	4425	4425	4425	4425	3983	3540
Nominal input speed (with T_{2N} and 20°C ambient temperature) [b), c)]			n_{1N} rpm	1900	2000	2200	2000	2000	2900	2900	2900	2900	2900	2900	2900	3200	3200	3900
Max. continuous speed (with 20% T_{2N} and 20°C ambient temperature)			n_{1Ncym} rpm	2500	2800	3100	2800	2800	For higher speeds, please contact us.									
Max. input speed			n_{1Max} rpm	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500
Mean no load running torque (with n_1 = 3000 rpm and 20°C gearhead temperature) [d)]			T_{012} Nm	7.0	5.2	4.5	7.5	5.5	1.4	0.9	0.7	0.5	0.5	0.4	0.4	0.3	0.3	0.3
			in.lb	62	46	40	66	49	12.4	8	6.2	4.4	4.4	3.5	3.5	2.7	2.7	2.7
Max. torsional backlash			j_t arcmin	≤ 4														
Torsional rigidity			C_{t21} Nm/ arcmin	27	30	32	32	32	29	29	29	29	29	29	29	31	31	31
			in.lb/ arcmin	239	266	283	283	283	257	257	257	257	257	257	257	274	274	274
Max. axial force [e)]			F_{2AMax} N	9900														
			lb_f	2228														
Max. radial force [e)]			F_{2RMax} N	9500														
			lb_f	2138														
Max. tilting moment			M_{2KMax} Nm	1692														
			in.lb	14974														
Efficiency at full load			η %	96					94									
Service life (For calculation, see the Chapter "Information")			L_h h	> 20000														
Weight incl. standardadapter plate			*m* kg	22.6					25.0									
			lb_m	50					55									
Operating noise (with n_1 = 3000 rpm without load)			L_{PA} dB(A)	≤ 68														
Max. permitted housing temperature			°C	+90														
			F	194														
Ambient temperature			°C	0 to +40														
			F	32 to 104														
Lubrication				Lubricated for life														
Paint				Blue RAL 5002														
Direction of rotation				Motor and gearhead opposite directions														
Protection class				IP 65														
Moment of inertia (relates to the drive) Clamping hub diameter [mm]	G	24	J_1 kgcm²	–	–	–	–	–	4.21	3.85	3.28	3.17	2.78	2.73	2.48	2.46	2.43	2.42
			10^{-3} in.lb.s²						3.73	3.41	2.90	2.80	2.46	2.41	2.20	2.17	2.15	2.14
	K	38	J_1 kgcm²	25.0	19.1	16.3	14.1	12.8	11.1	10.7	10.2	10.1	9.69	9.64	9.39	9.37	9.34	9.33
			10^{-3} in.lb.s²	22.1	16.9	14.4	12.4	11.3	9.83	9.51	9.01	8.92	8.58	8.53	8.31	8.29	8.27	8.26

[a)] Other ratios available on request
[b)] Higher speeds are possible if the nominal torque is reduced
[c)] For higher ambient temperatures, please reduce input speed
[d)] Idling torques decrease during operation
[e)] Refers to center of the output shaft or flange

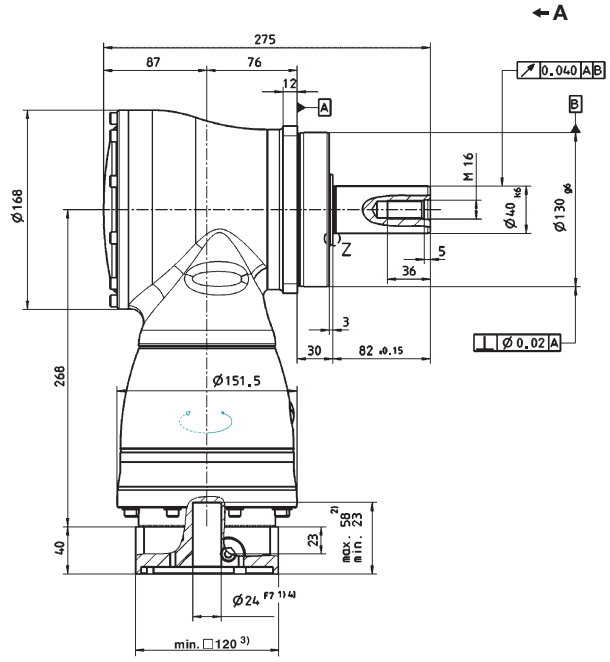
Please contact us for information on the best configuration for S1 conditions of use (continuous operation).

1-stage:

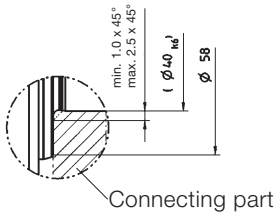




2-stage:

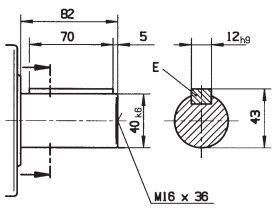


Z: Detail



Alternatives: Output shaft variants

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



Involute gearing DIN 5480 available as an option.

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

⚠ Motor mounting according to operating manual

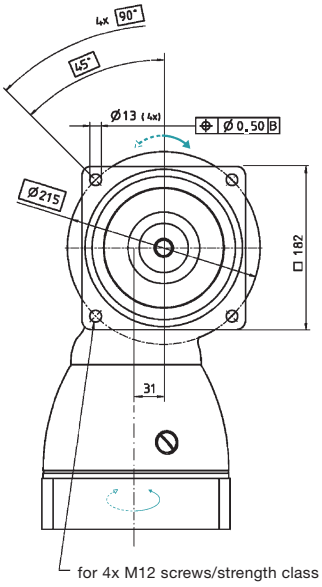
SK+ 180 1/2-stage

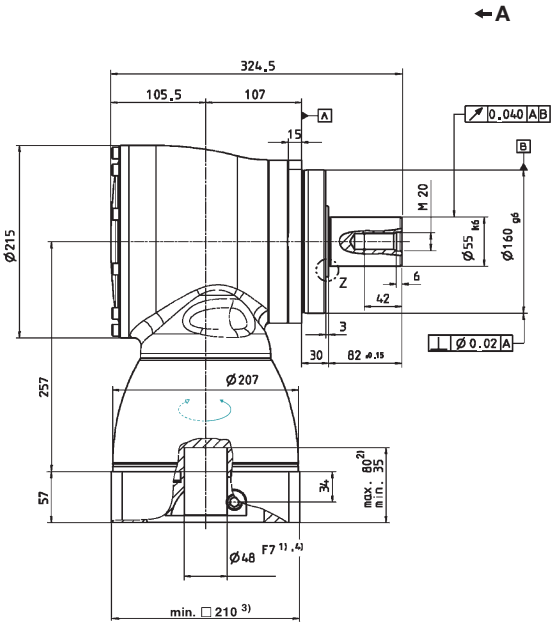
				1-stage					2-stage									
Ratio [a]			*i*	**3**	**4**	**5**	**7**	**10**	**12**	**16**	**20**	**25**	**28**	**35**	**40**	**50**	**70**	**100**
Max. acceleration torque (max. 1000 cycles per hour)			T_{2B} Nm	640	640	640	550	470	640	640	640	640	640	640	640	640	550	470
			in.lb	5664	5664	5664	4868	4160	5664	5664	5664	5664	5664	5664	5664	5664	4868	4160
Nominal output torque (with n_{1N})			T_{2N} Nm	400	400	400	380	360	400	400	400	400	400	400	400	400	380	360
			in.lb	3540	3540	3540	3363	3186	3540	3540	3540	3540	3540	3540	3540	3540	3363	3186
Emergency stop torque (permitted 1000 times during the service life of the gearhead)			T_{2Not} Nm	900	1050	1050	970	900	1050	1050	1050	1050	1050	1050	1050	1050	970	900
			in.lb	7965	9293	9293	8585	7965	9293	9293	9293	9293	9293	9293	9293	9293	8585	7965
Nominal input speed (with T_{2N} and 20°C ambient temperature) [b], [c]			n_{1N} rpm	1600	1800	2000	1800	1800	2700	2700	2700	2700	2700	2700	2700	2900	3200	3400
Max. continuous speed (with 20% T_{2N} and 20°C ambient temperature)			n_{1Ncym} rpm	2000	2400	2800	2500	2500	For higher speeds, please contact us.									
Max. input speed			n_{1Max} rpm	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000
Mean no load running torque (with n_1 = 3000 rpm and 20°C gearhead temperature) [d]			T_{012} Nm	14.5	12.0	10.0	15.0	12.5	3.0	2.3	1.8	1.6	1.3	1.2	0.9	0.9	0.9	0.9
			in.lb	128	106	89	133	111	26.6	20.4	15.9	14.2	11.5	10.6	8.0	8.0	8.0	8.0
Max. torsional backlash			j_t arcmin	≤ 4														
Torsional rigidity			C_{t21} Nm/ arcmin	64	71	79	78	77	71	71	71	71	71	71	71	78	78	78
			in.lb/ arcmin	566	628	699	690	681	628	628	628	628	628	628	628	690	690	690
Max. axial force [e]			F_{2AMax} N	14200														
			lb_f	3195														
Max. radial force [e]			F_{2RMax} N	14700														
			lb_f	3308														
Max. tilting moment			M_{2KMax} Nm	3213														
			in.lb	28435														
Efficiency at full load			η %	96					94									
Service life (For calculation, see the Chapter "Information")			L_h h	> 20000														
Weight incl. standardadapter plate			*m* kg	45.4					48									
			lb_m	100					106									
Operating noise (with n_1 = 3000 rpm no load)			L_{PA} dB(A)	≤ 68														
Max. permitted housing temperature			°C	+90														
			F	194														
Ambient temperature			°C	0 to +40														
			F	32 to 104														
Lubrication				Lubricated for life														
Paint				Blue RAL 5002														
Direction of rotation				Motor and gearhead opposite directions														
Protection class				IP 65														
Moment of inertia (relates to the drive) Clamping hub diameter [mm]	K	38	J_1 kgcm²	–	–	–	–	–	15.3	14.0	12.3	12.0	10.9	10.7	10.1	10.0	9.95	9.91
			10^{-3} in.lb.s²						13.6	12.3	10.9	10.6	9.65	9.48	8.96	8.88	8.81	8.77
	M	48	J_1 kgcm²	73.3	51.6	42.1	34.0	29.7	30.0	28.7	27.1	26.7	25.6	25.4	24.8	24.7	24.7	24.6
			10^{-3} in.lb.s²	64.9	45.6	37.3	30.1	26.3	26.6	25.4	23.9	23.6	22.7	22.5	22.0	21.9	21.8	21.8

[a] Other ratios available on request
[b] Higher speeds are possible if the nominal torque is reduced
[c] For higher ambient temperatures, please reduce input speed
[d] Idling torques decrease during operation
[e] Refers to center of the output shaft or flange

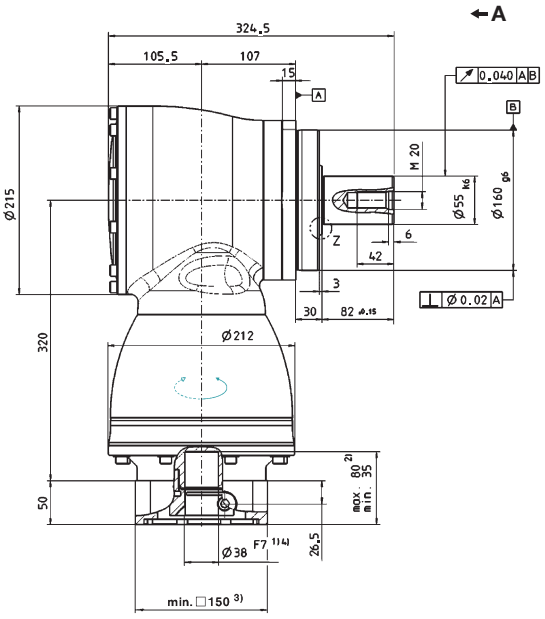
Please contact us for information on the best configuration for S1 conditions of use (continuous operation).

1-stage:

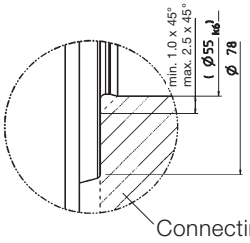




2-stage:

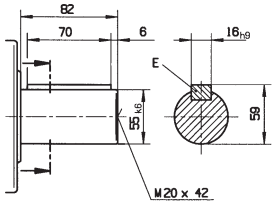


Z: Detail



Alternatives: Output shaft variants

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



Involute gearing DIN 5480 available as an option.

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

⚠ Motor mounting according to operating manual

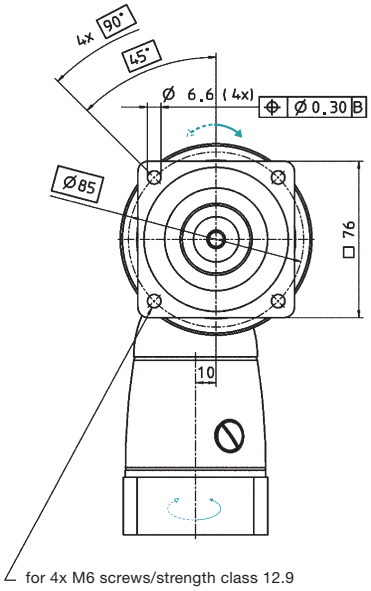
SPK+ 075 2-stage

				2-stage									
Ratio [a]			i	**12**	**16**	**20**	**25**	**28**	**35**	**40**	**50**	**70**	**100**
Max. acceleration torque (max. 1000 cycles per hour)			T_{2B} Nm	110	110	110	110	110	110	80	100	110	90
			in.lb	974	974	974	974	974	974	974	885	974	797
Nominal output torque (with n_{1N})			T_{2N} Nm	75	75	75	75	75	75	60	75	75	52
			in.lb	664	664	664	664	664	664	531	664	664	460
Emergency stop torque (permitted 1000 times during the service life of the gearhead)			T_{2Not} Nm	160	160	200	200	250	175	120	150	210	200
			in.lb	1416	1416	1770	1770	2213	1549	1062	1328	1859	1770
Nominal input speed (with T_{2N} and 20°C ambient temperature) [b), c)]			n_{1N} rpm	2000	2400	2400	2700	2400	2500	2500	2500	2500	2500
Max. continuous speed (with 20% T_{2N} and 20°C ambient temperature)			n_{1Ncym} rpm	3000	3400	3400	3800	3400	3200	3200	3200	3200	3200
Max. input speed			n_{1Max} rpm	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000
Mean no load running torque (with n_1=3000 rpm and 20°C gearhead temperature) [d)]			T_{012} Nm	1.5	1.3	1.2	1.2	1.2	1.3	1.3	1.3	1.3	1.3
			in.lb	13.3	11.5	10.6	10.6	10.6	11.5	11.5	11.5	11.5	11.5
Max. torsional backlash			j_t arcmin	Standard ≤ 6 / Reduced ≤ 4									
Torsional rigidity			C_{t21} Nm/ arcmin	10									
			in.lb/ arcmin	89									
Max. axial force [e)]			F_{2AMax} N	3350									
			lb_f	753									
Max. radial force [e)]			F_{2RMax} N	4000									
			lb_f	900									
Max. tilting moment			M_{2KMax} Nm	236									
			in.lb	2089									
Efficiency at full load			η %	94									
Service life (For calculation, see the Chapter "Information")			L_h h	> 20000									
Weight incl. standard adapter plate			m kg	5.2									
			lb_m	11.5									
Operating noise (with n_1=3000 rpm no load)			L_{PA} dB(A)	≤ 66									
Max. permitted housing temperature			°C	+90									
			F	194									
Ambient temperature			°C	0 to +40									
			F	32 to 104									
Lubrication				Lubricated for life									
Paint				Blue RAL 5002									
Direction of rotation				Motor and gearhead opposite directions									
Protection class				IP 65									
Moment of inertia (relates to the drive) Clamping hub diameter [mm]	C	14	J_1 kgcm²	0.54	0.45	0.44	0.40	0.44	0.36	0.35	0.34	0.34	0.34
			10^{-3} in.lb.s²	0.48	0.40	0.39	0.35	0.39	0.32	0.31	0.30	0.30	0.30
	E	19	J_1 kgcm²	0.89	0.80	0.79	0.75	0.79	0.71	0.70	0.70	0.70	0.69
			10^{-3} in.lb.s²	0.79	0.71	0.70	0.66	0.70	0.63	0.62	0.62	0.62	0.61

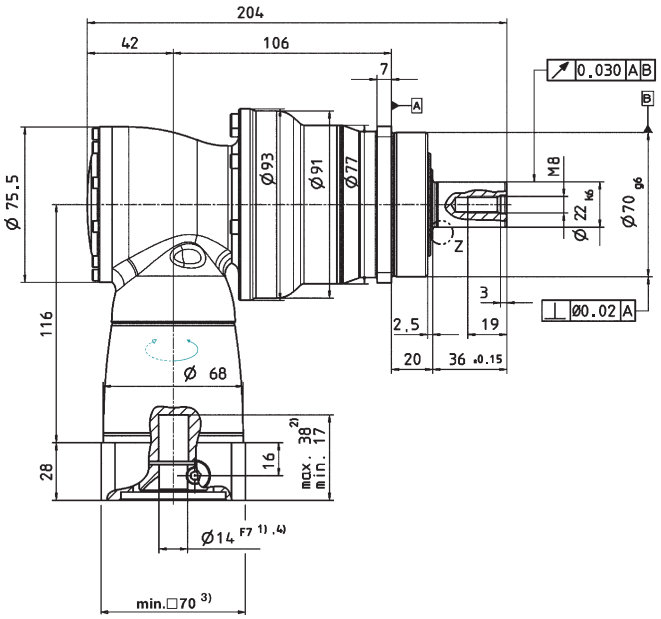
[a)] Other ratios up to i=1000 available on request
[b)] Higher speeds are possible if the nominal torque is reduced
[c)] For higher ambient temperatures, please reduce input speed
[d)] Idling torques decrease during operation
[e)] Refers to center of the output shaft or flange

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

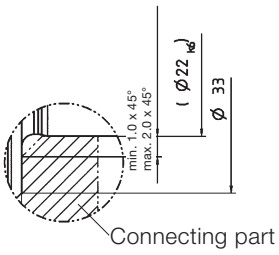
2-stage:



←A

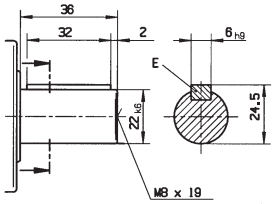


Z: Detail

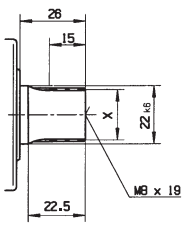


Alternatives: Output shaft variants

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 6m, DIN 5480



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

⚠ Motor mounting according to operating manual

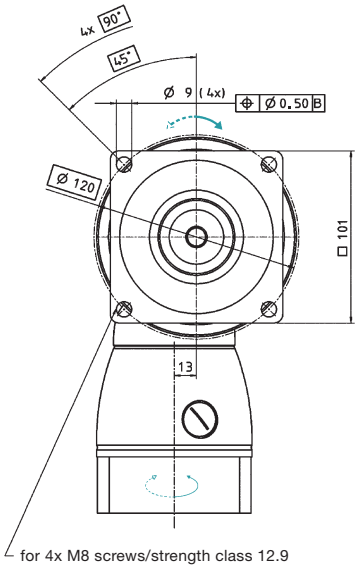
				2-stage									
Ratio [a]			*i*	**12**	**16**	**20**	**25**	**28**	**35**	**40**	**50**	**70**	**100**
Max. acceleration torque (max. 1000 cycles per hour)			T_{2B} Nm	280	280	300	300	300	300	200	250	300	225
			T_{2B} in.lb	2478	2478	2655	2655	2655	2655	1770	2213	2655	1991
Nominal output torque (with n_{1N})			T_{2N} Nm	180	180	175	175	170	175	160	175	170	120
			T_{2N} in.lb	1593	1593	1549	1549	1505	1549	1416	1549	1505	1062
Emergency stop torque (permitted 1000 times during the service life of the gearhead)			T_{2Not} Nm	400	400	500	500	625	500	400	500	625	500
			T_{2Not} in.lb	3540	3540	4425	4425	5531	4425	3540	4425	5531	4425
Nominal input speed (with T_{2N} and 20°C ambient temperature) [b], [c]			n_{1N} rpm	2000	2400	2400	2700	2400	2500	2500	2500	2500	2500
Max. continuous speed (with 20% T_{2N} and 20°C ambient temperature)			n_{1Ncym} rpm	3000	3400	3400	3800	3400	3200	3200	3200	3200	3200
Max. input speed			n_{1Max} rpm	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000
Mean no load running torque (with n_1=3000 rpm and 20°C gearhead temperature) [d]			T_{012} Nm	2.5	2.1	2.0	1.8	2.0	2.2	2.0	2.0	2.0	2.0
			T_{012} in.lb	22.1	18.6	17.7	15.9	17.7	19.5	17.7	17.7	17.7	17.7
Max. torsional backlash			j_t arcmin	Standard ≤ 4 / Reduced ≤ 2									
Torsional rigidity			C_{t21} Nm/ arcmin	31									
			C_{t21} in.lb/ arcmin	274									
Max. axial force [e]			F_{2AMax} N	5650									
			F_{2AMax} lb_f	1271									
Max. radial force [e]			F_{2RMax} N	6300									
			F_{2RMax} lb_f	1418									
Max. tilting moment			M_{2KMax} Nm	487									
			M_{2KMax} in.lb	4310									
Efficiency at full load			η %	94									
Service life (For calculation, see the Chapter "Information")			L_h h	> 20000									
Weight incl. standard adapter plate			*m* kg	9.7									
			m lb_m	21.4									
Operating noise (with n_1=3000 rpm no load)			L_{PA} dB(A)	≤ 68									
Max. permitted housing temperature			°C	+90									
			F	194									
Ambient temperature			°C	0 to +40									
			F	32 to 104									
Lubrication				Lubricated for life									
Paint				Blue RAL 5002									
Direction of rotation				Motor and gearhead opposite directions									
Protection class				IP 65									
Moment of inertia (relates to the drive) Clamping hub diameter [mm]	E	19	J_1 kgcm²	1.48	1.20	1.17	1.05	1.15	0.95	0.90	0.89	0.89	0.89
			J_1 10^{-3} in.lb.s²	1.31	1.06	1.04	0.93	1.02	0.84	0.79	0.79	0.79	0.78
	H	28	J_1 kgcm²	2.89	2.62	2.59	2.46	2.56	2.36	2.31	2.31	2.30	2.30
			J_1 10^{-3} in.lb.s²	2.56	2.31	2.29	2.18	2.27	2.09	2.05	2.04	2.04	2.04

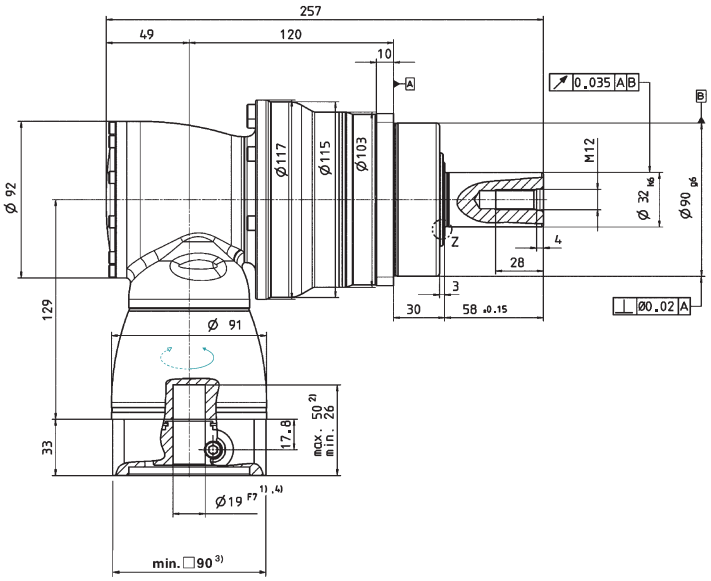
[a] Other ratios up to i=1000 available on request
[b] Higher speeds are possible if the nominal torque is reduced
[c] For higher ambient temperatures, please reduce input speed
[d] Idling torques decrease during operation
[e] Refers to center of the output shaft or flange

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

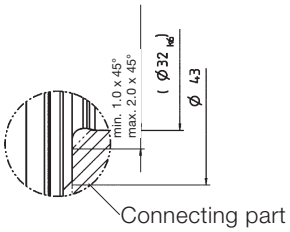
2-stage:

←A





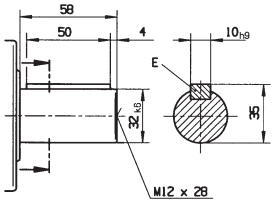
Z: Detail



Alternatives: Output shaft variants

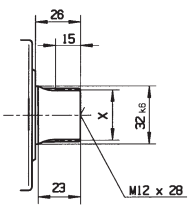
Keywayed output shaft in mm

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



Involute gearing DIN 5480 in mm

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



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

⚠ Motor mounting according to operating manual

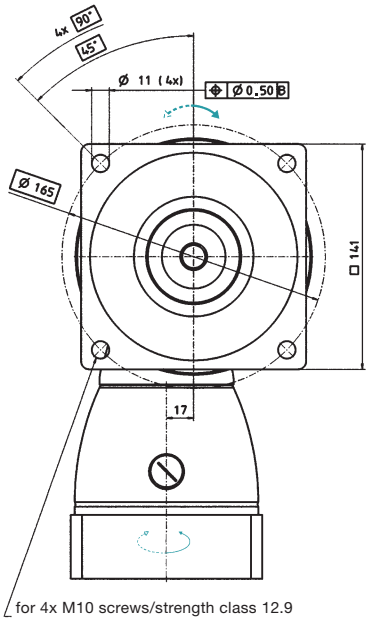
				2-stage									
Ratio [a]			*i*	**12**	**16**	**20**	**25**	**28**	**35**	**40**	**50**	**70**	**100**
Max. acceleration torque (max. 1000 cycles per hour)			T_{2B} Nm	600	600	600	600	600	600	500	600	600	480
			T_{2B} in.lb	5310	5310	5310	5310	5310	5310	4425	5310	5310	4248
Nominal output torque (with n_{1N})			T_{2N} Nm	360	360	360	360	360	360	320	360	360	220
			T_{2N} in.lb	3186	3186	3186	3186	3186	3186	2832	3186	3186	1947
Emergency stop torque (permitted 1000 times during the service life of the gearhead)			T_{2Not} Nm	1000	1000	1250	1250	1250	1250	1000	1250	1250	1000
			T_{2Not} in.lb	8850	8850	11063	11063	11063	11063	8850	11063	11063	8850
Nominal input speed (with T_{2N} and 20°C ambient temperature) [b], [c]			n_{1N} rpm	1900	2300	2300	2600	2300	2300	2300	2300	2300	2300
Max. continuous speed (with 20% T_{2N} and 20°C ambient temperature)			n_{1Ncym} rpm	2700	3100	3100	3500	3100	3000	3000	3000	3000	3000
Max. input speed			n_{1Max} rpm	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500
Mean no load running torque (with n_1=3000 rpm and 20°C gearhead temperature) [d]			T_{012} Nm	4.0	3.7	3.6	2.8	3.5	3.9	3.1	3.1	3.1	3.1
			T_{012} in.lb	35.4	32.7	31.9	24.8	31	34.5	27.4	27.4	27.4	27.4
Max. torsional backlash			j_t arcmin	Standard ≤ 4 / Reduced ≤ 2									
Torsional rigidity			C_{t21} Nm/ arcmin	53									
			C_{t21} in.lb/ arcmin	469									
Max. axial force [e]			F_{2AMax} N	9870									
			F_{2AMax} lb_f	2221									
Max. radial force [e]			F_{2RMax} N	9450									
			F_{2RMax} lb_f	2126									
Max. tilting moment			M_{2KMax} Nm	952									
			M_{2KMax} in.lb	8425									
Efficiency at full load			η %	94									
Service life (For calculation, see the Chapter "Information")			L_h h	> 20000									
Weight incl. standard adapter plate			*m* kg	20									
			m lb_m	44									
Operating noise (with n_1=3000 rpm no load)			L_{PA} dB(A)	≤ 68									
Max. permitted housing temperature			°C	+90									
			F	194									
Ambient temperature			°C	0 to +40									
			F	32 to 104									
Lubrication				Lubricated for life									
Paint				Blue RAL 5002									
Direction of rotation				Motor and gearhead opposite directions									
Protection class				IP 65									
Moment of inertia (relates to the drive) Clamping hub diameter [mm]	H	28	J_1 kgcm²	4.68	3.82	3.75	3.31	3.68	2.97	2.80	2.79	2.78	2.77
			J_1 10^{-3} in.lb.s²	4.14	3.38	3.32	2.93	3.26	2.63	2.48	2.47	2.46	2.45
	K	38	J_1 kgcm²	11.8	11.0	10.9	10.5	10.9	10.1	9.96	9.95	9.94	9.94
			J_1 10^{-3} in.lb.s²	10.5	9.73	9.66	9.27	9.60	8.97	8.82	8.81	8.80	8.79

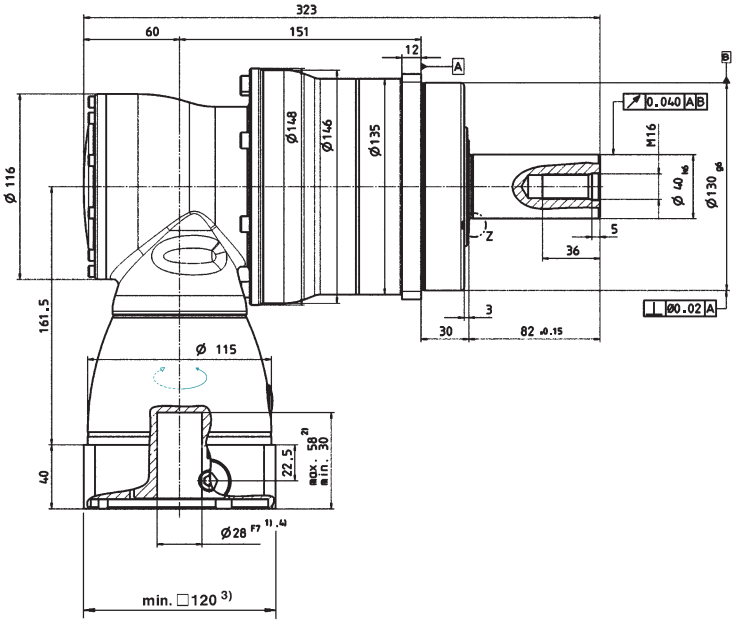
[a] Other ratios up to i=1000 available on request
[b] Higher speeds are possible if the nominal torque is reduced
[c] For higher ambient temperatures, please reduce input speed
[d] Idling torques decrease during operation
[e] Refers to center of the output shaft or flange

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

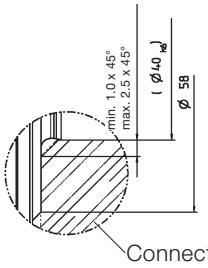
2-stage:

←A





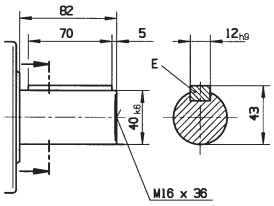
Z: Detail



Alternatives: Output shaft variants

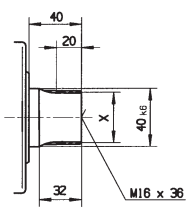
Keywayed output shaft in mm

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



Involute gearing DIN 5480 in mm

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



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

⚠ Motor mounting according to operating manual

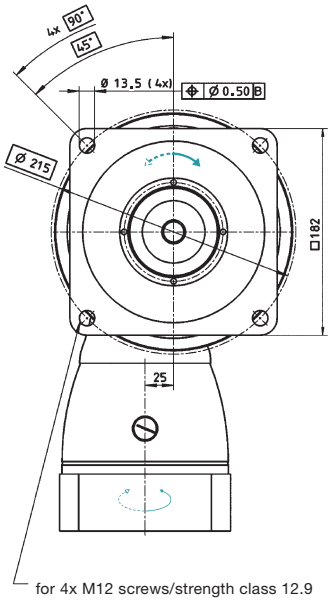
				2-stage									
Ratio [a]			*i*	**12**	**16**	**20**	**25**	**28**	**35**	**40**	**50**	**70**	**100**
Max. acceleration torque (max. 1000 cycles per hour)			T_{2B} Nm	1100	1100	1100	1100	1100	1100	840	1050	1100	880
			T_{2B} in.lb	9735	9735	9735	9735	9735	9735	7434	9293	9735	7788
Nominal output torque (with n_{1N})			T_{2N} Nm	750	750	750	750	750	750	640	750	750	750
			T_{2N} in.lb	6638	6638	6638	6638	6638	6638	5664	6638	6638	6638
Emergency stop torque (permitted 1000 times during the service life of the gearhead)			T_{2Not} Nm	1600	1600	2000	2000	2750	2000	1600	2000	2750	2200
			T_{2Not} in.lb	14160	14160	17700	17700	24338	17700	14160	17700	24338	19470
Nominal input speed (with T_{2N} and 20°C ambient temperature) [b), c)]			n_{1N} rpm	1600	1900	1900	2100	1900	2100	2100	2100	2100	2100
Max. continuous speed (with 20% T_{2N} and 20°C ambient temperature)			n_{1Ncym} rpm	2300	2600	2600	2800	2600	3000	3000	3000	3000	3000
Max. input speed			n_{1Max} rpm	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500
Mean no load running torque (with n_1=3000 rpm and 20°C gearhead temperature) [d)]			T_{012} Nm	9.0	6.5	6.5	5.5	6.0	8.0	6.0	6.0	6.0	6.0
			T_{012} in.lb	79.7	57.5	57.5	48.7	53.1	70.8	53.1	53.1	53.1	53.1
Max. torsional backlash			j_t arcmin	Standard ≤ 4 / Reduced ≤ 2									
Torsional rigidity			C_{t21} Nm/ arcmin	175									
			C_{t21} in.lb/ arcmin	1549									
Max. axial force [e)]			F_{2AMax} N	14150									
			F_{2AMax} lb_f	3184									
Max. radial force [e)]			F_{2RMax} N	14700									
			F_{2RMax} lb_f	3308									
Max. tilting moment			M_{2KMax} Nm	1600									
			M_{2KMax} in.lb	14160									
Efficiency at full load			η %	94									
Service life (For calculation, see the Chapter "Information")			L_h h	> 20000									
Weight incl. standardadapter plate			*m* kg	45									
			m lb_m	99									
Operating noise (with n_1=3000 rpm no load)			L_{PA} dB(A)	≤ 70									
Max. permitted housing temperature			°C	+90									
			F	194									
Ambient temperature			°C	0 to +40									
			F	32 to 104									
Lubrication				Lubricated for life									
Paint				Blue RAL 5002									
Direction of rotation				Motor and gearhead opposite directions									
Protection class				IP 65									
Moment of inertia (relates to the drive) Clamping hub diameter [mm]	K	38	J_1 kgcm²	24.7	19.5	19.0	16.3	18.6	14.0	12.9	12.8	12.7	12.7
			J_1 10^{-3} in.lb.s²	21.9	17.2	16.8	14.4	16.5	12.4	11.4	11.3	11.3	11.2

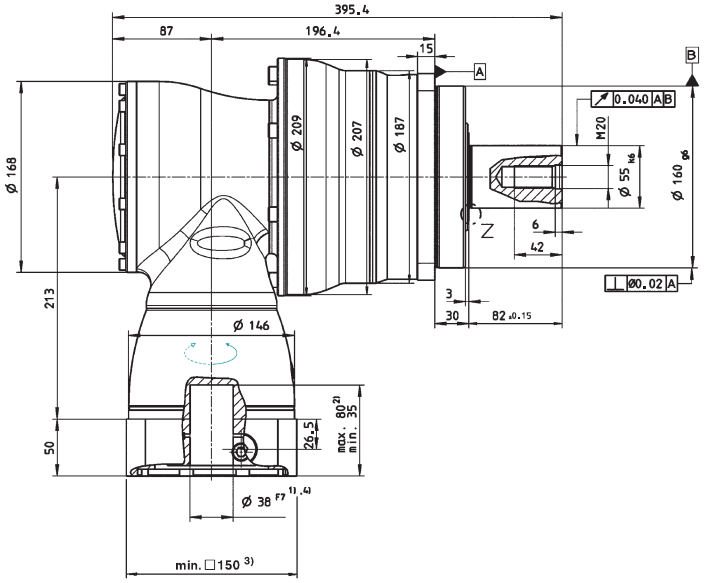
[a)] Other ratios up to i=1000 available on request
[b)] Higher speeds are possible if the nominal torque is reduced
[c)] For higher ambient temperatures, please reduce input speed
[d)] Idling torques decrease during operation
[e)] Refers to center of the output shaft or flange

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

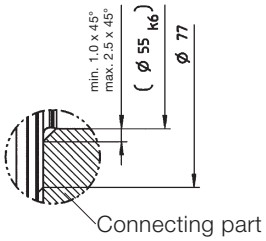
2-stage:

←A





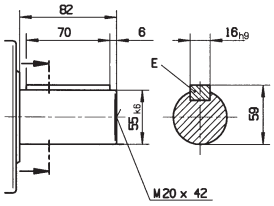
Z: Detail



Alternatives: Output shaft variants

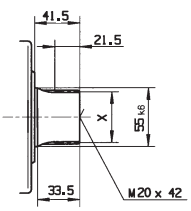
Keywayed output shaft in mm

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



Involute gearing DIN 5480 in mm

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



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

⚠ Motor mounting according to operating manual

HG⁺ – The successor to our versatile hypoid gearhead with hollow shaft

HG+ 060 1/2-stage

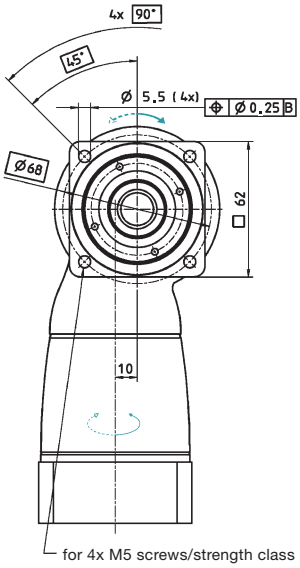
					1-stage					2-stage									
Ratio [a]			i		**3**	**4**	**5**	**7**	**10**	**12**	**16**	**20**	**25**	**28**	**35**	**40**	**50**	**70**	**100**
Max. acceleration torque (max. 1000 cycles per hour)			T_{2B}	Nm	30	30	30	25	20	30	30	30	30	30	30	30	30	25	20
				in.lb	266	266	266	221	177	266	266	266	266	266	266	266	266	221	177
Nominal output torque (with n_{1N})			T_{2N}	Nm	22	22	22	20	15	22	22	22	22	22	22	22	22	20	15
				in.lb	195	195	195	177	133	195	195	195	195	195	195	195	195	177	133
Emergency stop torque (permitted 1000 times during the service life of the gearhead)			T_{2Not}	Nm	40	50	50	45	40	50	50	50	50	50	50	50	50	45	40
				in.lb	354	443	443	398	354	443	443	443	443	443	443	443	443	398	354
Nominal input speed (with T_{2N} and 20°C ambient temperature) [b], [c]			n_{1N}	rpm	2500	2700	3000	3000	3000	4400	4400	4400	4400	4400	4400	4400	4800	5500	5500
Max. continuous speed (with 20% T_{2N} and 20°C ambient temperature)			n_{1Ncym}	rpm	3000	3500	4000	3500	3500	For higher speeds, please contact us.									
Max. input speed			n_{1Max}	rpm	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000
Mean no load running torque (with n_1 = 3000 rpm and 20°C gearhead temperature) [d]			T_{012}	Nm	1.3	1.2	1.1	1.3	1.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1
				in.lb	11.5	10.6	9.7	11.5	10.6	1.8	1.8	1.8	1.8	1.8	1.8	0.9	0.9	0.9	0.9
Max. torsional backlash			j_t	arcmin	≤ 5														
Torsional rigidity			C_{t21}	Nm/ arcmin	2.2	2.3	2.4	2.2	1.9	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.2	1.9
				in.lb/ arcmin	19	20	21	19	17	20	20	20	20	20	20	20	21	19	17
Max. axial force [e]			F_{2AMax}	N	2400														
				lb_f	540														
Max. radial force [e]			F_{2RMax}	N	2700														
				lb_f	608														
Max. tilting moment			M_{2KMax}	Nm	251														
				in.lb	2220														
Efficiency at full load			η	%	96					94									
Service life (For calculation, see the Chapter "Information")			L_h	h	> 20000														
Weight incl. standard adapter plate			m	kg	2.9					3.2									
				lb_m	6.4					7.1									
Operating noise (with n_1 = 3000 rpm no load)			L_{PA}	dB(A)	≤ 64														
Max. permitted housing temperature				°C	+90														
				F	194														
Ambient temperature				°C	0 to +40														
				F	32 to 104														
Lubrication					Lubricated for life														
Paint					Blue RAL 5002														
Direction of rotation					Motor and gearhead opposite directions														
Protection class					IP 65														
Moment of inertia (relates to the drive) Clamping hub diameter [mm]	B	11	J_1	kgcm²	–	–	–	–	–	0.09	0.09	0.07	0.07	0.06	0.06	0.06	0.06	0.06	0.06
				10^{-3} in.lb.s²						0.08	0.08	0.07	0.06	0.06	0.06	0.05	0.05	0.05	0.05
	C	14	J_1	kgcm²	0.52	0.44	0.40	0.36	0.34	0.20	0.20	0.19	0.19	0.18	0.18	0.17	0.17	0.17	0.17
				10^{-3} in.lb.s²	0.46	0.39	0.35	0.32	0.30	0.18	0.18	0.17	0.16	0.16	0.16	0.15	0.15	0.15	0.15
	E	19	J_1	kgcm²	0.87	0.79	0.75	0.71	0.70	–	–	–	–	–	–	–	–	–	–
				10^{-3} in.lb.s²	0.77	0.70	0.66	0.63	0.62										

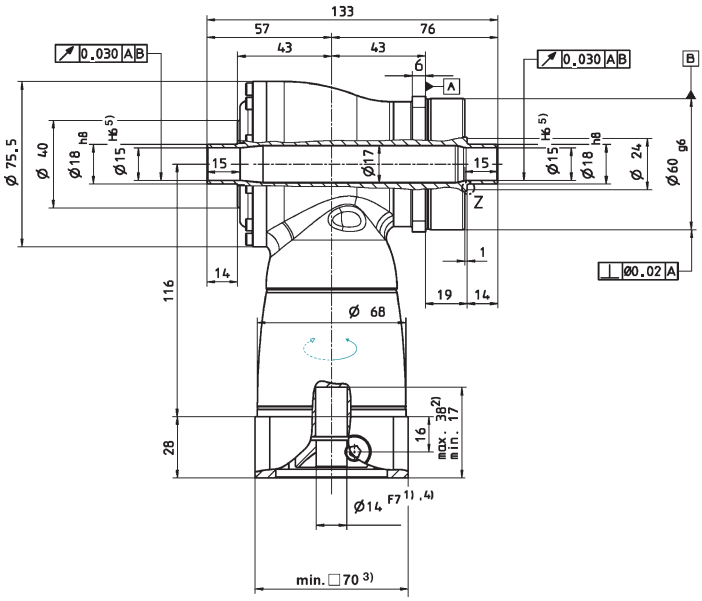
[a] Other ratios available on request
[b] Higher speeds are possible if the nominal torque is reduced
[c] For higher ambient temperatures, please reduce input speed
[d] Idling torques decrease during operation
[e] Refers to center of the output shaft or flange

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

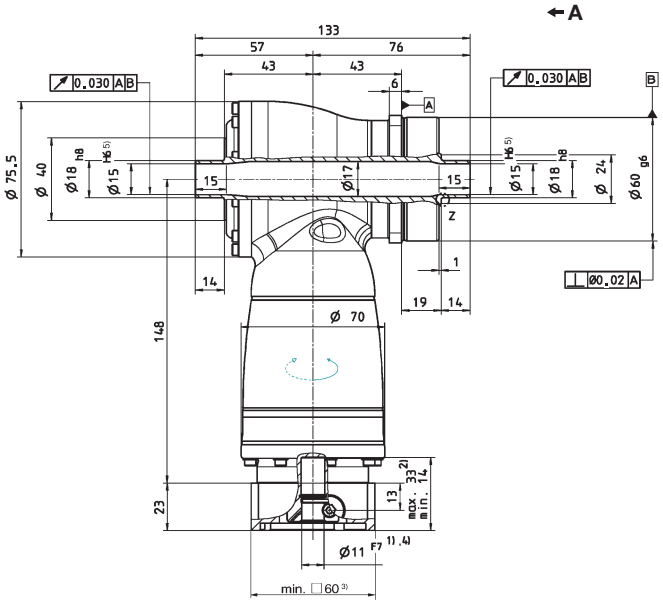
View A

1-stage:

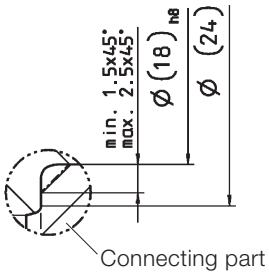




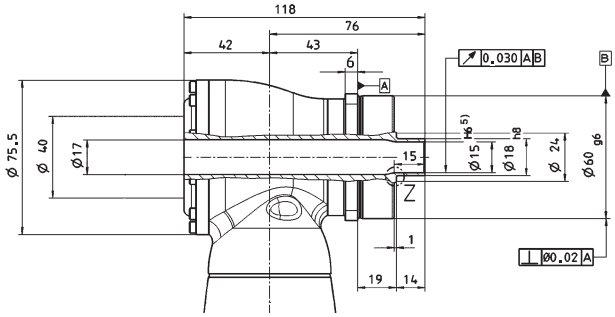
2-stage:



Z: Detail



Alternatives: Single output shaft



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

⚠ Motor mounting according to operating manual

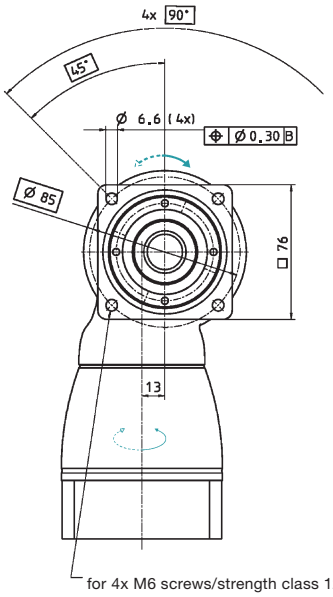
HG+ 075 1/2-stage

					1-stage					2-stage									
Ratio [a]			*i*		**3**	**4**	**5**	**7**	**10**	**12**	**16**	**20**	**25**	**28**	**35**	**40**	**50**	**70**	**100**
Max. acceleration torque (max. 1000 cycles per hour)			T_{2B}	Nm	70	70	70	60	50	70	70	70	70	70	70	70	70	60	50
				in.lb	620	620	620	531	443	620	620	620	620	620	620	620	620	531	443
Nominal output torque (with n_{1N})			T_{2N}	Nm	50	50	50	45	40	50	50	50	50	50	50	50	50	45	40
				in.lb	443	443	443	398	354	443	443	443	443	443	443	443	443	398	354
Emergency stop torque (permitted 1000 times during the service life of the gearhead)			T_{2Not}	Nm	95	115	115	110	100	115	115	115	115	115	115	115	115	110	100
				in.lb	841	1018	1018	974	885	1018	1018	1018	1018	1018	1018	1018	1018	974	885
Nominal input speed (with T_{2N} and 20°C ambient temperature) [b], [c]			n_{1N}	rpm	2300	2500	2800	2800	2800	3500	3500	3500	3500	3500	3500	3500	3800	4500	4500
Max. continuous speed (with 20?% T_{2N} and 20°C ambient temperature)			n_{1Ncym}	rpm	3000	3500	4000	3500	3500	For higher speeds, please contact us.									
Max. input speed			n_{1Max}	rpm	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000
Mean no load running torque (with n_1 = 3000 rpm and 20°C gearhead temperature) [d]			T_{012}	Nm	2.2	1.9	1.7	2.2	2.0	0.3	0.3	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1
				in.lb	19	17	15	19	18	2.7	2.7	1.8	1.8	1.8	1.8	0.9	0.9	0.9	0.9
Max. torsional backlash			j_t	arcmin	≤ 4														
Torsional rigidity			C_{t21}	Nm/ arcmin	5.3	5.9	6.7	6.6	6.5	5.9	5.9	5.9	5.9	5.9	5.9	5.9	6.7	6.6	6.5
				in.lb/ arcmin	47	52	60	58	57	52	52	52	52	52	52	52	59	58	58
Max. axial force [e]			F_{2AMax}	N	3400														
				lb_f	765														
Max. radial force [e]			F_{2RMax}	N	4000														
				lb_f	900														
Max. tilting moment			M_{2KMax}	Nm	437														
				in.lb	3867														
Efficiency at full load			η	%	96					94									
Service life (For calculation, see the Chapter "Information")			L_h	h	> 20000														
Weight incl. standard adapter plate			*m*	kg	4.8					5.1									
				lb_m	10.6					11.3									
Operating noise (with n_1 = 3000 rpm no load)			L_{PA}	dB(A)	≤ 66														
Max. permitted housing temperature				°C	+90														
				F	194														
Ambient temperature				°C	0 to +40														
				F	32 to 104														
Lubrication					Lubricated for life														
Paint					Blue RAL 5002														
Direction of rotation					Motor and gearhead opposite directions														
Protection class					IP 65														
Moment of inertia (relates to the drive) Clamping hub diameter [mm]	C	14	J_1	kgcm²	–	–	–	–	–	0.28	0.27	0.23	0.23	0.20	0.20	0.18	0.18	0.18	0.18
				10^{-3} in.lb.s²						0.25	0.24	0.21	0.20	0.18	0.18	0.16	0.16	0.16	0.16
	E	19	J_1	kgcm²	1.46	1.19	1.06	0.95	0.90	0.73	0.71	0.68	0.67	0.63	0.62	0.63	0.63	0.63	0.63
				10^{-3} in.lb.s²	1.29	1.05	0.94	0.84	0.79	0.64	0.63	0.60	0.59	0.55	0.55	0.56	0.55	0.55	0.55
	H	28	J_1	kgcm²	2.86	2.60	2.47	2.36	2.31	–	–	–	–	–	–	–	–	–	–
				10^{-3} in.lb.s²	2.53	2.30	2.19	2.09	2.04										

[a] Other ratios available on request
[b] Higher speeds are possible if the nominal torque is reduced
[c] For higher ambient temperatures, please reduce input speed
[d] Idling torques decrease during operation
[e] Refers to center of the output shaft or flange

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

1-stage:



for 4x M6 screws/strength class 12.9

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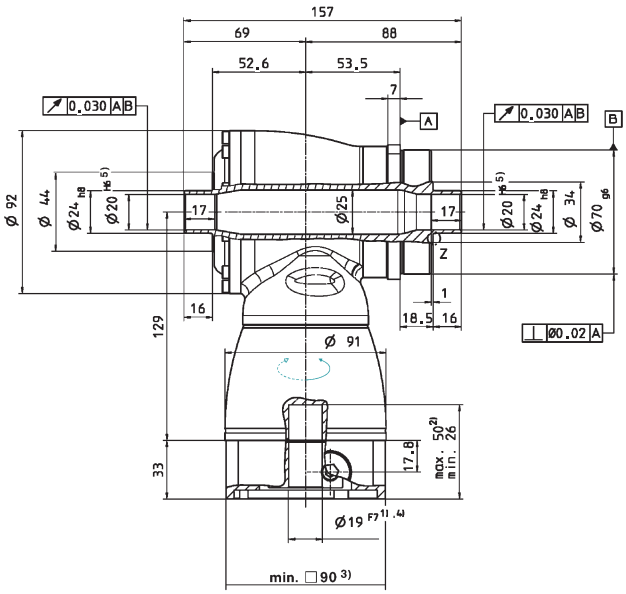

2-stage:

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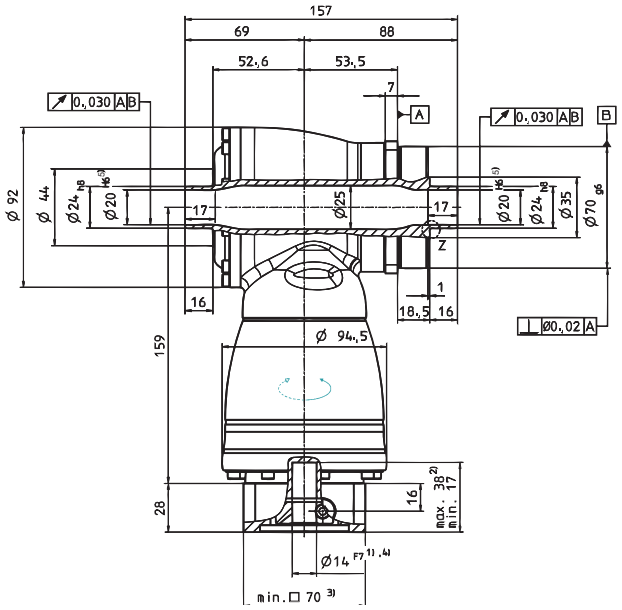
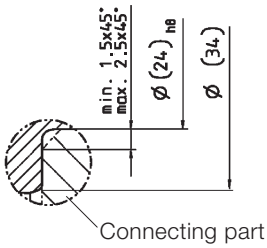
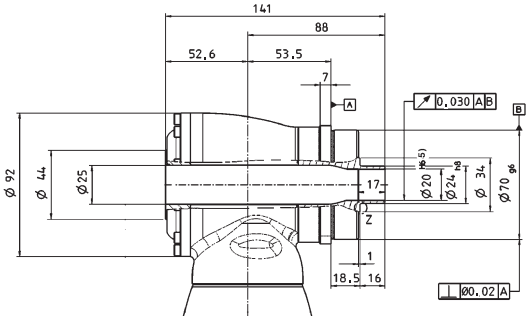


Z: Detail



Alternatives: Single output shaft



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

⚠ Motor mounting according to operating manual

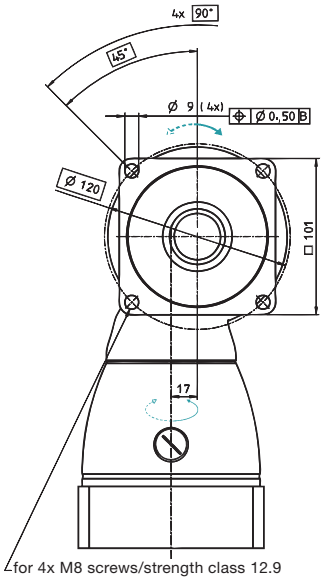
HG+ 100 1/2-stage

					1-stage					2-stage									
Ratio [a]			i		**3**	**4**	**5**	**7**	**10**	**12**	**16**	**20**	**25**	**28**	**35**	**40**	**50**	**70**	**100**
Max. acceleration torque (max. 1000 cycles per hour)			T_{2B}	Nm	170	170	170	145	125	170	170	170	170	170	170	170	170	145	125
				in.lb	1505	1505	1505	1283	1106	1505	1505	1505	1505	1505	1505	1505	1505	1283	1106
Nominal output torque (with n_{1N})			T_{2N}	Nm	100	100	100	90	80	100	100	100	100	100	100	100	100	90	80
				in.lb	885	885	885	797	708	885	885	885	885	885	885	885	885	797	708
Emergency stop torque (permitted 1000 times during the service life of the gearhead)			T_{2Not}	Nm	220	260	260	255	250	260	260	260	260	260	260	260	260	255	250
				in.lb	1947	2301	2301	2257	2213	2301	2301	2301	2301	2301	2301	2301	2301	2257	2213
Nominal input speed (with T_{2N} and 20°C ambient temperature) [b], [c]			n_{1N}	rpm	2200	2400	2700	2500	2500	3100	3100	3100	3100	3100	3100	3100	3500	4200	4200
Max. continuous speed (with 20% T_{2N} and 20°C ambient temperature)			n_{1Ncym}	rpm	3000	3400	3800	3400	3400	For higher speeds, please contact us.									
Max. input speed			n_{1Max}	rpm	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500
Mean no load running torque (with n_1 = 3000 rpm and 20°C gearhead temperature) [d]			T_{012}	Nm	4.2	3.3	2.5	3.9	3.1	0.7	0.7	0.6	0.4	0.4	0.3	0.2	0.2	0.2	0.2
				in.lb	37	29	22	35	27	6.2	6.2	5.3	3.5	3.5	2.7	1.8	1.8	1.8	1.8
Max. torsional backlash			j_t	arcmin	≤ 4														
Torsional rigidity			C_{t21}	Nm/ arcmin	10.7	12.1	14.0	14.2	14.4	12.1	12.1	12.1	12.1	12.1	12.1	12.1	14.0	14.2	14.4
				in.lb/ arcmin	95	107	124	126	127	107	107	107	107	107	107	107	124	126	127
Max. axial force [e]			F_{2AMax}	N	5700														
				lb_f	1283														
Max. radial force [e]			F_{2RMax}	N	6300														
				lb_f	1418														
Max. tilting moment			M_{2KMax}	Nm	833														
				in.lb	7370														
Efficiency at full load			η	%	96					94									
Service life (For calculation, see the Chapter "Information")			L_h	h	> 20000														
Weight incl. standard adapter plate			m	kg	9.3					9.5									
				lb_m	21					21									
Operating noise (with n_1 = 3000 rpm no load)			L_{PA}	dB(A)	≤ 66														
Max. permitted housing temperature				°C	+90														
				F	194														
Ambient temperature				°C	0 to +40														
				F	32 to 104														
Lubrication					Lubricated for life														
Paint					Blue RAL 5002														
Direction of rotation					Motor and gearhead opposite directions														
Protection class					IP 65														
Moment of inertia (relates to the drive) Clamping hub diameter [mm]	E	19	J_1	kgcm²	–	–	–	–	–	1.02	0.97	0.86	0.84	0.75	0.74	0.69	0.69	0.68	0.68
				10^{-3} in.lb.s²						0.91	0.86	0.76	0.74	0.66	0.66	0.61	0.61	0.60	0.60
	G	24	J_1	kgcm²	–	–	–	–	–	2.59	2.54	2.42	2.40	2.31	2.30	2.26	2.25	2.25	2.25
				10^{-3} in.lb.s²						2.29	2.25	2.14	2.13	2.05	2.04	2.00	1.99	1.99	1.99
	H	28	J_1	kgcm²	4.64	3.80	3.34	2.98	2.79	–	–	–	–	–	–	–	–	–	–
				10^{-3} in.lb.s²	4.10	3.36	2.95	2.64	2.47										
	K	38	J_1	kgcm²	11.8	11.0	10.6	10.2	10.0	–	–	–	–	–	–	–	–	–	–
				10^{-3} in.lb.s²	10.4	9.73	9.34	9.04	8.88										

[a] Other ratios available on request
[b] Higher speeds are possible if the nominal torque is reduced
[c] For higher ambient temperatures, please reduce input speed
[d] Idling torques decrease during operation
[e] Refers to center of the output shaft or flange

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

1-stage:



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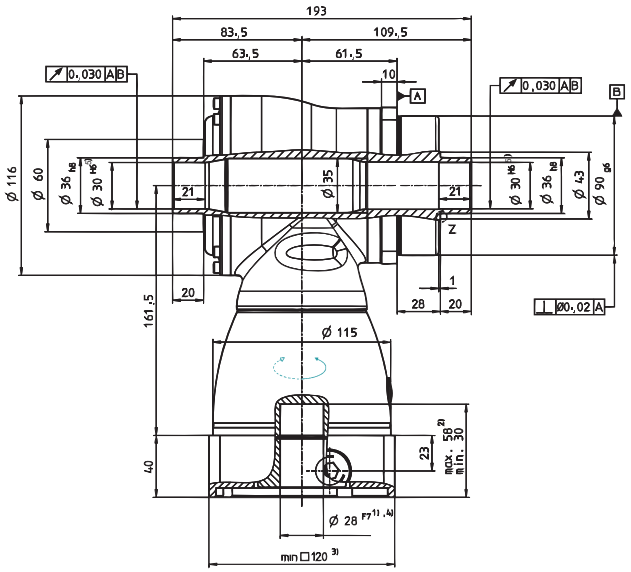

2-stage:

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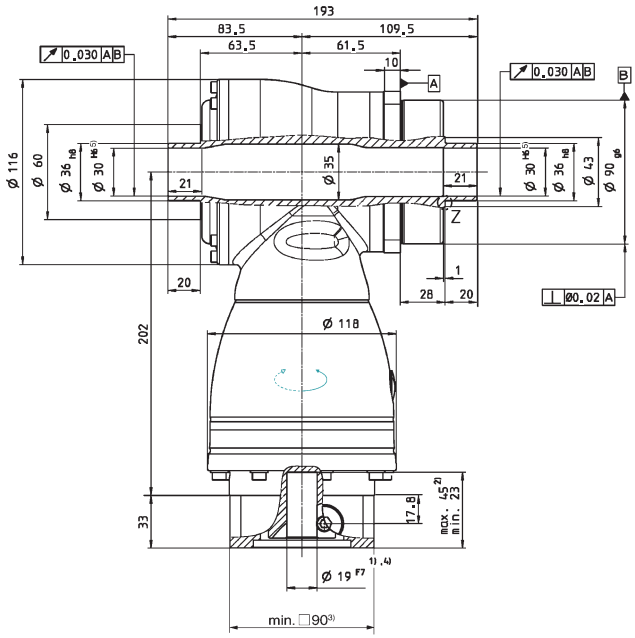
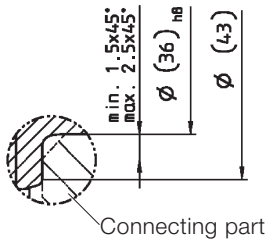
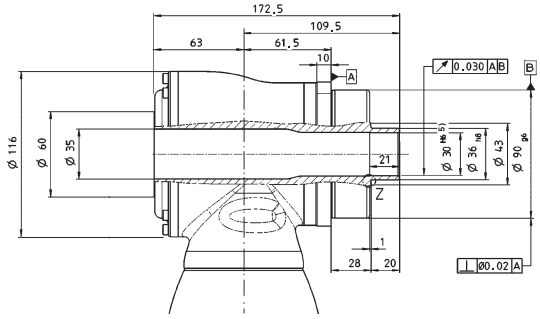


Z: Detail



Alternatives: Single output shaft



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

⚠ Motor mounting according to operating manual

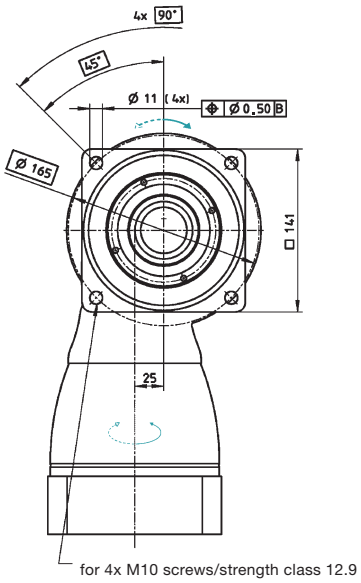
HG+ 140 1/2-stage

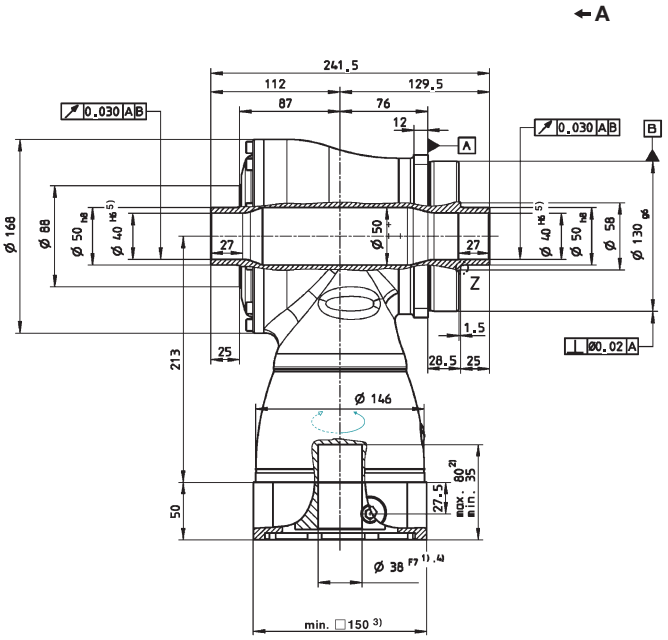
				1-stage					2-stage									
Ratio [a]			*i*	**3**	**4**	**5**	**7**	**10**	**12**	**16**	**20**	**25**	**28**	**35**	**40**	**50**	**70**	**100**
Max. acceleration torque (max. 1000 cycles per hour)			T_{2B} Nm	300	300	300	250	210	300	300	300	300	300	300	300	300	250	210
			in.lb	2655	2655	2655	2213	1859	2655	2655	2655	2655	2655	2655	2655	2655	2213	1859
Nominal output torque (with n_{1N})			T_{2N} Nm	190	190	190	175	160	190	190	190	190	190	190	190	190	175	160
			in.lb	1682	1682	1682	1549	1416	1682	1682	1682	1682	1682	1682	1682	1682	1549	1416
Emergency stop torque (permitted 1000 times during the service life of the gearhead)			T_{2Not} Nm	400	500	500	450	400	500	500	500	500	500	500	500	500	450	400
			in.lb	3540	4425	4425	3983	3540	4425	4425	4425	4425	4425	4425	4425	4425	3983	3540
Nominal input speed (with T_{2N} and 20°C ambient temperature) [b], [c]			n_{1N} rpm	1900	2000	2200	2000	2000	2900	2900	2900	2900	2900	2900	2900	3200	3200	3900
Max. continuous speed (with 20% T_{2N} and 20°C ambient temperature)			n_{1Ncym} rpm	2500	2800	3100	2800	2800	For higher speeds, please contact us.									
Max. input speed			n_{1Max} rpm	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500
Mean no load running torque (with n_1 = 3000 rpm and 20°C gearhead temperature) [d]			T_{012} Nm	7.7	5.7	5.0	8.3	6.1	1.5	1.0	0.8	0.6	0.6	0.4	0.4	0.3	0.3	0.3
			in.lb	68	50	44	73	54	13.3	8.9	7.1	5.3	5.3	3.5	3.5	2.7	2.7	2.7
Max. torsional backlash			j_t arcmin	≤ 4														
Torsional rigidity			C_{t21} Nm/ arcmin	32	36	41	39	38	36	36	36	36	36	36	36	41	39	38
			in.lb/ arcmin	287	321	360	346	337	319	319	319	319	319	319	319	363	345	336
Max. axial force [e]			F_{2AMax} N	9900														
			lb_f	2228														
Max. radial force [e]			F_{2RMax} N	9500														
			lb_f	2138														
Max. tilting moment			M_{2KMax} Nm	1692														
			in.lb	14974														
Efficiency at full load			η %	96					94									
Service life (For calculation, see the Chapter "Information")			L_h h	> 20000														
Weight incl. standardadapter plate			*m* kg	22.6					24									
			lb_m	50					53									
Operating noise (with n_1 = 3000 rpm no load)			L_{PA} dB(A)	≤ 68														
Max. permitted housing temperature			°C	+90														
			F	194														
Ambient temperature			°C	0 to +40														
			F	32 to 104														
Lubrication				Lubricated for life														
Paint				Blue RAL 5002														
Direction of rotation				Motor and gearhead opposite directions														
Protection class				IP 65														
Moment of inertia (relates to the drive)	G	24	J_1 kgcm²	–	–	–	–	–	4.20	3.84	3.27	3.16	2.78	2.73	2.48	2.45	2.43	2.42
			10^{-3} in.lb.s²						3.71	3.40	2.90	2.80	2.46	2.41	2.20	2.17	2.15	2.14
Clamping hub diameter [mm]	K	38	J_1 kgcm²	25.0	19.1	16.3	14.1	12.8	11.1	10.7	10.2	10.1	9.69	9.64	9.39	9.37	9.34	9.33
			10^{-3} in.lb.s²	22.1	16.9	14.4	12.4	11.3	9.83	9.51	9.01	8.92	8.58	8.53	8.31	8.29	8.27	8.26

[a] Other ratios available on request
[b] Higher speeds are possible if the nominal torque is reduced
[c] For higher ambient temperatures, please reduce input speed
[d] Idling torques decrease during operation
[e] Refers to center of the output shaft or flange

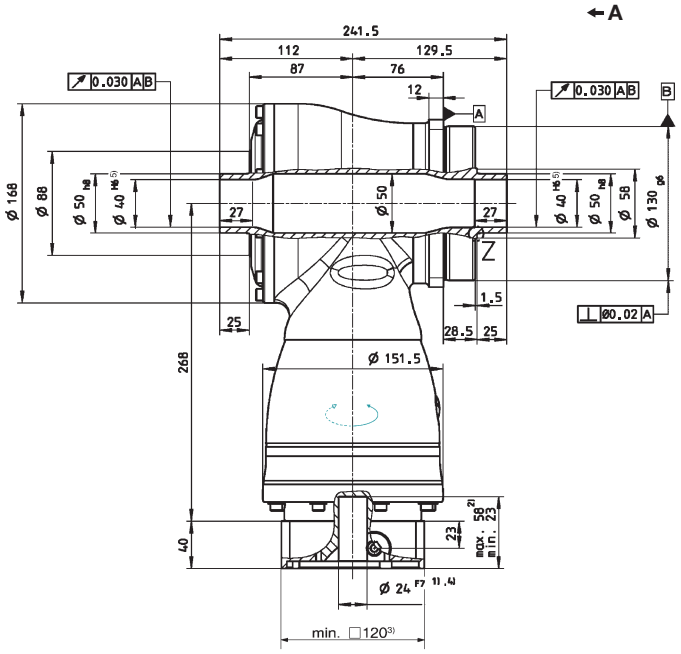
Please contact us for information on the best configuration for S1 conditions of use (continuous operation).

1-stage:

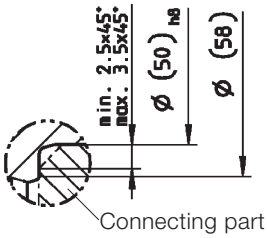




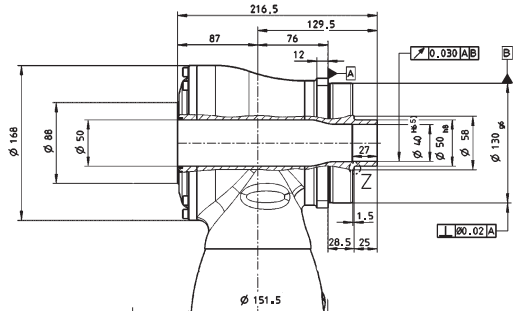
2-stage:



Z: Detail



Alternatives: Single output shaft



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

⚠ Motor mounting according to operating manual

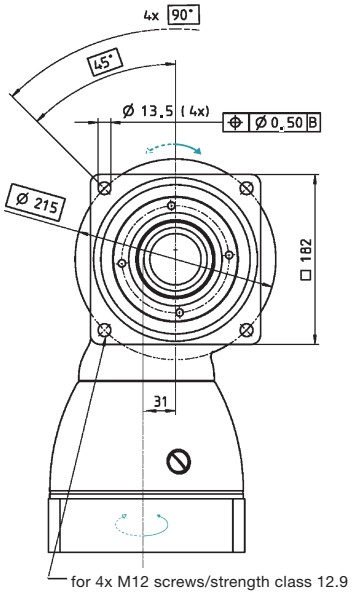
HG+ 180 1/2-stage

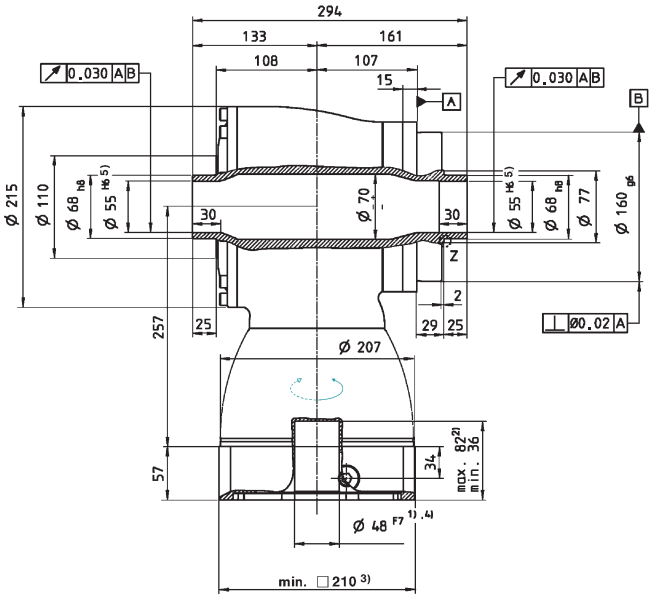
				1-stage					2-stage									
Ratio [a]			*i*	**3**	**4**	**5**	**7**	**10**	**12**	**16**	**20**	**25**	**28**	**35**	**40**	**50**	**70**	**100**
Max. acceleration torque (max. 1000 cycles per hour)			T_{2B} Nm	640	640	640	550	470	640	640	640	640	640	640	640	640	550	470
			T_{2B} in.lb	5664	5664	5664	4868	4160	5664	5664	5664	5664	5664	5664	5664	5664	4868	4160
Nominal output torque (with n_{1N})			T_{2N} Nm	400	400	400	380	360	400	400	400	400	400	400	400	400	380	360
			T_{2N} in.lb	3540	3540	3540	3363	3186	3540	3540	3540	3540	3540	3540	3540	3540	3363	3186
Emergency stop torque (permitted 1000 times during the service life of the gearhead)			T_{2Not} Nm	900	1050	1050	970	900	1050	1050	1050	1050	1050	1050	1050	1050	970	900
			T_{2Not} in.lb	7965	9293	9293	8585	7965	9293	9293	9293	9293	9293	9293	9293	9293	8585	7965
Nominal input speed (with T_{2N} and 20°C ambient temperature) [b], [c]			n_{1N} rpm	1600	1800	2000	1800	1800	2700	2700	2700	2700	2700	2700	2700	2900	3200	3400
Max. continuous speed (with 20% T_{2N} and 20°C ambient temperature)			n_{1Ncym} rpm	2000	2400	2800	2500	2500	For higher speeds, please contact us.									
Max. input speed			n_{1Max} rpm	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000
Mean no load running torque (with n_1 = 3000 rpm and 20°C gearhead temperature) [d]			T_{012} Nm	16.0	13.0	11.0	16.5	14.0	3.3	2.5	2.0	1.8	1.4	1.3	1.0	1.0	1.0	1.0
			T_{012} in.lb	142	115	97	146	124	29.2	22.1	17.7	15.9	12.4	11.5	8.9	8.9	8.9	8.9
Max. torsional backlash			j_t arcmin	≤ 4														
Torsional rigidity			C_{t21} Nm/ arcmin	71	80	91	89	88	80	80	80	80	80	80	80	91	89	88
			C_{t21} in.lb/ arcmin	633	711	803	791	780	708	708	708	708	708	708	708	805	788	779
Max. axial force [e]			F_{2AMax} N	14200														
			F_{2AMax} lb_f	3195														
Max. radial force [e]			F_{2RMax} N	14700														
			F_{2RMax} lb_f	3308														
Max. tilting moment			M_{2KMax} Nm	3213														
			M_{2KMax} in.lb	28435														
Efficiency at full load			η %	96					94									
Service life (For calculation, see the Chapter "Information")			L_h h	> 20000														
Weight incl. standardadapter plate			*m* kg	45.4					47									
			m lb_m	100					104									
Operating noise (with n_1 = 3000 rpm no load)			L_{PA} dB(A)	≤ 68														
Max. permitted housing temperature			°C	+90														
			F	194														
Ambient temperature			°C	0 to +40														
			F	32 to 104														
Lubrication				Lubricated for life														
Paint				Blue RAL 5002														
Direction of rotation				Motor and gearhead opposite directions														
Protection class				IP 65														
Moment of inertia (relates to the drive) Clamping hub diameter [mm]	K	38	J_1 kgcm²	–	–	–	–	–	15.3	13.9	12.3	12.0	10.9	10.7	10.1	10.0	9.95	9.91
			J_1 10^{-3} in.lb.s²						13.5	12.3	10.9	10.6	9.65	9.48	8.96	8.88	8.80	8.77
	M	48	J_1 kgcm²	73.3	51.6	42.1	34.0	29.7	30.0	28.7	27.0	26.7	25.6	25.4	24.8	24.7	24.7	24.6
			J_1 10^{-3} in.lb.s²	64.9	45.6	37.3	30.1	26.3	26.6	25.4	23.9	23.6	22.7	22.5	22.0	21.9	21.8	21.8

[a] Other ratios available on request
[b] Higher speeds are possible if the nominal torque is reduced
[c] For higher ambient temperatures, please reduce input speed
[d] Idling torques decrease during operation
[e] Refers to center of the output shaft or flange

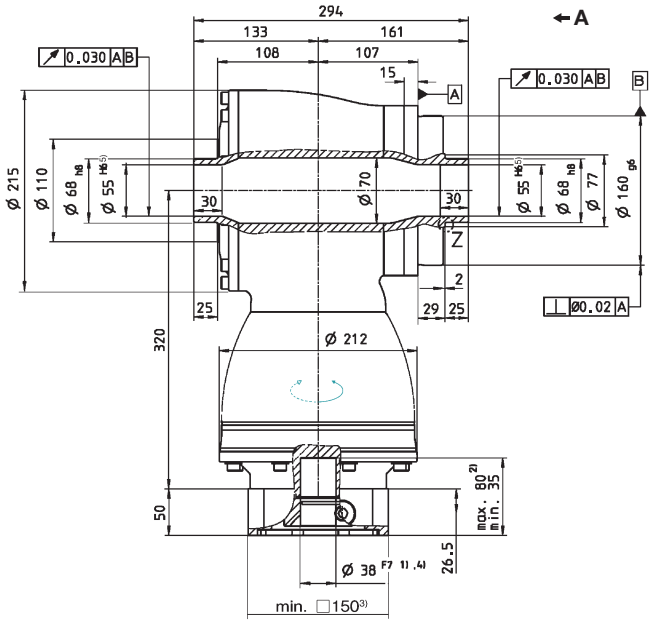
Please contact us for information on the best configuration for S1 conditions of use (continuous operation).

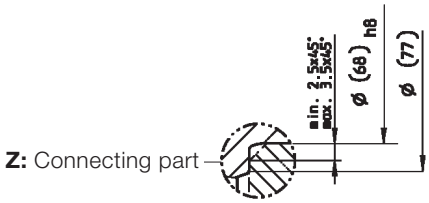
1-stage:



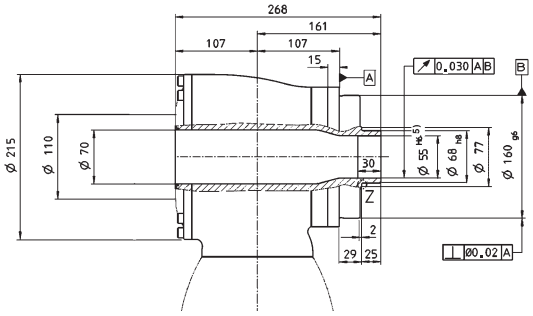


2-stage:





Alternatives: Single output shaft



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

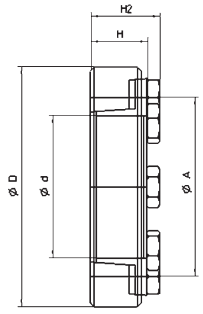
⚠ Motor mounting according to operating manual

HG+ - **machine shaft installation**

A shrink disc is used to fit the mounted shaft to the gearhead. The shrink disc is not included in the HG+ gearhead scope of delivery and must be ordered as an accessory (see table).

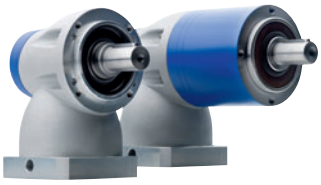
Gearhead type	Shrink disc	d	D	A	H*	H2*	J
HG+ 060	HSD18-22	18	44	30	15	19	0,393
HG+ 075	HSD24-22	24	50	36	18	22	0,753
HG+ 100	HSD36-22	36	72	52	22	27,3	3,94
HG+ 140	HSD50-22	50	90	68	26	31,3	11,1
HG+ 180	HSD68-22	68	115	86	29	35,4	31,1

* in unclamped state



One shrink disc per gearhead is sufficient.
Installing two shrink discs is also possible on applications involving different machine shafts, for example.

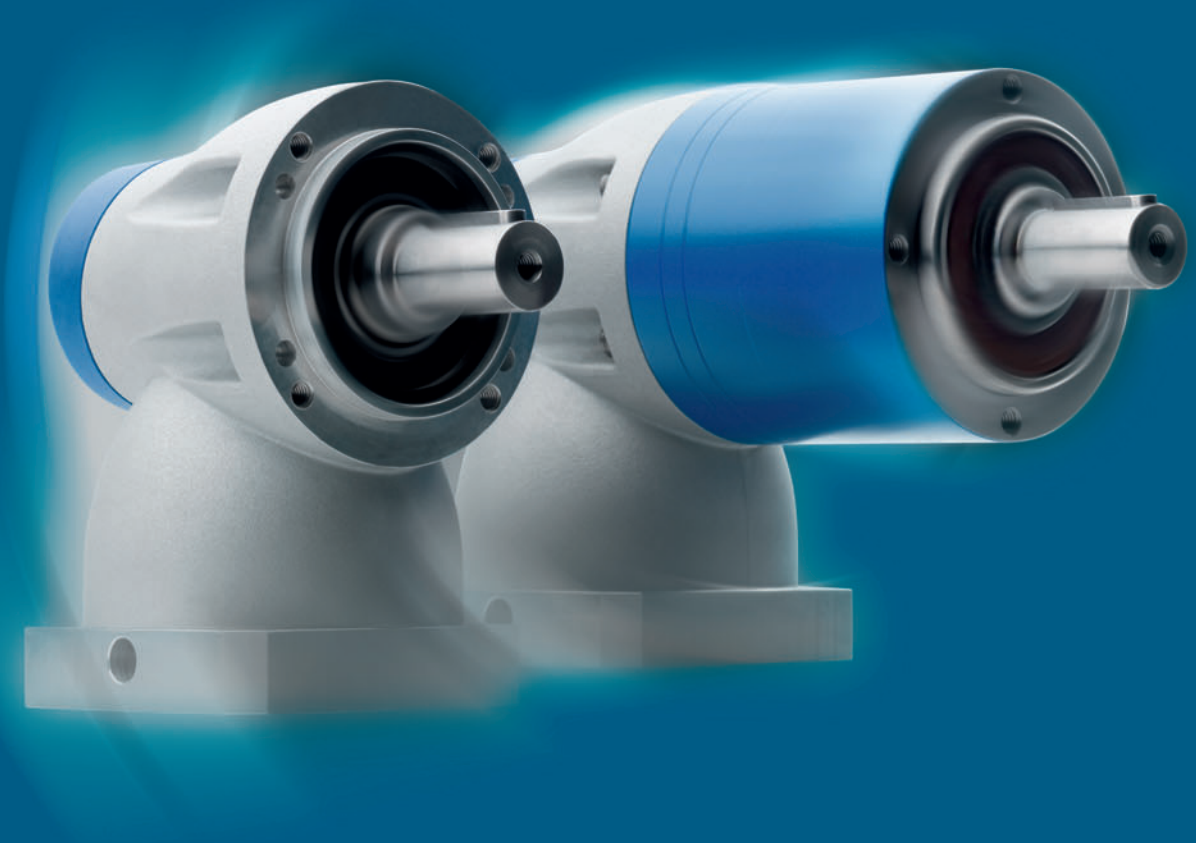
Please refer to the HG+ operating instructions for information on correct shrink disc installation. The instructions are enclosed with the order.



LK+/LPK+ – Economical bevel gears with optional planetary stage

LK+/LPK+

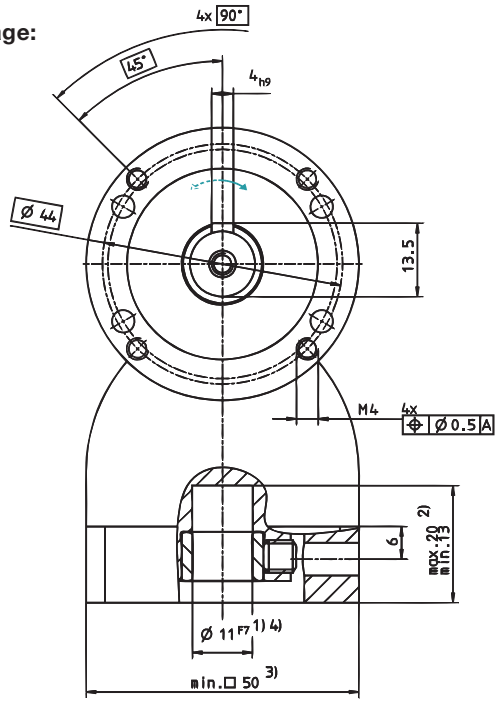
Details

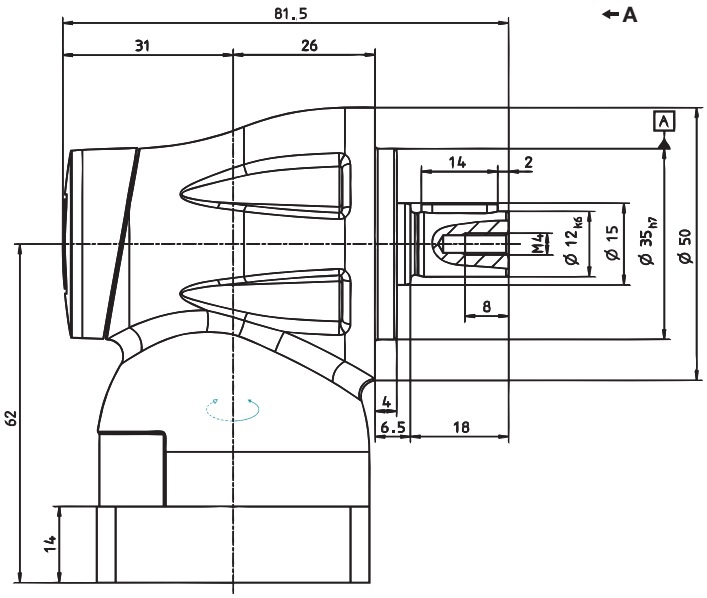


			1-stage
Ratio	***i***		**1**
Max. acceleration torque (max. 1000 cycles per hour)	T_{2B}	Nm	2.5
		in.lb	22
Nominal output torque (with n_{1N})	T_{2N}	Nm	1.2
		in.lb	11
Emergency stop torque (permitted 1000 times during the service life of the gearhead)	T_{2Not}	Nm	5
		in.lb	44
Nominal input speed (with T_{2N} and 20°C ambient temperature) [a]	n_{1N}	rpm	3200
Max. input speed	n_{1Max}	rpm	5000
Mean no load running torque (with n_1 = 3000 rpm and 20°C gearhead temperature)	T_{012}	Nm	–
		in.lb	
Max. torsional backlash	j_t	arcmin	≤ 15
Torsional rigidity	C_{t21}	Nm/ arcmin	–
		in.lb/ arcmin	
Max. axial force [b]	F_{2AMax}	N	100
		lb_f	23
Max. radial force [b]	F_{2RMax}	N	650
		lb_f	146
Efficiency at full load	η	%	95
Service life (For calculation, see the Chapter “Information”)	L_h	h	> 20000
Weight incl. standard adapter plate	*m*	kg	0.7
		lb_m	1.5
Operating noise (with n_1 = 3000 rpm no load)	L_{PA}	dB(A)	–
Max. permitted housing temperature		°C	+90
		F	194
Ambient temperature		°C	0 to +40
		F	32 to 104
Lubrication			Lubricated for life
Paint			without
Direction of rotation			Motor and gearhead same direction
Protection class			IP 64
Moment of inertia (relates to the drive)	J_1	$kgcm^2$	0.14
		10^{-3} in.lb.s²	0.12

[a] For higher ambient temperatures, please reduce input speed
[b] Refers to center of the output shaft, if n_2 = 1000 rpm

1-stage:





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Non-tolerated dimensions ±1 mm

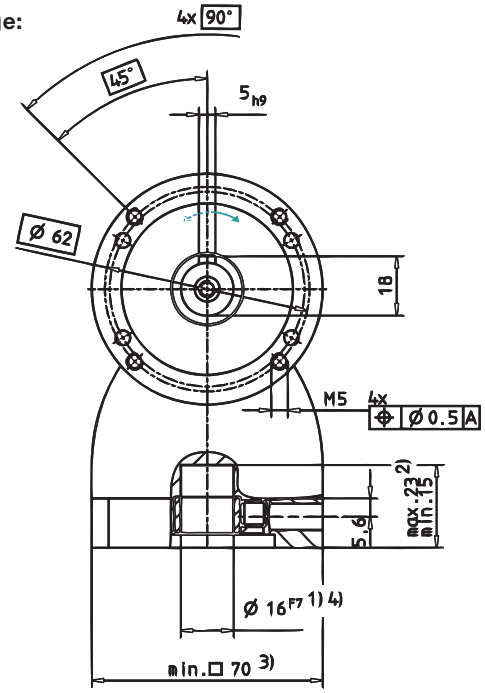
1) Check motor shaft fit.
2) Min./Max. permissible motor shaft length. Longer motor shafts are adaptable, please contact us.
3) The dimensions depend on the motor.
4) Smaller motor shaft diameter is compensated by a bushing.

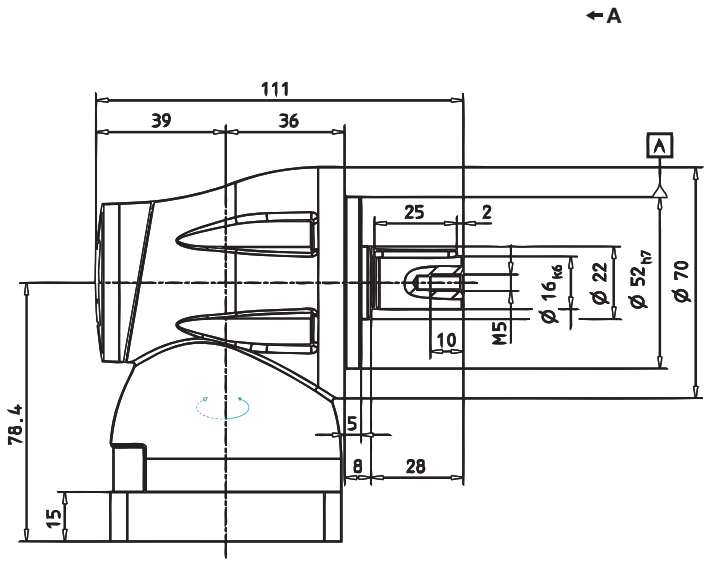
⚠ Motor mounting according to operating manual

			1-stage
Ratio	***i***		**1**
Max. acceleration torque (max. 1000 cycles per hour)	T_{2B}	Nm	7
		in.lb	62
Nominal output torque (with n_{1N})	T_{2N}	Nm	3.7
		in.lb	33
Emergencye stop torque (permitted 1000 times during the service life of the gearhead)	T_{2Not}	Nm	15
		in.lb	133
Nominal input speed (with T_{2N} and 20°C ambient temperature) [a]	n_{1N}	rpm	3000
Max. input speed	n_{1Max}	rpm	4500
Mean no load running torque (with n_1 = 3000 rpm and 20°C gearhead temperature)	T_{012}	Nm	0.3
		in.lb	2.7
Max. torsional backlash	j_t	arcmin	≤ 15
Torsional rigidity	C_{t21}	Nm/ arcmin	–
		in.lb/ arcmin	
Max. axial force [b]	F_{2AMax}	N	200
		lb_f	45
Max. radial force [b]	F_{2RMax}	N	1450
		lb_f	326
Efficiency at full load	η	%	95
Service life (For calculation, see the Chapter “Information”)	L_h	h	> 20000
Weight incl. standard adapter plate	m	kg	1.9
		lb_m	4.2
Operating noise (with n_1 = 3000 rpm no load)	L_{PA}	dB(A)	–
Max. permitted housing temperature		°C	+90
		F	194
Ambient temperature		°C	0 to +40
		F	32 to 104
Lubrication			Lubricated for life
Paint			without
Direction of rotation			Motor and gearhead same direction
Protection class			IP 64
Moment of inertia (relates to the drive)	J_1	$kgcm^2$	0.73
		10^{-3} in.lb.s²	0.65

[a] For higher ambient temperatures, please reduce input speed
[b] Refers to center of the output shaft, if n_2 = 1000 rpm

1-stage:





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Non-tolerated dimensions ±1 mm

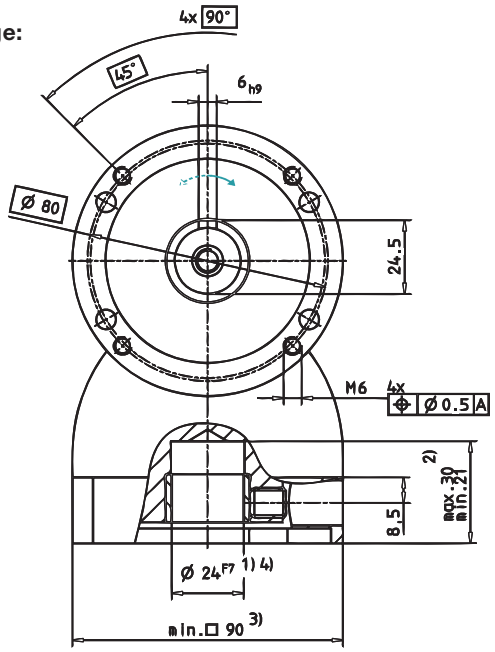
1) Check motor shaft fit.
2) Min./Max. permissible motor shaft length. Longer motor shafts are adaptable, please contact us.
3) The dimensions depend on the motor.
4) Smaller motor shaft diameter is compensated by a bushing.

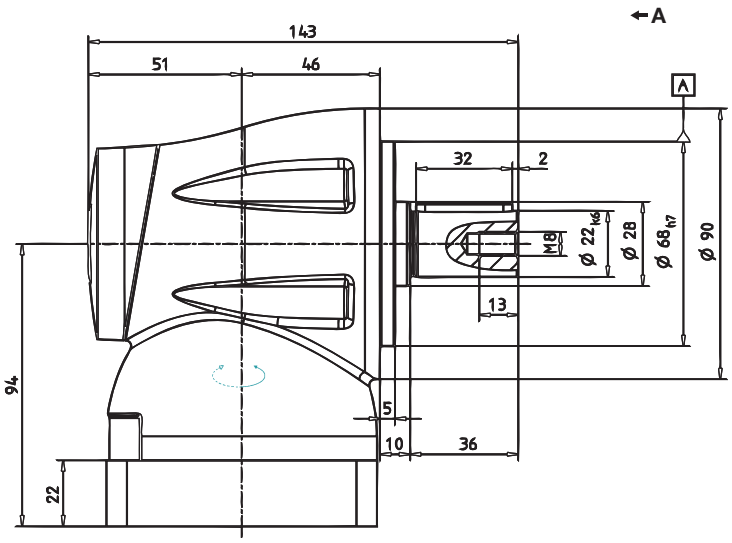
⚠ Motor mounting according to operating manual

			1-stage
Ratio	i		**1**
Max. acceleration torque (max. 1000 cycles per hour)	T_{2B}	Nm	19
		in.lb	168
Nominal output torque (with n_{1N})	T_{2N}	Nm	9.3
		in.lb	82
Emergencye stop torque (permitted 1000 times during the service life of the gearhead)	T_{2Not}	Nm	37
		in.lb	327
Nominal input speed (with T_{2N} and 20°C ambient temperature) [a]	n_{1N}	rpm	2700
Max. input speed	n_{1Max}	rpm	4000
Mean no load running torque (with n_1 = 3000 rpm and 20°C gearhead temperature)	T_{012}	Nm	0.9
		in.lb	8.0
Max. torsional backlash	j_t	arcmin	≤ 15
Torsional rigidity	C_{t21}	Nm/ arcmin	1.26
		in.lb/ arcmin	11.2
Max. axial force [b]	F_{2AMax}	N	450
		lb_f	101
Max. radial force [b]	F_{2RMax}	N	2400
		lb_f	540
Efficiency at full load	η	%	95
Service life (For calculation, see the Chapter “Information”)	L_h	h	> 20000
Weight incl. standard adapter plate	m	kg	3.2
		lb_m	7.1
Operating noise (with n_1 = 3000 rpm no load)	L_{PA}	dB(A)	–
Max. permitted housing temperature		°C	+90
		F	194
Ambient temperature		°C	0 to +40
		F	32 to 104
Lubrication			Lubricated for life
Paint			without
Direction of rotation			Motor and gearhead same direction
Protection class			IP 64
Moment of inertia (relates to the drive)	J_1	$kgcm^2$	3.3
		10^{-3} in.lb.s²	2.9

[a] For higher ambient temperatures, please reduce input speed
[b] Refers to center of the output shaft, if n_2 = 1000 rpm

1-stage:





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Non-tolerated dimensions ±1 mm

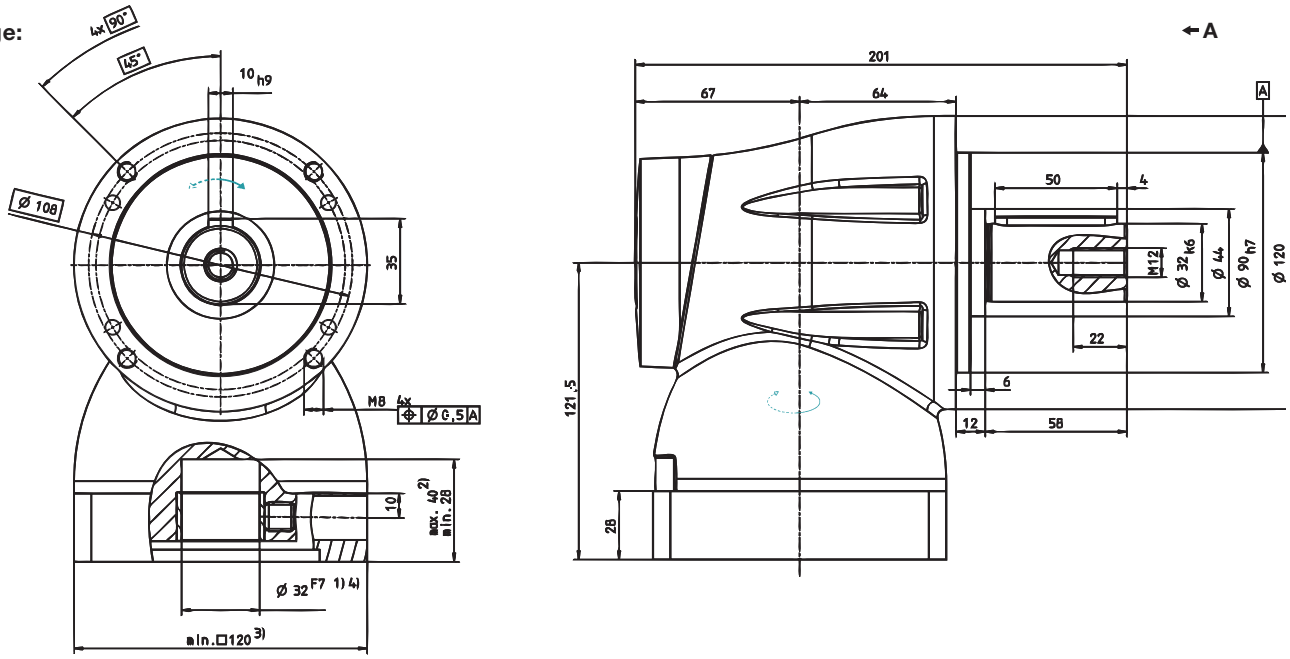
1) Check motor shaft fit.
2) Min./Max. permissible motor shaft length. Longer motor shafts are adaptable, please contact us.
3) The dimensions depend on the motor.
4) Smaller motor shaft diameter is compensated by a bushing.

⚠ Motor mounting according to operating manual

			1-stage
Ratio	***i***		**1**
Max. acceleration torque (max. 1000 cycles per hour)	T_{2B}	Nm	45
		in.lb	398
Nominal output torque (with n_{1N})	T_{2N}	Nm	23
		in.lb	204
Emergency stop torque (permitted 1000 times during the service life of the gearhead)	T_{2Not}	Nm	93
		in.lb	823
Nominal input speed (with T_{2N} and 20°C ambient temperature) [a]	n_{1N}	rpm	2100
Max. input speed	n_{1Max}	rpm	3500
Mean no load running torque (with n_1 = 3000 rpm and 20°C gearhead temperature)	T_{012}	Nm	2.3
		in.lb	20.4
Max. torsional backlash	j_t	arcmin	≤ 15
Torsional rigidity	C_{t21}	Nm/ arcmin	–
		in.lb/ arcmin	
Max. axial force [b]	F_{2AMax}	N	750
		lb_f	169
Max. radial force [b]	F_{2RMax}	N	4600
		lb_f	1035
Efficiency at full load	η	%	95
Service life (For calculation, see the Chapter “Information”)	L_h	h	> 20000
Weight incl. standard adapter plate	m	kg	8.9
		lb_m	19.7
Operating noise (with n_1 = 3000 rpm no load)	L_{PA}	dB(A)	–
Max. permitted housing temperature		°C	+90
		F	194
Ambient temperature		°C	0 to +40
		F	32 to 104
Lubrication			Lubricated for life
Paint			without
Direction of rotation			Motor and gearhead same direction
Protection class			IP 64
Moment of inertia (relates to the drive)	J_1	$kgcm^2$	13.9
		10^{-3} in.lb.s²	12.3

[a] For higher ambient temperatures, please reduce input speed
[b] Refers to center of the output shaft, if n_2 = 1000 rpm

1-stage:



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Non-tolerated dimensions ±1 mm

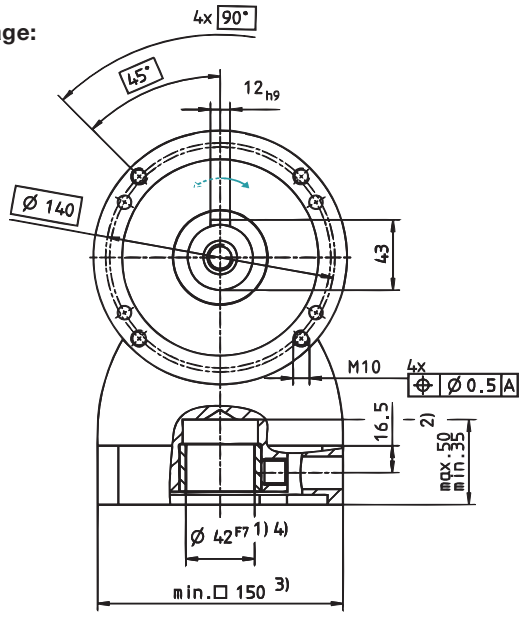
1) Check motor shaft fit.
2) Min./Max. permissible motor shaft length. Longer motor shafts are adaptable, please contact us.
3) The dimensions depend on the motor.
4) Smaller motor shaft diameter is compensated by a bushing.

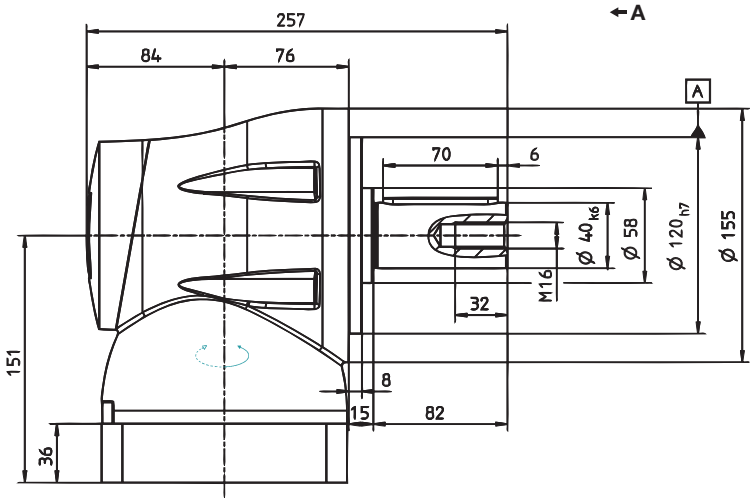
⚠ Motor mounting according to operating manual

			1-stage
Ratio	***i***		**1**
Max. acceleration torque (max. 1000 cycles per hour)	T_{2B}	Nm	93
		in.lb	823
Nominal output torque (with n_{1N})	T_{2N}	Nm	66
		in.lb	584
Emergency stop torque (permitted 1000 times during the service life of the gearhead)	T_{2Not}	Nm	194
		in.lb	1717
Nominal input speed (with T_{2N} and 20°C ambient temperature) [a]	n_{1N}	rpm	1600
Max. input speed	n_{1Max}	rpm	3000
Mean no load running torque (with n_1 = 3000 rpm and 20°C gearhead temperature)	T_{012}	Nm	–
		in.lb	
Max. torsional backlash	j_t	arcmin	≤ 15
Torsional rigidity	C_{t21}	Nm/ arcmin	–
		in.lb/ arcmin	
Max. axial force [b]	F_{2AMax}	N	1000
		lb_f	225
Max. radial force [b]	F_{2RMax}	N	7500
		lb_f	1688
Efficiency at full load	η	%	95
Service life (For calculation, see the Chapter “Information”)	L_h	h	> 20000
Weight incl. standard adapter plate	m	kg	18.9
		lb_m	42
Operating noise (with n_1 = 3000 rpm no load)	L_{PA}	dB(A)	–
Max. permitted housing temperature		°C	+90
		F	194
Ambient temperature		°C	0 to +40
		F	32 to 104
Lubrication			Lubricated for life
Paint			without
Direction of rotation			Motor and gearhead same direction
Protection class			IP 64
Moment of inertia (relates to the drive)	J_1	$kgcm^2$	57.1
		10^{-3} in.lb.s²	50.5

[a] For higher ambient temperatures, please reduce input speed
[b] Refers to center of the output shaft, if n_2 = 1000 rpm

1-stage:





The through bore holes are not intended for attaching components to the machine. Please contact us if you have any questions.

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.

⚠ Motor mounting according to operating manual

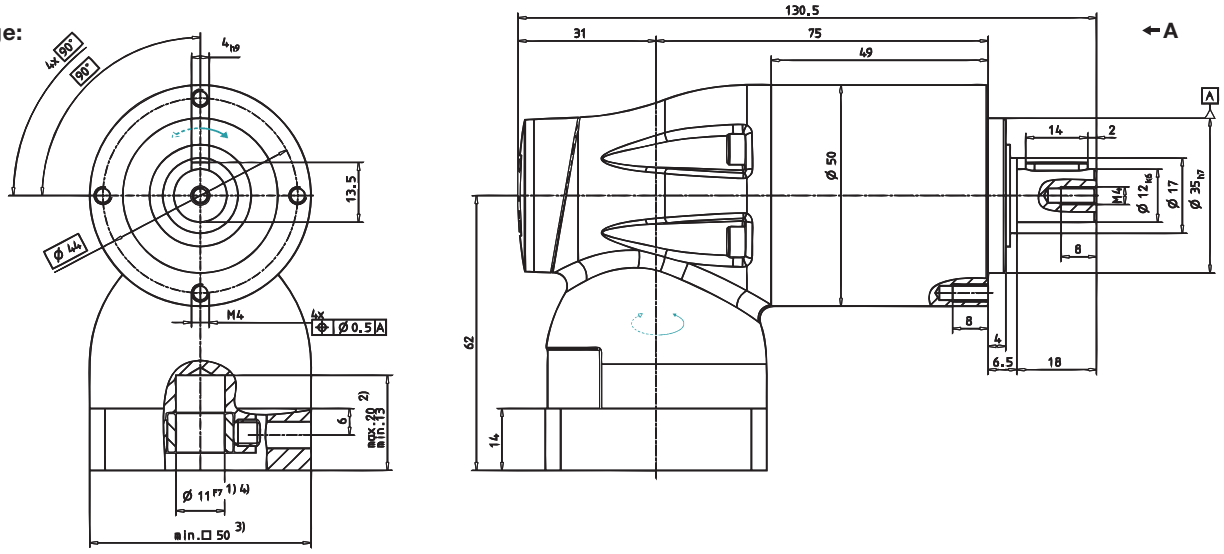
LPK+ 050 2/3-stage

			2-stage		3-stage		
Ratio	***i***		**5**	**10**	**25**	**50**	**100**
Max. acceleration torque (max. 1000 cycles per hour)	T_{2B}	Nm	12	11	12	12	11
		in.lb	106	97	106	106	97
Nominal output torque (with n_{1N})	T_{2N}	Nm	5.7	5.2	5.7	5.7	5.2
		in.lb	50	46	50	50	46
Emergency stop torque (permitted 1000 times during the service life of the gearhead)	T_{2Not}	Nm	26	26	26	26	26
		in.lb	230	230	230	230	230
Nominal input speed (with T_{2N} and 20°C ambient temperature) [a]	n_{1N}	rpm	3200	3200	3200	3200	3200
Max. input speed	n_{1Max}	rpm	5000	5000	5000	5000	5000
Mean no load running torque (with n_1 = 3000 rpm and 20°C gearhead temperature)	T_{012}	Nm	–	–	–	–	–
		in.lb					
Max. torsional backlash	j_t	arcmin	≤ 13		≤ 15		
Torsional rigidity	C_{t21}	Nm/ arcmin	1.9		–		
		in.lb/ arcmin	16.8				
Max. axial force [b]	F_{2AMax}	N	700		700		
		lb_f	158		158		
Max. radial force [b]	F_{2RMax}	N	650		650		
		lb_f	146		146		
Efficiency at full load	η	%	92		90		
Service life (For calculation, see the Chapter “Information”)	L_h	h	> 20000		> 20000		
Weight incl. standard adapter plate	m	kg	1.4		1.6		
		lb_m	3.1		3.5		
Operating noise (with n_1 = 3000 rpm no load)	L_{PA}	dB(A)	–				
Max. permitted housing temperature		°C	+90				
		F	194				
Ambient temperature		°C	0 to +40				
		F	32 to 104				
Lubrication			Lubricated for life				
Paint			Blue RAL 5002				
Direction of rotation			Motor and gearhead same direction				
Protection class			IP 64				
Moment of inertia (relates to the drive)	J_1	$kgcm^2$	0.156	0.156	0.156	0.156	0.156
		10^{-3} in.lb.s²	0.138	0.138	0.138	0.138	0.138

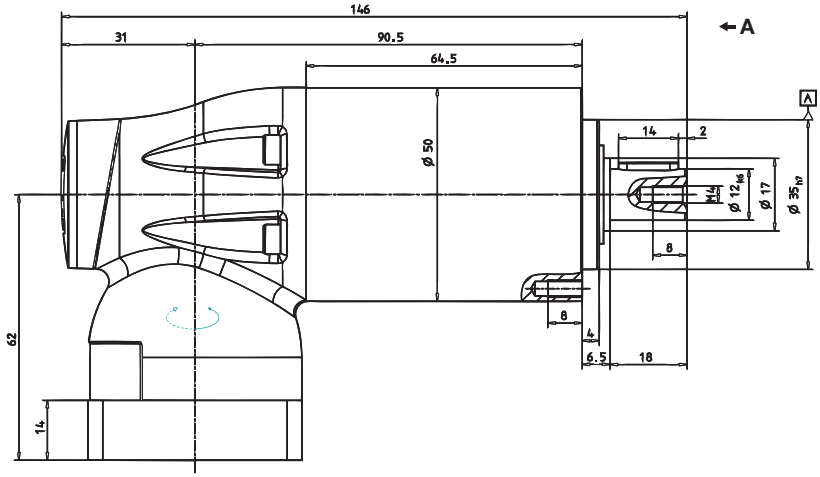
[a] For higher ambient temperatures, please reduce input speed

[b] Refers to center of the output shaft, if n_2 = 100 rpm

2-stage:



3-stage:



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.

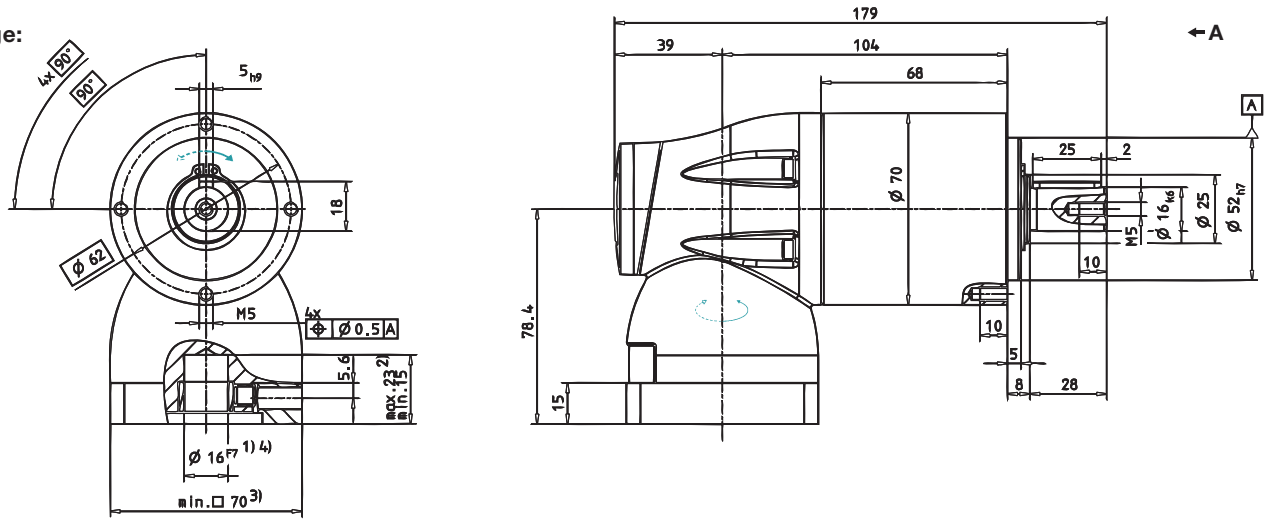
⚠ Motor mounting according to operating manual

LPK+ 070 2/3-stage

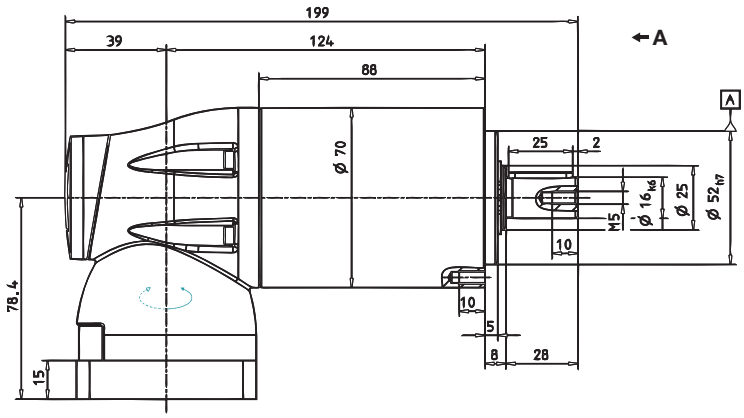
			2-stage					3-stage						
Ratio	***i***		**3**	**4**	**5**	**7**	**10**	**15**	**16**	**25**	**30**	**50**	**70**	**100**
Max. acceleration torque (max. 1000 cycles per hour)	T_{2B}	Nm	22	29	35	35	32	32	35	35	32	35	35	32
		in.lb	195	257	310	310	283	283	310	310	283	310	310	283
Nominal output torque (with n_{1N})	T_{2N}	Nm	11	15	18	18	16.5	16.5	18	18	16.5	18	18	16.5
		in.lb	97	133	159	159	146	146	159	159	146	159	159	146
Emergency stop torque (permitted 1000 times during the service life of the gearhead)	T_{2Not}	Nm	45	60	75	75	75	75	75	75	75	75	75	75
		in.lb	398	531	664	664	664	664	664	664	664	664	664	664
Nominal input speed (with T_{2N} and 20°C ambient temperature) [b]	n_{1N}	rpm	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000
Max. input speed	n_{1Max}	rpm	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500
Mean no load running torque (with n_1 = 3000 rpm and 20°C gearhead temperature)	T_{012}	Nm	0.6	0.55	0.5	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.4
		in.lb	5.3	4.9	4.4	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.5
Max. torsional backlash	j_t	arcmin	≤ 11					≤ 13						
Torsional rigidity	C_{t21}	Nm/ arcmin	–					–						
		in.lb/ arcmin												
Max. axial force [c]	F_{2AMax}	N	1550					1550						
		lb_f	349					349						
Max. radial force [c]	F_{2RMax}	N	1450					1450						
		lb_f	326					326						
Efficiency at full load	η	%	92					90						
Service life (For calculation, see the Chapter "Information")	L_h	h	> 20000					> 20000						
Weight incl. standardadapter plate	*m*	kg	3.8					4.2						
		lb_m	8.4					9.3						
Operating noise (with n_1 = 3000 rpm no load)	L_{PA}	dB(A)	–											
Max. permitted housing temperature		°C	+90											
		F	194											
Ambient temperature		°C	0 to +40											
		F	32 to 104											
Lubrication			Lubricated for life											
Paint			Blue RAL 5002											
Direction of rotation			Motor and gearhead same direction											
Protection class			IP 64											
Moment of inertia (relates to the drive)	J_1	$kgcm^2$	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
		10^{-3} in.lb.s²	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75

[a] For higher ambient temperatures, please reduce input speed
[b] Refers to center of the output shaft, if n_2 = 100 rpm

2-stage:



3-stage:



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.

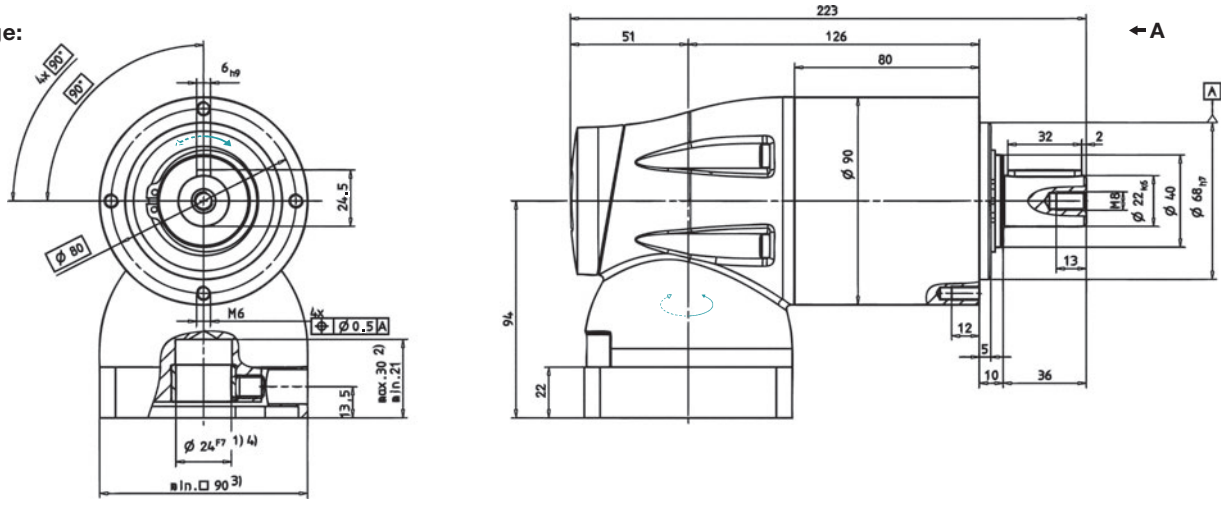
⚠ Motor mounting according to operating manual

LPK+ 090 2/3-stage

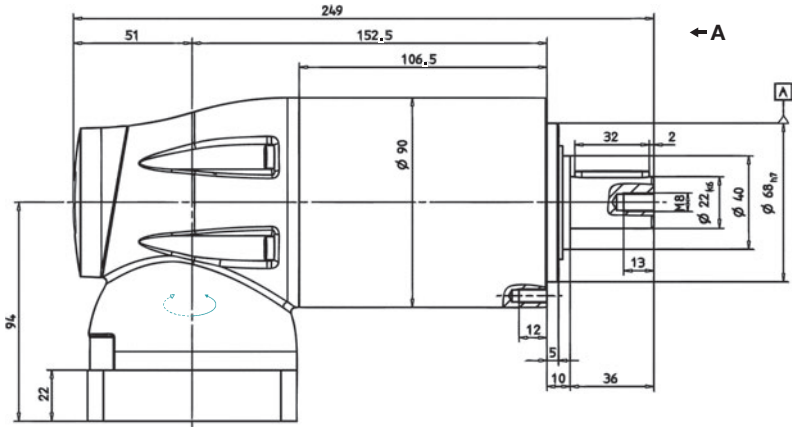
			2-stage					3-stage						
Ratio	***i***		**3**	**4**	**5**	**7**	**10**	**15**	**16**	**25**	**30**	**50**	**70**	**100**
Max. acceleration torque (max. 1000 cycles per hour)	T_{2B}	Nm	56	74	90	90	80	80	90	90	80	90	90	80
		in.lb	496	655	797	797	708	708	797	797	708	797	797	708
Nominal output torque (with n_{1N})	T_{2N}	Nm	28	37	45	45	40	40	45	45	40	45	45	40
		in.lb	248	327	398	398	354	354	398	398	354	398	398	354
Emergency stop torque (permitted 1000 times during the service life of the gearhead)	T_{2Not}	Nm	110	150	190	190	190	190	190	190	190	190	190	190
		in.lb	974	1328	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682
Nominal input speed (with T_{2N} and 20°C ambient temperature) [b]	n_{1N}	rpm	2700	2700	2700	2700	2700	2700	2700	2700	2700	2700	2700	2700
Max. input speed	n_{1Max}	rpm	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000
Mean no load running torque (with n_1 = 3000 rpm and 20°C gearhead temperature)	T_{012}	Nm	1.3	1.3	1.2	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.0
		in.lb	12	11	11	10	10	10	10	10	10	10	10	9
Max. torsional backlash	j_t	arcmin	≤ 11					≤ 13						
Torsional rigidity	C_{t21}	Nm/ arcmin	8.5	9.5	9.5	9.5	8.5	8.5	9.5	9.5	8.5	9.5	9.5	8.5
		in.lb/ arcmin	75	84	84	84	75	75	84	84	75	84	84	75
Max. axial force [c]	F_{2AMax}	N	1900					1900						
		lb_f	428					428						
Max. radial force [c]	F_{2RMax}	N	2400					2400						
		lb_f	540					540						
Efficiency at full load	η	%	92					90						
Service life (For calculation, see the Chapter "Information")	L_h	h	> 20000					> 20000						
Weight incl. standard adapter plate	*m*	kg	6.9					7.9						
		lb_m	15.2					17.5						
Operating noise (with n_1 = 3000 rpm no load)	L_{PA}	dB(A)	–											
Max. permitted housing temperature		°C	+90											
		F	194											
Ambient temperature		°C	0 to +40											
		F	32 to 104											
Lubrication			Lubricated for life											
Paint			Blue RAL 5002											
Direction of rotation			Motor and gearhead same direction											
Protection class			IP 64											
Moment of inertia (relates to the drive)	J_1	kgcm²	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1
		10^{-3} in.lb.s²	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6

[a] For higher ambient temperatures, please reduce input speed
[b] Refers to center of the output shaft, if n_2 = 100 rpm

2-stage:



3-stage:



Non-tolerated dimensions ±1 mm

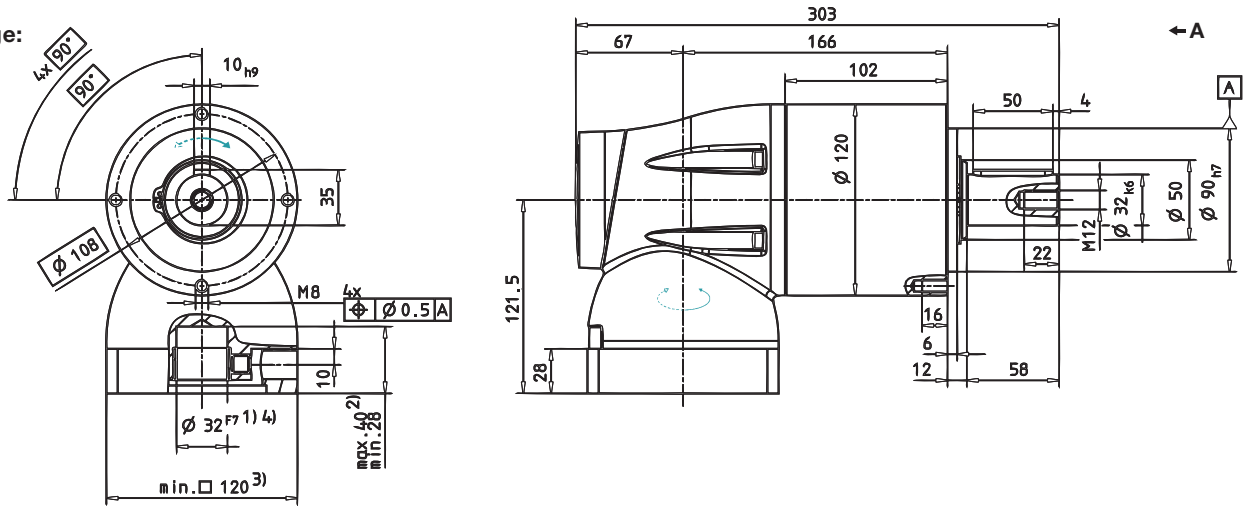
1) Check motor shaft fit.
2) Min./Max. permissible motor shaft length. Longer motor shafts are adaptable, please contact us.
3) The dimensions depend on the motor.
4) Smaller motor shaft diameter is compensated by a bushing.

⚠ Motor mounting according to operating manual

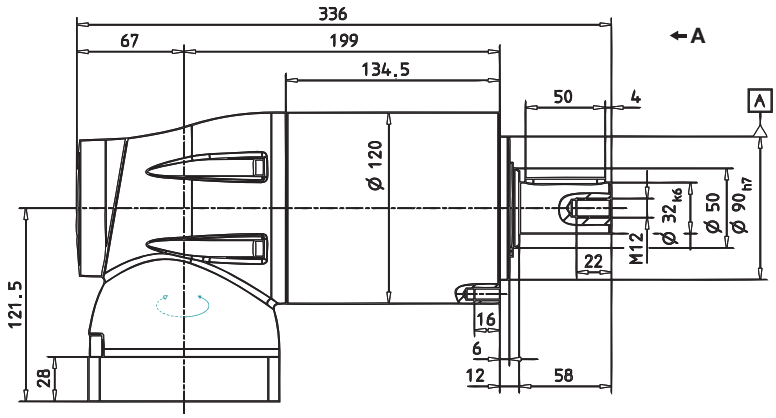
			2-stage					3-stage						
Ratio	***i***		**3**	**4**	**5**	**7**	**10**	**15**	**16**	**25**	**30**	**50**	**70**	**100**
Max. acceleration torque (max. 1000 cycles per hour)	T_{2B}	Nm	136	181	220	220	200	200	220	220	200	220	220	200
		in.lb	1204	1602	1947	1947	1770	1770	1947	1947	1770	1947	1947	1770
Nominal output torque (with n_{1N})	T_{2N}	Nm	68	91	110	110	100	100	110	110	100	110	110	100
		in.lb	602	805	974	974	885	885	974	974	885	974	974	885
Emergency stop torque (permitted 1000 times during the service life of the gearhead)	T_{2Not}	Nm	280	380	480	480	480	480	480	480	480	480	480	480
		in.lb	2478	3363	4248	4248	4248	4248	4248	4248	4248	4248	4248	4248
Nominal input speed (with T_{2N} and 20°C ambient temperature) [b]	n_{1N}	rpm	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Max. input speed	n_{1Max}	rpm	3500	3500	3500	3500	3500	3500	3500	3500	3500	3500	3500	3500
Mean no load running torque (with n_1 = 3000 rpm and 20°C gearhead temperature)	T_{012}	Nm	3.5	3.3	3.2	3.1	3.1	2.9	2.9	2.8	2.7	2.7	2.7	2.7
		in.lb	31	29	28	27	27	26	26	25	24	24	24	24
Max. torsional backlash	j_t	arcmin	≤ 11					≤ 13						
Torsional rigidity	C_{t21}	Nm/ arcmin	21.7					–						
		in.lb/ arcmin	192.0											
Max. axial force [c]	F_{2AMax}	N	4000					4000						
		lb_f	900					900						
Max. radial force [c]	F_{2RMax}	N	4600					4600						
		lb_f	1035					1035						
Efficiency at full load	η	%	92					90						
Service life (For calculation, see the Chapter "Information")	L_h	h	> 20000					> 20000						
Weight incl. standard adapter plate	*m*	kg	16.8					19.2						
		lb_m	37.1					42.4						
Operating noise (with n_1 = 3000 rpm no load)	L_{PA}	dB(A)	–											
Max. permitted housing temperature		°C	+90											
		F	194											
Ambient temperature		°C	0 to +40											
		F	32 to 104											
Lubrication			Lubricated for life											
Paint			Blue RAL 5002											
Direction of rotation			Motor and gearhead same direction											
Protection class			IP 64											
Moment of inertia (relates to the drive)	J_1	$kgcm^2$	16.6	16.6	16.6	16.6	16.6	16.7	16.7	16.7	16.7	16.7	16.7	16.7
		10^{-3} in.lb.s²	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7

[a] For higher ambient temperatures, please reduce input speed
[b] Refers to center of the output shaft, if n_2 = 100 rpm

2-stage:



3-stage:



Non-tolerated dimensions ±1 mm

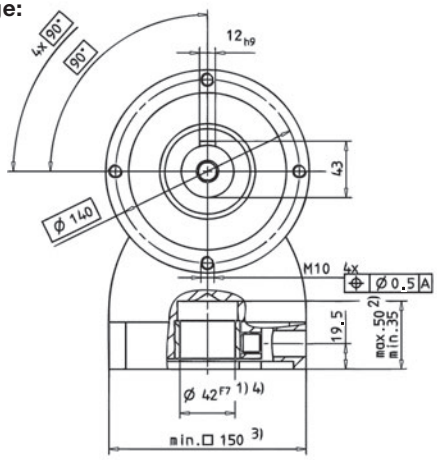
1) Check motor shaft fit.
2) Min./Max. permissible motor shaft length. Longer motor shafts are adaptable, please contact us.
3) The dimensions depend on the motor.
4) Smaller motor shaft diameter is compensated by a bushing.

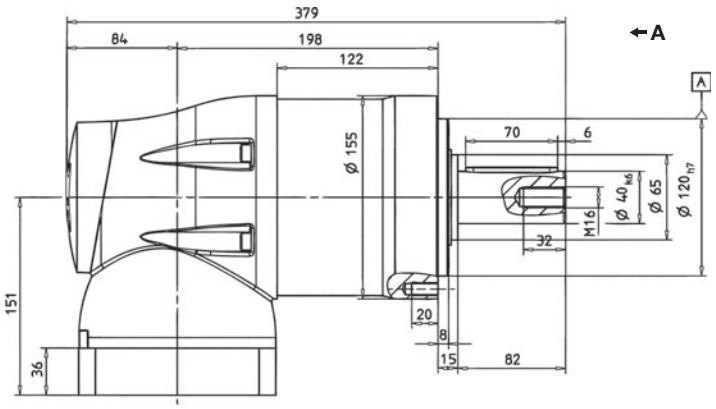
⚠ Motor mounting according to operating manual

			2-stage		3-stage		
Ratio	***i***		**5**	**10**	**25**	**50**	**100**
Max. acceleration torque (max. 1000 cycles per hour)	T_{2B}	Nm	450	350	450	450	350
		in.lb	3983	3098	3983	3983	3098
Nominal output torque (with n_{1N})	T_{2N}	Nm	320	190	320	320	190
		in.lb	2832	1682	2832	2832	1682
Emergency stop torque (permitted 1000 times during the service life of the gearhead)	T_{2Not}	Nm	1000	1000	1000	1000	1000
		in.lb	8850	8850	8850	8850	8850
Nominal input speed (with T_{2N} and 20°C ambient temperature) [a]	n_{1N}	rpm	1600	1600	1600	1600	1600
Max. input speed	n_{1Max}	rpm	3000	3000	3500	3500	3500
Mean no load running torque (with n_1=3000 rpm and 20°C gearhead temperature)	T_{012}	Nm	–	–	–	–	–
		in.lb					
Max. torsional backlash	j_t	arcmin	≤ 11		≤ 13		
Torsional rigidity	C_{t21}	Nm/ arcmin	43.7		–		
		in.lb/ arcmin	386.7				
Max. axial force [b]	F_{2AMax}	N	6000		6000		
		lb_f	1350		1350		
Max. radial force [b]	F_{2RMax}	N	7500		7500		
		lb_f	1688		1688		
Efficiency at full load	η	%	92		90		
Service life (For calculation, see the Chapter “Information”)	L_h	h	> 20000		> 20000		
Weight incl. standard adapter plate	m	kg	34.7		38.7		
		lb_m	76.7		85.5		
Operating noise (with n_1=3000 rpm no load)	L_{PA}	dB(A)	–				
Max. permitted housing temperature		°C	+90				
		F	194				
Ambient temperature		°C	0 to +40				
		F	32 to 104				
Lubrication			Lubricated for life				
Paint			Blue RAL 5002				
Direction of rotation			Motor and gearhead same direction				
Protection class			IP 64				
Moment of inertia (relates to the drive)	J_1	$kgcm^2$	75.1	75.1	16.8	16.8	16.8
		10^{-3} in.lb.s²	66.5	66.5	14.8	14.8	14.8

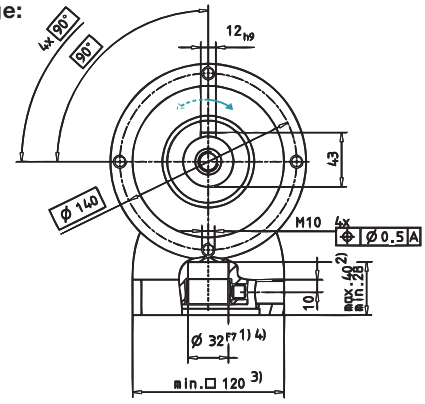
[a] For higher ambient temperatures, please reduce input speed
[b] Refers to center of the output shaft, if n_2 = 100 rpm

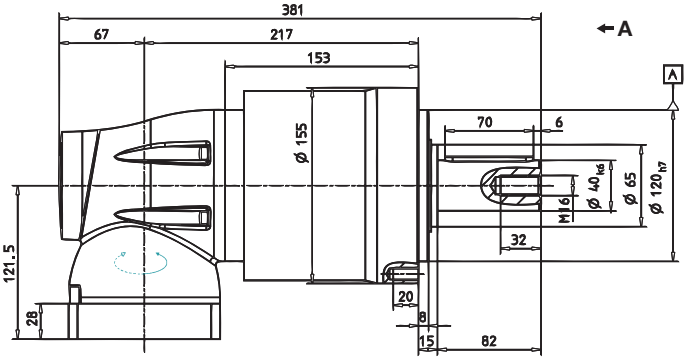
2-stage:





3-stage:

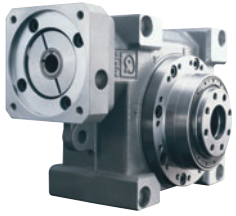




Non-tolerated dimensions ±1 mm

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.

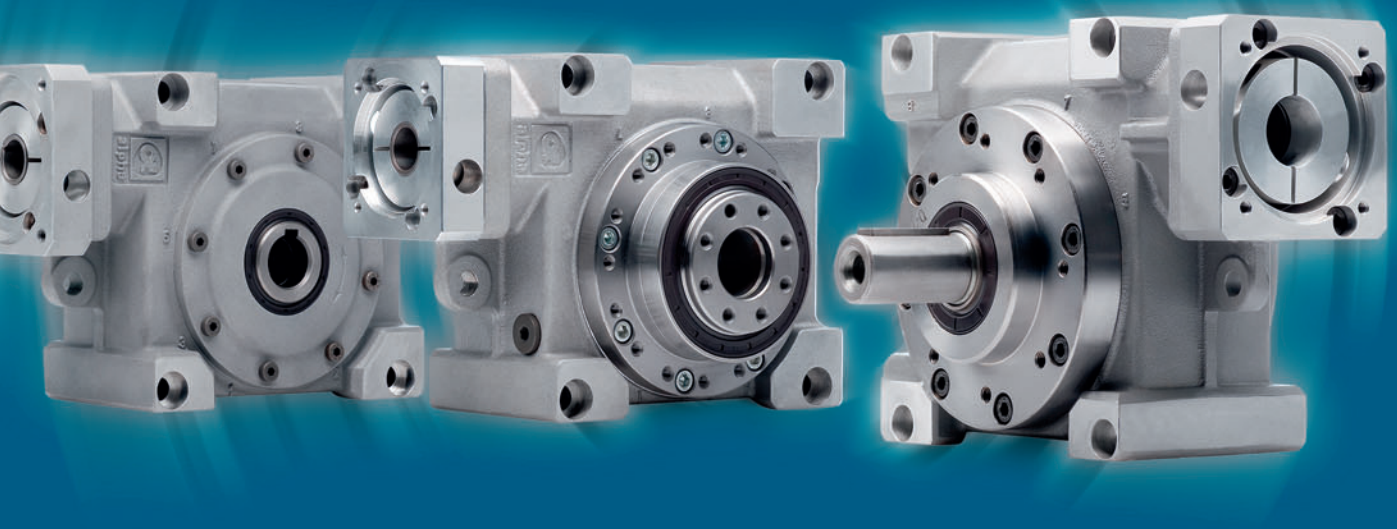
⚠ Motor mounting according to operating manual



V-DRIVE® – The servo worm gearhead with solid shaft, hollow shaft and hollow shaft flange outputs

V-DRIVE®

Details



VDT, VDH, VDS

Technical data

Size				050	063	080	100
Max. acceleration torque (n_1=3000 rpm) [a]	T_{2B} Nm (in.lb)		i=4	59 (523)	138 (1222)	247 (2186)	420 (3717)
			i=7	77 (682)	176 (1558)	320 (2832)	551 (4877)
			i=10	81 (717)	194 (1717)	319 (2824)	606 (5364)
			i=16	88 (779)	209 (1850)	381 (3372)	629 (5567)
			i=28	97 (859)	224 (1983)	413 (3656)	718 (6355)
			i=40	81 (717)	217 (1921)	362 (3204)	692 (6125)
Nominal output torque (n_1=3000 rpm) [a]	T_{2N} Nm (in.lb)		i=4	43 (381)	87 (770)	155 (1372)	261 (2310)
			i=7	56 (496)	124 (1098)	224 (1983)	384 (3399)
			i=10	59 (523)	141 (1248)	233 (2063)	443 (3921)
			i=16	64 (567)	152 (1346)	278 (2461)	459 (4063)
			i=28	71 (629)	165 (1461)	301 (2664)	524 (4638)
			i=40	59 (523)	159 (1408)	264 (2337)	505 (4470)
Max. input speed	n_{1Max} rpm			6000	4500	4000	3000
Nominal speed	n_{1N} rpm			4000	4000	3500	3000
Ratios	i			4, 7, 10, 16, 28, 40			
Torsional backlash	j_t arcmin			< 3	< 3	< 3	< 3
Torsional rigidity	C_{t21} Nm/arcmin (in.lb/arcmin)	VDT	i=40	17 (150)	50 (442)	113 (1000)	213 (1885)
		VDH	i=40	8 (70)	28 (247)	78 (690)	153 (1354)
		VDS	i=40	8 (70)	28 (247)	78 (690)	153 (1354)
Max. axial force	F_{2AMax} N (lbf)			5000 (1125)	8250 (1855)	13900 (3125)	19500 (4384)
Max. radial force	F_{2RMax} N (lbf)			3800 (855)	6000 (1349)	9000 (2024)	14000 (3148)
Max. tilting moment	M_{2KMax} Nm (in.lb)			409 (3620)	843 (7461)	1544 (13664)	3059 (27072)
Tilting rigidity	C_{2k} Nm/arcmin (in.lb/arcmin)	VDT		504 (4460)	603 (5337)	1178 (10425)	2309 (20435)
idling torque (n_1=3000 rpm)	T_{012} Nm (in.lb)		i=4	1.28 (11)	2.07 (18)	3.63 (32)	9.75 (86)
			i=7	1.23 (10)	1.9 (16)	3.48 (30)	8.06 (71)
			i=10	1.18 (10)	1.83 (16)	3.37 (29)	7.41 (65)
			i=16	1.09 (9.7)	1.73 (15)	3.15 (27)	6.72 (59)
			i=28	0.98 (8.7)	1.6 (14)	3 (26)	5.79 (51)
			i=40	0.89 (7.9)	1.44 (12)	2.76 (24)	4.99 (44)
Service life	L_h h			> 20000			
Efficiency [a] (n_1=3000 rpm)	η %		i=4	96	96	97	97
			i=7	94	95	96	96
			i=10	93	94	94	95
			i=16	90	91	92	92
			i=28	83	85	86	87
			i=40	78	81	81	84
Weight (without motor attachment parts)	m kg (lb)	VDT		8 (17)	16 (35)	30 (66)	64 (141)
		VDH		7 (15)	13 (28)	25 (55)	47 (103)
		VDS		8 (17)	14 (30)	27 (59)	57 (125)
Lubrication				Synthetic transmission oil			
Paint				None			
Permissible gearhead temperature	°C (°F)			-10 to +90 (14 to 194)			
Direction of rotation				See drawings			
Protection class				IP 64			
Operating noise (n_1=3000 rpm)	L_{PA} dB(A)			≤ 62	≤ 64	≤ 66	≤ 70

[a] See the dimensioning factors in the Chapter "Information".

Moments of inertia J_1 [kgcm²] (10^{-3} in.lb.s²) relating to the drive

Size	i	VDT	VDH	VDS
050	4	1.27 (1.12)	1.00 (0.89)	0.97 (0.86)
	7	0.75 (0.66)	0.65 (0.58)	0.65 (0.58)
	10	0.65 (0.58)	0.60 (0.53)	0.59 (0.52)
	16	0.59 (0.52)	0.57 (0.50)	0.57 (0.50)
	28	0.55 (0.49)	0.55 (0.49)	0.55 (0.49)
	40	0.61 (0.54)	0.61 (0.54)	0.61 (0.54)

Size	i	VDT	VDH	VDS
063	4	3.73 (3.30)	3.03 (2.68)	3.03 (2.68)
	7	2.43 (2.15)	2.13 (1.89)	2.23 (1.97)
	10	2.03 (1.80)	1.93 (1.71)	1.93 (1.71)
	16	1.93 (1.71)	1.83 (1.62)	1.83 (1.62)
	28	1.80 (1.59)	1.79 (1.58)	1.79 (1.58)
	40	1.79 (1.58)	1.78 (1.58)	1.79 (1.58)

Size	i	VDT	VDH	VDS
080	4	13.40 (11.86)	9.52 (8.43)	10.72 (9.49)
	7	8.32 (7.36)	7.32 (6.48)	7.42 (6.57)
	10	8.02 (7.10)	7.62 (6.74)	7.62 (6.74)
	16	6.52 (5.77)	6.32 (5.59)	6.32 (5.59)
	28	6.12 (5.42)	6.12 (5.42)	6.12 (5.42)
	40	7.02 (6.21)	7.02 (6.21)	7.02 (6.21)

Size	i	VDT	VDH	VDS
100	4	62.40 (55.23)	49.60 (43.90)	49.50 (43.81)
	7	44.70 (39.56)	40.60 (35.93)	40.50 (35.85)
	10	40.30 (35.67)	38.40 (33.99)	38.40 (33.99)
	16	40.70 (36.02)	39.90 (35.31)	39.90 (35.31)
	28	37.00 (32.75)	36.70 (32.48)	36.70 (32.48)
	40	38.70 (34.25)	38.60 (34.16)	38.60 (34.16)

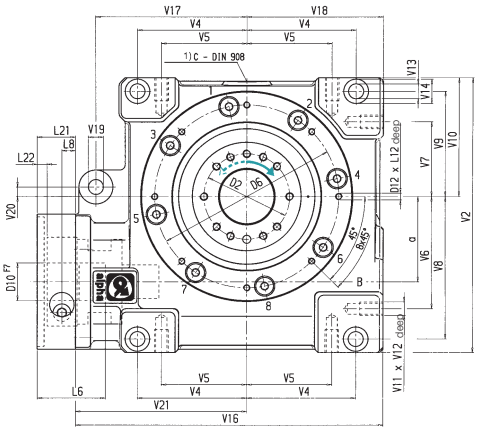
VDT version

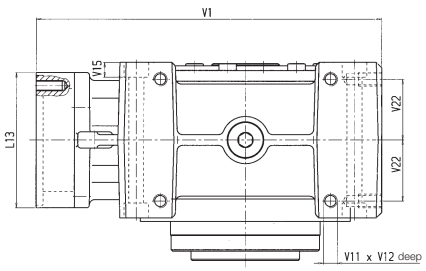
WITTENSTEIN

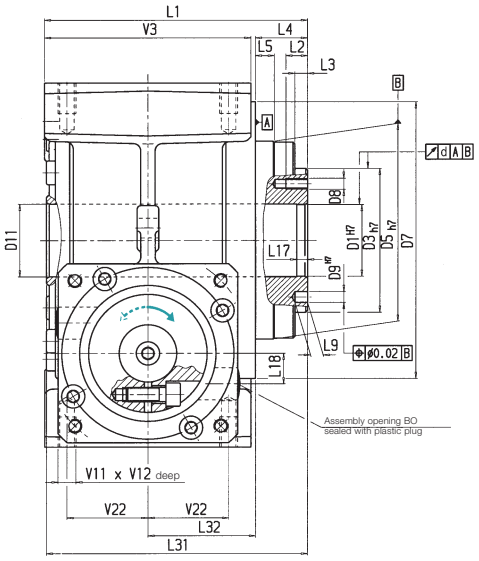
Dimensions [mm]

Size	050	063	080	100
a	50	63	80	100
d	0.03	0.03	0.03	0.04
c	G 1/2	G 1/2	G 3/4	G 1
B0	15	18	20	20
D1 H7	31.5	40	50	80
D2	50	63	80	125
D3 h7	63	80	100	160
D5 h7	90	110	140	200
D6	109	135	168	233
D7	124	154	202	257
D8	M6	M6	M8	M10
D9 H7	6	6	8	10
D10 F7	19	28	35	48
D11	30	40.5	50.5	70
D12	M5	M5	M6	M8
L1	132.5	146.5	190.5	247.5
L2	10	12	15	20
L3	7	7	7	9
L4	30	29	38	50
L5	10	10.5	12.5	15.5
L6 min./max. [a]	23/40	30/50	32/60	45/82
L8	8.5	10	12.5	13
L9	7	7	7	10
L12	8.5	8.5	12	15.5
□ L13 [a]	80	100	140	190
L17	6	6	6	8
L18	12	17	19	29
L21 [a]	22	28	30.5	37.5
L22 [a]	6.7	7.2	5.7	9.8
L31	132.5	145.5	190.5	246.5
L32	52.5	60	77.5	100
V1 [a]	220	253.5	325	402.5
V2	162.5	203	260	335
V3	100	115	150	195
V4	70	80	110	132.5
V5	52.5	62.5	90	110
V6	65	83	115	157.5
V7	42.5	55	70	97.5
V8	82.5	105.5	142.5	185
V9	60	77.5	97.5	125
V10	70	87.5	107.5	137.5
V11	M8	M10	M12	M12
V12	13.5	17	19.5	19.5
V13	11	11	11	14
V14	18	18	18	20
V15	11	11	11	13
V16	198	225.5	294.5	365
V17	98	110.5	152	194
V18	85	100	127.5	152.5
V19	11	11	11	14
V20	10	7	10	20
V21	113	125.5	167	212.5
V22	40	45	60	82.5

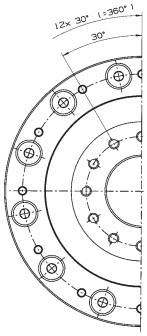
[a] The dimensions depend on the motor



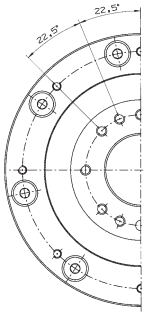




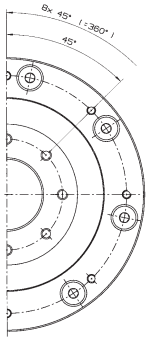
VDT 080/100

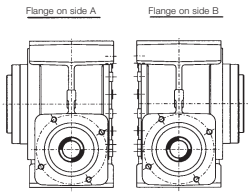


VDT 063



VDT 050





Identical arrows indicate dependence on the direction of rotation.

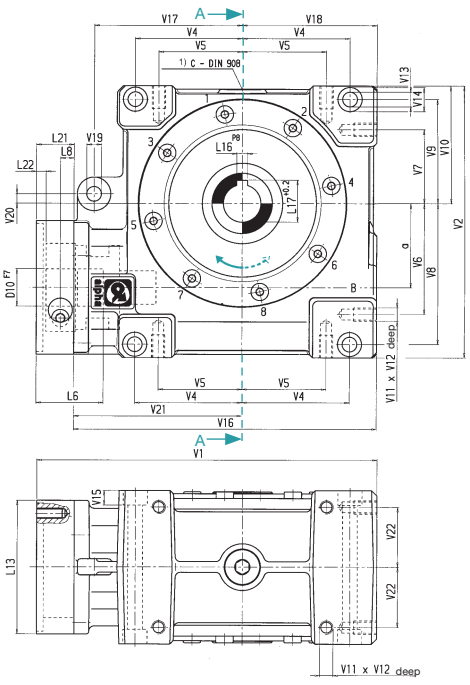
[1] Oil filler and drain plug

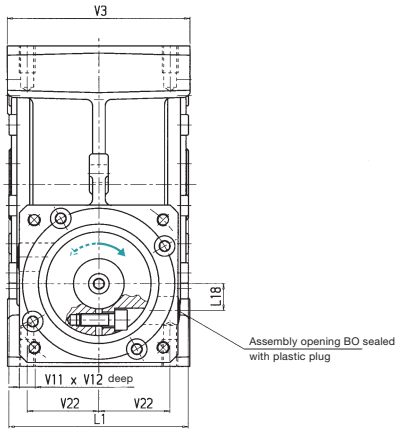
VDH version Hollow shaft, keywayed

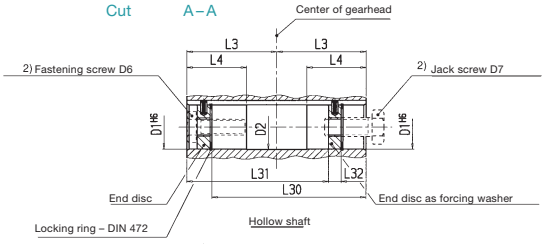
Dimensions [mm]

Size	050	063	080	100
a	50	63	80	100
c	G 1/2	G 1/2	G 3/4	G 1
B0	15	18	20	20
D1 H6	25	28	36	48
D2	25.5	28.5	36.5	49
D7	M12	M12	M16	M20
D8	M10	M10	M12	M16
D10 F7	19	28	35	48
L1	100	113	150	193
L3	50	56.5	75	96.5
L4	30	37.5	45	64
L6 min./max. [a]	23/40	30/50	32/60	45/82
L8	8.5	10	12.5	13
□ L13 [a]	80	100	140	190
L16 P8	8	8	10	14
L17	28.3	31.3	39.3	51.8
L18	12	17	19	29
L21 [a]	22	28	30.5	37.5
L22 [a]	6.7	7.2	5.7	9.8
L30	84.5	97.2	130	169.9
L31 max [b]	77	89	119	159
L32	7	8	10	11
V1 [a]	220	253.5	325	402.5
V2	162.5	203	260	335
V3	100	115	150	195
V4	70	80	110	132.5
V5	52.5	62.5	90	110
V6	65	83	115	157.5
V7	42.5	55	70	97.5
V8	82.5	105.5	142.5	185
V9	60	77.5	97.5	125
V10	70	87.5	107.5	137.5
V11	M8	M10	M12	M12
V12	13.5	17	19.5	19.5
V13	11	11	11	14
V14	18	18	18	20
V15	11	11	11	13
V16	198	225.5	294.5	365
V17	98	110.5	152	194
V18	85	100	127.5	152.5
V19	11	11	11	14
V20	10	7	10	20
V21	113	125.5	167	212.5
V22	40	45	60	82.5

[a] The dimensions depend on the motor
[b] Only valid when forcing disc is used







Identical arrows indicate dependence on the direction of rotation.
[1] Oil filler and drain plug
[2] not included in the scope of delivery
Tolerance h6 for mounted shaft.

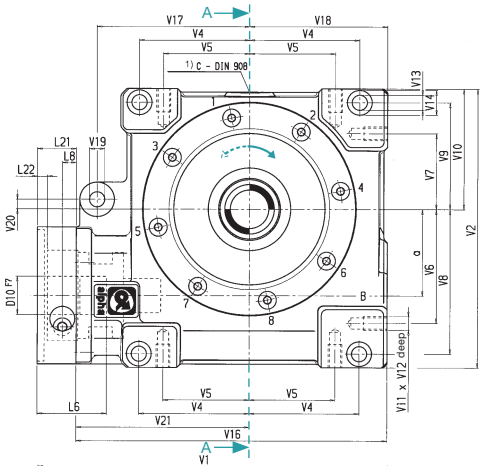
VDH version Hollow shaft, smooth

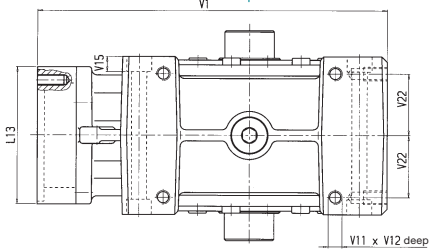
WITTENSTEIN

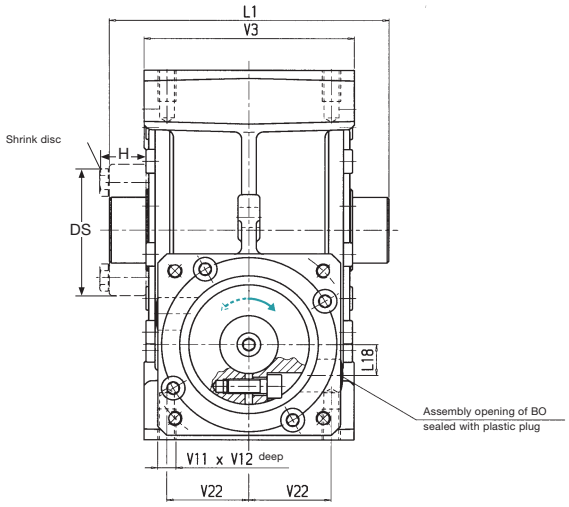
Dimensions [mm]

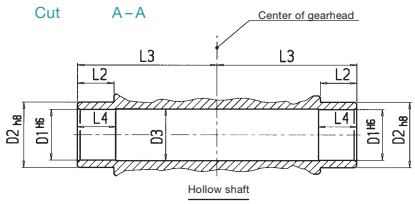
Size	050	063	080	100
a	50	63	80	100
c	G 1/2	G 1/2	G 3/4	G 1
B0	15	18	20	20
D1 H6	25	28	36	48
D2 h8	30	36	50	62
D3	25.5	28.5	36.5	49
D10 F7	19	28	35	48
DS	60	72	90	110
H	24	27.5	31.5	34.5
L1	137	153	200	253
L2	18.5	20	25	25
L3	68.5	76.5	100	126.5
L4	20	21	26	28
L6 min./max. [a]	23/40	30/50	32/60	45/82
L8	8.5	10	12.5	13
□ L13 [a]	80	100	140	190
L18	12	17	19	29
L21 [a]	22	28	30.5	37.5
L22 [a]	6.7	7.2	5.78	9.8
V1 [a]	220	253.5	325	402.5
V2	162.5	203	260	335
V3	100	115	150	195
V4	70	80	110	132.5
V5	52.5	62.5	90	110
V6	65	83	115	157.5
V7	42.5	55	70	97.5
V8	82.5	105.5	142.5	185
V9	60	77.5	97.5	125
V10	70	87.5	107.5	137.5
V11	M8	M10	M12	M12
V12	13.5	17	19.5	19.5
V13	11	11	11	14
V14	18	18	18	20
V15	11	11	11	13
V16	198	225.5	294.5	365
V17	98	110.5	152	194
V18	85	100	127.5	152.5
V19	11	11	11	14
V20	10	7	10	20
V21	113	125.5	167	212.5
V22	40	45	60	82.5

[a] The dimensions depend on the motor









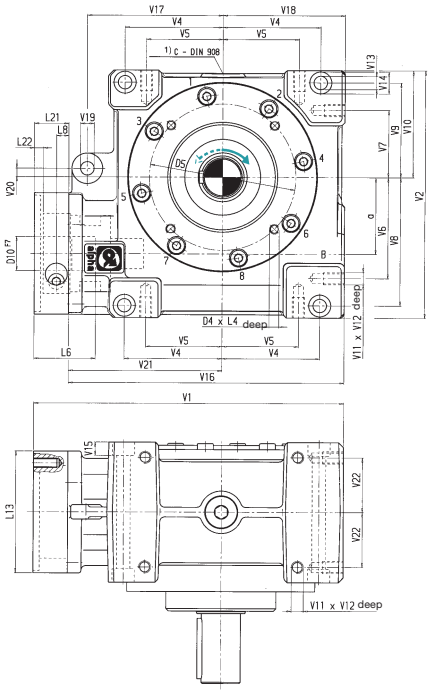
Identical arrows indicate dependence on the direction of rotation.
[1] Oil filler and drain plug
Tolerance h6 for mounted shaft.

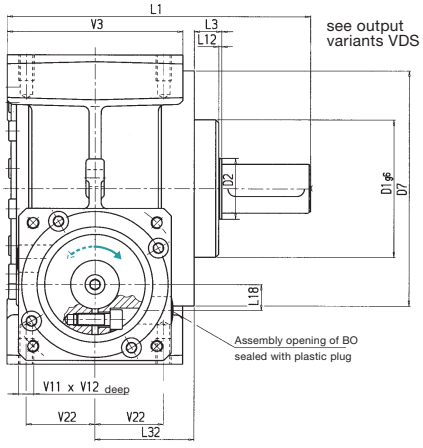
VDS version

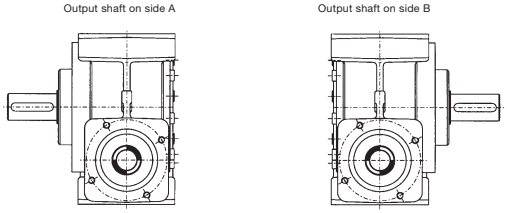
Dimensions [mm]

Size	050	063	080	100
a	50	63	80	100
c	G 1/2	G 1/2	G 3/4	G 1
B0	15	18	20	20
D1 g6	70	90	130	160
D2	30	40	55	65
D4	M6	M8	M10	M12
D5	85	120	165	215
D7	124	154	202	257
D10 F7	19	28	35	48
L1 smooth/keywayed	156	198.5	265	306.5
L1 involute	146	166.5	223	266
L3	14	18	23	27
L4	10	13	15	23
L6 min./max. [a]	23/40	30/50	32/60	45/82
L8	8.5	10	12.5	13
L12	2	2	3	3
□ L13 [a]	80	100	140	190
L18	12	17	19	29
L21 [a]	22	28	30.5	37.5
L22 [a]	6.7	7.2	5.7	9.8
L32	56	65	85	100
V1 [a]	220	253.5	325	402.5
V2	162.5	203	260	335
V3	100	115	150	195
V4	70	80	110	132.5
V5	52.5	62.5	90	110
V6	65	83	115	157.5
V7	42.5	55	70	97.5
V8	82.5	105.5	142.5	185
V9	60	77.5	97.5	125
V10	70	87.5	107.5	137.5
V11	M8	M10	M12	M12
V12	13.5	17	19.5	19.5
V13	11	11	11	14
V14	18	18	18	20
V15	11	11	11	13
V16	198	225.5	294.5	365
V17	98	110.5	152	194
V18	85	100	127.5	152.5
V19	11	11	11	14
V20	10	7	10	20
V21	113	125.5	167	212.5
V22	40	45	60	82.5

[a] The dimensions depend on the motor





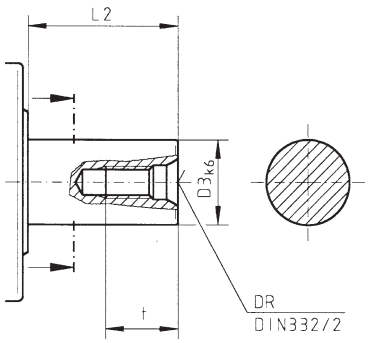


Identical arrows indicate dependence on the direction of rotation.

[1] Oil filler and drain plug

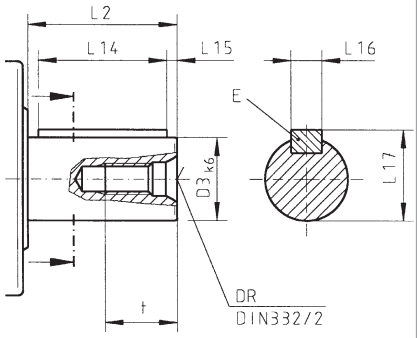
Smooth output shaft [mm]

Size		VDS 050	VDS 063	VDS 080	VDS 100
Output shaft dia.	D3 k6	22	32	40	55
Centering bore hole	DR	M8	M12	M16	M20
Output shaft length	L2	36	58	82	82
Thread depth, centering bore hole	t	19	28	36	42



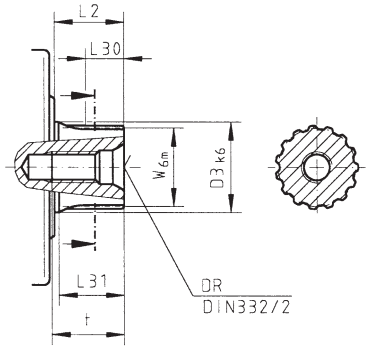
Keywayed output shaft [mm]

Size		VDS 050	VDS 063	VDS 080	VDS 100
Output shaft dia.	D3 k6	22	32	40	55
Centering bore hole	DR	M8	M12	M16	M20
Key	E	Key as per DIN 6885, sheet 1, form A			
Output shaft length	L2	36	58	82	82
Key length	L14	32	50	70	70
Position of key	L15	2	4	5	6
Key width	L16 h9	6	10	12	16
Output shaft with key	L17	24.5	35	43	59
Thread depth, centering bore hole	t	19	28	36	42



Output shaft with **involute gearing** as per DIN 5480 [mm]

Size		VDS 050	VDS 063	VDS 080	VDS 100
Designation as per DIN 5480		22 x 1.25 x 30 x 16 x 6m	32 x 1.25 x 30 x 24 x 6m	40 x 2 x 30 x 18 x 6m	55 x 2 x 30 x 26 x 6m
Output shaft dia.	D3 k6	22	32	40	55
Centering bore hole	DR	M8	M12	M16	M20
Lead angle		30°	30°	30°	30°
Output shaft length	L2	26	26	40	41.5
Effective length, involute	L30	15	15	20	21.5
Involute length	L31	22.5	23	32	33.5
Module	m	1.25	1.25	2	2
Thread depth	t	19	28	36	42
Shaft to DIN 5480	W 6m	22	32	40	55
Number of teeth	z	16	24	18	26
Fit combination 7H/6m yields the following face clearances:					
min. face clearance	$j_{t\,min}$	-0.027	-0.033	-0.033	-0.037
max. face clearance	$j_{t\,max}$	0.021	0.028	0.028	0.031
With $j_{t\,min}$, the pinion must be heated to approx. +80°C.					



We recommend using smooth output shafts during reverse operation and with high gearhead loads.