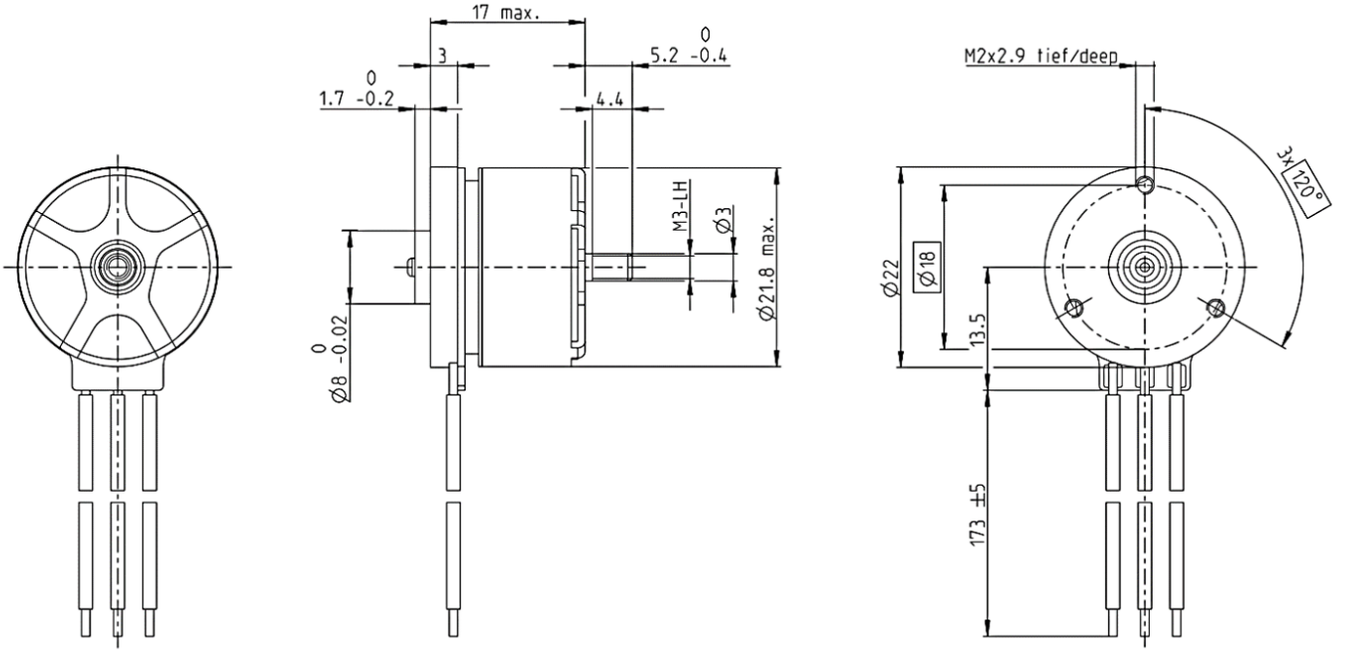
# ECX 22 flat UAV ∅22 mm, brushless

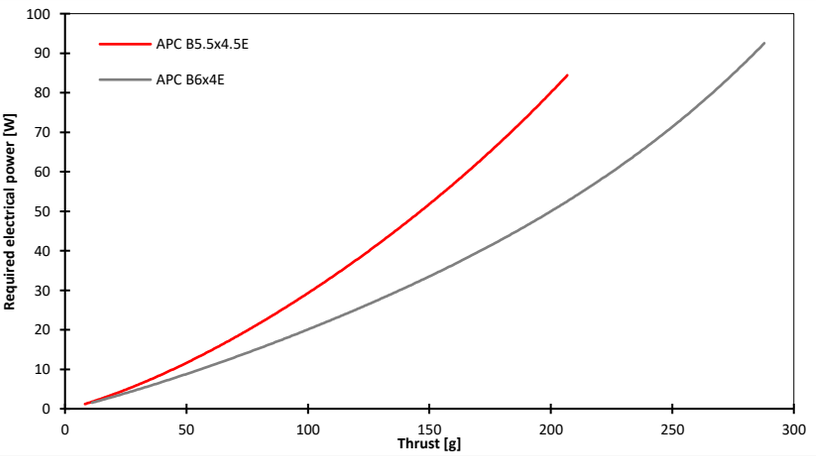
NEW

designed for small professional UAV applications




| Part Number | Sensorless | 762144 |
|---|---|---|
| **Motor Data** | | |
| **Values at nominal voltage** | | |
| 1 Nominal voltage | V | 9 |
| 2 No load speed | rpm | 14700 |
| 3 No load current | mA | 280 |
| 4 Nominal speed | rpm | 11500 |
| 5 Nominal torque (max. continuous torque) | mNm | 27.5 |
| 6 Nominal current (max. continuous current) | A | 4.63 |
| 7 Stall torque[1] | mNm | 132 |
| 8 Stall current | A | 32.4 |
| 9 Max. efficiency | % | 82.6 |
| **Characteristics** | | |
| 12 Terminal resistance phase to phase | Ω | 0.277 |
| 13 Terminal inductance phase to phase | mH | 0.0416 |
| 14 Torque constant | mNm/A | 5.77 |
| 15 Speed constant | rpm/V | 1700 |
| 16 Speed/torque gradient | rpm/mNm | 79.5 |
| 17 Mechanical time constant | ms | 5.68 |
| 18 Rotor inertia | gcm² | 6.82 |

**Propeller selection**




**Specifications**

**Thermal data**

| | | |
|---|---|---|
| 19 | Thermal resistance housing-ambient[2] | 6.22 K/W |
| 20 | Thermal resistance winding-housing[2] | 6.00 K/W |
| 21 | Thermal time constant winding | 5.78 s |
| 22 | Thermal time constant motor | 14.9 s |
| 23 | Ambient temperature | -40…+100°C |
| 24 | Max. winding temperature | +155°C |
| | Absolute winding temperature | +180°C |

**Mechanical data (preloaded ball bearings)**

| | | |
|---|---|---|
| 25 | Max. speed | 15000 rpm |

**Other specifications**

| | | |
|---|---|---|
| 26 | Number of pole pairs | 6 |
| 27 | Number of phases | 3 |
| 28 | Weight of motor (incl. 300mm cable) | 22.5g |
| 29 | Recommended propeller sizes | 5''…6'' |

**Connection**

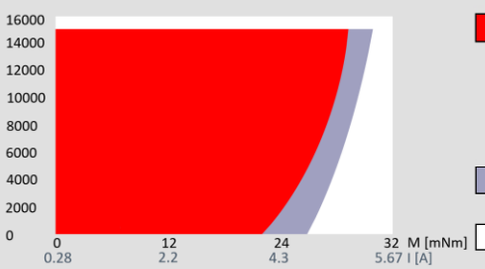
W 1 Motor winding 1
W 2 Motor winding 2
W 3 Motor winding 3

**Cable**

Connection cable PTFE, L = 173 mm
AWG 22

[1]Calculation does not include saturation effect
[2]At nominal working point

**Operating Range**




Comments

**Continuous operation**
In observation of listed thermal resistance (lines 19 and 20) the maximum permissible winding temperature will be reached during continuous operation at 25°C ambient. = Thermal limit.

**Continuous operation**
Thermal resistance Rth2 reduced by 50%.

**Short term operation**
The motor may be briefly overloaded (recurring).

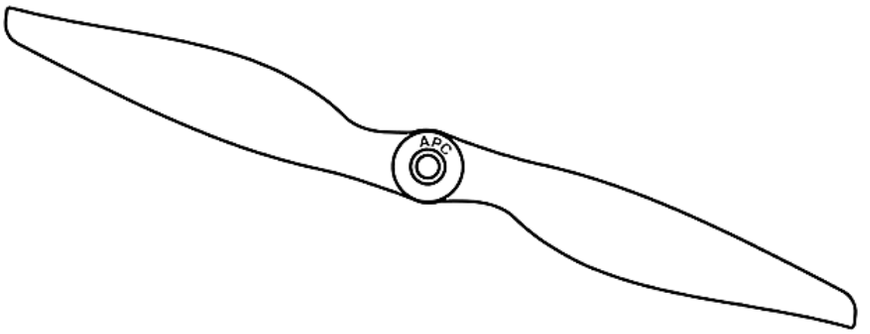
**Notes**

**Please contact aerospace@maxongroup.com**

# Propeller B5.5x4.5E

propeller recommendation

maxon recommended propeller for ECX 22 flat



## Supplier Propeller Specification

| | | |
|---|---|---|
| 1 | Diameter | 5.5'' (139.7 mm) |
| 2 | Pitch | 4.5'' (114.3 mm) |
| 3 | Interface thickness | 7.6 mm |
| 4 | Shaft diameter | 6.4 mm |
| 5 | Weight of Propeller | 4.0 g |
| 6 | Material | reinforced plastic compound |

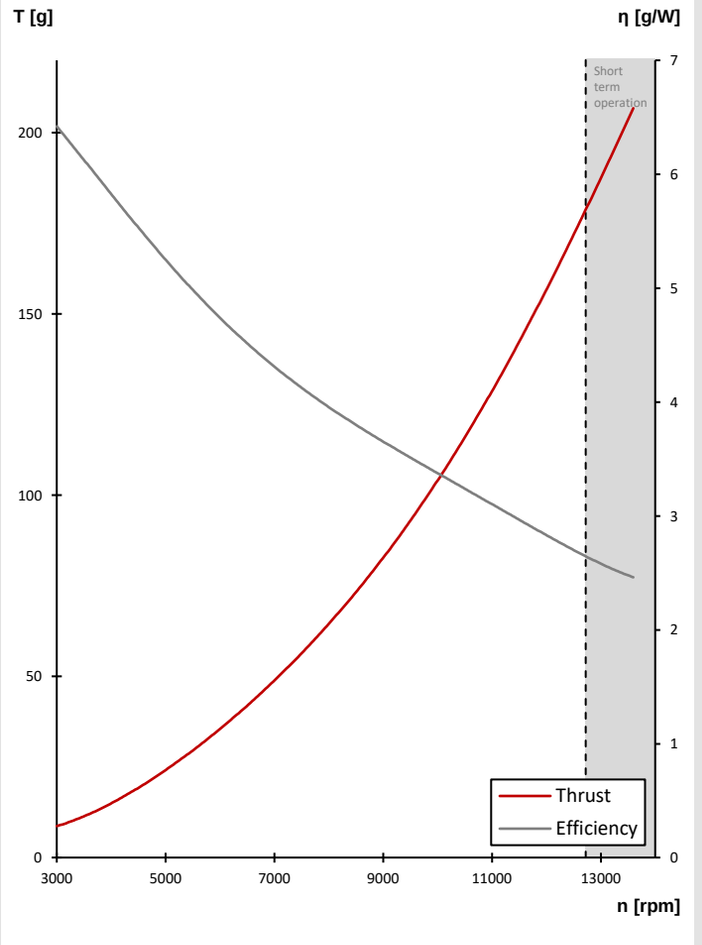
## Motor Propeller Combination

### Motor Operational Data

*Adjusted motor data for use with specified propeller (active cooling)*

| | | | |
|---|---|---|---|
| 7 | Nominal speed | rpm | 12730 |
| 8 | Nominal torque (max. continuous torque) | mNm | 31.8 |
| 9 | Nominal current (max. continuous current) | A | 7.25 |
| 10 | Max. continuous power output | W | 43 |
| 11 | Max. peak power output | W | |
| 12 | Thermal time constant winding | s | |

## Propulsion System Efficiency




## Propulsion System Performance Table

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

| 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 |
| 12400 | 4.9 | 29 | 170 | 61 | 2.8 |
| ***short term operation*** | | | | | |
| 12800 | 5.4 | 30 | 182 | 68 | 2.7 |
| 13200 | 6.0 | 32 | 194 | 76 | 2.6 |
| 13600 | 6.7 | 33 | 207 | 85 | 2.4 |

*Bench test data for reference only. Direct comparison with datasheets from other manufacturers can be misleading.*

## Notes

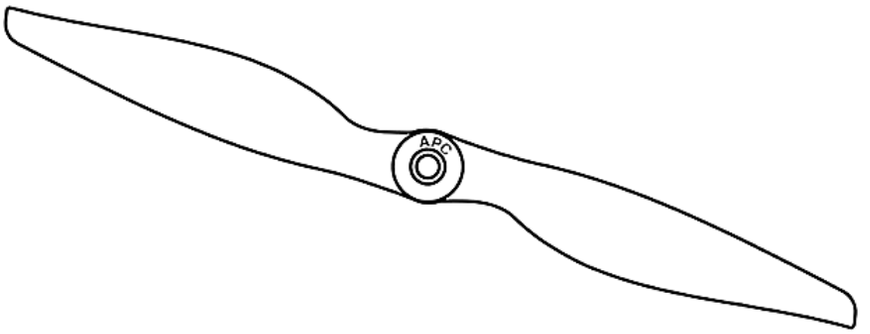
**Please contact aerospace@maxongroup.com**

*Propeller interface not directly compatible with motor interface (adapter required).*

# Propeller B6x4E

propeller recommendation

maxon recommended propeller for ECX 22 flat



## Supplier Propeller Specification

| | | |
|---|---|---|
| 1 | Diameter | 6'' (152.4 mm) |
| 2 | Pitch | 4'' (101.6 mm) |
| 3 | Interface thickness | 6.4 mm |
| 4 | Shaft diameter | 6.4 mm |
| 5 | Weight of Propeller | 5.4 g |
| 6 | Material | reinforced plastic compound |

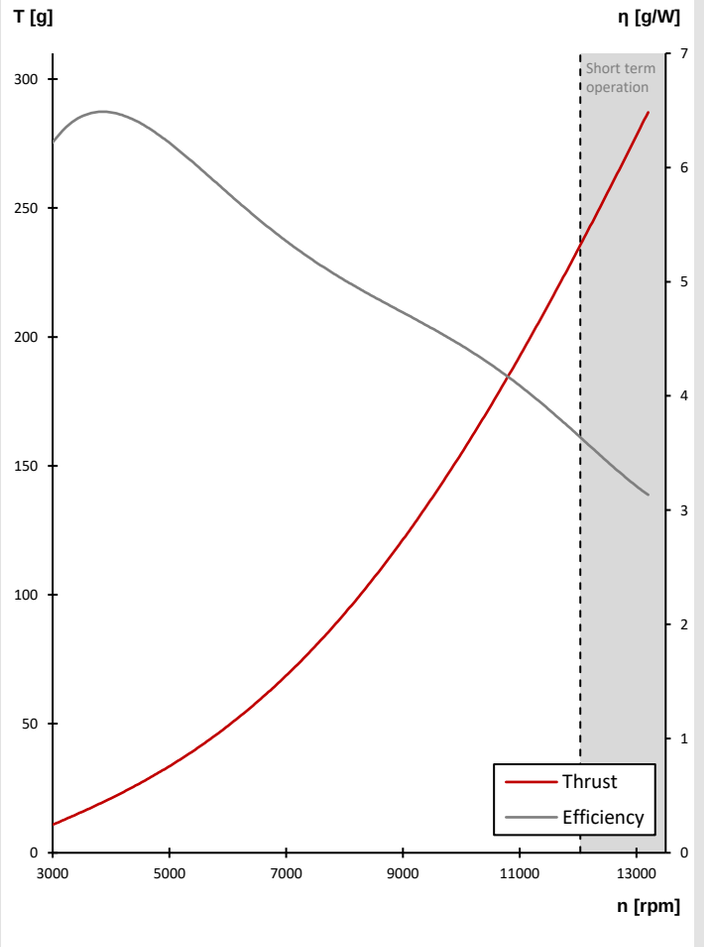
## Motor Propeller Combination

### Motor Operational Data

*Adjusted motor data for use with specified propeller (active cooling)*

| | | | |
|---|---|---|---|
| 7 | Nominal speed | rpm | 12050 |
| 8 | Nominal torque (max. continuous torque) | mNm | 30.0 |
| 9 | Nominal current (max. continuous current) | A | 7.04 |
| 10 | Max. continuous power output | W | 38 |
| 11 | Max. peak power output | W | |
| 12 | Thermal time constant winding | s | |

## Propulsion System Efficiency




## Propulsion System Performance Table

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

| 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 |
| ***short term operation*** | | | | | |
| 12400 | 5.7 | 32 | 253 | 72 | 3.5 |
| 12800 | 6.4 | 34 | 270 | 80 | 3.4 |
| 13200 | 7.4 | 37 | 288 | 92 | 3.1 |

*Bench test data for reference only. Direct comparison with datasheets from other manufacturers can be misleading.*

## Notes

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