WITTENSTEIN | alpha

V-Drive+ / V-Drive economy

The new generation of servo worm gearbox

compact
powerful
smooth

Contents

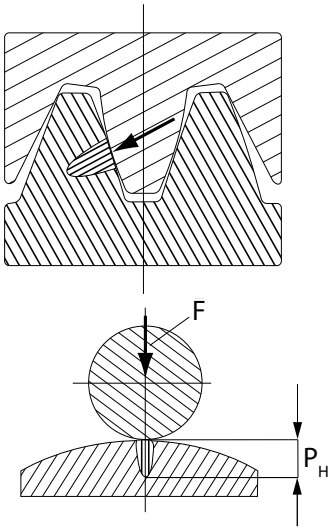
V-Drive
A unique technology

Our new range of servo worm gear – the V-Drive – offers unique variety for applications.
Through manufacturing process innovations, we are bringing the servo worm gear to a new level and offering two versions, the V-Drive⁺ and V-Drive economy – to provide exceptional servo solutions.

Optimized hollow-flank teeth provide for constant positioning accuracy and low backlash, along with up to 50% more torque.

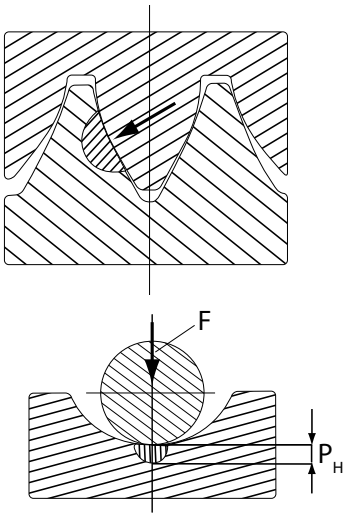
The V-Drive⁺ boasts 97% efficiency, the highest for servo worm gears on the market.
Our commitment to you is 100% delivery satisfaction along with the optional Wittenstein alpha 72-hour delivery service.

Involute teeth



- High surface pressure = increased wear (pitting)
- Smaller tooth root thickness

Hollow-flank teeth with V-Drive



- Low surface pressure = reduced wear (no pitting)
- Larger tooth root thickness = high load and overload capacity

A new design philosophy
for servo worm gears

To meet the needs for a variety of applications requiring servo worm gears, Wittenstein alpha has developed a revolutionary new design philosophy.

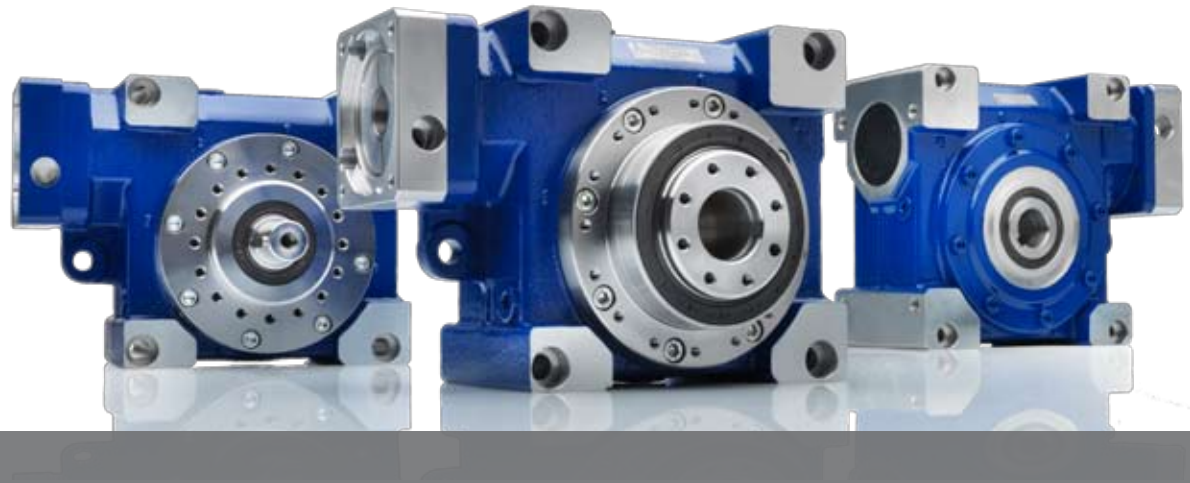
The transmittable torque is arranged into two types:

T_{2Max}

T_{2Max} means the maximum torque which can be transmitted by the gearbox.
This value can be chosen for applications that can accept a slight increase in backlash over time.

T_{2Servo}

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



V-Drive+

The plus stands for torque

With continuously high positioning accuracy and low backlash of <3 arcmin, the V-Drive+ sets new standards for servo worm gears. These outstanding characteristics create an optimal symbiosis between power and precision.

VDT+
shaft flange

VDS+
shaft, smooth/
keyed/
involute

VDH+
hollow shaft,
smooth/
keyed

The following output options are available:

- VDH (hollow shaft, smooth/keyed)
- VDS (shaft, smooth/keyed/involute)
- VDT (shaft flange)

Sizes 050, 063, 080, 100

Features:
Ratio 4, 7, 10, 16, 28, 40
Torsional backlash < 3 arcmin
Efficiency of up to 97%

Revolutionary teeth technology for 50% more torque!

V-Drive economy

Highest quality with maximum results

With the V-Drive economy, an economical solution has been created for low-duty applications. WITTENSTEIN quality combined with optimized hollow-flank teeth provides more torque and power density than comparable products.

The following output options are available:

- VDH (hollow shaft, smooth/keyed)
- VDS (shaft, smooth/keyed)

Sizes 050, 063

Features:
Ratio 7, 10, 16, 28, 40
Torsional backlash < 8 arcmin

VDH economy
hollow shaft
smooth/keyed

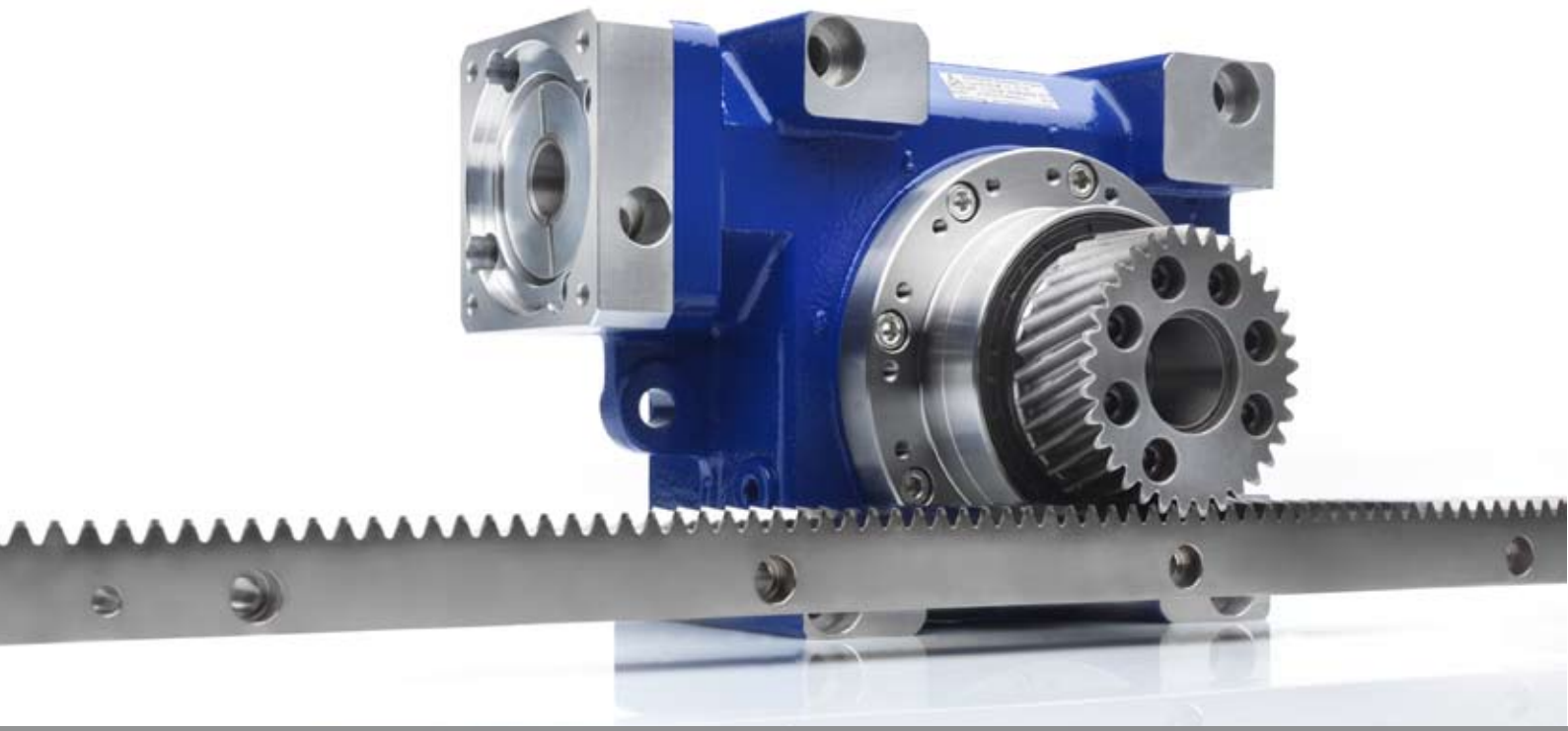
VDS economy
shaft
smooth/keyed

Optimal performance for low-duty applications!

V-Drive

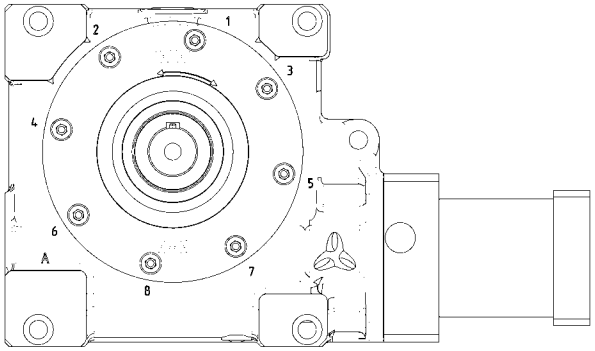
As a system solution

- Combined with rack/pinion (versions VDT+, VDS+, VDS economy)
- Food-grade grease
- Washdown finish
- Dual-shaft output (versions VDS+, VDS economy)
- Couplings, Shrink disk



Flexible solution for diverse requirements!

V-Drive
Options and Accessories

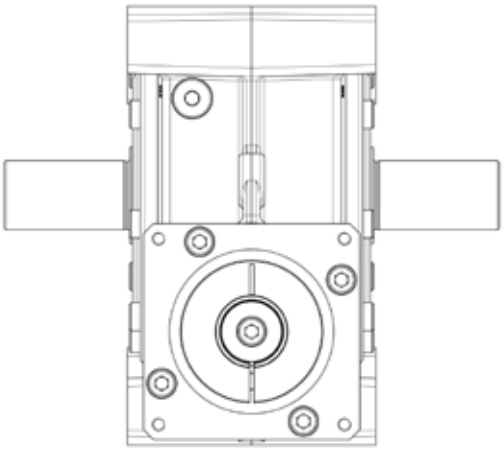


Combined with planetary gearbox for 2-stage

Food-grade grease

Shrink-disk*

Couplings*



Dual-shaft output

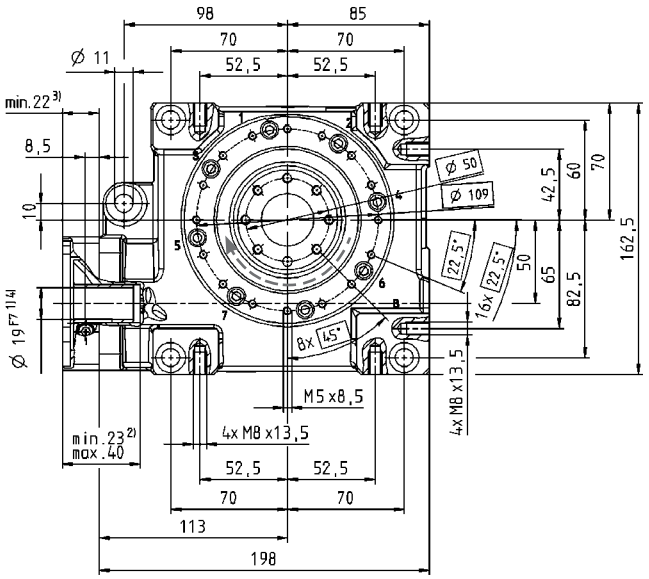
Rack and pinion

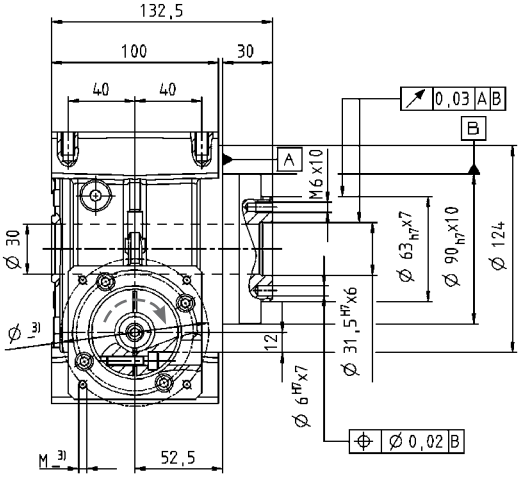
* further information can be found in the complete catalog

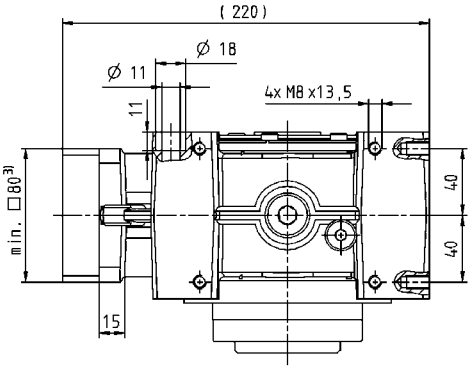
			1-stage					
Ratio	***i***		**4**	**7**	**10**	**16**	**28**	**40**
n_1=500 rpm	T_{2Max}	Nm	124	132	148	154	165	158
		in.lb	1097	1168	1310	1363	1460	1398
	T_{2Servo}	Nm	54	71	74	81	90	74
		in.lb	478	628	655	717	797	655
	η	%	92	89	86	82	72	64
n_1=1000 rpm	T_{2Max}	Nm	124	130	136	140	151	142
		in.lb	1097	1151	1204	1239	1336	1257
	T_{2Servo}	Nm	58	76	80	88	97	81
		in.lb	513	673	708	779	858	717
	η	%	94	91	89	85	77	69
n_1=2000 rpm	T_{2Max}	Nm	88	106	112	120	134	122
		in.lb	779	938	991	1062	1186	1080
	T_{2Servo}	Nm	60	78	82	89	99	83
		in.lb	531	690	726	788	876	735
	η	%	95	93	91	88	75	75
n_1=3000 rpm	T_{2Max}	Nm	72	86	95	106	112	108
		in.lb	637	761	841	938	991	956
	T_{2Servo}	Nm	59	77	81	88	97	81
		in.lb	522	681	717	779	858	717
	η	%	96	94	93	90	83	78
n_1=4000 rpm	T_{2Max}	Nm	62	77	83	92	102	95
		in.lb	549	681	735	814	903	841
	T_{2Servo}	Nm	58	76	79	87	96	80
		in.lb	513	673	699	770	850	708
	η	%	96	95	93	91	85	80
Emergency stop torque	T_{2Not}	Nm	230	242	242	250	262	236
		in.lb	2036	2142	2142	2213	2319	2089
Nominal input speed	n_{1N}	rpm	4000	4000	4000	4000	4000	4000
Max. input speed	n_{1Max}	rpm	6000					
Mean no load running torque [a] (With n_1=3000 min^{-1} and 20° C gear temperature)	T_{012}	Nm	1,3	1,2	1,2	1,1	1	0,9
		in.lb	11,5	10,6	10,6	9,7	8,9	8,0
Max. torsional backlash	j_t	arcmin	≤3					
Torsional rigidity	C_{t12}	Nm/arcmin	17					
		in.lb/arcmin	150					
Max. axial force [b]	F_{2AMax}	N	5000					
		lb_f	1125					
Max. radial force [b]	F_{2RMax}	N	3800					
		lb_f	855					
Max. tilting moment	M_{2KMax}	Nm	409					
		in.lb	3620					
Tilting rigidity	C_{2K}	Nm/arcmin	504					
		in.lb/arcmin	4460					
Service life (For calculation see "Information")	L_h	h	> 20000					
Weight (without motor attechment parts)	m	kg	8,8					
		lb_m	19,4					
Operating noise (with n_1=3000 rpm no load)	L_{PA}	dB(A)	≤ 62					
Max. permitted housing temperature		°C	+90					
		F	194					
Ambient temperature		°C	-15 to +40					
		F	5 to 104					
Lubrication			Synthetic transmission oil					
Paint			None					
Direction of rotation			See drawing					
Protection class			IP 65					
Moment of inertia (relates to the drive)	J_1	kgcm²	2,59	2,12	1,98	1,86	1,82	1,86
		10^{-3} in.lb.s²	2,29	1,87	1,75	1,64	1,61	1,65

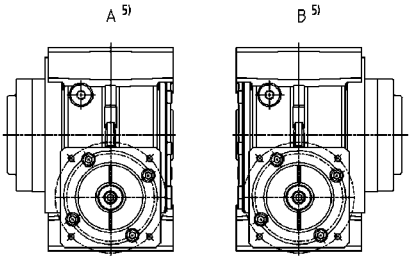
[a]) Decrease in operation

[b]) In reference to the center of output flange/shaft









Non-tolerated dimensions ± 1 mm

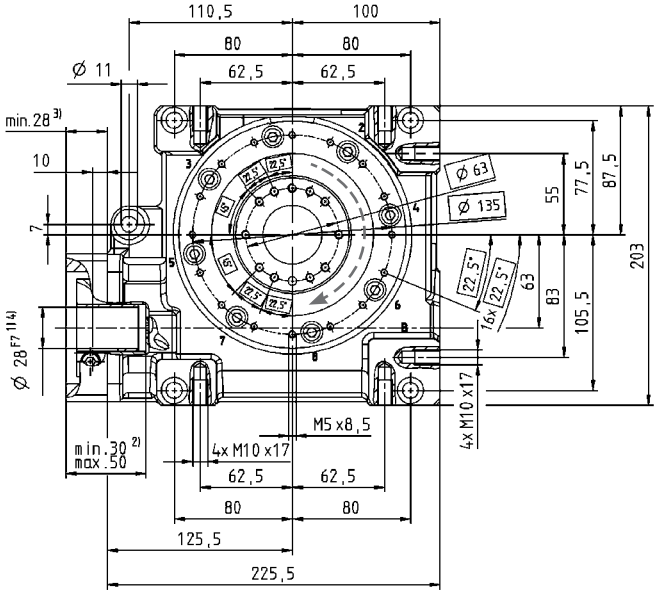
1) Check motor shaft fit.
2) Min./Max. permissible motor shaft length.
   Longer motor shafts are adaptable, please contact us.
3) The dimensions depend on the motor.
4) Smaller motor shaft diameter is compensated by a bushing with a minimum thickness of 1 mm.
5) Output side

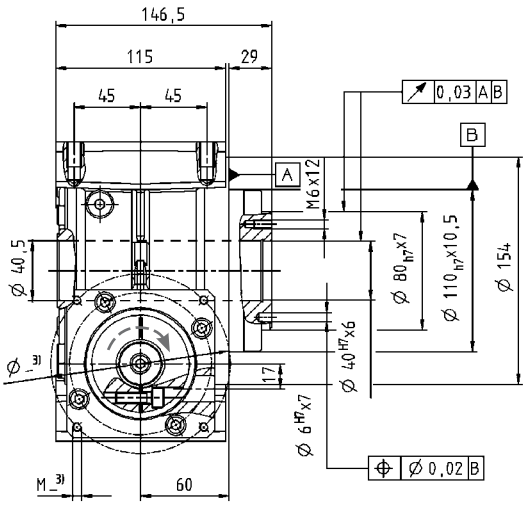
⚠ Motor mounting according to operating manual

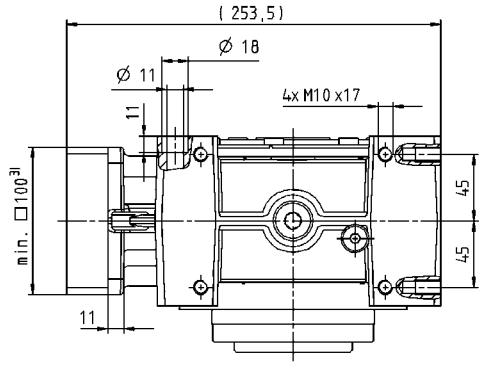
			1-stage					
Ratio	***i***		**4**	**7**	**10**	**16**	**28**	**40**
n_1=500 rpm	T_{2Max}	Nm	302	314	315	320	328	324
		in.lb	2673	2779	2788	2832	2903	2867
	T_{2Servo}	Nm	198	210	225	221	229	226
		in.lb	1752	1859	1991	1956	2027	2000
	η	%	93	91	88	83	74	68
n_1=1000 rpm	T_{2Max}	Nm	264	284	290	298	304	301
		in.lb	2336	2513	2567	2637	2690	2664
	T_{2Servo}	Nm	192	228	240	238	245	241
		in.lb	1699	2018	2124	2106	2168	2133
	η	%	94	93	91	86	78	73
n_1=2000 rpm	T_{2Max}	Nm	202	243	262	271	282	278
		in.lb	1788	2151	2319	2398	2496	2460
	T_{2Servo}	Nm	174	212	230	238	248	243
		in.lb	1540	1876	2036	2106	2195	2151
	η	%	96	94	93	89	83	78
n_1=3000 rpm	T_{2Max}	Nm	164	190	202	209	235	231
		in.lb	1451	1682	1788	1850	2080	2044
	T_{2Servo}	Nm	128	166	184	209	198	194
		in.lb	1133	1469	1628	1850	1752	1717
	η	%	96	95	94	91	85	81
n_1=4000 rpm	T_{2Max}	Nm	128	148	164	175	201	198
		in.lb	1133	1310	1451	1549	1779	1752
	T_{2Servo}	Nm	104	132	152	175	165	162
		in.lb	920	1168	1345	1549	1460	1434
	η	%	97	96	94	92	86	83
Emergency stop torque	T_{2Not}	Nm	460	484	491	494	518	447
		in.lb	4071	4283	4345	4372	4584	3956
Nominal input speed	n_{1N}	rpm	4000	4000	4000	4000	4000	4000
Max. input speed	n_{1Max}	rpm	4500					
Mean no load running torque [a] (With n_1=3000 min^{-1} and 20° C gear temperature)	T_{012}	Nm	2,1	1,9	1,8	1,7	1,6	1,4
		in.lb	18,6	16,8	15,9	15,0	14,2	12,4
Max. torsional backlash	j_t	arcmin	≤3					
Torsional rigidity	C_{t12}	Nm/arcmin	50					
		in.lb/arcmin	443					
Max. axial force [b]	F_{2AMax}	N	8250					
		lb_f	1856					
Max. radial force [b]	F_{2RMax}	N	6000					
		lb_f	1350					
Max. tilting moment	M_{2KMax}	Nm	843					
		in.lb	7461					
Tilting rigidity	C_{2K}	Nm/arcmin	603					
		in.lb/arcmin	5337					
Service life (For calculation see "Information")	L_h	h	> 20000					
Weight (without motor attechment parts)	m	kg	14,5					
		lb_m	32					
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	-15 to +40					
		F	5 to 104					
Lubrication			Synthetic transmission oil					
Paint			None					
Direction of rotation			See drawing					
Protection class			IP 65					
Moment of inertia (relates to the drive)	J_1	kgcm²	7,45	6,02	5,65	5,49	5,42	5,36
		10^{-3} in.lb.s²	6,60	5,33	5,00	4,86	4,80	4,75

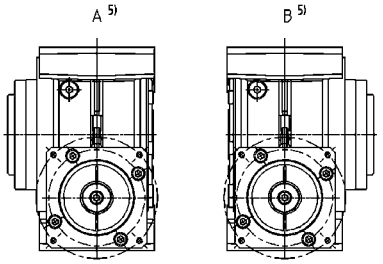
[a]) Decrease in operation

[b]) In reference to the center of output flange/shaft









Non-tolerated dimensions ± 1 mm

1) Check motor shaft fit.
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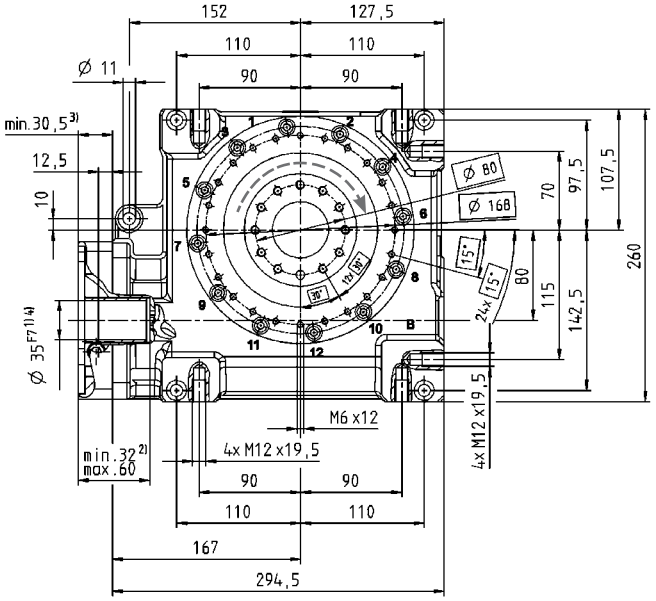
3) The dimensions depend on the motor.
4) Smaller motor shaft diameter is compensated by a bushing with a minimum thickness of 1 mm.
5) Output side

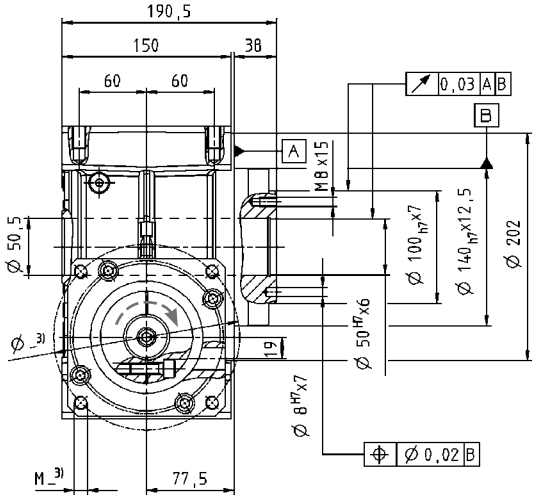
⚠ Motor mounting according to operating manual

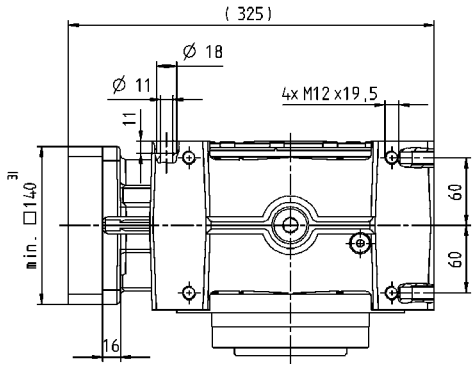
			1-stage					
Ratio	***i***		**4**	**7**	**10**	**16**	**28**	**40**
n_1=500 rpm	T_{2Max}	Nm	578	646	672	702	785	676
		in.lb	5115	5717	5947	6213	6947	5983
	T_{2Servo}	Nm	469	601	613	677	764	631
		in.lb	4151	5319	5425	5991	6761	5584
	η	%	94	92	89	86	77	70
n_1=1000 rpm	T_{2Max}	Nm	514	602	588	656	698	613
		in.lb	4549	5328	5204	5806	6177	5425
	T_{2Servo}	Nm	491	574	561	625	665	584
		in.lb	4345	5080	4965	5531	5885	5168
	η	%	95	93	91	88	81	74
n_1=2000 rpm	T_{2Max}	Nm	350	435	431	500	536	470
		in.lb	3098	3850	3814	4425	4744	4160
	T_{2Servo}	Nm	335	415	411	476	511	448
		in.lb	2965	3673	3637	4213	4522	3965
	η	%	96	95	93	89	84	79
n_1=3000 rpm	T_{2Max}	Nm	259	336	334	400	433	380
		in.lb	2292	2974	2956	3540	3832	3363
	T_{2Servo}	Nm	247	320	319	381	413	362
		in.lb	2186	2832	2823	3372	3655	3204
	η	%	97	96	94	92	86	81
n_1=4000 rpm	T_{2Max}	Nm	227	299	300	362	394	346
		in.lb	2009	2646	2655	3204	3487	3062
	T_{2Servo}	Nm	217	285	286	345	376	330
		in.lb	1920	2522	2531	3053	3328	2921
	η	%	97	96	94	92	87	82
Emergency stop torque	T_{2Not}	Nm	938	993	963	1005	1064	941
		in.lb	8301	8788	8523	8894	9416	8328
Nominal input speed	n_{1N}	rpm	3500	3500	3500	3500	3500	3500
Max. input speed	n_{1Max}	rpm	4000					
Mean no load running torque [a] (With n_1=3000 min^{-1} and 20° C gear temperature)	T_{012}	Nm	3,6	3,5	3,4	3,2	3	2,8
		in.lb	31,9	31,0	30,1	28,3	26,6	24,8
Max. torsional backlash	j_t	arcmin	≤3					
Torsional rigidity	C_{t12}	Nm/arcmin	113					
		in.lb/arcmin	1000					
Max. axial force [b]	F_{2AMax}	N	13900					
		lb_f	3128					
Max. radial force [b]	F_{2RMax}	N	9000					
		lb_f	2025					
Max. tilting moment	M_{2KMax}	Nm	1544					
		in.lb	13664					
Tilting rigidity	C_{2K}	Nm/arcmin	1178					
		in.lb/arcmin	10425					
Service life (For calculation see "Information")	L_h	h	> 20000					
Weight (without motor attechment parts)	m	kg	31					
		lb_m	68,5					
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	-15 to +40					
		F	5 to 104					
Lubrication			Synthetic transmission oil					
Paint			None					
Direction of rotation			See drawing					
Protection class			IP 65					
Moment of inertia (relates to the drive)	J_1	kgcm²	23,99	18,64	18,23	16,54	16,32	16,94
		10^{-3} in.lb.s²	21,23	16,49	16,13	14,64	14,44	14,99

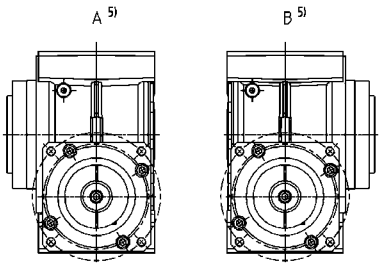
[a]) Decrease in operation

[b]) In reference to the center of output flange/shaft









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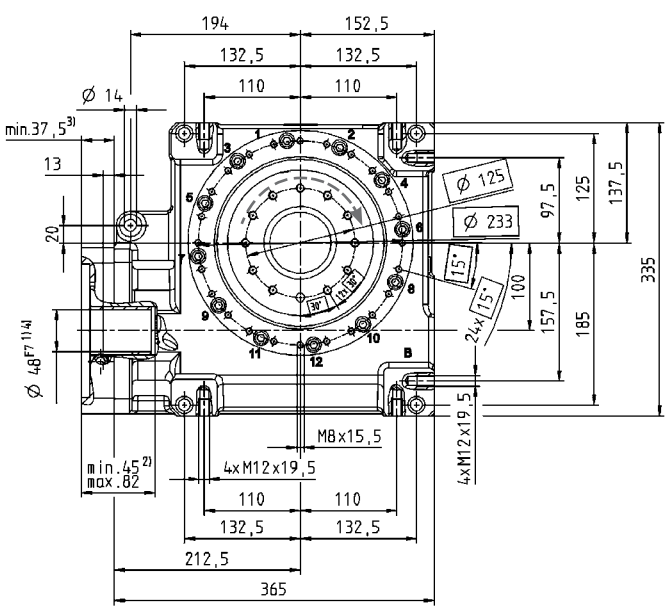
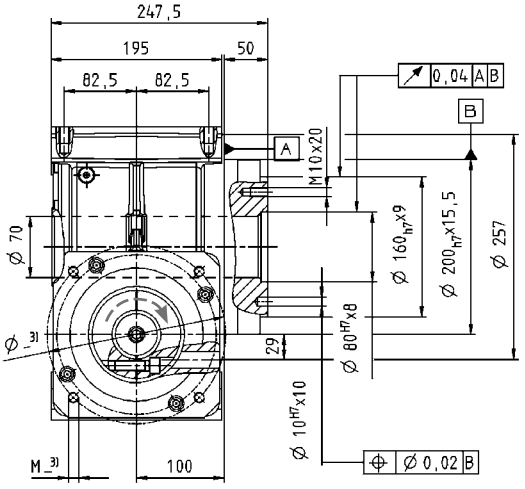
⚠ Motor mounting according to operating manual

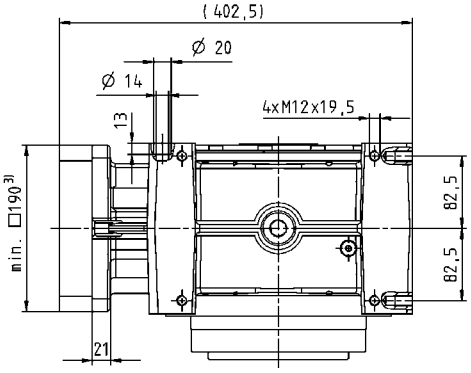
			1-stage					
Ratio	***i***		**4**	**7**	**10**	**16**	**28**	**40**
n_1=500 rpm	T_{2Max}	Nm	1184	1336	1377	1392	1505	1376
		in.lb	10478	11824	12186	12319	13319	12178
	T_{2Servo}	Nm	1155	1304	1343	1359	1469	1343
		in.lb	10222	11540	11886	12027	13001	11886
	η	%	95	93	91	87	80	76
n_1=1000 rpm	T_{2Max}	Nm	905	1070	1122	1140	1251	1162
		in.lb	8009	9470	9930	10089	11071	10284
	T_{2Servo}	Nm	883	1044	1095	1113	1221	1134
		in.lb	7815	9239	9691	9850	10806	10036
	η	%	95	94	92	88	82	79
n_1=2000 rpm	T_{2Max}	Nm	595	748	807	830	930	883
		in.lb	5266	6620	7142	7346	8231	7815
	T_{2Servo}	Nm	581	730	788	810	908	862
		in.lb	5142	6461	6974	7169	8036	7629
	η	%	96	95	94	91	86	82
n_1=3000 rpm	T_{2Max}	Nm	430	564	621	644	735	709
		in.lb	3806	4991	5496	5699	6505	6275
	T_{2Servo}	Nm	420	551	606	629	718	692
		in.lb	3717	4876	5363	5567	6354	6124
	η	%	97	96	95	92	87	84
n_1=4000 rpm	T_{2Max}	Nm in.lb	–	–	–	–	–	–
	T_{2Servo}	Nm in.lb	–	–	–	–	–	–
	η	%	–	–	–	–	–	–
Emergency stop torque	T_{2Not}	Nm	1819	1932	1940	1955	2073	1856
		in.lb	16098	17098	17169	17302	18346	16426
Nominal input speed	n_{1N}	rpm	3000	3000	3000	3000	3000	3000
Max. input speed	n_{1Max}	rpm	3500					
Mean no load running torque [a] (With n_1=3000 min^{-1} and 20° C gear temperature)	T_{012}	Nm	9,8	8,1	7,4	6,7	5,8	5
		in.lb	86,7	71,7	65,5	59,3	51,3	44,3
Max. torsional backlash	j_t	arcmin	≤3					
Torsional rigidity	C_{t12}	Nm/arcmin	213					
		in.lb/arcmin	1885					
Max. axial force [b]	F_{2AMax}	N	19500					
		lb_f	4388					
Max. radial force [b]	F_{2RMax}	N	14000					
		lb_f	3150					
Max. tilting moment	M_{2KMax}	Nm	3059					
		in.lb	27072					
Tilting rigidity	C_{2K}	Nm/arcmin	2309					
		in.lb/arcmin	20435					
Service life (For calculation see "Information")	L_h	h	> 20000					
Weight (without motor attechment parts)	m	kg	62					
		lb_m	137					
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	-15 to +40					
		F	5 to 104					
Lubrication			Synthetic transmission oil					
Paint			None					
Direction of rotation			See drawing					
Protection class			IP 65					
Moment of inertia (relates to the drive)	J_1	kgcm²	83,51	64,27	59,95	59,40	56,32	56,49
		10^{-3} in.lb.s²	73,90	56,88	53,06	52,56	49,85	50,00

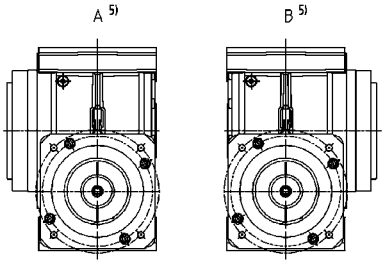
[a]) Decrease in operation

[b]) In reference to the center of output flange/shaft









Non-tolerated dimensions ± 1 mm

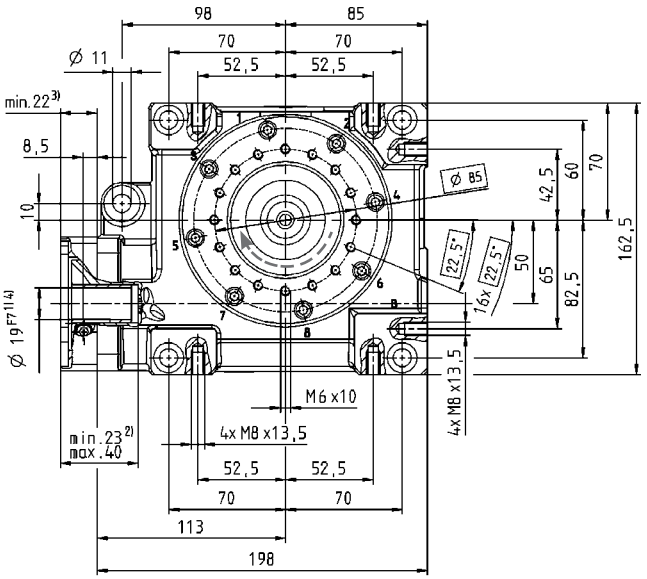
1) Check motor shaft fit.
2) Min./Max. permissible motor shaft length.
   Longer motor shafts are adaptable, please contact us.
3) The dimensions depend on the motor.
4) Smaller motor shaft diameter is compensated by a bushing with a minimum thickness of 1 mm.
5) Output side

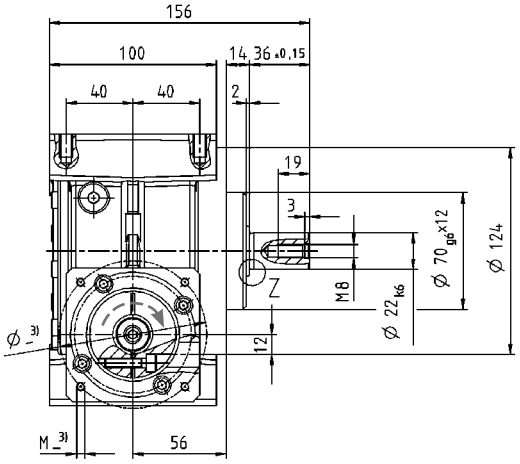
⚠ Motor mounting according to operating manual

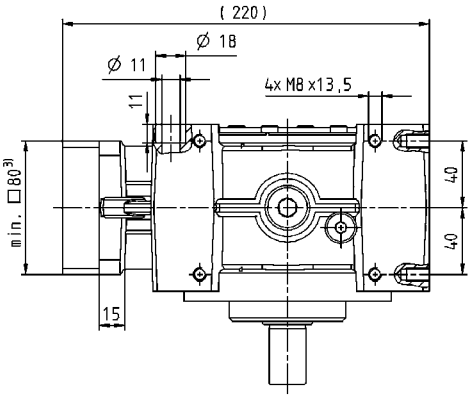
			1-stage					
Ratio	***i***		**4**	**7**	**10**	**16**	**28**	**40**
n_1=500 rpm	T_{2Max}	Nm	124	132	148	154	165	158
		in.lb	1097	1168	1310	1363	1460	1398
	T_{2Servo}	Nm	54	71	74	81	90	74
		in.lb	478	628	655	717	797	655
	η	%	92	89	86	82	72	64
n_1=1000 rpm	T_{2Max}	Nm	124	130	136	140	151	142
		in.lb	1097	1151	1204	1239	1336	1257
	T_{2Servo}	Nm	58	76	80	88	97	81
		in.lb	513	673	708	779	858	717
	η	%	94	91	89	85	77	69
n_1=2000 rpm	T_{2Max}	Nm	88	106	112	120	134	122
		in.lb	779	938	991	1062	1186	1080
	T_{2Servo}	Nm	60	78	82	89	99	83
		in.lb	531	690	726	788	876	735
	η	%	95	93	91	88	75	75
n_1=3000 rpm	T_{2Max}	Nm	72	86	95	106	112	108
		in.lb	637	761	841	938	991	956
	T_{2Servo}	Nm	59	77	81	88	97	81
		in.lb	522	681	717	779	858	717
	η	%	96	94	93	90	83	78
n_1=4000 rpm	T_{2Max}	Nm	62	77	83	92	102	95
		in.lb	549	681	735	814	903	841
	T_{2Servo}	Nm	58	76	79	87	96	80
		in.lb	513	673	699	770	850	708
	η	%	96	95	93	91	85	80
Emergency stop torque	T_{2Not}	Nm	230	242	242	250	262	236
		in.lb	2036	2142	2142	2213	2319	2089
Nominal input speed	n_{1N}	rpm	4000	4000	4000	4000	4000	4000
Max. input speed	n_{1Max}	rpm	6000					
Mean no load running torque [a] (With n_1=3000 min^{-1} and 20° C gear temperature)	T_{012}	Nm	1,3	1,2	1,2	1,1	1	0,9
		in.lb	11,5	10,6	10,6	9,7	8,9	8,0
Max. torsional backlash	j_t	arcmin	≤3					
Torsional rigidity	C_{t12}	Nm/arcmin	8					
		in.lb/arcmin	71					
Max. axial force [b]	F_{2AMax}	N	5000					
		lb_f	1125					
Max. radial force [b]	F_{2RMax}	N	3800					
		lb_f	855					
Max. tilting moment	M_{2KMax}	Nm	409					
		in.lb	3620					
Service life (For calculation see "Information")	L_h	h	> 20000					
Weight (without motor attechment parts)	m	kg	8,5					
		lb_m	18,8					
Operating noise (with n_1 = 3000 rpm no load)	L_{PA}	dB(A)	≤ 62					
Max. permitted housing temperature		°C	+90					
		F	194					
Ambient temperature		°C	-15 to +40					
		F	5 to 104					
Lubrication			Synthetic transmission oil					
Paint			None					
Direction of rotation			See drawing					
Protection class			IP 65					
Moment of inertia (relates to the drive)	J_1	kgcm²	2,27	2,03	1,94	1,84	1,81	1,86
		10^{-3} in.lb.s²	2,01	1,80	1,72	1,63	1,60	1,64

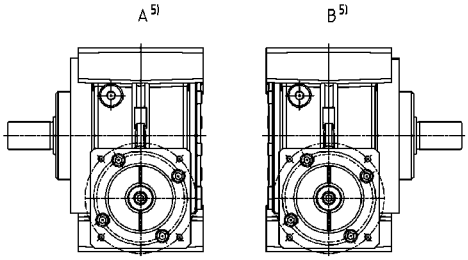
[a]) Decrease in operation

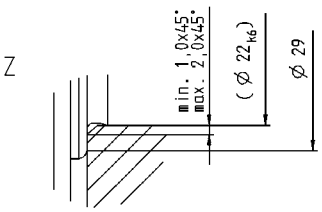
[b]) In reference to the center of output flange/shaft

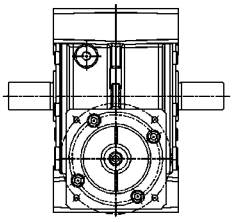








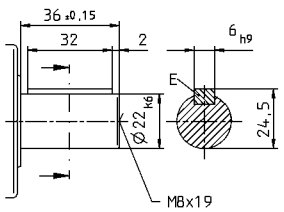




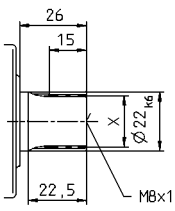
Optional dual-shaft output. Drawings available upon request.
Involute gearing is not possible.

Alternatives: Output shaft variants

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



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



Non-tolerated dimensions ± 1 mm

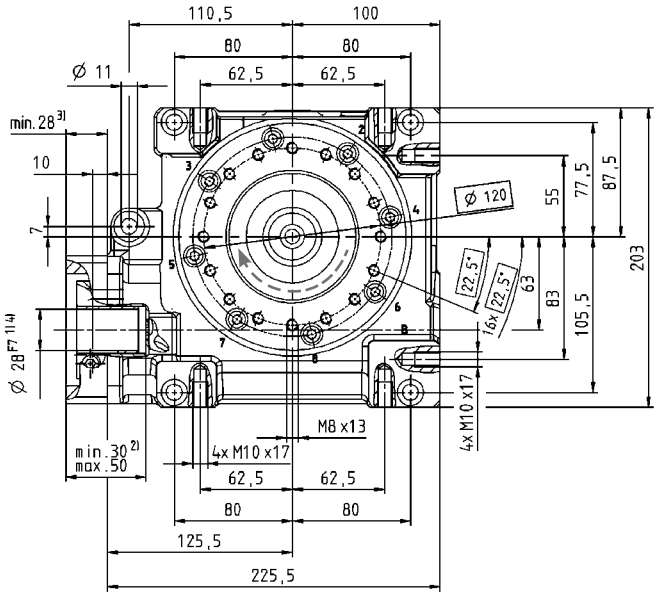
1) Check motor shaft fit.
2) Min./Max. permissible motor shaft length.
   Longer motor shafts are adaptable, please contact us.
3) The dimensions depend on the motor.
4) Smaller motor shaft diameter is compensated by a bushing with a minimum thickness of 1 mm.
5) Output side

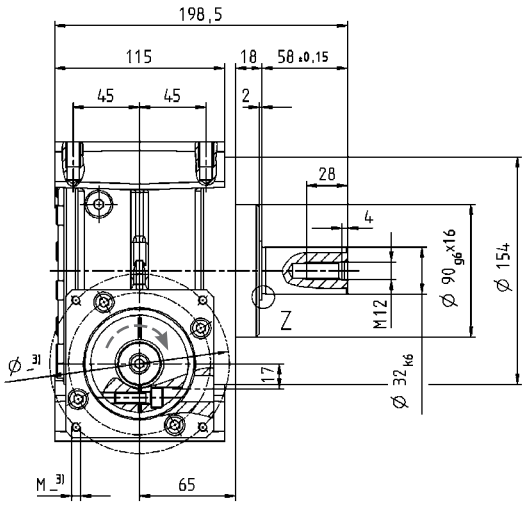
⚠ Motor mounting according to operating manual

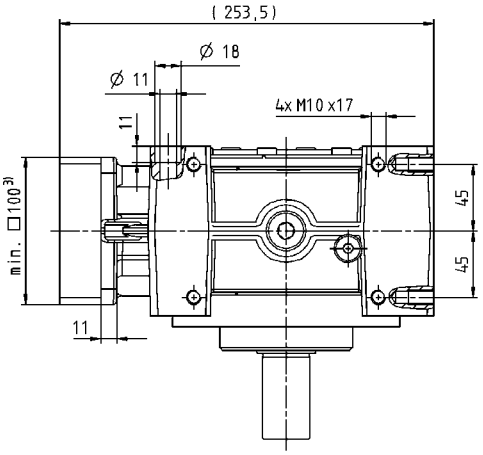
			1-stage					
Ratio	***i***		**4**	**7**	**10**	**16**	**28**	**40**
n_1=500 rpm	T_{2Max}	Nm	302	314	315	320	328	324
		in.lb	2673	2779	2788	2832	2903	2867
	T_{2Servo}	Nm	198	210	225	221	229	226
		in.lb	1752	1859	1991	1956	2027	2000
	η	%	93	91	88	83	74	68
n_1=1000 rpm	T_{2Max}	Nm	264	284	290	298	304	301
		in.lb	2336	2513	2567	2637	2690	2664
	T_{2Servo}	Nm	192	228	240	238	245	241
		in.lb	1699	2018	2124	2106	2168	2133
	η	%	94	93	91	86	78	73
n_1=2000 rpm	T_{2Max}	Nm	202	243	262	271	282	278
		in.lb	1788	2151	2319	2398	2496	2460
	T_{2Servo}	Nm	174	212	230	238	248	243
		in.lb	1540	1876	2036	2106	2195	2151
	η	%	96	94	93	89	83	78
n_1=3000 rpm	T_{2Max}	Nm	164	190	202	209	235	231
		in.lb	1451	1682	1788	1850	2080	2044
	T_{2Servo}	Nm	128	166	184	209	198	194
		in.lb	1133	1469	1628	1850	1752	1717
	η	%	96	95	94	91	85	81
n_1=4000 rpm	T_{2Max}	Nm	128	148	164	175	201	198
		in.lb	1133	1310	1451	1549	1779	1752
	T_{2Servo}	Nm	104	132	152	175	165	162
		in.lb	920	1168	1345	1549	1460	1434
	η	%	97	96	94	92	86	83
Emergency stop torque	T_{2Not}	Nm	460	484	491	494	518	447
		in.lb	4071	4283	4345	4372	4584	3956
Nominal input speed	n_{1N}	rpm	4000	4000	4000	4000	4000	4000
Max. input speed	n_{1Max}	rpm	4500					
Mean no load running torque [a] (With n_1=3000 min^{-1} and 20° C gear temperature)	T_{012}	Nm	2,1	1,9	1,8	1,7	1,6	1,4
		in.lb	18,6	16,8	15,9	15,0	14,2	12,4
Max. torsional backlash	j_t	arcmin	≤3					
Torsional rigidity	C_{t12}	Nm/arcmin	28					
		in.lb/arcmin	248					
Max. axial force [b]	F_{2AMax}	N	8250					
		lb_f	1856					
Max. radial force [b]	F_{2RMax}	N	6000					
		lb_f	1350					
Max. tilting moment	M_{2KMax}	Nm	843					
		in.lb	7461					
Service life (For calculation see "Information")	L_h	h	> 20000					
Weight (without motor attechment parts)	m	kg	15					
		lb_m	33,2					
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	-15 to +40					
		F	5 to 104					
Lubrication			Synthetic transmission oil					
Paint			None					
Direction of rotation			See drawing					
Protection class			IP 65					
Moment of inertia (relates to the drive)	J_1	kgcm²	6,72	5,79	5,54	5,44	5,41	5,35
		10^{-3} in.lb.s²	5,95	5,12	4,90	4,82	4,78	4,74

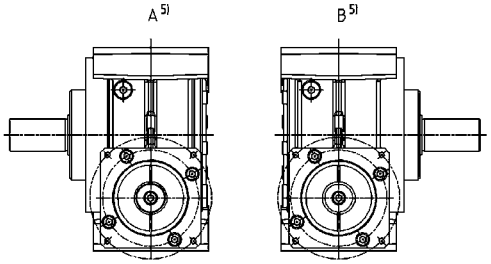
[a] Decrease in operation

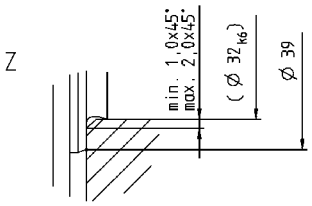
[b] In reference to the center of output flange/shaft

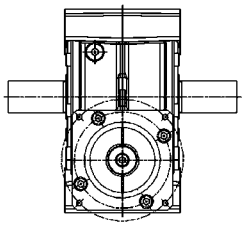








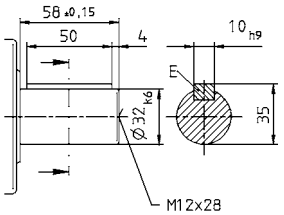




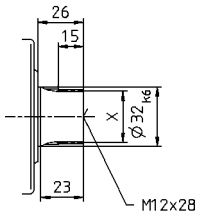
Optional dual-shaft output. Drawings available upon request.
Involute gearing is not possible.

Alternatives: Output shaft variants

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



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



Non-tolerated dimensions ± 1 mm

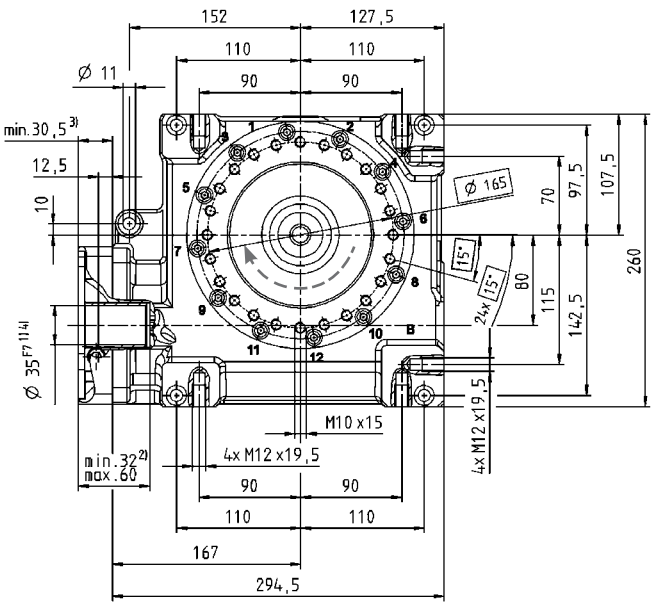
1) Check motor shaft fit.
2) Min./Max. permissible motor shaft length.
   Longer motor shafts are adaptable, please contact us.
3) The dimensions depend on the motor.
4) Smaller motor shaft diameter is compensated by a bushing with a minimum thickness of 1 mm.
5) Output side

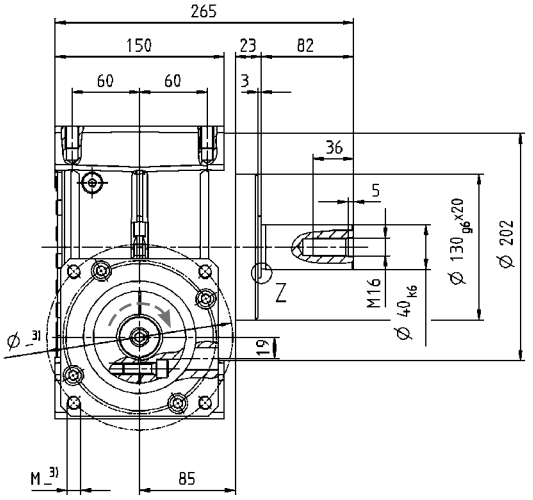
⚠ Motor mounting according to operating manual

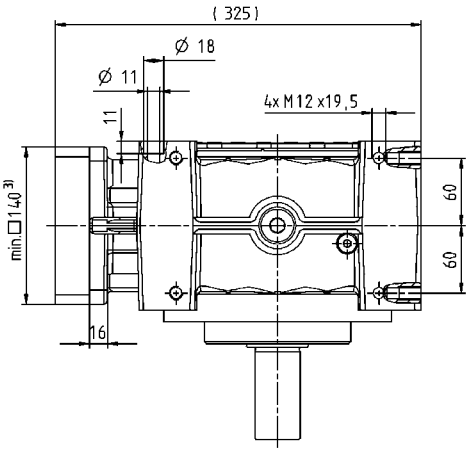
			1-stage					
Ratio	***i***		**4**	**7**	**10**	**16**	**28**	**40**
n_1=500 rpm	T_{2Max}	Nm	578	646	672	702	785	676
		in.lb	5115	5717	5947	6213	6947	5983
	T_{2Servo}	Nm	469	601	613	677	764	631
		in.lb	4151	5319	5425	5991	6761	5584
	η	%	94	92	89	86	77	70
n_1=1000 rpm	T_{2Max}	Nm	514	602	588	656	698	613
		in.lb	4549	5328	5204	5806	6177	5425
	T_{2Servo}	Nm	491	574	561	625	665	584
		in.lb	4345	5080	4965	5531	5885	5168
	η	%	95	93	91	88	81	74
n_1=2000 rpm	T_{2Max}	Nm	350	435	431	500	536	470
		in.lb	3098	3850	3814	4425	4744	4160
	T_{2Servo}	Nm	335	415	411	476	511	448
		in.lb	2965	3673	3637	4213	4522	3965
	η	%	96	95	93	89	84	79
n_1=3000 rpm	T_{2Max}	Nm	259	336	334	400	433	380
		in.lb	2292	2974	2956	3540	3832	3363
	T_{2Servo}	Nm	247	320	319	381	413	362
		in.lb	2186	2832	2823	3372	3655	3204
	η	%	97	96	94	92	86	81
n_1=4000 rpm	T_{2Max}	Nm	227	299	300	362	394	346
		in.lb	2009	2646	2655	3204	3487	3062
	T_{2Servo}	Nm	217	285	286	345	376	330
		in.lb	1920	2522	2531	3053	3328	2921
	η	%	97	96	94	92	87	82
Emergency stop torque	T_{2Not}	Nm	938	993	963	1005	1064	941
		in.lb						
Nominal input speed	n_{1N}	rpm	3500	3500	3500	3500	3500	3500
Max. input speed	n_{1Max}	rpm	4000					
Mean no load running torque [a] (With n_1=3000 min^{-1} and 20° C gear temperature)	T_{012}	Nm	3,6	3,5	3,4	3,2	3	2,8
		in.lb	31,9	31,0	30,1	28,3	26,6	24,8
Max. torsional backlash	j_t	arcmin	≤3					
Torsional rigidity	C_{t12}	Nm/arcmin	78					
		in.lb/arcmin	690					
Max. axial force [b]	F_{2AMax}	N	13900					
		lb_f	3128					
Max. radial force [b]	F_{2RMax}	N	9000					
		lb_f	2025					
Max. tilting moment	M_{2KMax}	Nm	1544					
		in.lb	13664					
Service life (For calculation see "Information")	L_h	h	> 20000					
Weight (without motor attechment parts)	m	kg	32					
		lb_m	70,7					
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	-15 to +40					
		F	5 to 104					
Lubrication			Synthetic transmission oil					
Paint			None					
Direction of rotation			See drawing					
Protection class			IP 65					
Moment of inertia (relates to the drive)	J_1	kgcm²	20,74	17,57	17,70	16,34	16,25	16,91
		10^{-3} in.lb.s²	18,36	15,55	15,67	14,46	14,38	14,96

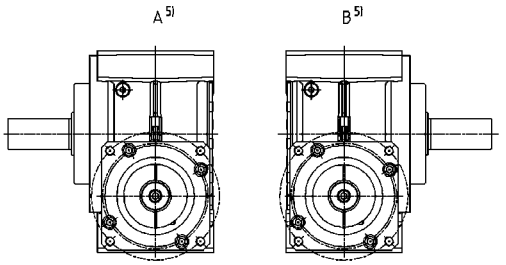
[a]) Decrease in operation

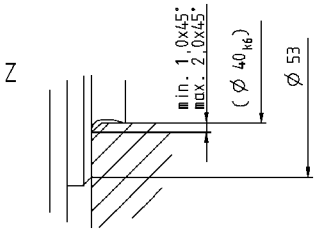
[b]) In reference to the center of output flange/shaft

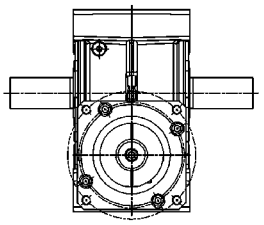








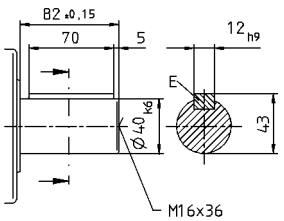




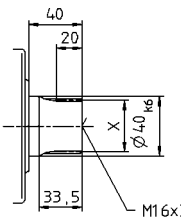
Optional dual-shaft output. Drawings available upon request.
Involute gearing is not possible.

Alternatives: Output shaft variants

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



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



Non-tolerated dimensions ± 1 mm

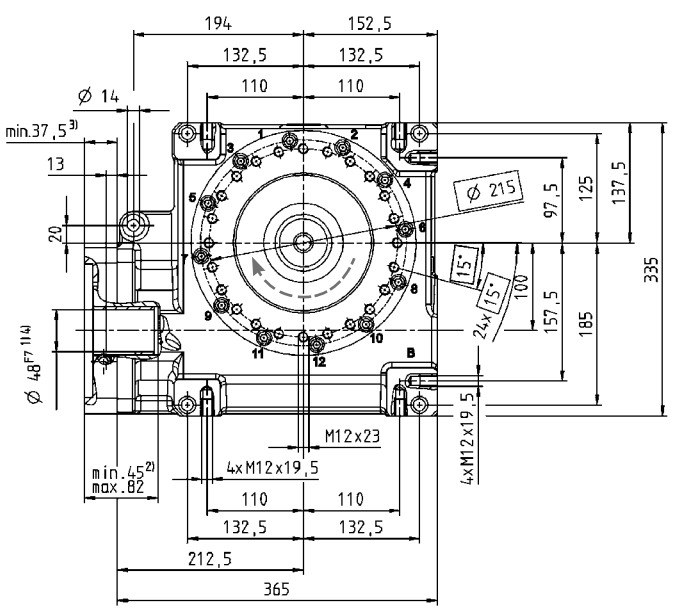
1) Check motor shaft fit.
2) Min./Max. permissible motor shaft length.
   Longer motor shafts are adaptable, please contact us.
3) The dimensions depend on the motor.
4) Smaller motor shaft diameter is compensated by a bushing with a minimum thickness of 1 mm.
5) Output side

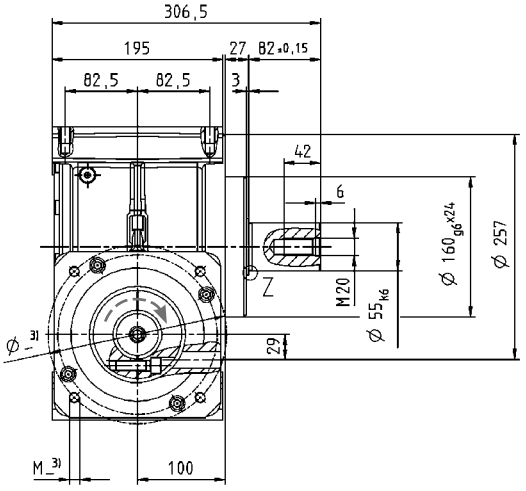
⚠ Motor mounting according to operating manual

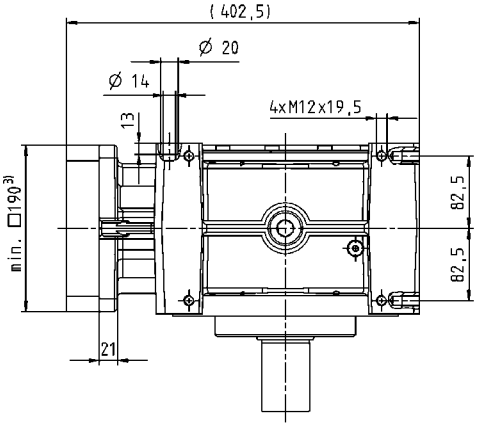
			1-stage					
Ratio	***i***		**4**	**7**	**10**	**16**	**28**	**40**
n_1=500 rpm	T_{2Max}	Nm	1184	1336	1377	1392	1505	1376
		in.lb	10478	11824	12186	12319	13319	12178
	T_{2Servo}	Nm	1155	1304	1343	1359	1469	1343
		in.lb	10222	11540	11886	12027	13001	11886
	η	%	95	93	91	87	80	76
n_1=1000 rpm	T_{2Max}	Nm	905	1070	1122	1140	1251	1162
		in.lb	8009	9470	9930	10089	11071	10284
	T_{2Servo}	Nm	883	1044	1095	1113	1221	1134
		in.lb	7815	9239	9691	9850	10806	10036
	η	%	95	94	92	88	82	79
n_1=2000 rpm	T_{2Max}	Nm	595	748	807	830	930	883
		in.lb	5266	6620	7142	7346	8231	7815
	T_{2Servo}	Nm	581	730	788	810	908	862
		in.lb	5142	6461	6974	7169	8036	7629
	η	%	96	95	94	91	86	82
n_1=3000 rpm	T_{2Max}	Nm	430	564	621	644	735	709
		in.lb	3806	4991	5496	5699	6505	6275
	T_{2Servo}	Nm	420	551	606	629	718	692
		in.lb	3717	4876	5363	5567	6354	6124
	η	%	97	96	95	92	87	84
n_1=4000 rpm	T_{2Max}	Nm in.lb	–	–	–	–	–	–
	T_{2Servo}	Nm in.lb	–	–	–	–	–	–
	η	%	–	–	–	–	–	–
Emergency stop torque	T_{2Not}	Nm	1819	1932	1940	1955	2073	1856
		in.lb	16098	17098	17169	17302	18346	16426
Nominal input speed	n_{1N}	rpm	3000	3000	3000	3000	3000	3000
Max. input speed	n_{1Max}	rpm	3500					
Mean no load running torque [a] (With n_1=3000 min^{-1} and 20° C gear temperature)	T_{012}	Nm	9,8	8,1	7,4	6,7	5,8	5
		in.lb	86,7	71,7	65,5	59,3	51,3	44,3
Max. torsional backlash	j_t	arcmin	≤3					
Torsional rigidity	C_{t12}	Nm/arcmin	153					
		in.lb/arcmin	1354					
Max. axial force [b]	F_{2AMax}	N	19500					
		lb_f	4388					
Max. radial force [b]	F_{2RMax}	N	14000					
		lb_f	3150					
Max. tilting moment	M_{2KMax}	Nm	3059					
		in.lb	27072					
Service life (For calculation see "Information")	L_h	h	> 20000					
Weight (without motor attechment parts)	m	kg	61					
		lb_m	134,8					
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	-15 to +40					
		F	5 to 104					
Lubrication			Synthetic transmission oil					
Paint			None					
Direction of rotation			See drawing					
Protection class			IP 65					
Moment of inertia (relates to the drive)	J_1	kgcm²	65,59	56,20	54,30	55,17	52,71	53,04
		10^{-3} in.lb.s²	58,05	49,73	48,06	48,83	46,65	46,94

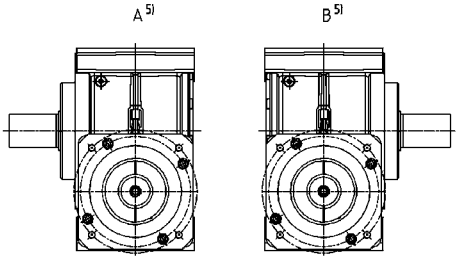
[a]) Decrease in operation

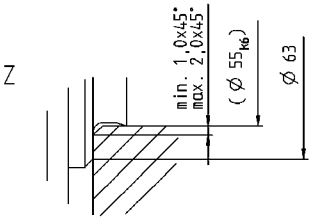
[b]) In reference to the center of output flange/shaft

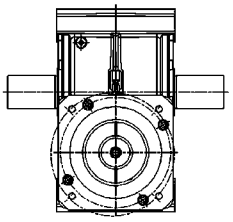








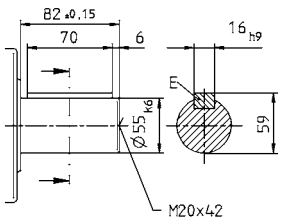




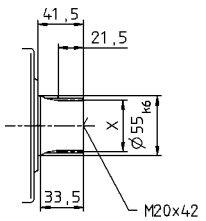
Optional dual-shaft output. Drawings available upon request.
Involute gearing is not possible.

Alternatives: Output shaft variants

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



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



Non-tolerated dimensions ± 1 mm

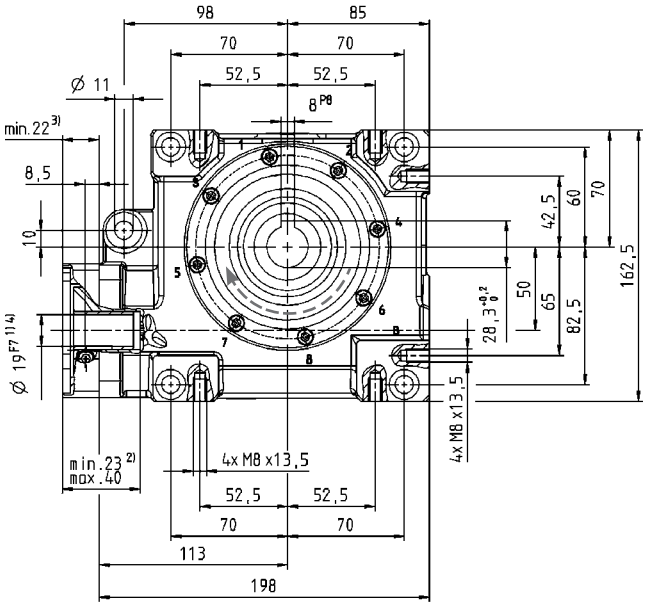
1) Check motor shaft fit.
2) Min./Max. permissible motor shaft length.
   Longer motor shafts are adaptable, please contact us.
3) The dimensions depend on the motor.
4) Smaller motor shaft diameter is compensated by a bushing with a minimum thickness of 1 mm.
5) Output side

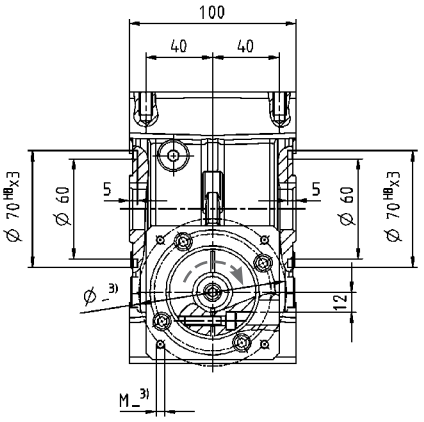
⚠ Motor mounting according to operating manual

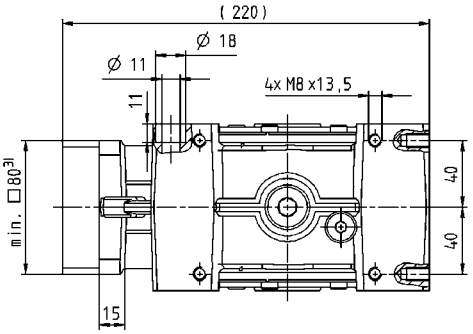
			1-stage					
Ratio	***i***		**4**	**7**	**10**	**16**	**28**	**40**
n_1=500 rpm	T_{2Max}	Nm	124	132	148	154	165	158
		in.lb	1097	1168	1310	1363	1460	1398
	T_{2Servo}	Nm	54	71	74	81	90	74
		in.lb	478	628	655	717	797	655
	η	%	92	89	86	82	72	64
n_1=1000 rpm	T_{2Max}	Nm	124	130	136	140	151	142
		in.lb	1097	1151	1204	1239	1336	1257
	T_{2Servo}	Nm	58	76	80	88	97	81
		in.lb	513	673	708	779	858	717
	η	%	94	91	89	85	77	69
n_1=2000 rpm	T_{2Max}	Nm	88	106	112	120	134	122
		in.lb	779	938	991	1062	1186	1080
	T_{2Servo}	Nm	60	78	82	89	99	83
		in.lb	531	690	726	788	876	735
	η	%	95	93	91	88	75	75
n_1=3000 rpm	T_{2Max}	Nm	72	86	95	106	112	108
		in.lb	637	761	841	938	991	956
	T_{2Servo}	Nm	59	77	81	88	97	81
		in.lb	522	681	717	779	858	717
	η	%	96	94	93	90	83	78
n_1=4000 rpm	T_{2Max}	Nm	62	77	83	92	102	95
		in.lb	549	681	735	814	903	841
	T_{2Servo}	Nm	58	76	79	87	96	80
		in.lb	513	673	699	770	850	708
	η	%	96	95	93	91	85	80
Emergency stop torque	T_{2Not}	Nm	230	242	242	250	262	236
		in.lb	2036	2142	2142	2213	2319	2089
Nominal input speed	n_{1N}	rpm	4000	4000	4000	4000	4000	4000
Max. input speed	n_{1Max}	rpm	6000					
Mean no load running torque [a] (With n_1=3000 min^{-1} and 20° C gear temperature)	T_{012}	Nm	1,3	1,2	1,2	1,1	1	0,9
		in.lb	11,5	10,6	10,6	9,7	8,9	8,0
Max. torsional backlash	j_t	arcmin	≤3					
Torsional rigidity	C_{t12}	Nm/arcmin	8					
		in.lb/arcmin	71					
Max. axial force [b]	F_{2AMax}	N	5000					
		lb_f	1125					
Max. radial force [b]	F_{2RMax}	N	3800					
		lb_f	855					
Max. tilting moment	M_{2KMax}	Nm	409					
		in.lb	3620					
Service life (For calculation see "Information")	L_h	h	> 20000					
Weight (without motor attechment parts)	m	kg	7,4					
		lb_m	16,4					
Operating noise (with n_1 = 3000 rpm no load)	L_{PA}	dB(A)	≤ 62					
Max. permitted housing temperature		°C	+90					
		F	194					
Ambient temperature		°C	-15 to +40					
		F	5 to 104					
Lubrication			Synthetic transmission oil					
Paint			None					
Direction of rotation			See drawing					
Protection class			IP 65					
Moment of inertia (relates to the drive)	J_1	kgcm²	2,31	2,02	1,93	1,84	1,81	1,86
		10^{-3} in.lb.s²	2,04	1,79	1,71	1,63	1,60	1,64

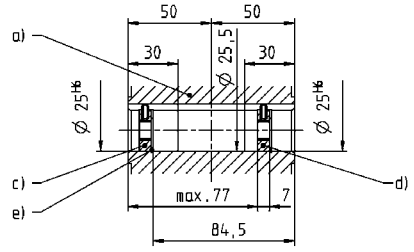
[a]) Decrease in operation

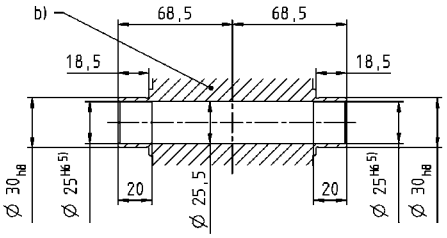
[b]) In reference to the center of output flange/shaft











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

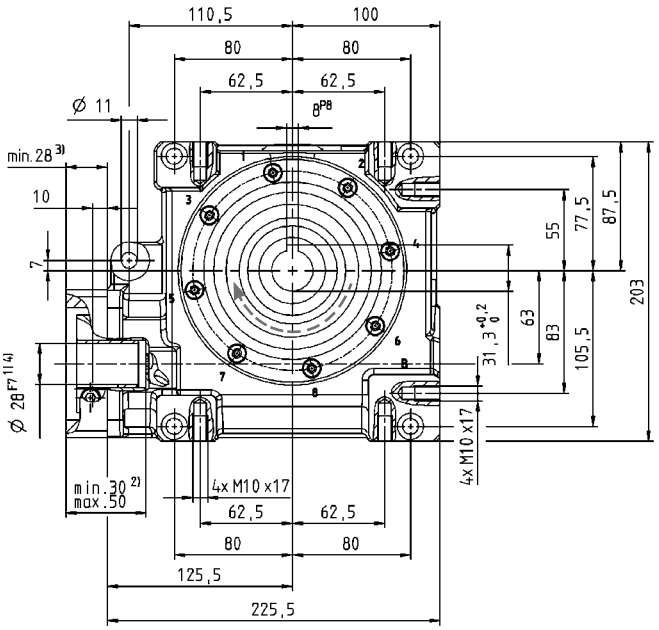
Non-tolerated dimensions ± 1 mm
1) Check motor shaft fit.
2) Min./Max. permissible motor shaft length.
Longer motor shafts are adaptable, please contact us.
3) The dimensions depend on the motor.
4) Smaller motor shaft diameter is compensated by a bushing with a minimum thickness of 1 mm.
5) Tolerance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

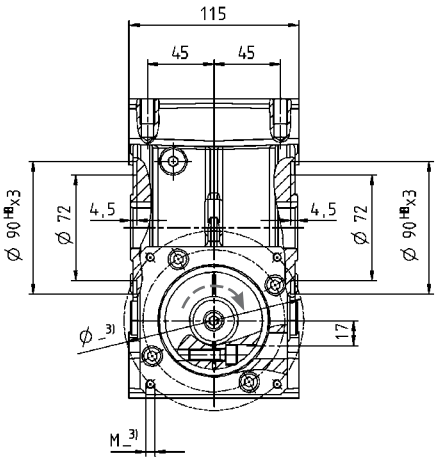
⚠ Motor mounting according to operating manual

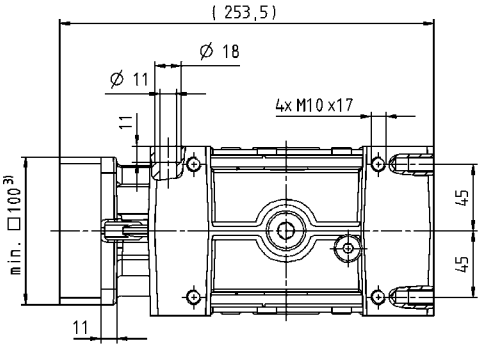
			1-stage					
Ratio	***i***		**4**	**7**	**10**	**16**	**28**	**40**
n_1=500 rpm	T_{2Max}	Nm	302	314	315	320	328	324
		in.lb	2673	2779	2788	2832	2903	2867
	T_{2Servo}	Nm	198	210	225	221	229	226
		in.lb	1752	1859	1991	1956	2027	2000
	η	%	93	91	88	83	74	68
n_1=1000 rpm	T_{2Max}	Nm	264	284	290	298	304	301
		in.lb	2336	2513	2567	2637	2690	2664
	T_{2Servo}	Nm	192	228	240	238	245	241
		in.lb	1699	2018	2124	2106	2168	2133
	η	%	94	93	91	86	78	73
n_1=2000 rpm	T_{2Max}	Nm	202	243	262	271	282	278
		in.lb	1788	2151	2319	2398	2496	2460
	T_{2Servo}	Nm	174	212	230	238	248	243
		in.lb	1540	1876	2036	2106	2195	2151
	η	%	96	94	93	89	83	78
n_1=3000 rpm	T_{2Max}	Nm	164	190	202	209	235	231
		in.lb	1451	1682	1788	1850	2080	2044
	T_{2Servo}	Nm	128	166	184	209	198	194
		in.lb	1133	1469	1628	1850	1752	1717
	η	%	96	95	94	91	85	81
n_1=4000 rpm	T_{2Max}	Nm	128	148	164	175	201	198
		in.lb	1133	1310	1451	1549	1779	1752
	T_{2Servo}	Nm	104	132	152	175	165	162
		in.lb	920	1168	1345	1549	1460	1434
	η	%	97	96	94	92	86	83
Emergency stop torque	T_{2Not}	Nm	460	484	491	494	518	447
		in.lb	4071	4283	4345	4372	4584	3956
Nominal input speed	n_{1N}	rpm	4000	4000	4000	4000	4000	4000
Max. input speed	n_{1Max}	rpm	4500					
Mean no load running torque [a] (With n_1=3000 min^{-1} and 20° C gear temperature)	T_{012}	Nm	2,1	1,9	1,8	1,7	1,6	1,4
		in.lb	18,6	16,8	15,9	15,0	14,2	12,4
Max. torsional backlash	j_t	arcmin	≤3					
Torsional rigidity	C_{t12}	Nm/arcmin	28					
		in.lb/arcmin	248					
Max. axial force [b]	F_{2AMax}	N	8250					
		lb_f	1856					
Max. radial force [b]	F_{2RMax}	N	6000					
		lb_f	1350					
Max. tilting moment	M_{2KMax}	Nm	843					
		in.lb	7461					
Service life (For calculation see "Information")	L_h	h	> 20000					
Weight (without motor attechment parts)	m	kg	12					
		lb_m	26,5					
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	-15 to +40					
		F	5 to 104					
Lubrication			Synthetic transmission oil					
Paint			None					
Direction of rotation			See drawing					
Protection class			IP 65					
Moment of inertia (relates to the drive)	J_1	kgcm²	6,68	5,77	5,53	5,44	5,40	5,35
		10^{-3} in.lb.s²	5,91	5,11	4,89	4,81	4,78	4,74

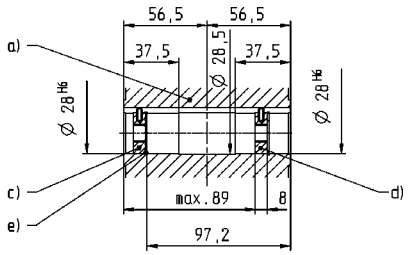
[a] Decrease in operation

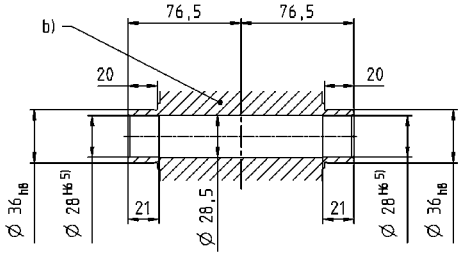
[b] In reference to the center of output flange/shaft











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

Non-tolerated dimensions ± 1 mm

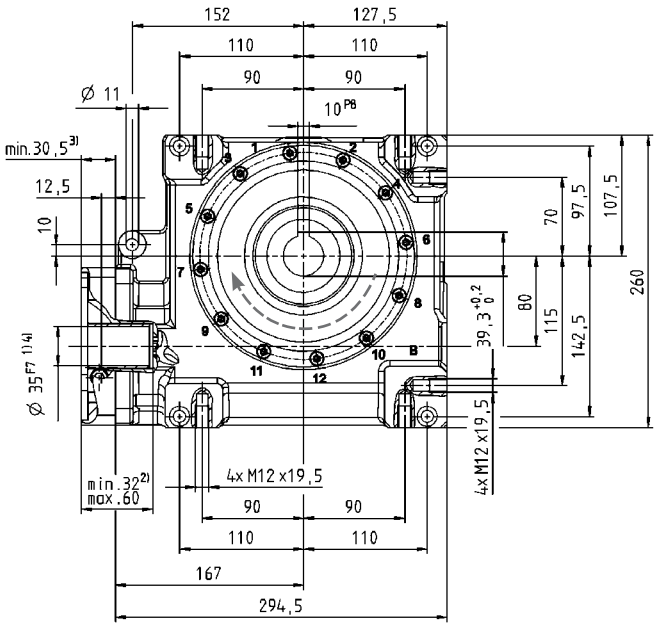
1) Check motor shaft fit.
2) Min./Max. permissible motor shaft length.
   Longer motor shafts are adaptable, please contact us.
3) The dimensions depend on the motor.
4) Smaller motor shaft diameter is compensated by a bushing with a minimum thickness of 1 mm.
5) Tolerance h6 for mounted shaft.

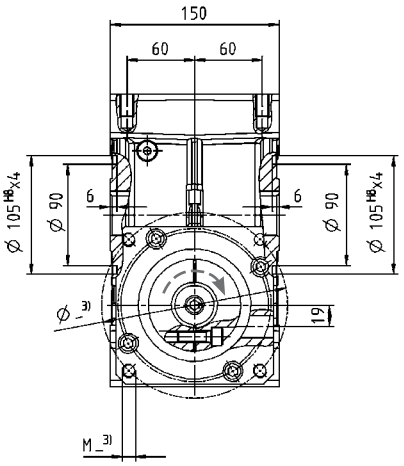
⚠ Motor mounting according to operating manual

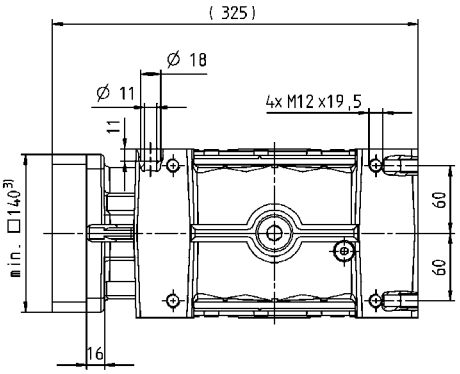
			1-stage					
Ratio	***i***		**4**	**7**	**10**	**16**	**28**	**40**
n_1=500 rpm	T_{2Max}	Nm	578	646	672	702	785	676
		in.lb	5115	5717	5947	6213	6947	5983
	T_{2Servo}	Nm	469	601	613	677	764	631
		in.lb	4151	5319	5425	5991	6761	5584
	η	%	94	93	91	87	80	76
n_1=1000 rpm	T_{2Max}	Nm	514	602	588	656	698	613
		in.lb	4549	5328	5204	5806	6177	5425
	T_{2Servo}	Nm	491	574	561	625	665	584
		in.lb	4345	5080	4965	5531	5885	5168
	η	%	95	93	91	88	81	74
n_1=2000 rpm	T_{2Max}	Nm	350	435	431	500	536	470
		in.lb	3098	3850	3814	4425	4744	4160
	T_{2Servo}	Nm	335	415	411	476	511	448
		in.lb	2965	3673	3637	4213	4522	3965
	η	%	96	95	93	89	84	79
n_1=3000 rpm	T_{2Max}	Nm	259	336	334	400	433	380
		in.lb	2292	2974	2956	3540	3832	3363
	T_{2Servo}	Nm	247	320	319	381	413	362
		in.lb	2186	2832	2823	3372	3655	3204
	η	%	97	96	94	92	86	81
n_1=4000 rpm	T_{2Max}	Nm	227	299	300	362	394	346
		in.lb	2009	2646	2655	3204	3487	3062
	T_{2Servo}	Nm	217	285	286	345	376	330
		in.lb	1920	2522	2531	3053	3328	2921
	η	%	97	96	94	92	87	82
Emergency stop torque	T_{2Not}	Nm	938	993	963	1005	1064	941
		in.lb	8301	8788	8523	8894	9416	8328
Nominal input speed	n_{1N}	rpm	3500	3500	3500	3500	3500	3500
Max. input speed	n_{1Max}	rpm	4000					
Mean no load running torque [a] (With n_1=3000 min^{-1} and 20° C gear temperature)	T_{012}	Nm	3,6	3,5	3,4	3,2	3	2,8
		in.lb	31,9	31,0	30,1	28,3	26,6	24,8
Max. torsional backlash	j_t	arcmin	≤3					
Torsional rigidity	C_{t12}	Nm/arcmin	78					
		in.lb/arcmin	690					
Max. axial force [b]	F_{2AMax}	N	13900					
		lb_f	3128					
Max. radial force [b]	F_{2RMax}	N	9000					
		lb_f	2025					
Max. tilting moment	M_{2KMax}	Nm	1544					
		in.lb	13664					
Service life (For calculation see "Information")	L_h	h	> 20000					
Weight (without motor attechment parts)	m	kg	26					
		lb_m	57,5					
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	-15 to +40					
		F	5 to 104					
Lubrication			Synthetic transmission oil					
Paint			None					
Direction of rotation			See drawing					
Protection class			IP 65					
Moment of inertia (relates to the drive)	J_1	kgcm²	21,31	17,76	17,80	16,38	16,27	16,91
		10^{-3} in.lb.s²	18,86	15,72	15,75	14,49	14,40	14,97

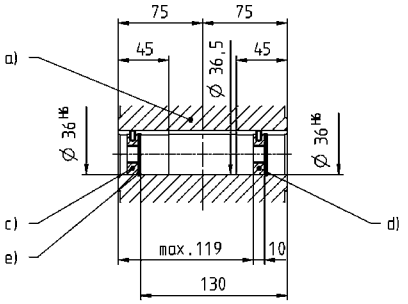
[a]) Decrease in operation

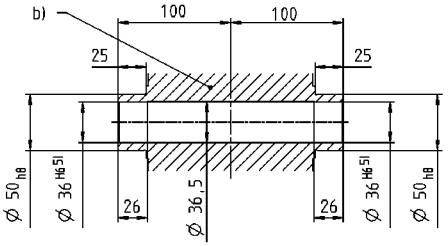
[b]) In reference to the center of output flange/shaft











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

Non-tolerated dimensions ± 1 mm

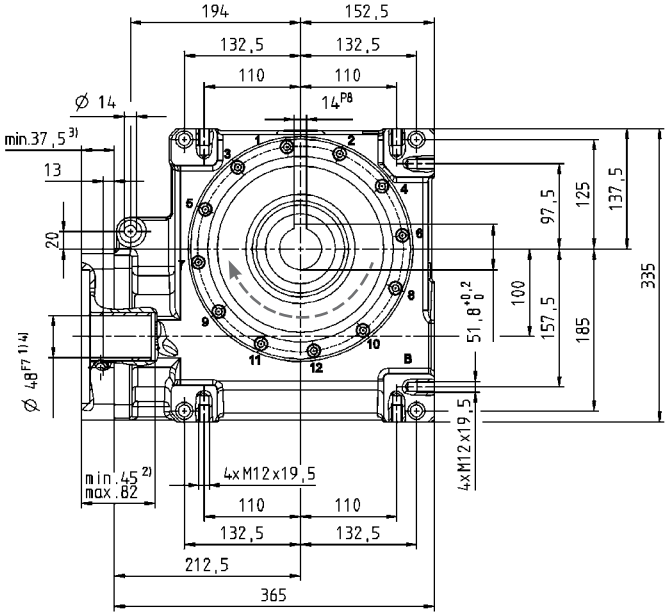
1) Check motor shaft fit.
2) Min./Max. permissible motor shaft length.
   Longer motor shafts are adaptable, please contact us.
3) The dimensions depend on the motor.
4) Smaller motor shaft diameter is compensated by a bushing with a minimum thickness of 1 mm.
5) Tolerance h6 for mounted shaft.

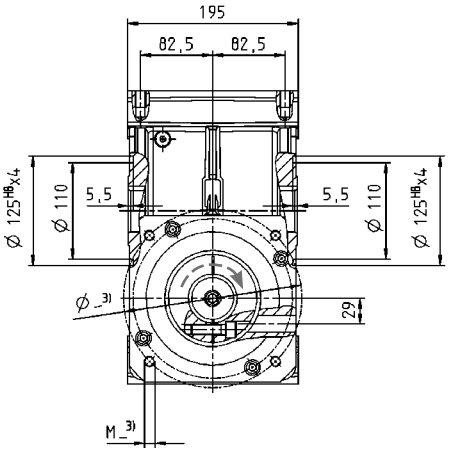
⚠ Motor mounting according to operating manual

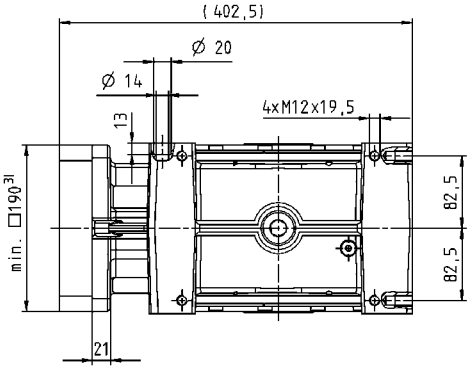
			1-stage					
Ratio	***i***		**4**	**7**	**10**	**16**	**28**	**40**
n_1=500 rpm	T_{2Max}	Nm	1184	1336	1377	1392	1505	1376
		in.lb	10478	11824	12186	12319	13319	12178
	T_{2Servo}	Nm	1155	1304	1343	1359	1469	1343
		in.lb	10222	11540	11886	12027	13001	11886
	η	%	95	93	91	87	80	76
n_1=1000 rpm	T_{2Max}	Nm	905	1070	1122	1140	1251	1162
		in.lb	8009	9470	9930	10089	11071	10284
	T_{2Servo}	Nm	883	1044	1095	1113	1221	1134
		in.lb	7815	9239	9691	9850	10806	10036
	η	%	95	94	92	88	82	79
n_1=2000 rpm	T_{2Max}	Nm	595	748	807	830	930	883
		in.lb	5266	6620	7142	7346	8231	7815
	T_{2Servo}	Nm	581	730	788	810	908	862
		in.lb	5142	6461	6974	7169	8036	7629
	η	%	96	95	94	91	86	82
n_1=3000 rpm	T_{2Max}	Nm	430	564	621	644	735	709
		in.lb	3806	4991	5496	5699	6505	6275
	T_{2Servo}	Nm	420	551	606	629	718	692
		in.lb	3717	4876	5363	5567	6354	6124
	η	%	97	96	95	92	87	84
n_1=4000 rpm	T_{2Max}	Nm in.lb	–	–	–	–	–	–
	T_{2Servo}	Nm in.lb	–	–	–	–	–	–
	η	%	–	–	–	–	–	–
Emergency stop torque	T_{2Not}	Nm	1819	1932	1940	1955	2073	1856
		in.lb	16098	17098	17169	17302	18346	16426
Nominal input speed	n_{1N}	rpm	3000	3000	3000	3000	3000	3000
Max. input speed	n_{1Max}	rpm	3500					
Mean no load running torque [a] (With n_1=3000 min^{-1} and 20° C gear temperature)	T_{012}	Nm	9,8	8,1	7,4	6,7	5,8	5
		in.lb	86,7	71,7	65,5	59,3	51,3	44,3
Max. torsional backlash	j_t	arcmin	≤3					
Torsional rigidity	C_{t12}	Nm/arcmin	153					
		in.lb/arcmin	1354					
Max. axial force [b]	F_{2AMax}	N	19500					
		lb_f	4388					
Max. radial force [b]	F_{2RMax}	N	14000					
		lb_f	3150					
Max. tilting moment	M_{2KMax}	Nm	3059					
		in.lb	27072					
Service life (For calculation see "Information")	L_h	h	> 20000					
Weight (without motor attechment parts)	m	kg	50					
		lb_m	110,5					
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	-15 to +40					
		F	5 to 104					
Lubrication			Synthetic transmission oil					
Paint			None					
Direction of rotation			See drawing					
Protection class			IP 65					
Moment of inertia (relates to the drive)	J_1	kgcm²	65,82	56,27	54,34	55,19	52,72	53,04
		10^{-3} in.lb.s²	58,25	49,80	48,09	48,84	46,66	46,94

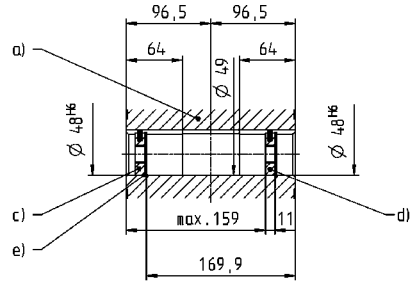
[a]) Decrease in operation

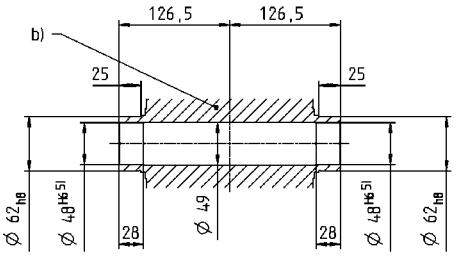
[b]) In reference to the center of output flange/shaft











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

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

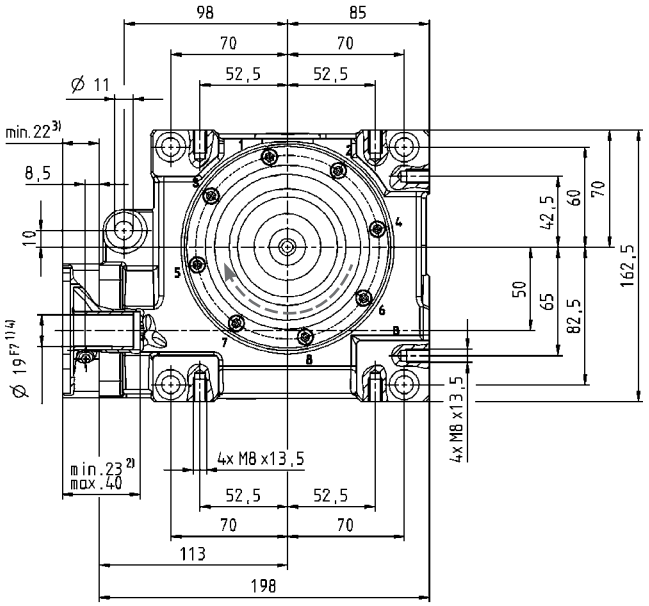
⚠ Motor mounting according to operating manual

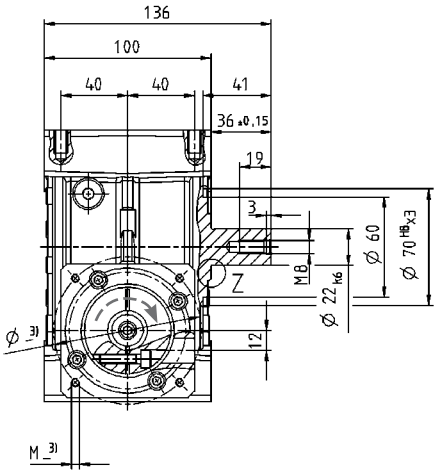
VDS economy 050 1-stage

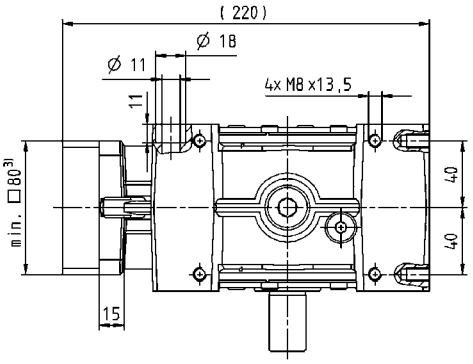
			1-stage					
Ratio	***i***		**4**	**7**	**10**	**16**	**28**	**40**
n_1=500 rpm	T_{2Max}	Nm	–	102	111	118	128	116
		in.lb	–	903	982	1044	1133	1027
	T_{2Servo}	Nm	–	62	64	70	78	64
		in.lb	–	549	566	620	690	566
	η	%	–	89	86	82	72	64
n_1=1000 rpm	T_{2Max}	Nm	–	103	108	114	124	112
		in.lb	–	912	956	1009	1097	991
	T_{2Servo}	Nm	–	66	70	76	84	70
		in.lb	–	584	620	673	743	620
	η	%	–	91	89	85	77	69
n_1=2000 rpm	T_{2Max}	Nm	–	92	97	105	117	103
		in.lb	–	814	858	929	1035	912
	T_{2Servo}	Nm	–	68	71	77	86	72
		in.lb	–	602	628	681	761	637
	η	%	–	93	91	88	75	75
n_1=3000 rpm	T_{2Max}	Nm	–	82	88	97	105	95
		in.lb	–	726	779	858	929	841
	T_{2Servo}	Nm	–	67	70	76	84	70
		in.lb	–	593	620	673	743	620
	η	%	–	94	93	90	83	78
n_1=4000 rpm	T_{2Max}	Nm	–	77	81	90	99	88
		in.lb	–	681	717	797	876	779
	T_{2Servo}	Nm	–	64	69	75	83	69
		in.lb	–	566	611	664	735	611
	η	%	–	95	93	91	85	80
Emergency stop torque	T_{2Not}	Nm	–	242	242	250	262	236
		in.lb	–	2142	2142	2213	2319	2089
Nominal input speed	n_{1N}	rpm	–	4000	4000	4000	4000	4000
Max. input speed	n_{1Max}	rpm	6000					
Mean no load running torque [a] (With n_1=3000 min^{-1} and 20° C gear temperature)	T_{012}	Nm	–	1,2	1,2	1,1	1	0,9
		in.lb	–	10,6	10,6	9,7	8,9	8,0
Max. torsional backlash	j_t	arcmin	≤8					
Torsional rigidity	C_{t12}	Nm/arcmin	8					
		in.lb/arcmin	71					
Max. axial force [b]	F_{2AMax}	N	5000					
		lb_f	1125					
Max. radial force [b]	F_{2RMax}	N	3800					
		lb_f	855					
Max. tilting moment	M_{2KMax}	Nm	409					
		in.lb	3620					
Service life (For calculation see "Information")	L_h	h	> 20000					
Weight (without motor attechment parts)	m	kg	7,7					
		lb_m	17,0					
Operating noise (with n_1 = 3000 rpm no load)	L_{PA}	dB(A)	≤ 62					
Max. permitted housing temperature		°C	+90					
		F	194					
Ambient temperature		°C	-15 to +40					
		F	5 to 104					
Lubrication			Synthetic transmission oil					
Paint			None					
Direction of rotation			See drawing					
Protection class			IP 65					
Moment of inertia (relates to the drive)	J_1	kgcm²	–	2,01	1,93	1,84	1,81	1,86
		10^{-3} in.lb.s²	–	1,78	1,71	1,63	1,60	1,64

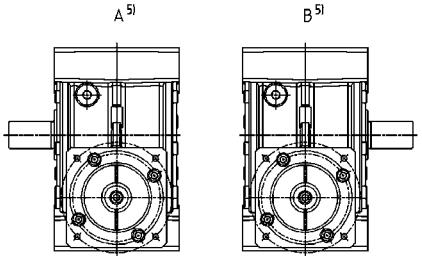
[a]) Decrease in operation

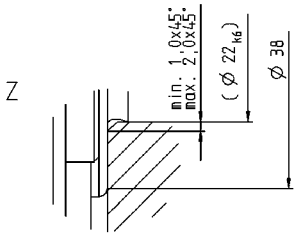
[b]) In reference to the center of output flange/shaft

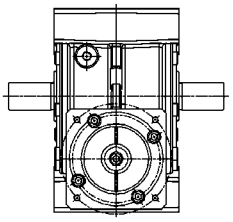










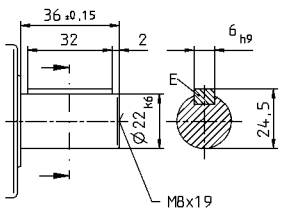


Optional dual-shaft output. Drawings available upon request.

Alternatives: Output shaft variants

Keywayed output shaft in mm

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



Non-tolerated dimensions ± 1 mm

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

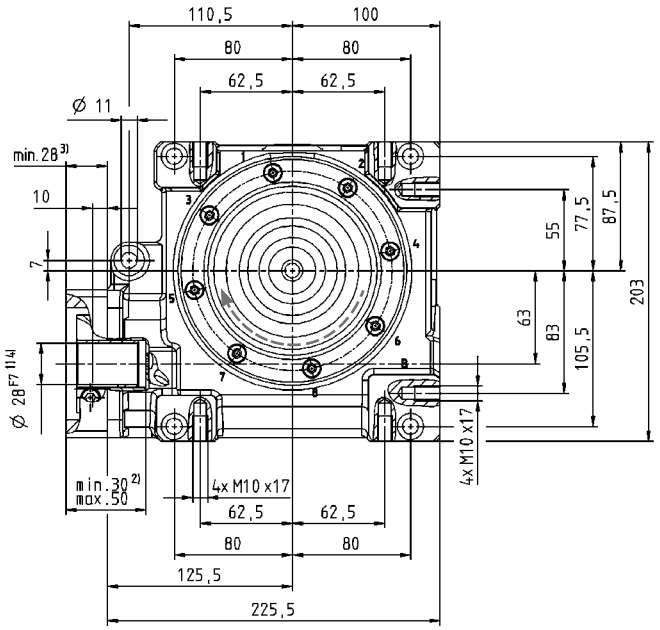
⚠ Motor mounting according to operating manual

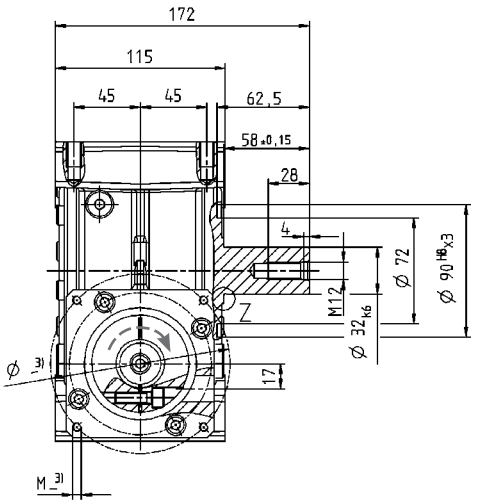
VDS economy 063 1-stage

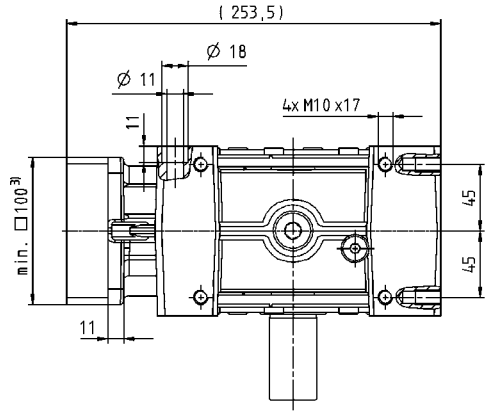
			1-stage					
Ratio	***i***		**4**	**7**	**10**	**16**	**28**	**40**
n_1=500 rpm	T_{2Max}	Nm	–	264	270	279	301	282
		in.lb	–	2336	2390	2469	2664	2496
	T_{2Servo}	Nm	–	183	195	198	215	201
		in.lb	–	1620	1726	1752	1903	1779
	η	%	–	91	88	83	74	68
n_1=1000 rpm	T_{2Max}	Nm	–	256	265	276	299	280
		in.lb	–	2266	2345	2443	2646	2478
	T_{2Servo}	Nm	–	197	208	212	230	215
		in.lb	–	1743	1841	1876	2036	1903
	η	%	–	93	91	86	78	73
n_1=2000 rpm	T_{2Max}	Nm	–	234	252	263	277	269
		in.lb	–	2071	2230	2328	2451	2381
	T_{2Servo}	Nm	–	188	203	212	224	217
		in.lb	–	1664	1797	1876	1982	1920
	η	%	–	94	93	89	83	78
n_1=3000 rpm	T_{2Max}	Nm	–	183	198	209	230	224
		in.lb	–	1620	1752	1850	2036	1982
	T_{2Servo}	Nm	–	145	163	181	182	177
		in.lb	–	1283	1443	1602	1611	1566
	η	%	–	95	94	91	85	81
n_1=4000 rpm	T_{2Max}	Nm	–	146	162	175	196	193
		in.lb	–	1292	1434	1549	1735	1708
	T_{2Servo}	Nm	–	114	134	152	152	149
		in.lb	–	1009	1186	1345	1345	1319
	η	%	–	96	94	92	86	83
Emergency stop torque	T_{2Not}	Nm	–	484	491	494	518	447
		in.lb	–	4283	4345	4372	4584	3956
Nominal input speed	n_{1N}	rpm	–	4000	4000	4000	4000	4000
Max. input speed	n_{1Max}	rpm	6000					
Mean no load running torque [a] (With n_1=3000 min^{-1} and 20° C gear temperature)	T_{012}	Nm	–	1,9	1,8	1,7	1,6	1,4
		in.lb	–	16,8	15,9	15,0	14,2	12,4
Max. torsional backlash	j_t	arcmin	≤8					
Torsional rigidity	C_{t12}	Nm/arcmin	28					
		in.lb/arcmin	248					
Max. axial force [b]	F_{2AMax}	N	8250					
		lb_f	1856					
Max. radial force [b]	F_{2RMax}	N	6000					
		lb_f	1350					
Max. tilting moment	M_{2KMax}	Nm	843					
		in.lb	7461					
Service life (For calculation see "Information")	L_h	h	> 20000					
Weight (without motor attechment parts)	m	kg	12,5					
		lb_m	27,6					
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	-15 to +40					
		F	5 to 104					
Lubrication			Synthetic transmission oil					
Paint			None					
Direction of rotation			See drawing					
Protection class			IP 65					
Moment of inertia (relates to the drive)	J_1	kgcm²	–	5,78	5,53	5,44	5,40	5,35
		10^{-3} in.lb.s²	–	5,12	4,90	4,82	4,78	4,74

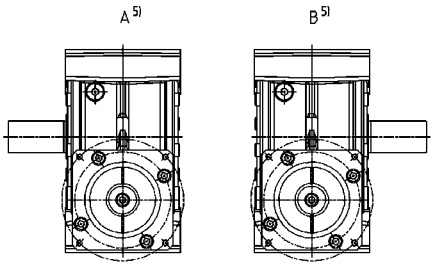
[a]) Decrease in operation

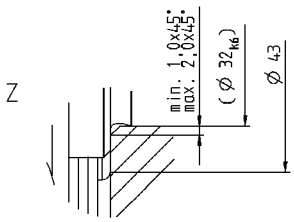
[b]) In reference to the center of output flange/shaft

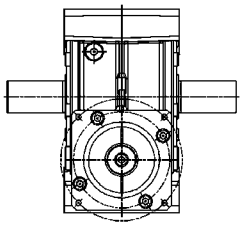










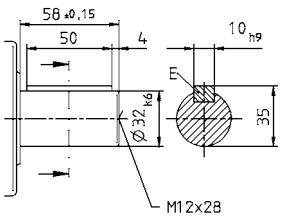


Optional dual-shaft output. Drawings available upon request.

Alternatives: Output shaft variants

Keywayed output shaft in mm

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



Non-tolerated dimensions ± 1 mm

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

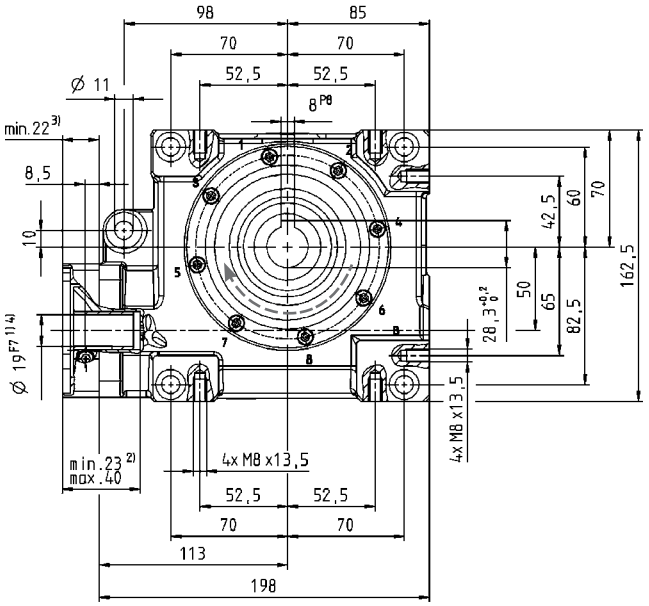
⚠ Motor mounting according to operating manual

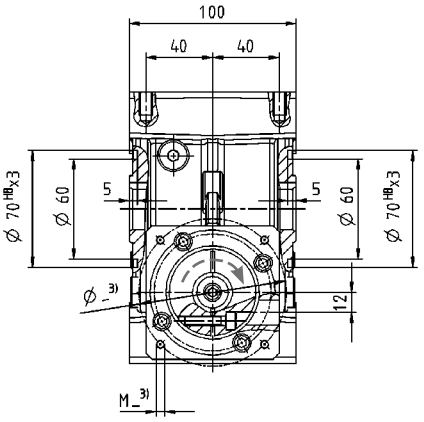
VDH economy 050 1-stage

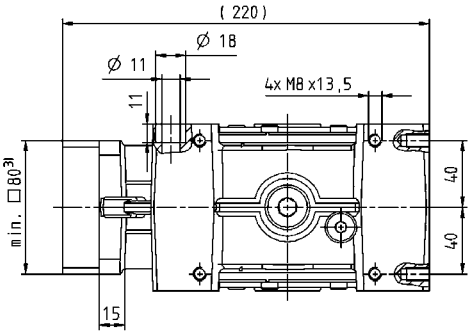
			1-stage					
Ratio	***i***		**4**	**7**	**10**	**16**	**28**	**40**
n_1=500 rpm	T_{2Max}	Nm	–	102	111	118	128	116
		in.lb	–	903	982	1044	1133	1027
	T_{2Servo}	Nm	–	62	64	70	78	64
		in.lb	–	549	566	620	690	566
	η	%	–	89	86	82	72	64
n_1=1000 rpm	T_{2Max}	Nm	–	103	108	114	124	112
		in.lb	–	912	956	1009	1097	991
	T_{2Servo}	Nm	–	66	70	76	84	70
		in.lb	–	584	620	673	743	620
	η	%	–	91	89	85	77	69
n_1=2000 rpm	T_{2Max}	Nm	–	92	97	105	117	103
		in.lb	–	814	858	929	1035	912
	T_{2Servo}	Nm	–	68	71	77	86	72
		in.lb	–	602	628	681	761	637
	η	%	–	93	91	88	75	75
n_1=3000 rpm	T_{2Max}	Nm	–	82	88	97	105	95
		in.lb	–	726	779	858	929	841
	T_{2Servo}	Nm	–	67	70	76	84	70
		in.lb	–	593	620	673	743	620
	η	%	–	94	93	90	83	78
n_1=4000 rpm	T_{2Max}	Nm	–	77	81	90	99	88
		in.lb	–	681	717	797	876	779
	T_{2Servo}	Nm	–	64	69	75	83	69
		in.lb	–	566	611	664	735	611
	η	%	–	95	93	91	85	80
Emergency stop torque	T_{2Not}	Nm	–	242	242	250	262	236
		in.lb	–	2142	2142	2213	2319	2089
Nominal input speed	n_{1N}	rpm	–	4000	4000	4000	4000	4000
Max. input speed	n_{1Max}	rpm	6000					
Mean no load running torque [a] (With n_1=3000 min^{-1} and 20° C gear temperature)	T_{012}	Nm	–	1,2	1,2	1,1	1	0,9
		in.lb	–	10,6	10,6	9,7	8,9	8,0
Max. torsional backlash	j_t	arcmin	≤8					
Torsional rigidity	C_{t12}	Nm/arcmin	8					
		in.lb/arcmin	71					
Max. axial force [b]	F_{2AMax}	N	5000					
		lb_f	1125					
Max. radial force [b]	F_{2RMax}	N	3800					
		lb_f	855					
Max. tilting moment	M_{2KMax}	Nm	409					
		in.lb	3620					
Service life (For calculation see "Information")	L_h	h	> 20000					
Weight (without motor attechment parts)	m	kg	7,4					
		lb_m	16,4					
Operating noise (with n_1 = 3000 rpm no load)	L_{PA}	dB(A)	≤ 62					
Max. permitted housing temperature		°C	+90					
		F	194					
Ambient temperature		°C	-15 to +40					
		F	5 to 104					
Lubrication			Synthetic transmission oil					
Paint			None					
Direction of rotation			See drawing					
Protection class			IP 65					
Moment of inertia (relates to the drive)	J_1	kgcm²	–	2,02	1,93	1,84	1,81	1,86
		10^{-3} in.lb.s²	–	1,79	1,71	1,63	1,60	1,64

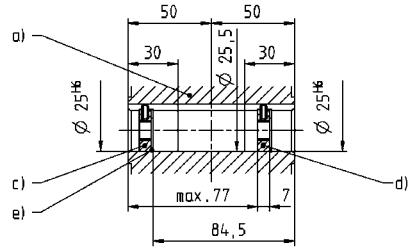
[a]) Decrease in operation

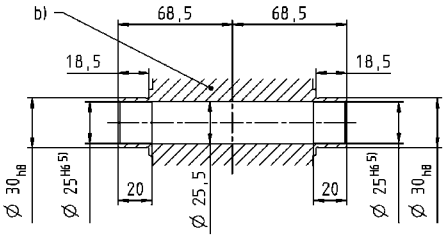
[b]) In reference to the center of output flange/shaft











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

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

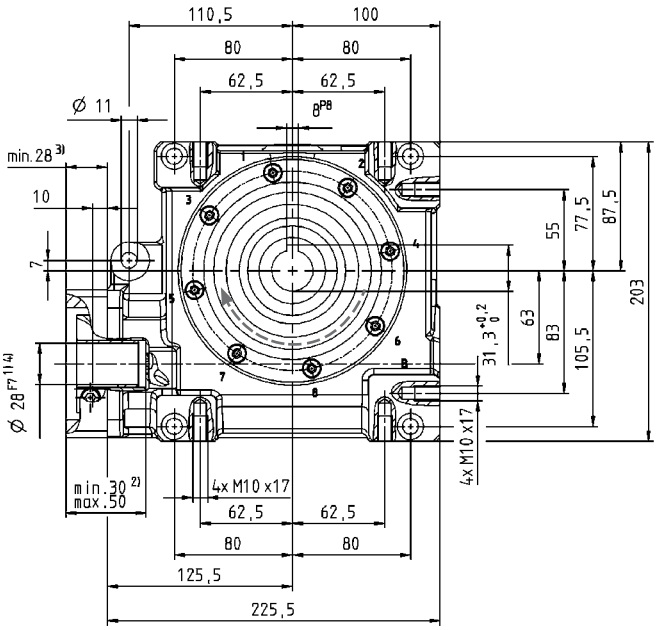
⚠ Motor mounting according to operating manual

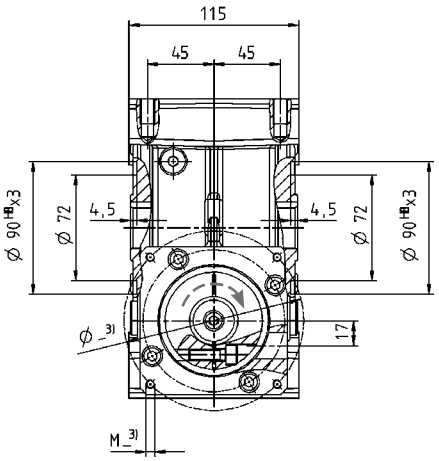
VDH economy 063 1-stage

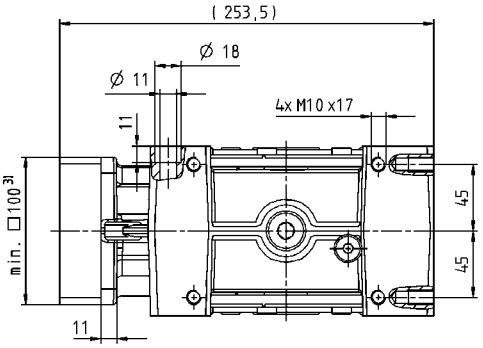
			1-stage					
Ratio	***i***		**4**	**7**	**10**	**16**	**28**	**40**
n_1=500 rpm	T_{2Max}	Nm	–	264	270	279	301	282
		in.lb	–	2336	2390	2469	2664	2496
	T_{2Servo}	Nm	–	183	195	198	215	201
		in.lb	–	1620	1726	1752	1903	1779
	η	%	–	91	88	83	74	68
n_1=1000 rpm	T_{2Max}	Nm	–	256	265	276	299	280
		in.lb	–	2266	2345	2443	2646	2478
	T_{2Servo}	Nm	–	197	208	212	230	215
		in.lb	–	1743	1841	1876	2036	1903
	η	%	–	93	91	86	78	73
n_1=2000 rpm	T_{2Max}	Nm	–	234	252	263	277	269
		in.lb	–	2071	2230	2328	2451	2381
	T_{2Servo}	Nm	–	188	203	212	224	217
		in.lb	–	1664	1797	1876	1982	1920
	η	%	–	94	93	89	83	78
n_1=3000 rpm	T_{2Max}	Nm	–	183	198	209	230	224
		in.lb	–	1620	1752	1850	2036	1982
	T_{2Servo}	Nm	–	145	163	181	182	177
		in.lb	–	1283	1443	1602	1611	1566
	η	%	–	95	94	91	85	81
n_1=4000 rpm	T_{2Max}	Nm	–	146	162	175	196	193
		in.lb	–	1292	1434	1549	1735	1708
	T_{2Servo}	Nm	–	114	134	152	152	149
		in.lb	–	1009	1186	1345	1345	1319
	η	%	–	96	94	92	86	83
Emergency stop torque	T_{2Not}	Nm	–	484	491	494	518	447
		in.lb	–	4283	4345	4372	4584	3956
Nominal input speed	n_{1N}	rpm	–	4000	4000	4000	4000	4000
Max. input speed	n_{1Max}	rpm	6000					
Mean no load running torque [a] (With n_1=3000 min^{-1} and 20° C gear temperature)	T_{012}	Nm	–	1,9	1,8	1,7	1,6	1,4
		in.lb	–	16,8	15,9	15,0	14,2	12,4
Max. torsional backlash	j_t	arcmin	≤8					
Torsional rigidity	C_{t12}	Nm/arcmin	28					
		in.lb/arcmin	248					
Max. axial force [b]	F_{2AMax}	N	8250					
		lb_f	1856					
Max. radial force [b]	F_{2RMax}	N	6000					
		lb_f	1350					
Max. tilting moment	M_{2KMax}	Nm	843					
		in.lb	7461					
Service life (For calculation see "Information")	L_h	h	> 20000					
Weight (without motor attechment parts)	m	kg	12					
		lb_m	26,5					
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	-15 to +40					
		F	5 to 104					
Lubrication			Synthetic transmission oil					
Paint			None					
Direction of rotation			See drawing					
Protection class			IP 65					
Moment of inertia (relates to the drive)	J_1	kgcm²	–	5,77	5,53	5,44	5,40	5,35
		10^{-3} in.lb.s²	–	5,11	4,89	4,81	4,78	4,74

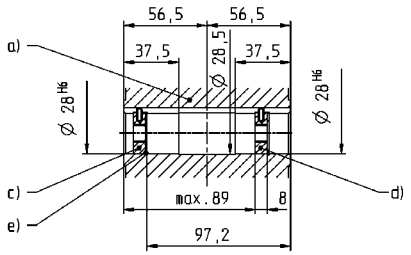
[a]) Decrease in operation

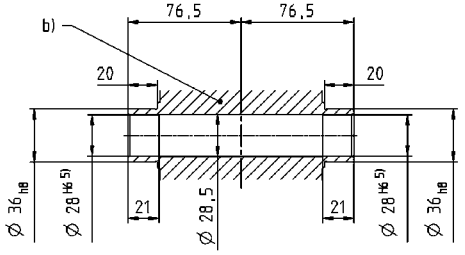
[b]) In reference to the center of output flange/shaft









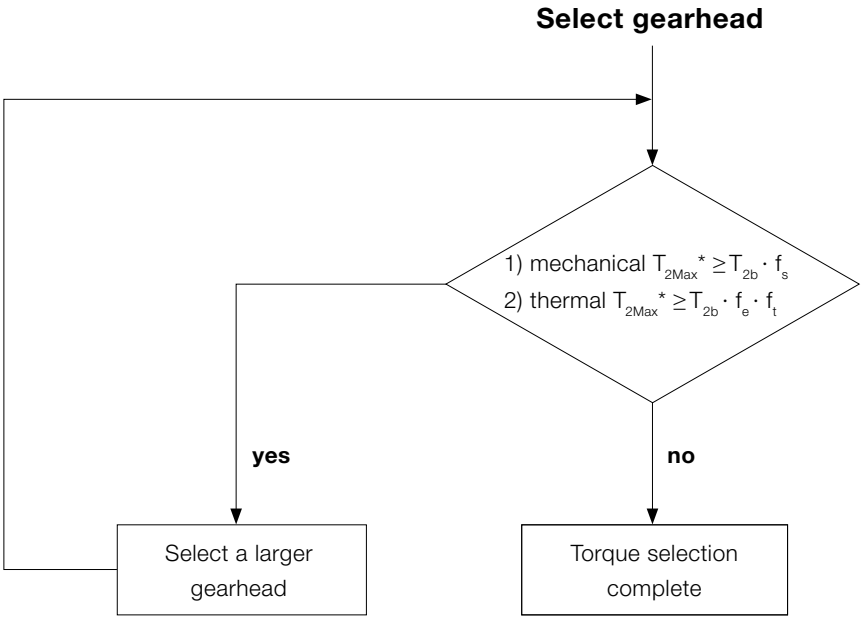


a) Hollow shaft, keywayed
b) Hollow shaft, smooth
c) End disc for screw M10 (on request)
d) End disc as forcing washer for screw M12 (on request)
e) Locking ring – DIN 472 (on request)

Non-tolerated dimensions ± 1 mm

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

⚠ Motor mounting according to operating manual



Cycles per hour	Load factor f_s	Duty cycle for each hour (ED %)	f_e for duty cycle
0	1	100	1
1000	1,3	80	0,94
3000	1,9	60	0,86
6000	2,2	40	0,74
10000	2,3	20	0,56

Temperature factor f_t

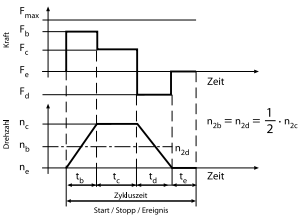
	VD 050						VD 063					
Ratio	**4**	**7**	**10**	**16**	**28**	**40**	**4**	**7**	**10**	**16**	**28**	**40**
n1= 500 1/min	0,53	0,53	0,53	0,53	0,53	0,53	0,53	0,53	0,53	0,53	0,53	0,53
n1=1000 1/min	0,53	0,53	0,53	0,53	0,53	0,53	0,53	0,53	0,53	0,56	0,65	0,57
n1=2000 1/min	0,53	0,53	0,53	0,56	0,61	0,53	0,76	0,95	0,94	0,99	1,06	1,01
n1=3000 1/min	0,57	0,75	0,78	0,86	0,95	0,79	1	1,11	1,23	1,32	1,42	1,38
n1=4000 1/min	0,89	1,16	1,22	1,16	1,28	1,23	1,44	1,56	1,74	1,9	2,07	2,03
	VD 080						**VD 100**					
Ratio	**4**	**7**	**10**	**16**	**28**	**40**	**4**	**7**	**10**	**16**	**28**	**40**
n1= 500 1/min	0,53	0,53	0,54	0,57	0,64	0,53	0,62	0,7	0,72	0,73	0,79	0,69
n1=1000 1/min	0,7	0,82	0,8	0,83	0,88	0,78	0,79	0,93	0,98	0,99	1,09	0,94
n1=2000 1/min	0,9	1,12	1,1	1,28	1,37	1,2	1,18	1,3	1,4	1,44	1,62	1,53
n1=3000 1/min	1,22	1,58	1,57	1,88	2,03	1,78	1,83	1,96	2,16	2,24	2,56	2,46
n1=4000 1/min	1,66	1,78	1,79	2,16	2,35	2,06						

$T_{2Max}{}^{*}$ = maximum torque which can be transmitted by the gearbox
T_{2b} = process torque

Ratios i = 28 and i = 40 are self-locking at zero speed. The self-locking state may be overcome and therefore the gearhead should not replace a brake. For applications that run at a continuous speed of 3000 rpm or more in installation position F or G, please contact us.

* For applications requiring high precision over the life of the application, use T_{2Servo}

Bearing lifespan L_{h10} (output bearing)



Output (VDT⁺-, VDH⁺-, VDHe-, VDS⁺- & VDSe-Version)

Calculate the average axial and radial force F_{2am}, F_{2rm} [N]

Index „2“ ≙ output

$$\frac{F_{2am}}{F_{2rm}} \le 0{,}4 \qquad x_2 > 0$$

no — **yes**

$$F_{2am} = \sqrt[3]{\frac{n_{2b} \cdot t_b \cdot F_{2ab}{}^3 + \ldots + n_{2n} \cdot t_n \cdot F_{2an}{}^3}{n_{2b} \cdot t_b + \ldots + n_{2n} \cdot t_n}}$$

$$F_{2rm} = \sqrt[3]{\frac{n_{2b} \cdot t_b \cdot F_{2rb}{}^3 + \ldots + n_{2n} \cdot t_n \cdot F_{2rn}{}^3}{n_{2b} \cdot t_b + \ldots + n_{2n} \cdot t_n}}$$

Contact us!

$$M_{2km} = \frac{F_{2am} \cdot y_2 + F_{2rm} \cdot (x_2 + z_2)}{W}$$

Calculate the average tilting torque $M_{2k\,m}$ [Nm] or [in.lb]

Z_2 [mm]	VDT	VDH⁺/VDHe/ VDSe	VDS⁺
VD050	104	71,5	92,25
VD063	113,5	82	111,5
VD080	146,75	106,25	143,25
VD100	196	145,5	181

	metric
W	1000

$$M_{2\,k\,max} = \frac{F_{2\,a\,max} \cdot y_2 + F_{2\,r\,max} \cdot (x_2 + z_2)}{W}$$

Calculate the maximum tilting torque $M_{2k\,max}$ [Nm] or [in.lb]

Version	VD 050	VD 063	VD 080	VD 100
$M_{2K\,Max}$ [Nm]	409	843	1544	3059
$F_{2R\,Max}$ [N]	3800	6000	9000	14000
$F_{2A\,Max}$ [N]	5000	8250	13900	19500

$$M_{2\,k\,max} \le M_{2\,K\,Max}$$
$$F_{2\,r\,max} \le F_{2\,R\,Max}$$
$$F_{2\,a\,max} \le F_{2\,A\,Max}$$

no — **ja**

Select a larger gearhead

$K1_2$ [Nm]	VDT	VDH⁺/VDHe/ VDSe	VDS⁺
VD 050	3050	2320	2580
VD 063	4600	3620	5600
VD 080	9190	9770	10990
VD 100	20800	15290	20400

$$n_{2\,m} = \frac{n_{2\,b} \cdot t_b + \ldots + n_{2\,n} \cdot t_n}{t_b + \ldots + t_n}$$

Calculate the average speed $n_{2\,m}$ [rpm]

P_t	T/H/S
i=4	1,5
i=7	0,72
i=10	0,6
i=16	0,5
i=28	0,4
i=40	0,36

$$L_{h10} = \frac{16666}{n_{2m}} \cdot \left[\frac{K1_2}{p_t \cdot T_{2m} + M_{2km}} \right]^{3{,}33}$$

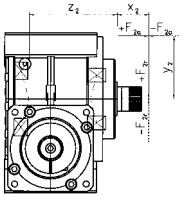
Calculate the lifespan L_{h10} [h]

lifespan L_{h10} sufficient?

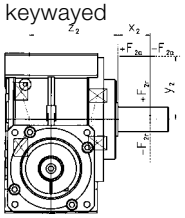
no — **yes**

Torque selection complete

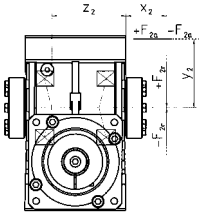
VDS⁺ involute



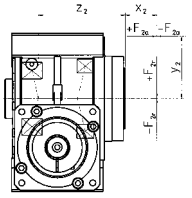
VDS⁺/VDSe smooth, keywayed



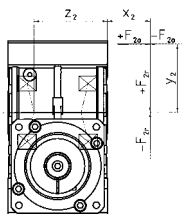
VDH⁺/VDHe smooth



VDT⁺



VDH⁺/VDHe keywayed



V-DRIVE® – Order information & Ordering codes

Order information

Gearhead type	Gearhead version	Distance between axes	Gearhead variations	Gearhead model	Number of stages
VDT = TP flange VDH = hollow shaft VDS = shaft	e = economy (only with VDH and VDS, Sizes 050 and 063)	050 063 080 100	M = Motor attachment gearhead	F = Standard L = Food-grade grease W = Washdown	1 = 1-stage

Ordering codes

V-DRIVE®

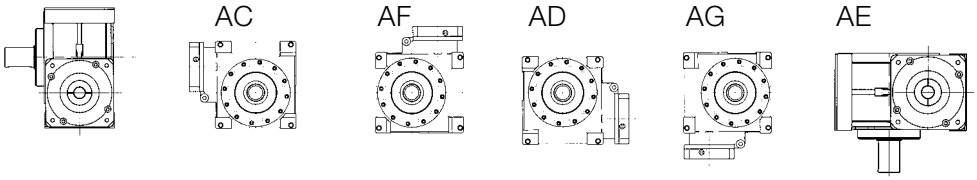
V	D	H	e	0	5	0	–	M	F	1	–	7	–	0	3	1	–	A	C	0	/ Motor

- **Gearhead type**
- **Gearhead version**
- **Distance between axes**
- **Gearhead variations**
- **Gearhead model**
- **Number of stages**
- **Ratios**
- **Output shape**
- **Clamping hub bore hole diameter**
- **Backlash**
- **Mounting position** (see overview)
- **VDH** – number of shrink discs

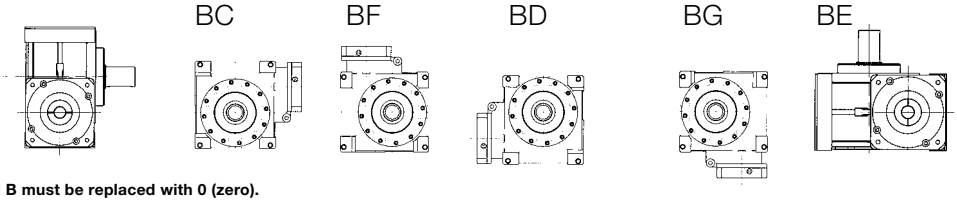
Mounting positions for V-DRIVE®

Mounting position (only relevant for oil volume)

Output side A:
View of motor interface
Only valid for VDS⁺, VDSe and VDT⁺



Output side B:
View of motor interface
Only valid for VDS⁺, VDSe and VDT⁺



For VDH⁺, VDHe and VDS⁺/VDSe with Dual-shaft output, A and B must be replaced with 0 (zero).

Ratios

4 (not for economy)

7

10

16

28

40

Output shape

0 = smooth shaft/flange (VDT+, VDH+, VDS+, VDHe, VDSe)

1 = shaft with key (VDH+, VDS+, VDHe, VDSe)

2 = involute to DIN 5480 (VDS+)

4 = other (see technical data sheets)

8 = Dual-shaft output, smooth (VDS+, VDSe)

9 = Dual-shaft output with key (VDS+, VDSe)

Clamping hub bore hole diameter

3 = 19 mm (050)

4 = 28 mm (063)

5 = 35 mm (080)

7 = 48 mm (100)

Backlash

1 = Standard

VDH – number of shrink discs

0 = no shrink disc

1 = one shrink disc

2 = two shrink discs

V-Drive
Washdown Version

When environmental conditions demand a higher level of protection, corrosion resistant and washdown gearheads from WITTENSTEIN alpha provide the perfect solution.

Available nickel plated, lacquer coated or in stainless steel, our solutions are built for specific applications in food processing, pharmaceutical and harsh environments.

Product Description

- Output shaft / flange made of stainless steel / nickel plated
- Special lacquer coating (optional)
- Plug screw made of stainless steel
- Food grade grease
- IP 65 protected
- Accessories available in stainless steel

WITTENSTEIN | alpha

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