SB-120-220-60

120/220Vac – 90/60 Volt – 15/10 Amp – 60Hz – 900 Watt:

SB-120-220-50

120/220Vac – 90/60 Volt – 15/10 Amp – 50Hz – 900 Watt:

Broadband Network
Non-Standby Power Supply

Technical Manual

r04162018

PDI Communications, Inc.

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IMPORTANT SAFETY INSTRUCTIONS

1. Read these instructions carefully before proceeding with any part of this unit's installation.
2. Keep these instructions.
3. Heed all warnings.
4. Follow all instructions.
5. "Only qualified, professional personal should perform the procedures described in this document.
6. It is required that the user contacts local utilities, local building maintenance departments, and cable/piping locator services to ensure that installation does not interfere with existing utility or building cables & piping.
7. The unit must be installed vertically in a well-ventilated area and away from flammable, explosive and corrosive material.
8. Don't block any ventilation openings. Install in accordance with the manufactures instructions.
9. Don't install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
10. DO NOT connect the AC inlet while installing the unit or servicing the unit.
11. Always wear insulating gloves and face shield whenever working with the unit.
12. The unit must be well earthed before proceeding with installation and operation. The integrity of the protective earth must be ensured at all times.
13. Branch Circuit protection**:** An External Service Disconnect is required for this equipment.
14. Wiring of the unit and connection of output ports must be firm and reliable. Poor connections may cause fire.
15. Verify that AC input voltage to the equipment matches with respect to voltage and frequency prior to installation.
16. Verify that output voltage from the equipment matches the voltage requirements of the connected equipment (load).
17. Always remove power before working inside the unit.
18. Always refer to the manufactures recommendation whenever replacing parts on the unit.
19. Unauthorized alteration or repair is not allowed without manufactures written authorization.
20. Only use attachments/accessories specified by the manufacturer.
21. Always use proper lifting techniques whenever handling the unit.
22. Always lock the enclosure when unattended.

IMPORTANT NOTES

NOTE

Photographs contained in this manual are for illustrative purposes only. These photographs may not match your installation exactly. Our products are subject to change through continuing improvement processes without prior notice.

NOTE

Operator is cautioned to review and be fully aware of the drawings and illustrations contained in this manual before proceeding. If there are questions regarding safe operation of the unit, please contact PDI directly. Save this user manual properly.

NOTE

PDI Communications Inc. shall not be held liable for any damage or injury involving its enclosures, power supplies, generators, batteries, or other hardware if used or operated in any manner or subject to any condition not consistent with its intended purpose, or is installed or operated in an unapproved manner, or improperly maintained.

NOTE

The following symbols have been placed throughout this manual. Where these symbols appear, use extra care and attention.

WARNING!

Presents safety information to **PREVENT INJURY OR DEATH** to the technician or user.

CAUTION!

Indicates safety information intended to **PREVENT DAMAGE** to material or equipment.

OVERVIEW

1.1 Unpacking and Pre-installation Inspection

1.1.1 Unpacking

Remove the Power Supply from the shipping container and verify if all parts you ordered have been included. Standard package should contain the following:

- ✓ One (1) piece SB-120-220-xx Non-standby Power Supply.
- ✓ One (1) copy of this User Manual.
- ✓ Installation Hardware.

Carefully inspect the contents of the shipping container. If any items are damaged or missing, contact PDI immediately.

1.1.2 Pre-installation Inspection

- During shipping, movement of components may occur. Inspect the power supply for possible shipping-related failures, such as loosened or damaged connectors. If needed, inspect the interior for loose or damaged connectors. Correct any discrepancies before proceeding with the power supply installation.
- Do not attempt to install a damaged power supply without first passing a complete Pre-installation Inspection.

⚠ CAUTION!

Use the original shipping container if the unit needs to be returned for service. If the original container is not available, make sure the unit is packed with at least three inches of shock-absorbing material in all orientations to prevent shipping damage. PDI is not responsible for damage caused by improper packaging on returned units.

1.2 Brief Introduction

SB-120-220-xx non-standby power supply provides conditioned power to signal amplifiers in cable television and broadband distribution systems. The SB 120-220xx has screened vents and a power ON indicator light. The transformer is mounted inside an enclosure and supplies the load with current limited, fully regulated AC power that is free from disturbances caused by spikes, surges and other forms of power line transients. AC power enters the transformer, is converted into a quasi-square wave and regulated at the required output voltage.
The power supply output is 60Vac or 90Vac field selectable," Not to be used simultaneously."

1.3 Theory of Operation

The SB-120-220-xx contains a ferroresonant transformer, resonant capacitor, input breaker, terminal blocks and some electrical components.

The transformer is a ferroresonant design, which features constant and fully regulated output voltage, stable performance and high reliability. Primary and secondary windings of the transformer are physically isolated from each other by a steel core which reduces the capacitive coupling of spikes and noise to the secondary winding.

A resonant capacitor is connected to the secondary winding of the transformer forming a tank circuit. The advantage of this type of transformer/capacitor design is the ability of the transformer to regulate its output voltage over a wide range of input voltages and output loading. It is advantageous in Broadband TV Network applications as active devices are protected from dangerous voltage fluctuations.

OVERVIEW (continued)

1.4 Outline Diagram

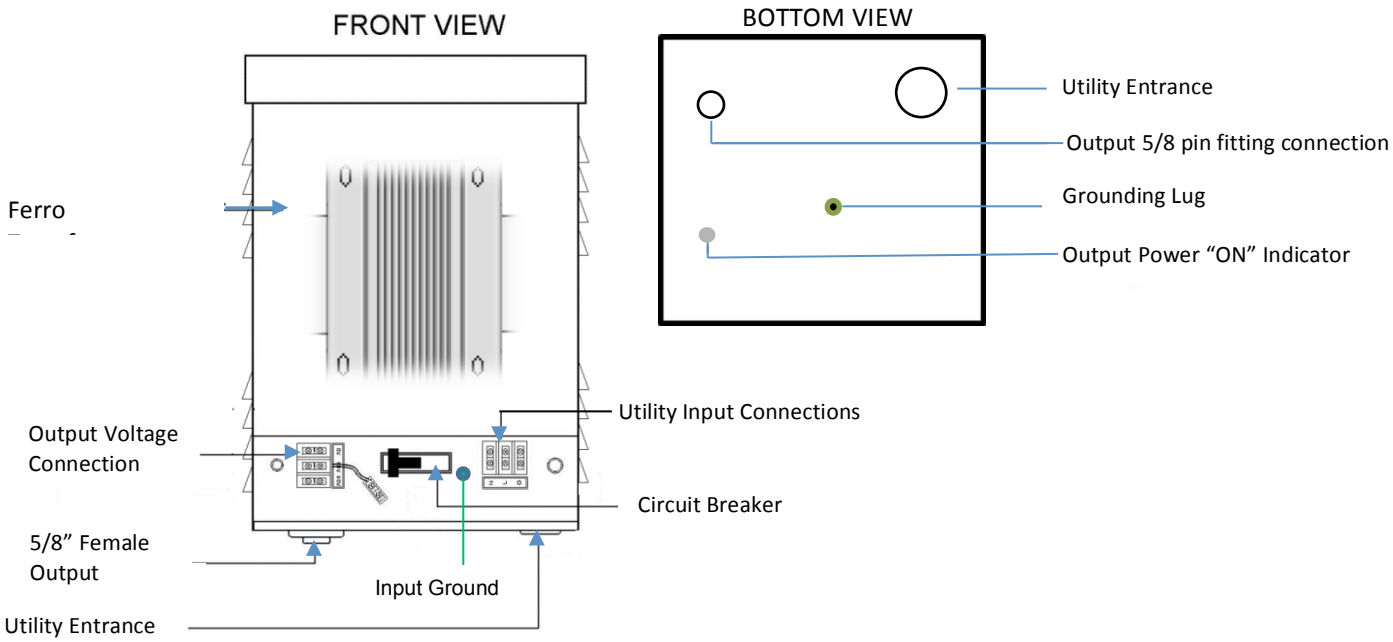


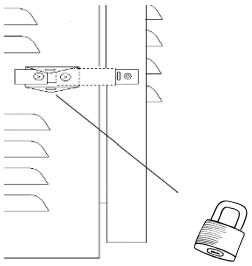
Figure 1.1, Outline Diagram

1.5 Technical Specifications

Table 5.1, Technical specifications

Models	Input voltage (VAC)	Input frequency (Hz)	Output voltage (VAC)	Output current (A) MAX.	Output power (VA, max.
SB-120-220-60	120/220	60	60/90V	15/10	900
SB-120-220-50	120/220	50	60/90V	15/10	900
Voltage range Input	+/- 22%				
Power factor	>0.90 at full load				
Protection	Circuit breaker 1P, 16A Supp. (Thermo-magnetic release)				
Output					
Current/Load	15/10 amps Maximum				
Voltage Regulation	±5%				
Waveform	Quasi-square wave				
Efficiency	≥90%				
Protection	Current limited				
Short circuit current	150% of maximum current rating				
Mechanical					
Enclosure	Vented/Lockable				
Dimensions	(H) 13.5" (W) 8.5" (D) 9.0"				
Finish	Powder coat				
Material	Aluminum				
Environmental					
Operating temperature	-40°C to +55°C				
Humidity	0-90% non-condensing				

PAD LOCK

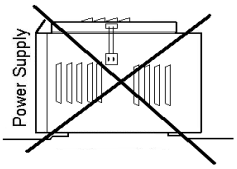


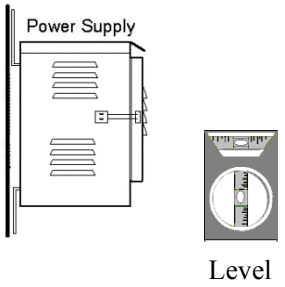
WARNING!

- The enclosure is equipped with a Pad Lockable Draw Latch.
- The enclosure MUST always be locked when un-attended.
  ("pad lock not supplied")

2. INSTALLATION *This power supply is designed to be mounted on a pole or wall.*

WARNING! DO NOT operate this equipment unless it is up-right, vertical and horizontally Level, and installed in accordance with these instructions.





Level

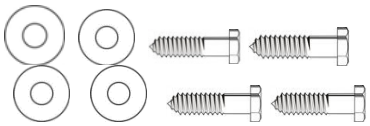
CAUTION!

2.1 Installation Notes:

- Installation of this unit must be performed only by qualified professional personnel.
- In some districts, local codes may require that the base of the enclosure be at a minimum height from the ground. Always verify height restrictions before proceeding.
- Installation of the unit must be firm and reliable. Failure to do so may result in injury.
- Wear protective equipment when installing the unit.
- Be careful of sharp edges and corners on the enclosure.
- Use proper lifting techniques.

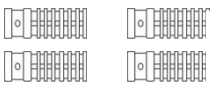
2.2 Wall Installation

The SB-120-220-xx standard installation hardware includes: 4 Hex head lag screws 5/16" x 1 3/4" and 4 washers.



CAUTION!

This Unit must be mounted on a strong, solid, reliable surface. When mounting to concrete or any masonry, it is required to use masonry wall anchors or concrete screws. *(Not supplied)*



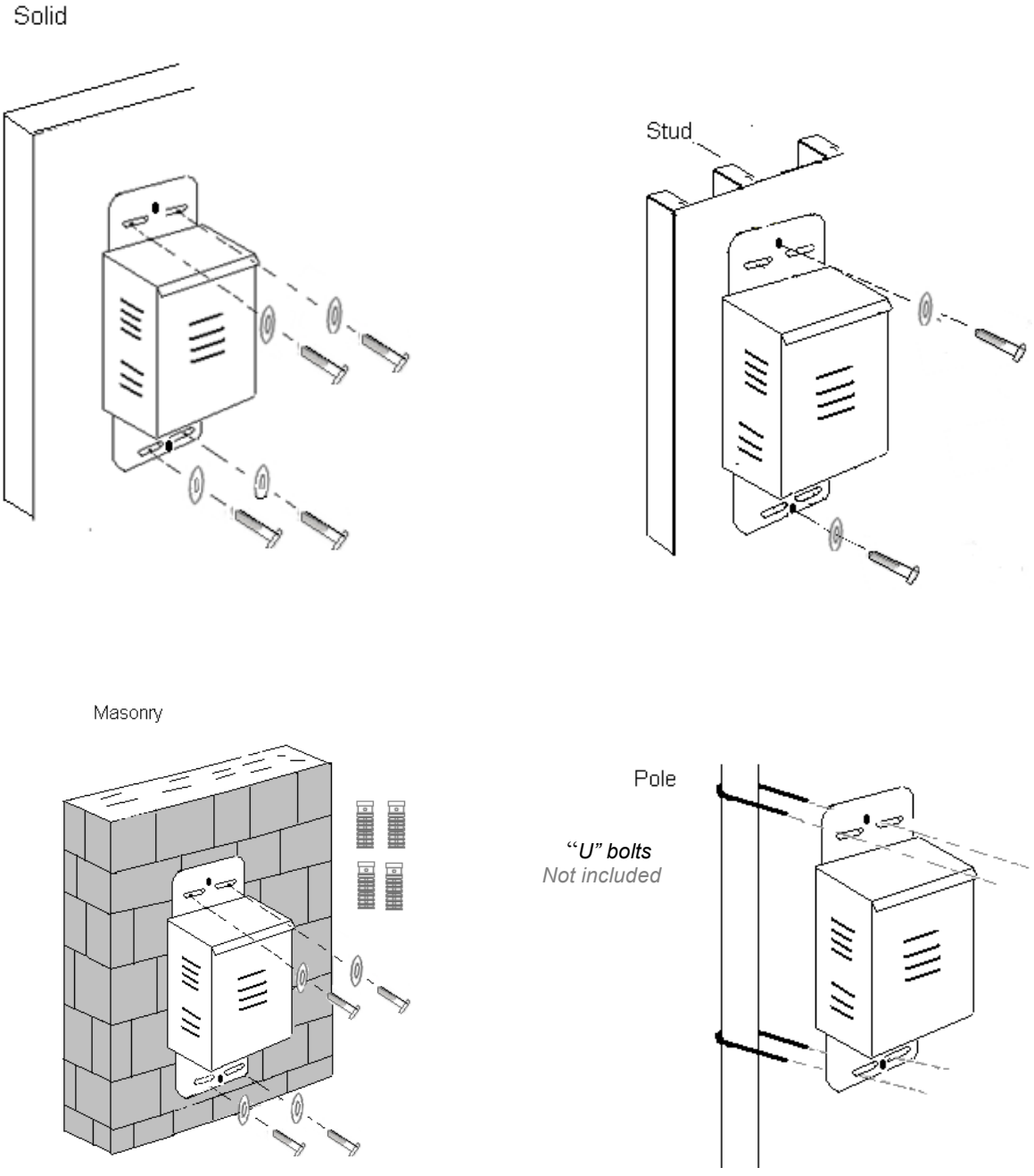
5/16" Lag Shield Masonry Wall Anchors

1.) Mark Positions for mounting.
2.) Drill a 15/64" pilot hole for soft to medium wood or a 1/4" pilot hole for hard wood.
follow mounting examples.

(continued)

MOUNTING EXAMPLES

figure 2.3



2.3 Pole Mount Installations

The power supply can be mounted on poles up to 4 ½" in diameter using a "U" Bolt system. For larger diameter poles, we have several options available. Please contact your sales rep so we can select the correct pole mounting hardware to fit your specific application.

NOTE: Utility poles are typically the property of the local Utility. The Utility must approve both the location and the method used to mount on these poles before installation.

2.4 Utility Power (Input) Connection

WARNING!

Grounding

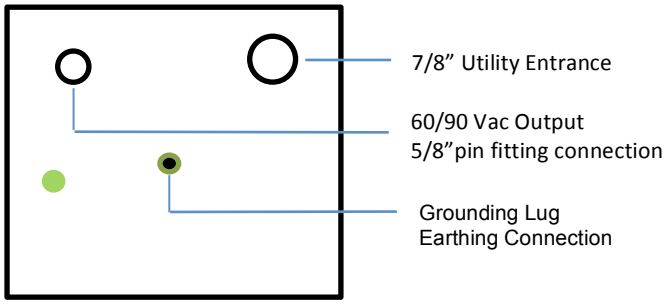
Before proceeding, this equipment must be connected directly to earth ground. **"The bonding conductor used must be a #6awg copper or equivalent."** Connect the conductor to the external earthing connection *(grounding Lug), located on the bottom of the power supply*. Connect the opposite end to a reliable earth ground. Failure to do so can cause electrical shock. Consideration of a dedicated Grounding Rod is highly recommended. The integrity of the protective earth must be ensured at all times.
(follow all applicable local, and/or state electrical codes) *see fig.2.5*

UTILITY ENTRANCE / BRANCH CIRCUIT PROTECTION

The 7/8" Utility Entrance opening, *on the bottom of the enclosure*, *(see fig. 2.5)*, accepts a standard 1/2" conduit hub, *(not supplied)*. Note: "Installation per the American National Electric Code" *(NEC)*, or Canadian Electric Code *(CEC)* guidelines as applicable. The required branch circuit overcurrent protection device shall be a fuse or circuit breaker appropriately rated for voltage/current being fed. Branch circuit protection is installed between the Utility power source and the power supply.

With the branch circuit protection device **NOT connected** at this time, Install the hub, the conduit, and run the utility wires thru. Connect the wires to the Input terminal block as per specifications. *(See table 9.1 pg.9)*

fig.2.5



WARNING!

- Utility power presents dangerous voltage. Wear insulating gloves and use insulating tools.
- DO NOT work alone.
- Make sure voltage and frequency of the utility power fed into the unit is in accordance with nominal input voltage and frequency of the unit.

Terminal Blocks

Table 9.1, terminal blocks

Input / Output / Terminal Specifications			
Wire Gauge	**Type**	**Tightening Torque**	**Rating**
8 - 14 awg. cu	sol/str.	7 in- lbs.	500V 41A Max

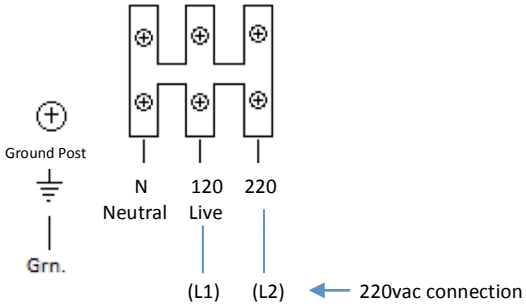
Utility Power - Connection to Input Terminal Block:

The SB-120-220-xx Power Supply utilizes a 3 position terminal block for **utility power** connection. Positions marked "**N**" Neutral, "**120 VAC**" Live, "**220 VAC.**" Connect input ground to the "**Ground post.**"

220VAC OPERATION

With Utility power turned off, make the appropriate connections according to *"figure 2.5a"*

figure 2.5a



2.5. AC Output Connections / Selection Tap Specifications

Output connection for the SB-120-220-xx power supply is made via a 5/8" threaded female opening on the bottom of the enclosure, *(for a hard-line pin fitting connector),* and the tap that connects to the terminal block for output voltage selection.

Tap Specifications

Wire gauge	Type	Tightening Torque	Rating
8-14 awg.cu	sol/str.	7 in-lbs.	500v 41A Max

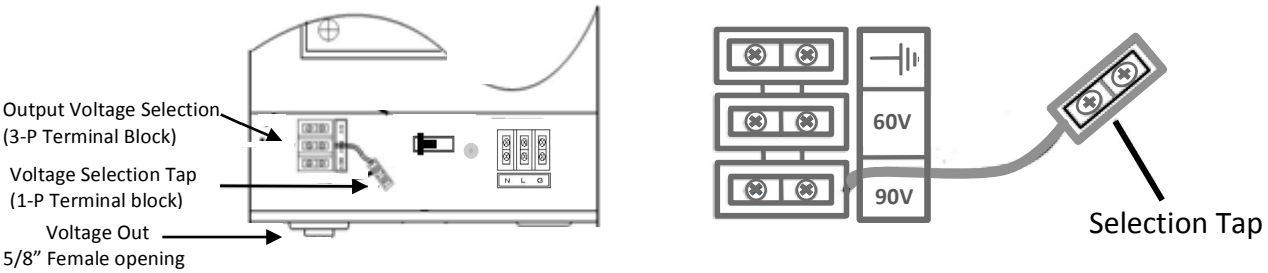


Figure 2.6,
Output Connection

2.5.1 Output connection

WARNING

(Continued)

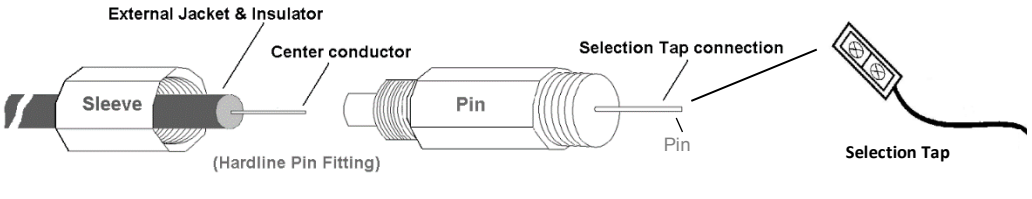
- **Make sure AC input power is removed before making output connections.**
- **Wear insulating gloves and use insulating tools.**

CAUTION!

(continued) Use minimum, ½" (.500) Hard-line coaxial cable and appropriate pin fitting.

1) Prepare the coaxial cable used for distribution of power and the external Hard-Line Pin fitting *(not supplied)*.
2) Using the appropriate stripping/coring tool, remove external material, (jacket, insulator and so on). "*Follow the fittings recommended stripping lengths."*

Fig. 2.7



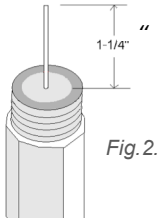


Fig.2.7A

3) Cut the pin on the fitting to be 1-1/4" from the tip to the thread base. *(fig.2.7A)*
4) Screw the "Pin Section" of the fitting into the 5/8" threaded female output connection, *on the bottom of the enclosure: (see fig 2.5 pg.8).*
5) Attach the sleeve to the cable and then insert them into the pin section of the fitting.
6) Screw the "sleeve section" onto the "pin section" and tighten the connection between the two.
7) Connect the selection tap to the Pin (*shown in fig 2.6 &.2.7).*
8) Tighten seizure screw of the tap to specified torque.

2.5.2 Output Voltage Configuration

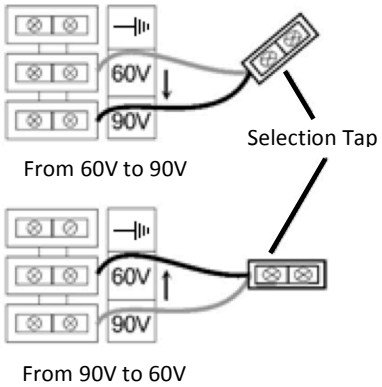
Output voltage of SB-120-220-xx power supply can be reconfigured from 60V to 90V or from 90V to 60V. The terminal block, along with the selection tap, is placed on the left-hand side of the internal panel and marked by, "60Vac" and "90Vvac" Output. Follow these procedures to re-configure. *(Factory configuration is 60Vac)*

WARNING! - The unit must be turned off with AC power removed prior to output voltage selection.

CAUTION! -Do the selection carefully. Wrong selection may damage the loads.

2.5.3. Re-configuration from 60Vac to 90Vac

1) Make sure the power supply is turned off and the "utility power is removed."
2) Loosen seizure screws on positions marked by "60Vac" and "90Vac".
3) Switch the tap wire from 60Vac position to 90Vac position.
4) Tighten seizure screws of both positions to specified torque.



2.5.4. Re-configuration from 90Vac to 60Vac

1) Make sure the power supply is turned off and the utility power is removed.
2) Loosen seizure screws on the positions marked by "60Vac" and "90Vac".
3) Switch the tap wire from 90Vac position to 60Vac position.
4) Tighten seizure screws of both positions to specified torque.

Figure 2.8, Output Voltage Reconfiguration

3. STARTUP & TEST

Once connections and configurations are made, start-up and test may begin.

1) Before you apply power, ensure that voltage and frequency of the utility matches nominal input specification of the power supply.

2) Please remove all the loads before running startup test.

3) **Connect** and switch "ON" the branch circuit protection device, *(user provided, located outside of the enclosure),* then switch the power supply's circuit breaker, *(located on the internal panel)*, to the "ON" position.

4) Use an RMS meter to measure output voltage of the unit. Regulation of output voltage is 5%. This means output voltage reading should be in the range of 95% to 105% of the selected output voltage.

5) Turn off the power supply circuit breaker and switch external service disconnect to the "OFF" position. Rewire the output voltage selection tap to select another output voltage and repeat steps 3 & 4.

6) If no output, please refer to **Trouble Shooting Guidelines**.

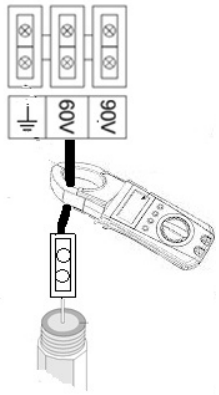
NOTE:

Output waveform of the power supply is quasi-square. So a true RMS meter is required for accurate measurement of the output voltage.

Current Measurement

With all loads attached, a convenient way to check the output current using a clamp meter. *(Fig 2.9)*

"do not exceed maximum output current specifications"



(Fig 2.9)

WARNING! The transformer inside the enclosure may be very HOT when the power supply is in operation, or has recently been turned off, " DO NOT touch it! "

5. TROUBLE SHOOTING GUIDELINES

The table shown below, is designed to display typical symptoms, causes and solutions, beginning with the most obvious and working systematically through the unit. By following the solutions in this table, users can repair the units in the field. In the event that a component(s) in the unit needs to be replaced, please contact PDI for recommendations. Improper replacement may damage the unit, or the loads. If symptoms or problems that have arisen are not listed in (*table 11.1)*, please contact Technical Support.

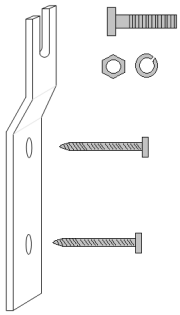
TROUBLE SHOOTING GUIDELINE TABLE

table 11.1

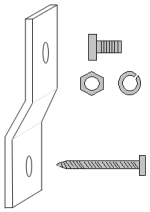
Symptom	Probable Causes	Solution
NO OUTPUT	Utility Power Failure	Verify Utility Power
	Poor Output Connections	Check connection at terminal block and tap wire for output connection and voltage
	Short Circuit	Remove Power and Repair the Short

EZ MOUNT
Installation Instructions

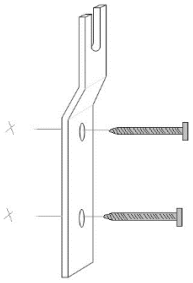
Top Hardware



Bottom Hardware

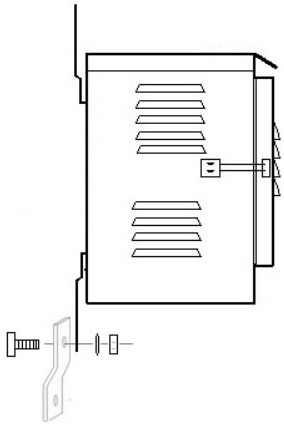


STEP 1



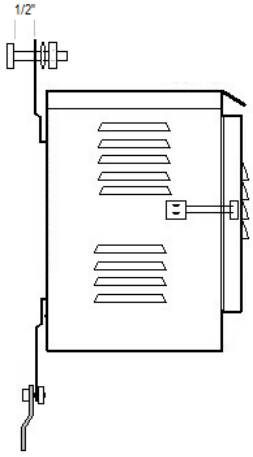
On a strong reliable surface:
Mark positions for mounting. Drill pilot holes and secure the top bracket with lag bolts. When mounting to concrete or any masonry, it is required to use masonry wall anchors or concrete screws.
(Not supplied)

STEP 2



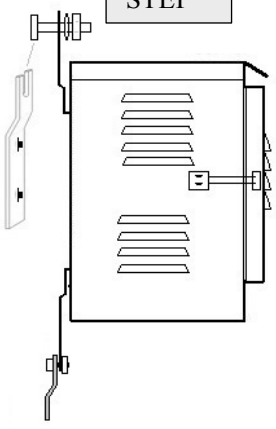
Attach the bottom hardware to the enclosure as shown. Use the center hole in the back plate. Tighten completely!

STEP 3



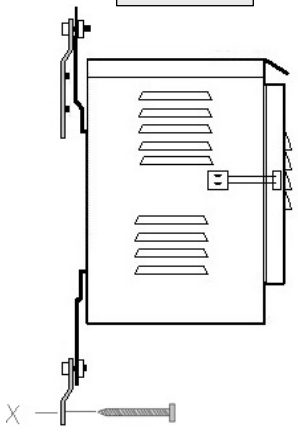
Attach the top machine bolt washer & nut as shown. Use the center hole in the back plate. Hand tighten until the head of the bolt is sticking out the back approx. ½"

STEP



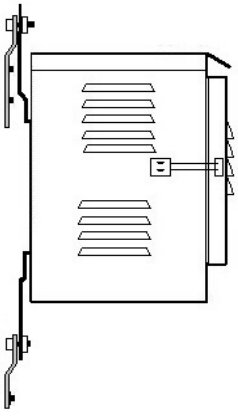
Carefully lift the unit and slide the head of the bolt into the slot of the already secured bracket.
Tighten completely!

STEP 5



Level the unit! Then secure bottom bracket with the lag bolt.

Installation Complete



Technical Support: **1(800) 242-1606**

Starburst®
TECHNOLOGIES
a division of PDI Communications, Inc.

LIMITED 5-YEAR WARRANTY:
MODELS SB-120-220-60 & SB-120-220-50

PDI Communications Inc., the parent of **Starburst Technologies**, a division of **PDI**, warrants that this non-standby power supply was thoroughly tested by a qualified technician, and is free of defects and meets all published specifications when arriving on site. PDI Communications Inc. is not responsible for any deficiency in performance resulting from accidents, network failures, natural disasters, earthquakes, floods, misuse, or modifications to the unit.

In the event of a component failure, PDI Communications Inc. recommends that the customer does not attempt to repair the unit, but instead returns it to our plant in Boca Raton Florida for repair freight prepaid. PDI will either repair the damaged unit or replace it with a new unit. PDI Communications Inc. will cover the freight costs back to originating site.

Along with the return, please include documentation explaining the problem with the unit, and the RMA # assigned to the return. The RMA # should also be written on the outside of the carton. Call 1(800) 242-1606 and speak to the operator or contact your salesman, and he or she will issue an RMA number assigned to the return and will advise you accordingly.

Failure to put the RMA number on the outside of the carton could result in a delay of repair, or the shipment may be refused at the door. In the event the returned unit or units are found to be defect free, the customer will pay for the freight back to the site. A complete engineering report will be sent to the customer.

For power supply engineering support, please call **1-800-242-1606**,
Attention: Nick Salcito ext. **293**, or Rick Pool ext. **298**.