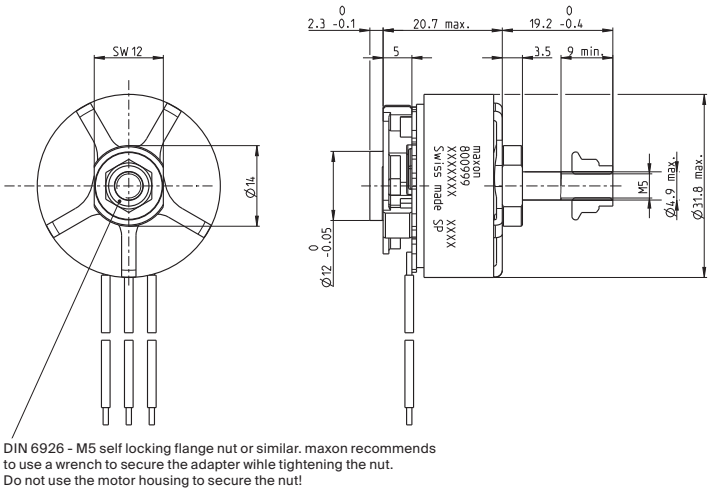
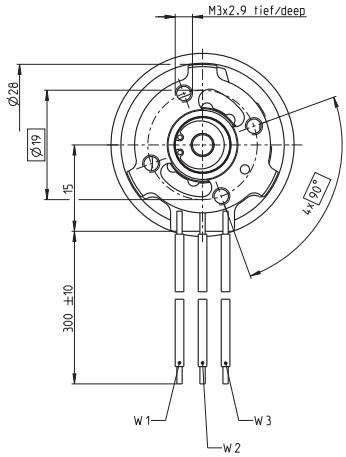
ECX 32 flat UAV ∅32 mm, brushless

High power to weight ratio

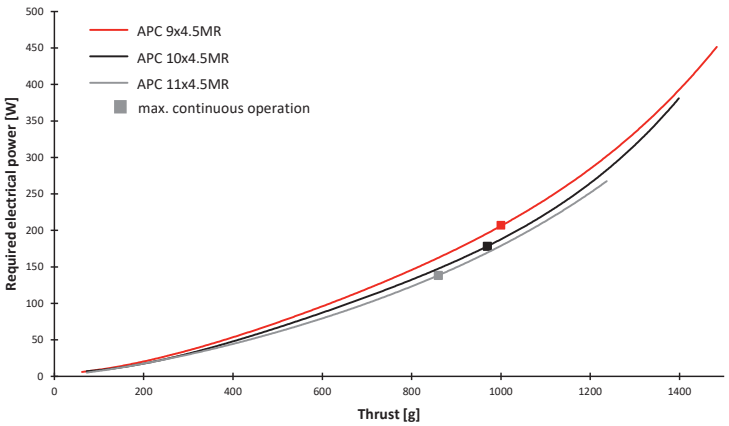




DIN 6926 - M5 self locking flange nut or similar. maxon recommends to use a wrench to secure the adapter wihle tightening the nut. Do not use the motor housing to secure the nut!

			Part number
		sensorless	800999
Motor data			
	Values at nominal voltage		
1	Nominal voltage[1]	V	16
2	No load speed	rpm	13400
3	No load current	mA	393
4	Nominal speed	rpm	10200
5	Nominal torque (max. continuous torque)	mNm	104
6	Nominal current (max. continuous current)	A	8.08
7	Stall torque[2]	mNm	442
8	Stall current	A	99.8
9	Max. efficiency	%	87.8
	Characteristics		
10	Terminal resistance phase to phase	Ω	0.16
11	Terminal inductance phase to phase	mH	0.0949
12	Torque constant	mNm/A	11.2
13	Speed constant	rpm/V	850
14	Speed/torque gradient	rpm/mNm	12.1
15	Mechanical time constant	ms	3.9
16	Rotor inertia	gcm²	30.7
17	Thermal resistance housing-ambient[3]	K/W	3.85
18	Thermal resistance winding-housing[3]	K/W	2.99
19	Thermal time constant winding	s	10.9
20	Thermal time constant motor	s	137

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	14000
	Other specifications		
24	Number of pole pairs		6
	Magnetic system configuration		9N12P
25	Number of phases		3
26	Weight of motor (incl. 300 mm cable)	g	58
27	Recommended propeller sizes	inch	9...11

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)
- Propeller mounting interface
  - Threaded shaft CW or CCW
  - Propeller adapter and 2 x M3 screws

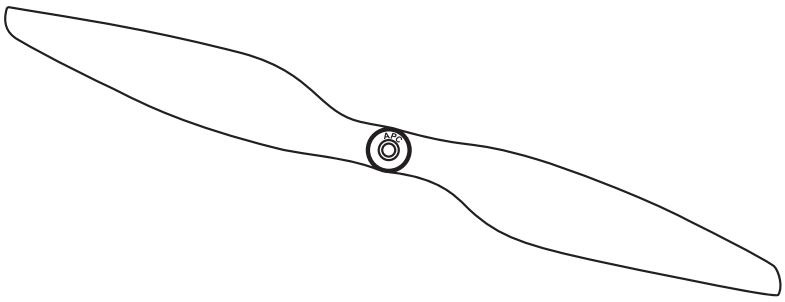
Values listed in the tables are nominal, i.e. defined for operation without a propeller attached (no active cooling).

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 20
W1: Motor winding 1, W2: Motor winding 2, W3: Motor winding 3

Propeller 9x4.5MR

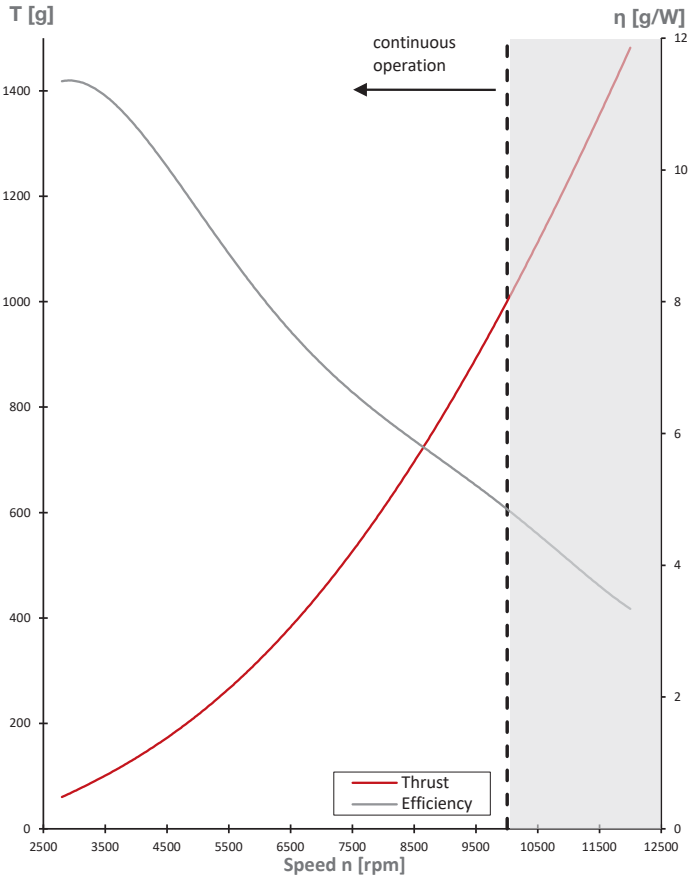
maxon recommended propeller for ECX 32 flat



Propeller specifications			
1	Diameter	inch	9.0 (228.6 mm)
2	Pitch	inch	4.5 (114.3 mm)
3	Weight of propeller	g	11.1
4	Shaft diameter	mm	6.4
5	Interface thickness	mm	8.6
6	Material		reinforced plastic compound
7	Max. recommended speed	rpm	11670

Motor propeller combination				
Adjusted motor data for use with specified propeller (active cooling)				
8	Max. continuous speed	rpm	10007	
9	Max. continuous torque	mNm	152	
10	Max. continuous current	A	14.5	motor current = output current from ESC | maxon UAV ESC parameter: nominal current
11	Max. continuous electrical power	W	212	
12	Max. peak electrical power	W	350	<15s
13	Thermal time constant winding	s	16.0	

Propulsion system thrust and efficiency curves



Propulsion system performance table

ESC supply voltage **25.2 V** (6S max. LiPo voltage)
Ambient temperature 20°C
Elevation (AMSL) 475m
800999

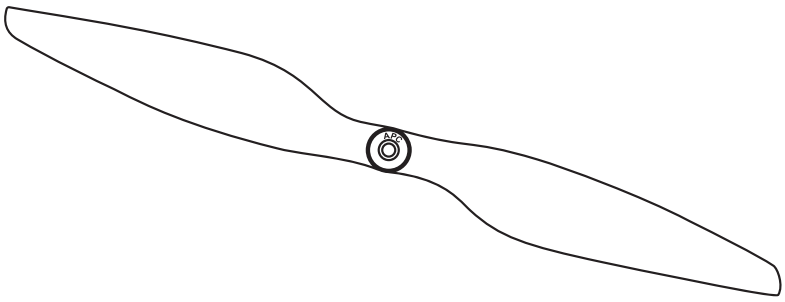
Achievable speed with battery level	Speed [rpm]	Current [A]	Torque [mNm]	Thrust [g]	el. Power [W]	Efficiency [g/W]
	Continuous operation (T_w < 155 °C)					
	2800	0.2	12	62	5	11.3
	3200	0.3	15	82	7	11.3
	3500	0.4	18	99	9	11.2
	3900	0.5	22	127	12	10.8
	4200	0.6	26	149	14	10.4
	4600	0.8	31	182	18	9.9
	4900	0.9	35	208	22	9.4
	5300	1.1	40	246	28	8.9
	5600	1.3	45	278	32	8.6
	6000	1.6	52	320	40	8.1
	6300	1.9	57	355	46	7.7
	6700	2.3	65	410	55	7.4
	7000	2.6	71	447	63	7.1
	7400	3.2	81	519	76	6.8
	7800	3.7	89	577	89	6.5
	8100	4.1	95	617	99	6.2
	8500	4.9	107	694	118	5.9
	8800	5.6	116	753	134	5.6
	9200	6.4	128	832	155	5.4
	9500	7.2	135	888	172	5.2
	9900	8.4	150	983	202	4.9
4S (12.8V)	**Short term operation (T_w > 155 °C)**					
10100 rpm	10200	9.3	159	1046	223	4.7
	10600	10.8	175	1140	259	4.4
	10900	12.0	185	1208	287	4.2
	11300	13.7	198	1289	327	3.9
6S (22.2V)	11600	16.1	213	1386	383	3.6
11700 rpm	12000	18.2	229	1483	452	3.3

Notes

Bench test data for reference only.
Direct comparison with datasheets from other manufacturers can be misleading.
Use the adapter ring recommended by the propeller manufacturer.
The propeller is not distributed by maxon. Please contact the propeller manufacturer.

Propeller 10x4.5MR

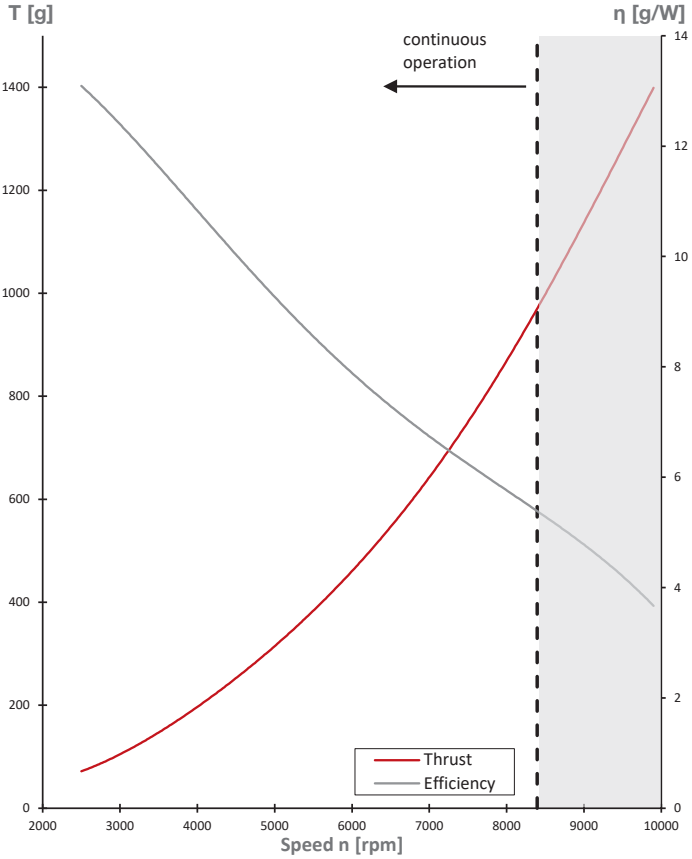
maxon recommended propeller for ECX 32 flat



Propeller specifications			
1	Diameter	inch	10.0 (254.0 mm)
2	Pitch	inch	4.5 (114.3 mm)
3	Weight of propeller	g	15.0
4	Shaft diameter	mm	6.4
5	Interface thickness	mm	8.9
6	Material		reinforced plastic compound
7	Max. recommended speed	rpm	10500

Motor propeller combination				
Adjusted motor data for use with specified propeller (active cooling)				
8	Max. continuous speed	rpm	8395	
9	Max. continuous torque	mNm	148	
10	Max. continuous current	A	13.9	motor current = output current from ESC | maxon UAV ESC parameter: nominal current
11	Max. continuous electrical power	W	180	
12	Max. peak electrical power	W	310	<15s
13	Thermal time constant winding	s	16.0	

Propulsion system thrust and efficiency curves



Propulsion system performance table

ESC supply voltage **22.2 V** (6S nominal LiPo voltage)
Ambient temperature 20°C
Elevation (AMSL) 475m
800999

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)					
	2500	0.3	13	72	6	12.9
	2800	0.3	15	91	7	12.9
	3100	0.4	19	113	9	12.3
	3400	0.5	22	138	12	11.8
	3600	0.6	25	155	14	11.4
	3900	0.8	29	186	17	11.0
	4200	0.9	34	219	21	10.4
	4500	1.1	39	252	25	10.0
	4800	1.4	45	287	30	9.5
	5100	1.7	52	335	37	9.1
	5300	1.8	56	360	40	8.9
	5600	2.1	61	398	47	8.5
	5900	2.5	68	447	55	8.1
	6200	2.9	74	485	64	7.6
	6500	3.3	82	539	74	7.3
	6800	3.9	91	600	86	7.0
	7100	4.5	101	665	100	6.6
	7300	5.0	108	716	112	6.4
	7600	5.7	117	766	125	6.1
	7900	6.6	129	848	145	5.8
	8200	7.5	139	920	165	5.6
	Short term operation (T_w > 155 °C)					
	8500	8.6	152	1004	190	5.3
	8800	9.9	164	1081	217	5.0
4S (16.8V)	9000	10.7	171	1129	236	4.8
9200 rpm	9300	12.3	185	1219	271	4.5
	9600	14.6	200	1317	322	4.1
6S (22.2V)	9900	17.5	213	1398	385	3.6
10000 rpm						

Notes

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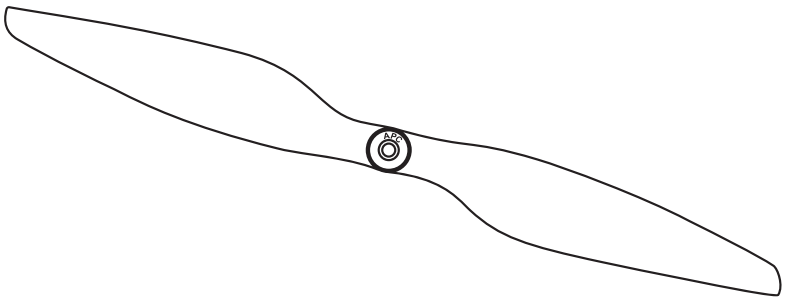
The propeller is not distributed by maxon. Please contact the propeller manufacturer.

Propeller 11x4.5MR

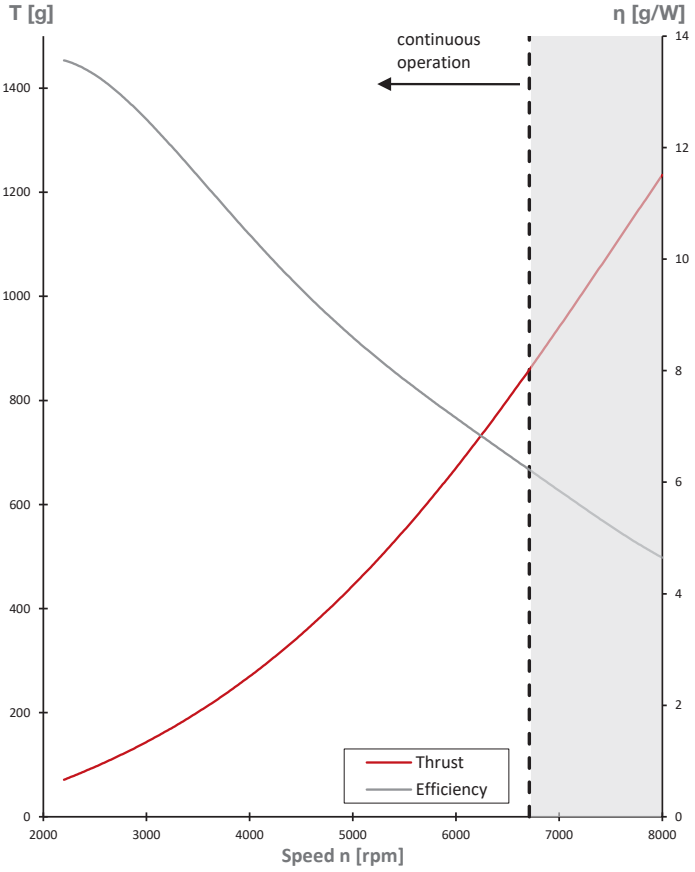
maxon recommended propeller for ECX 32 flat



Propeller specifications			
1	Diameter	inch	11.0 (279.4 mm)
2	Pitch	inch	4.5 (114.3 mm)
3	Weight of propeller	g	17.0
4	Shaft diameter	mm	6.4
5	Interface thickness	mm	8.9
6	Material		reinforced plastic compound
7	Max. recommended speed	rpm	9550

Motor propeller combination				
Adjusted motor data for use with specified propeller (active cooling)				
8	Max. continuous speed	rpm	6711	
9	Max. continuous torque	mNm	140	
10	Max. continuous current	A	12.6	motor current = output current from ESC | maxon UAV ESC parameter: nominal current
11	Max. continuous electrical power	W	140	
12	Max. peak electrical power	W	270	<15s
13	Thermal time constant winding	s	16.0	

Propulsion system thrust and efficiency curves



Propulsion system performance table

ESC supply voltage **16.8 V** (4S max. LiPo voltage)
Ambient temperature 20°C
Elevation (AMSL) 475m
800999

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)					
	2200	0.3	16	72	5	13.6
	2400	0.4	18	87	7	13.3
	2600	0.5	21	104	8	13.2
	2900	0.6	25	132	10	12.7
	3100	0.7	29	153	12	12.3
	3300	0.9	33	176	15	11.8
	3500	1.0	37	201	17	11.5
	3800	1.3	45	244	23	10.8
	4000	1.6	49	273	26	10.5
	4200	1.8	53	300	30	10.0
	4400	2.1	59	336	35	9.7
	4700	2.5	67	386	42	9.1
	4900	2.9	73	420	48	8.7
	5100	3.2	79	460	54	8.5
	5300	3.7	86	503	62	8.1
	5500	4.2	94	551	70	7.9
	5800	5.0	106	625	84	7.4
	6000	5.7	114	678	95	7.1
	6200	6.3	122	719	105	6.9
	6400	7.0	131	777	118	6.6
	6700	8.2	142	850	137	6.2
	Short term operation (T_w > 155 °C)					
	6900	9.1	152	912	152	6.0
	7100	10.1	161	967	168	5.7
	7300	11.4	173	1037	189	5.5
	7600	13.2	185	1113	219	5.1
	7800	14.5	195	1170	240	4.9
4S (16.8V)	8000	16.1	205	1237	267	4.6
8000 rpm						

Notes

Bench test data for reference only.
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