



Maintenance Manual

Appareo Systems Stratus Power Pro System

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	Stratus Power Pro Maintenance Manual			
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1. INTRODUCTION

1.1. PURPOSE

This Maintenance Manual describes the recommended and required maintenance practices to maintain the Appareo Systems Stratus Power Pro system.

Electronic media or hard copy revisions/updates to this document will be made available to all owners if contact information is provided to the manufacturer. Aircraft owners are encouraged to provide up-to-date information to ensure timely access to new information. You can contact the manufacturer at:

Appareo Systems, LLC
1830 NDSU Research Circle North
Fargo, ND 58102

To view the most current version of this document, go to www.appareo.com/dealer-portal or www.appareo.com/resources.

All structural and general maintenance must be performed in accordance with the aircraft's Standard Practices Manual and FAA AC 43.13-1B.

1.2. CERTIFICATION INFORMATION

1.2.1. TSO compliance

Stratus Power Pro is compliant with the following Technical Standard Order:

Reference/Issue	Title
FAA TSO-C71	Airborne Static ("DC to DC") Electrical Power Converter (For Air Carrier Aircraft)

Table 1: TSO compliance

1.2.2. TSO deviations

TSO	Section	Deviation
TSO-C71	Subpart B	Environmental qualification testing was performed to DO-160G, not DO-60.

Table 2: TSO deviations

1.2.3. Environmental qualifications

Stratus Power Pro is tested to DO-160G. The Stratus Power Pro Environmental Qualification form is in Appendix A of this document.

1.3. SYSTEM DESCRIPTION

Stratus Power Pro is a dual 3 amp USB charging hub used to power and charge electronic devices in the cockpit. Stratus Power Pro has one USB-C charging port and one USB-A charging port.

1.3.1. Operation of Stratus Power Pro

Users plug their portable electronic devices into Stratus Power Pro, and the unit powers and charges the devices. No other user input is required.

1.3.2. Stratus Power Pro parts catalog

Line Replaceable Units (LRUs):

Item	Appareo Part Number	Quantity
Stratus Power Pro Assembly	153510-000169	1
Power Connector Receptacle	251015-000115	1
Connector Terminals	251015-000116	2
Stratus Power Pro Panel Cover	353070-000074 or 353070-000242	1
Screw	356060-000100	2

Table 3: Required hardware (LRUs)

COTS components:

Item	Appareo Part Number	Commercial Part Number	Quantity
Connector	251015-000115	Molex 0436450200	1
20-24 AWG Pin	251015-000116	Molex 0430300001	2

Table 4: Required hardware (COTS components)

1.4. TOOLS

The following tools may be needed for maintenance of Stratus Power Pro.

Tool	Part Number	Used For
Multimeter	--	Measuring output power and polarity
Crimp tool	0640160201	Power connectors

Table 5: Required tools

1.5. WEIGHT AND BALANCE INFORMATION

The total weight of the Stratus Power Pro system and related hardware is less than 1 lb. Compute a Chart "C" in accordance with the table below, noting the proper aircraft station to obtain balance information.

Component	Weight
Stratus Power Pro Unit Weight	0.16 lbs. (.07 kg)

Table 6: Stratus Power Pro weight

1.6. EQUIPMENT DIMENSIONS

Dimensions for Stratus Power Pro are outlined in the table below. All figures given are representative of maximum equipment dimensions (where applicable).

Characteristic	Dimension
Width	1.848 inches (46.95 mm)
Height	1.848 inches (46.95 mm)
Depth*	1.263 inches (32.10 mm)

*includes mating connector, excludes bend radius

Table 7: Equipment dimensions

1.7. ENVIRONMENTAL SPECIFICATIONS

Characteristic	Specification
Operational Temperature Range	-20°C to +55°C

Table 8: Environmental specifications

1.8. POWER REQUIREMENTS

Characteristic	Specification
Input Voltage Range	10 to 32 VDC
Nominal Current Draw	<25 mA at 14 V and 28 V with no USB connections 1.2 A at 28 V at full output load on both ports 2.4 A at 14 V at full output load on both ports
Power Input	0.052 W with no USB connections 33.75 W max at 3A output load on both ports
Output Voltage Range	5.0 VDC +/-0.25 V
Max Current Output	3.0 A per port
Power Output	30 W

Table 9: Power requirements

2. AIRWORTHINESS LIMITATIONS

This Airworthiness Limitations section is FAA approved and specifies inspections and other maintenance required under §43.16 and §91.403 of the Federal Aviation Regulations unless an alternate program has been FAA approved.

There are no airworthiness limitations associated with this type design change.

3. INSPECTION REQUIREMENTS AND OVERHAUL (ATA CHAPTER 5)

3.1. GENERAL INSPECTION INFORMATION

There are no periodic maintenance cycles required for Stratus Power Pro.

Removal and installation instructions are found in this document. Manufacturer's installation manuals and basic aircraft maintenance manuals should be used for additional reference material. Component maintenance must be completed by an authorized repair facility. Refer to Section 10: Servicing. If for any reason during inspection Stratus Power Pro fails inspection or is otherwise not working properly, read the instructions contained in this manual before removing any Stratus Power Pro components. If difficulty is encountered, seek assistance by contacting the manufacturer.

4. DIMENSIONS AND ACCESS (ATA CHAPTER 6)

4.1. COMPONENT LOCATIONS

Stratus Power Pro is panel mounted.

4.2. MAINTENANCE INSTRUCTIONS

The following instructions are in addition to the standard practices used to maintain the aircraft structure, the wiring described in the aircraft manufacturer's maintenance manual, and FAA Advisory Circular 43.13-1B.

4.2.1. Stratus Power Pro System Removal

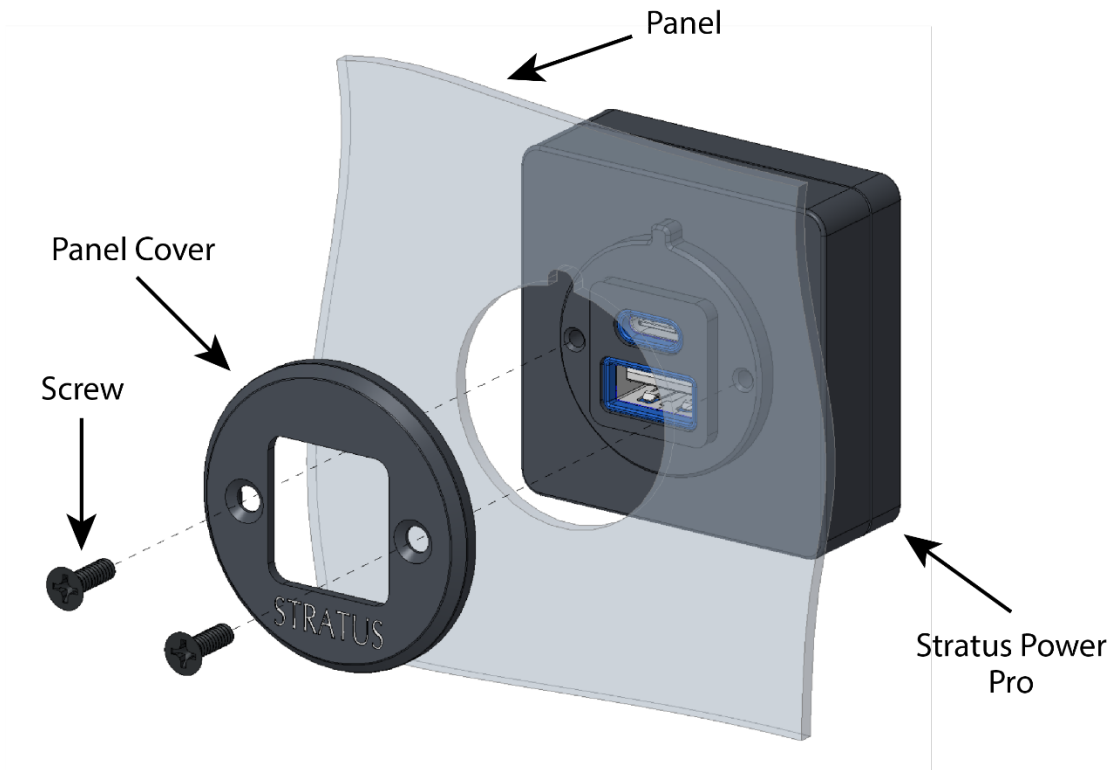


Figure 1: Stratus Power Pro removal and replacement

1. Disconnect aircraft power.
2. Disconnect the power receptacle.
3. Remove the screws from the panel cover and remove the panel cover. Ensure that the unit does not fall behind the panel.

4.2.2. Stratus Power Pro System Replacement

1. Place the Stratus Power Pro unit behind the panel and align the front of the unit with the hole. Place the panel cover over the front of the unit and secure with screws.
2. Verify input power and polarity.
 - a. Connect aircraft power and ensure that the breaker is pushed in.
 - b. On the power harness, place the negative probe of a multimeter on Pin 2 and the positive probe on Pin 1 (See Figure 2 for pin-out).

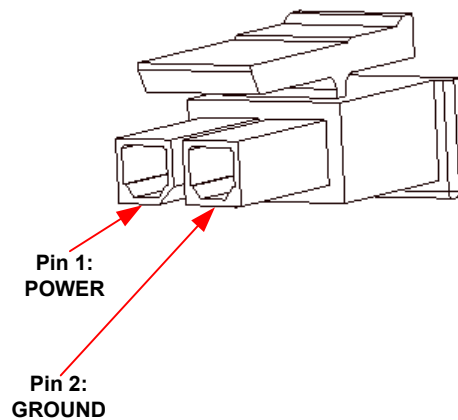


Figure 2: Harness

- c. Measure the voltage across the two wires using a multimeter. The voltage reading should be equal to your aircraft power.
- d. Disconnect aircraft power.

3. Push the power receptacle into the header on the back of Stratus Power Pro.

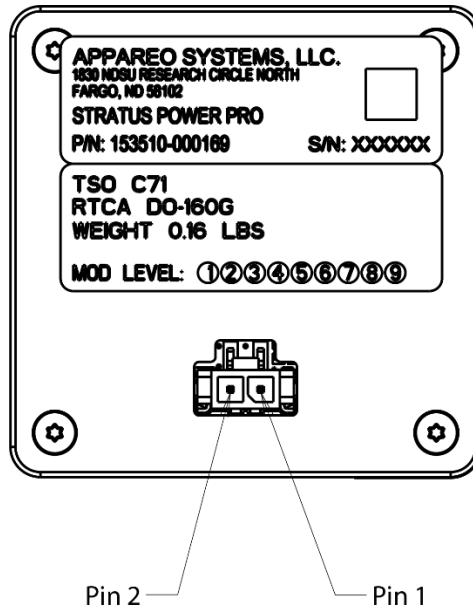


Figure 3: Back of Stratus Power Pro

4. Connect aircraft power and ensure that the breaker is pushed in.
5. Verify the voltage output of Stratus Power Pro before connecting any devices.

5. LIFTING AND SHORING (ATA CHAPTER 7)

5.1. LIFTING INFORMATION

5.1.1. Jacking Information

No change to basic aircraft Instructions for Continued Airworthiness (Maintenance Manuals)

5.1.2. Lifting Information

No change to basic aircraft Instructions for Continued Airworthiness (Maintenance Manuals)

5.2. SHORING INFORMATION

No change to basic aircraft Instructions for Continued Airworthiness (Maintenance Manuals)

6. LEVELING AND WEIGHING (ATA CHAPTER 8)

6.1. LEVELING INFORMATION

No change to basic aircraft Instructions for Continued Airworthiness (Maintenance Manuals)

6.2. WEIGHING INFORMATION

No change to basic aircraft Instructions for Continued Airworthiness (Maintenance Manuals)

7. TOWING AND TAXIING (ATA CHAPTER 9)

7.1. TOW INSTRUCTIONS

No change to basic aircraft Instructions for Continued Airworthiness (Maintenance Manuals)

7.2. TAXIING INSTRUCTIONS

No change to basic aircraft Instructions for Continued Airworthiness (Maintenance Manuals)

8. PARKING, MOORING AND STORAGE (ATA CHAPTER 10)

8.1. MOORING INFORMATION

No change to basic aircraft Instructions for Continued Airworthiness (Maintenance Manuals)

8.2. PARKING INFORMATION

No change to basic aircraft Instructions for Continued Airworthiness (Maintenance Manuals)

8.3. STORAGE LIMITATIONS

No change to basic aircraft Instructions for Continued Airworthiness (Maintenance Manuals)

9. PLACARDS AND MARKINGS (ATA CHAPTER 11)

Ensure that the labeling is in accordance with AC 43.13-2B, Chapter 2, Section 207, Sub-Section f., Paragraph (4).

10. SERVICING (ATA CHAPTER 12)

10.1. SERVICING INFORMATION

10.1.1. Component Repair

Equipment determined in need of repair must be returned to a properly rated repair facility that is trained and qualified.

Appareo provides repair services and has an authorized repair station.

To utilize Appareo's repair services, contact Appareo support for a Return Merchandise Authorization (RMA) number. Return all defective and suspected defective components to the following address for repair and replacement.

Appareo Systems, LLC
Attn: [RMA Number]
1830 NDSU Research Circle North
Fargo, ND 58102

For additional information, contact Appareo Systems at +1-701-356-2200.

10.1.2. Troubleshooting

Problem	Troubleshooting Steps
Stratus Power Pro is not powering a device.	<ul style="list-style-type: none"> Verify that the circuit protective device is functioning correctly. Verify that the polarity on the power connector is correct.

Table 10: Troubleshooting guide

10.2. LUBRICATION INFORMATION

No change to basic aircraft Instructions for Continued Airworthiness (Maintenance Manuals)

10.3. EQUIPMENT REQUIRED FOR SERVICING

No change to basic aircraft Instructions for Continued Airworthiness (Maintenance Manuals)

10.4. CONSUMABLE MATERIALS

No change to basic aircraft Instructions for Continued Airworthiness (Maintenance Manuals)

Appendix A

Nomenclature: Stratus Power Pro

Part number: 153510-000169

TSO number: TSO-C71

Manufacturer: Appareo Systems

Address: 1830 NDSU Research Circle North, Fargo, ND 58102, USA

Conditions	DO-160G Section	Description of tests conducted
Temperature and Altitude	4.0	
Short-Time Operating Low Temperature	4.5.1	Equipment tested to Category F1.
Operating Low Temperature	4.5.2	Equipment tested to Category F1.
Short-Time Operating High Temperature	4.5.3	Equipment tested to Category F1.
Operating High Temperature	4.5.4	Equipment tested to Category F1.
In-Flight Loss of Cooling	4.5.5	Equipment identified as Category X, no test performed.
Altitude	4.6.1	Equipment tested to Category F1.
Decompression	4.6.2	Equipment identified as Category X, no test performed.
Overpressure	4.6.3	Equipment identified as Category X, no test performed.
Temperature Variation	5.0	Equipment tested to Category C.
Humidity	6.0	Equipment tested to Category A.
Operational Shocks and Crash Safety	7.0	
Operational Shocks	7.2	Equipment tested to Category B. 11ms duration.
Crash Safety	7.3	Equipment tested to Category B. Aircraft type: 5R
Vibration	8.0	
Fixed Wing Aircraft Standard Vibration	8.5	Equipment tested to Category S. Curve M.
Sine-on-Random for Category U	8.8.2	Equipment tested to Category U. Curve G.

Explosive Atmosphere	9.0	Equipment identified as Category X, no test performed.
Waterproofness	10.0	Equipment identified as Category X, no test performed.
Fluids Susceptibility	11.0	Equipment identified as Category X, no test performed.
Sand and Dust	12.0	Equipment identified as Category X, no test performed.
Fungus Resistance	13.0	Equipment identified as Category X, no test performed.
Salt Fog	14.0	Equipment identified as Category X, no test performed.
Magnetic Effect	15.0	Equipment tested to Category Z.
Power Input	16.0	
Normal Operating Conditions (dc)	16.6.1	Equipment tested to Category BXX.
Voltage (average value dc)	16.6.1.1	Equipment tested to Category BXX.
Abnormal Operating Conditions (dc)	16.6.2	Equipment tested to Category BXX.
Voltage Spike	17.0	Equipment tested to Category B.
Audio Frequency Conducted Susceptibility	18.0	Equipment tested to Category B.
Induced Signal Susceptibility	19.0	Equipment identified as Category X, no test performed.
Radio Frequency Susceptibility	20.0	Equipment identified as Category X, no test performed.
Emission of Radio Frequency Energy	21.0	
Conducted RF Emissions	21.4	Equipment tested to Category B.
Radiated RF Emissions	21.5	Equipment tested to Category M.
Lightning Induced Transient Susceptibility	22.0	Equipment identified as Category X, no test performed.
Lightning Direct Effects	23.0	Equipment identified as Category X, no test performed.
Icing	24.0	Equipment identified as Category X, no test performed.
Electrostatic Discharge	25.0	Equipment tested to Category A.
Fire, Flammability	26.0	Equipment identified as Category X, no test performed.