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PACSystems* RX7i

IC698PSA100E, IC698PSA350E

Power Supplies

GFK-2237F

August 2010

The PACSystems* RX7i power supplies provide +5 VDC, +12 VDC, and -12 VDC power, logic level sequencing signals to modules on the RX7i backplane. The Power Supply Module plugs directly into slot 0 in the RX7i main rack.

The power supply output can ride through the loss of up to one AC input line cycle without loss of output power. Protection is provided for overcurrent, overtemperature, and overvoltage fault conditions.

IC698PSA100: Provides up to 100 W total output power at ambient temperatures of 0 to 60°C without forced air cooling.

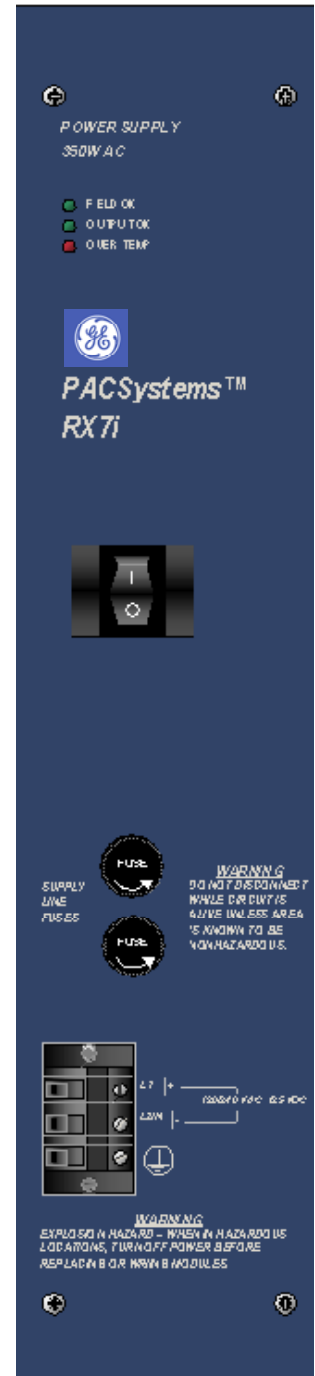
Output voltages: +5 VDC output up to 20 amps
+12 VDC output up to 2 amps
-12 VDC output up to 1 amp

IC698PSA350: Provides up to 350 W total output power; requires forced air cooling, provided by a fan tray mounted on the bottom of the rack.

Output voltages: +5 VDC output up to 60 amps
+12 VDC output up to 12 amps
-12 VDC output up to 4 amps

Features

- Operation from 85 to 264 VAC, 100 to 150 VDC
- Slide-in rack mount construction
- Electronic short circuit overcurrent protection
- Overcurrent and overvoltage fault protection
- Power factor correction for AC operation



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GFK-2237F

Release Information

Functional Compatibility

The E version is interchangeable with all previous versions.

Release History

Version	Date	Comments
PSA100E/PSA350E	Aug 2010	Label change only. No change in functionality, performance or compatibility.
PSA100D/PSA350D	Aug 2006	Power supplies qualified to the Explosive Atmospheres Directive, European Safety for Hazardous Locations, Equipment Group II, Category 3 (ATEX) agency standard. Corrected an infrequently observed issue with power supply shutdown causing corrupted memory faults in CPU.
PSA100C/PSA350C	Jun 2005	Overtemperature detection. See GFK-2237C for details.
PSA100B/PSA350B	May 2004	See GFK-2237B for details.
PSA100A/PSA350A	May 2003	Initial release.

Power Supply Operation

On/Off Switch

The two position On/Off switch, located on the front faceplate, is a logic level switch that enables or disables the output channels only. This switch does not interrupt the AC line input.

Warning

Lethal voltages are present inside the module whenever input power is present.

VMEbus Power Monitor Interface Timing

ACFAIL#

The ACFAIL# signal is pulled down when the power supply inputs are no longer being provided or when the ON/OFF switch is OFF. The ACFAIL# signal is asserted at least 5ms before outputs fall below their specified limits to provide sufficient warning to the system of power failure.

SYSRESET#

The RX7i power supplies do not drive the SYSRESET# signal on the VME backplane. The RX7i CPU module controls the SYSRESET# signal.

Indicators

The following LED indicators are provided on the power supply front panel.

LED Name	Color	Function
FIELD OK	green	Turns ON when AC power is applied within its specification range.
OUTPUT OK	green	Turns ON when all three DC outputs channels are operating within their specifications. Turns OFF if any of the three DC output channels has failed.
OVER TEMP IC698PSA350 only	red	Turns ON if the critical supply temperature is exceeded or if the airflow sensor detects cessation of air flow.

Overvoltage Protection

Any output channel that exceeds the nominal output voltage by 15% or more will cause all outputs to latch off. The ON/OFF control switch or the AC input power must be recycled to reset

Replaceable fuses are present on both the hot and neutral AC inputs.

IC698PSA100 uses 4 Amp/250 Volt fuses.

IC698PSA350 uses 8 Amp/250 Volt fuses.

Note that the "A" version of the power supplies used 0.25" x 1.25" fuses. The "B" and later versions use 5 x 20mm fuses.

Overcurrent/Short Circuit Protection

All outputs are protected against overcurrent and short circuit with automatic recovery upon removal of fault.

An electronic current limit is provided on each of the three outputs. An overload on any output will cause the voltage to collapse and may cause the other output voltages to collapse.

Normal operation will resume after removal of the overload. Some component cooling time may be required before normal operation resumes.

Over Temperature Protection

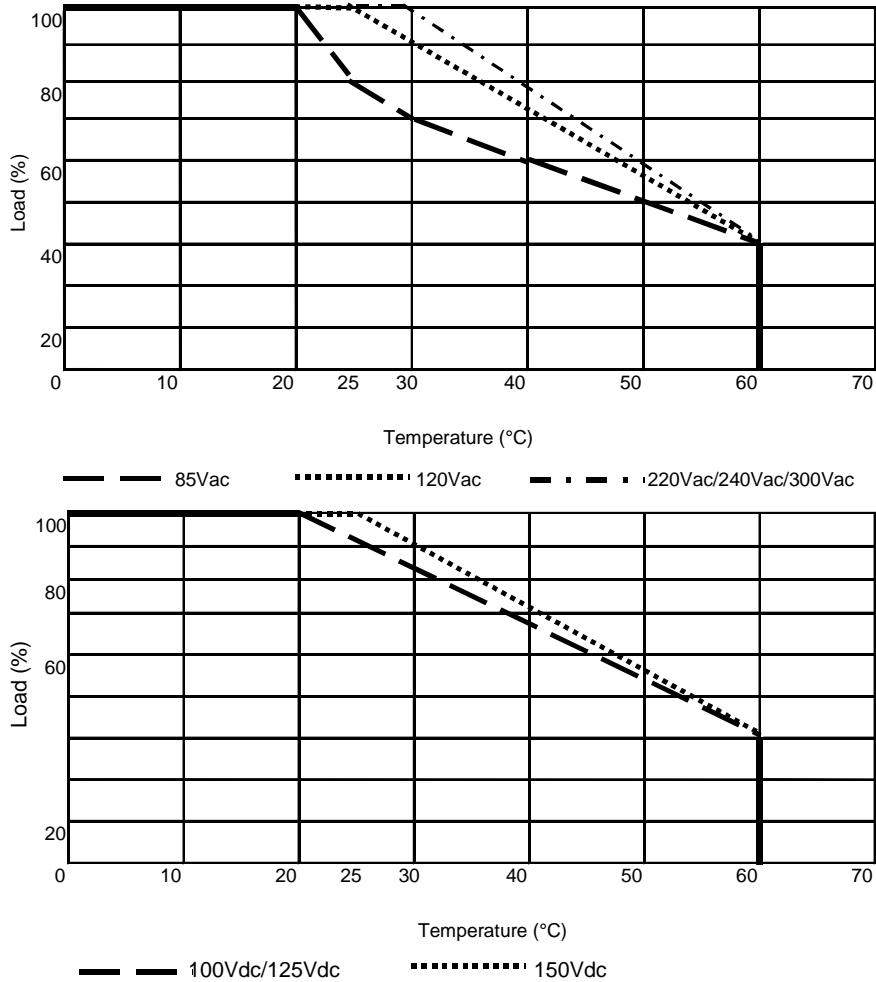
The IC698PSA100 power supply can operating at full capacity (100W) from 0 to 60°C with only convection cooling.

The IC698PSA350 power supply is capable of operating at full capacity (350W) from 0 to 60°C with 70 CFM forced air cooling provided by a fan tray mounted below the system chassis. This power supply can operate at a limited capacity with only convection cooling. See the temperature derating curves on the next page.

The RX7i power supplies have internal temperature sensing that shuts down the output channels when overheated. The overtemperature failure allows automatic recovery once the unit cools down.

GFK-2237F

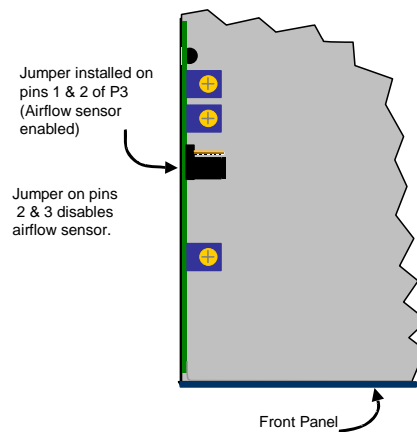
Temperature Derating Curves for IC698PSA350 without Forced Air Cooling



Airflow Sensor

An airflow sensor is provided in the 120/240 VAC/125 VDC and 350 W power supplies to detect a fan failure or air blockage. If the power supply senses a cessation of air flow, it responds by latching off all outputs and turning on the overtemperature LED indicator. The power supply automatically recovers from this condition when the internal temperature has decreased to operating levels.

You can enable or disable the airflow sensor via a jumper located on the outside of the Power Supply. The airflow sensor option is enabled (jumper on pins 1 and 2) as the default for each power supply. To disable the airflow sensor, place the jumper on pins 2 and 3.



Location of Airflow Sensor Jumper – Top View

Installation

Warning

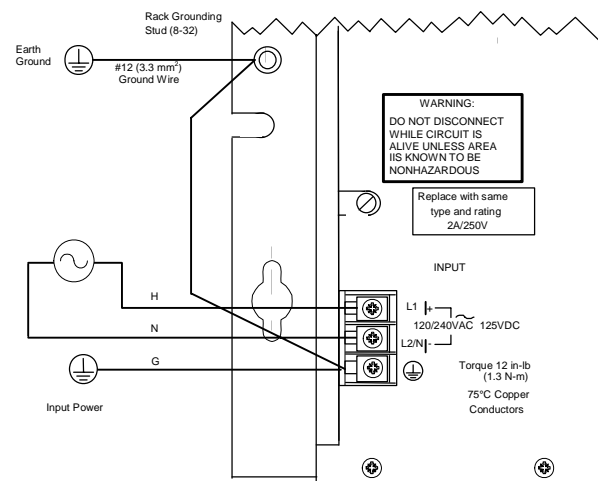
Do not remove (or insert) modules when the power supply or any externally-connected power sources are on. Hazardous voltages may exist. Personal injury, damage to the module, or unpredictable operation of the device or process being controlled may result.

This Power Supply is a plug-in module that is installed in the leftmost slot of any standard RX7i rack. For additional installation information, refer to *PACSystems RX7i Installation Manual*, GFK-2223.

Power Source and Ground Connections

The input terminals are located on the front faceplate of the power supply. The top two terminals (L1|+ and L2/N|-) are used for 120/240 VAC and 125 VDC inputs. Power input connections should be made with copper AWG #16 (1.3 mm²) wire rated for 75°C (167°F). Each terminal can accept two solid or stranded wires, but the wires into any given terminal should be the same type and size. The terminal can accept a single wire connection up to AWG #12. All wire lengths should be stripped to 0.25" (7mm). **Longer stripping lengths will result in exposed power wires, which is a potential shock hazard.**

The **GND** (ground) terminal on the power supply should be connected to the GND terminal on the rack and to earth using copper AWG #12 (3.3 mm²) wire rated for 75°C (167°F) to ensure adequate grounding. Use of a ring terminal and star washer to ensure ground integrity is recommended.



Terminal Board Connections for IC698PSA100/350

System Noise Protection

The following steps must be taken to reduce the possibility of errors due to electrical noise.

- Make sure that the power supply mounting screws are properly secured.
- Properly ground the system as described in “Power Source and Ground Connections” above.

Note: Each RX7i module has a noise reduction gasket on the right side of the faceplate that maintains contact with the adjacent module or the rack. (RX7i power supplies have the noise strip on both sides.) Installing modules that do not have this strip makes the rack system more susceptible to electrical noise.

GFK-2237F

Specifications

Nominal Rated Voltage:	120/240 VAC, 125 VDC
Input Voltage Range:	85 to 264 VAC 47 to 63 Hz, 100-150VDC
Input Power 100 W Supply:	125 watts (typical), 150 watts (maximum)
Input Power 350 W Supply:	437 watts (typical), 500 watts (maximum)
Input Requirements 100W Supply	
Inrush current (cold start – 115 VAC)	15 amps maximum
Inrush current (cold start – 230 VAC)	30 amps maximum
Inrush current duration	100 milliseconds
Input Requirements 350W Supply	
Inrush current (cold start – 115 VAC)	30 amps maximum
Inrush current (cold start – 230 VAC)	60 amps maximum
Inrush current duration	100 milliseconds
Power Factor	0.99 min (only valid between 90 VAC and 260 VAC)
Output Requirements (100 W Supply)	
Output Power:	100 watts maximum (total for all three outputs)
Output Voltage:	+5 VDC: 4.875 to 5.25 volts, 0—20 amps
	+12 VDC: 11.64 to 12.6 volts, 0—2 amps
	–12 VDC: –12.60 to –11.64 volts, 0—1 amps
Overvoltage Limit:	+5 VDC Output: 5.7 to 6.7 volts
Overcurrent Limit:	+5 VDC output: 21 A (typical)
	+12 VDC output: 2.5 A (typical)
	–12 VDC output: 3.5 A (typical)
Output Requirements (350 W Supply)	
Output Power:	350 watts maximum (total for all 3 outputs)
Output Voltage:	+5 VDC: 4.875 to 5.25 volts, 0 to 60 amps
	+12 VDC: 11.64 to 12.6 volts, 0 to 12 amps
	–12 VDC: –12.6 to –11.64 volts, 0 to 4 amps
Overvoltage Limit:	+5 VDC Output: 5.7 to 6.7 volts
Overcurrent Limit:	+5 VDC output: 66A (typical)
	+12 VDC output: 15A (typical)
	–12 VDC output: 4.6A (typical)
Isolation , input to all outputs	250 VAC continuous; 1500 VAC for 1 minute
Protective Limits:	
Ride-through (time allowed for loss of AC input without affecting DC outputs)	15 milliseconds minimum
Holdup Time (time from ACFail# system failure signal is activated to when any DC output drops out of specification)	5 milliseconds minimum
Operating Temperature:	
100W Supply	0°C to 60°C (32° to 140°F)
350W Supply	0°C to 60°C (32°F to 140°F) Fan tray attachment required for full capacity. See “Ordering Information.”

* For environmental specifications and compliance to standards (for example, FCC or European Union Directives), refer to Appendix A of the PACSystems RX7i Installation Manual, GFK-2223.

Ordering Information

Description	Catalog Number
RX7i Power Supply: 85 to 264 VAC at 47 to 63 Hz, 125 VDC Input, 100 watt output	IC698PSA100
RX7i Power Supply: 85 to 264 VAC at 47 to 63 Hz, 125 VDC Input, 350 watt output	IC698PSA350
120 VAC Input Rack Fan Assembly for 17-Slot Rack	IC697ACC721
240 VAC Input Rack Fan Assembly for 17-Slot Rack	IC697ACC724
24 VDC Input Rack Fan Assembly for 17-Slot Rack	IC697ACC744
120 VAC Input Rack Fan Assembly for 9-Slot Rack	IC697ACC621
240 VAC Input Rack Fan Assembly for 9-Slot Rack	IC697ACC624
24 VDC Input Rack Fan Assembly for 9-Slot Rack	IC697ACC644

Installation in Hazardous Locations

The following statements are required to appear for Class I Div 2 Hazardous Locations.

1. EQUIPMENT LABELED WITH REFERENCE TO CLASS I, GROUPS A, B, C, and D, DIV. 2 HAZARDOUS LOCATIONS IS SUITABLE FOR USE IN CLASS I, DIVISION 2, GROUPS A, B, C, D OR NON-HAZARDOUS LOCATIONS ONLY.
2. WARNING – EXPLOSION HAZARD – SUBSTITUTION OF COMPONENTS MAY IMPAIR SUITABILITY FOR CLASS I, DIVISION 2.
3. WARNING – EXPLOSION HAZARD – DO NOT DISCONNECT EQUIPMENT UNLESS POWER HAS BEEN SWITCHED OFF OR THE AREA IS KNOWN TO BE NON-HAZARDOUS.