UAV Motors & Controllers

Sparrow, Falcon, and Hercules - Powering Your UAVs with Precision and Efficiency

ePROPELLED™
EMPOWERING UNCREWED MOTION

info@epropelled.com | www.epropelled.com

1. Welcome to ePropelled

1.1 Overview of ePropelled and its Mission

ePropelled designs and manufactures state-of-the-art motors, generators, and power management systems for all variety of uncrewed vehicles.

ePropelled's patented technologies reduce energy consumption and improve performance, resiliency, and energy efficiency in uncrewed vehicles. ePropelled solutions provide best-in-class thrust-to-weight ratios and unparalleled reliability that together solve many uncrewed vehicle challenges.

ePropelled stands out as one of the world's leaders in uncrewed vehicle solutions, delivering high-performance systems and integrated solutions that empower organizations to shape the future of intelligent mobility.

For businesses seeking the most advanced, reliable, and scalable uncrewed vehicle solutions, ePropelled is the premier one-stop provider offering cutting-edge systems for air, ground, and sea operations. Powered by multiple patented technologies and unrivaled ePConnect™ and ePCloud Connect™, ePropelled sets the standard in efficiency innovation, connectivity, and performance.

OUR MISSION

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1.2 Values: Innovation, Efficiency, Reliability

As a pioneer in patented magnetics engineering, dynamic hybrid power solutions, and operational data gathering, ePropelled's uncrewed vehicle propulsion solutions meet the most demanding requirements.

ePropelled systems enable mission success and agility – via high thermal tolerance, low weight, high thrust, and energy efficiency. From the highest-quality manufacturing and test facilities ePropelled delivers a broad range of drone propulsion and power designs at volume.

From tiny to massive, ePropelled's broad range of solutions leverage patented advances in real-time analytics software to enable reliable electric-only and hybrid thrust and power delivery across myriad vehicle propulsion scenarios.

ePropelled stands out as one of the world's leaders in uncrewed vehicle solutions, delivering high-performance systems and integrated solutions that empower organizations to achieve limitless possibilities for intelligent and autonomous mobility.

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2. Sparrow Motor and Controller

2.1 Overview of the Sparrow Motor System

ePropelled Sparrow Series of compact UAV motor solutions are not just advanced they're revolutionary. Sparrow motors and controllers deliver compact, lightweight, and highly efficient solutions that ensure enhanced thrust, longer flight ranges, and reduced ongoing costs.

We make an excellent choice to swap out commodity propulsion motors and attain better performance, greater life, longer range, and far higher operational interity.

Engineered to be compact and lightweight, Sparrow systems maximize output while delivering powerful performance and extended ranges. The curved magnets and self-cooling designs withstand extreme temperatures, ensuring consistent performance in harsh environments.

Designed for top performance, energy efficiency, and intelligence, the Sparrow Series delivers an exceptional blend of flight control, energy management, and low-noise features, setting a high standard for agile UAV propulsion.

2.2 Key Features

- Superior quality insulation provides long life and high reliability of windings
- Ultra-light, efficient, and long flight time
- Built for industrial strength
- Unique ventilation and cooling system
- Ultrathin Design Lightest Weight
- Best in power, efficiency, and stability

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2.3 Performance Specifications for Sparrow Motors

Products	Kv Rating	Voltage	Maximum Thrust	Motor Dimension	Weight	IP Rating
APM 3115-Kv900	900 Kv	4S – 6S	Up to 4.7 Kg	ϕ37.2 mm x 51.1 mm	113 g	IP25
APM 4006-Kv380	380 Kv	4S – 6S	Up to 2.2 Kg	ϕ44.5 mm x 27 mm	68 g	IP25
APM 6007-Kv320	320 Kv	4S – 6S	Up to 4.2 Kg	ϕ67.2 mm x 26 mm	159 g	IP25
APM 7005-Kv230	230 Kv	6S	Up to 5.3 Kg	ϕ79 mm x 21.5 mm	189 g	IP25
APM 5010-Kv360	360 Kv	6S	Up to 4.8 Kg	ϕ55.6 mm x 33.9 mm	175 g	IP45
APM 4130-Kv300	300 Kv	6S – 12S	Up to 10.6 Kg	ϕ50 mm x 79 mm	405 g	IP25
APM 1404-Kv2900	2900 Kv	3S – 6S	Up to 0.5 Kg	ϕ17.9 mm x 16.6 mm	10 g	IP25
APM 2207.5-Kv1950	1950 Kv	3S – 6S	Up to 1.9 Kg	ϕ26.8 mm x 32.1 mm	34 g	IP25
APM 2812-Kv1155	1155 Kv	6S	Up to 3.35 Kg	ϕ33.4 mm x 41 mm	78 g	-

2.4 Performance Specifications for Sparrow Controllers

Products	Voltage	Peak Current (10s)	Continuous Current (180s)	Dimension (L x W x H)	Weight	IP Rating
AMC 6S20A	2S – 6S	30 A	20 A	68 mm x 29 mm x 12 mm	30 g	IP20
AMC 6S20AW	2S – 6S	30 A	20 A	73.4 mm x 30.8 mm x 19.3 mm	68 g	IP55
AMC 6S40A	2S – 6S	60 A	40 A	78.5 mm x 29 mm x 17.5 mm	56 g	IP20
AMC 6S40AW	2S – 6S	60 A	40 A	73.4 mm x 30.8 mm x 19.3 mm	68 g	IP55

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2.5 Applications

- FPV Cinematic Drone
- Aerial Photography
- Surveillance
- Heavy duty professional drones
- Aerial Mapping
- Rescue
- Long-Duration Flights
- Environmental Monitoring
- Inspection
- Industrial & Commercial UAV Operations

2.6 Recommended UAV Models for Sparrow Series

- MTOW of 2kgf to 15kgf (X4)
- Multi Rotor UAV (FPV, Quad, Hexa, and Octa)
- VTOLs and Fixed Wing

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3. Falcon Motor and Controller

3.1 Overview of the Falcon Motor System

ePropelled's high-power Falcon Series is designed for top performance, energy efficiency, and intelligence. The Falcon Series delivers an exceptional blend of control, management, and smart features, setting a new standard for powerful while agile UAV propulsion.

Using ePConnect™, Falcon-enabled UAVs gain enhanced observability, eliminate maintenance blind spots, and offer programmable in-flight optimization. ePConnect harvests rich sensors-derived data to share insights that enhance performance and adaptability in demanding environments.

Engineered to be compact and lightweight, Falcon systems maximize output without increasing size, delivering steady power and extended ranges. The curved magnets and self-cooling designs withstand extreme temperatures, ensuring consistent performance in harsh and high-altitude environments.

In the most demanding uses, Falcon solutions and systems enable mission success and agility – via high thermal tolerance, low weight, high thrust, and energy efficiency.

3.2 Key Features

- Superior quality insulation provides long life and high reliability of windings
- Lowest weight in its class to provide outstanding power density
- Designed for heavy loads and industrial use, it performs well at high temperatures
- Advanced cooling technology to enable higher flight in thinner air
- K-type thermal sensor to measure winding temperature
- Best thrust to weight ratio
- Designed for applications requiring high thrust and efficiency

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3.3 Performance Specifications for Falcon Motors

Products	Kv Rating	Voltage	Maximum Thrust	Motor Dimension	Weight	Maximum Power (180s)
APM100	96 Kv	12S – 20S	Up to 12 Kg	ϕ99.2 mm x 39.8 mm	525 g	2.5 kW
APM300	101 Kv	14S – 24S	Up to 25 Kg	ϕ122.2 mm x 48.6 mm	975 g	5.5 kW
APM600	87 Kv	14S – 24S	Up to 40 Kg	ϕ149 mm x 59.2 mm	1,840 g	10 kW
APM900	65 Kv	14S – 24S	Up to 52 Kg	ϕ149.2 mm x 69.5 mm	2,600 g	12.5 kW
APM1200	83 Kv	14S – 24S	Up to 56 Kg	ϕ171.1 mm x 69.3 mm	3,100 g	21 kW

3.4 Performance Specifications for Falcon Controllers

Products	Voltage	Peak Current	Peak Power	Dimension (L x W x H)	Weight	Commu-nication	Speed Command	RTDM
iAMC600	14S – 24S	110 A	10 kW	131 mm x 157 mm x 39 mm	565 g	CAN 2.0A	PWM or CAN Command via ePConnect™	Yes

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3.5 Applications

- Aerial Photography
- Filming
- Surveillance
- Agriculture applications
- Aerial Mapping
- Delivery Services
- Cargo Services
- Heavy – Lifting UAV
- Rescue
- Industrial & Commercial UAV Operations

3.6 Recommended UAV Models for Falcon Series

- MTOW of 25kgf to 120kgf (X4)
- Multi Rotor UAV (Quad, Hexa, and Octa)
- Heavy Lifting UAVs and VTOLs

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4. Hercules Series

4.1 Overview of the Hercules Series

Uncrewed vehicles on land, air, and sea are increasingly exploiting more than one kind of propulsion motor for a variety of impactful reasons. That's where innovative ePropelled hybrid-ready Hercules Series integrated electric generation and power management systems come into play.

By extending range and mission agility, integrated technologies that support hybrid propulsion – cooperatively combining electric motors and internal combustion engines – are advancing the modern uncrewed vehicles market, not only for aerial drones but across diverse land and marine use cases.

ePropelled's customizable Hercules power generation and management solutions cater to the specific needs of uncrewed vehicle OEMs. ePropelled's engineers have overcome sector-specific challenges such as weight and size constraints, range limitations, and the integration of hybrid propulsion systems to provide customizable solutions for such uses as defense, agriculture, surveillance, and inspection.

4.2 Key Features

- Superior quality insulation provides long life and high reliability of windings
- Lowest weight in its class to provide outstanding power density
- Active air-cooling system operates at high temperatures
- Hybrid-ready design to optimize engine size while providing battery assist
- K-type thermal sensor to measure winding temperature
- Unique adaptor allows bearingless mounting of the starter generator directly onto the engine
- Directly mounted on engine crankshaft with custom shaft interface ring

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4.3 Performance Specifications for Hercules Starter Generators

Products	Kv Rating (Tested as generator)	No-Load, Line -to-Line Voltage Constant	Winding Type	Motor Dimension	Weight With Bearing	Weight Without Bearing-less
SG750	101 Kv	7.4Vac/1000 RPM	3-Phase	ϕ101 mm x 29.2 mm	440 g	410 g
SG1500	116 Kv	6.6Vac/1000 RPM	3-Phase	ϕ127 mm x 41.9 mm	1,132 g	1,093 g
SG3000	70 Kv	10.7Vac/1000 RPM	3-Phase	ϕ127 mm x 41.9 mm	1,109 g	1,069 g
SG6000	99 Kv	7.5Vac/1000 RPM	3-Phase	ϕ186 mm x 50.9 mm	2,450 g	2,350 g
SG12000	78 Kv	9.5Vac/1000 RPM	3-Phase	ϕ188 mm x 67.4 mm	4,300 g	4,200 g

4.4 Performance Specifications for Hercules iPS/PMU/EES

Products	Maximum Total Continuous Output Power	Primary Output Voltage	Secondary Output Voltage 1	Secondary Output Voltage 2	Onboard Battery Charging Voltage	Onboard Battery Charging Type	Dimension (L x W x H)	Weight
iPS750	750 W	28 V	12 V – 14 V	5 V – 8 V	29.4 V	7S	201.9 mm x 99.3 mm x 54.0 mm	780 g
iPS1500	1500 W	28 V	12 V – 14 V	5 V – 6 V	29.4 V	7S	204.8 mm x 155.2 mm x 50.0 mm	1,115 g
iPS3000	3000 W	28 V - 48 V	--	--	29.4 V, 50.4 V	7S	286.4 mm x 152.4 mm x 52.6 mm	1,540 g
iPS6000	6000 W	28 V, 48 V, 55 V	--	--	29.4 V	7S	295.3 mm x 277.6 mm x 52.6 mm	2,800 g

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Hercules Series

Products	Maximum total Continuous Output power	Peak Power (60s)	Input Voltage Range	Start Duration	Start Trigger	Dimension (L x W x H)	Weight
EES3000	3000 W	--	24 V – 58 V	1s – 10s	2.3 V – 5 V	178.5 mm x 152.4 mm x 45 mm	950 g
EES6000	10,000 W	--	65V – 120V	1s – 10s	CAN or Digital	216.5 mm x 190 mm x 51.13 mm	995 g
EESMC 6000	10,000 W	20,000 W	24 V – 120 V	1s – 10s	CAN or digital	215 mm x 159 mm x 66 mm	1450 g

4.5 Applications

- Hybrid Drone Application
- High Altitude Operation
- Extended Flight Operation
- Military and Defence UAV

4.6 Recommended UAV Models for Hercules Series

- Output Power Up to 12KW
- Hybrid Multi Rotor UAV (Quad, Hexa, and Octa)
- Hybrid VTOL UAV and Long-Range Extender UAV

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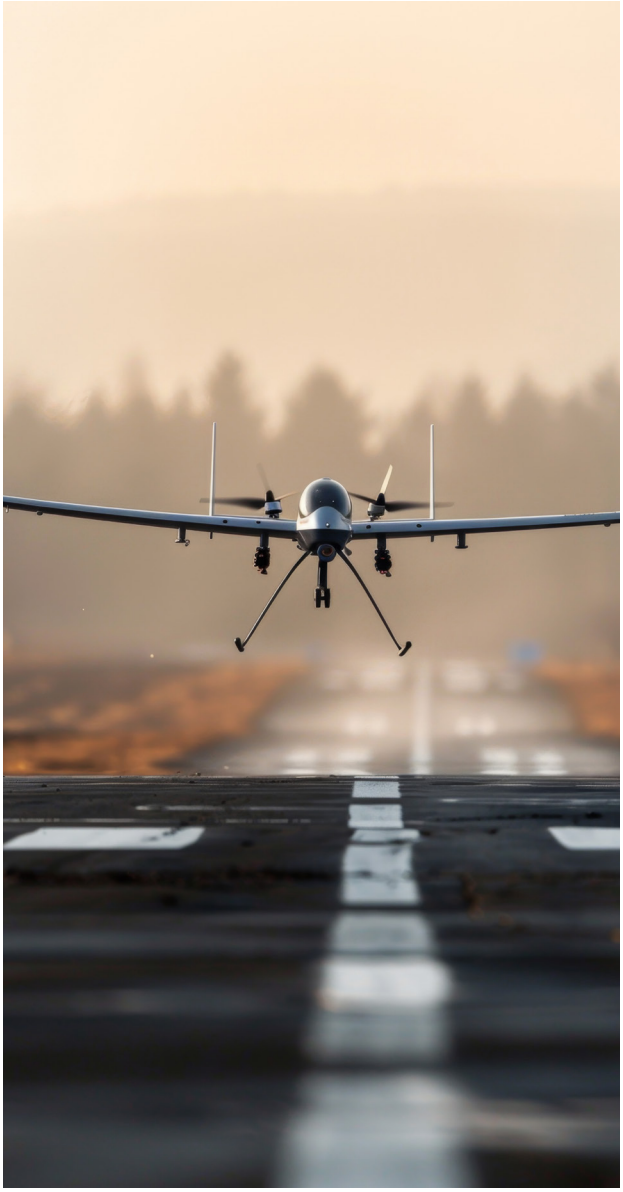
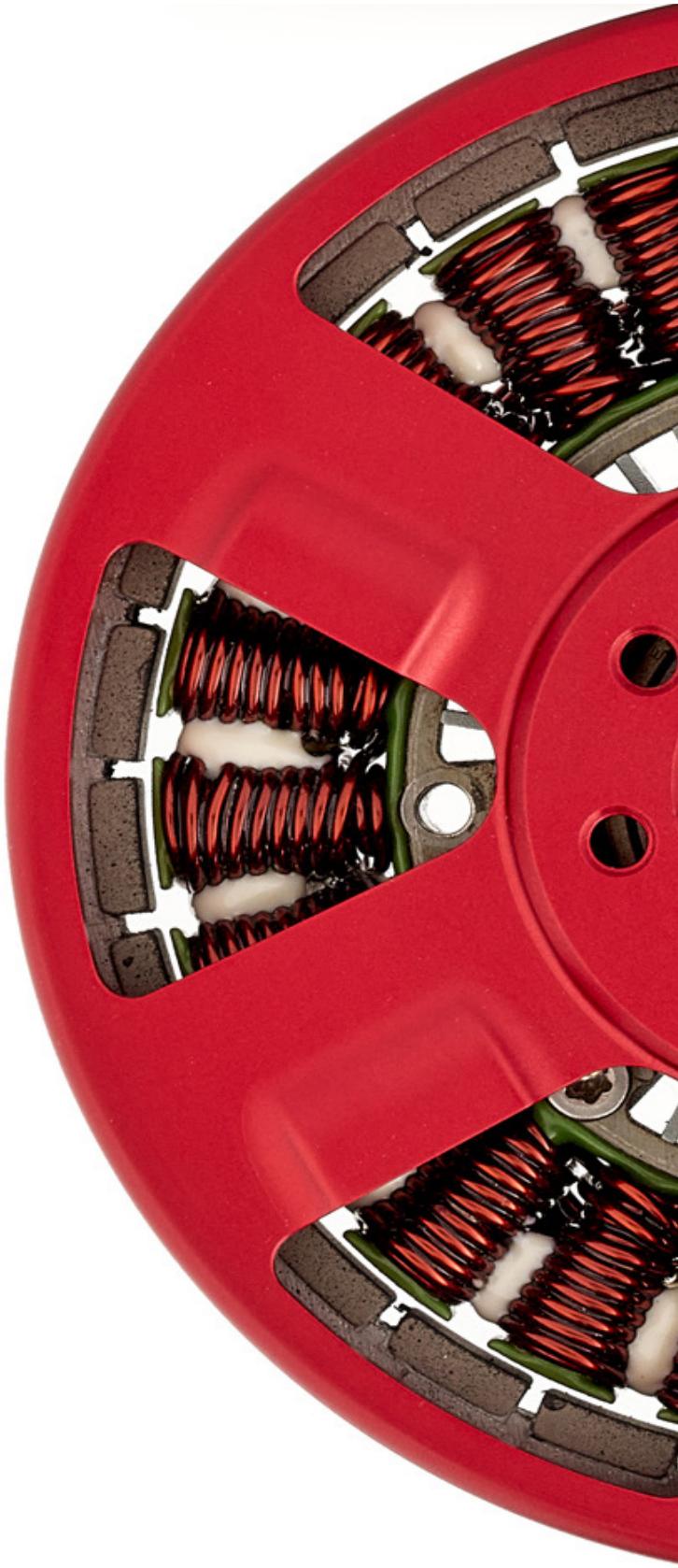
5. Customer Applications & Case Study

5.1 Customer Applications

ePropelled offers electric and hybrid propulsion solutions for uncrewed air, land, and sea vehicles. With high thermal tolerance, low weight, and energy efficiency, ePropelled systems enable longer mission times and improved battery life.

Used across industries like commercial, agriculture, public safety, and military, ePropelled is the go-to provider for advanced, reliable, and scalable uncrewed vehicle solutions.





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5.2 Case Study

ePropelled Brings Hercules Hybrid Propulsion to New Breeds of Quadcopters for Innovation Across Commercial and Defense Uses Cases.

By solving the requirements for agile, intelligent, and robust propulsion, ePropelled, Inc. empowers uncrewed vehicle designers to rapidly meet their most demanding mission objectives.

ePropelled delivers complete, hybrid-ready propulsion solutions for uncrewed air, land, and sea vehicles. The Hercules integrated electric generation, power management, and hybrid-ready solutions, for example, extend range and mission potential for any uncrewed vehicles.

With up to 200 kg lift, 900 km range, and up to 9 hours duration, the Aerotor AQP is a hybrid propulsion vehicle that uses a variety of energy sources – both electrical and internal combustion engine (ICE), for example.

Aerotor projects that an AQP as alternative to traditional copters will reduce air pollution by up to 97 percent and decrease noise pollution considerably. It will also improve safety by eliminating the need for a human pilot. Incorporating the AQP into day-to-day missions will change the face of air mobility, says Aerotor.

Aerotor Unmanned Systems in Israel specializes in the design of quadcopter uncrewed aerial vehicles (UAVs). In 2022, it began outfitting its Apus 15 multi-rotor Quadcopter UAV with ePropelled's Hercules starter generators and intelligent power systems.

UAV technologies like those developed by Aerotor are solving some of the biggest social and environmental issues. UAV hybrid technologies offer dual-use propulsion for a wide range of applications, allowing a variety of civilian and defense manufacturers to integrate them into their vehicle portfolios.

Aerotor worked with ePropelled to design a number of hybrid UAVs in the lead up to a broader offering of scalable Apus Quadcopter Platforms (AQPs). The Aerotor AQP is a software-enabled, versatile, environmentally friendly, and safe flying platform that in larger versions replaces manned light helicopters in a variety of use cases.

"A multi-rotor quadcopter aircraft with a hybrid assembly allows switching between an ICE and an electric motor during flight – similar to the hot-swap that a hybrid car can do on the road," says Raz Geva, co-founder and CEO of Aerotor, "Our vision is to provide the next 'light-duty truck' solutions as the game changer of the autonomous multi-rotors market."

The Aerotor Apus 15 system includes ICE or fully hybrid (electric motor and ICE) models, and is designed for high flight speeds, long endurance and heavy payloads lift. It can be utilized in both military and commercial applications.

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Customer Applications & Case Study

The ePropelled Hercules electric starter generators series includes starter generators, ranging from 500W to 12kW. Compact, lightweight, saving significant weight in the aircraft, the Hercules generators can operate up to high temperatures (200°C).

"Electric starter generators and intelligent power systems will play an important role in enhancing UAV performance and making them better suited for everyday use," said Nick Grewal, CEO at ePropelled. "These innovations can make UAVs a reality for a wide range of uncrewed applications."

As a global leader in patented magnetics engineering, dynamic hybrid power solutions, and operational data gathering, ePropelled's uncrewed vehicle propulsion solutions meet the most demanding performance and environmental requirements. ePropelled hybrid systems enable mission success and agility – via high thermal tolerance, low weight, high thrust, and energy efficiency.

For such hybrid applications, the Hercules electronic engine starter aids in driving the starter generator during engine start-up, switching to regulated voltage once the combustion engine reaches operational speed, allowing for extended USV range, reduced noise, and increased power.

Hercules intelligent power systems provide a comprehensive power management solution that continuously monitors and regulates input and output voltages, as well as current levels. Hercules generators deliver managed power to battery recharging and all USV onboard systems such as propulsion, servos, and various other mission payloads.

5.3 Testimonials and Customer Quotes

"[Using ePropelled Hercules] is the first time a multi-rotor quadcopter aircraft has had a hybrid assembly, which allows switching between an internal combustion engine and an electric motor during flight – similar to the hot-swap that a hybrid car can do," said Raz Geva, CEO of Aerotor, an Israeli UAV designer.

Uncrewed aircraft systems maker Callen-Lenz, based in Wiltshire, England, deploys ePropelled custom-designed and -built uncrewed aerial vehicle electric propulsion solutions. Callen-Lenz rigorously selects its suppliers based on strategic relationships, transparency, sustainability, and excellence. Fortune 500 defense contractor BAE Systems plc recently acquired Callen-Lenz.

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6. Technical Specifications

6.1 Specifications for Sparrow Motors

Parameters	**APM 3115-Kv900**	**APM 4006-Kv380**	**APM 6007-Kv320**
Kv (Velocity Constant)	900 Kv	380 Kv	320 Kv
Rated Voltage	4S – 6S	4S - 6S	4S - 6S
Peak Current (180s)	80 A (10s)	18 A	44 A
Maximum Power (180s)	1915 W (10s)	430 W	998 W
Internal Resistance	38.1mΩ	159mΩ	47.5mΩ
Nominal Operational Speed	0 to 14,000 RPM	0 to 6,500 RPM	0 to 6,000 RPM
Maximum Speed Limit	15,000 RPM	7,000 RPM	7,000 RPM
Magnetic Poles	14	24	28
Stator Slots	12	18	24
Winding Operating Temperature Allowed up to	150°C/302°F	150°C/302°F	150°C/302°F
Rotor Operating Temperature Allowed up to	150°C/302°F	150°C/302°F	150°C/302°F
Motor Diameter	37.2 mm	44.5 mm	67.2 mm
Motor Length	51.1 mm	27 mm	26 mm
Motor Weight	113 g	68 g	159 g
Motor Mounting Pitch Circle Diameter (PCD) 4xM3	19 mm	25 mm	31.5 mm
Propeller Mounting Pitch Circle Diameter (PCD)	Adaptor dependent	Adaptor dependent	Adaptor dependent
IP Rating	IP25	IP25	IP25
Recommended Propeller	9” to 11” inch	13” to 16” inch	18” to 22” inch
Recommended ESC	Suitable Controller 80A Required	AMC 6S20A and AMC 6S40A series	AMC 6S40A series

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6.1 Specifications for Sparrow Motors

Parameters	**APM 7005-Kv230**	**APM 5010-Kv360**	**APM 4130-Kv300**
Kv (Velocity Constant)	230 Kv	360 Kv	300 Kv
Rated Voltage	6S	6S	6S – 12S
Peak Current (180s)	40 A	38 A	75 A
Maximum Power (180s)	960 W	960 W	3200 W
Internal Resistance	71mΩ	45mΩ	33mΩ
Nominal Operational Speed	0 to 4,000 RPM	0 to 7,000 RPM	0 to 11,000 RPM
Maximum Speed Limit	5,000 RPM	8,000 RPM	12,000 RPM
Magnetic Poles	28	28	14
Stator Slots	24	24	12
Winding Operating Temperature Allowed up to	150°C/302°F	150°C/302°F	150°C/302°F
Rotor Operating Temperature Allowed up to	150°C/302°F	150°C/302°F	150°C/302°F
Motor Diameter	79 mm	55.6 mm	50 mm
Motor Length	21.5 mm	33.9 mm	79 mm
Motor Weight	189 g	175 g	405 g
Motor Mounting Pitch Circle Diameter (PCD) 4xM3	23 mm	25 mm	20 mm
Propeller Mounting Pitch Circle Diameter (PCD)	Adaptor dependent	Adaptor dependent	Adaptor dependent
IP Rating	IP25	IP45	IP25
Recommended Propeller	24” to 26” inch	17” to 18.5” inch	14” to 18” inch
Recommended ESC	AMC 6S40A series	AMC 6S40A series	Suitable Controller 80A Required

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6.1 Specifications for Sparrow Motors

Parameters	**APM 1404-Kv2900**	**APM 2207.5-Kv1950**	**APM 2812-Kv1155**
Kv (Velocity Constant)	2900 Kv	1950 Kv	1155 Kv
Rated Voltage	3S – 6S	3S – 6S	6S
Peak Current	10 A	50 A	63 A
Maximum Power	262 W	1240 W	1580 W
Internal Resistance	310mΩ	70mΩ	-
Nominal Operational Speed	0 to 36,000 RPM	0 to 31,500 RPM	-
Maximum Speed Limit	40,000 RPM	32000 RPM	-
Magnetic Poles	12	14	14
Stator Slots	09	12	12
Winding Operating Temperature Allowed up to	150°C/302°F	150°C	150°C/302°F
Rotor Operating Temperature Allowed up to	150°C/302°F	150°C	150°C/302°F
Motor Diameter	17.9 mm	26.8 mm	33.4 mm
Motor Length	16.6 mm	32.1 mm	41 mm
Motor Weight	10 g	34 g	78 g
Motor Mounting Pitch Circle Diameter (PCD)	09 mm	16 mm	19 mm
Propeller Mounting Pitch Circle Diameter (PCD)	Adaptor dependent	M5	Adaptor dependent
IP Rating	IP25	IP25	-
Recommended Propeller	3” – 4” inch	5” inch	5” - 8” inch
Recommended ESC	-	Suitable controller 60A required	-

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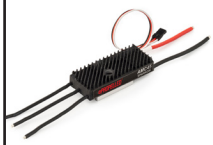
6.2 Specifications for Sparrow Controllers

				
Parameters	**AMC 6S20A**	**AMC 6S20AW**	**AMC 6S40A**	**AMC 6S40AW**
Input Voltage Range	8.5 V – 25.5 V	8.5 V – 25.2 V	8.5 V – 25.5 V	8.5 V – 25.5 V
Input Battery Configuration	2S – 6S	2S – 6S	2S – 6S	2S – 6S
Motor Compatibility	Sensorless	Sensorless	Sensorless	Sensorless
Peak Current (10s)	30 A	30 A	60 A	60 A
Continuous Current (180s)	20 A	20 A	40 A	40 A
Efficiency	Up to 90%	Up to 90%	Up to 90%	Up to 90%
Ambient Temperature Range	-20°C to 50°C	-20°C to 50°C	-20°C to 50°C	-20°C to 50°C
Power Cable	18 AWG Silicon Wire Black/Red	18 AWG Silicon Wire Black/Red	14 AWG Silicon Wire Black/Red	14 AWG Silicon Wire Black/Red
Motor Cable	18 AWG Silicon Wire Black	18 AWG Silicon Wire Black	16 AWG Silicon Wire Black	16 AWG Silicon Wire Black
Signal Cable	PVC Flat Cable-White/Black/JP 3P male Connector	PVC Flat Cable-White/Black/JP 3P male Connector	PVC Flat Cable -White/Red/ Black/JP 3P male Connector	PVC Flat Cable -White/Red/Black/JP 3P male Connector
Signal	PWM	PWM	PWM	PWM
IP Rating	IP20 (Excluding JP 3P Connector)	IP55 (Excluding JP 3P Connector)	IP20 (Excluding JP 3P Connector)	IP55 (Excluding JP 3P Connector)
Weight	30 g	68 g	56 g	68 g
Dimensions (L x W x H)	68 mm x 29 mm x 12 mm	73.4 mm x 30.8 mm x 19.3 mm	78.5 mm x 29 mm x 17.5 mm	73.4 mm x 30.8 mm x 19.3 mm

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6.3 Specifications for Falcon Motors

Parameters	**APM100**	**APM300**	**APM600**	**APM900**
Kv (Velocity Constant)	96 Kv	101 Kv	87 Kv	65 Kv
Rated Voltage	12S – 20S	14S – 24S	14S – 24S	14S – 24S
Peak Current (180s)	30 A	60 A	105 A	130 A
Maximum Power (180s)	2.5 kW	5.5 kW	10 kW	12.5 kW
Kt (Torque Constant)	0.12 Nm/A	0.12 Nm/A	0.13 Nm/A	0.18 Nm/A
Nominal Operational Speed	0 to 6,000 RPM	0 to 6,000 RPM	0 to 6,000 RPM	0 to 6,000 RPM
Maximum Speed Limit	8,000 RPM	8,000 RPM	8,000 RPM	8,000 RPM
Stator Winding Temperature Sensor	K-type thermocouple	K-type thermocouple	K-type thermocouple	K-type thermocouple
Magnetic Poles	40	40	40	40
Stator Slots	33	33	36	36
Winding Operating Temperature Allowed up to	180°C/356°F	180°C/356°F	180°C/356°F	180°C/356°F
Rotor Operating Temperature Allowed up to	170°C/338°F	170°C/338°F	170°C/338°F	170°C/338°F
Motor Diameter	99.2 mm	122.2 mm	149 mm	149.2 mm
Motor Length (With Airflow Inserts)	39.8 mm	48.6 mm	59.2 mm	69.5 mm
Motor Weight (With Airflow Inserts)	525 g	975 g	1,840 g	2,600 g
Motor Mounting Pitch Circle Diameter (PCD) 4 x M4	35 mm	40 mm	50 mm	52.5 mm
Propeller Mounting Pitch Circle Diameter (PCD)	Adapter dependent	Adapter dependent	Adapter dependent	Adapter dependent
IP Rating	IP23	IP23	IP23	IP23
Recommended Propeller Diameter	21.5” to 28” inch	24.5” to 30.5” inch	34” to 36” inch*	40” inch*
Recommended ESC	iAMC100	iAMC300	iAMC600	iAMC1200

Notes: * Propeller diameter may be different due to higher altitudes.

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Technical Specifications

Parameters	**APM1200**
Kv (Velocity Constant)	83 Kv
Rated Voltage	14S – 24S
Peak Current (180s)	185 A
Maximum Power (180s)**	21 kW
Kt (Torque Constant)	0.14 Nm/A
Nominal Operational Speed	0 to 6,000 RPM
Maximum Speed Limit	8,000 RPM
Stator Winding Temperature Sensor	K-type thermocouple
Magnetic Poles	40
Stator Slots	33
Winding Operating Temperature Allowed up to	180°C/356°F
Rotor Operating Temperature Allowed up to	170°C/338°F
Motor Diameter	171.1 mm
Motor Length (With Airflow Inserts)	69.3 mm
Motor Weight (With Airflow Inserts)	3,100 g
Motor Mounting Pitch Circle Diameter (PCD) 4 x M4	60.0 mm
Propeller Mounting Pitch Circle Diameter (PCD)	Adaptor dependent
IP Rating	IP23
Recommended Propeller Diameter	40” inch*
Recommended ESC	iAMC1200

Notes: ** Higher ambient temperature may reduce the peak power duration.
* Propeller diameter may be different due to higher altitudes.

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6.4 Specifications for Falcon Controller

Parameters	**iAMC600**
Input Voltage Range	14S – 24S
Peak Input Current (180s)	110 A @96Vdc and 120 A @ 84Vdc
Continuous Input Current	62.5 A @96Vdc and 71.5 A @ 84Vdc
Peak Input Power (180 s)	10 kW
Continuous Input Power	6,000 W
Efficiency	Up to 98%
Maximum Electrical Frequency	2.67kHz
Ambient Temperature Range	-10°C to 40°C (14°F to 104°F)
Maximum Internal Inverter Temperature	110°C (230°F)
Motor Temperature Protection/ Measurement	Yes (when enabled with power pullback)
Power Connection	2 X M5 screw terminal
Motor Lead	3 X M5 screw terminal
Communication	CAN 2.0A
Speed Commands	PWM or CAN Command via ePConnect™
Real-time Data Monitoring (RTDM)	Yes (10 data points, e.g., speed, current, and temperatures)
Cooling airflow for operation without a fan	4m/s minimum required
Speed Command/CAN Connector	JST Header
Dimensions (L x W x H)	131 mm x 157 mm x 39 mm
Weight	565 g
Configurable Parameters	24 parameters covering system, motor, inverter, PWM input & alert thresholds
Alerts via CAN bus	Alerts covering 18 conditions such as under-voltage, over-voltage, over-current, over-temperature, etc.,
Multiple iAMCs can be used on the same CAN bus	Up to 16 devices

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6.5 Specifications for Hercules Series

Parameters	**SG750**	**SG1500**	**SG3000**	**SG6000**
Diameter	101 mm	127 mm	127 mm	186 mm
Length	29.2 mm	41.9 mm	41.9 mm	50.9 mm
Weight With Bearing	440 g	1,132 g	1,109 g	2,450 g
Weight Without Bearing (Bearingless)	410 g	1,093 g	1,069 g	2,350 g
Stator Winding Temperature Sensor	K-type Thermocouple	K-Type Thermocouple	K-Type Thermocouple	K-Type Thermocouple
Winding Operating Temperature	180°C (356°F)	180°C (356°F)	180°C (356°F)	180°C (356°F)
Rotor Operating Temperature	180°C (356°F)	180°C (356°F)	180°C (356°F)	180°C (356°F)
Generator Type	Brushless Permanent Magnet, outer rotor	Brushless Permanent Magnet, Outer Rotor	Brushless Permanent Magnet, Outer Rotor	Brushless Permanent Magnet, Outer Rotor
Winding Type	3-phase	3-phase	3-phase	3-phase
No-Load, Line-to-Line Voltage Constant	7.4Vac/1000 RPM	6.6Vac/1000 RPM	10.7Vac/1000 RPM	7.5Vac/1000 RPM
Kv Rating (Tested as a generator)	101 Kv	116 Kv	70 Kv	99 Kv
Maximum Continuous Power	15% below peak power	10% below peak power	10% below peak power	8% below peak power
Peak Power Duration	180s	180s	180s	300s
Mounting Type	Direct on crankshaft via customizable coupling ring	Direct on crankshaft via customizable coupling ring	Direct on crankshaft via customizable coupling ring	Direct on crankshaft via customizable coupling ring

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6.5 Specifications for Hercules Series

Parameters	**SG12000**
Diameter	188 mm
Length	67.4 mm
Weight With Bearing	4,300 g
Weight Without Bearing (Bearingless)	4,200 g
Stator Winding Temperature Sensor	K-Type Thermocouple
Winding Operating Temperature	180°C (356°F)
Rotor Operating Temperature	180°C (356°F)
Generator Type	Brushless Permanent Magnet, Outer Rotor
Winding Type	3-phase
No-Load, Line-to-Line Voltage Constant	9.5Vac/1000 RPM
KV Rating (Tested as a generator)	78 Kv
Maximum Continuous Power	3% below peak power
Peak Power Duration	600s
Mounting Type	Direct on crankshaft via customizable coupling ring

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7. Ordering & Shipping Information

7.1 How to Place an Order (direct sales, online store)

To place an order, please contact our sales team at info@epropelled.com, call 603-236-7444 or submit a request through our website at www.epropelled.com/contact-sales.

7.2 Lead Time, Shipping options, and Global Delivery

Lead times vary by product and quantities. Please contact our sales team for more information. ePropelled is able to ship globally via numerous carriers or any shipping option our customers prefer.

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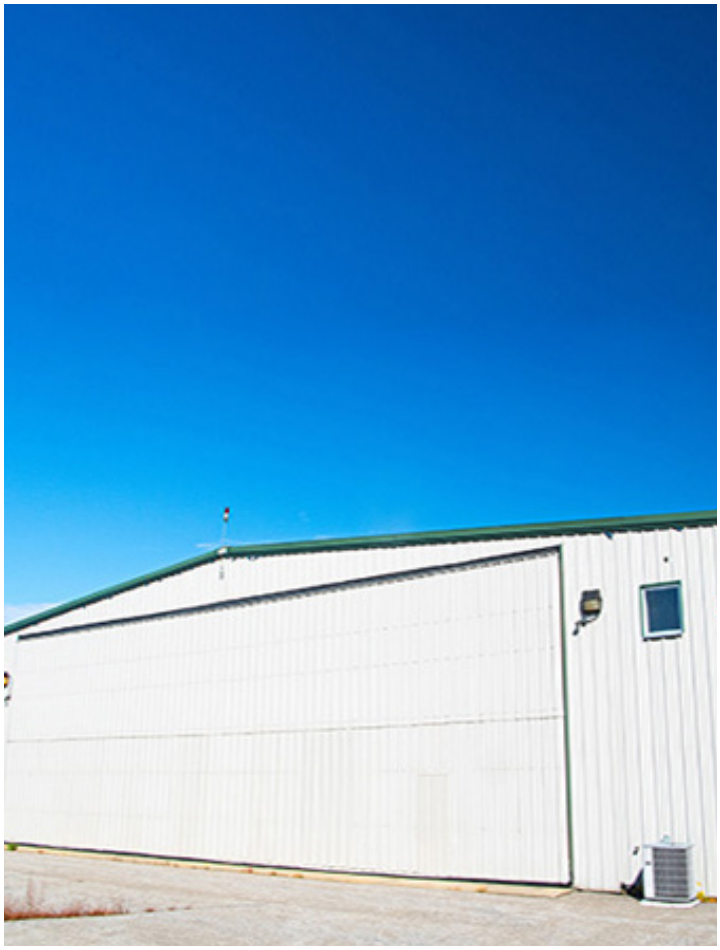
8. Company Overview

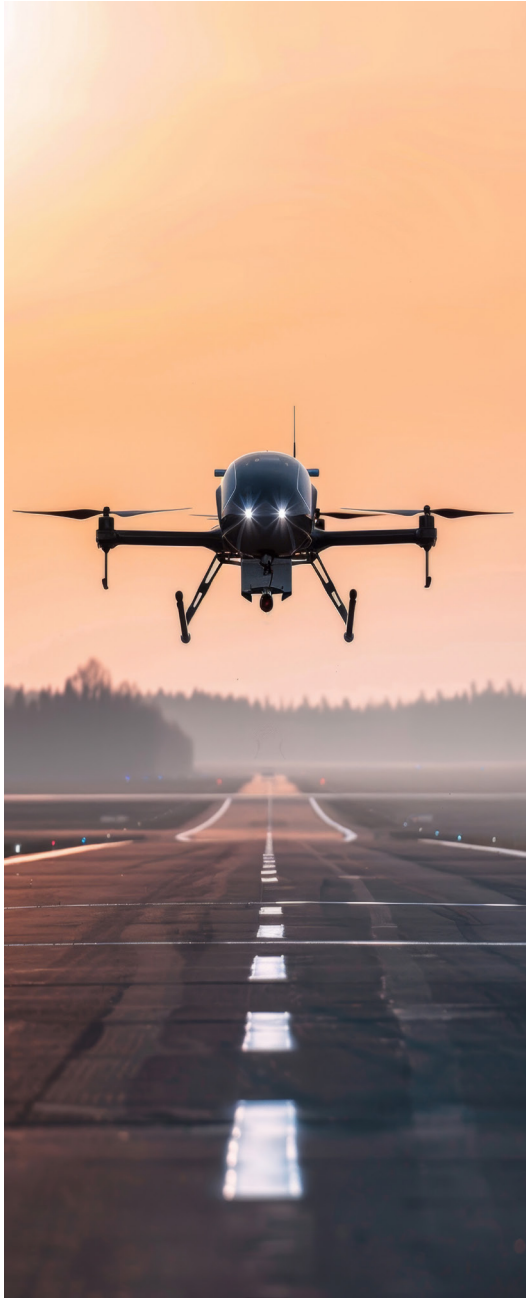
8.1 Mission Statement

ePropelled is dedicated to advancing UAV technology with highly efficient, reliable, and scalable propulsion systems.

ePropelled designs and manufactures top-performing propulsion motors, controllers, and hybrid power solutions for uncrewed aerial vehicles (UAVs). From the highest-quality manufacturing and test facilities, ePropelled delivers a broad range of custom and industry-standard drone propulsion and power designs at volume.

ePropelled Sparrow series of compact UAV motor solutions are not just advanced they're revolutionary. Sparrow motors and controllers deliver compact, lightweight, and highly efficient motor solutions that ensure enhanced thrust efficiency, longer flight ranges, and reduced operational costs.





Critically, ePropelled Sparrow Series elevates the performance of UAVs and drones where commodity motors from other regions are being swapped out globally. Sparrow systems provide top-tier propulsion solutions with unmatched efficiency and long life.

ePropelled's Falcon Series offers top performance, energy efficiency, and smart technology. With advanced control and management features, it sets a new standard for powerful, agile UAV propulsion.

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Company Overview

We specialize in creating high-performance motors and controllers designed for the most demanding applications in the UAV industry.

ePropelled stands out as one of the world's leaders in uncrewed vehicle solutions, delivering high-performance systems and integrated solutions that empower organizations to achieve limitless possibilities—ePropelled "Uncrewed, Unlimited"—shaping the future of intelligent mobility.

UAVs are increasingly exploiting more than one kind of motor on each drone for a variety of impactful reasons. That's where innovative ePropelled hybrid-ready Hercules integrated electric generation, power management, and systems come into play. By extending range and mission agility for UAVs, integrated technologies that support hybrid propulsion – cooperatively combining electric motors and internal combustion engines -- is advancing the modern uncrewed vehicles market for aerial drones.

ePropelled's customizable UAV solutions cater to the specific needs of global drone OEMs. ePropelled's engineers have overcome sector-specific challenges such as weight and size constraints, range limitations, and the integration of hybrid propulsion systems to provide customizable that extended ranges and provide mission agility.

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8.2 About ePropelled

8.2.1 History: Overview of the company's founding, growth, and key milestones.

Now rapidly growing with more than 80 employees, including a high percentage of Ph.Ds. among personnel, ePropelled has headquarters, operations, engineering, and production facilities in the US, UK, and India.

Based in Laconia, NH, ePropelled launched in 2018 with an initial private investment from founder Nick Grewal, now President, CEO, and Chairman. Later in 2018, ePropelled acquired ElectronicaUK Ltd in Cardiff, Wales, a magnetics research and design consultancy founded in 1999 by current ePropelled CTO Dr. Nabeel Shirazee.

The combined firm, growing through additional private funding from angel investors, opened its Coventry, England facility in 2022 and shipped its first two ePropelled-branded products that same year – the iPS750 power system and the SG750 starter generator.

ePropelled currently has 36 patents across 10 patent families as a global leader in patented magnetics engineering, dynamic hybrid propulsion solutions, and connected telemetry-based data gathering.

In 2023, ePropelled achieved positive cash flow, and moved its headquarters from Massachusetts to Laconia, NH to further develop the leading electric propulsion solutions for air, land, and marine mobility. The business has more than 40 global customers and a strong balance sheet.

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8.2.2 Innovation: How ePropelled leads the way in propulsion technologies, contributing to multiple industries and more.

As a pioneer in patented magnetics engineering, dynamic hybrid power solutions, and operational data gathering, ePropelled's uncrewed vehicle propulsion solutions meet demanding performance requirements. In the most demanding uses, ePropelled systems enable mission success and agility – via high thermal tolerance, low weight, high thrust, and energy efficiency.

Based in Laconia, NH, ePropelled empowers unmanned vehicle designers to unleash their total mission creativity by solving the requirements for agile and efficient propulsion systems and solutions. ePropelled's complete electric propulsion solutions include propulsion motors, engine starters, intelligent power systems, starter generators, and intelligent air.

From tiny to massive—from farm fields to the edge of space—ePropelled's broad range of solutions leverage patented advances in real-time analytics software to enable reliable electric-only and hybrid thrust and power delivery across myriad vehicle propulsion scenarios.

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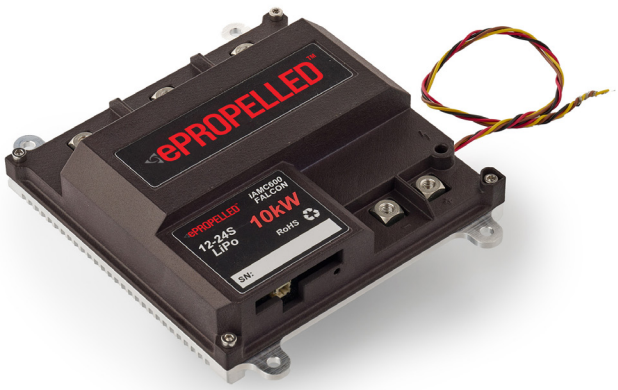
8.2.3 Sustainability: Commitment to creating energy-efficient solutions that reduce carbon footprints in the UAV sector.

ePropelled compact UAV motor solutions are not just advanced they're revolutionary. ePropelled motors and controllers deliver compact, lightweight, and highly efficient motor solutions that ensure enhanced thrust efficiency, longer flight ranges, and reduced carbon use.

By managing the intricate integration of hybrid propulsion systems within a single device, ePropelled has solved the significant engineering and operational challenges to ensure reliable, adaptive, and efficient electric and hybrid propulsion options in a single system.

ePropelled propulsion motors not only optimize energy efficiency, they also reduce noise, are compact, lightweight, and make excellent replacements across various end-use applications where energy conservation and lower carbon footprints are imperatives.

A well-designed green motor system from ePropelled also uses less materials, resulting in motors and generators that are both compact and cost effective. As with all ePropelled designs, by taking an integrated solutions vehicle OEMs can optimize their own products to meet their end customers' energy use goals and meet their regulatory requirements.



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info@epropelled.com | www.epropelled.com

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