

NorthStar UPS Quick Start Guide

Unpacking the Batteries

When received, the batteries should be inspected. Make sure the batteries were not damaged during transport, and that all the proper accessories were included in the delivery. If problems arise, please initiate a claim immediately.

Note: * indicates where further information can be found in the NSB UPS Application Manual. Warnings and notifications can be found on the label (shown below) which appears on each product. Be aware and adhere to all warnings which appear on the product

NON-SPILLABLE / NON-SERVICEABLE	
Contains: Lead, Sulfuric Acid (Electrolyte), Lead Compounds, Arsenic	
Ensure reference materials are reviewed and made available to all operators including application manual, installation guide, and MSDS.	
DANGER	
<p>Harmful if swallowed, inhaled, or in contact with skin. Acid causes severe skin burns and eye damage. May damage fertility or the unborn child if ingested or inhaled. May cause harm to breast-fed children. May cause cancer if ingested or inhaled. Causes skin irritation, serious eye damage. Contact with internal components may cause irritation or severe burns. Causes damage to central nervous system, blood and kidneys through prolonged or repeated exposure if ingested or inhaled. Irritating to eyes, respiratory system, and skin. May form explosive air/gas mixture during charging. Extremely flammable gas (hydrogen). Explosive, fire blast or projection hazard. Do not handle until all safety precautions have been read and understood. Wash thoroughly after handling. Do not eat drink or smoke when using this product. Avoid contact during pregnancy/while nursing.</p>	<p>Wear protective gloves/protective clothing, eye protection/face protection. Use only outdoors or in a well-ventilated area. Avoid contact with internal acid. Do not breathe dust/fume/gas/mist/vapors/spray. Keep away from heat/sparks/open flames/hot surfaces. No smoking IF SWALLOWED OR CONSUMED: rinse mouth. Do NOT induce vomiting. Call a poison center/doctor if you feel unwell. IF ON CLOTHING OR SKIN (or hair): Remove/Take off immediately all contaminated clothing and wash it before reuse. Rinse skin with water/shower. IF INHALED: Remove person to fresh air and keep comfortable for breathing. Immediately call a POISON CENTER or doctor/physician. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If exposed/concerned, or if you feel unwell seek medical attention/advise. Store locked up, in a well-ventilated area, in accordance with local and national regulation. Dispose of contents/container in accordance with local and national regulation. Keep out of reach of children.</p>
PROPOSITION 65 WARNING: Battery posts, terminals and related accessories contain lead and lead compounds, chemicals known to the State of California to cause cancer and reproductive harm. Batteries also contain other chemicals known to the State of California to cause cancer. Wash hands after handling.	
WARNING: Risk of fire, explosion or burns. Do not disassemble, heat above 65°C or incinerate. Not recommended for inverted use. Follow product charging instructions.	
Manufactured by: NorthStar Battery Company Springfield, MO 65814 417 575 8000	
MADE IN USA	

Installation

1. Before proceeding with the installation of the battery, review or determine the arrangement of the batteries for the application.
2. Checking the voltage spread is vital before connecting the monoblocks in series. Refer to section 10.2 for more information.
3. If installing multiple parallel strings, the cabling to each string should be the same size and approximate length resulting in the same resistance per string.
**(Battery Connection to Load/Charger 10.12)*
4. The cable size selected should consider allowable voltage drop of $\leq 0.5V$
**(Battery Connection to Load/Charger 10.12)*
5. Carefully install batteries into position as determined. The battery should be oriented so that the negative (-) post of one battery is adjacent to the positive (+) post of the next adjacent battery.
6. Make sure the batteries are all evenly spaced approximately 10mm (3/8 inch) apart.
7. Check that all contact surfaces are clean, and then install the bloc or cell connectors and the terminal screws using the

torque value printed on the battery label. **(Commissioning/Installation 10.9)*

8. The insulation covers should be put back after all connections have been completed.
**(Commissioning/Installation 10.10)*

Charging

9. It is highly recommended to give the batteries a refreshing charge prior to commissioning. Failure to observe these conditions may result in greatly reduced capacity and service life. **(Charge 10.14)*

Charging Regime Prior to Qualification Testing

Case 1)

For batteries that have a date code older than 6 months:

- a. Equalization charge the battery strings at 2.41vpc for four hours
- b. Reduce voltage to 2.35vpc for eight hours
- c. Reduce voltage at battery to 2.27vpc and float for at least four hours to let all the gas generated during charging recombine.

Case 2)

For batteries that have a date code less than six months:

- a. Refresh/Boost charge the battery string at 2.35vpc for twenty-four hours
- b. Reduce voltage at battery to 2.27vpc and float for at least four hours to let all the gas generated during charging recombine.

10. The optimum level for float charging the NSB UPS batteries is 2.27 volts/cell at 25°C (77°F). **(Charge 2.2)*
 - a. Example: 40 battery string = 544.8V
 - b. Example: 32 battery string = 435.8V

11. If the ambient temperature increases above 25°C (77°F), a thermal compensation of -2 mV/cell/°C is recommended. Conversely, if the temperature decreases below 25°C (77°F), the voltage should be increased by 2 mV/cell/°C. **(Charge 2.2)*

12. Verify the battery string voltage matches the rectifier output voltage. **(Maintenance 11.3)*

13. If a voltage difference is identified due to a voltage drop in the cables, then the rectifier must be adjusted until the battery string voltage is within battery specification.

