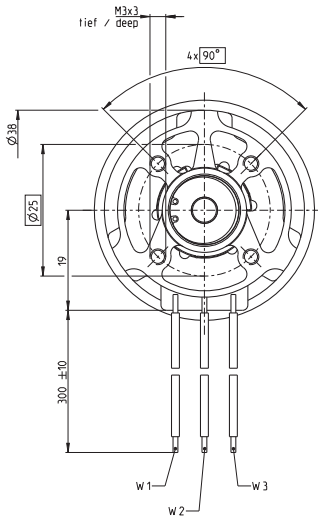
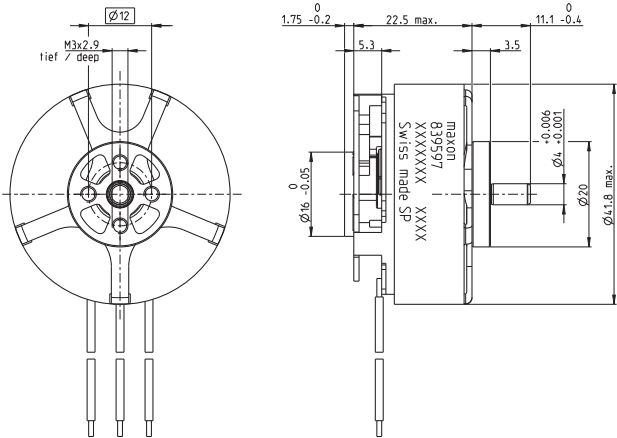


ECX 42 flat UAV Ø42 mm, brushless

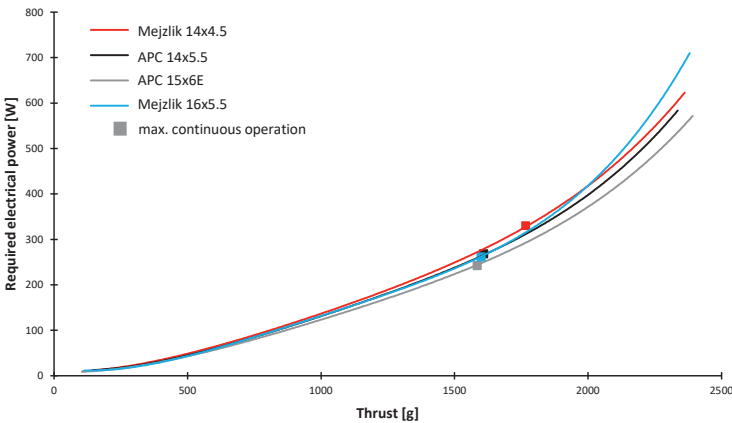
High power to weight ratio



		Part number
sensorless		839597
Motor data		Propeller selection

Values at nominal voltage		
1	Nominal voltage ¹	V 12
2	No load speed	rpm 6980
3	No load current	mA 569
4	Nominal speed	rpm 5490
5	Nominal torque (max. continuous torque)	mNm 210
6	Nominal current (max. continuous current)	A 12.5
7	Stall torque ²	mNm 1020
8	Stall current	A 138
9	Max. efficiency	% 82.8

Characteristics		
10	Terminal resistance phase to phase	Ω 0.0867
11	Terminal inductance phase to phase	mH 0.0512
12	Torque constant	mNm/A 16.3
13	Speed constant	rpm/V 588
14	Speed/torque gradient	rpm/mNm 3.14
15	Mechanical time constant	ms 2.83
16	Rotor inertia	gcm ² 86.2
17	Thermal resistance housing-ambient ³	K/W 1.87
18	Thermal resistance winding-housing ³	K/W 3.12
19	Thermal time constant winding	s 20.7
20	Thermal time constant motor	s 104



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

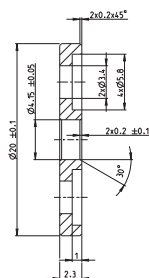
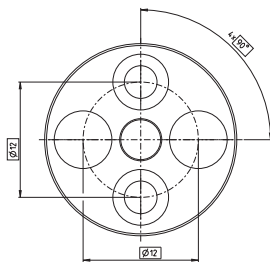
² Calculation does not include saturation effect.

³ At nominal working point.

Specifications				Modifications on request - contact aerospace@maxongroup.com
Thermal data				- Cable length
21	Ambient temperature	°C	-40...+70	- Type of cables
22	Max. continuous winding temperature	°C	+155	- Electrical connector
	Absolute winding temperature	°C	+180	- Shaft length
Mechanical data (preloaded ball bearings)				- Shaft design (e.g. hollow shaft)
23	Max. speed	rpm	10000	- Mounting interface
Other specifications				- Speed constant and torque constant
24	Number of pole pairs		8	- Customized labeling (text only)
	Magnetic system configuration		12NP16	- Motor length (shorter motor = reduced motor performance)
25	Number of phases		3	- Propeller mounting interface
26	Weight of motor (incl. 300 mm cable)	g	105	- Threaded shaft CW or CCW
27	Recommended propeller sizes	inch	14...16	- Threaded shaft and self locking flange nut
maxon accessories				

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)."

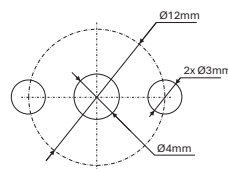
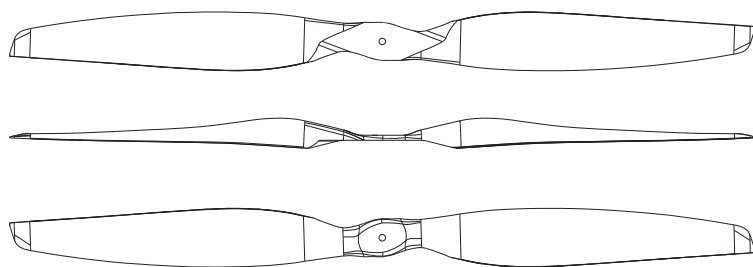
Cable and connection
Connection cable PTFE, L = 300 mm, AWG 18
W1: Motor winding 1, W2: Motor winding 2, W3: Motor winding 3



maxon accessories
Propeller adapter: 806748

Propeller 14x4.5

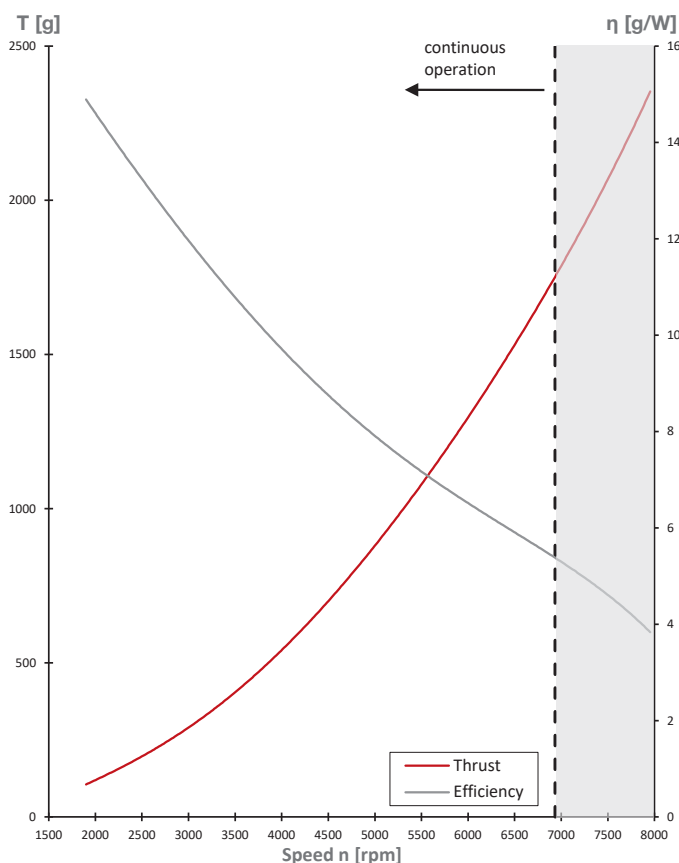
maxon recommended propeller for ECX 42 flat



Propeller specifications		
1 Diameter	inch	14.0 (355.6 mm)
2 Pitch	inch	4.5 (114.3 mm)
3 Weight of propeller	g	15.0
4 Drill pattern		maxon ECX42fl UAV
5 Interface thickness	mm	2.7
6 Material		carbon/glass fiber
7 Max. recommended speed	rpm	12900

Motor propeller combination			
Adjusted motor data for use with specified propeller (active cooling)			
8 Max. continuous speed	rpm	6935	
9 Max. continuous torque	mNm	345	
10 Max. continuous current	A	26.0	motor current = output current from ESC maxon UAV ESC parameter: nominal current
11 Max. continuous electrical power	W	363	
12 Max. peak electrical power	W	620	
13 Thermal time constant winding	s	16.0	<15s

Propulsion system thrust and efficiency curves



Propulsion system performance table

ESC supply voltage **44.4V** (12S nominal LiPo voltage)
Ambient temperature 20°C
Elevation (AMSL) 475m
839597

Achievable
speed with
battery level

Speed [rpm]	Current [A]	Torque [mNm]	Thrust [g]	el. Power [W]	Efficiency [g/W]
Continuous operation ($T_w < 155^\circ\text{C}$)					
1900	0.2	24	108	7	15.0
2100	0.2	29	132	9	14.0
2400	0.3	37	179	13	13.7
2600	0.4	44	212	16	13.3
2800	0.5	51	248	20	12.3
3100	0.6	62	311	27	11.6
3300	0.7	71	357	32	11.2
3500	0.9	80	406	38	10.7
3800	1.1	95	485	48	10.1
4000	1.3	106	543	56	9.7
4200	1.5	117	604	65	9.3
4500	1.8	134	699	80	8.8
4700	2.1	147	770	91	8.5
4900	2.4	161	839	103	8.1
5200	2.8	182	956	125	7.6
5400	3.2	197	1032	141	7.3
5600	3.6	214	1120	159	7.0
5900	4.3	240	1250	190	6.6
6100	4.8	257	1342	210	6.4
6400	5.6	283	1483	246	6.0
6600	6.3	303	1586	274	5.8
6800	7.0	323	1687	306	5.5
Short term operation ($T_w > 155^\circ\text{C}$)					
7100	8.2	352	1845	360	5.1
7300	9.0	369	1946	396	4.9
7500	10.1	391	2062	441	4.7
7800	12.1	428	2245	532	4.2
7955	14.3	451	2362	633	3.7

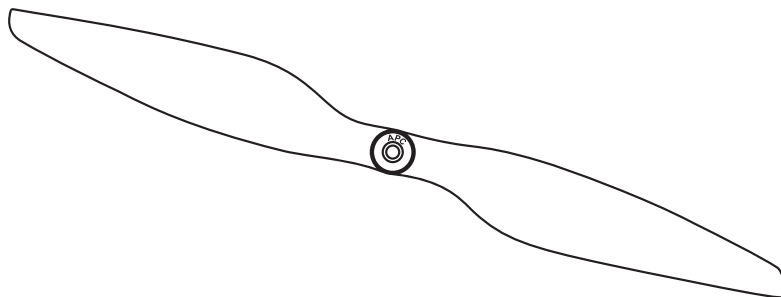
6S (22.2V)
7955 rpm

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 14x5.5MR

maxon recommended propeller for ECX 42 flat



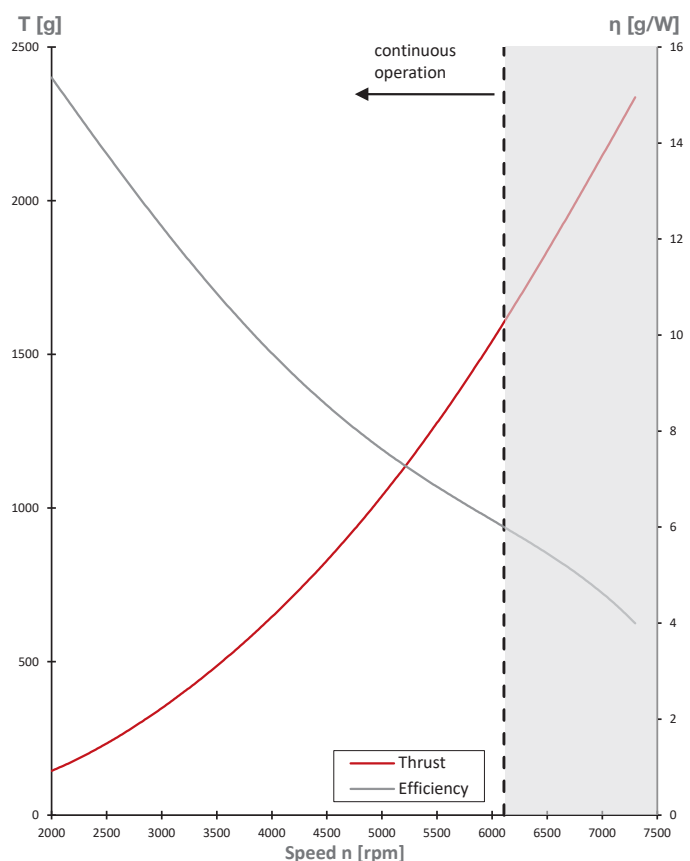
Propeller specifications		
1	Diameter	inch 14.0 (355.6 mm)
2	Pitch	inch 5.5 (139.7 mm)
3	Weight of propeller	g 30.0
4	Shaft diameter	mm 6.4
5	Interface thickness	mm 9.7
6	Material	reinforced plastic compound
7	Max. recommended speed	rpm 7500

Motor propeller combination			
Adjusted motor data for use with specified propeller (active cooling)			
8	Max. continuous speed	rpm	6110
9	Max. continuous torque	mNm	308
10	Max. continuous current	A	25.0
11	Max. continuous electrical power	W	286
12	Max. peak electrical power	W	580
13	Thermal time constant winding	s	16.0

motor current = output current from ESC | maxon UAV ESC parameter: nominal current

<15s

Propulsion system thrust and efficiency curves



Propulsion system performance table

ESC supply voltage **44.4 V** (12S nominal LiPo voltage)
Ambient temperature 20°C
Elevation (AMSL) 475m
839597

Achievable speed with battery level	Speed [rpm]	Current [A]	Torque [mNm]	Thrust [g]	el. Power [W]	Efficiency [g/W]
Continuous operation ($T_w < 155^\circ\text{C}$)						
	2000	0.2	33	143	9	15.4
	2200	0.3	39	176	12	14.6
	2400	0.3	46	214	15	14.1
	2600	0.4	53	255	19	13.5
	2800	0.5	61	299	23	13.0
	3000	0.7	70	348	28	12.2
	3200	0.8	80	400	34	11.7
	3400	0.9	90	455	41	11.1
	3600	1.1	102	514	49	10.5
	3800	1.3	114	577	58	10.0
	4000	1.5	127	646	68	9.6
	4200	1.8	140	718	77	9.3
	4400	2.0	154	794	89	8.9
	4700	2.5	177	908	112	8.1
	4900	2.9	194	993	127	7.8
	5100	3.3	212	1084	146	7.4
	5300	3.7	229	1175	165	7.1
	5500	4.2	246	1272	187	6.8
	5700	4.8	266	1380	210	6.6
	5900	5.4	288	1489	236	6.3
	6100	6.1	309	1604	267	6.0
	Short term operation ($T_w > 155^\circ\text{C}$)					
	6300	6.8	333	1723	300	5.7
	6500	7.6	353	1826	337	5.4
	6700	8.6	378	1955	382	5.1
	6900	9.8	403	2083	431	4.8
	7100	11.1	427	2211	488	4.5
	7300	13.4	454	2336	595	3.9

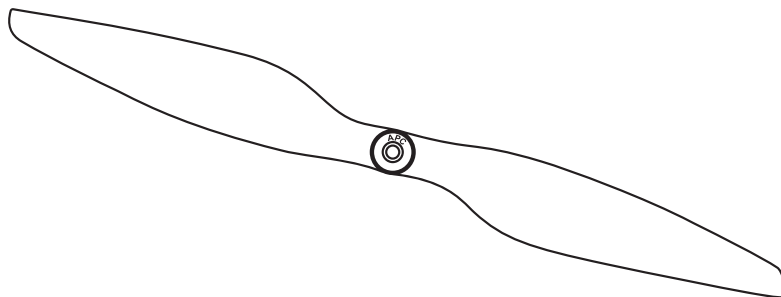
6S (22.2V)
7300 rpm

Notes

Bench test data for reference only.
Direct comparison with datasheets from other manufacturers can be misleading.
Propeller interface not directly compatible with motor interface (adapter required).
The propeller is not distributed by maxon. Please contact the propeller manufacturer.

Propeller 15x6E

maxon recommended propeller for ECX 42 flat



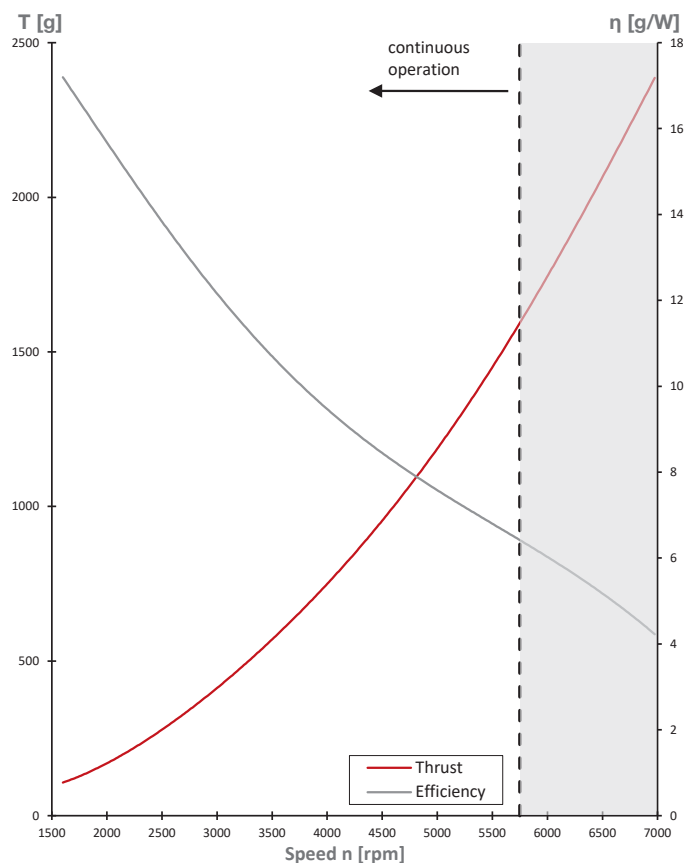
Propeller specifications		
1 Diameter	inch	15.0 (381.0 mm)
2 Pitch	inch	6.0 (152.4 mm)
3 Weight of propeller	g	45.1
4 Shaft diameter	mm	6.4
5 Interface thickness	mm	12.0
6 Material	reinforced plastic compound	
7 Max. recommended speed	rpm	10000

Motor propeller combination			
Adjusted motor data for use with specified propeller (active cooling)			
8	Max. continuous speed	rpm	5750
9	Max. continuous torque	mNm	303
10	Max. continuous current	A	25.0
11	Max. continuous electrical power	W	268
12	Max. peak electrical power	W	550
13	Thermal time constant winding	s	16.0

motor current = output current from ESC | maxon UAV ESC parameter: nominal current

<15s

Propulsion system thrust and efficiency curves



Propulsion system performance table

ESC supply voltage **44.4 V** (12S nominal LiPo voltage)
Ambient temperature 20°C
Elevation (AMSL) 475m
839597

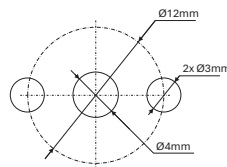
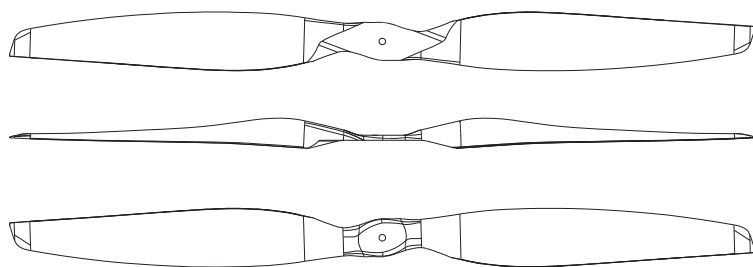
Achievable speed with battery level	Speed [rpm]	Current [A]	Torque [mNm]	Thrust [g]	el. Power [W]	Efficiency [g/W]
Continuous operation ($T_w < 155^\circ\text{C}$)						
	1600	0.1	28	104	6	17.4
	1800	0.2	33	136	9	15.9
	2000	0.3	40	172	11	16.0
	2200	0.3	47	212	14	15.0
	2400	0.4	56	255	18	14.3
	2600	0.5	65	303	22	13.4
	2800	0.6	75	355	28	12.7
	3000	0.8	85	410	34	12.0
	3300	1.0	103	502	45	11.2
	3500	1.2	115	569	53	10.7
	3700	1.4	127	636	62	10.2
	3900	1.6	140	709	73	9.7
	4100	1.9	156	794	85	9.3
	4300	2.2	171	874	98	8.9
	4500	2.6	187	957	113	8.5
	4700	2.9	203	1049	129	8.1
	4900	3.3	221	1138	148	7.7
	5100	3.8	238	1236	167	7.4
	5300	4.3	257	1340	189	7.1
	5500	4.8	274	1439	214	6.7
	5700	5.5	297	1557	241	6.5
	Short term operation ($T_w > 155^\circ\text{C}$)					
	5900	6.2	322	1689	272	6.2
	6100	7.0	346	1804	310	5.8
	6400	8.4	379	2013	371	5.4
	6600	9.6	408	2139	422	5.1
	6800	11.1	433	2248	487	4.6
6S (22.2V) 6975 rpm	6975	13.0	458	2392	576	4.2

Notes

Bench test data for reference only.
Direct comparison with datasheets from other manufacturers can be misleading.
Propeller interface not directly compatible with motor interface (adapter required).
The propeller is not distributed by maxon. Please contact the propeller manufacturer.

Propeller 16x5.5

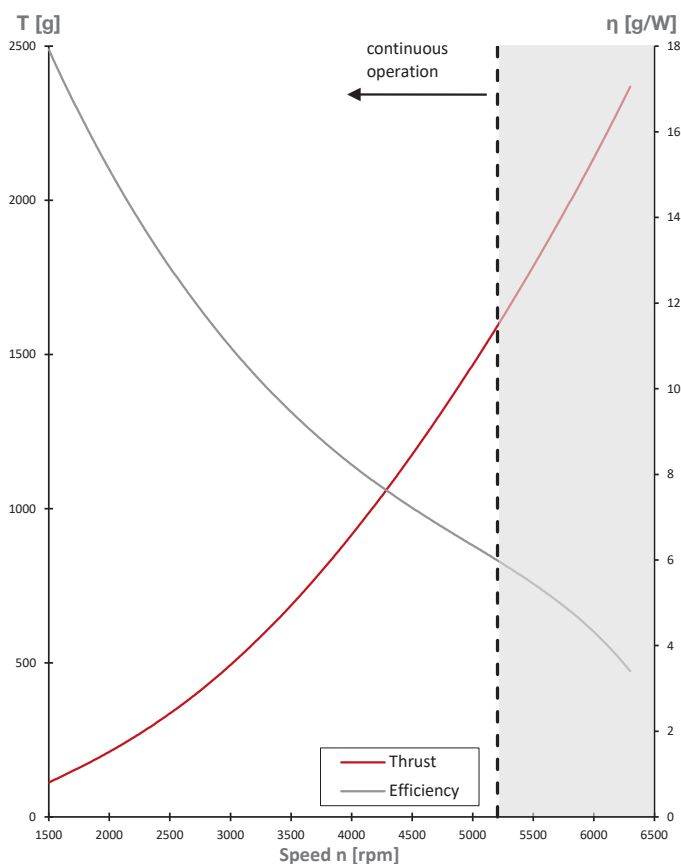
maxon recommended propeller for ECX 42 flat



Propeller specifications		
1 Diameter	inch	16.0 (406.4 mm)
2 Pitch	inch	5.5 (139.7 mm)
3 Weight of propeller	g	20.0
4 Drill pattern		maxon ECX42fl UAV
5 Interface thickness	mm	2.85
6 Material		carbon/glass fiber
7 Max. recommended speed	rpm	11300

Motor propeller combination			
Adjusted motor data for use with specified propeller (active cooling)			
8 Max. continuous speed	rpm	5205	motor current = output current from ESC maxon UAV ESC parameter: nominal current
9 Max. continuous torque	mNm	353	
10 Max. continuous current	A	26.0	
11 Max. continuous electrical power	W	297	
12 Max. peak electrical power	W	700	
13 Thermal time constant winding	s	16.0	<15s

Propulsion system thrust and efficiency curves



Propulsion system performance table

ESC supply voltage **44.4 V** (12S nominal LiPo voltage)
Ambient temperature 20°C
Elevation (AMSL) 475m
839597

Achievable speed with battery level	Speed [rpm]	Current [A]	Torque [mNm]	Thrust [g]	el. Power [W]	Efficiency [g/W]
Continuous operation ($T_w < 155^\circ\text{C}$)						
6S (22.2V)	1500	0.1	31	114	6	17.9
	1700	0.2	38	148	9	16.8
	1900	0.3	46	188	12	15.6
	2100	0.4	55	233	16	14.7
	2200	0.4	61	255	18	14.3
	2400	0.5	72	309	23	13.2
	2600	0.7	85	364	29	12.4
	2800	0.8	98	428	37	11.6
	3000	1.0	113	494	45	10.9
	3200	1.2	128	568	55	10.3
	3300	1.4	136	605	60	10.0
	3500	1.6	153	686	72	9.5
	3700	1.9	172	773	86	9.0
	3900	2.3	193	864	102	8.5
	4100	2.7	214	965	119	8.1
	4300	3.2	236	1064	140	7.6
	4500	3.7	258	1172	162	7.2
6300 rpm	4600	4.0	270	1234	175	7.1
	4800	4.6	296	1340	203	6.6
	5000	5.3	322	1461	233	6.3
	5200	6.1	350	1597	267	6.0
	Short term operation ($T_w > 155^\circ\text{C}$)					
	5400	7.0	378	1735	308	5.6
	5600	8.1	406	1861	356	5.2
	5700	8.6	418	1917	382	5.0
	5900	10.0	446	2057	443	4.6
	6100	11.9	479	2197	527	4.2
	6300	16.2	522	2381	721	3.3

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.