POWER INNOVATIONS INTERNATIONAL

LITEON GROUP

MGX Rectifier Shelf
Models:
PF-1103-P25N

Operation Manual

MNL231

Revision: 1.1

READ THIS MANUAL CAREFULLY
SAVE ALL INSTRUCTIONS

This manual contains important information regarding Power Innovations International (Pii) products or processes listed on the title page. Please read all instructions carefully before assembling, installing, or operating equipment. Keep this manual handy for easy reference.

This manual may accompany other instructional guides or manuals for standard installation and operations of the supported products. Please contact Pii if you need additional guides or manuals and have not received them.

Contents

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1 - Introduction

This user manual is based on the engineering specification PF-1103-P25N. It includes installation and operation instructions for the 10 kW Rectifier Shelf System.

2 - System Description

The PF-1103-P25N Rectifier Shelf is a 10 kW, 48 - 51 Vdc output power system designed to power accessory equipment for data processing racks. It supports full redundancy when configured independently parallel and integrates rectifiers, signal interfaces, and AC connectors.

Input rating:

- 190 - 305 Vac and 300 - 440 Vdc for each phase to return. Can accommodate Wye, Delta, Single Phase or DC inputs, depending on the wiring of the 7 pin input cable whip. 16 A per pin within input connector that mates to Positronic SP10RSSS1M2001/AA-2268.

Output rating:

- 60 Vdc, 42 Vdc to 64 Vdc, adjustable, 174 A maximum, ORV3 150 A power clip.

Power Shelf:

- The power shelf houses three (3) rectifier units. The system is capable of full redundancy when configured in parallel. Each shelf in the system also houses the controller.

SC:

- The shelf controller (SC) is is a management and communication module for Pii's PSU (rectifier), inverter, and DC/DC converter modules that communicates via Modbus RS-485. The upstream system controller can communicate with the shelf controller to control the shelf, change parameters, and collect data from the power conversion modules.

Rectifiers:

- The system contains three rectifiers (PS-2332-02P1-LF) which provide load power and during normal operating conditions.

3 - Power Shelf: Installing the System

Ensure proper alignment with input busbars and secure the shelf using mounting levers.

3.1. Acceptance Checklist

This section contains the Acceptance Checklist, designed to ensure the system is properly installed and ready for initial operation. If a procedure does not apply to your installation site, still ensure that you have reviewed it. Once installation is complete, verify that every item on the checklist has been completed. Note that some procedures may have already been completed at the factory.

Making Electrical Connections

- 51 VDC Input Connection Made
- AC Output Connections Made & Secured

Installing the PSUs and SC

- 3 pcs Rectifiers installed as required
- 1 pcs SC (CM-12CM-P10U) installed as required

Power shelf starting up and operation checking

- Preparation for power up and operation checking

3.2. Checking the Equipment

1. Check the packing slip to make sure all components ordered were received. Report any missing items to the carrier and your local sales representative immediately.
2. Inspect the equipment and shipping container(s) for any signs of damage or mishandling.
3. As the equipment is unpacked, visually examine the system for transit damage.
4. Do not attempt to install the system if damage is apparent.
5. If any damage is noted, follow local practices for reporting and handling damaged goods.

3.3. Installing the Bracket Kit and Power Shelf into a Rack

There are two types of brackets that can be installed on 19-inch and 21-inch racks.

3.3.1. Installing the brackets into a 19-inch rack

Install rack brackets kit into a 19-inch frame of a rack as follows. Refer to Figure 3.1, Figure 3.2, and Figure 3.3 as this procedure is performed.

Procedure

1. Use a Phillips screwdriver to remove the mounting screws from the bracket.
2. Align the positioning screws on the bracket with the mounting holes on the rack, and insert the bracket.
3. Align the other side of the bracket with the mounting holes on the rack, and insert it.
4. Reinstall the mounting screws onto the bracket to secure the shelf to the rack.

Item	Description
1	PF-1103-P25N - Power Shelf
2	M6 Mounting Hardware
3	KE-0001-015N Rails

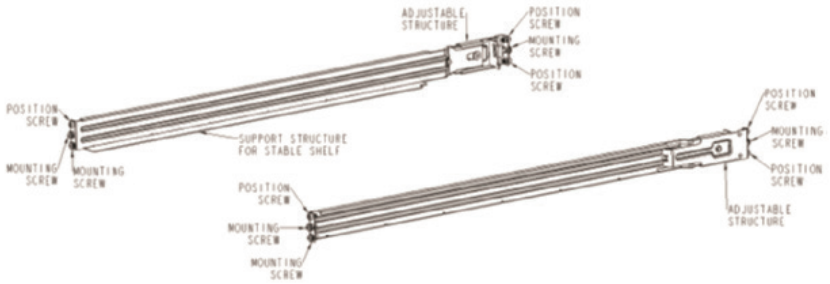
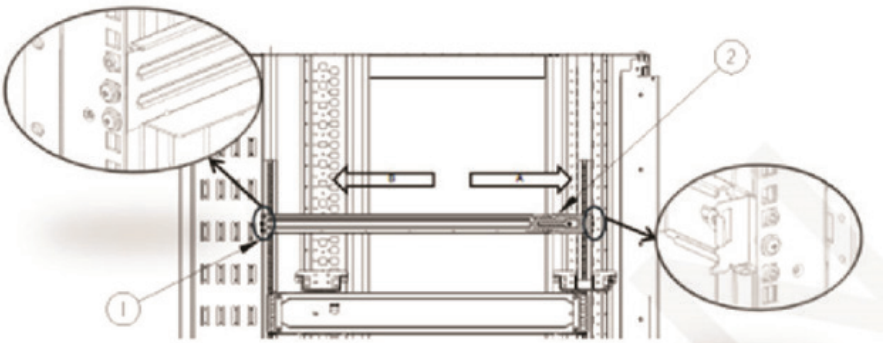
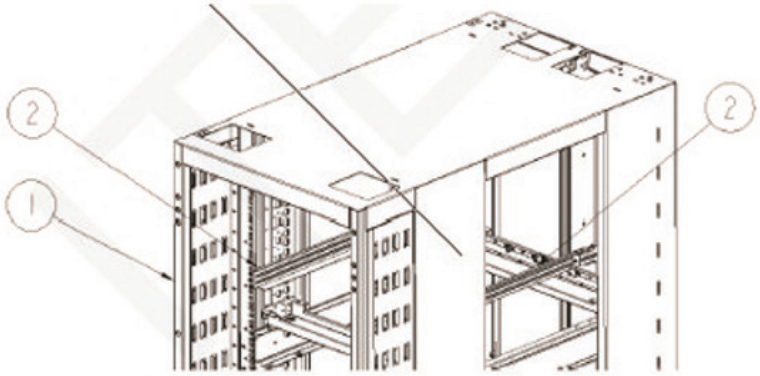


Figure 3.1 - KE-0001-015N Rails



Item	Description
1	Fix structure of rack
2	Position of brackets

Figure 3.2 - Brackets



Item	Description
1	Rack
2	Brackets

Figure 3.3 - Brackets

3.3.2. Installing the power shelf into a 19-inch rack

Procedure

1. Insert the Power shelf into the front of the rack, resting the bottom of the Power shelf on the rack brackets.
2. Confirm the power shelf DC input clip with the DC busbar set in the rear of the rack.

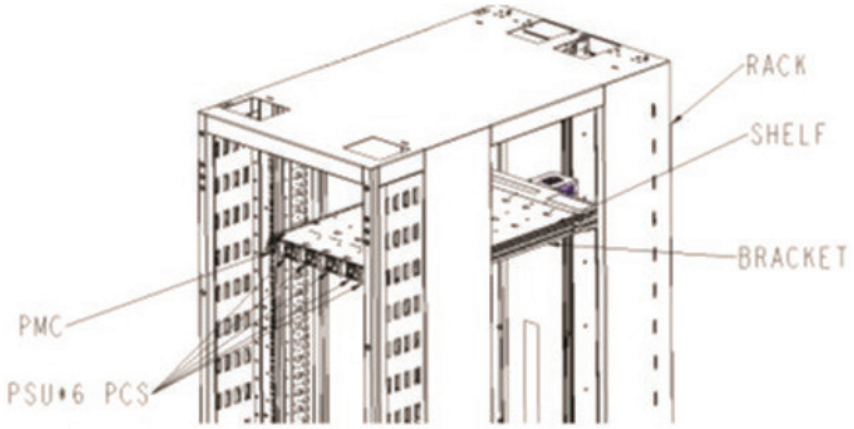


Figure 3.4 - Install the 19-inch power shelf into the 19-inch rack

3.3.3. Installing the brackets kit and power shelf into a 21-inch rack

Install the brackets kit into a 21-inch frame of a rack as follows. Refer to Figure 3.6 as this procedure is performed.

Item	Description
1	PF-1103-P25N - Power Shelf
2	MT03146 - 21” ORV3 Power Shelf Rail Kit, 1OU
3	KE-0001-014N – 19-21” Adapter Tray and Shelf Hardware

Procedure

1. Set the left and right bracket onto the corresponding holes in the rack.
2. Insert the Power shelf into the front of the Adapter Tray, resting the bottom of the Power shelf on the tray as shown in Figure 3.6.
3. Slide all the way in and fix screw between the bracket and shelf in location shown in Figure 3.7.
4. Slide the combined Adapter Tray and Shelf assembly into the 21” support brackets. Confirm the power shelf DC input clip with the DC busbar set in the rear of the rack.

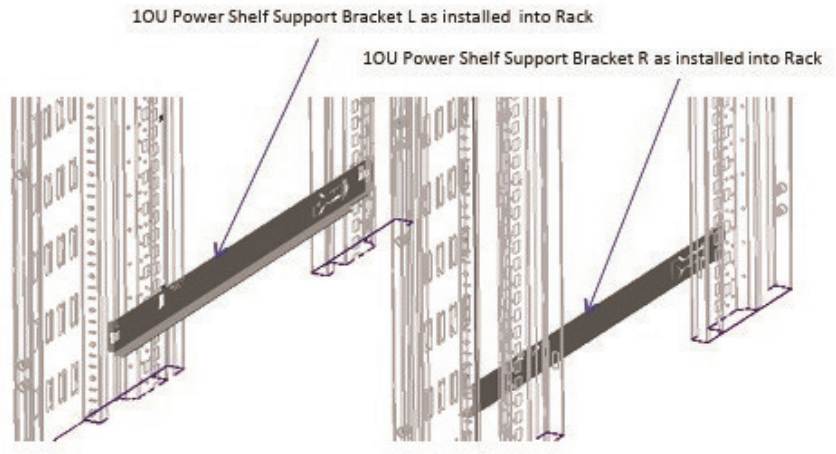


Figure 3.5 - Installing 21” brackets kit

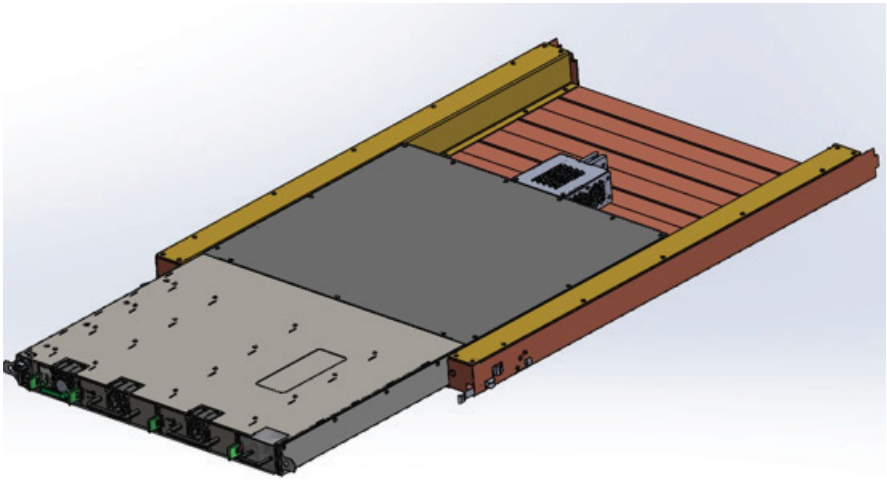


Figure 3.6 - Shelf sliding into adapter tray

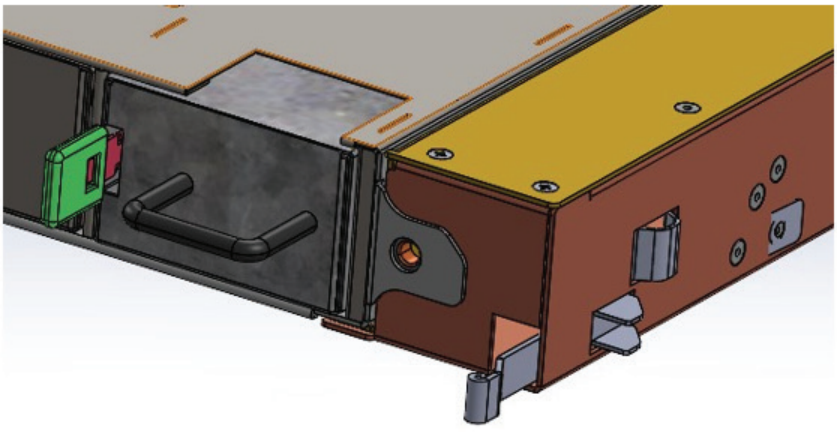


Figure 3.7 - Fasten with provided M6 mounting hardware through front hole

4 - Making Electrical Connections

Connect DC input to DC busbar. Connect AC outputs using properly secured connectors.

4.1. Acceptance Checklist

DC input is provided via a DC input connector located on the back of the Power shelf as shown in Figure 4.1. This connector is compatible with the vertical DC busbar set in a rack.

4.2. AC Input and AC Input Equipment

The Power shelf is designed to accommodate Wye, Delta, Single Phase or DC inputs, depending on the wiring of the 7 pin input cable whip. There is 16 A per pin within the input connector that mates to the Positronic SP10RSSS1M2001/AA-2268. See Figure 4.1.

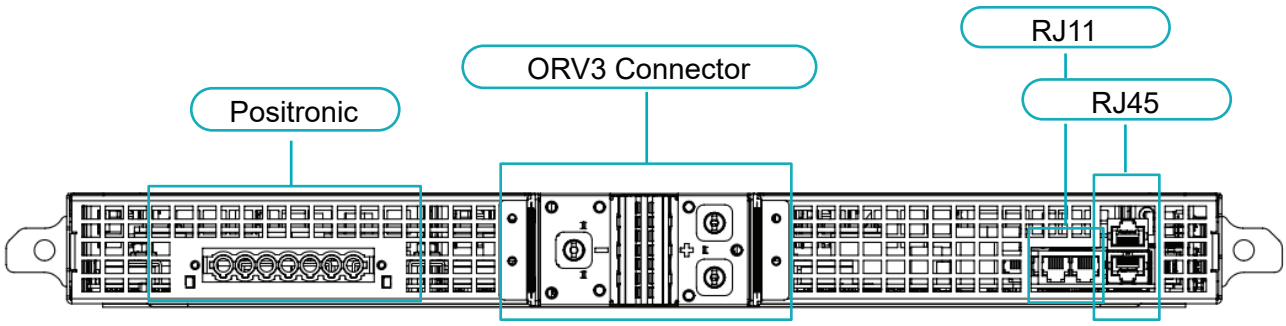


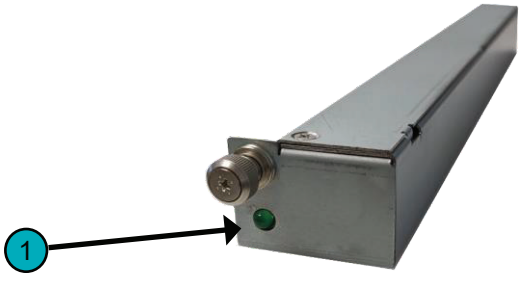
Figure 4.1 - Power shelf rear view

4.3. Shelf Controller Rear Panel RJ45 Connector

In the rear of the shelf controller, there is a blind mate connector that mates with the power shelf when inserted. In the rear of the power shelf, there are two RJ45 and RJ11 ports. These ports must be daisy chained to other PF-1103-P25N power shelves within the rack, with a terminating resistor in the last RJ45 within the system. The top RJ45 will connect to the upstream and external controller.

Front Panel

1	LED	Shelf controller status indicator



Front Panel LED Status

LED	Status
Solid Green	Normalizing
Blinking Green	Initializing
Solid Red	Alarm

Table 4.1 - LED indicator definitions

5 - Installing the Rectifiers and SC Units

Insert rectifier units into designated slots and secure with latch. SC module should be installed similarly, but be secured with the integrated screw. Ensure EEPROM FRU is present and readable. Verify LED indicators for operational status.

5.1. Installing Rectifiers

1. Unpack the rectifier.
2. Partially insert the rectifier into the mounting shelf.
3. Push the spring latch handle on the front of the rectifier to the right to retract the securing latch located on the side of the unit.
4. Fully slide the rectifier into the shelf and release the spring latch handle. The securing latch will automatically engage with a notch in the shelf, locking the rectifier in place.
5. When all rectifiers are installed in their respective shelves, they are ready for immediate operation once power is supplied.
6. If the system is operating, ensure that there are no local or remote alarms active on the system.

Figure 5.1 - Installing rectifier

5.2. Installing the SC

1. Unpack the Shelf Controller (SC).
2. Partially insert the SC into the shelf.
3. Fully slide the SC into the shelf and secure with the integrated screw.
4. If the system is operating, wait for the SC to complete its boot process and verify that the system is functioning normally.
5. Verify LED indicators for operational status.
6. If the system is operating, ensure that there are no local or remote alarms active on the system.

Figure 5.2 - Installing shelf controller

6 - Power Shelf Starting Up and Operation Checking

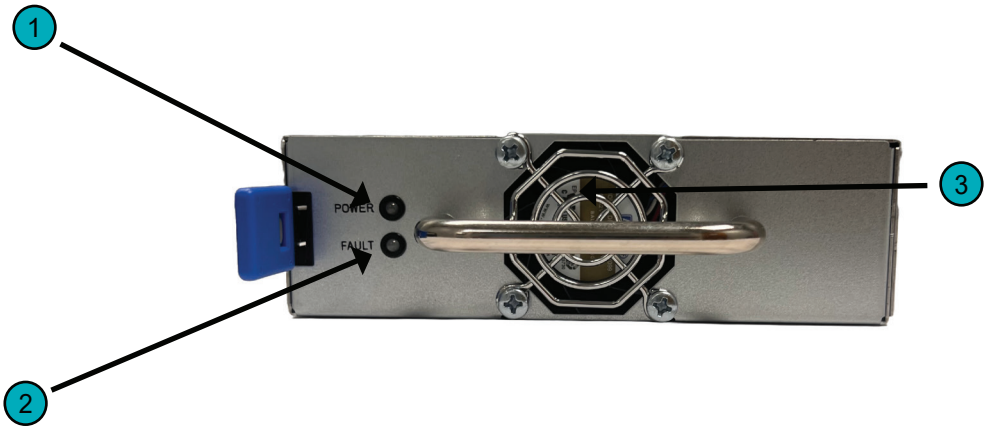
Apply Rectifier modules and shelf controller indicators. Confirm Modbus communication.

6.1. Preparation for Power-Up

1. Check out Rectifier, SC, busbar and power shelf installing on the rack.
2. Measure input voltage matched the spec requirement.

6.2. Operation Checking

1. When the DC input is on, modules are waiting for a Sync Start signal and module's indicator LED1 is blinking green at 2Hz.
2. Rectifiers normally turn on, the Inverter indicator LED1 is solid green.
3. SC card will turn on.
4. Confirm there are no alarms.



1	"POWER" LED	Output power indicator: green-colored LED
2	"FAULT" LED	PSU fault indicator: amber-colored LED
3	Fans	Cooling fans

Figure 6.1 - D2D Indicators

Status	LED Green: Power	LED Amber: FAULT
Output Normal	**Solid Green**	Off
Storage Temperature	**Blinking Green @ 2 Hz**	Off
Output Disable/Fault	Off	**Solid Amber**
Output Disable/Firmware Update	Off	**Blinking Amber @ 2 Hz**

Table 6.1- Rectifier LED1 and LED2 Indicators

*For the LED indicator definition, please refer to Table 4.1.

Figure 6.2- SC Indicator

7 - Safety and Specifications

The following safety instructions apply throughout the Power Shelf and Module installation process. Be familiar with them before moving on to the next section to complete the installation.

IMPORTANT SAFETY INSTRUCTIONS - SAVE THESE INSTRUCTIONS

ELECTRICAL WARNINGS – WARNING! RISK OF ELECTRIC SHOCK!

WARNING! RISK OF ELECTRIC SHOCK! ONLY QUALIFIED ELECTRICAL PERSONNEL FAMILIAR WITH THE CONSTRUCTION AND OPERATION OF THIS TYPE OF EQUIPMENT AND THE HAZARDS INVOLVED SHOULD ADJUST, MODIFY, AND SERVICE THIS EQUIPMENT. FAILURE TO OBSERVE THIS PRECAUTION COULD RESULT IN SEVERE INJURY OR DEATH.

WARNING! RISK OF ELECTRIC SHOCK! READ THIS MANUAL THOROUGHLY PRIOR TO INSTALLING AND ENERGIZING THE EQUIPMENT. INSPECTION AND MAINTENENACE OF THIS EQUIPMENT SHOULD BE PERFORMED IN ACCORDANCE WITH THE PROCEDURES DETAILED IN THIS MANUAL.

WARNING! RISK OF ELECTRIC SHOCK! THIS UNIT CONTAINS NO INTERIOR PARTS THAT CAN BE SERVICED WITHOUT QUALIFIED PERSONNEL. IF MAINTENANCE PROCESSES SPECIFIED IN THIS MANUAL FAIL TO SOLVE THE PROBLEM, QUALIFIED PERSONNEL MUST SERVICE THE UNIT.

WARNING! RISK OF ELECTRIC SHOCK! THE PURPOSE OF THIS MANUAL IS TO PROVIDE YOU WITH INFORMATION NECESSARY TO SAFELY INSTALL, OPERATE, AND MAINTAIN THIS EQUIPMENT. KEEP THIS MANUAL FOR FUTURE REFERENCE.

WARNING! RISK OF ELECTRIC SHOCK! SHUT OFF POWER SUPPLY BEFORE BEGINNING INSTALLATION ACTIVITIES OR MAINTENANCE WORK. FAILURE TO OBSERVE THIS PRECAUTION COULD RESULT IN SEVERE INJURY OR DEATH.

WARNING! RISK OF ELECTRIC SHOCK! THIS EV FAST CHARGER CONTAINS HIGH VOLTAGE POWER THAT IS POTENTIALLY DANGEROUS IF NOT HANDLED PROPERLY.

CAUTION!
The installer is responsible for conforming to all local and national electrical codes and standards applicable in the jurisdiction this equipment is installed in.

8 - Regulatory Information

This product and its documentation are designed to the following UL Standards:

- **IEC 62368-1 Standard for Safety**: Audio/Video, Information and Communication Technology Equipment - Part 1: Safety Requirements

9 - Warranty

Power Innovations International warrants that products purchased hereunder are free and clear of all liens and encumbrances.

Power Innovations International warrants that products are to be free from material or workmanship defect under normal use for a period of two (2) years from the invoice date.

In the event that any defect is found under normal usage conditions during the above warranty period, Power Innovations International will be responsible for repair or replacement at its sole discretion and subject to the replacement may be refurbished products.

All repair covered by this warranty must be done at Power Innovations International factory, or other repair facilities as designated by Power Innovations International unless Power Innovations International specifically directs that this service be performed at another location or service provider.

Customer shall, at its own costs, be responsible for shipping the defective products to the designated repair facilities subject to a RMA issued by Power Innovations International.

Power Innovations International will be responsible for shipping the repaired or refurbished unit back to the customer.

Power Innovations International shall not have any warranty obligations for claims: (i) caused by the misuse or abuse of products by end users; (ii) caused by modifications or repairs made to the products or disassembly of products by any person other than Power Innovations International, unless receiving Power Innovations International authorization; (iii) in relation to the appearance damage.

This Warranty Term states the exclusive liability of Power Innovations International and the exclusive remedy of buyer/customer with respect to any claim or defects of the products.

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10 - Contact Information

If there are any questions or comments about this product, please feel free to contact us.

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