3-Phase, 10-Slot Power Supply System

STARTUP GUIDE

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Introduction

The 3-Phase Power Supply System is a 10-slot chassis with 2.5KW Power Supply Units (PSUs) that provides stable DC output power. This 21-inch power system uses up to 10 high-power, hot-swappable PSUs for flexibility in full power or redundant operation.

There are different models of the 10-Slot Power Supply System depending on output power requirements and input power configuration as shown in the table below.

3-phase Input Power Configuration	Model Number
Line-to-Line 4-Wire System	PF-2223-1L1N – 10 slot single input
	PF-2123-2LNN – 5+5 slot single input
Line-to-Neutral 5-Wire System	PF-2223-1L1M – 10 slot single input
	PF-2123-2LNM – 5+5 slot single input

The 2.5kW PSUs efficiently supply both main output DC power and standby DC power from either AC or DC sources. These compact PSUs provide 2.5kW, 12.5V / 200A for main power output and 30W, 12V / 2.5A for standby power applications. In addition, they support PMBUS 1.2 with boot loader, LED status indicators, and circuit protection features. For more information about the 2.5kW PSU, refer to the *Lite-On 2.5kW Power Supply Unit Datasheet*.

This startup guide provides instructions to startup the 10-Slot Power Supply System for the first time. It assumes that the 10-Slot Power Supply System has been properly installed and is ready for initial power up and testing. Refer to *Lite-On 3-Phase 22.5kW Power Supply System User Guide* for installation instructions.

General Safety

This startup guide uses the safety conventions described below. Ensure that you follow the safety instructions in this guide and observe its directives to protect you from injury and to protect your equipment from damage.

WARNING	Indicates highly-dangerous consequences such as fire, serious injury, or death when failing to comply with the instructions.

Caution	Indicates dangerous consequences such as moderate injury or equipment damage when failing to comply with the instructions.

Required Tools for Startup

Caution	There are NO USER SERVICEABLE PARTS inside the Power Shelf or Power Supply Units. All repairs and service must be performed by AUTHORIZED SERVICE PERSONNEL only. Warranty coverage will be void if unauthorized repair or service has been attempted. Lite-On PSS shall not be liable for reimbursements, claims, damages, or injuries that may result from the unauthorized repair of this product.

The following tools are required for initial startup of the 10-Slot Power Supply System.

- Digital Multimeter (DMM) for verifying power

Startup Checklist

Before activating power to the 10-Slot Power Supply System, verify that all conditions in the table below have been met. At this point, the Power Shelf should be installed in the rack, but power not yet turned on. None of the Power Supply Units (PSUs), nor the optional Shelf Controller, should be installed in the Power Shelf.

WARNING	To reduce the risk of fire, the unit connects only to a circuit provided with branch circuit overcurrent protection in accordance with the National Electric Code, ANSI/NFPA 70. The upstream circuit breaker must be easily accessible. The unit must be disconnected from AC power source by opening this circuit breaker.

WARNING	Do not connect power to the 22.5kW Power System until all conditions in the table below have been successfully verified by qualified personnel who are knowledgeable with this equipment and have proper electrical and mechanical expertise. Failure to meet all these conditions could result in damage to the equipment or harm or death to personnel.

Conditions to be Met before Initial Startup	Yes?	No?
Is the rack properly installed, leveling feet down, and physically stable?		
Are all rack screws and bolts tightened properly?		
Is the rack properly grounded electrically?		
Is the Power Shelf properly installed in the rack with its spring latches connected to the rack so it cannot be pulled out?		
Are all PSUs and the optional Shelf Controller removed from the Power Shelf?		
Are all Power Shelf linking bus bars properly installed and tightened?		
Are all electrical cables the correct size?		
Do all cable installations meet local electrical standards?		
Are all power and control cables secured, routed, and properly terminated?		
Are all electrical bolts and screws properly installed and tightened?		
Does the power source meet electrical current and voltage requirements?		
Is the Power Shelf properly connected to branch circuit overcurrent protection in accordance with the National Electric Code, ANSI/NFPA 70?		
Is the installation area dry and away from liquids?		
Have all components to be installed been stored in a dry area?		
Is the air temperature within normal operating range?		
Is the area clean and free of debris and packing materials?		
Are all people wearing proper protective equipment as defined by local standards?		
Do all people in the area know the location of emergency power-off switches, fire extinguishers, and first aid equipment?		

Initial Power Activation

After all conditions above have been met, power can be activated to the disconnected input power connector and tested.

WARNING	To reduce the risk of fire, the unit connects only to a circuit provided with branch circuit overcurrent protection in accordance with the National Electric Code, ANSI/NFPA 70. The upstream circuit breaker must be easily accessible. The unit must be disconnected from AC power source by opening this circuit breaker.

Caution	For Wye configurations, the voltage between line to neutral connection should not exceed 264VAC. If this voltage is exceeded, the PSUs will shut down and may cause PSU damage.

To test power to the input power connector:

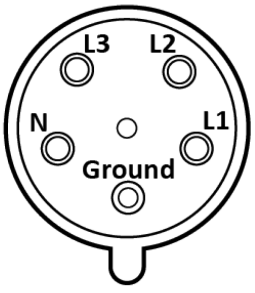
1. If necessary, disconnect input power connector from the power shelf.
2. Activate power to a properly-wired, but disconnected, input power connector by turning on its upstream circuit breaker.

WARNING	Do not confuse the pinouts of the power shelf plug with the pinouts with the receptacle. The plug pinout images shown below are from the perspective of the power shelf plug, not from the perspective of the receptacle.

3. Using a DMM, verify that legs L1–L2, L2–L3, L3–L1, N (neutral), L1–N, L2–N, L3–N, and FG (frame ground) have the expected voltage according to the 3-phase electrical configuration (4-wire or 5-wire connection) and voltage of your system. Refer to the input power connector pinout graphic and wiring tables below as an aid to identify correct voltages at the power source.

3-Phase, 5-Wire System (with neutral)

The input cable plug contains AC power for L1, L2, L3, Frame Ground, and Neutral. The power shelf plug (pinout shown below) is P/N C563P6W by HUBBELL.



Front View

Power Shelf Plug Pinout

3-Phase, 5-Wire System Power Source Values (with neutral)

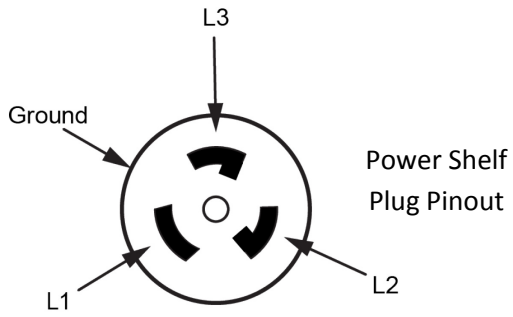
Note: The values in the tables below are from the perspective of the power receptacle, not from the power shelf plug pinout shown above.

PF-2223-1L1M – 10 slot single input PF-2123-2LNM – 5+5 slot single input	L1–L2	L2–L3	L3–L1
380VAC	380VAC	380VAC	380VAC
400VAC	400VAC	400VAC	400VAC
415VAC	415VAC	415VAC	415VAC

PF-2223-1L1M – 10 slot single input PF-2123-2LNM – 5+5 slot single input	L1–N	L2–N	L3–N
380 VAC	220 VAC	220 VAC	220 VAC
400 VAC	230 VAC	230 VAC	230 VAC
415 VAC	240 VAC	240 VAC	240 VAC

3-Phase, 4-Wire System (without neutral)

The input cable plug contains AC power for L1, L2, L3, and Frame Ground. The power shelf plug (pinout shown below) is P/N CS8365L by HUBBELL.



3-Phase, 4-Wire System Power Source Values (without neutral)

Note: The values in the table below are from the perspective of the power receptacle, not from the power shelf plug pinout shown above.

PF-2223-1L1N – 10 slot single input PF-2123-2LNN – 5+5 slot single input	L1–L2	L2–L3	L3–L1
208VAC	208VAC	208VAC	208VAC
220VAC	220VAC	220VAC	220VAC
230VAC	230VAC	230VAC	230VAC
240VAC	240VAC	240VAC	240VAC

4. After verifying the input power connector has been wired correctly, disconnect power from the connector by turning off its upstream circuit breaker.

Shelf Power Activation

After the wiring to the input power connector has been tested and verified, it can be plugged into and secured to the Power Shelf.

To secure the input power connector and activate the Power Shelf:

1. Using a DMM, verify that power is disconnected from the input power connector.
2. Insert the wired connector into the input connector of the Power Shelf and secure the connector in place by torqueing the screws to 4 N-m (3.0 ft-lbs) with a T-20 star driver.
3. Activate electrical power to the Power Shelf via its circuit breakers. The Power Shelf is activated and ready for testing.

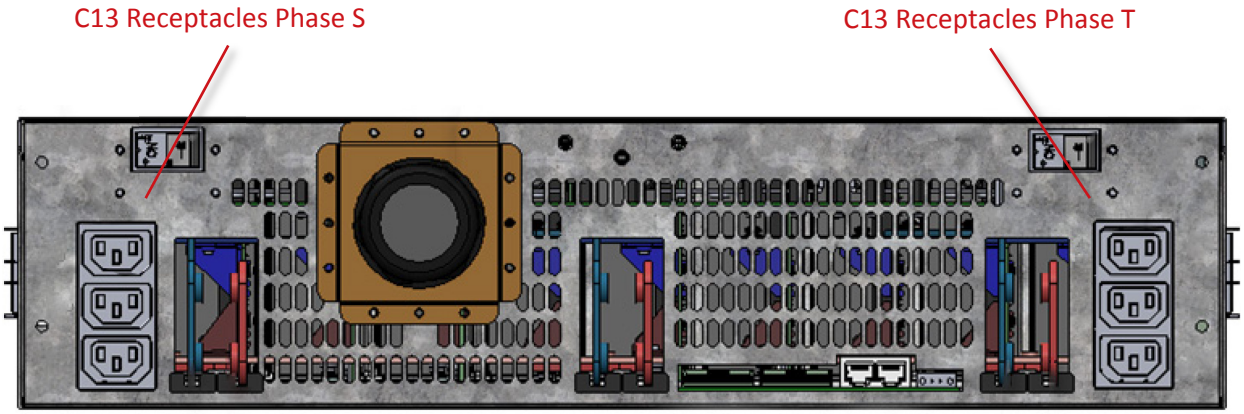
C13 Voltage Tests

Verify that the Power Shelf has the same voltage on the C13 receptacles as the input voltage.

Caution	C13 receptacle voltage is the same as the input voltage to the Power Shelf. Ensure that any device you plug into a C13 receptacle can support this voltage. If you are unsure if your equipment can support this voltage, check with the manufacturer.

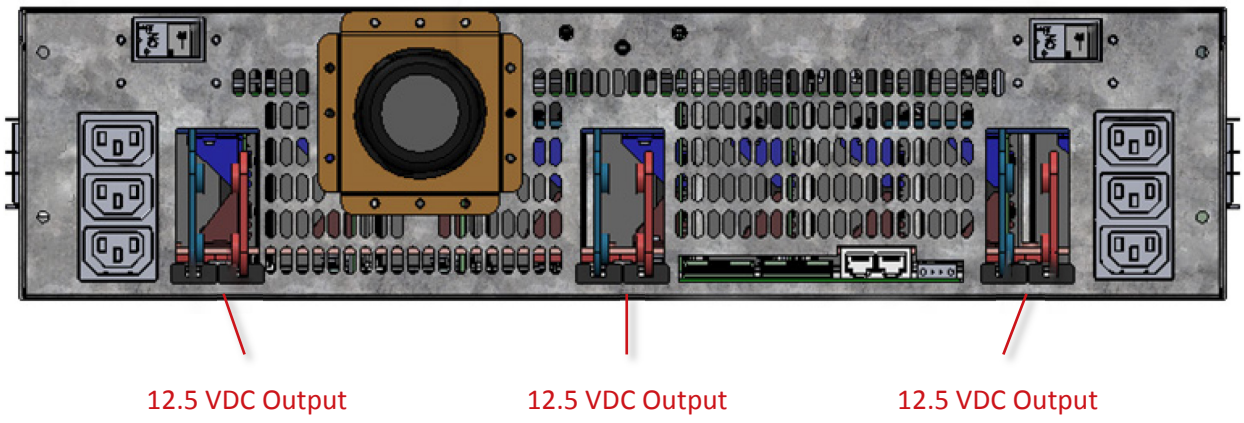
To verify correct voltage on the C13 receptacles:

- With a DMM, verify that the C13 receptacles have the same voltage as the input voltage.



Installing Power Supply Units

After power has been activated and verified, PSUs can be installed into the Power Shelf. A PSU can be plugged into any slot in the Power Shelf and they are keyed so they cannot be inserted incorrectly. At this point, power should be activated and the output voltage will be tested after installing one of the PSUs. As shown below, output voltage is tested at the rear of the Power Shelf.



To install and test Power Supply Units:

1. Slide a PSU into an empty slot in the front of the Power Shelf until it clicks into place. Both lights on the PSU illuminate green to indicate that it is operational. If both lights do not illuminate green on the PSU, contact Lite-On Power Systems technical support before proceeding.
2. Using a DMM, verify that the output voltage is 12.5VDC on all three output connectors. **Note**: the output connectors are on the same bus so the voltage should be the same on all three connectors.
3. If the output voltage from the previous step is correct, slide the remaining PSUs into the empty slots in the Power Shelf until they click into place. Both lights on all PSUs should illuminate green.
4. Using a DMM, verify that the output voltage is still 12.5VDC.
5. Turn on any connected devices to the Power Shelf and verify that the Power System is providing power to the devices.
6. Refer to the *Lite-On 3-Phase 22.5kW Power Supply System User Guide* to install any other devices to the Power System.

Related Documentation

For information about the 22.5kW Power Shelf, refer to the *Lite-On 22.5kW Power Shelf Datasheet*.

For information about the 2.5kW Power Supply Unit, refer to the *Lite-On 2.5kW Power Supply Unit Datasheet*.

For instructions on installing and using the 3-Phase 22.5kW Power Supply System, refer to the *Lite-On 3-Phase 22.5kW Power Supply System User Guide*.

For more information related to the Lite-On Power Systems, visit the Lite-On Power Systems Solutions web site at: http://www.liteon-pss.com.

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