A-max 22 mit Getriebe GP22A

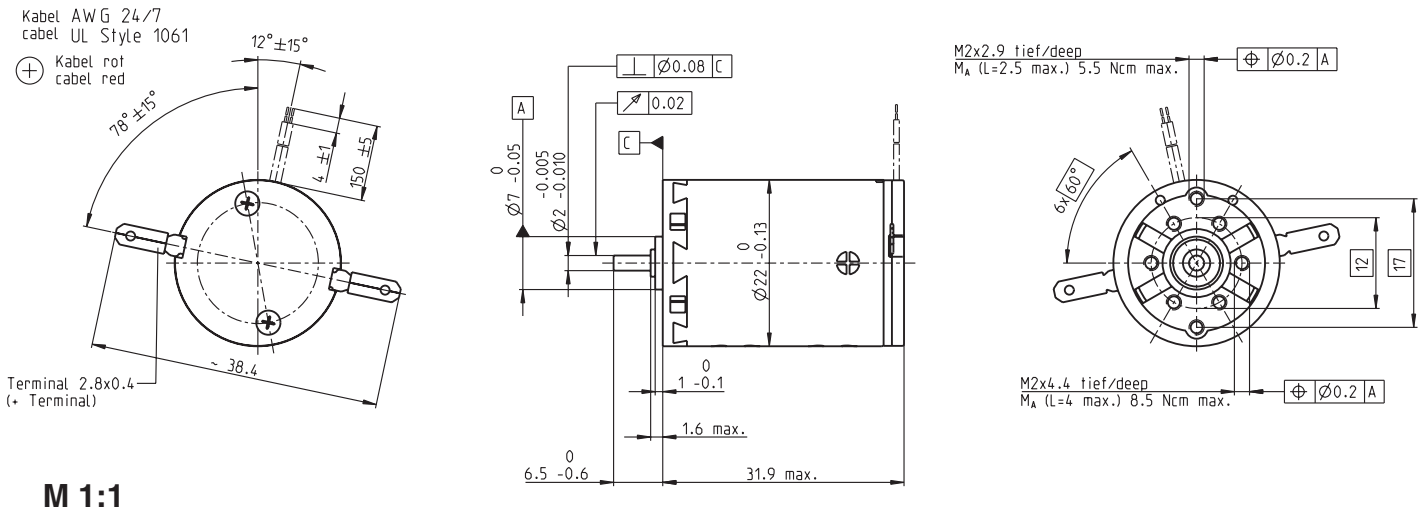
Distrelec Art.-Nr. 370688

Combination data		
Nominal voltage	V	12
No load speed	min-1	537
Max. continuous torque	Nm	0.5
Stall torque	mNm	0.8

Gear data		
Article No.		110338
Program Planetary Gearhead GP 22 A Ø22 mm, 0.5 - 1.0 Nm, Metal Version		
Reduction		19:1
No. of stages		2
Max. continuous torque	Nm	0.5
Intermittently permissible torque at gear output	Nm	0.8
Sense of rotation, drive to output	=	
Max. efficiency	%	70
Average backlash no load	°	1.2
Mass inertia	gcm2	0.4
Gearhead length L1	mm	32.2
Weight	g	55
Max. motor shaft diameter	mm	3.2

Motor data		
Article No.		110147
Program A-max 22 Ø22 mm, Graphite Brushes, 6 Watt		
Assigned power rating	W	6
Nominal voltage	V	12
No load speed	min-1	10200
Stall torque	mNm	22.8
Max. continuous torque	mNm	6.77
Speed / torque gradient	min-1 / mNm-1	461
No load current	mA	45.9
Starting current	A	2.09
Terminal resistance	Ohm	5.74
Max. permissible speed	min-1	9800
Nominal current (max. continuous current)	A	0.664
Max. efficiency	%	72
Torque constant	mNm / A-1	10.9
Speed constant	min-1 / V-1	875
Mechanical time constant	ms	20.6
Rotor inertia	gcm2	4.26
Terminal inductance	mH	0.362
Thermal resistance housing-ambient	KW-1	20
Thermal resistance winding-housing	KW-1	6.0
Thermal time constant winding	s	10.2
Motor lenght	mm	31.9
Weight	g	54

A-max 22 ∅22 mm, Graphite Brushes, 6 Watt



M 1:1

Stock program
Standard program
Special program (on request)

Order Number												
with terminals	110143	110145	110146	**110147**	110148	110149	110150	**110151**	110152	110153	**110154**	110155
with cables	139840	353017	199807	320206	323856	108828	199424	202921	267433	325492	313302	353019
Motor Data												
Values at nominal voltage												
1 Nominal voltage	V	6.0	9.0	9.0	12.0	12.0	15.0	18.0	24.0	24.0	36.0	48.0	48.0
2 No load speed	rpm	9250	9710	8530	10200	9200	10100	9800	10500	8500	9650	9130	8220
3 No load current	mA	83.2	57.9	49.7	45.9	40.5	36.0	29.0	23.7	18.4	14.2	10.0	8.85
4 Nominal speed	rpm	5550	6370	5240	6990	5960	6880	6630	7430	5340	6500	5920	5020
5 Nominal torque (max. continuous torque)	mNm	5.82	6.52	6.76	6.77	6.82	6.87	6.94	6.97	7.07	7.00	6.91	7.02
6 Nominal current (max. continuous current)	A	1.06	0.816	0.741	0.664	0.602	0.529	0.433	0.350	0.287	0.214	0.150	0.138
7 Stall torque	mNm	16.1	20.4	18.7	22.8	20.4	22.7	22.3	24.3	19.5	21.9	20.1	18.5
8 Starting current	A	2.73	2.38	1.92	2.09	1.69	1.64	1.30	1.14	0.745	0.631	0.411	0.340
9 Max. efficiency	%	65	70	69	72	71	72	72	73	71	72	71	70
Characteristics												
10 Terminal resistance	Ω	2.20	3.78	4.69	5.74	7.12	9.15	13.8	21.0	32.2	57.1	117	141
11 Terminal inductance	mH	0.106	0.222	0.288	0.362	0.445	0.584	0.890	1.37	2.10	3.68	7.29	8.95
12 Torque constant	mNm / A	5.90	8.55	9.73	10.9	12.1	13.9	17.1	21.2	26.2	34.8	48.9	54.3
13 Speed constant	rpm / V	1620	1120	981	875	790	689	558	450	364	274	195	176
14 Speed / torque gradient	rpm / mNm	604	494	473	461	465	455	451	445	447	450	466	458
15 Mechanical time constant	ms	25.1	21.8	21.2	20.6	20.3	19.9	19.4	19.1	19.0	18.9	18.9	18.8
16 Rotor inertia	gcm²	3.97	4.22	4.28	4.26	4.17	4.17	4.11	4.11	4.07	4.00	3.88	3.92

Specifications

Thermal data

17	Thermal resistance housing-ambient	20 K / W
18	Thermal resistance winding-housing	6.0 K / W
19	Thermal time constant winding	10.1 s
20	Thermal time constant motor	540 s
21	Ambient temperature	-30 ... +85°C
22	Max. permissible winding temperature	+125°C

Mechanical data (sleeve bearings)

23	Max. permissible speed	9800 rpm
24	Axial play	0.05 - 0.15 mm
25	Radial play	0.012 mm
26	Max. axial load (dynamic)	1 N
27	Max. force for press fits (static)	80 N
28	Max. radial loading, 5 mm from flange	2.8 N

Mechanical data (ball bearings)

23	Max. permissible speed	9800 rpm
24	Axial play	0.05 - 0.15 mm
25	Radial play	0.025 mm
26	Max. axial load (dynamic)	3.3 N
27	Max. force for press fits (static)	45 N
28	Max. radial loading, 5 mm from flange	12.3 N

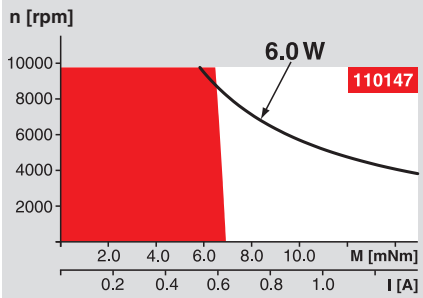
Other specifications

29	Number of pole pairs	1
30	Number of commutator segments	9
31	Weight of motor	54 g

Values listed in the table are nominal.
Explanation of the figures on page 49.

Option
Ball bearings in place of sleeve bearings

Operating Range



Comments

Continuous operation
In observation of above listed thermal resistance (lines 17 and 18) the maximum permissible winding temperature will be reached during continuous operation at 25°C ambient.
= Thermal limit.

Short term operation
The motor may be briefly overloaded (recurring).

Assigned power rating

maxon Modular System

Overview on page 16 - 21

Planetary Gearhead
∅22 mm
0.1 - 0.6 Nm
Page 220 / 221

Planetary Gearhead
∅22 mm
0.5 - 2.0 Nm
Page 222 / 223

Spur Gearhead
∅24 mm
0.1 Nm
Page 227

Spindle Drive
∅22 mm
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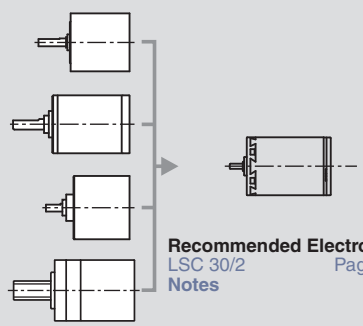
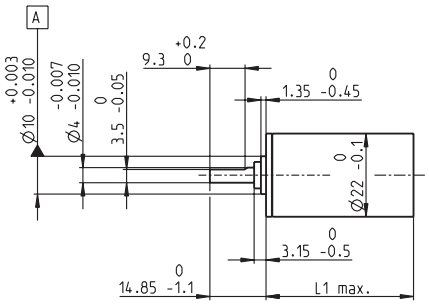
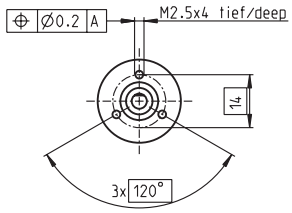


Recommended Electronics:
LSC 30/2 Page 282
Notes 18

Planetary Gearhead GP 22 A ∅22 mm, 0.5 - 1.0 Nm





M 1:2

Technical Data

Planetary Gearhead	straight teeth
Output shaft	stainless steel, hardened
Bearing at output	ball bearing
Option	sleeve bearing
Radial play, 10 mm from flange	max. 0.2 mm
Axial play	max. 0.2 mm
Max. radial load, 10 mm from flange	70 N
Max. permissible axial load	100 N
Max. permissible force for press fits	100 N
Sense of rotation, drive to output	=
Recommended input speed	< 6000 rpm
Recommended temperature range	-40 ... +100°C

Stock program
Standard program
Special program (on request)

Order Number										
134156	134158	134163	134168	134172	110340	134183	134186	134190	134195	134203

Gearhead Data

1	Reduction		3.8 : 1	14 : 1	53 : 1	104 : 1	198 : 1	370 : 1	590 : 1	742 : 1	1386 : 1	1996 : 1	3189 : 1
2	Reduction absolute		$^{15}/_{4}$	$^{225}/_{16}$	$^{3375}/_{64}$	$^{87723}/_{845}$	$^{50625}/_{256}$	$^{10556001}/_{28561}$	$^{59049}/_{100}$	$^{759375}/_{1024}$	$^{158340015}/_{114244}$	$^{285012027}/_{142805}$	$^{1594323}/_{500}$
3	Max. motor shaft diameter	mm	4	4	4	3.2	4	3.2	4	4	3.2	3.2	4
	Order Number		110337	134159	134164	134169	134173	134178	134184	134187	134193	134198	134204
1	Reduction		4.4 :1	16 : 1	62 : 1	109 : 1	231 : 1	389 : 1	690 : 1	867 : 1	1460 : 1	2102 : 1	3728 : 1
2	Reduction absolute		$^{57}/_{13}$	$^{855}/_{52}$	$^{12825}/_{208}$	$^{2187}/_{20}$	$^{192375}/_{832}$	$^{263169}/_{676}$	$^{1121931}/_{1625}$	$^{2885625}/_{3328}$	$^{3947535}/_{2704}$	$^{7105563}/_{3380}$	$^{30292137}/_{8125}$
3	Max. motor shaft diameter	mm	3.2	3.2	3.2	4	3.2	3.2	3.2	3.2	3.2	3.2	3.2
	Order Number		134157	110338	134165	134170	134174	134180	134185	134188	134196	134200	134205
1	Reduction		5.4 : 1	19 : 1	72 : 1	128 : 1	270 : 1	410 : 1	850 : 1	1014 : 1	1538 : 1	2214 : 1	4592 : 1
2	Reduction absolute		$^{27}/_{5}$	$^{3249}/_{169}$	$^{48735}/_{676}$	$^{41553}/_{325}$	$^{731025}/_{2704}$	$^{6561}/_{16}$	$^{531441}/_{625}$	$^{10965375}/_{10816}$	$^{98415}/_{64}$	$^{177147}/_{80}$	$^{14348907}/_{3125}$
3	Max. motor shaft diameter	mm	2.5	3.2	3.2	3.2	3.2	4	2.5	3.2	4	4	2.5
	Order Number			134160	134166	134171	134176	134179		134191	110341	134199	
1	Reduction			20 : 1	76 : 1	157 : 1	285 : 1	455 : 1		1068 : 1	1621 : 1	2458 : 1	
2	Reduction absolute			$^{81}/_{4}$	$^{1215}/_{16}$	$^{19683}/_{125}$	$^{18225}/_{64}$	$^{5000211}/_{10985}$		$^{273375}/_{256}$	$^{60169205 7}/_{371293}$	$^{135005697}/_{54925}$	
3	Max. motor shaft diameter	mm		4	4	2.5	4	3.2		4	3.2	3.2	
	Order Number			134161	110339		134175	134181		134189	134194	134201	
1	Reduction			24 : 1	84 : 1		316 : 1	479 : 1		1185 : 1	1707 : 1	2589 : 1	
2	Reduction absolute			$^{1539}/_{65}$	$^{185193}/_{2197}$		$^{2777895}/_{8788}$	$^{124659}/_{260}$		$^{41668425}/_{35152}$	$^{15000633}/_{8788}$	$^{3365793}/_{1300}$	
3	Max. motor shaft diameter	mm		3.2	3.2		3.2	3.2		3.2	3.2	3.2	
	Order Number			134162	134167		134177	134182		134192	134197	134202	
1	Reduction			29 : 1	89 : 1		333 : 1	561 : 1		1249 : 1	1798 : 1	3027 : 1	
2	Reduction absolute			$^{729}/_{25}$	$^{4617}/_{52}$		$^{69255}/_{208}$	$^{2368521}/_{4225}$		$^{1038825}/_{832}$	$^{373977}/_{208}$	$^{6395006 7}/_{21125}$	
3	Max. motor shaft diameter	mm		2.5	3.2		3.2	3.2		3.2	3.2	3.2	
4	Number of stages		1	2	3	3	4	4	4	5	5	5	5
5	Max. continuous torque	Nm	0.5	0.5	0.8	0.8	1.0	1.0	1.0	1.0	1.0	1.0	1.0
6	Intermittently permissible torque at gear output	Nm	0.8	0.8	1.2	1.2	1.6	1.6	1.6	1.6	1.6	1.6	1.6
7	Max. efficiency	%	84	70	59	59	49	49	49	42	42	42	42
8	Weight	g	42	55	68	68	81	81	81	94	94	94	94
9	Average backlash no load	°	1.0	1.2	1.6	1.6	2.0	2.0	2.0	2.0	2.0	2.0	2.0
10	Mass inertia	gcm²	0,5	0,4	0,4	0,4	0,4	0,4	0,4	0,4	0,4	0,4	0,4
11	Gearhead length L1*	mm	22.6	29.4	36.2	36.2	43.0	43.0	43.0	49.8	49.8	49.8	49.8

*for EC 32fl. L1 is + 7.1 mm

maxon Modular System

+ Motor	Page	+ Sensor / Brake	Page	Overall length [mm] = Motor length + gearhead length + (sensor / brake) + assembly parts										
A-max 19	93/94			51.6	58.4	65.2	65.2	72.0	72.0	72.0	78.8	78.8	78.8	78.8
A-max 19, 1.5 W	94	MR	258/260	56.7	63.5	70.3	70.3	77.1	77.1	77.1	83.9	83.9	83.9	83.9
A-max 19, 1.5 W	94	Enc 22	265	66.0	72.8	79.6	79.6	86.4	86.4	86.4	93.2	93.2	93.2	93.2
A-max 19, 1.5 W	94	MEnc 13	274	59.1	65.9	72.7	72.7	79.5	79.5	79.5	86.3	86.3	86.3	86.3
A-max 19, 2.5 W	95/96			54.2	61.0	67.8	67.8	74.6	74.6	74.6	81.4	81.4	81.4	81.4
A-max 19, 2.5 W	96	MR	258/260	58.5	65.3	72.1	72.1	78.9	78.9	78.9	85.7	85.7	85.7	85.7
A-max 19, 2.5 W	96	Enc 22	265	68.6	75.4	82.2	82.2	89.0	89.0	89.0	95.8	95.8	95.8	95.8
A-max 19, 2.5 W	96	MEnc 13	274	61.7	68.5	75.3	75.3	82.1	82.1	82.1	88.9	88.9	88.9	88.9
A-max 22	97-100			54.6	61.4	68.2	68.2	75.0	75.0	75.0	81.8	81.8	81.8	81.8
A-max 22	98/100	MR	258/260	59.6	66.4	73.2	73.2	80.0	80.0	80.0	86.8	86.8	86.8	86.8
A-max 22	98/100	Enc 22	265	69.0	75.8	82.6	82.6	89.4	89.4	89.4	96.2	96.2	96.2	96.2
A-max 22	98/100	MEnc 13	274	61.7	68.5	75.3	75.3	82.1	82.1	82.1	88.9	88.9	88.9	88.9
RE-max 21	123/124			51.6	58.4	65.2	65.2	72.0	72.0	72.0	78.8	78.8	78.8	78.8
RE-max 21, 3.5 W	124	MR	259/261	56.7	63.5	70.3	70.3	77.1	77.1	77.1	83.9	83.9	83.9	83.9
RE-max 21, 6 W	125/126			54.2	61.0	67.8	67.8	74.6	74.6	74.6	81.4	81.4	81.4	81.4
RE-max 21, 6 W	126	MR	259/261	58.5	65.3	72.1	72.1	78.9	78.9	78.9	85.7	85.7	85.7	85.7
EC 20 flat, 3 W, A	183			33.1	39.9	46.7	46.7	53.5	53.5	53.5	60.3	60.3	60.3	60.3
EC 20 flat, 3 W, B	183			32.5	39.3	46.1	46.1	52.9	52.9	52.9	59.7	59.7	59.7	59.7
EC 20 flat, 5 W	184			36.7	43.5	50.3	50.3	57.1	57.1	57.1	63.9	63.9	63.9	63.9
EC 20 flat, IE, IP 00	185			39.7	46.5	53.3	53.3	60.1	60.1	60.1	66.9	66.9	66.9	66.9
EC 20 flat, IE, IP 40	185			40.8	47.6	54.4	54.4	61.2	61.2	61.2	68.0	68.0	68.0	68.0
EC 20 flat, IE, IP 00	186			43.7	50.5	57.3	57.3	64.1	64.1	64.1	70.9	70.9	70.9	70.9
EC 20 flat, IE, IP 40	186			44.8	51.6	58.4	58.4	65.2	65.2	65.2	72.0	72.0	72.0	72.0
EC 32 flat, 6 W	187			39.8	46.6	53.4	53.4	60.2	60.2	60.2	67.0	67.0	67.0	67.0