

Intelligent Power System

iPS3000



Key Features



One primary output (28 V) and two adjustable secondary outputs (12 V-14 V and 5 V-8 V)



High efficiencies of up to 93.5%, load dependent



Overcurrent and short circuit protection



Onboard battery charging



Configurable EES parameters for different internal combustion engines



LED indicators provide status for each output voltage and current



Software and hardware alerts to system controller

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

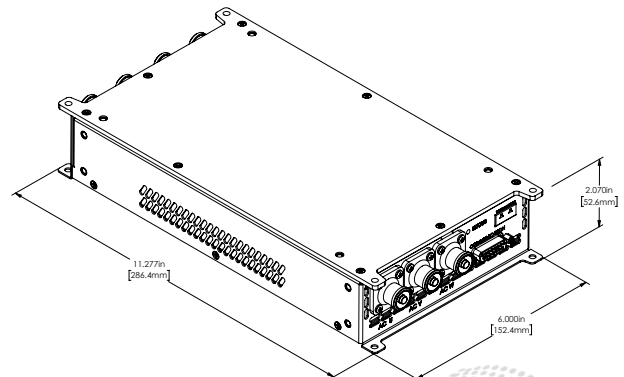
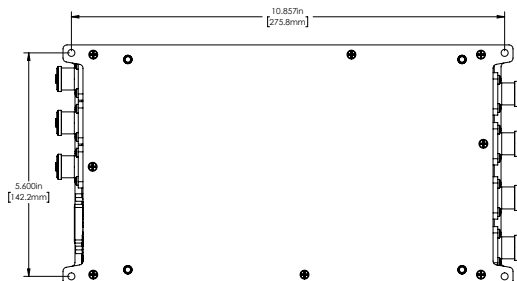
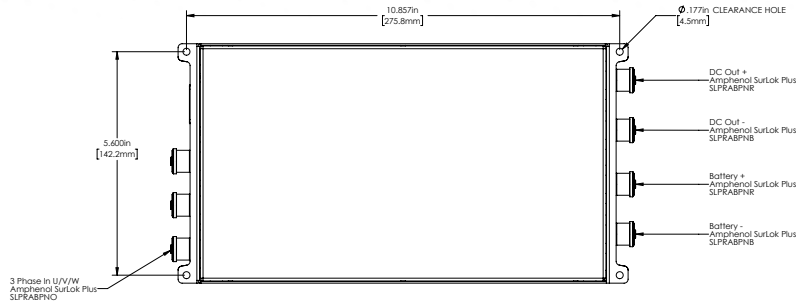
- ▶ Synchronous rectifier FETs
- ▶ DC converter FETs
- ▶ Output OR-ing FETs

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

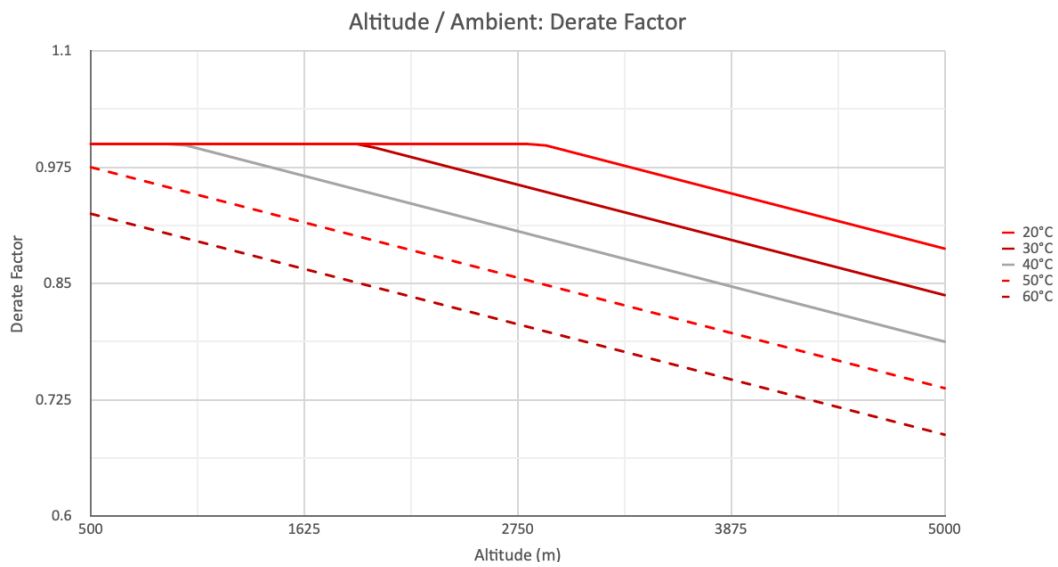
Parameter	INPUT				Notes
	iPS3000-28V		iPS3000-48V		
	Min	Max	Min	Max	
Input voltage range	25 V @ no load 50 V @ full load	95 V	25 V @ no load 50 V @ full load	95 V	Volts RMS No load for system checks only
Onboard battery input	24 V	28 V	44 V	48 V	DC
Maximum total input power	3,150 W			At 50°C ambient [122°F]	
Parameter	OUTPUT			Notes	
	Value				
Maximum total output power (continuous)	3,000 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 LiFePo
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 [1,540 grams]				
Cooling	Natural convection (0.1 m/s airflow lengthwise) @ 1,250 W Required 5 m/s airflow lengthwise for operation @ 3,000 W				
Ambient operating temperature	-32°C to 50°C at 3,000 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 in-line fuse**. **Failure to add the specified in-line fuse will result in damage to the unit and void the warranty.**

Derating with Increased Altitude

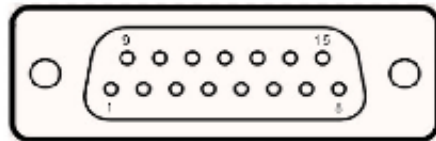
The derating factor for altitude is based on the loss of dielectric strength of the air as the density decrease with the altitude. The diagram below shows how the cooling efficiency changes with high altitude and ambient temperatures.



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 onboard battery
Battery-	Negative input connection for onboard 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: Thermocouple input used for SG temperature measurement is not yet 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

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