

Intelligent Power System

iPS3000



Key Features



One primary output (factory configurable 28 V or 48 V)



High efficiencies of up to 95%, load dependent



Software and hardware alerts to system controller



Overcurrent and short circuit protection



Onboard battery charging



Real-time data monitoring for all voltages, currents, and temperatures



Visual status indication for DC output provided through RGB LED

Fly Higher. Fly Longer. Fly Smarter.

Unmanned aerial vehicle (UAV) electronics continue to evolve as mission profiles become more demanding. System power designers are being challenged to provide more innovative power supply systems to improve efficiency, ensure reliability, reduce weight, minimize heat dissipation, and lower overall cost. New levels of energy and system-level efficiencies are also required to meet tomorrow's aviation needs.

Intelligent Power Systems

ePropelled intelligent power systems (iPS) are a complete power management solution for aviation applications. They convert the 3-phase sinusoidal AC voltage produced by a starter generator to tightly regulated DC voltage that can be used to power onboard avionics, servos, and payloads.

Designed to operate over a wide input range that varies with the speed of the starter generator or alternator, the iPS uses active rectification and switching regulation to supply the required steady DC output voltages.

These smart power systems also provide a wide array of real-time performance and operational data for a range of useful applications and analytics. The iPS monitors all input and output voltage, as well as current levels, and collects and reports that data via an integrated controller area network (CAN) interface. Custom applications can be created via our open application programming interface (API) and thresholds can be set for alerts and alarms based on specific applications and mission profiles.

There is an optional electronic engine starter (EES) unit that can be used to drive the starter generator during the engine start sequence. Once the engine is up to speed, the iPS delivers the regulated voltages. If, for any reason, the starter generator stops working, an onboard battery (if connected) automatically engages to provide the required voltage for a limited time, dependent on the onboard battery size.

Battery Features

- ▶ Onboard battery can provide power to outputs if 3-phase generator power is lost
- ▶ Onboard battery is charged when the unit is connected to 3-phase power

Temperatures Monitored and Logged

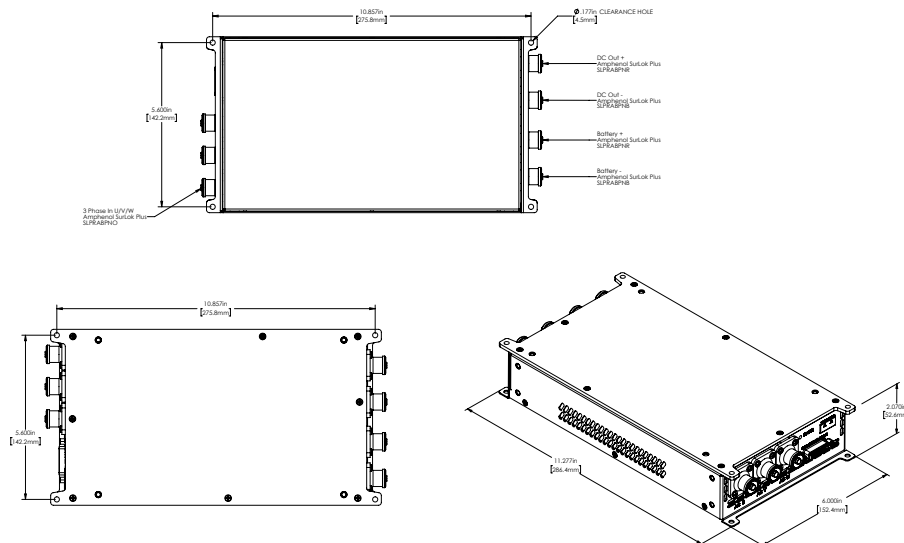
- ▶ Synchronous rectifier FETs
- ▶ DC converter FETs
- ▶ Output OR-ing FETs

User-Configurable Parameters

- ▶ Conductor compensation voltage boost
- ▶ Alert and threshold settings
- ▶ RTDM settings
- ▶ CAN bus settings

Mounting Instructions

The figure below depicts the overall dimensions of the iPS chassis. Four holes are used for mounting the unit. Please note that weight and other details are provided in the technical specification table.



iPS3000 SPECIFICATIONS

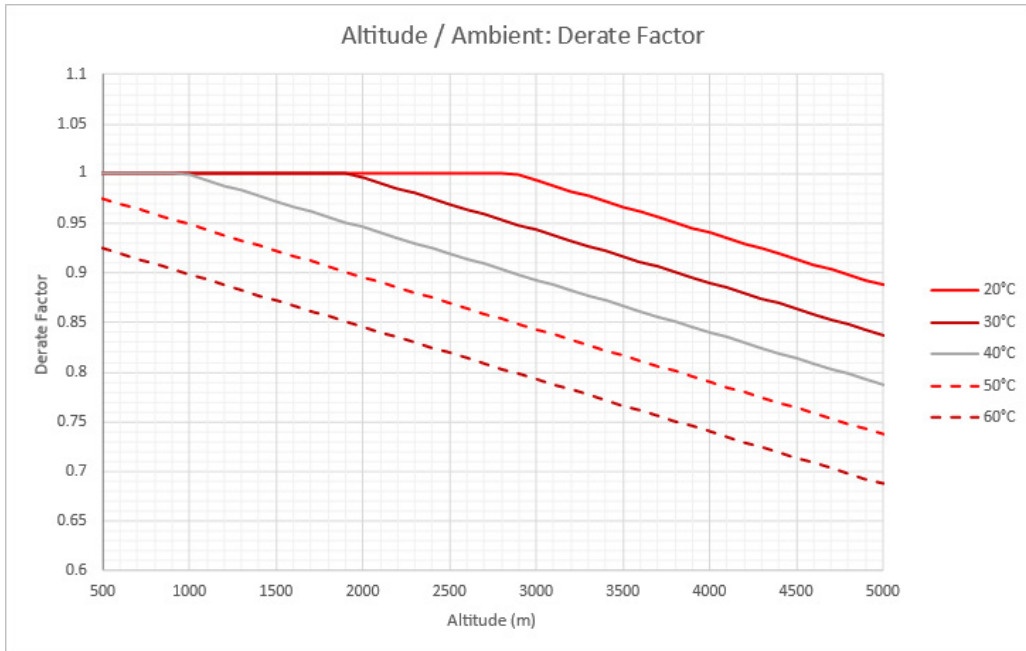
| Parameter | INPUT | | | | Notes |
|--|---|------|------------------------------------|------|---|
| | iPS3000-28V | | iPS3000-48V | | |
| | Min | Max | Min | Max | |
| Input voltage range | 25 V @ no load 50 V @ full load | 95 V | 25 V @ no load 50 V @ full load | 95 V | Volts RMS No load for system checks only |
| Onboard battery input | 24 V | 28 V | 44 V | 48 V | DC |
| Maximum total input power | 3150 W | | | | At 50°C ambient [122°F] |
| Parameter | OUTPUT | | | | Notes |
| | Value | | | | |
| Maximum total output power (continuous) | 3000 W | | | | DC at 50°C ambient [122°F] |
| Primary output voltage | 28 V | | 48 V | | DC (108 A, 62.5 A) factory set |
| Voltage regulation | ±500 mV | | | | Both 28 V / 48 V versions |
| Voltage ripple P-P | <500 mV | | | | Both 28 V / 48 V versions |
| Peak efficiency | ≥95% | | | | Load dependent |
| Onboard battery charge voltage (iPS3000-28V) | 29.2 V | | - | | Battery Type: 8S LiFePo4 |
| Onboard battery charge voltage (iPS3000-48V) | - | | 54.8 V | | Battery Type: 15S LiFePo4 |
| Onboard battery charge current | 1.67 A | | | | Max |
| Protection features | Input undervoltage and overvoltage warning Output undervoltage and overvoltage warning *Output short circuit protection Output overcurrent warning and protection Over temperature warning | | | | |
| Parameter | MECHANICAL | | | | Notes |
| | | | | | |
| Dimensions | 11.3" x 6.0" x 2.1" [286.4 mm x 152.4 mm x 52.6 mm] | | | | |
| Weight | 3.4 pounds [1540 grams] | | | | |
| Cooling | Natural convection (0.1 m/s airflow lengthwise) @ 1250 W Required 5m/s airflow lengthwise for operation @ 3000 W | | | | |
| Ambient operating temperature | -32°C to 50°C at 3000 W [-26°F to 122°F] | | | | |
| Storage temperature | -40°C to 85°C [-40°F to 185°F] | | | | |
| Ingress protection | IP20 | | | | |

⚠️ *WARNING: When operating without an onboard battery, the unit has output short circuit protection. However, if a battery or a power supply is connected to the onboard battery terminals, the short circuit protection will force the unit into a switchover state when the output is shorted. **This will cause damage to the circuit that is responsible for handling the switchover and it will void the warranty.**

⚠️ *WARNING The onboard battery must be fused with a **120 A fast blow inline fuse**. Failure to add the specified inline fuse will result in damage to the unit and void the warranty.

Derating with increased altitude

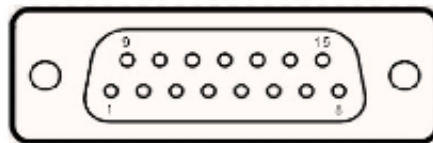
The derating factor for altitude is based on the loss of dielectric strength of the air as the density decrease with the altitude. The diagram below shows how the cooling efficiency changes with high altitude and ambient temperatures.



iPS3000 PINOUT

| Name | Description |
|---|---|
| Power (SurLok Plus 5.7 mm Receptacles) | |
| AC U | U phase output connection for SG |
| AC V | V phase output connection for SG |
| AC W | W phase output connection for SG |
| Battery+ | Positive input connection for starter battery |
| Battery- | Negative input connection for starter battery |
| DC out+ | Positive output connection for DC load |
| DC out- | Negative output connection for DC load |
| Thermocouple (Type-K Mini Connector) | |
| TC+ | Positive type-K thermocouple input |
| TC- | *Negative type-K thermocouple input |
| Communications (Female DB-15) | |
| 1-5 | Not to be used by customer |
| 6 | Ground |
| 7 | CAN high |
| 8-13 | Not to be used by customer |
| 14 | CAN low |
| 15 | Not to be used by customer |

*Note: Function is currently not implemented



Recommended Applications

- ▶ Aircraft power systems
- ▶ Unmanned vehicle power systems
- ▶ Power conditioning
- ▶ Stand-alone power systems (SAPS) for remote area power supply
- ▶ Voltage regulation in the renewable power generation system

Assembled in USA

Errors and omissions excepted. All specifications subject to change without notice. For more information, including ordering product, please contact us at info@ePropelled.com.

Warnings and Labels



ePropelled © 2021. ePropelled designs intelligent motors, motor controllers, generators, and power management systems. Our technology helps reduce energy consumption and improve system efficiency at a lower cost in the aerospace, manned and unmanned aerial vehicles, electric vehicles, and pump markets. We are a leader in magnetics engineering, and our patented technology innovations are used in the air, on the road, and on water, defining the future of electric propulsion.