PACSystems™ RX7i
IC698PSA100, IC698PSA350
Power Supplies

GFK-2237A
May 2004

The RX7i power supplies provide 5V, 12V, and -12V power, and the VME AC_FAIL# logic level signal to modules on the RX7i backplane. The low capacity power supply (IC698PSA100) delivers up to 100W total output at ambient temperatures of 0 to 60ºC without forced air cooling. The high capacity power supply (IC698PSA350) accommodates applications requiring more power, providing up to 350W total output. The high capacity supply requires forced air cooling, provided by a fan tray mounted on the bottom of the rack.

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.



Features

- Operation from 85 to 264 VAC, 100-150 VDC
- Three output voltages: IC698PSA100
  - +5 VDC output up to 20 amps
  - +12 VDC output up to 2 amps
  - –12 VDC output up to 1 amp
- Three output voltages: IC698PSA350
  - +5 VDC output up to 60 amps
  - +12 VDC output up to 12 amps
  - –12 VDC output up to 4 amps
- Slide-in rack mount construction using PICMG 2.11 standard connector
- Electronic short circuit overcurrent protection
- Electronic overvoltage and overtemperature fault protection
- Power Factor correction for AC operation

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.

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 4A/250V fuses.

IC698PSA350 uses 8A/250V fuses.

Note that the “A” version of the power supplies used 0.25” x 1.25” fuses. The “B” and any 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.

VMEbus Power Monitor Interface Timing

ACFAIL#

The ACFAIL# signal is pulled down when the power supply inputs are no longer being provided, when the ON/OFF switch is OFF, or when the required DC output voltage levels are not within specifications. The ACFAIL# signal is asserted at least 5ms before outputs fall below their specified limits to provide sufficient warning to the system of imminent 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.

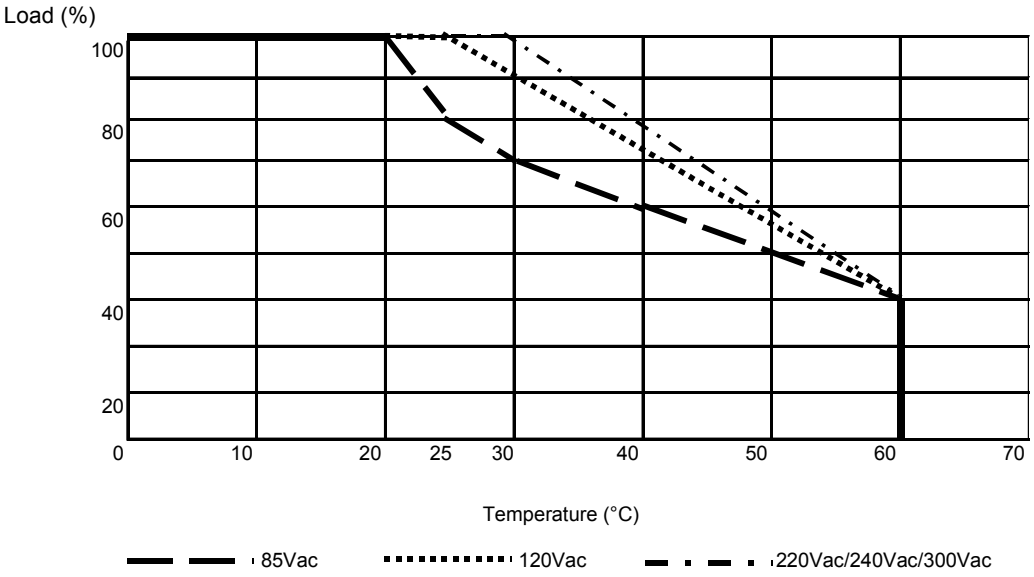
Over Temperature and Air Flow Protection

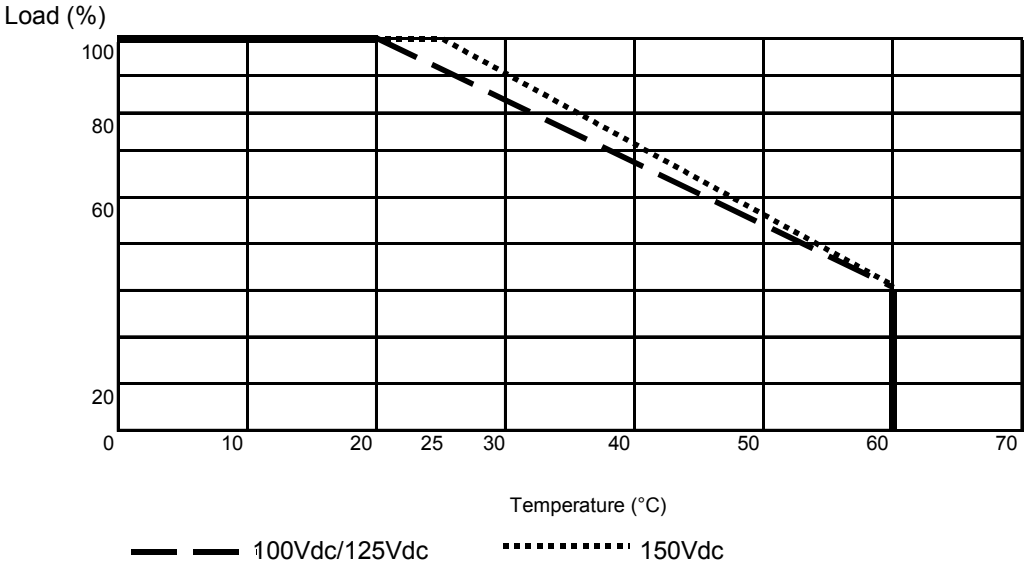
The RX7i power supplies have internal temperature sensing that shuts down the output channels when overheated. The overtemperature failure allows automatic recovery once the unit cools down.

The low capacity power supply is capable of operating at full capacity (100W) from 0 to 60ºC with only convection cooling.

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

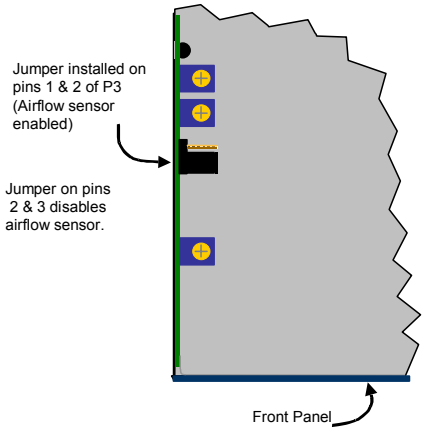
Temperature Derating Curves





An airflow sensor is provided in the 120/240VAC/125VDC and 350W 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. A power cycle is required to recover from this latched condition.

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

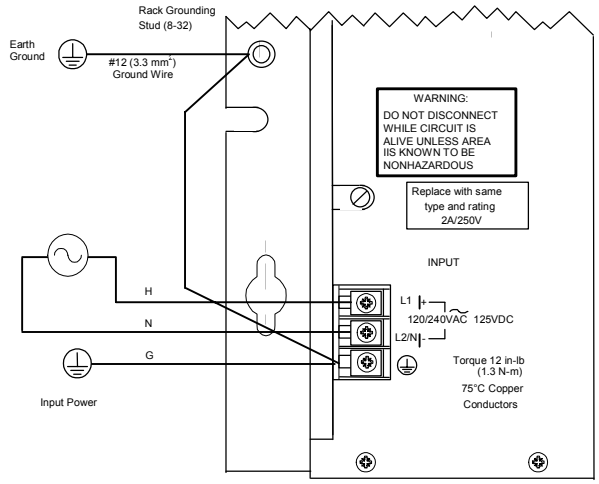
Do not remove (or insert) modules when the power supply or any externally-connected power sources are on. Hazardous voltages may exist. Personal injury, damage to the module, or unpredictable operation of the device or process being controlled may result.

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.

Field Wiring Connections

The input terminals are located on the front faceplate of the power supply. The top two terminals (L1|+ and L2/N|-) are 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.**

It is recommended that the **GND** (ground) terminal on the power supply be connected to the GND terminal on the rack and to earth using copper AWG #12 (3.3 mm^2) wire rated for 75°C (167°F) to ensure adequate grounding. Use of a nut and star washer for each wire on the ground terminal is recommended.



Terminal Board Connections for IC698PSA100/350

System Noise Immunity

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

1. Make sure that the power supply mounting screws are properly secured.
2. The GND terminal on the power supply must be connected to the GND terminal on either side of the rack using AWG #12 (3.33 mm^2) wire. Use of a ring terminal and star washer is recommended.
3. The GND terminal on the rack must be connected to a good earth ground.

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.

Specifications

Nominal Rated Voltage:	120/240 VAC, 125VDC
Input Voltage Range:	85 to 264 VAC 47 to 63 Hz, 100-150VDC
Input Power 100W Supply:	125 watts (typical), 150 watts (maximum)
Input Power 350W Supply:	440 watts (typical), 500 watts (maximum)
Input Requirements 100W Supply	
Inrush current (cold start – 115VAC)	15 amps maximum
Inrush current (cold start – 230VAC)	30 amps maximum
Input Requirements 350W Supply	
Inrush current (cold start – 115VAC)	30 amps maximum
Inrush current (cold start – 230VAC)	60 amps maximum
Power Factor	0.99 min (only valid between 90VAC and 260VAC)
Output Requirements (100 W Supply)	
Output Power:	100 watts maximum (total for all 3 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
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
Isolation, input to all outputs	1500 VDC
Protective Limits:	
Overvoltage Limit:	+5 VDC Output: 5.7 to 6.7 volts
Overcurrent Limit:	+5 VDC output: 21A (typical 100W; 66A (typical 350W)
	+12 VDC output: 2.5A (typical 100W); 15A (typical 350W)
	–12 VDC output: 3.5A (typical 100W); 4.6A (typical 350W)
Ride-through (time allowed for loss of AC input without affecting DC outputs)	15 milliseconds min
Holdup Time (time from ACFAIL# system failure signal activated to when any DC output drops out of specification)	5 milliseconds min
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, 125VDC Input, 100 watt output	IC698PSA100B and later
RX7i Power Supply: 85 to 264 VAC at 47 to 63 Hz, 125VDC Input, 350 watt output	IC698PSA350B and later
120VAC Input Rack/Fan Assembly	IC697ACC721
240VAC Input Rack/Fan Assembly	IC697ACC724

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.