



## *Intelligent Power Stabilizer & Up-converter*

**Model: IPS-24v-5a**

The Intelligent Power Stabilizer, IPS, is an electronic power converter for critical electrical equipment found in general aviation aircraft. The IPS system provides aircraft bus voltage surge and sag protection for the connected electrical equipment. The IPS system will operate over an input voltage range from 10 volts to 30 volts and provides a regulated output voltage of 24 volts. The IPS system allows electronic equipment such as engine monitors, EFIS and GPS's and radios to be operational before and during engine starting. This important feature allows the pilot to load flight plan data into the aircraft GPS prior to starting the engine, thereby saving fuel and operating expense. When used with aircraft engine monitors it ensures the pilot can monitor critical engine operating parameters such as oil pressure during the engine starting process.

The electronic power converter in the IPS system ensures the connected electronic equipment is provided with a stabilized source of power even when the aircraft battery voltage drops significantly. This is particularly important during engine starting or alternator out conditions. IPS additionally provides surge protection by actively clamping the regulated output voltage.

The IPS-24V may also be used as an up converter for electronic equipment requiring 24 volts from a standard 12 volt aircraft power bus.

The Intelligent Power Stabilizer system is suitable for use with equipment such as Garmin GNS-430/wa, GNS-530/wa, G900X, G3X systems. Advanced Flight System EFIS, Dynon EFIS, Grand Rapids EFIS, MGL EFIS, Tru-trak Autopilots. The IPS system may also be used for operating 24 volt radios and electronics such as those utilized in the Garmin G900x system and the GNS 430W-A / GNS-530W-A systems in 12 volt aircraft.

No other uses of the IPS system are permitted except for those identified in this installation manual.

IPS must be installed using the current aircraft standards and practices. Refer to AC 43.13-2A/1B. The installer/builder is solely responsible for determining the suitability of the installation and use of this product.

## Installation instructions:

### 1. IMPORTANT NOTE:

Consult the attached wiring diagrams to identify wiring connections similar to your particular installation. Please note, some equipment such as GPS's and EFIS systems may be provided with multiple power inputs. For these installations the IPS system must be connected on the "back-up" power input. It is strongly recommended that the "main" power input in these installations be provided from the aircraft avionics bus. The "back-up" power source should be provided through the IPS system and fed from a bus that is active during engine starting. This will typically be the master bus. For equipment having a single source of power, ensure the IPS system is fed from a bus that remains active during engine starting, such as the master bus.

Garmin 430/530(w) GPS systems are available in versions with and without back-up power inputs. Consult the Garmin GPS installation manual to determine which model you are working with, wiring diagrams for connection of each type to the IPS system are shown at the end of this document.

2. Check the total connected load to be used with the IPS system and ensure that it is less than the following product ratings.  
IPS-24v-5a = 5 amps maximum continuous current, 10 amps peak
3. Mount the IPS power converter in a suitable location in the aircraft. The IPS must be mounted inside the aircraft, do not mount IPS in the firewall forward area.
4. Connect the aircraft wiring according to the wiring diagrams as shown.  
The IPS must be powered through a properly sized circuit breaker or fuse. ENSURE the proper size wire is utilized for the input feed and ground connection powering the IPS system. Additionally, the output of the IPS must be fused as shown in the wiring diagrams.

### FUSING:

For continuous loads: Input Fuse = 15 amps, Output Fuse= 5 amps

For radios and transient loads: Input Fuse = 20 amps, Output Fuse= 7.5 amps

## **PRODUCT OPERATION:**

The IPS system is fully automatic and requires no input from the pilot. The IPS system will provide a regulated output voltage to the connected equipment with an input bus voltage as low as 10 volts. The IPS system will automatic shut down if the input bus voltage remains below 10 volts for an extended period of time. NOTE: During automatic shutdown the output voltage of the IPS will no longer be regulated, but instead will fall to the nominal input voltage, thereby reverting back to system operation equivalent to that of systems not having the benefits of the IPS system.

### **IMPORTANT NOTES:**

If the aircraft battery is extremely weak, the IPS system may not be able to keep the connected equipment operational during engine starting. If the battery is incapable of driving the starter to rotate the engine through a complete compression cycle the aircraft battery may be sagging below 10 volts. During these conditions the IPS system will protect itself and the attached equipment by shutting down.

Battery replacement is strongly encouraged if this condition persists.

Additionally, if the aircraft battery is deeply discharged, i.e. below 9 volts continuous output with no load attached, then when the aircraft systems are initially energized (i.e. at aircraft power-up) the IPS system will not boost the output voltage and it is likely the attached equipment will not power up. This is a warning the aircraft battery is in a state of deep discharge and may be in need of service or replacement.

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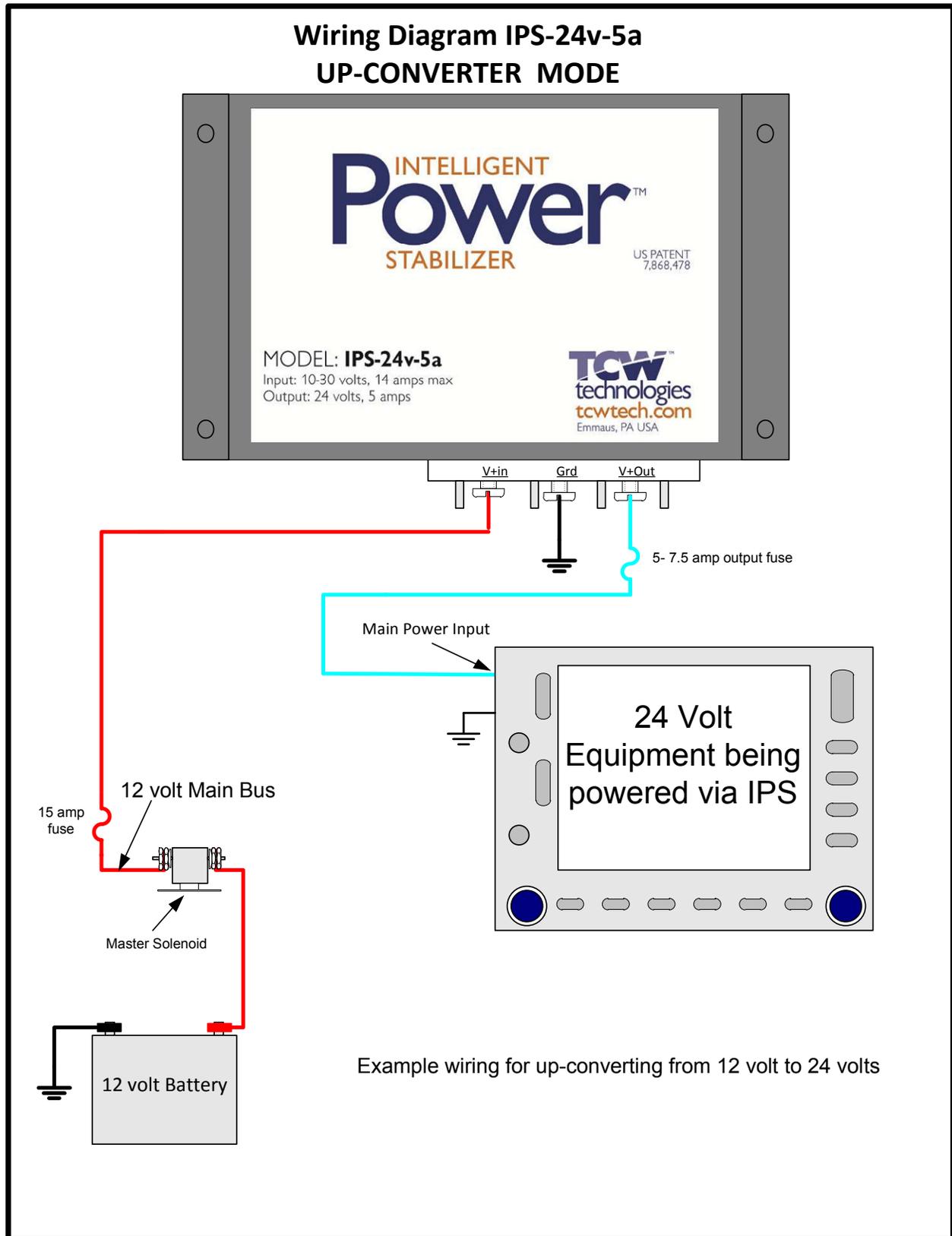
email: [support@tcwtech.com](mailto:support@tcwtech.com)

## **SPECIFICATIONS:**

<b>Input Voltage:</b>	<b>10-30 volts DC</b>
<b>Output Voltage:</b>	<b>&gt;24.0 volts DC</b>
<b>Output Current:</b>	<b>IPS-24v-5a 5 amps continuous, 10 amps peak</b>
<b>Converter:</b>	<b>True DC:DC converter with output over voltage, over current and over temperature protection</b>
<b>Surge Protection:</b>	<b>32 volt active clamp, 1500w 10/1000uS waveform</b>
<b>Wiring:</b>	<b>IPS-24v-5a : insulated barrier strip, #6 screws</b>
<b>Enclosure:</b>	<b>Cast aluminum IPS-24v-5a : 4.6" x 3.7" x 1.18"</b>
<b>Weight:</b>	<b>IPS-24v-5a : 14 oz.</b>
<b>Temperature range:</b>	<b>-25 C° to 55 C°</b>

# Intelligent Power Stabilizer™

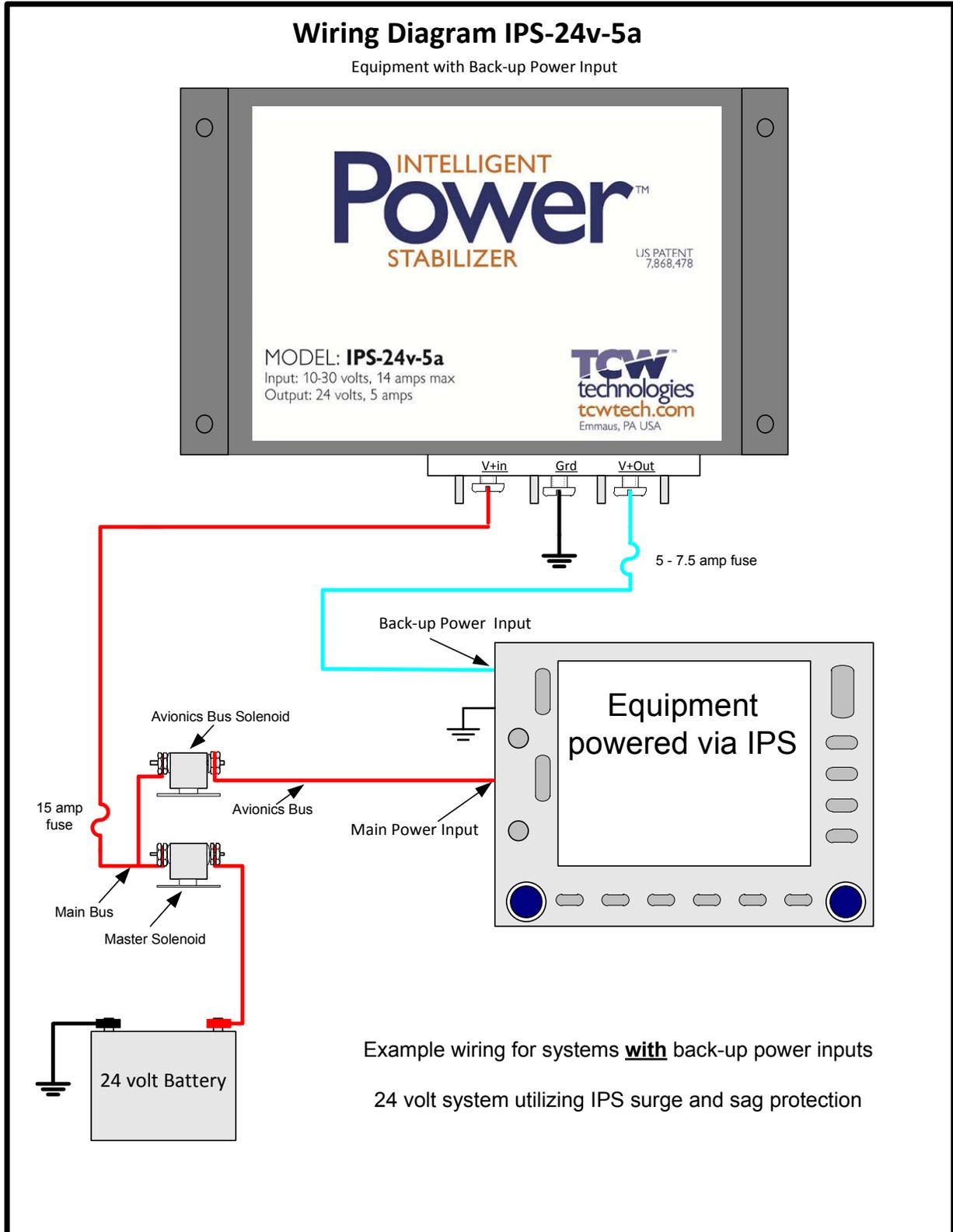
## Wiring Diagram IPS-24v-5a UP-CONVERTER MODE



# Intelligent Power Stabilizer™

## Wiring Diagram IPS-24v-5a

Equipment with Back-up Power Input



Example wiring for systems with back-up power inputs

24 volt system utilizing IPS surge and sag protection

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