



MiniMax Power Supply Installation and Operation Manual

60V/9A and 60V/15A Output Models

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Power

Alpha Technologies. Protecting The Power in Communications.



MiniMax Power Supply
Installation and Operation Manual

60V/9A and 60V/15A Output Models

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NOTE

Photographs and drawings contained in this manual are for illustrative purposes only. These photographs and drawings may not exactly match your installation.

NOTE

Review the drawings and illustrations contained in this manual before proceeding. If there are questions regarding the safe operation of this powering system, please contact Alpha Technologies or your nearest Alpha representative.

NOTE

Alpha denies responsibility for any damage or injury involving its enclosures, power supplies, generators, batteries, or other hardware when used for an unintended purpose, installed or operated in an unapproved manner, or improperly maintained.

WARRANTY NOTICE

Alpha Technologies, Inc., provides a LIMITED WARRANTY covering the performance of all Alpha's CATV and Broadband products. The terms and conditions of the LIMITED WARRANTY STATEMENT are contained in a separate written LIMITED WARRANTY STATEMENT. If there are any warranty claims, the purchaser (or purchaser's representative) must follow the LIMITED WARRANTY guidelines, described in the applicable LIMITED WARRANTY STATEMENT.

Contacting Alpha Technologies:

For general **product information and customer service**

1-800-863-3930

(7:00 AM to 5:00 PM Pacific Time)

For complete **technical support**

1-800-863-3364

(7:00 AM to 5:00 PM Pacific Time, or 24/7 emergency support)



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WARNINGS & CAUTIONS

A “**Warning**” identifies conditions and actions that pose a hazard to the user.

A “**Caution**” identifies conditions and actions that may damage the power supply or associated equipment.

WARNING

This power supply and its associated hardware (enclosure, cabling) may contain equipment(s), or parts which have accessible hazardous voltage or currents.

To avoid injury:

- This power supply and its associated hardware must be serviced by authorized personnel only.
- Verify AC line power is de-energized prior to installation or service.
- Remove all conductive jewelry or personal equipment prior to servicing equipment, parts, connectors, wiring, or batteries.
- Read and follow all installation, equipment grounding, usage, and service instructions included in this manual.

CAUTION

This Power Supply may contain equipment(s) or part(s) that may be damaged or cause damage to other equipment if improperly used.

To avoid damage:

- An agency-approved service disconnect switch with overcurrent protection must be provided by the installer. It must be connected between the utility power source and the power supply. Subject to local codes, the service disconnect switch must be an outdoor, NEMA 3R enclosure, rated 120/240V, with a non-interrupted termination. The disconnect shall be a circuit breaker type provided with a dual 15A circuit breaker for the main and neutral input lines. Due to the ferroresonant transformer, the circuit breaker should be a high inrush magnetic type able to withstand short duration inrush currents.
- Overcurrent protection and disconnecting means for the AC output are to be supplied by the installer as required by local codes.
- Use #16AWG (1,28mm²) minimum Copper, 75C, for all utility input wiring.
- Prior to installation, verify that the output voltage from the enclosure or its equipment match the voltage requirements of the connected equipment (load).
- Verify the enclosure which houses the power supply has sufficient ventilation to maintain the power supply in its specified operating temperature range (-40°C to +55°C).
- Do not operate the power supply in an environment containing corrosive or conductive gas, vapor, liquid, or dust.
- When servicing the power supply, use on specified replacement parts.
- Servicing is to be performed only by authorized personnel.

1. Introduction

1.1 Overview

This manual provides information related to the installation, operation and service of specific equipment. For assistance regarding personnel training, specific problems, or questions relating to applications, please call Alpha Technologies.

The information contained in this manual is restricted to customers of Alpha Technologies, and use by unauthorized personnel is strictly prohibited.

Prior knowledge of good CATV system construction practice and a good working knowledge of electrical safety practices are minimum qualifications for installation and operation. However, for equipment servicing, the technician should also be well versed in basic electronics.

It is recommended that you carefully read this manual prior to leaving your office to perform any work on the Broadband Ferro Power Supply.

WARNING

Do not install damaged equipment.

Carefully inspect each package for evidence of damage during transit. If items are damaged, report any damage to the shipping company and the local Alpha sales or service office immediately.

After inspection by the shipping company and a written appraisal of the damage has been received, inform Alpha Technologies that you intend to return the merchandise and request a return authorization number. Return the items promptly with the return authorization and invoice number clearly shown on the shipping label.

Alpha Technologies will either repair or replace the equipment, depending upon the extent of the damage.



Fig. 1-1
Pole Mount MiniMax



Fig. 1-2
European Wall Mount MiniMax



Fig. 1-3
Ground Mount MiniMax

2. Specifications

2.1 Electrical & Mechanical Specifications

		120 VAC MODELS	
		Outdoor Pole and Ground Mount	
ELECTRICAL SPECIFICATIONS		PSF-MXP-AXX, PSF-MXG-AXX PCS-MXP-111, PCS-MXG-111	PCS-MXP-113, PCS-MXG-113 PCS-MXP-114, PCS-MXG-114
Input Voltage	← 120 Vac, 60Hz (+15% / -20%) →		
Input Current (@ 60V, 15A Nominal)	9A	5A	
Output Voltage	← 60Vrms Quasi-square wave ±3% →		
Output Current	15A (maximum)	9A (maximum)	
Full Load Efficiency (typical)	← 88% (minimum) →		
Output Power	900VA max. @ 60V (15A resistive)	540VA max. @ 60V (9A resistive)	
Operating Environment	← Temperature: -40°C to 55°C (-40°F to 131°F) Humidity: 0 to 95% (noncondensing) →		

		220VAC, 230VAC MODELS	
		Outdoor Pole and Ground Mount	
ELECTRICAL SPECIFICATIONS		PSF-MXP-CXX PSF-MXG-CXX	PSF-MXP-DXX PSF-MXG-DXX
Input Voltage	220 Vac, 60Hz +15% / -20%	230 Vac 50Hz	
Input Current (@ 60V, 15A Nominal)	4.8A	4.8A Max.	
Output Voltage	← 60Vrms Quasi-square wave ±3% →		
Output Current	15A (maximum)	15A (maximum)	
Full Load Efficiency (typical)	← 88% (minimum) →		
Output Power	← 900VA maximum @ 60V (15A resistive) →		
Operating Environment	← Temperature: -40°C to 55°C (-40°F to 131°F) Humidity: 0 to 95% (noncondensing) →		

Continued on next page.

2.1 Electrical & Mechanical Specifications, *continued*

230VAC, 50Hz (CE) MODELS Indoor/Wall Mount		
ELECTRICAL SPECIFICATIONS	PSF-W00-D09	PSF-W00-D15
Input Voltage	230 Vac, 50Hz +15% / -20%	230 Vac, 50Hz +15% / -20%
Input Current (@ 60V, 15A Nominal)	3.0A	4.8A
Output Voltage	←———— 60Vrms Quasi-square wave ±3% —————→	
Output Current	9A (maximum)	15A (maximum)
Full Load Efficiency (typical)	90%	88%
Output Power	540VA maximum @ 60V (9A resistive)	900VA maximum @ 60V (15A resistive)
Operating Environment	←———— Temperature: -40°C to 55°C (-40°F to 131°F) Humidity: 0 to 95% (noncondensing) —————→	

MECHANICAL SPECIFICATIONS				
Cabinet type	Height	Width	Depth	Weight
Pole Mount	386mm (15.2")	197mm (7.3")	213mm (8.4")	15kg (33lb)
Ground Mount	561mm (22.2")	197mm (7.3")	213mm (8.4")	16kg (35lb)
Indoor Enclosure	350mm (13.8")	179mm (7.0")	170mm (6.7")	16kg (35lb)

3. Installation

3.1 Pole Mounting (*Models PSF-MXP-*** and PCS-MXP-****)

A bucket truck or other suitable equipment such as spikes and safety harnesses, should be used during installation or service of pole-mounted cabinets. To mount the MiniMax power supply to a utility pole, perform the following steps:

NOTE

Pole mounting the cabinet should be done in accordance with the local agreement between the cable operator and the utility company.

1. Install an agency approved service disconnect switch with overcurrent protection between the AC power source and the cabinet mounting point. Wire to power line in accordance with local codes.

NOTE

The disconnect box should have a high-magnetic type circuit breaker, capable of passing short duration inrush currents, and have a 15A minimum rating.

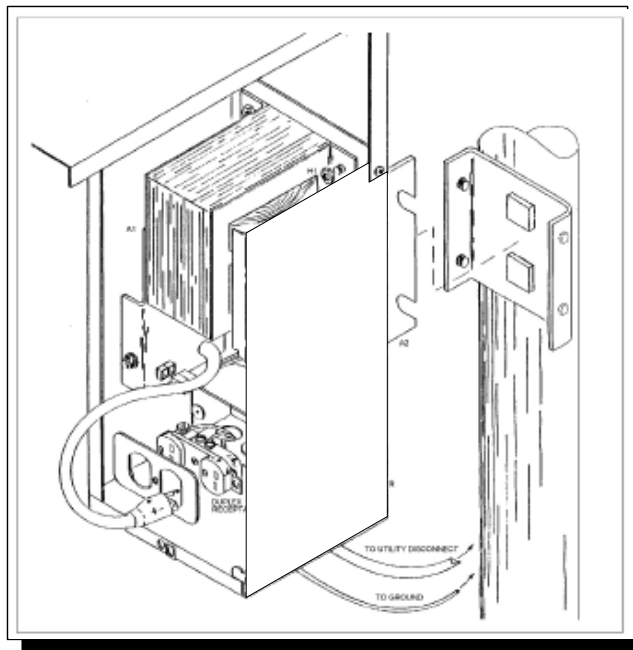


Fig. 3-1 MiniMax Pole Mount Arrangement

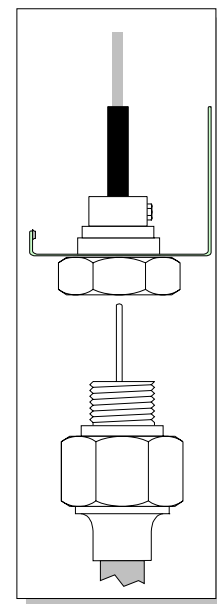


Fig. 3-2
Output Voltage Connector

3. Installation

3.1 Pole Mounting (*Models PSF-MXP-*** and PCS-MXP-****), *continued*

2. Remove all equipment, hardware, and options from the cabinet and store in a secure location for future use.
3. Remove the U-shaped mounting bracket from the cabinet rear panel.
4. Use the bracket as a template to mark mounting holes at the desired mounting location. If possible, position the cabinet so the front panel is easily accessible.
5. Drill 11/16" holes in the pole at the marked locations.
6. Attach the mounting bracket to the pole using customer-supplied hardware. Tighten securely.
7. Optional metal band mounting for metal/cement poles: insert the customer-supplied metal bands or straps through the band slots on the mounting bracket. Tighten the bands securely.
8. Raise the cabinet and set into place on the bracket. Attach the cabinet using the hardware removed in Step 2. Tighten the bolts securely.
9. Confirm availability of a suitable ground rod next to the power pole. If required, drive a rod according to local codes.
10. Continue to "Electrical Connections".

3.2 Ground Mounting (*Models PSF-MXG-*** and PCS-MXG-****)

Although ground mounting the power supply can be accomplished by several methods, the following procedure is recommended.

1. Select an appropriate site. Remove the turf and level an area of approximately 36" x 36".
2. In accordance with local codes, install the disconnect box near the AC power source.

NOTE

The disconnect box should have a high-magnetic type circuit breaker, capable of passing short duration inrush currents, and have a 15A minimum rating.

3. From the disconnect, install conduit to the power supply site and turn a stub up to extend above ground level. Drive a suitable ground rod according to local codes. Install appropriate size conduit for the output connections and turn a stub up to extend flush with the pad surface cast into the concrete. Ensure the conduit locations correspond with the appropriate cabinet connections.
4. Use 1" x 4" lumber to construct a form for the cement pad (see figure for dimensions). Anchor the form securely to the ground.

NOTE

It is recommended that the cement pad dimensions extend beyond the ground skirt by 3" in front, and 3-5" in the back.

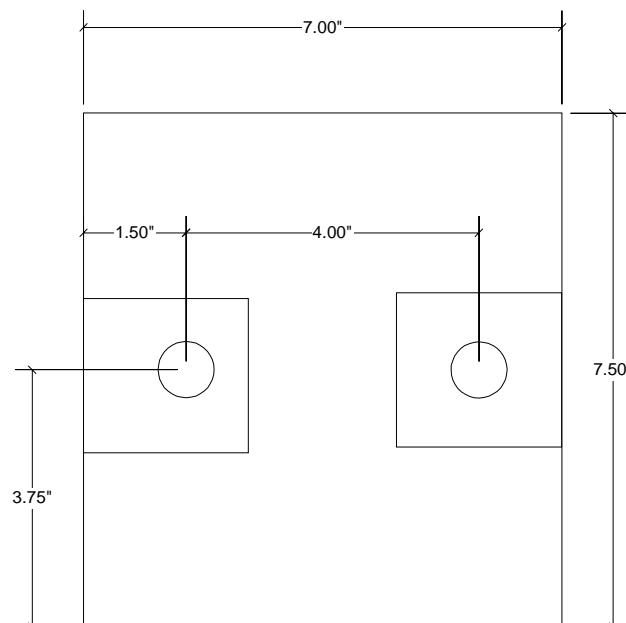


Fig. 3-3 MiniMax Concrete Pad Dimensions

3. Installation

3.2 Ground Mounting (*Models PSF-MXG-*** and PCS-MXG-****), continued

5. Attach the ground mounting brackets from the supplied kit to the ground skirt using the 5/16-18 x 3/4" screws and the 5/16"-18 nuts.
6. Make a template from sheet metal or wood indicating the position of the ground mounting bracket mounting holes. Drill out the four holes in the template and insert two customer-supplied 5/8" x 4" bolts. The head of the bolts will be embedded into the concrete pad when installation is complete. Leave sufficient thread above the pad for securing the ground skirt.
7. Center and secure template (with bolts in position) over the form. Be sure the conduit stub-ups for the AC input and the ground rod are positioned at the desired locations just outside the ground skirt. *Optional: the conduit stub-ups may pass through the cement pad.*
8. Pour, level, and finish the concrete to the bottom of the template. Allow to cure for 24 hours.
9. Attach the ground skirt to power supply cabinet. Align skirt inside the bottom lip of the cabinet and secure with the 10-32 x 3/8" screws from the parts kit.
10. Attach the power supply to the concrete pad with customer-supplied 5/8" nuts through the ground mounting brackets. Tighten all hardware securely.
11. Continue to "Electrical Connections"

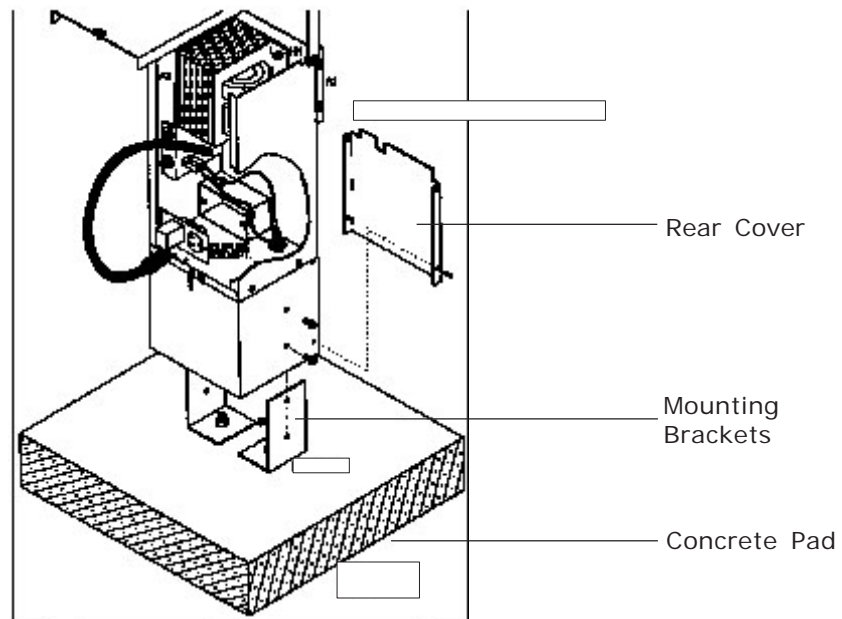


Fig. 3-4 Attaching the MiniMax Cabinet to the Pad

3.3 Electrical Connections for Pole and Ground Mounts

WARNING

Verify the utility disconnect is off and that no conductors are energized before proceeding.

1. Open the housing cover and place a screwdriver blade in the small notch at the top of the housing to hold the cover in place.
2. Install a liquid tight conduit to the fitting on the cabinet bottom and pull the AC primary wiring in to the cabinet housing.
3. Remove the necessary receptacle knockout and install the receptacle provided as shown. Connect the AC high input to the receptacle terminal labeled MAIN, the AC neutral input to the receptacle labeled N, and the utility protective ground (green/yellow) to the green receptacle terminal. Tighten the screw to a torque of 20 lb-in.

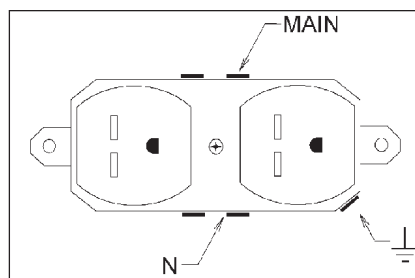


Fig. 3-5 Receptacle Connections

4. Position all wiring neatly in the receptacle box and install the receptacle and cover.
5. Using the output wire harness (green and yellow wires with power lock connectors, a seizure clamp, and O-ring), and cable adapter from the parts kit, install the cable adapter and ground wire. Insert the cable adapter from the outside of the cabinet into the paint-masked hole, along with the supplied cable feed guard bracket for ground mount installation. Use the locknut to secure the adapter and the large O-ring to the cabinet. Tighten securely.
6. Prepare the incoming coaxial cable used for the distribution of power (including external fittings not supplied by Alpha).
7. Loosen the brass seizure screw output fitting to accommodate the center pin (“stinger”) of the cable connector.

NOTE

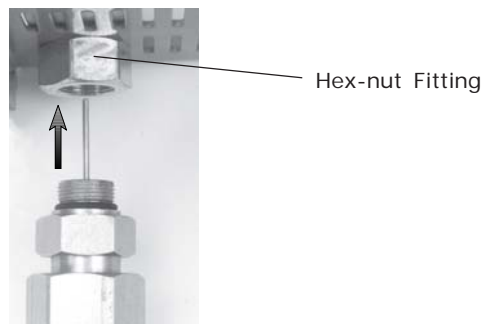
The center conductor may also be trimmed to allow for a flush fit. The length of the center conductor must be 1.25” from the end to the center of the O-Ring.

3. Installation

3.3 Electrical Connections for Pole and Ground Mounts, *continued*



8. Screw the cable connector into the output port (large hex nut fitting) located on the baseplate of the APC2. Make sure that the center pin extends far enough into the fitting so that the seizure assembly can be secured.



9. Tighten the brass seizure screw on the cable “stinger” or center conductor. If a connection is left loose, arcing and possible damage to the center conductor could occur. During routine maintenance, always check the seizure screw assembly to ensure that it is tight.
10. Connect an unbroken 6 AWG soft-drawn copper ground wire between the lug provided on the back of the cabinet and a ground rod for lightning protection. Use a ground rod clamp of the proper type, above or below grade.

NOTE

If local codes require bonding to utility ground, a separate ground rod and vertical should be provided, then the two verticals should be bonded at the bottom of the pole.

11. If this is a ground mount installation, attach and secure the ground skirt front with the screws provided.
12. Plug the power cord into the receptacle box.
13. Install any optional equipment at this time, referring to the instructions supplied with the option.
14. Remove the screwdriver used as a lid stop and close the lid, securing it with the single screw at the bottom

3.4 Wall Mounting and Electrical Connection (*Models PSF-W00-D***, *PSF-W00-D09*, and *PSF-W00-D15*)

NOTE

The MiniMax non-standby power supply must be installed in accordance with local building codes to prevent damage to the mounting structure and the unit itself.

1. Install an agency-approved service disconnect switch with overcurrent protection, between the AC power source and the cabinet mounting point. Wire to power line in accordance with local codes.
2. Power to the MiniMax is supplied with a round service cable such as UL type SJT-16/14-3 (3 x 1mm²) conductor (max. dia. 11.5mm/0.47") from the service disconnects to the inside of the unit. Allow enough length for an adequate service loop.
3. If mounting to sheet rock or paneling, find the wall studs for secure mounting.
4. Mount to wall with appropriate hardware, such as (6) M5 x 25mm wood screws.
5. Route service (mains) cable in through the bottom of the unit via the black nylon fitting. After cable is inserted to the proper position, twist fitting knob in the clockwise direction to tighten on cable.

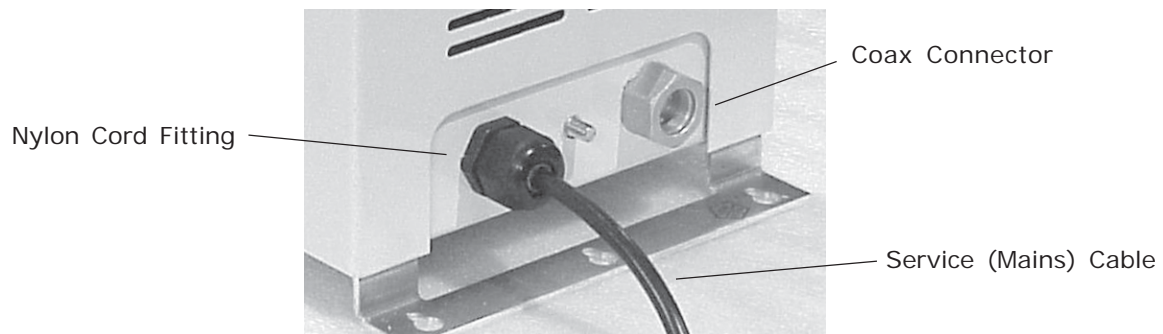


Fig. 3-6 Service Cable Routing

3. Installation

3.4 Wall Mounting and Electrical Connection (*Models PSF-W00-D***, *PSF-W00-D09*, and *PSF-W00-D15*), *continued*

6. Connect the electrical service to the terminal block located inside the unit, as shown in figure 3-7.

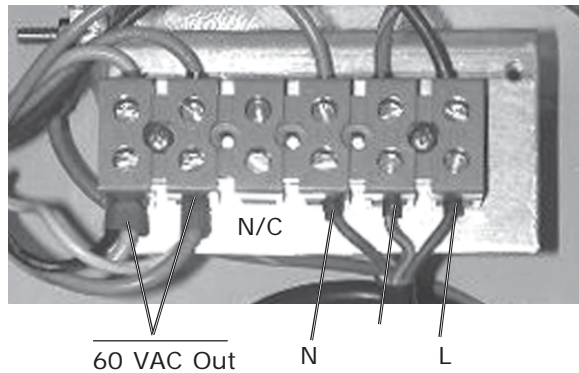


Fig. 3-7 Terminal Block Connections

7. Connect the CATV coax cable to the type G2 connector on bottom of the enclosure. (Refer to figure 3-2.)
8. Test installation according to requirements. When power is applied to mains, and appropriate cable load is connected, verify that output voltage across coax cable connector is $60V \pm 3\%$.

4.1 Initial Turn Up

1. Turn the utility disconnect ON. The green lamp should light, indicating power output. Power will be applied to the cable plant at this time.
2. If desired, the output voltage can be checked at the cable center conductor seizure clamp and the cable ground, using a true RMS AC voltmeter.

NOTE

If operating from an alternative AC power source such as a generator, the generator must have a high-quality regulated output consistent with a minimum power rating that is 50% higher (measured in Watts) than the MiniMax power rating.

5. Maintenance

Once the initial installation and testing are complete, operation is automatic. When the green indicator lamp is on, the system is operating from the power line. Proper operation and long system life can be best assured by a regular performance of the following maintenance steps.

1. Before opening the housing, inspect it for external damage or tampering, including the grounding circuit.
2. Unlock and open the housing.
3. Inspect the connectors and cable for damage or corrosion.
4. Close and re-lock the housing.

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