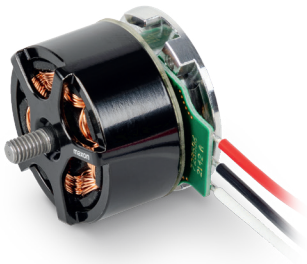
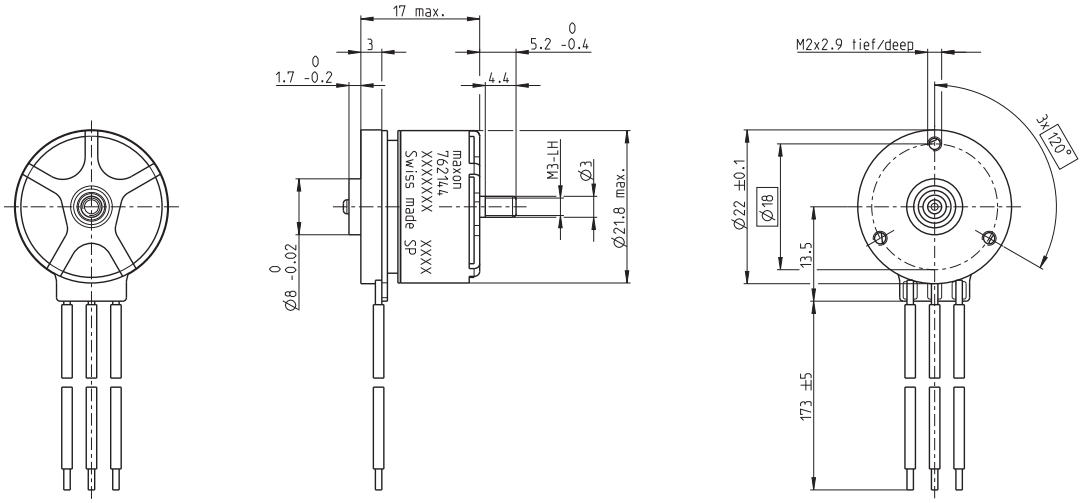
ECX 22 flat UAV ∅22 mm, brushless

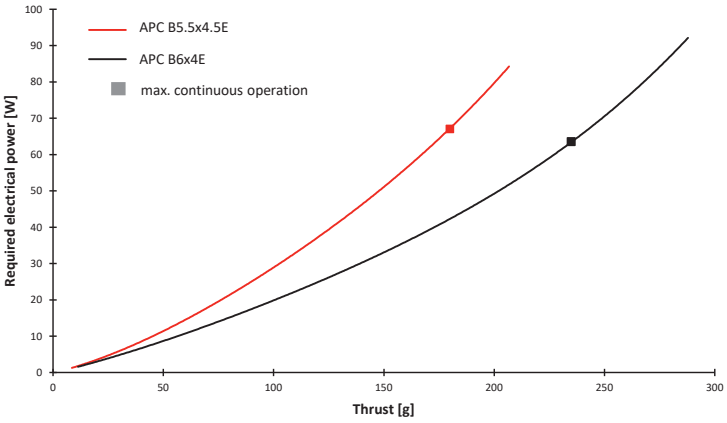
Designed for small professional UAV applications





		Part number
	sensorless	762144
Motor data		
	Values at nominal voltage	
1	Nominal voltage[1]	9 V
2	No load speed	14700 rpm
3	No load current	290 mA
4	Nominal speed	11500 rpm
5	Nominal torque (max. continuous torque)	28.3 mNm
6	Nominal current (max. continuous current)	4.76 A
7	Stall torque[2]	136 mNm
8	Stall current	34.2 A
9	Max. efficiency	82.8 %
	Characteristics	
10	Terminal resistance phase to phase	0.278 Ω
11	Terminal inductance phase to phase	0.0418 mH
12	Torque constant	5.77 mNm/A
13	Speed constant	1650 rpm/V
14	Speed/torque gradient	85.5 rpm/mNm
15	Mechanical time constant	5.39 ms
16	Rotor inertia	6.82 gcm²
17	Thermal resistance housing-ambient[3]	6.21 K/W
18	Thermal resistance winding-housing[3]	6.00 K/W
19	Thermal time constant winding	5.41 s
20	Thermal time constant motor	14.9 s

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 15000
	Other specifications	
24	Number of pole pairs	6
	Magnetic system configuration	9N12P
25	Number of phases	3
26	Weight of motor (incl. 173 mm cable)	g 22.5
27	Recommended propeller sizes	inch 5...6

Modifications on request - contact aerospace@maxongroup.com

- Cable length
- Type of cables
- Electrical connector
- Shaft length
- Shaft design
- Mounting interface
- Speed constant and torque constant
- Customized labeling (text only)
- Motor length (shorter motor = reduced motor performance)

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 = 173 mm, AWG 22
W1: Motor winding 1, W2: Motor winding 2, W3: Motor winding 3

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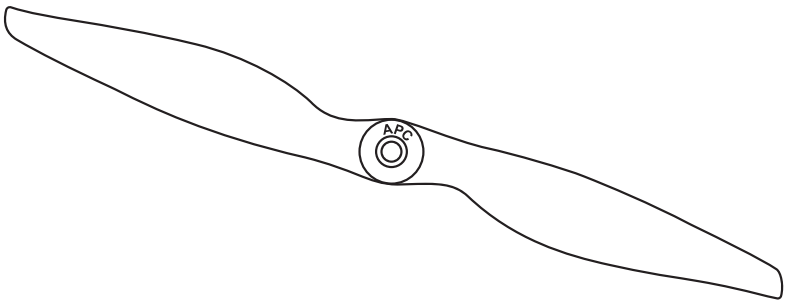
Propeller B5.5x4.5E

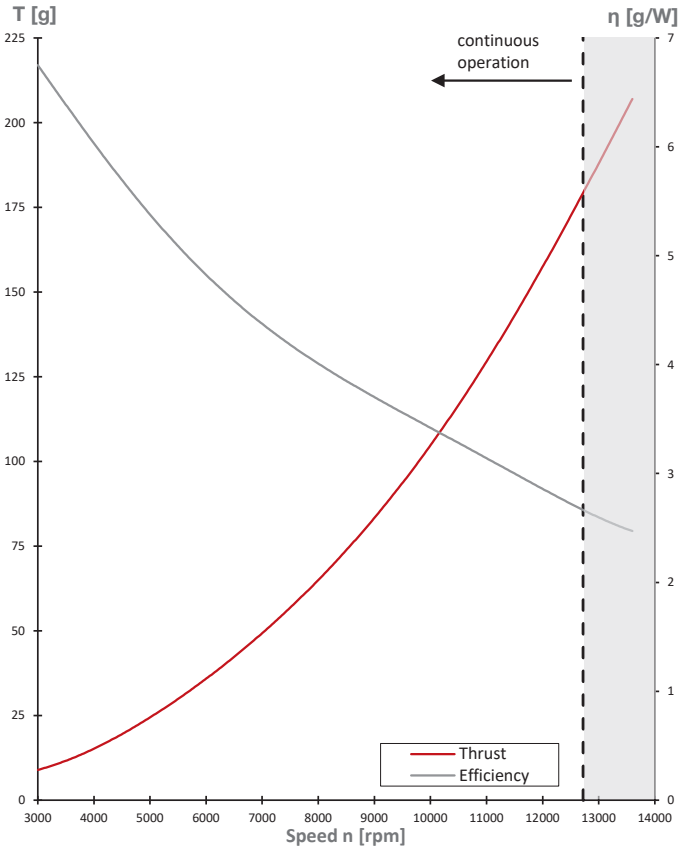
maxon recommended propeller for ECX 22 flat



Propeller specifications			
1	Diameter	inch	5.5 (139.7 mm)
2	Pitch	inch	4.5 (144.3 mm)
3	Weight of propeller	g	4.0
4	Shaft diameter	mm	6.4
5	Interface thickness	mm	7.6
6	Material		reinforced plastic compound
7	Max. recommended speed	rpm	27270

Motor propeller combination				
Adjusted motor data for use with specified propeller (active cooling)				
8	Max. continuous speed	rpm	12725	
9	Max. continuous torque	mNm	32	
10	Max. continuous current	A	7.3	motor current = output current from ESC | maxon UAV ESC parameter: nominal current
11	Max. continuous electrical power	W	74	
12	Max. peak electrical power	W	87	<15s
13	Thermal time constant winding	s	7.0	

Propulsion system thrust and efficiency curves



Propulsion system performance table

ESC supply voltage **12.6 V** (3S max. LiPo voltage)
Ambient temperature 20°C
Elevation (AMSL) 475m
762144

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)					
	3000	0.1	2	9	1	6.6
	3400	0.1	2	11	2	6.6
	3800	0.2	3	14	2	6.2
	4200	0.2	3	17	3	5.8
	4600	0.3	4	20	4	5.6
	5000	0.4	5	24	5	5.4
	5500	0.5	6	29	6	5.0
	5900	0.6	7	34	7	4.9
	6300	0.7	8	40	8	4.7
	6700	0.8	9	45	10	4.5
	7100	0.9	10	51	12	4.3
	7500	1.1	11	57	13	4.2
	7900	1.2	12	63	16	4.1
	8300	1.4	13	71	18	3.9
	8700	1.6	14	78	21	3.8
	9100	1.8	16	85	23	3.7
	9500	2.1	17	94	26	3.6
	10000	2.4	19	104	31	3.4
	10400	2.8	20	114	35	3.3
	10800	3.1	22	125	39	3.2
	11200	3.5	24	135	44	3.1
	11600	3.9	25	146	49	3.0
	12000	4.4	27	157	55	2.8
3S (11.1 V)	12400	4.9	29	170	61	2.8
12500 rpm	**Short term operation (T_w > 155 °C)**					
	12800	5.4	30	182	68	2.7
	13200	6.0	32	194	76	2.6
12.6 V	13600	6.7	33	207	85	2.4
13600 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.

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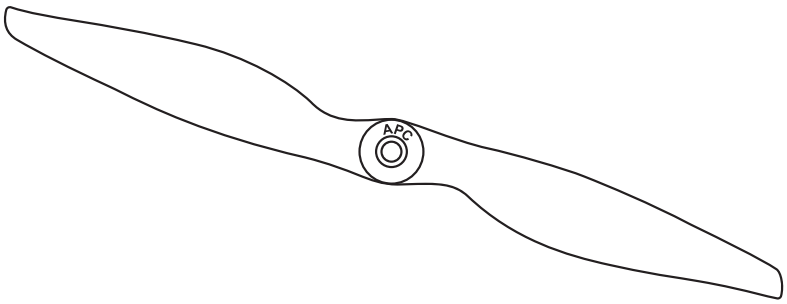
Propeller B6x4E

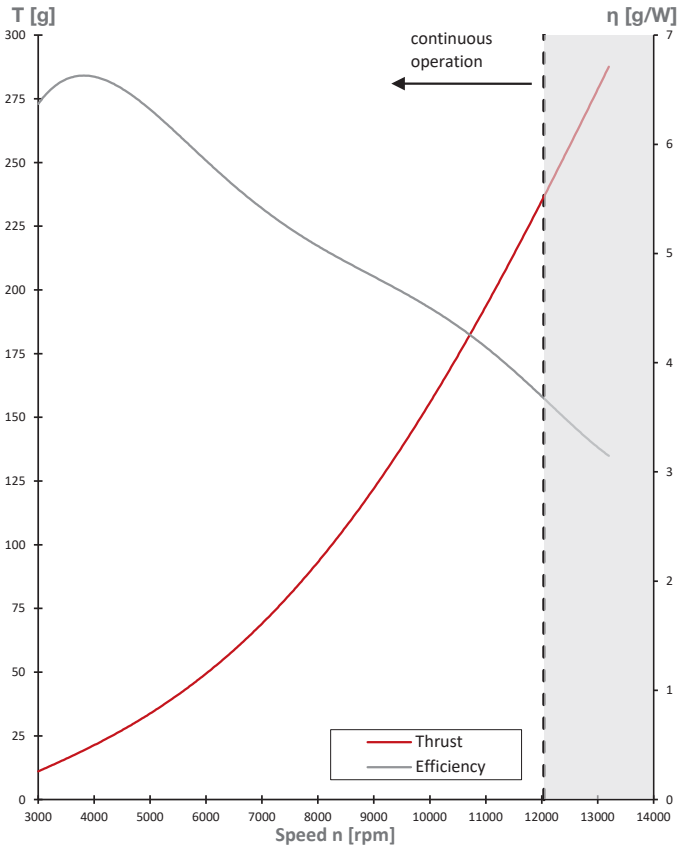
maxon recommended propeller for ECX 22 flat



Propeller specifications			
1	Diameter	inch	6.0 (152.4 mm)
2	Pitch	inch	4.0 (101.6 mm)
3	Weight of propeller	g	5.4
4	Shaft diameter	mm	6.4
5	Interface thickness	mm	6.4
6	Material		reinforced plastic compound
7	Max. recommended speed	rpm	25000

Motor propeller combination				
Adjusted motor data for use with specified propeller (active cooling)				
8	Max. continuous speed	rpm	12040	
9	Max. continuous torque	mNm	30	
10	Max. continuous current	A	7.0	motor current = output current from ESC | maxon UAV ESC parameter: nominal current
11	Max. continuous electrical power	W	71	
12	Max. peak electrical power	W	92	<15s
13	Thermal time constant winding	s	7.0	

Propulsion system thrust and efficiency curves



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ESC supply voltage **12.6 V** (3S max. LiPo voltage)
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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)					
	3000	0.1	2	11	2	6.3
	3400	0.2	3	15	2	6.7
	3800	0.2	3	19	3	6.6
	4200	0.3	4	23	4	6.7
	4600	0.3	5	28	4	6.4
	5000	0.4	6	33	5	6.2
	5400	0.5	7	40	7	6.1
	5800	0.6	8	46	8	5.9
	6100	0.7	8	52	9	5.9
	6500	0.8	9	59	11	5.6
	6900	1.0	10	67	12	5.5
	7300	1.1	12	76	14	5.3
	7700	1.3	13	85	16	5.2
	8100	1.5	14	95	19	5.0
	8500	1.7	16	107	22	4.9
	8900	2.0	17	117	25	4.8
	9300	2.2	18	130	28	4.6
	9700	2.5	20	147	32	4.7
	10100	2.8	21	160	35	4.5
	10500	3.2	23	175	40	4.3
	10900	3.6	25	190	46	4.2
	11300	4.1	27	205	52	4.0
	11600	4.5	29	217	56	3.9
	12000	5.1	30	234	64	3.7
3S (11.1 V)	**Short term operation (T_w > 155 °C)**					
12300 rpm	12400	5.7	32	253	72	3.5
	12800	6.4	34	270	80	3.4
12.6 V	13200	7.4	37	288	92	3.1
13200 rpm						

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