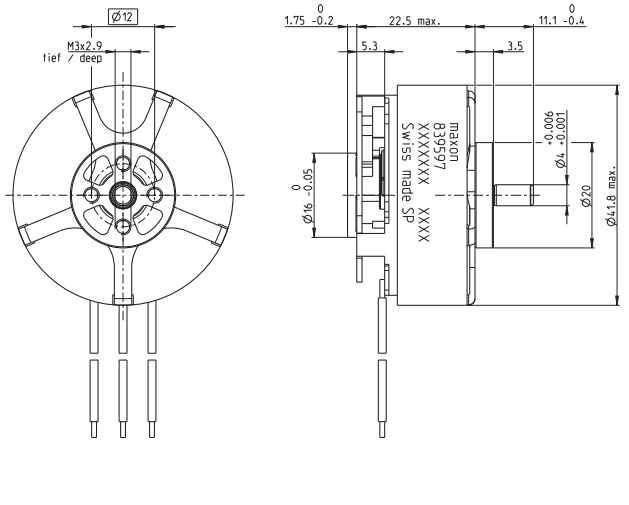
ECX 42 flat UAV ∅42 mm, brushless

High power to weight ratio

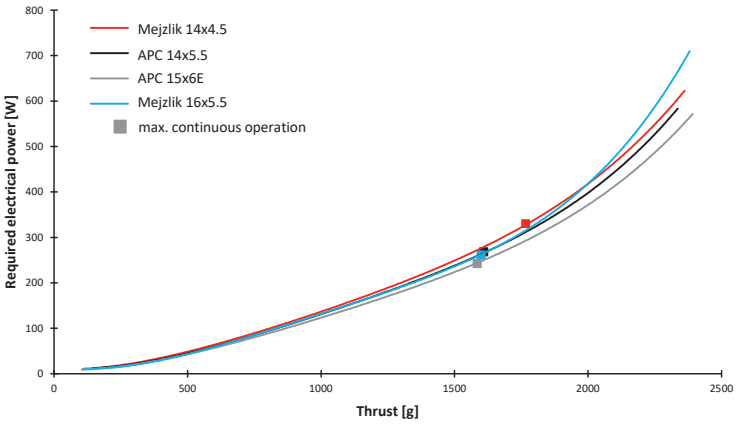


	Part number
sensorless	839597

Motor data

			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	gcm²	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

Propeller selection



[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
22	Max. continuous winding temperature	°C	+155
	Absolute winding temperature	°C	+180
	Mechanical data (preloaded ball bearings)		
23	Max. speed	rpm	10000
	Other specifications		
24	Number of pole pairs		8
	Magnetic system configuration		12NP16
25	Number of phases		3
26	Weight of motor (incl. 300 mm cable)	g	105
27	Recommended propeller sizes	inch	14...16

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)."

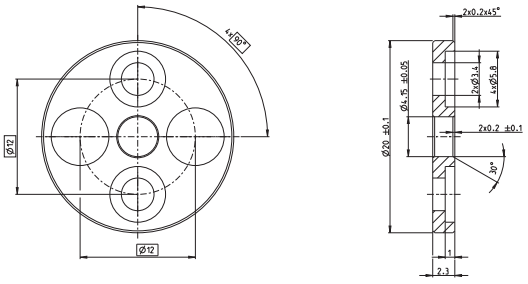
Cable and connection
Connection cable PTFE, L = 300 mm, AWG 18
W1: Motor winding 1, W2: Motor winding 2, W3: Motor winding 3

Modifications on request - contact aerospace@maxongroup.com

- Cable length
- Type of cables
- Electrical connector
- Shaft length
- Shaft design (e.g. hollow shaft)
- Mounting interface
- Speed constant and torque constant
- Customized labeling (text only)
- Motor length (shorter motor = reduced motor performance)
- Propeller mounting interface
  - Threaded shaft CW or CCW
  - Threaded shaft and self locking flange nut

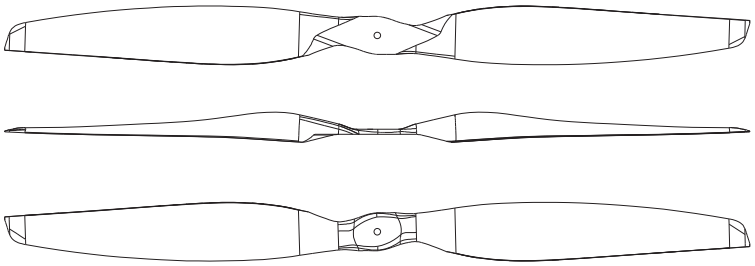
maxon accessories

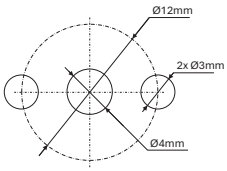
Propeller adapter: 806748



Propeller 14x4.5

maxon recommended propeller for ECX 42 flat

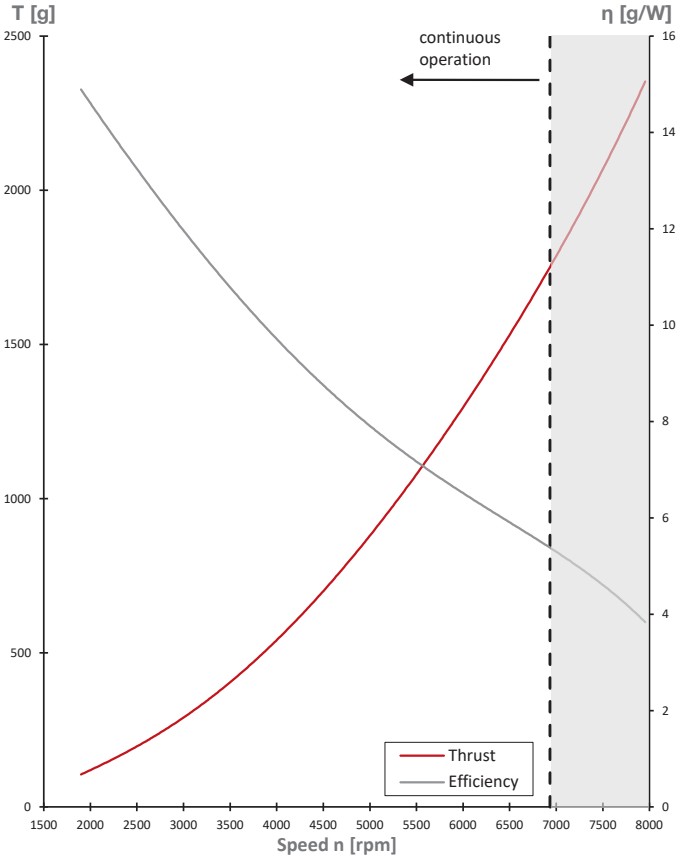




Propeller specifications			
1	Diameter	inch	14.0 (355.6 mm)
2	Pitch	inch	4.5 (114.3 mm)
3	Weight of propeller	g	15.0
4	Drill pattern		maxon ECX42fl UAV
5	Interface thickness	mm	2.7
6	Material		carbon/glass fiber
7	Max. recommended speed	rpm	12900

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	<15s
13	Thermal time constant winding	s	16.0	

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 °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 °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
6S (22.2V)	7955	14.3	451	2362	633	3.7
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.