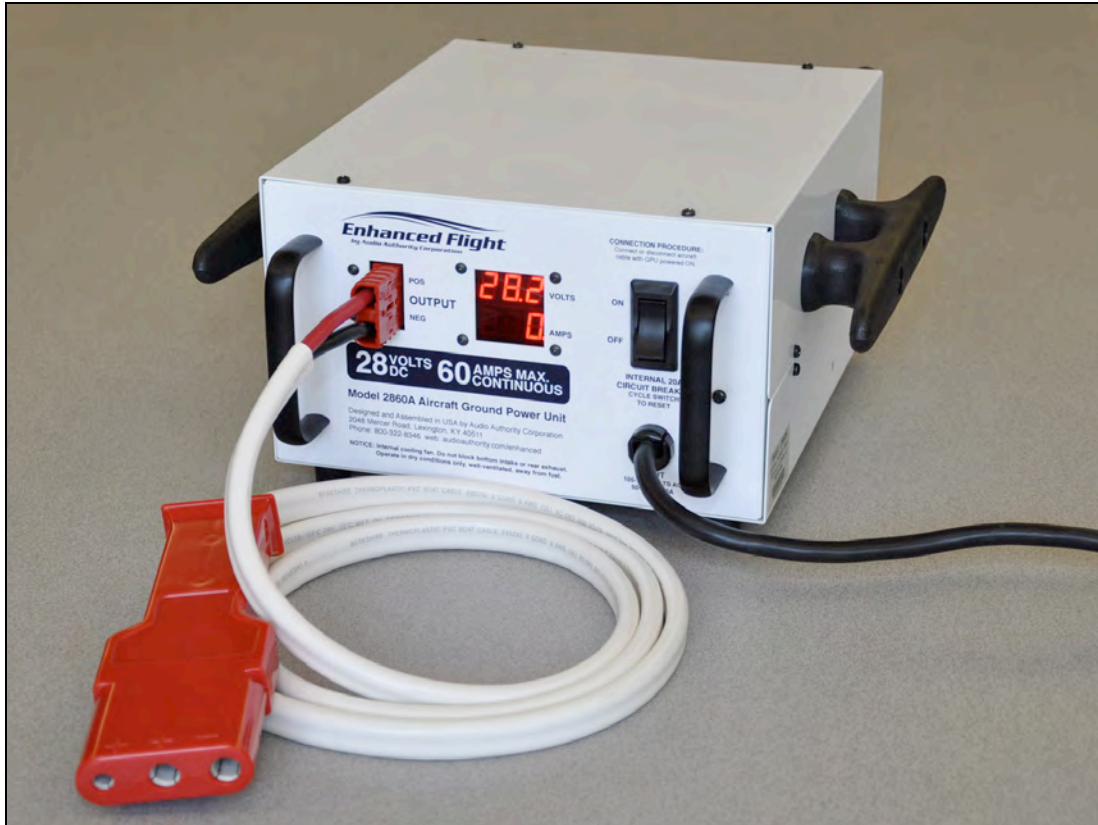


# Operator's Manual

## Model 2860A Portable Ground Power Unit (GPU)



### IMPORTANT DISCLAIMER & OPERATING LIMITATIONS

#### Read this before connecting the GPU to your aircraft!

Audio Authority authorizes this device for use ONLY by aviation professionals, such as licensed pilots and maintenance technicians, knowledgeable about their aircraft electrical system and batteries. Aircraft electrical systems vary widely. Many aircraft electrical systems have been altered in the field from the original OEM configuration and these changes are often poorly documented in the aircraft records. The operational concepts, recommendations, and instructions presented in this manual are necessarily general and make assumptions that do not apply to every aircraft, and may not be correct for your particular aircraft. Incorrect use of this device has the potential to damage the GPU and/or aircraft components.

It is the operator's responsibility to read completely and fully understand this manual, plus those sections of the Aircraft Flight Manual and Maintenance Manual that pertain to their aircraft's electrical system design, to determine the appropriate use of this, or any, external power source. **If you cannot do this, do not use this product.** Instead, consult the airframe manufacturer, service center, or a technician familiar with your specific aircraft type and configuration before connecting the GPU to your aircraft.

This device may be used safely for several hours continuously, but is NOT intended or approved for unattended use. NEVER leave the GPU connected to any aircraft when unattended.

## General Description and Application

The Model 2860A GPU is a modular switching-mode power supply designed to provide pilots and aviation maintenance professionals with a portable, affordable source of stable, high-current, noise-free DC power. Its rated output is 28 Volts DC, up to 60 amps continuous, from a 20A 120 VAC 60 Hz input. It will safely provide continuous power for the most delicate electronics with stable, ripple-free DC up to its full rated output. It is ideal for:

- private aircraft hangars
- baggage-carried backup power source for remote sites
- FBOs, avionics & maintenance shops
- air shows and aircraft exhibitions
- aircraft production and testing facilities

Operation of sophisticated avionics and electrical equipment by poorly regulated, noisy power sources risks costly damage. This portable GPU is designed as a practical alternative to large, expensive start carts, battery chargers, and other transformer/rectifier-based power systems designed for engine starter power. It is suitable for ground operation of airframe systems such as:

- power during preflight and battery top-off
- avionics for familiarization & training, database updates, testing or maintenance
- aircraft heating, air conditioning and ventilation systems
- cabin entertainment systems
- hydraulic and electric motors for landing gear
- electrical equipment, motors, and lighting
- electronic equipment and gyros

## Operating Conditions & Limitations

The 2860A GPU has rubber feet on both the bottom and back panels so it can be operated in either a horizontal or vertical position. However, it is fan-cooled and relies on unobstructed access for cooling air to enter the bottom and exit the rear of the cabinet. The GPU should operate on a clean, hard surface so that debris is not ingested.

The 2860A GPU design assumes a dry operating environment. If used outdoors, it is the operator's responsibility to insure that the unit is not exposed to moisture.

At full output, the GPU can draw up to 18 amperes and therefore should be connected to a dedicated 120 volt AC, 20-amp wall receptacle. Connecting the GPU to a standard 15-amp wall outlet will limit its output to about 50A, but otherwise it will function properly. If an extension cord is to be used with the GPU, a 3-pin grounded AWG-12 type of less than 50 feet is recommended – the shorter, the better.

## Connecting GPU to Aircraft

Consult your Aircraft Flight Manual, Pilot's Operating Handbook, or Aircraft Maintenance Manual for the correct procedures for connecting an external power source to your particular aircraft. Our general recommendation is to turn the GPU ON and observe its output voltage stabilized at approximately 28 volts before connecting its output cable to the aircraft's external power receptacle. Similarly, we recommend removing the GPU's output cable from the aircraft prior to turning its power switch OFF. This procedure will avoid any possibility of subjecting the aircraft electrical system to turn-on or power-down transients from the GPU. If the GPU voltage is less than 24 volts, do not connect to aircraft, if connected, discontinue operation and seek repair.

The GPU ON/OFF switch contains an internal 20A circuit breaker. If the GPU shuts down while operating, disconnect it from the aircraft, check for and resolve any potential overload or short circuit conditions, cycle the ON/OFF switch to restore GPU power, then reconnect to the aircraft.

## Operation

The GPU is forced air-cooled and uses an internal fan. If the fan is inoperative for any reason, or if the bottom intake or rear exhaust ports are blocked, the GPU should be repaired before further use.

The 2860A includes dual digital output meters on the front panel for voltage and current. It is characteristic of the switching-mode power design to provide a nominal 28 VDC up to its full output. If the load exceeds 60 amps, the current display will flash to indicate an overload condition and alert the user to reduce the circuit load to the GPU. Prolonged overload conditions may damage the GPU.

## GPU/Aircraft Compatibility

The 2860A GPU is compatible with all piston and turbine aircraft with 28 VDC electrical systems (24 volt batteries) that initially draw less than 60 amperes without optional equipment turned ON. This includes most piston aircraft and a large number of turboprops and business jets. Current load on the GPU can be observed with the built-in meter on the front panel. The GPU may also be compatible with additional aircraft where the initial load to the GPU can be reduced by pulling circuit breakers for non-essential equipment such as lighting and environmental systems. This may require some experimentation to determine the configuration that fits within the output limitations of the GPU, but once identified, the configuration can be easily reproduced for subsequent ground power operation.

## Battery Use and Charging Limitations

Connecting the GPU to the aircraft will replicate the 28VDC electrical flight environment. If the aircraft's battery is in-circuit with the GPU output (by engaging the Battery Master switch in many aircraft) the battery will benefit from the GPU "topping off" the battery, just as it would in flight. Be aware that the initial load to the GPU will be slightly and temporarily higher, even with a well-charged battery, until the battery's demand on the GPU is satisfied. This can be observed as the GPU's amp meter ticks down over a period of minutes until stabilized. Operating the GPU with the battery in-circuit for a period of several hours should not cause any problems. In addition, if the GPU is used to operate devices where the inrush current is greater than 60 amps (hydraulic gear motors, electric air conditioning, etc.), supplying the surge amperage from the ship's battery is recommended and will facilitate operation of these devices, so long as the continuous load is not in excess of the GPU's output. Similarly, topping off a serviceable battery with the GPU in preparation for engine start will improve battery output and starting performance.

The 2860A GPU is NOT an automatic battery charger:

- It cannot isolate the ship's battery from the rest of the electrical system and contains no circuitry to monitor or evaluate the battery's level of charge. Battery chargers MUST be connected directly to the battery, NOT through the external power receptacle.
- It will not automatically turn off when the battery is fully charged.
- Its output voltage is fixed at 28 volts DC and is not compensated for non-standard temperature.
- It cannot vary the output current in response to battery temperature or charge condition, so a deeply discharged battery may recharge too rapidly, risking battery damage and acid spillage.

A deeply discharged battery (less than 22 volts on the ship's volt meter) should be removed from the aircraft and serviced in accordance with the aircraft Maintenance Manual before returning to service.

## GPU Start Assist (piston engines only)

The GPU may be used for piston engine start assist with a well-charged battery. Check that the following precautions have been observed before proceeding:

- GPU and all cables are well clear of the propeller arc and that once engine has been started, cables can be unplugged from the aircraft, the GPU removed, and the aircraft external power receptacle secured without danger to ground personnel or the aircraft. Consult your Aircraft Flight Manual for procedures for starting with external power.

- Resting battery voltage must be at least 23 volts on the ship's meter. If less, allow time to top-off battery charge, or if deeply discharged, remove the battery from the aircraft for service in accordance with the manufacturer's instructions before returning to service.

### **WARNING!**

Do not attempt flight with a battery not fully charged. In the event of an electrical system failure, the battery's capacity to operate the aircraft electrical equipment would be severely diminished, which could jeopardize safety of flight, risking property damage and lives.

### **NOTE**

The 2860A GPU is adequate for piston engine start ASSIST ONLY. Its capacity is completely inadequate for turbine engine starts or motoring and should be used for airframe systems power only. Do not attempt turbine engine starts with the GPU connected to aircraft.

### **Specifications:**

Input:	105-125 Volts AC, 50-60 Hz, up to 20 amperes
Output:	28 +/- 0.5 Volts DC, 60 amperes continuous
Weight:	23.8 lbs (10.8 kg) including output cable
Dimensions:	7.25"H x 14.6" W x 13.75"D (18.1 cm x 27.6 cm x 34.9 cm)

### **One Year Limited Warranty**

Model 2860A Ground Power Units are warranted to the original purchaser to be free of defects in materials and workmanship for a period of one year from date of shipment.