Storage and Maintenance

1. Storage

a. Lead-acid Battery Charging Frequency

• Charge the batteries before you store the system.
• Assure that the unit is completely shut down.
• Keep system in original packing materials and shipping carton.
• Protect the system from moisture and weather.

To maximize battery life during storage, it is recommended that a battery runtime test described in the next section be performed, followed by at least 12 hours of operation (system unloaded preferred) under external power to recharge the batteries before returning to storage. If that is not possible, then you must at least power up the system per the chart above for at least 8 hours at the intervals specified for the average storage temperature. Failure to do so will void warranty. These intervals are considered to be the maximum recommended cycle time. A shorter interval is preferred.

NOTE: Depleted lead-acid batteries may not be charged in ambient temperatures above 50 C/122 F without risk of venting, swelling, and permanently-compromised energy capacity.

Average Storage Temperature	Charging Frequency (Months)
Less than 20°C	9
21° to 30°C	6
31° to 40°C	3
41° to 50°C	1.5
51° to 60°C*	1

2. Operational Battery Maintenance

It is recommended to perform a battery runtime test upon receipt of the units to be stored and at least every 3 months thereafter. Use the battery maintenance worksheet at the end of this document for the logging of BRT results.

Proper battery maintenance requires a quarterly battery runtime test. Results should be retained for comparison with the results of future tests.

a. Allow the unit at least 6 hours of on-time after the battery capacity meter on the front panel has reached 100%. Upon the battery capacity meter reaching 100%, the unit has transitioned from fast-charge mode to float charge mode and is top-charging the last few percent at a slower, safer rate.
b. Reference the load specified by IntelliPower as the load to be applied for battery runtime testing.

c. Remove input AC and start a timer simultaneously. The front panel battery capacity meter will start flashing and the unit will sound a beeping alarm. The beeping alarm may be silenced by pressing the F3 Silence button.
d. Once approximately 90% of battery capacity has been exhausted, the unit will sound a continuous tone alarm (whether or not you used the F3 Silence button in the previous step). Allow the unit to continue until complete battery exhaustion – the unit will shut down.
e. Record the unit serial number and measured time. Use the data as a runtime benchmark for future tests.
f. Allow the unit to cool down, un-powered (off) for at least 2 hours but not more than 12 hours following a battery runtime test to allow the batteries to return ambient temperature before powering unit back up for a battery recharge for at least 12 hours.
   WARNING – Do NOT begin a battery recharge if ambient temperature is above 50°C/122°F.

3. Battery Evaluation

The battery capacity meter – if in fast charge mode – will indicate 80% or less state of charge (SOC). It indicates 100% only when it transitions to the float charge level.

The most common and most potentially damaging failure mode is for a single cell to partially short. When this happens, the pack will never reach float charge level because of the missing voltage from the shorted cell, and will stay in “Fast Charge” mode. If this continues indefinitely, the remaining cells will eventually be damaged from overcharging and could swell and/or vent. The system microprocessor monitors charger mode – if the unit remains in fast charge mode for 12 hours, the Service Battery LED will turn ON. It is possible, depending on the level of the cell short, that the remaining batteries will overcharge and be permanently damaged before the 12-hour period is complete; especially if more than one cell shorts at about the same time.

A second mode of battery failure is for a cell to partially open rather than short. If this happens, it appears to the system that the batteries are simply at the float charge level; thus, the front-panel battery capacity meter indicates 100%. This 100% indication is misleading if there is an open cell. What is actually happening is that the one open cell causes the entire pack voltage to rise, giving the charging hardware the impression that all cells are nearing full charge. This causes the charger to transition from fast-charge mode to float charge mode even though the remaining cells are not yet fully charged. In these conditions’ battery runtime is severely reduced. This failure mode is not detectable unless a user periodically performs a battery runtime test. Generally, regular BRT testing will catch end-of-life batteries long before they become a problem.

4. Recycling

Lead-acid batteries must always be recycled in accordance with local laws and regulations. For the local recycling facility in your area, consult the website: earth911.com or the battery vendor as shown on the battery.

Battery Runtime from Product Specification Sheet

_____ of runtime at _____ Watts.

Battery Runtime Test Results Log

Receiving/Initial Test – Battery Runtime Results		
Date	Runtime	Wattage

Quarterly Test – Battery Runtime Results		
Date	Runtime	Wattage

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