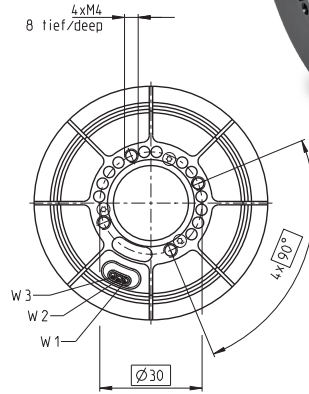
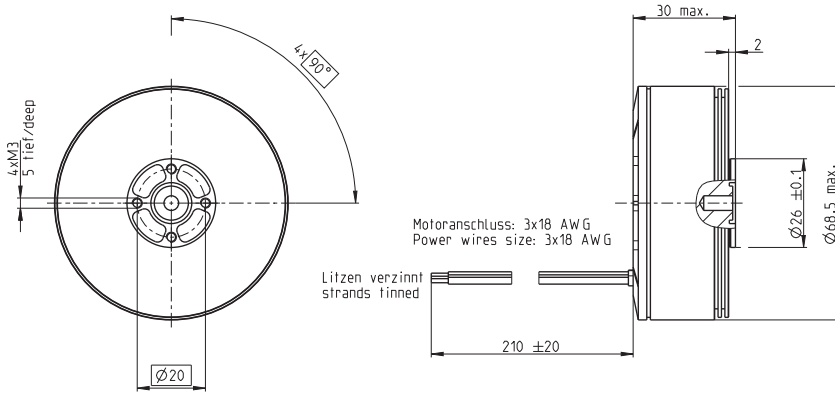


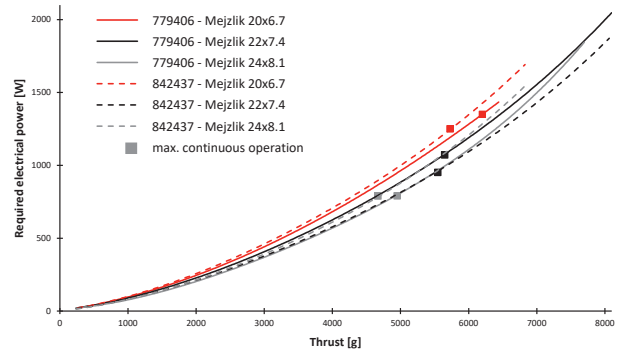
EC 69 flat UAV Ø69 mm, brushless

Designed for professional UAV applications



Part number			
sensorless			
779406			
842437			
Propeller selection			

Motor data			
Values at nominal voltage			
1 Nominal voltage ¹	V	24	12
2 No load speed	rpm	3800	4070
3 No load current	mA	551	1230
4 Nominal speed	rpm	2900	3240
5 Nominal torque (max. continuous torque)	mNm	1180	993
6 Nominal current (max. continuous current)	A	17.6	32.6
7 Stall torque ²	mNm	3000	3020
8 Stall current	A	168	368
9 Max. efficiency	%	88.9	88.8
Characteristics			
10 Terminal resistance phase to phase	Ω	0.143	0.0326
11 Terminal inductance phase to phase	mH	0.0799	0.0174
12 Torque constant	mNm/A	59.9	28.0
13 Speed constant	rpm/V	159	342
14 Speed/torque gradient	rpm/mNm	0.381	0.398
15 Mechanical time constant	ms	2.95	3.09
16 Rotor inertia	gcm ²	740	740
17 Thermal resistance housing-ambient ³	K/W	0.344	0.311
18 Thermal resistance winding-housing ³	K/W	0.852	1.28
19 Thermal time constant winding	s	15.2	19.9
20 Thermal time constant motor	s	46.3	41.8



¹ The nominal voltage is used to characterize the motor properties. This value does not represent the maximum operating voltage.

² Calculation does not include saturation effect.

³ At nominal working point.

Specifications			
Thermal data			
21 Ambient temperature	°C	-40...+70	-40...+70
22 Max. continuous winding temperature	°C	+155	+155
Absolute winding temperature	°C	+180	+180
Mechanical data (preloaded ball bearings)			
23 Max. speed	rpm	6500	6500
Other specifications			
24 Number of pole pairs		14	14
Magnetic system configuration		24N28P	24N28P
25 Number of phases		3	3
26 Weight of motor (incl. 210 mm cable)	g	269	269
27 Recommended propeller sizes	inch	20...24	20...24
Modifications on request - contact aerospace@maxongroup.com			
- Cable length			
- Electrical connector			
- Shaft length			
- Additional shaft end			
- Shaft design (e.g. hollow shaft)			
- Customized labeling (text only)			
- Speed constant and torque constant			
- Active propeller positioning feature			
- Open motor design			
- Integration of a NTC temperature sensor			

maxon accessories

Propeller adapter: 718087

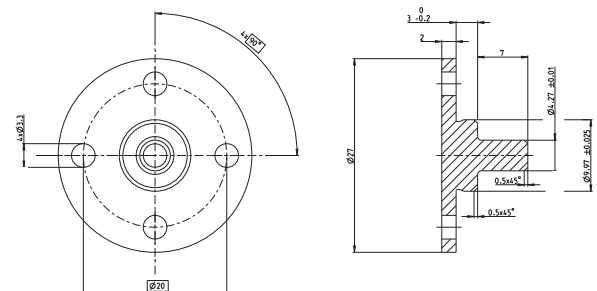
Values listed in the tables are nominal, i.e. defined for operation without a propeller attached (no active cooling).

Motor data when operated with a propeller attached differs from the nominal values. The adjusted motor data depending on the propeller used can be found on the following pages under the section "Adjusted motor data for use with specified propeller (active cooling)."

Cable and connection

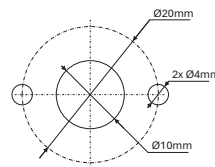
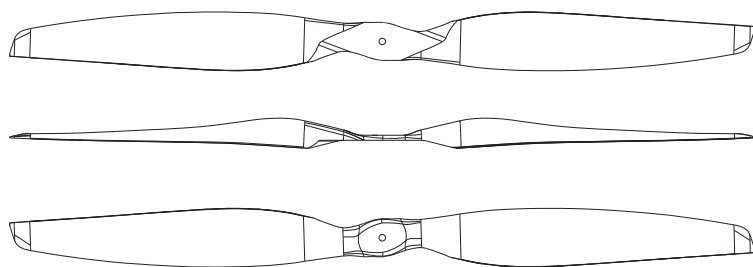
Connection cable with polyolefin insulation, L = 210 mm, AWG 18

W1: Motor winding 1, W2: Motor winding 2, W3: Motor winding 3



Propeller 20x6.7

maxon recommended propeller for EC 69 flat



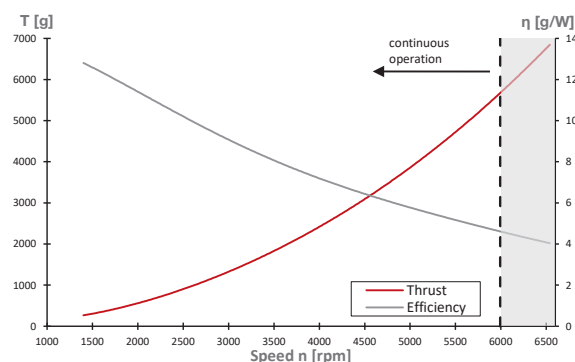
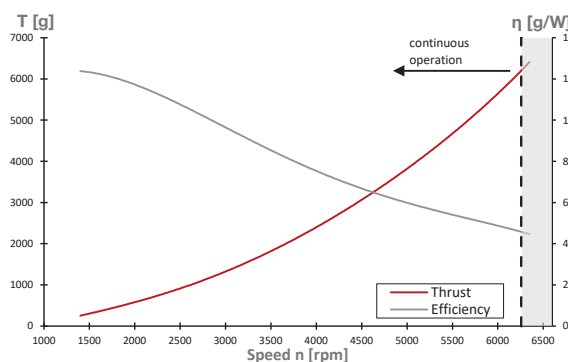
Propeller specifications		
1 Diameter	inch	20.0 (508.0 mm)
2 Pitch	inch	6.7 (170.2 mm)
3 Weight of propeller	g	31.0
4 Drill pattern		maxon EC69fl UAV
5 Interface thickness	mm	3.94
6 Material		carbon/glass fiber
7 Max. recommended speed	rpm	9000

Motor propeller combination				
Adjusted motor data for use with specified propeller (active cooling)				
		779406	842437	
8 Max. continuous speed	rpm	6260	5995	
9 Max. continuous torque	mNm	1620	1490	
10 Max. continuous current	A	32.8	60.4	motor current=output current from ESC maxon UAV ESC parameter: nominal current
11 Max. continuous electrical power	W	1450	1325	
12 Max. peak electrical power	W	1696	1797	<15s
13 Thermal time constant winding	s	28.5	30.5	

Propulsion system performance table

ESC supply voltage: 52.2 V (12S max. LiPo voltage) / Ambient temperature: 20°C / Elevation (AMSL): 475 m

779406							842437							
Achievable speed with battery level	Speed [rpm]	Current [A]	Torque [mNm]	Thrust [g]	el. Power [W]	Efficiency [g/W]	Achievable speed with battery level	Speed [rpm]	Current [A]	Torque [mNm]	Thrust [g]	el. Power [W]	Efficiency [g/W]	
Continuous operation ($T_w < 155\text{ }^{\circ}\text{C}$)							Continuous operation ($T_w < 155\text{ }^{\circ}\text{C}$)							
6S (22.2V)	1400	0.4	82	262	21	12.4	6S (22.2V)	1400	0.4	82	261	20	12.8	
	1600	0.6	105	351	29	12.2		1600	0.5	105	351	28	12.4	
	1800	0.7	130	455	38	12.0		1800	0.7	131	451	38	11.9	
	2000	0.9	160	574	49	11.8		2100	1.1	174	624	56	11.1	
	2300	1.3	209	768	69	11.2		2300	1.3	204	750	70	10.7	
	2500	1.6	244	905	85	10.7		2500	1.7	244	907	89	10.2	
	2700	2.0	283	1070	105	10.2		2700	2.1	284	1066	109	9.7	
3225 rpm	2900	2.4	331	1249	123	10.1	3000 rpm	3000	2.8	349	1328	146	9.1	
	3100	2.9	376	1439	154	9.4		3200	3.4	396	1514	175	8.6	
	3300	3.4	422	1612	180	8.9		3400	4.0	445	1707	208	8.2	
8S (29.6V)	3500	4.1	476	1833	215	8.5	3600 rpm	3600	4.7	501	1935	244	7.9	
	3800	5.2	556	2160	270	8.0		3900	6.0	591	2293	311	7.4	
	4000	6.1	617	2371	319	7.4		4100	7.0	659	2560	364	7.0	
4150 rpm	4200	7.1	682	2612	369	7.1	4300 rpm	4300	8.1	727	2833	420	6.7	
	4400	8.1	754	2902	425	6.8		4500	9.3	794	3092	482	6.4	
	4600	9.4	838	3234	490	6.6		4800	11.3	916	3553	589	6.0	
10S (37.0V)	4800	10.7	907	3490	557	6.3	5000 rpm	5000	12.8	986	3832	665	5.8	
	4980 rpm	5100	13.1	1049	4067	685		5.9	5200	14.7	1086	4203	763	5.5
	5300	14.6	1115	4315	763	5.7		5400	16.5	1168	4519	856	5.3	
12S (44.4V)	5500	16.6	1209	4660	867	5.4	6S (22.2V)	5600	18.7	1270	4908	970	5.1	
	5700	18.7	1306	5054	976	5.2		5660 rpm	5900	22.4	1424	5481	1162	4.7
	5900	21.0	1409	5420	1094	5.0		Short term operation ($T_w > 155\text{ }^{\circ}\text{C}$)						
5700 rpm	6100	23.6	1517	5813	1230	4.7	8S (29.6V)	6100	25.3	1535	5896	1307	4.5	
Short term operation ($T_w > 155\text{ }^{\circ}\text{C}$)								6300	28.6	1657	6350	1476	4.3	
6350	27.4	1684	6441	1429	4.5	6530 rpm		6540	32.9	1798	6828	1697	4.0	

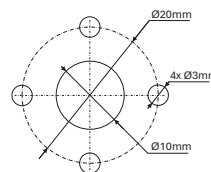
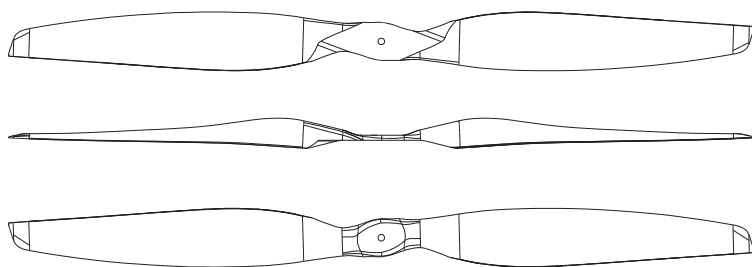


Notes

Bench test data for reference only. Direct comparison with datasheets from other manufacturers can be misleading.
The propeller is not distributed by maxon. Please contact the propeller manufacturer.
Please note the interface to the motor, see drawing above.

Propeller 22x7.4

maxon recommended propeller for EC 69 flat



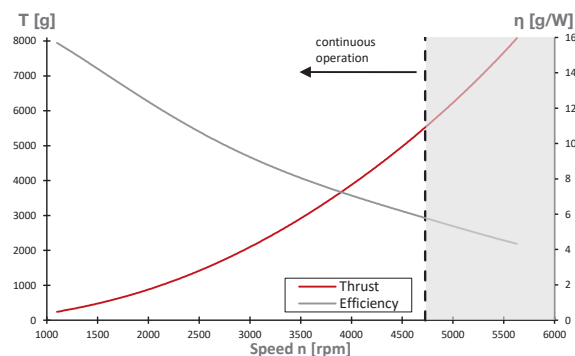
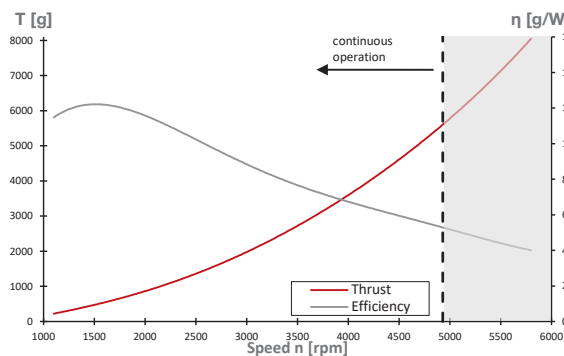
Propeller specifications		
1 Diameter	inch	22.0 (558.8 mm)
2 Pitch	inch	7.4 (188.0 mm)
3 Weight of propeller	g	46.0
4 Drill pattern		maxon EC69fl UAV
5 Interface thickness	mm	4.26
6 Material		carbon/glass fiber
7 Max. recommended speed	rpm	8200

Motor propeller combination				
Adjusted motor data for use with specified propeller (active cooling)				
		779406	842437	
8 Max. continuous speed	rpm	4930	4728	
9 Max. continuous torque	mNm	1575	1470	
10 Max. continuous current	A	30.5	57.9	motor current=output current from ESC maxon UAV ESC parameter: nominal current
11 Max. continuous electrical power	W	1145	1057	
12 Max. peak electrical power	W	2135	2061	<15s
13 Thermal time constant winding	s	28.5	30.5	

Propulsion system performance table

ESC supply voltage: 52.2 V (12S max. LiPo voltage) / Ambient temperature: 20°C / Elevation (AMSL): 475 m

779406							842437						
Achievable speed with battery level	Speed [rpm]	Current [A]	Torque [mNm]	Thrust [g]	el. Power [W]	Efficiency [g/W]	Achievable speed with battery level	Speed [rpm]	Current [A]	Torque [mNm]	Thrust [g]	el. Power [W]	Efficiency [g/W]
Continuous operation ($T_w < 155^\circ\text{C}$)							Continuous operation ($T_w < 155^\circ\text{C}$)						
6S (22.2V)	1100	0.4	84	237	21	11.5	6S (22.2V)	1100	0.3	83	241	15	15.6
	1300	0.5	113	336	28	11.9		1300	0.4	112	349	23	15.1
	1500	0.7	147	461	37	12.3		1500	0.6	147	476	33	14.3
	1700	1.0	186	608	50	12.2		1700	0.9	187	624	46	13.5
	1900	1.2	231	767	65	11.8		1900	1.2	233	796	63	12.7
	2100	1.6	282	959	84	11.4		2100	1.6	277	970	81	11.9
	2300	2.1	337	1152	108	10.6		2300	2.0	332	1177	105	11.2
	2500	2.6	401	1386	136	10.2		2500	2.5	392	1417	132	10.7
	2700	3.2	463	1623	167	9.7		2700	3.2	457	1674	165	10.1
	2900	3.9	529	1860	203	9.2		2900	3.9	532	1953	205	9.5
3110 rpm	3100	4.7	594	2091	243	8.6	3110 rpm	3100	4.8	610	2240	250	8.9
	3300	5.7	682	2393	295	8.1		3300	5.8	691	2582	302	8.5
	3600	7.3	814	2873	382	7.5		3500	6.9	772	2903	360	8.1
8S (29.6V)	3800	8.7	899	3215	452	7.1	8S (29.6V)	3700	8.3	883	3277	432	7.6
	3950 rpm	10.2	1001	3559	531	6.7		3900	9.8	984	3682	509	7.2
	4200	12.1	1134	4046	632	6.4		4100	11.4	1086	4083	592	6.9
10S (37.0V)	4400	13.9	1234	4398	724	6.1	10S (37.0V)	4300	13.5	1209	4520	698	6.5
	4600	16.1	1359	4824	838	5.8		4400	14.5	1275	4784	754	6.3
	4700 rpm	18.7	1500	5316	974	5.5		4600	16.8	1395	5214	873	6.0
Short term operation ($T_w > 155^\circ\text{C}$)							Short term operation ($T_w > 155^\circ\text{C}$)						
12S (44.4V)	5000	21.5	1635	5787	1122	5.2	12S (44.4V)	4800	19.4	1521	5667	1004	5.6
	5200	24.8	1797	6365	1296	4.9		5000	22.4	1658	6199	1159	5.3
	5400	28.2	1916	6762	1470	4.6		5200	26.2	1818	6810	1352	5.0
	5600	33.1	2093	7389	1727	4.3		5400	30.7	1998	7401	1585	4.7
5330 rpm	5800	39.1	2299	8099	2042	4.0	5330 rpm	5630	36.4	2170	8063	1874	4.3

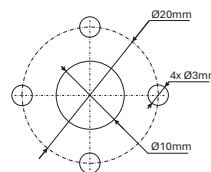
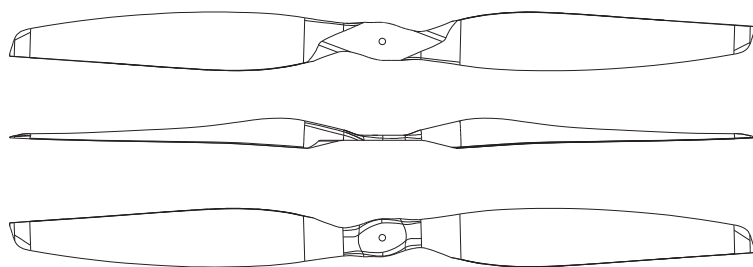


Notes

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The propeller is not distributed by maxon. Please contact the propeller manufacturer.
Please note the interface to the motor, see drawing above.

Propeller 24x8.1

maxon recommended propeller for EC 69 flat



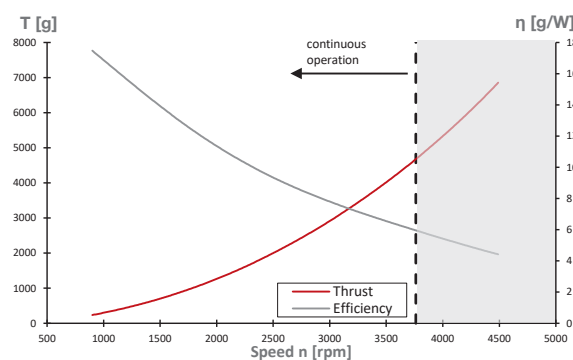
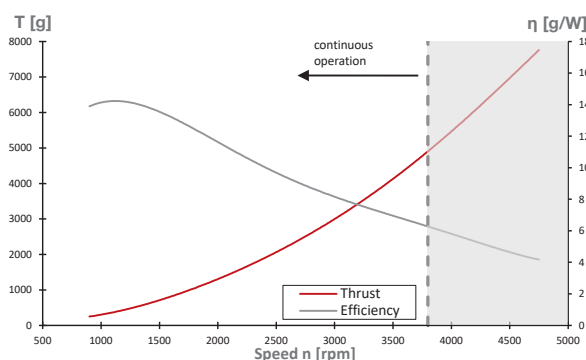
Propeller specifications		
1 Diameter	inch	24.0 (609.6 mm)
2 Pitch	inch	8.1 (205.7 mm)
3 Weight of propeller	g	57.0
4 Drill pattern		maxon EC69fl UAV
5 Interface thickness	mm	4.5
6 Material		carbon/glass fiber
7 Max. recommended speed	rpm	7500

Motor propeller combination				
Adjusted motor data for use with specified propeller (active cooling)				
		779406	842437	
8 Max. continuous speed	rpm	3800	3762	
9 Max. continuous torque	mNm	1500	1442	
10 Max. continuous current	A	28.8	56.4	motor current=output current from ESC maxon UAV ESC parameter: nominal current
11 Max. continuous electrical power	W	860	868	
12 Max. peak electrical power	W	1903	1727	<15s
13 Thermal time constant winding	s	28.5	30.5	

Propulsion system performance table

ESC supply voltage: 52.2 V (12S max. LiPo voltage) / Ambient temperature: 20°C / Elevation (AMSL): 475 m

779406							842437						
Achievable speed with battery level	Speed [rpm]	Current [A]	Torque [mNm]	Thrust [g]	el. Power [W]	Efficiency [g/W]	Achievable speed with battery level	Speed [rpm]	Current [A]	Torque [mNm]	Thrust [g]	el. Power [W]	Efficiency [g/W]
Continuous operation ($T_w < 155^{\circ}\text{C}$)							Continuous operation ($T_w < 155^{\circ}\text{C}$)						
6S (22.2V)	900	0.3	94	242	18	13.8	6S (22.2V)	900	0.3	93	237	14	17.4
	1100	0.5	135	372	26	14.4		1100	0.4	133	366	22	16.3
	1200	0.6	158	447	31	14.3		1200	0.5	157	441	28	15.7
	1400	0.8	208	613	44	13.8		1400	0.8	208	612	42	14.5
	1600	1.2	269	814	62	13.1		1500	1.0	235	701	51	13.9
	1700	1.4	303	925	73	12.8		1700	1.4	296	904	71	12.8
	1900	1.9	376	1178	98	12.0		1800	1.6	332	1022	83	12.3
	2100	2.5	454	1434	129	11.1		2000	2.1	402	1261	111	11.3
	2200	2.8	501	1591	147	10.8		2100	2.5	446	1404	129	10.9
	2400	3.6	593	1905	188	10.1		2300	3.2	528	1684	166	10.1
2950 rpm	2600	4.5	691	2235	237	9.4	2950 rpm	2500	4.1	627	2006	214	9.4
	2700	5.1	739	2402	265	9.1		2600	4.6	673	2154	239	9.0
	2900	6.3	850	2773	327	8.5		2800	5.8	784	2521	301	8.4
	3100	7.9	999	3255	411	7.9		2900	6.4	841	2718	335	8.1
	3200	8.6	1046	3440	449	7.7		3100	8.0	968	3123	416	7.5
8S (29.6V)	3400	10.4	1182	3866	543	7.1	8S (29.6V)	3200	8.8	1032	3333	459	7.3
	3600	12.7	1351	4420	661	6.7		3400	10.7	1168	3782	559	6.8
	3700	13.7	1402	4603	716	6.4		3600	13.1	1327	4282	680	6.3
3700 rpm	Short term operation ($T_w > 155^{\circ}\text{C}$)						3700 rpm	Short term operation ($T_w > 155^{\circ}\text{C}$)					
10S (37.0V)	3900	16.6	1596	5205	866	6.0	10S (37.0V)	3900	17.2	1566	5052	894	5.7
	4100	19.7	1762	5772	1030	5.6		4000	18.9	1652	5326	978	5.4
	4200	21.3	1823	5954	1110	5.4		4050 rpm	4200	22.8	1836	5910	1177
4270 rpm	4400	25.9	2053	6667	1352	4.9	4270 rpm	4300	25.1	1935	6245	1298	4.8
	4600	31.8	2287	7405	1663	4.5		4480 rpm	4490	30.2	2111	6855	1559
12S (44.4V)	4750	35.7	2397	7697	1865	4.1	12S (44.4V)	4750	35.7	2397	7697	1865	4.1



Notes

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The propeller is not distributed by maxon. Please contact the propeller manufacturer.
Please note the interface to the motor, see drawing above.