Scope

HindleHealth+ Battery Sensor optional add-on to ATevo Battery Charger.

Summary

Standards PRC-005 and TPL-001 from the North American Reliability Corporation (NERC) set requirements for ensuring overall reliability of the Bulk Electric System (BES), of which battery backup systems and battery chargers represent a minor subset. The HindleHealth+ (HH+) Battery Sensor is a companion product for the ATevo Battery Charger that employs an efficient and reliable electronically enhanced shunt sensor. Together with ATevo, it continuously supervises 4 parameters that are critical indicators that a battery will be available for power emergencies, for both lead-acid and nickel-cadmium batteries.

Requirements (to use HH+)

1. HH+ must be wired to the ATevo Battery Charger and dc bus according to HindleHealth+ Field Wiring Instruction (JD5082-00).
2. HH+ must be configured for use with the ATevo Battery Charger according to HindleHealth+ Operating Instructions (JA5136-00).
3. Examples of system configurations where HH+ can be deployed are found in JF5000-00.

What Do NERC Standards Require for Battery Chargers & Batteries?

Standards PRC-005 and TPL-001 from the North American Reliability Corporation (NERC) set requirements for ensuring overall reliability of the Bulk Electric System (BES). The requirements that affect battery backup systems and battery chargers are briefly discussed in the tables of those standards which discuss failure of protection system components (TPL-001, pages 22-24) and monitoring and alarming of battery string continuity (PRC-005, Tables 1-4 on pages 21-28).

How Does HindleHealth+ Help Satisfy NERC Standard System Reliability Requirements?

- HH+’s continuous monitoring provides confidence that the battery backup systems are constantly available to announce dc interruptions that affect the BES.
- Data provided by HH+’s continuous monitoring helps in system analysis and planning for contingencies. Alarms help with execution of contingency plans.
- Such monitoring may reduce the amount of physical inspection and maintenance required to achieve the same level of confidence.

Why is HindleHealth+ the best technical solution to help achieve the reliability that complies with all NERC standards?

- It supervises parameters that are critical indicators that ensure that batteries are available for power emergencies.
    - Battery Continuity Monitoring: Uses two independent tests to ensure that the battery connection to the system is continuous. The first involves a significant reduction in float current, which if detected triggers the second, a manual battery open test performed by the ATevo Battery Charger.
    - Float Current Monitoring: The battery charger's float current is designed to keep the battery at full charge by compensating for its self-discharge. HH+ continuously monitors actual float current compared to expected float current so that the battery's needs are met.
    - Battery Discharge/Charge Monitoring: Battery discharge events are detected, recorded, and alarmed.
    - Battery Ampere-hours (Ah) Remaining Calculation: A battery's capacity slowly degrades over its rated lifetime. HH+ monitors and logs three (3) battery aging events – depth of discharge and number of cycles, operating temperature, and maintenance activity – to predict "Battery Capacity Remaining" and enable planned replacement.
- It provides ATevo battery charger temperature monitoring and control capabilities that support battery life optimization.
    - Battery Temperature Monitoring: Using the wired remote probe that is connected to the battery with a ring lug, it monitors battery temperature and provides an overtemperature alarm.
    - Battery Temperature Voltage Compensation: Based on the difference between actual battery temperature and nominal 25 °C, the charger's dc output voltage can be adjusted so that battery life is prolonged.
- It conveniently provides a single source of data on battery reliability. The ATevo Battery Charger records and can report all data derived from the HH+ add-on.

References

Additional information is available from the following sources:

- HindleHealth+ Field Wiring Instruction (JD5082-00).
- HindleHealth+ Operating Instructions (JA5136-00).
- HH+ System Configurations (JF5000-00).
- Standard PRC-005-066 – Protection System, Automatic Reclosing, and Sudden Pressure Relaying Maintenance
- Transmission Planning Reliability Standard TPL-001-5

Version History

Date	Firmware Version	Changes
05/05/2024	3.2.0+	Date document originated.