



**UNINTERRUPTIBLE POWER SYSTEMS PERIPHERALS  
MAINTENANCE BYPASS CABINET  
MODULE BATTERY DISCONNECT, LOAD BUS SYNC  
POWER TIE  
SLIM LINE DISTRIBUTION CABINET  
SCOPE OF WORK**

**ESSENTIAL SERVICE (1)**

- Guaranteed 4-hour on-site emergency response, 7 days/week, 24 hours/day, within 150 miles of a Liebert Services' Service city.
- Includes 1-800-LIEBERT Customer Response Center.
- Includes 100% labor and travel coverage 7 days/week, 24 hours/day, within the 48 contiguous states and Hawaii.
- Includes 100% parts coverage (excluding circuit breakers).
- Performed by Liebert factory trained Customer Engineers.
- Includes access to Liebert Customer Services Network On-Line Internet portal.
- Includes one Annual Preventive Maintenance visit scheduled by the customer between 8am-5pm, Monday-Friday (excluding national holidays).
- Subject to all Terms & Conditions as noted in the Liebert Services Terms & Conditions or the terms of a Master Agreement between the parties, if any, shall apply.

**SERVICE PERFORMED**

**Full Preventive Maintenance Service**

1. Perform a complete visual inspection of the equipment, including sub-assemblies, wiring harnesses, contacts, cables and major components.
2. Check all mechanical connections for tightness and heat discoloration, making corrections where necessary.
3. Clean any foreign material and dust from internal compartments.
4. Perform a status check of alarm circuits. (If Applicable).
5. Calibration of the equipment to meet manufacturer's specifications (if applicable).
6. Operational checkout of the system to include transfers and proper status indications.
7. Check or perform Engineering Field Change Notices (FCN) as necessary.
8. Return unit to operational service with normal load then measure and verify display indications.

**Note1: Preventive Maintenance usually requires a shutdown to ensure electrical connection integrity.**



**UNINTERRUPTIBLE POWER SYSTEMS  
APM UPS ONLY  
SCOPE OF WORK**

**ESSENTIAL SERVICE (1)**

- Guaranteed 4-hour on-site emergency response, 7 days/week, 24 hours/day, within 150 miles of a Liebert Services' Service city.
- Includes 100% parts for the UPS (excluding air filters and proactive full bank capacitor replacement) and limited internal battery coverage (if applicable).
- Limited Internal Battery Coverage - Includes parts, labor and battery jars as required - up to 10% of the battery string per year (not accumulated over contract term).
- Includes 1-800-LIEBERT Customer Response Center.
- Includes 100% labor and travel coverage 7 days/week, 24 hours/day, within the 48 contiguous states and Hawaii.
- Includes access to Liebert Customer Services Network On-Line Internet portal.
- Includes battery recycling as required, with documentation meeting EPA requirements.
- Performed by Level I Liebert factory trained Customer Engineers.
- Includes one Annual Preventive Maintenance Service on the Liebert UPS and Liebert internal batteries scheduled by the customer between 8am-5pm, Monday - Friday (excluding national holidays).
- Subject to all Terms & Conditions as noted in the Liebert Services Terms & Conditions or the terms of a Master Agreement between the parties, if any, shall apply.

**SERVICE PERFORMED**

**UPS Full Preventive Maintenance Service**

***Annual Service Includes***

1. Perform a temperature check on all breakers, connections and associated controls. Repair and/or report all high temperature areas.
2. Perform a complete visual inspection of the equipment, including sub-assemblies, wiring harnesses, contacts, cables, and major components.
3. Check air filters for cleanliness. (if applicable)
4. Check module(s) completely for the following (if applicable):
5. Rectifier and inverter snubber boards for discoloration.
6. Record all voltage and current meter readings on the module control cabinet or the system control cabinet.
7. Check the inverter and rectifier snubbers for burned or broken wires.
8. Check all nuts, bolts, screws, and connectors for tightness and heat discoloration.
9. Check fuses on the DC capacitor deck for continuity (if applicable).

10. With customer approval, perform operational test of the system including unit transfer and battery discharge.
11. Calibrate and record all electronics to system specifications.
12. Check or perform Engineering Field Change Notices (FCN) as necessary.
13. Measure and record all low-voltage power supply levels.
14. Record phase-to-phase input voltage and currents.
15. Review system performance with customer to address any questions and to schedule any repairs.
16. Check power capacitors for swelling or leaking oil. (if applicable)
17. DC capacitor vent caps that have extruded more than 1/8". (if applicable)
18. Measure and record harmonic trap filter currents. (if applicable)

**Internal Battery Full Preventive Maintenance Service (Applicable to 45kVA Models Only).**

***Annual Service Includes***

1. Inspect the appearance and cleanliness of the battery and the battery room. Clean normal cell top dirt accumulation (to be done only with battery off line).
2. Measure and record the total battery float voltage and charging current.
3. Measure and record the overall AC ripple current.
4. Measure and record the overall AC ripple voltage.
5. Visually inspect the jars and covers for cracks and leakage.
6. Visually inspect for evidence of corrosion.
7. Measure and record the ambient temperature.
8. Verify the condition of the ventilation equipment, if applicable.
9. Verify the integrity of the battery rack/cabinet.
10. Measure and record 100% of the cell temperatures.
11. Measure and record the float voltage of all cells.
12. Measure and record all internal impedance readings.
13. Provide a detailed written report noting any deficiencies and corrective action needed, taken and/or planned.
14. Re-tighten all battery connections to the battery manufacturer's specifications, offline only.

**Corrective Maintenance Performed as Required**

1. Refurbish cell connections as deemed necessary by the detailed inspection report.

**Note1: Customer should check air filters monthly for cleanliness and replace as necessary.**

**Note2: Preventive Maintenance usually requires a shutdown to ensure electrical connection integrity.**

**Note3: All battery checks are recorded through the LDI reporting system. Only visual battery inspection and total battery voltages are to be recorded on the UPS E-form. The full battery maintenance inspection will be conducted through LDI.**

**Note4: Above maintenance does not include System Control Cabinet, Power Tie, Breaker Cabinets, Load Bus Sync or Maintenance Bypass Cabinets.**



## STATIONARY BATTERY SYSTEMS VRLA (SEALED) BATTERY SCOPE OF WORK

### ESSENTIAL SERVICE (1)

- Guaranteed 4-hour on-site emergency response, 7 days/week, 24 hours/day, within 150 miles of a Liebert Services' Service city.
- For 3-Phase UPS customers, includes one Annual PM.
- For Single-Phase UPS customers, includes one Annual PM.
- Includes 1-800-LIEBERT Customer Response Center.
- Includes 100% corrective labor and travel coverage 7 days/week, 24 hours/day, within the 48 contiguous states and Hawaii. Does not include labor for full-string replacement.
- Includes access to Liebert Services Customer Services Network On-Line Internet portal.
- Includes battery recycling as required, with documentation meeting EPA requirements.
- Performed by Liebert factory trained Battery Specialist or Customer Engineers.
- Preventive Maintenance Service scheduled by the customer between 8am-5pm, Monday-Friday (excluding national holidays).
- Single Jar Replacement Service for Lead Acid Batteries: Includes freight, labor, disposal and batteries. Subject to limitations as stated below.
- Up to 10% of defective battery jars may be replaced within a 12-month period as exclusively determined by Liebert Services.
- Subject to all Terms & Conditions as noted in the Liebert Services Terms & Conditions or the terms of a Master Agreement between the parties, if any, shall apply.

### SERVICE PERFORMED

#### **Annual Service**

1. Inspect the appearance and cleanliness of the battery and the battery room. Clean normal cell top dirt accumulation (to be done only with battery off line).
2. Measure and record the total battery float voltage and charging current.
3. Measure and record the overall AC ripple voltage.
4. Measure and record the overall AC ripple current.
5. Visually inspect the jars and covers for cracks and leakage.
6. Visually inspect for evidence of corrosion.
7. Measure and record the ambient temperature.
8. Verify the integrity of the battery rack/cabinet.
9. Measure and record 100% of the jar temperatures.
10. Measure and record the float voltage of all jars.
11. Measure and record all internal ohmic readings.

12. Provide a detailed written report noting any deficiencies and corrective action needed, taken and/or planned.
13. Re-tighten all connections to the battery manufacturer's specifications, if required. Refer to the manufacturer's literature to determine if re-tightening is required.
14. Measure and record all battery connection resistances in micro-ohms, when applicable.
15. Verify approval for Battery Life program.

**Corrective Maintenance Performed as Required**

1. Refurbish cell connections as deemed necessary by the detailed inspection report.

**Conditions for Single Jar Replacement Service for Lead Acid Batteries**

1. The Customer is covered by an Essential or Preferred Contract.
2. The battery string is in overall good health as determined by Liebert Services; the battery string is not beyond expected service years or has had excessive single jar replacements that would make the string unstable.
3. Up to 10% of defective battery jars may be replaced within a 12-month period as exclusively determined by Liebert Services.
4. Contracts have no cash value for future years or full string battery replacements. Single jar replacement is limited to batteries in the original string.