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Power Supplies

IC697PWR710 / 712

GFK-1388A
August 1997

120/240 VAC or 125 VDC, 55W Power Supply Module

– This data sheet (GFK-1388) describes version H (IC697PWR710H/712H), or later versions of this power supply.
– For a description of version G (IC697PWR710G/712G), and earlier versions – see data sheet GFK-0083L.

Features

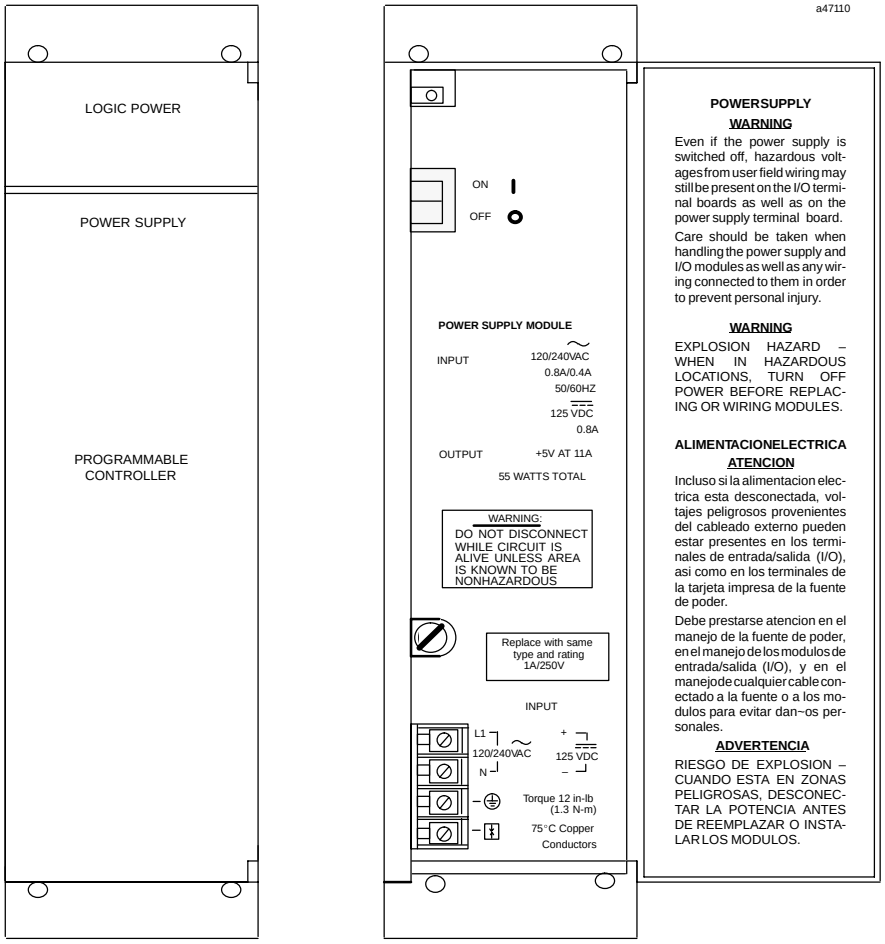
- Operation from 120 / 240 VAC or 125 VDC
- Five volt DC output up to 11 amps
- Slide-in rack mount construction
- Electronic short circuit overcurrent protection provided on 5 volt bus
- Two rack operation from a single power supply
- Power factor corrected on AC inputs
- Jumper for overvoltage protection devices

Functions

This **Power Supply Module** for the programmable controller is a rack-mounted unit that plugs directly into a 48-pin backplane-mounted connector in the leftmost slot in the rack. It provides +5 volt power and logic level sequencing signals to the backplane.

This power supply may be used either in a single rack application, or may also be used to provide power to a second rack if the total load is within the supply rating. Interconnection to the second rack is through an available prewired cable (see the ordering instructions on the last page of this data sheet).

The power supply output will ride through a one-cycle total loss of input power at full load. Protection is provided for overcurrent and overvoltage fault conditions.



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Operation of the Power Supply

This Power Supply Module can operate from either a 120 VAC or 240 VAC nominal line. For these two ranges, the power supply can accept an input voltage range of from 90 to 264 VAC, 47 to 63 Hz. Active power factor correction circuits in this supply maintain a unity power factor which eliminates the need for oversized circuit breakers and wiring.

This power supply will also operate with a 125 VDC nominal line. It will accept a DC input voltage range of 100 to 150 VDC.

Overvoltage Protection

The power supply includes an electronic overvoltage protection circuit. This circuit will clamp the output if the 5 volt bus exceeds 6.2 volts. External overvoltage on the output will not cause the power supply fuse to open. However, if an internal fault in the power supply caused the overvoltage condition, the fuse may open. Replace this fuse with a 1 amp, 250 volt 5x20 mm fuse.

Overcurrent Protection

The power supply provides an electronic overcurrent limit at 12 amperes, typical. If the maximum current rating is exceeded, the output voltage will drop.

It will remain in that state until the load is either removed or reduced. A current overload (including a short circuit condition) will not cause the fuse to open.

Dual Rack Operation

A single power supply can provide power for two racks under the following conditions:

- Only 5 volt power is required in the second rack, and the total power required by both racks is within the capability of the supply.
- The current drawn by the second rack is less than 5.2 amperes.
- The two racks must be mounted in close proximity as limited by the 3-foot connecting cable.

The connecting cable used for dual rack operation is listed in the ordering instructions. This cable carries the +5 volt power bus as well as the power sequencing signals. It uses a 9-pin D-type connector which connects directly to the backplane through an opening in the rack frame.

Note that the cable carries power and power sequencing signals only. Inter-rack communication and bus interface modules must be provided separately. See the applicable *Programmable Controller Installation Manual* for application information.

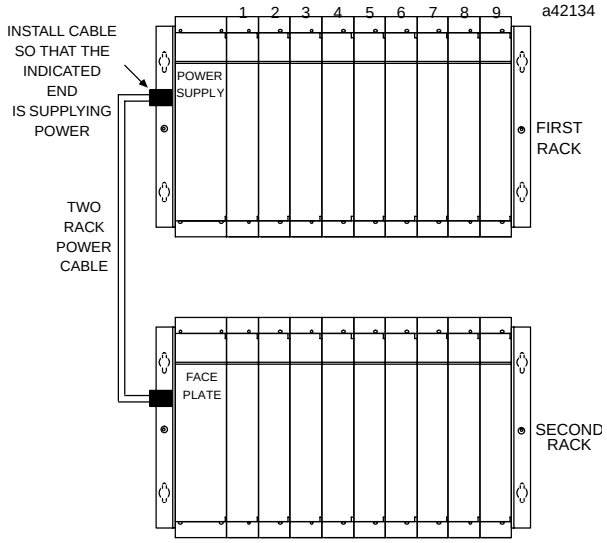


Figure 1. Dual Rack Configuration

Timing Diagram

The timing diagram below shows the relationship of the AC input power to the 5 volt DC output and to the two system signals generated by the power supply: *ACFAIL* and *SYSRESET.*

On application of power, the ACFAIL signal goes false soon after the 5 volt bus is within specification. The system is held in the Reset state by *SYSRESET* for at least 200 milliseconds after 5 volt power is available. (During this time, outputs are forced off).

If AC input power is interrupted, the 5 volt bus will remain within specifications for at least one cycle. The system is then given an additional 5 ms to complete an orderly shutdown before *SYSRESET* stops all processing.

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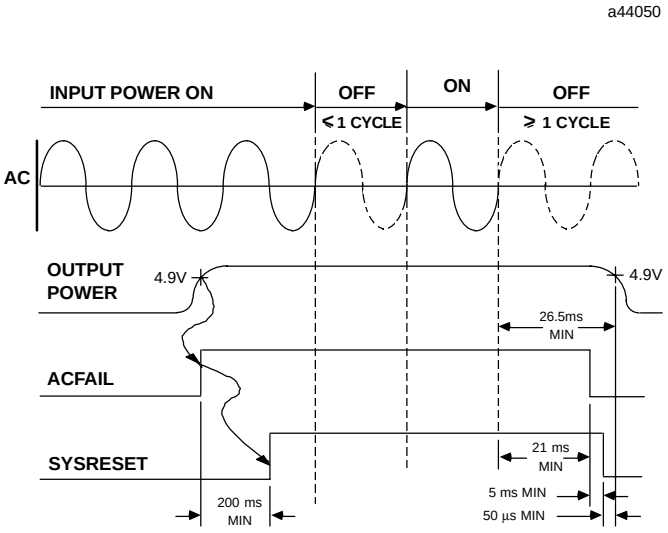


Figure 2. Timing Diagram for Versions D and Later

Note

Input power interruptions which exceed the power supply ride through time (21 milliseconds minimum) will result in a complete power down/power up cycle of *ACFAIL* and *SYSRESET*.

Mounting

The Power Supply is a plug-in module that is installed in the leftmost slot of any standard IC697 rack or VME Integrator's rack.

Power Supply Door

The power supply door can easily be opened by grasping the upper left corner of the door with your right thumb or a fingernail and gently pulling the door towards you. Use care when opening the door since pulling from the bottom can cause the hinge or the door to break.

Field Wiring Connections

The power input terminal board has four terminals. The top two (**L1** and **N**) are for 120/240 VAC or 125 VDC input power connections; the third and fourth terminals are for ground and overvoltage protection device connections, respectively. Power input connections should be made with copper AWG #16 (1.3 mm^2) wire rated for 75°C (167°F). Each terminal can accept solid or stranded wires, but the wires into any given terminal should be the same type and size.

It is recommended that the **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.

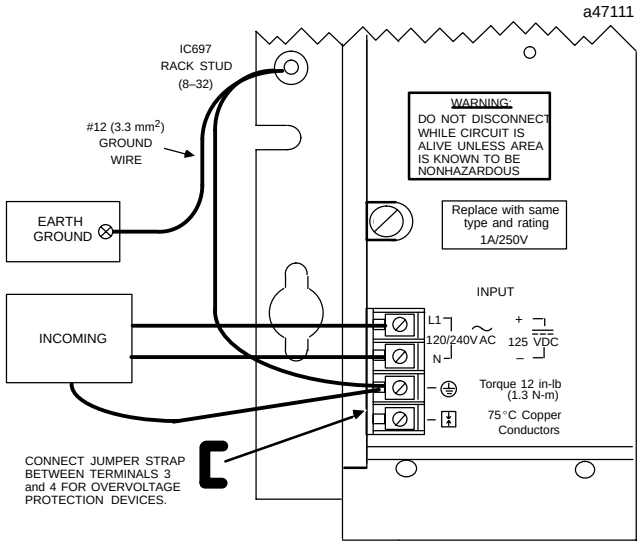


Figure 3. Terminal Board Connections for IC697PWR710/712, Versions H and Later

Overvoltage Protection Devices

The overvoltage protection devices (*see Figure 4)* for this power supply are connected internally to terminal 4 (*bottom terminal)* on the input terminal board. This pin is normally connected to frame ground (*terminal 3*) with the supplied jumper strap which is installed at the factory. If overvoltage protection is not required *or* is supplied upstream, this feature can be disabled by leaving terminal 4 unconnected by removing the jumper strap.

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If you want to Hi-pot test this supply, overvoltage protection ***must be disabled*** during the test by removing the terminal board strap. Re-enable overvoltage protection after testing by reinstalling the strap.

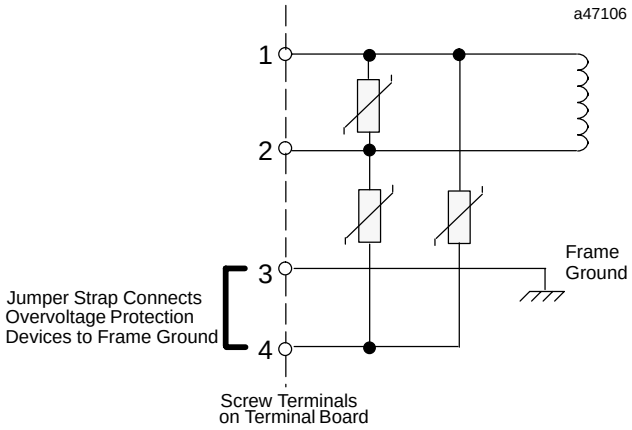


Figure 4. Overvoltage Protection Devices and Jumper

System Noise Immunity

Two easy steps must be taken to properly ground the programmable controller system to reduce the possibility of errors due to electrical noise.

1. A ground terminal on the power supply must be connected to the GND terminal on either side of the rack using AWG #12 (3.3 mm^2) wire.
2. The GND terminal on the rack must be connected to a good earth ground.

Table 3. Specifications for IC697PWR710/712 (Versions H and Later) †

Nominal Rated Voltage:	120 / 240 VAC or 125 VDC
Input Voltage Range:	
AC	90 to 264 VAC, 47 to 63 Hz
DC	100 to 150 VDC,
Input Power:	90 watts maximum at full load
Input Half Cycle Peak Inrush:	3 amps (typical)
Power Factor	> .95
Output Power:	56 watts maximum
Output Voltage:	+5 VDC: 4.90 to 5.25 volts (5.1 volts nominal)
Protective Limits -	
Overvoltage Limit:	6.2 volts (typical), *electronic overvoltage protection*
Overcurrent Limit:	12 amps (typical), *electronic current limit*
Ride Through Time:	21 milliseconds minimum (from loss of AC input)
VME	System designed to support the VME standard C.1

† Refer to data sheet GFK-0867C, or later for product standards and general specifications.

Table 4. Ordering Information

Description	Catalog Number
Power Supply - 120/240 Volts AC or 125 Volts DC, 55 Watts (H, or later version)	IC697PWR710/712
Power Supply Extension Cable (includes cable and faceplate for vacant power supply slot in second rack)	IC697CBL700/713

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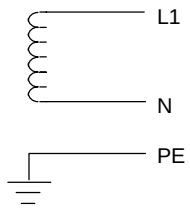
Special Installation Instructions for Floating Neutral (IT) Systems

When this power supply is installed in a system where the Neutral line is **not** referenced to Protective Earth Ground, these special installation instructions must be followed to prevent damage to the power supply.

Definition of Floating Neutral Systems

As described in this data sheet a *Floating Neutral System* is a system of power distribution wiring where Neutral and Protective Earth Ground are **not** tied together by a negligible impedance. In Europe this is referred to as an **IT** system (see IEC950). In a *Floating Neutral System*, voltages measured from input terminals to protective earth ground may exceed 264 Volts AC maximum input voltage as specified in the power supply specifications in this data sheet.

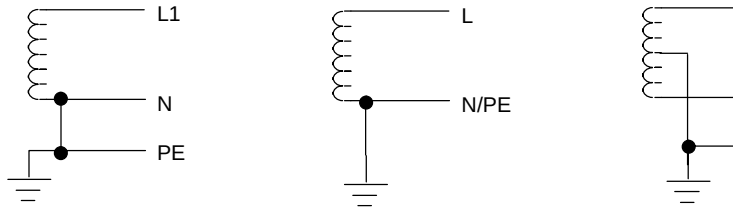
Example of Floating Neutral System



This system **must** be installed using the special installation instructions on this page.

Systems in which one leg of the power distribution wiring is tied to Protective Earth or a tap between two legs of the power distribution wiring is tied to Protective Earth are **not** *Floating Neutral Systems*.

Examples of Non-Floating Neutral System



These systems **do not** require these special installation instructions.

Use These Special Installation Instructions for Floating Neutral Systems

1. The input power terminals should be wired according to the instructions in this data sheet.
2. The factory installed jumper between terminals 3 and 4 of the power supply module **must** be removed.
3. Voltage surge protection devices, such as MOVs, **MUST** be installed between the following terminals:
   - From L1 to earth ground
   - From L2 (Neutral) to earth ground

The voltage surge devices must be rated such that the system is protected from power line transients that exceed *Line voltage + 100V +*$(N–PE)_{MAX.}$

For example, in a 240 Volt AC system with neutral floating 50V above earth ground, the transient protection should be rated at:

240V + 100V +50V = 390V

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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.

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