

## Liebert® PSI™

User Manual—1000/1500/2200/3000, 120VAC





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## IMPORTANT SAFETY INSTRUCTIONS

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### SAVE THESE INSTRUCTIONS

This manual contains important instructions that should be followed during installation and maintenance of the UPS.

- Intended for installation in a temperature-controlled, indoor area free of conductive contaminants.
- Maximum ambient temperature 104°F (40°C).

Read this manual thoroughly before attempting to install or operate this UPS.

The equipment can be installed and operated by individuals without previous training.

#### Size of Branch Circuit Overcurrent Protection



### CAUTION

To reduce the risk of fire, connect PS3000RT3-120 models only to a circuit provided with 30 amperes maximum branch circuit overcurrent protection in accordance with the National Electric Code, ANSI/NFPA 70. Other Liebert PSI models must be connected to a circuit with 20 amperes maximum branch circuit overcurrent protection.



### WARNING

Operate the UPS only from a properly grounded (earthed) 110-127VAC, 50Hz or 60Hz AC supply.

Some components are live, even when AC power is disconnected. For service, contact a properly trained and qualified technician. Do not remove the cover; the UPS has no user-serviceable parts inside except the internal battery pack.



### WARNING

Although the UPS has been designed and manufactured to ensure personal safety, improper use can result in electrical shock or fire. To ensure safety, observe the following rules:

- Turn Off and unplug the UPS before cleaning it. Clean the UPS with a dry cloth. Do not use liquid or aerosol cleaners.
- Do not install or operate the UPS in or near water.
- Never block or insert any objects into the ventilation holes or other openings of the UPS. Keep all vents free of dust accumulation that could restrict air flow.
- Do not place UPS power cord anywhere it might be damaged.

#### Battery Handling Precautions



### WARNING

Batteries should be replaced only by properly trained and qualified personnel knowledgeable of batteries and required precautions.

A battery can present a risk of electrical shock and high short-circuit current. The following precautions must be observed when working on batteries:

- Remove watches, rings and other metal objects.
- Use tools with insulated handles.
- Do not dispose of the battery or batteries in a fire. The battery may explode.
- Do not open or mutilate the battery or batteries. Released electrolyte is toxic. It may cause injury to the skin and eyes.
- When replacing the battery, use the same type of battery as is listed in **Table 5**.
- Handle, transport and recycle batteries in accordance with local regulations.

---

**CONDITIONS OF USE**—The input supply outlet must be within 6 ft. (1.8m) of the UPS and be easily accessed.

This UPS provides conditioned power to connected equipment. It is not intended for use with life-support and other designated “critical” devices. Maximum load must not exceed that shown on the UPS rating label. If uncertain, consult your local dealer, local Emerson Network Power representative or Channel Support Applications.

When installing the UPS or making input and output connections, comply with all relevant safety codes and standards (e.g., UL 1778).

Placing magnetic storage media on top of the UPS may result in data corruption.

**ELECTROMAGNETIC COMPATIBILITY**—The Liebert PSI complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

- This device may not cause harmful interference, and
- This device must accept any interference received, including interference that may cause undesired operation.

This equipment uses, generates and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference with radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the UPS and the receiver.
- Connect the UPS to an outlet on a circuit different from the one the receiver is connected to.

## NOTICE

Do not connect equipment that could overload the UPS or demand half-wave rectification from the UPS, such as electric drills, vacuum cleaners, laserjet printers and hair dryers.

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## GLOSSARY OF SYMBOLS

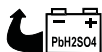
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**Risk of electrical shock**



**Indicates caution followed by important instructions**



**Indicates the unit contains a valve-regulated, lead-acid battery**



**Recycle**



**DC voltage**



**Equipment grounding conductor**



**Bonded to ground**



**AC voltage**



**ON/Alarm Silence/Manual Self-Diagnostic Test**



**OFF**



**Status Change Button**

## 1.0 INTRODUCTION

The Liebert PSI is a 2U, line-interactive UPS that may be installed in a rack or used as a tower UPS. Status indicators on the front of the Liebert PSI display load level, battery level, buck/boost, site-wiring fault, overload, battery status and UPS operation. Controls include a combination On/Alarm Silence/Manual Self-Diagnostic Test button, an Off button and a Status Change button.

The Liebert PSI has USB, DB-9 (contact closure) and Liebert IntelliSlot® ports. The DB-9 and USB ports provide detailed operating information including voltages, currents, and alarm status to the host system when used in conjunction with Liebert MultiLink™ software.

The Liebert PSI is compliant with the Restriction of Hazardous Substances Directive (ROHS), prohibiting use of six hazardous materials manufacturing of electronics, including lead-free solder.

**Figure 1 Front view of UPS**



**Liebert PSI  
rack-mount configuration  
Display rotates for use as tower**



**Liebert PSI  
tower configuration  
Display rotates for use in rack**

**Figure 2 1000 and 1500—rear view**

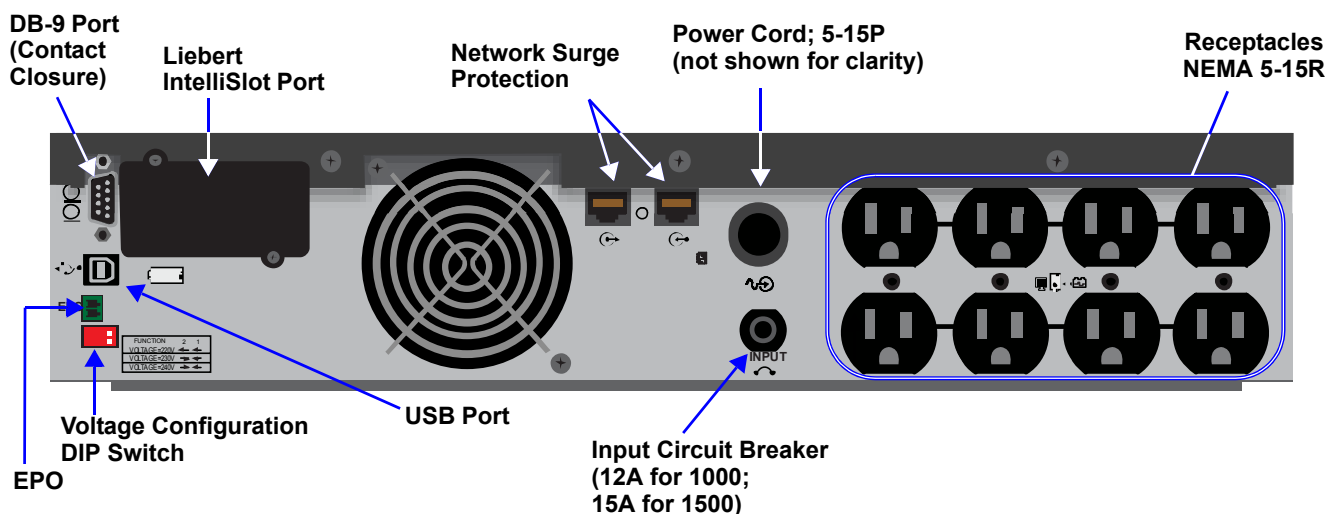




Figure 3 2200—rear view

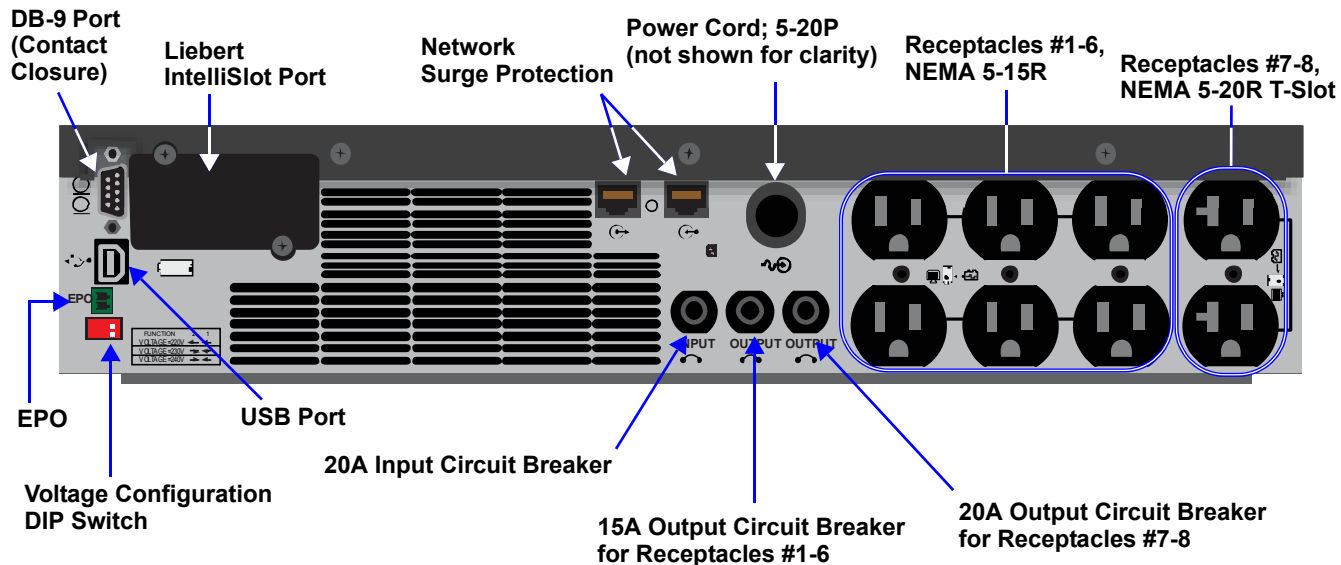
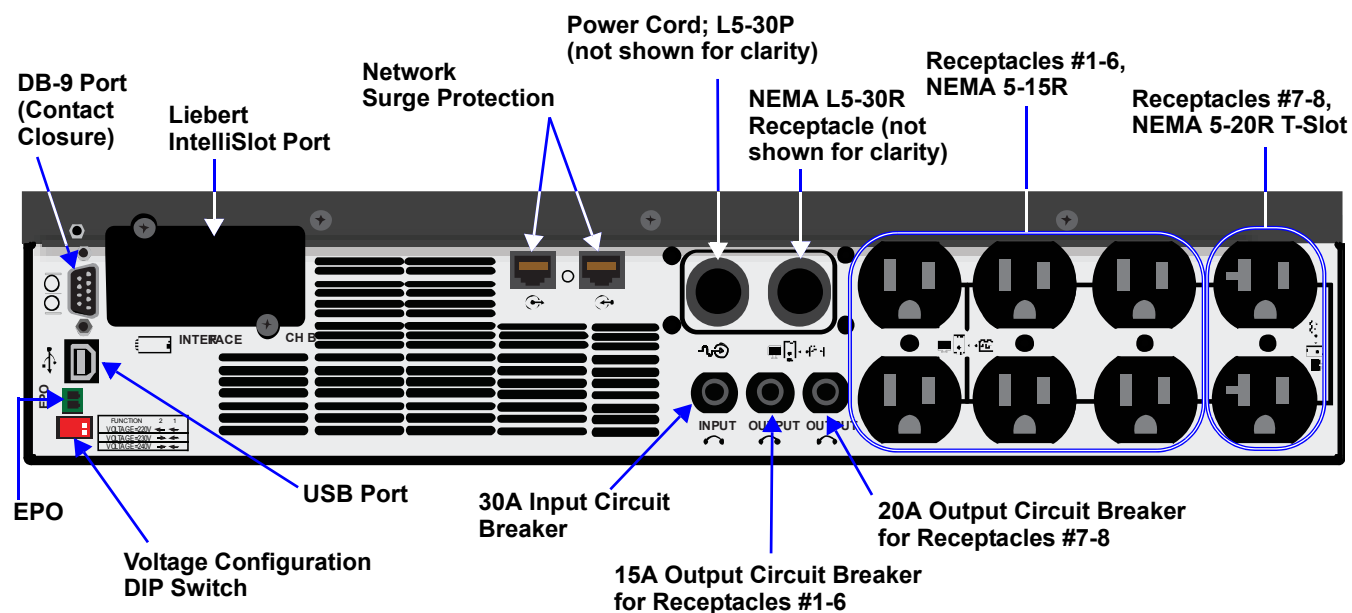


Figure 4 3000—rear view

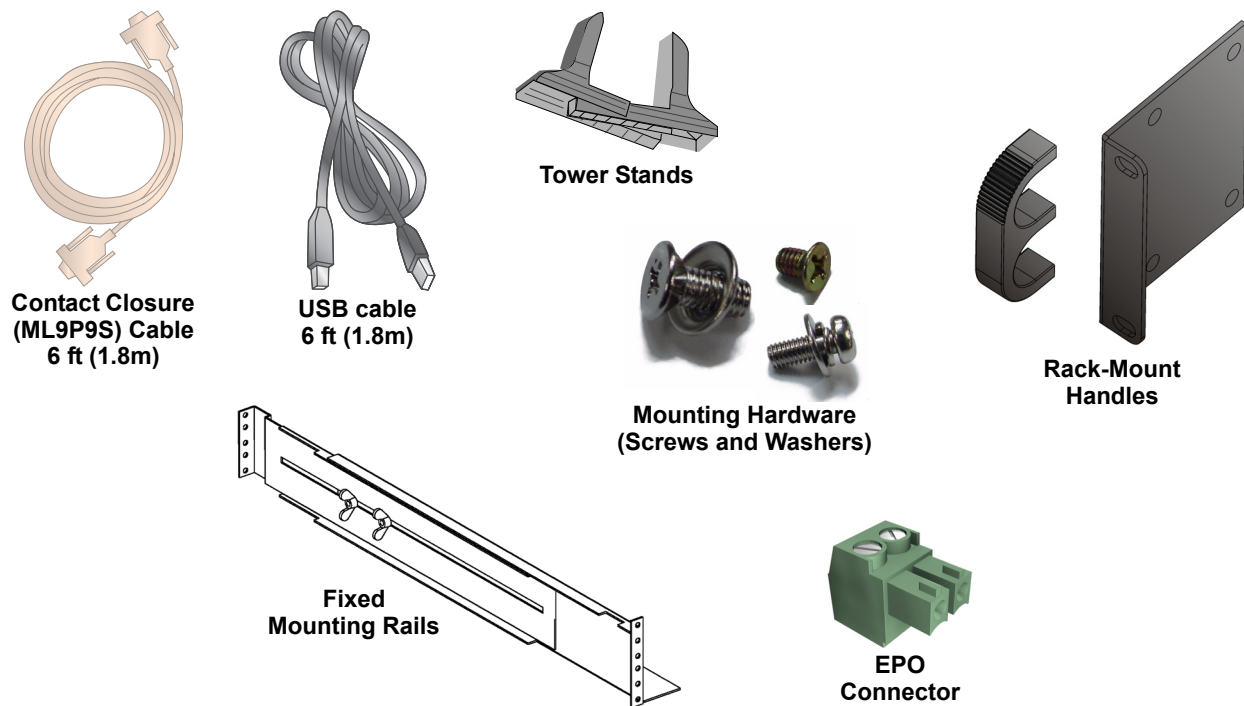


## 2.0 WHAT'S INCLUDED

The Liebert PSI is shipped with the following items:

- Multi-Language User Manual on CD
- Liebert MultiLink Software and User Manual, downloadable at [multilink.liebert.com](http://multilink.liebert.com)
- Contact Closure (ML9P9S) Cable
- USB Cable
- Tower Stands
- Mounting Hardware
- Rack-Mount Handles
- Fixed Mounting Rails
- EPO Connector

**Figure 5 Accessories**



## 3.0 INSTALLATION

### 3.1 Preparation



## CAUTION

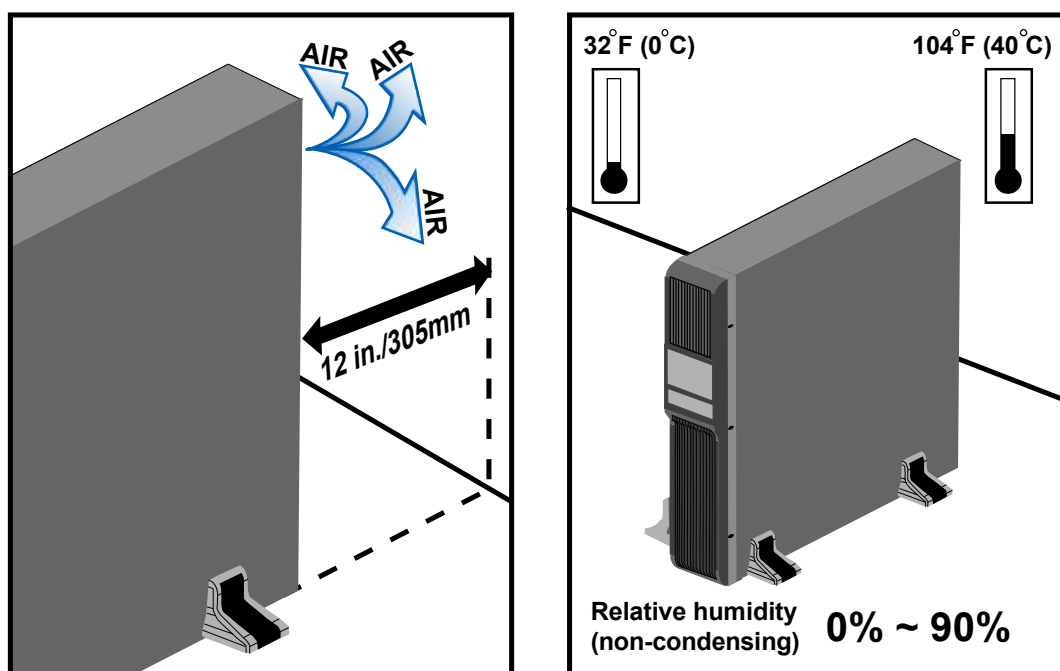
The UPS is heavy (see **Table 5**). Take proper precautions when lifting or moving it.

The Liebert PSI may be installed in either a tower or rack configuration. Determine the method that suits the application and proceed.

Decide where to install the Liebert PSI. The UPS must be installed indoors in a controlled environment. Place it in an area with unrestricted airflow around the unit, away from water, flammable liquids, gases, corrosives and conductive contaminants (see **Figure 6**).

Maintain a minimum clearance of 12 inches (305mm) in the front and rear of the UPS. Maintain an ambient temperature range of 32°F to 104°F (0°C to 40°C).

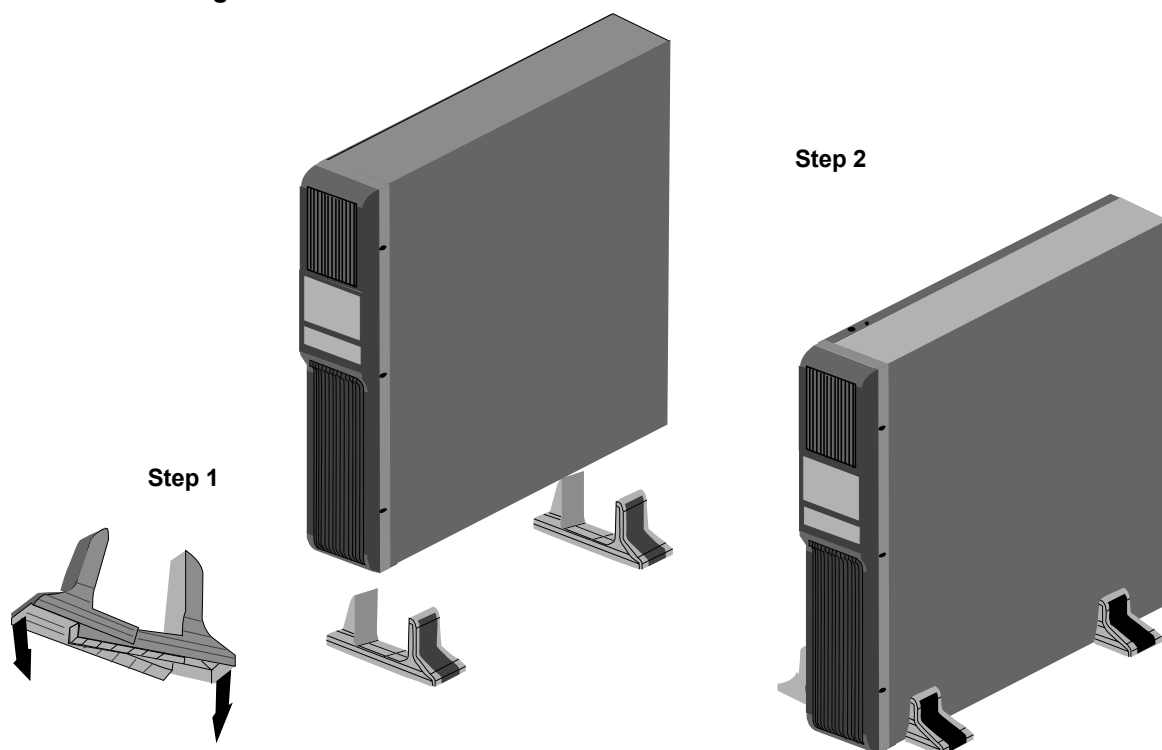
**Figure 6** Placing the Liebert PSI



## 3.2 Tower UPS Installation

See **Figure 7** when using the Liebert PSI in a tower configuration.

**Figure 7** Tower configuration—attach Tower Stands



### 3.3 Rack-Mount UPS Conversion and Installation

See **Figure 8** when installing the Liebert PSI in a rack.

**Figure 8** Convert the Liebert PSI for rack installation

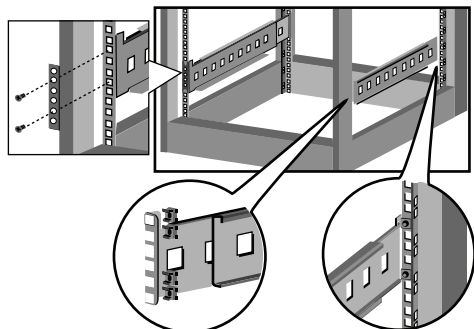
**Step 1**



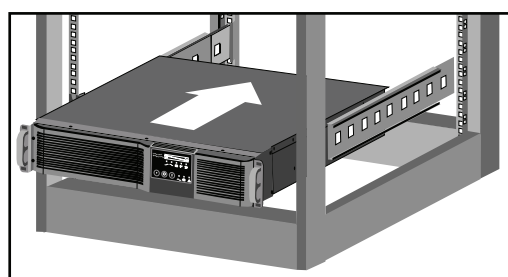
**Step 2**



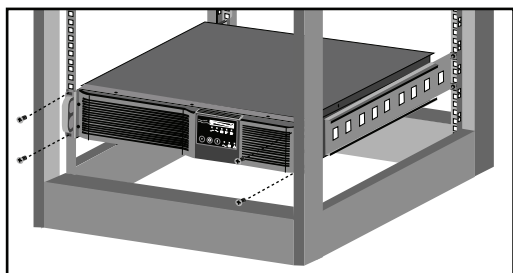
**Step 3**



**Step 4**



**Step 5**



#### **WARNING**

Placing heavy equipment near the top of a rack may increase the risk of tipping. Place the UPS in the bottom of the rack.



#### **CAUTION**

Lifting equipment into rack may be a two-person job, depending on weight of equipment.

#### **NOTICE**

When rack-mounted, the UPS must be supported by a shelf, slide rails, brackets or fixed rails on each side. The rack-mount handles **WILL NOT** support the weight of the UPS. They are used to move the UPS into and out of the rack.

### 3.4 Orient Display for Installation

The Liebert PSI features a rotating display that may be oriented for either tower or rack installations.

To set the display for your installation, pull out on the display and rotate it until it is oriented correctly, then press it into the UPS until it is seated.

**Figure 9** Orienting the UPS display



### 3.5 Charge Batteries and Perform Battery Startup

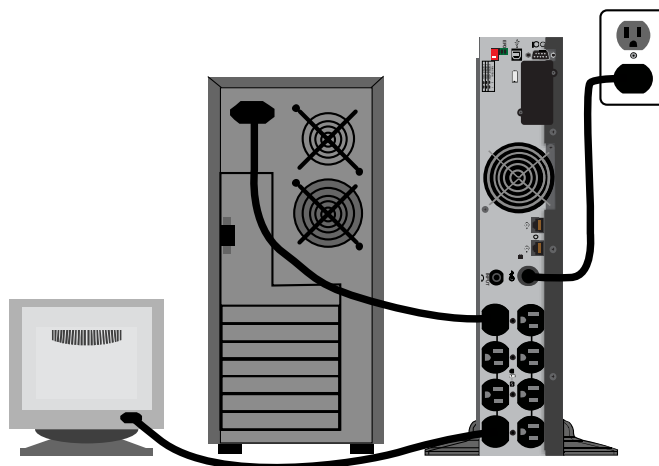
Before connecting input power or connecting the load, Emerson recommends these steps:

- Charge the battery for at least 8 hours.
- Start the UPS on battery to ensure the battery is fully functional and charged.
- Turn the unit Off and proceed to **3.6 - Connect Input Power and Load**.

### 3.6 Connect Input Power and Load

Connect input power to the UPS, then plug the equipment into the outlets on the rear of the UPS. These UPS outlets provide battery backup and surge protection to the equipment when utility power fails, spikes or sags (see **Figure 10**).

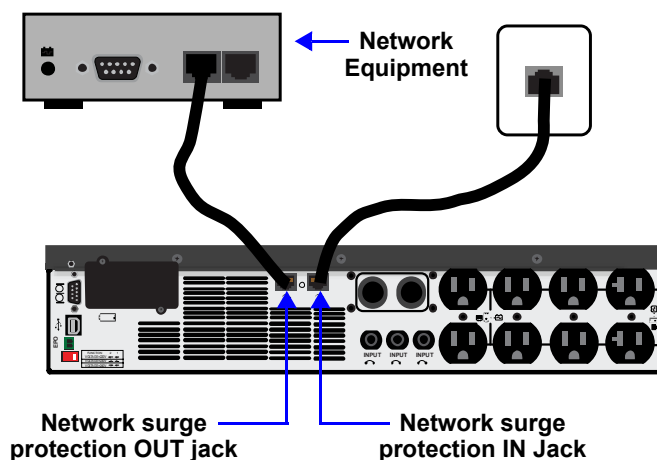
**Figure 10** Connect input power and load



### 3.7 Connect Network Surge protection

Connect a 10 base-T/100 network cable to the network surge protection IN jack on the rear of the UPS. Connect from the OUT jack with network cabling to network equipment (see **Figure 11**).

**Figure 11** Connect network surge protection



### 3.8 Connect Communication Interface

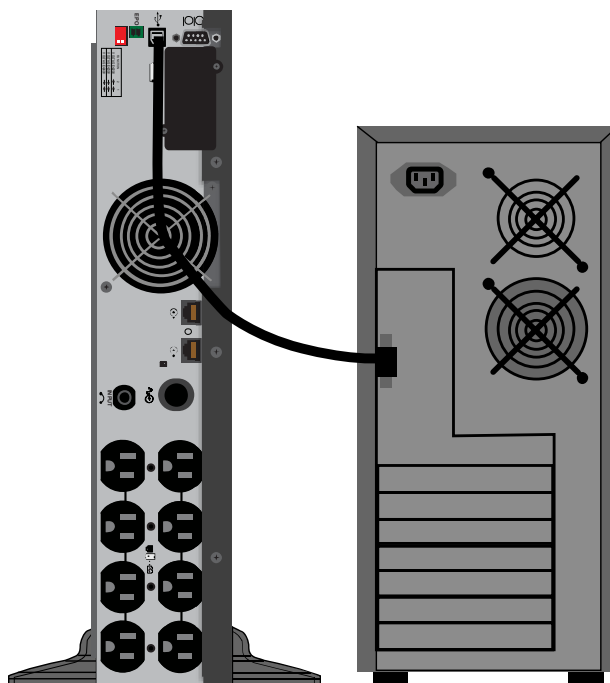
Determine what type of communication connection to use to manage the UPS. The Liebert PSI can be monitored with any of these communication methods:

- Contact closure
- USB
- SNMP (requires optional IS-WEBRT3 card)

Connect the appropriate, factory-supplied cable to the interface port on the rear of the UPS and to the computer interface port.

See **3.9 - Set Up Liebert MultiLink software** for details and installation information. Also refer to **6.4 - UPS Communications**.

**Figure 12** Connect communication interface



### 3.9 Set Up Liebert MultiLink software

To start using Liebert MultiLink (software and user manual available at [multilink.liebert.com](http://multilink.liebert.com)):

- Install the software.  
See the Liebert MultiLink quick-start guide or user manual for installation instructions.
- Connect one end of the USB cable (supplied) to the USB port on the rear of the UPS. Connect the other end to a USB port on the computer.  
See the Liebert MultiLink user manual for operating instructions.



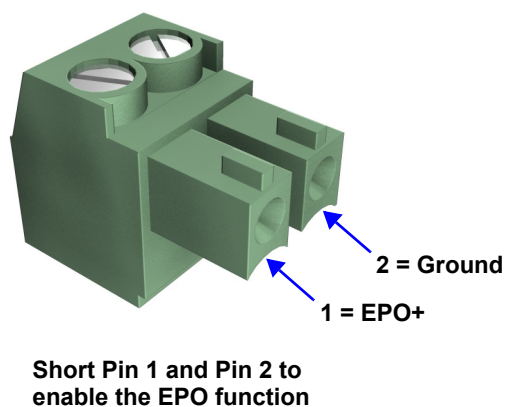
#### NOTE

*Emerson recommends connecting the USB cable directly to the computer **WITHOUT** using a USB hub.*

### 3.10 EPO Switch

The Liebert PSI is equipped with an Emergency Power Off (EPO) switch. The user must supply a means of interfacing with the EPO circuit to allow disconnecting the UPS input feeder breaker to interrupt all sources of power to the UPS and connected equipment to comply with national and local wiring codes and regulations.

**Figure 13 EPO connection for normally open operation**

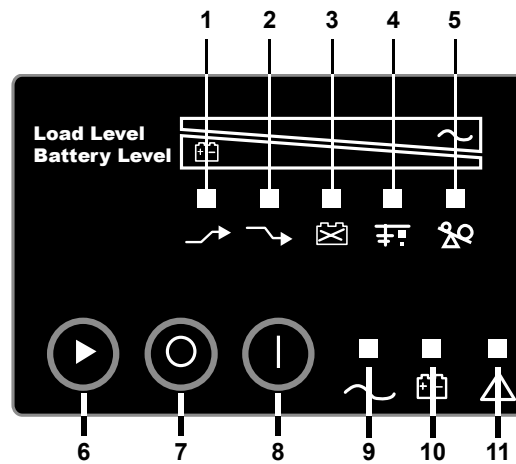




## 4.0 CONTROLS AND INDICATORS

Buttons on the front panel display control the Liebert PSI. Eight LEDs indicate the UPS's status. Refer to **Figure 14** and **Table 1**.

**Figure 14** Display and status indicators



**Table 1** Display and status indicators function, legend

| Item   | Name                 | Status Indicators           | Description                                                                     |
|--------|----------------------|-----------------------------|---------------------------------------------------------------------------------|
| 1      | LED 1                | AVR Boost                   | UPS Operation in AVR Boost Mode                                                 |
| 2      | LED 2                | AVR Buck                    | UPS Operation in AVR Buck Mode                                                  |
| 3      | LED 3                | Battery Condition           | Battery Fault/Weak                                                              |
| 4      | LED 4                | Grounding/Site Wiring Fault | UPS Grounding/Site Wiring Fault                                                 |
| 5      | LED 5                | Overload                    | UPS Overload                                                                    |
| 1 to 5 | Load/Battery Level   |                             | Indicate Load/Battery Level                                                     |
| 6      | Status Change Button |                             | Switches Display from Load Level Indicators to Battery Level Indicators         |
| 7      | OFF Button           |                             | UPS Off                                                                         |
| 8      | ON Button            |                             | Turn on UPS, Manual Self-Diagnostic (Normal Mode), Silence Alarm (Battery Mode) |
| 9      | LED 9                | Normal Mode                 | UPS Operation in Normal Mode                                                    |
| 10     | LED 10               | Battery Mode                | UPS Operation in Battery Mode                                                   |
| 11     | LED 11               | UPS Fault                   | UPS Fault                                                                       |

## 4.1 Control Buttons



### 4.1.1 On/Alarm Silence/Manual Self-Diagnostic Test

This button controls output power to connected load(s). It has three functions:

- On
- Alarm Silence
- Manual Self-Diagnostic Test

**ON**—Start the UPS by pressing this button for more than 3 seconds, then releasing the button (an alarm will sound briefly). If the ON button is pressed and utility is outside input parameters, the UPS will start on battery (dark start).

**Alarm Silence**—Silence a battery mode audible alarm by pressing this button for longer than one second, then releasing it.

**Manual Self-Diagnostic Test**—To initiate a Manual Self-Diagnostic, press this button for at least three (3) seconds while operating from utility power. UPS will switch to Battery Mode to detect battery voltage and whether the UPS is operating normally.

**If LED indicates the battery is weak:** Allow the UPS to recharge the batteries for 8 hours. Retest the battery after recharge.

If LED still indicates the battery is weak after the battery has been retested, contact your local dealer, local Emerson representative or Channel Support Applications.

**If LED indicates a Battery Fault:** Contact your local dealer, local Emerson representative or Channel Support Applications.

**If LED indicates a UPS Fault:** Remove the load, retest the self diagnostic test, if LED indicated UPS Fault, Contact your local dealer, local Emerson representative or Channel Support Applications.



#### NOTE

Refer to **Figure 14** and **Table 1** for details about the LEDs' meaning.



### 4.1.2 Off Button

When the UPS is operating in either Normal Mode or Battery Mode, pressing the Off button for more than three seconds will shut down the UPS.

## 4.2 Status Indicators



### 4.2.1 Status Change Button

The Status Change button determines the information displayed by the five LEDs on the front panel. The default information shown by the LEDs is the load level on the UPS. Pressing the Status Change button while the UPS is On prompts the LED display to show battery capacity for 5 seconds. This function assists in assessing the meaning of status indicators as described in **4.2.4 - UPS Status Indicators**. See **Figure 14** and **Table 1** for the Status Change button's location.

### 4.2.2 Load Level Indicator

The five LEDs at the top of the front panel illuminate with a steady glow to indicate the load level on the output of the UPS. The LEDs show the load level as a range,  $\pm 5\%$ . The LEDs' load level meanings and colors are:

| LED 1          | LED 2          | LED 3           | LED 4           | LED 5                 |
|----------------|----------------|-----------------|-----------------|-----------------------|
| 10-24% — Green | 25-49% — Green | 50-74% — Yellow | 75-99% — Yellow | 100% or greater — Red |

### 4.2.3 Battery Level Indicator

The five LEDs illuminate with a steady glow to indicate battery capacity. Battery capacity is shown for five seconds after the Status Change button is pressed. The LEDs show the battery capacity as a range,  $\pm 5\%$ . The LEDs' battery level meanings and colors are:

| LED 1           | LED 2          | LED 3           | LED 4           | LED 5             |
|-----------------|----------------|-----------------|-----------------|-------------------|
| 100-76% — Green | 75-51% — Green | 50-26% — Yellow | 25-11% — Yellow | 10% or less — Red |

### 4.2.4 UPS Status Indicators

LEDs on the display panel illuminate with a steady glow or flash to indicate the UPS's status:

**Normal Mode**—The Normal Mode indicator illuminates (LED 9) with a steady glow when utility power is available and within the input specifications.

**Battery Mode**—The Battery Indicator illuminates (LED 10) with a steady glow when the UPS is operating on battery.

**AVR Boost, AVR Buck**—When the UPS is in AVR Boost/Buck Mode, the LED display will indicate the relative load level on the output of the UPS and will flash LED 1 (boost) or LED 2 (buck) to indicate which mode the UPS is in.

**Weak Battery**—When the UPS battery voltage is low, the LED display will indicate the relative load level on the output of the UPS and LED 3 will flash as a warning.

**Site-Wiring Fault**—In case of a site-wiring fault, the LED display will indicate the relative load level on the output of the UPS and LED 4 will flash as a warning.

**Overload**—When UPS operates in overload status, the LED display will indicate the relative load level on the output of the UPS and LED 5 will flash as a warning.

**Table 2 Status indicators—color, illumination mode**

| Status                       | LED 1         | LED 2         | LED 3          | LED 4          | LED 5       | LED 9        | LED 10        | LED 11     |
|------------------------------|---------------|---------------|----------------|----------------|-------------|--------------|---------------|------------|
| Normal Mode                  |               |               |                |                |             | Green Steady |               |            |
| AVR Boost                    | Green Flashes |               |                |                |             | Green Steady |               |            |
| AVR Buck                     |               | Green Flashes |                |                |             | Green Steady |               |            |
| Battery Mode (dark start)    |               |               |                |                |             |              | Yellow Steady |            |
| Weak Battery                 |               |               | Yellow Flashes |                |             |              |               |            |
| Site-Wiring Fault            |               |               |                | Yellow Flashes |             |              |               |            |
| Overload                     |               |               |                |                | Red Flashes |              |               |            |
| Battery Fault Shutdown       |               |               | Yellow Steady  |                |             |              |               | Red Steady |
| Overload Shutdown            |               |               |                |                | Red Steady  |              |               | Red Steady |
| UPS Output Abnormal Shutdown |               |               |                |                |             |              | Yellow Steady | Red Steady |

## 5.0 OPERATIONAL MODES

---

### 5.1 Normal Mode

When the UPS is in Normal Mode, the Normal Mode Indicator illuminates green.

### 5.2 Buck/Boost Mode

The Automatic Voltage Regulator (AVR) circuitry compensates for fluctuations in utility power, such as voltage surges and sags. When the Liebert PSI detects an abnormality, it raises the undervoltage (boost) or lowers the overvoltage (buck) as needed. The AVR operates automatically and maintains the output voltage to the connected equipment, without utilizing the batteries.

LED 1 flashes green and LED 9 illuminates steady green when the UPS is in Boost Mode. LED 2 flashes green and LED 9 illuminates steady green when the UPS is in Buck Mode (see **9.0 - Troubleshooting** for details).

### 5.3 Battery Mode

The UPS switches to Battery Mode in the event of an extreme input voltage/frequency condition or utility failure.

When the UPS is in Battery Mode, the Battery Indicator illuminates amber and an alarm sounds at two-second intervals. As capacity decreases, fewer indicators remain illuminated.

When a Low Battery condition occurs, the Battery Indicator flashes amber and an alarm sounds at one-second intervals. Refer to **Table 6** for approximate battery run times.

### 5.4 Battery Recharge Operation

Once utility power is restored, the UPS resumes normal operation and the Battery Charger begins recharging the batteries.

## 6.0 COMMUNICATION

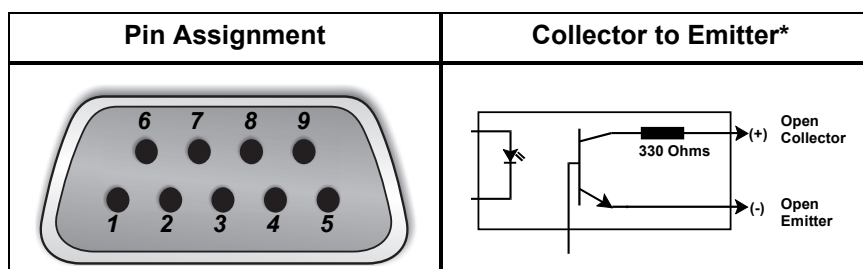
### 6.1 DB-9 Connector

The UPS has a DB-9 (9 pin female) connector on the rear to allow UPS status communications with a computer running Liebert MultiLink software in contact closure mode. The connection provides On Battery and Low Battery notification.

When power is interrupted and battery power is low, Liebert MultiLink software can signal the host computer to gracefully shut down the operating system.

**Table 3 DB-9 pin assignment**

| DB-9 Pin | Assignment Description                                         |
|----------|----------------------------------------------------------------|
| 1        | Low Battery (open collector)                                   |
| 2        | UPS TxD (not used)                                             |
| 3        | UPS RxD (not used)                                             |
| 4        | Remote Shutdown (5-12V); on-battery operation                  |
| 5        | Common                                                         |
| 6        | Output Off, (short to Pin 5, non-latching); any mode operation |
| 7        | Low Battery (open emitter)                                     |
| 8        | Utility Fail (open emitter)                                    |
| 9        | Utility Fail (open collector)                                  |



### 6.2 Remote Shutdown Via the DB-9 Connector

The Liebert PSI can be shut down remotely by shorting Pins 5 and 6 or via Pins 4 and 5 of the DB-9 connector.

#### 6.2.1 Any Mode Shutdown Via Pins 5 & 6

When Pin 6 is shorted to Pin 5, the UPS output is shut Off no matter what mode the UPS is operating in. The UPS cannot be started as long as the pins are shorted. When the short is removed, the UPS output can be enabled by pressing the ON/Alarm Silence/Manual Self-Diagnostic Test button.

#### 6.2.2 Battery Mode Shutdown Via Pins 4 & 5

While the UPS is operating on battery, a 5-12VDC signal for 2 seconds or longer is required to signal a shutdown. Signals for less than 2 seconds are ignored.

After Pin 4 receives the shutdown signal, a 2-minute shutdown timer begins a countdown. The shutdown timer cannot be stopped: If utility power returns during the 2-minute countdown, the shutdown timer continues until the end of 2 minutes and the UPS turns Off. The UPS will restart 10 seconds after utility power returns.

### 6.3 Network Surge Protection Connectors

Network (in and out) connectors on the rear of the UPS provide transient voltage surge suppression (TVSS) for network devices.

## 6.4 UPS Communications

The Liebert PSI is equipped with a Liebert IntelliSlot port to provide advanced communication and monitoring options.

Liebert MultiLink software continually monitors the UPS and can shut down your computer or server via USB, contact closure and SNMP (via IS-WEBRT3 card) in the event of an extended power failure.

The Liebert IS-WEBRT3 provides SNMP and Web-based monitoring and control of the UPS across the network.



### NOTE

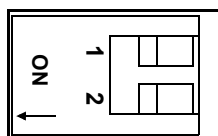
*The USB, SNMP and contact closure communications can operate in parallel.*

## 6.5 UPS Inverter/Transfer Voltage Configurations

A two-pin DIP switch on the rear of the PSI permits setting the UPS to operate at nominal voltages of 110V, 120V or 127V. This feature will change the high and low points at which the UPS switches to battery power. It also changes the UPS' output voltage when the UPS is operating in battery mode. The factory default setting is 120 VAC.

Turn Off the UPS before making any changes to the voltage configuration.

**Figure 15 DIP switch settings for 120V system**



| FUNCTION       | 2 | 1 |
|----------------|---|---|
| Voltage = 110V | ← | → |
| Voltage = 120V | ← | ← |
| Voltage = 120V | → | → |
| Voltage = 127V | → | ← |

**Table 4 Voltage configurations**

| Setting | Input Voltage Range | Output Voltage (Battery Mode) |
|---------|---------------------|-------------------------------|
| 110     | 83~138              | 110VAC                        |
| 120     | 90~150              | 120VAC                        |
| 127     | 96~159              | 127VAC                        |

## 7.0 BATTERY MAINTENANCE

### 7.1 Battery Charging, Storage

The batteries are valve-regulated, nonspillable, lead acid and must be kept charged to retain their design life. The Liebert PSI continuously charges the batteries when connected to the utility supply, even while the UPS is switched Off.

If the Liebert PSI will be stored for an extended period, Emerson recommends connecting the UPS to input power for at least 8 hours every four to six months to keep the batteries charged.

Emerson recommends performing a monthly manual self-diagnostic test via the Web card or the front panel display.

### 7.2 Internal Battery Replacement Procedure

#### NOTICE

This UPS is equipped with internal batteries that the user can replace without shutting down the UPS or connected loads (hot swappable). Caution must be exercised when replacing the batteries because the load is unprotected from power fluctuations and power failures.

To replace the batteries:

1. Remove the two screws on the left side of the front bezel.
2. Pull the front bezel off the UPS.
3. Remove the screw on the battery connector holder.
4. Remove the two screws on the battery bracket.
5. Disconnect the two slotted, red/gray and black battery connectors.
6. Grasp the battery pack assembly by the handle and pull it out of the front of the UPS.
7. Unpack the new battery assembly, taking care not to destroy the packing.
8. Compare the new and old battery assemblies to make sure they are the same. If so, proceed with replacement. If they are different, STOP and contact your local dealer, local Emerson representative or Channel Support Applications.
9. Slide the new battery pack into the UPS.
10. Reattach the battery bracket with the two screws.
11. Reconnect the slotted, red/gray and black battery connectors.
12. Reinsert the screw on the battery connector holder.
13. Reattach the front bezel.

**Figure 16 Battery replacement**

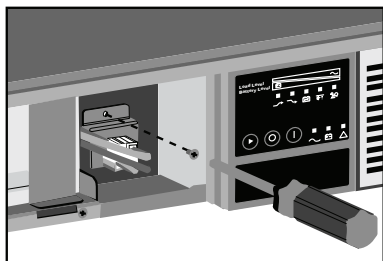
**Step 1**



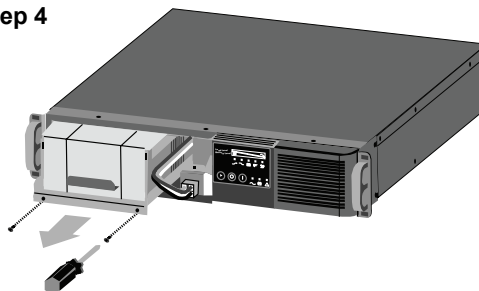
**Step 2**



**Step 3**



**Step 4**



## 8.0 SPECIFICATIONS

**Table 5 Liebert PSI specifications**

| Model Number                               | PS1000RT3-120<br>PS3000RT3-120W                                            | PS1500RT3-120<br>PS1500RT3-120W                         | PS2200RT3-120<br>PS2200RT3-120W                      | PS3000RT3-120<br>PS3000RT3-120W                                         |
|--------------------------------------------|----------------------------------------------------------------------------|---------------------------------------------------------|------------------------------------------------------|-------------------------------------------------------------------------|
| Power Rating, VA/W                         | 1000VA/900W                                                                | 1500VA/1350W                                            | 1920VA/1920W                                         | 3000VA/2700W                                                            |
| Dimensions, W x D x H, in (mm)             |                                                                            |                                                         |                                                      |                                                                         |
| Unit                                       | 17.3 x 16.2 x 3.5<br>(440 x 412 x 88)                                      |                                                         | 17.3 x 25.9 x 3.5<br>(440 x 657 x 88)                |                                                                         |
| Shipping                                   | 22 x 23.4 x 9<br>(560 x 595 x 228)                                         |                                                         | 22 x 33 x 9<br>(560 x 839 x 228)                     |                                                                         |
| Weight, lb (kg)                            |                                                                            |                                                         |                                                      |                                                                         |
| Unit                                       | 43 (20)                                                                    | 47 (21)                                                 | 76 (35)                                              | 84 (38)                                                                 |
| Shipping                                   | 51 (23)                                                                    | 54 (25)                                                 | 84 (38)                                              | 93 (42)                                                                 |
| Input AC Parameters                        |                                                                            |                                                         |                                                      |                                                                         |
| Surge Protection                           | 570J                                                                       |                                                         |                                                      |                                                                         |
| Voltage Range<br>Without Battery Operation | 83~159 VAC, Configurable                                                   |                                                         |                                                      |                                                                         |
| Frequency Range                            | 45~65Hz, (±0.5Hz)                                                          |                                                         |                                                      |                                                                         |
| Input Power Cord<br>10ft (3m) Attached     | NEMA 5-15P Plug                                                            |                                                         | NEMA 5-20P Plug                                      | NEMA L5-30P Plug                                                        |
| Output Receptacles                         | (8) NEMA 5-15R                                                             |                                                         | (6) NEMA 5-15R<br>(2) NEMA 5-20R,<br>accepts15A Plug | (6) NEMA 5-15R<br>(2) NEMA 5-20R,<br>accepts15A Plug<br>(1) NEMA L5-30R |
| Voltage (Normal mode)                      | 110 / 120 / 127 VAC (configurable) ±10%                                    |                                                         |                                                      |                                                                         |
| Voltage (Battery Mode)                     | 110 / 120 / 127 VAC, configurable<br>±5% Before Low Battery Warning        |                                                         |                                                      |                                                                         |
| Transfer Time                              | 4-6 ms, Typical                                                            |                                                         |                                                      |                                                                         |
| Waveform                                   | Sinewave                                                                   |                                                         |                                                      |                                                                         |
| Frequency, Normal Mode                     | 45~65Hz, (±0.5Hz)                                                          |                                                         |                                                      |                                                                         |
| Frequency, Battery Mode                    | 50/60Hz, (±0.5Hz), Auto Sensing                                            |                                                         |                                                      |                                                                         |
| Overload Warning                           |                                                                            |                                                         |                                                      |                                                                         |
| Normal Mode                                | >100% - 109%                                                               | Continuous Overload Alarm and Power to the Load         |                                                      |                                                                         |
|                                            | >110% - 120%                                                               | Shut down after 10 minutes                              |                                                      |                                                                         |
|                                            | >120%                                                                      | Shut down UPS immediately                               |                                                      |                                                                         |
| Battery Mode                               | >100% - 119%                                                               | Continuous Overload Alarm Till End of Battery Discharge |                                                      |                                                                         |
|                                            | >120% - 130%                                                               | Shut down after 10 seconds                              |                                                      |                                                                         |
|                                            | >130%                                                                      | Shut down UPS immediately                               |                                                      |                                                                         |
| Battery Parameters                         |                                                                            |                                                         |                                                      |                                                                         |
| Type                                       | Valve-Regulated, Nonspillable, Lead Acid                                   |                                                         |                                                      |                                                                         |
| Quantity x Voltage x Ah                    | 3 x 12 x 7.2                                                               | 3 x 12 x 9                                              | 6 x 12 x 7.2                                         | 6 x 12 x 9                                                              |
| Backup Time                                | See <b>Table 6</b>                                                         |                                                         |                                                      |                                                                         |
| Recharge Time                              | 5 Hours to 90% of Rated Capacity, After Full Discharge Into Resistive Load |                                                         |                                                      |                                                                         |

\* NEC limits the input current rating of the PS2200RT3-120 and PS2200RT3120W models to 80% of the input plug's rating.  
Up to 2200VA/1980W is available by contacting a certified electrician to change the input plug to 30A plug.  
Emerson Network Power assumes no liability for damage caused by miswiring or misapplication of the input plug.



**Table 5** Liebert PSI specifications (*continued*)

| Model Number              | PS1000RT3-120<br>PS3000RT3-120W                                                                        | PS1500RT3-120<br>PS1500RT3-120W | PS2200RT3-120<br>PS2200RT3-120W | PS3000RT3-120<br>PS3000RT3-120W |
|---------------------------|--------------------------------------------------------------------------------------------------------|---------------------------------|---------------------------------|---------------------------------|
| Power Rating, VA/W        | 1000VA/900W                                                                                            | 1500VA/1350W                    | 1920VA/1920W                    | 3000VA/2700W                    |
| Environmental             |                                                                                                        |                                 |                                 |                                 |
| Operating Temperature     | 32°F to 104°F (0°C to 40°C)                                                                            |                                 |                                 |                                 |
| Storage Temperature       | 5°F to 104°F (-15°C to 40°C)                                                                           |                                 |                                 |                                 |
| Relative Humidity         | 0% to 90%, non-condensing                                                                              |                                 |                                 |                                 |
| Operating Altitude        | Up to 10,000 ft. (3000m) at 95°F (35°C) without derating                                               |                                 |                                 |                                 |
| Audible Noise             | <45 dBA                                                                                                |                                 |                                 |                                 |
| Agency                    |                                                                                                        |                                 |                                 |                                 |
| Safety                    | UL 1778, c-UL Listed                                                                                   |                                 |                                 |                                 |
| Surge                     | ANSI C62.41 CatA Lev3 (surges)<br>IEC61000-4-5                                                         |                                 |                                 |                                 |
| ESD                       | IEC61000-4-2                                                                                           |                                 |                                 |                                 |
| Susceptibility            | IEC61000-4-3                                                                                           |                                 |                                 |                                 |
| Electrical Fast Transient | IEC61000-4-4                                                                                           |                                 |                                 |                                 |
| Emissions                 | FCC Part 15, Class A                                                                                   |                                 |                                 |                                 |
| Conducted Immunity        | IEC61000-4-6                                                                                           |                                 |                                 |                                 |
| Harmonics                 | IEC61000-3-2                                                                                           |                                 |                                 |                                 |
| Network surge             | UL 497 B                                                                                               |                                 |                                 |                                 |
| Transportation            | ISTA Procedure 1A Certification                                                                        |                                 |                                 |                                 |
| Environmental             | ROHS compliant<br> |                                 |                                 |                                 |

**Table 6** Liebert PSI 1000-3000 battery run times

|                         | Load % | 1000 | 1500 | 2200 | 3000 |
|-------------------------|--------|------|------|------|------|
| <b>Internal Battery</b> | 10     | 93   | 76   | 82   | 76   |
|                         | 20     | 47   | 32   | 44   | 32   |
|                         | 30     | 26   | 17   | 19   | 17   |
|                         | 40     | 15   | 12   | 14   | 12   |
|                         | 50     | 12   | 9    | 11   | 9    |
|                         | 60     | 9    | 7    | 9    | 7    |
|                         | 70     | 7    | 5    | 7    | 5    |
|                         | 80     | 6    | 4    | 5    | 4    |
|                         | 90     | 5    | 3    | 4    | 3    |
|                         | 100    | 4    | 3    | 3    | 3    |

**Note:** All run times are in minutes, assume fully charged batteries and are typical at 77°F (25°C) with resistive loads.

## 9.0 TROUBLESHOOTING

The information below indicates various symptoms a user may encounter if the Liebert PSI experiences a problem. See **Table 7** for suggested solutions.

1. An alarm sounds, alerting that the UPS requires attention. The alarm can be silenced except for low battery, overload warning and fault.
2. One or more additional indicators will be illuminated to provide a diagnostic aid to the operator, as described below:

If the UPS fails to operate properly, turn Off the unit and repeat the steps in **3.0 - Installation**. If the problem persists, refer to **Table 7**.

**Table 7 Troubleshooting—problems, causes and solutions**

| Problem                                                       | Cause                                                                                         | Solution                                                                                                                                                                                                   |
|---------------------------------------------------------------|-----------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| UPS will not start                                            | Short circuit                                                                                 | Check the circuit breaker on the rear of the UPS.<br>If it is tripped, reset it and restart the UPS.<br>For help, contact your local dealer, local Emerson representative or Channel Support Applications. |
|                                                               | Battery is disconnected or completely discharged                                              | Check for proper connection of battery or batteries.                                                                                                                                                       |
| UPS starts on battery, but will not switch to AC (dark start) | UPS not plugged in                                                                            | Plug in the power cord securely.                                                                                                                                                                           |
|                                                               | Circuit breaker tripped                                                                       | Reset the circuit breaker and restart the UPS.                                                                                                                                                             |
|                                                               | AC overvoltage                                                                                | Wait until voltage drops to an appropriate level or have the utility power checked by a properly trained and qualified electrician.                                                                        |
| UPS shuts down                                                | Short circuit or UPS output is abnormal; LED 10 and LED 11 illuminate and sound audible alarm | Remove the load and turn on the UPS again. For help, contact your local dealer, local Emerson representative or Channel Support Applications.                                                              |
|                                                               | Overload; LED 5 and LED 11 illuminate and sound audible alarm                                 | Check load level display and remove nonessential loads. Recalculate the load and reduce equipment connected to UPS - the total wattage must not exceed the capacity of the UPS.                            |
|                                                               | LED 3 and LED 11 illuminate and sound audible alarm                                           | Recharge the battery for 8 hours, then turn ON the UPS.                                                                                                                                                    |
|                                                               | Liebert MultiLink software                                                                    | Consult the Liebert MultiLink user manual or contact your LAN administrator.                                                                                                                               |
| Site Wiring Fault LED (LED 4) flashing                        | Site Wiring Fault, UPS detected a line-to-neutral reversal or a loss of proper grounding.     | Have the utility checked by a properly trained and qualified electrician.                                                                                                                                  |
| Battery weak LED (LED 3) flashing                             | Batteries weak                                                                                | Recharge batteries.                                                                                                                                                                                        |
|                                                               | Batteries need to be replaced                                                                 | Replace batteries.                                                                                                                                                                                         |



### NOTE

*The PS2200RT3-120 UPS will sound an Overload alarm under certain Low Line conditions when it is fully loaded and it exceeds the input current rating. Unless the load is reduced, the condition will trip the branch circuit breaker.*



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