

|                          |                                       |                                                                              |                                                                                                                                                                        |
|--------------------------|---------------------------------------|------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Revision:</b><br>---- | <b>Document Code:</b><br>WI- ML- 2754 | <b>Document Title:</b> Standard Operating Procedure (SOP)<br>For Faratel UPS |  <p>دانشگاه علوم پزشکی<br/>و خدمات بهداشتی و درمانی استان تهران<br/>دانشکده پزشکی</p> |
|--------------------------|---------------------------------------|------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

## Standard Operating Procedure: Uninterruptible Power Supply (UPS)

**Manufacturer:** Faratel (Made in Iran)

**Series:** Smart Sine Plus (SSP)

**Models:** SSP1500X-RT, SSP2000X-RT, SSP1500B-RT, SSP3000X-RT

### 1. Purpose

To define the standard procedures for the installation, operation, load management, and maintenance of the **Faratel Smart Sine Plus UPS** series to ensure continuous power supply and protection of sensitive laboratory electronic equipment against voltage fluctuations and power outages.

### 2. Scope of Operation

The UPS is designed to protect laboratory equipment by providing regulated power and battery backup. Its application range varies based on the specific model and connected load requirements.

### 3. Responsibility

Execution and compliance with this protocol are the responsibility of the laboratory technicians and electrical maintenance personnel.

### 4. Operating Procedure

#### A. Installation and Placement

- Environment:** Install the UPS in an indoor environment. It must be kept away from heat sources, rain, moisture, acidic vapors, and excessive dust.
- Ventilation:** Maintain a minimum clearance of  $10\text{ cm}$  from adjacent objects to ensure adequate airflow and heat dissipation.
- Stability:** Place the unit on a flat, stable surface. If installed in a rack or on a battery cabinet, ensure it is securely and properly mounted.
- Cable Safety:** Ensure that communication and power cables between the UPS and the battery cabinet are not placed in high-traffic walkways to prevent physical damage or tripping hazards.

#### B. Load Calculation and Electrical Setup

##### 1. Load Calculation (VA):

- Locate the electrical specification label on the rear of each device.

|                    |                |                                    |                          |
|--------------------|----------------|------------------------------------|--------------------------|
| تاریخ اجرا:        | تصویب کننده:   | تأیید کننده: دکتر محمدرضا عربستانی | تهیه کننده: رضوان گودرزی |
| تاریخ بازنگری:     | سمت:           | سمت: مدیر گروه میکروپ شناسی        | سمت: کارشناس آزمایشگاه   |
| شماره صفحه: ۱ از ۲ | تاریخ و امضاء: | تاریخ و امضاء:                     | تاریخ و امضاء:           |

|                   |                                |                                                                       |                                                                                                                                                                     |
|-------------------|--------------------------------|-----------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Revision:<br>---- | Document Code:<br>WI- ML- 2754 | Document Title: Standard Operating Procedure (SOP)<br>For Faratel UPS |  <p>دانشگاه علوم پزشکی<br/>و خدمات بهداشتی و درمانی آستان قدس<br/>و امام خمینی</p> |
|-------------------|--------------------------------|-----------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|

- Calculate the apparent power (VA) for each device:  $\text{Voltage (V)} \times \text{Current (A)} = \text{Power (VA)}$
- Total Load Rule:** Sum the VA of all connected devices. The total cumulative load **MUST NOT exceed the rated VA capacity** of the UPS.
- Grounding:** Ensure that the input power supply and all interconnecting cables are properly **grounded (Earthed)**.
- Electrical Isolation:** The input and output wiring circuits must be completely isolated. **DO NOT use a common neutral (Neutral-linked) wiring system**; the input phase/neutral and output phase/neutral must have no electrical connection between them.
- Connection:** Connect the UPS input cable to the mains power outlet.

### C. Initial Startup and Operation

- First-Time Commissioning:** If the UPS is being used for the first time, the batteries **must be charged for at least 10 hours** before turning the unit on. This can be done by simply connecting the UPS to the mains (charging occurs even if the unit is in “OFF” mode).
- Power On:** Press the **ON** button on the front panel until the alarm stops.
  - If the input voltage/frequency is within the permissible range, the UPS will operate in **Normal Mode**.
  - If the input power is unstable or absent, the UPS will automatically switch to **Battery Mode**.
- Power Off:** Press and hold the **OFF** button on the front panel for **3 seconds**.
  - Note:** In this state, the internal charger remains active to continue battery maintenance. To achieve a **complete shutdown**, disconnect the input plug from the mains after pressing OFF.

### D. Critical Device Constraints

- Consultation Required:** Before connecting any device other than a standard computer, consult with **Faratel Technical Support**.
- PROHIBITED DEVICES:** **NEVER** connect **Laser Printers** or **Plotters** to the UPS. These devices generate high current surges that can damage the UPS circuitry.

## 5. Safety Precautions

- Electrical Shock Hazard:** **NEVER** open the chassis of the UPS. Even when turned off, internal components and batteries carry high voltage that poses a risk of lethal electric shock.
- Battery Safety:** Do not touch the battery cabinet terminals. Avoid contact with the internal battery components due to the presence of corrosive acids which can cause skin and eye damage.
- Fire Prevention:** Keep batteries away from extreme heat, open flames, and combustible materials.

|                    |                |                                    |                          |
|--------------------|----------------|------------------------------------|--------------------------|
| تاریخ اجرا:        | تصویب کننده:   | تأیید کننده: دکتر محمدرضا عربستانی | تهیه کننده: رضوان گودرزی |
| تاریخ بازنگری:     | سمت:           | سمت: مدیر گروه میکروپ شناسی        | سمت: کارشناس آزمایشگاه   |
| شماره صفحه: ۱ از ۲ | تاریخ و امضاء: | تاریخ و امضاء:                     | تاریخ و امضاء:           |

|                          |                                       |                                                                              |                                                                                                                                                                                |
|--------------------------|---------------------------------------|------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Revision:</b><br>---- | <b>Document Code:</b><br>WI- ML- 2754 | <b>Document Title:</b> Standard Operating Procedure (SOP)<br>For Faratel UPS |  <p>دانشگاه علوم پزشکی<br/>و خدمات بهداشتی و درمانی استان خراسان<br/>شمالی<br/>واحد نرسکی</p> |
|--------------------------|---------------------------------------|------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

## 6. Maintenance and Care

### 1. Battery Maintenance Cycles (Temperature Dependent):

- If ambient temperature is between  $15^{\circ}\text{C}$  and  $30^{\circ}\text{C}$ : Perform a battery charge/test every **6 months**.
- If ambient temperature is between  $30^{\circ}\text{C}$  and  $45^{\circ}\text{C}$ : Perform a battery charge/test every **3 months**.

2. **Monthly Inspection:** Conduct a monthly review of all electrical connections. Ensure that input and output wires remain electrically isolated.

### 3. Cleaning Protocol:

- Use a slightly damp cloth to clean the exterior (except for the rear panel).
- **NEVER** spray liquid cleaning agents directly onto the device.
- Ensure that air vents and cooling fans are clean and unobstructed by dust or objects.

4. **Object Management:** Do not place any foreign objects or liquid containers on top of the UPS unit.

|                    |                |                                    |                          |
|--------------------|----------------|------------------------------------|--------------------------|
| تاریخ اجرا:        | تصویب کننده:   | تأیید کننده: دکتر محمدرضا عربستانی | تهیه کننده: رضوان گودرزی |
| تاریخ بازنگری:     | سمت:           | سمت: مدیر گروه میکروپ شناسی        | سمت: کارشناس آزمایشگاه   |
| شماره صفحه: ۱ از ۲ | تاریخ و امضاء: | تاریخ و امضاء:                     | تاریخ و امضاء:           |