

SECTION 18350

RECTIFIERS, BATTERIES AND BATTERY CHARGING EQUIPMENT

PART 1 - GENERAL

1.01 DESCRIPTION

- A. Section includes requirements for rectifiers, batteries, and battery charging equipment.

1.02 REFERENCE STANDARDS

- A. American Railway Engineering and Maintenance of Way Association (AREMA):
 - 1. Communications and Signals Manual of Recommended Practices (C&S Manual). When following the recommendations of the AREMA C&S Manual substitute the word "shall" for the word "should" in the applicable Manual Part.

1.03 DESIGN REQUIREMENTS

- A. Calculate the loads based upon the equipment proposed. Size all batteries to provide a minimum 48 hours standby capacity for all systems based on normal operating conditions. Verify the ampere-hour capacity shown on the Contract Drawings is adequate to provide a minimum of 48 hours standby capacity.
 - 1. Size battery to provide a minimum of 48 hours of uninterrupted power to the signal systems at the normal operating load.
- B. Size batteries which provide power for crossing warning devices, such as gates and flashing lights, to provide 12 hours of continuous operation with the gate arms in the horizontal position and all lights flashing. This requirement is in addition to the requirement for 48 hours standby capacity in the previous paragraph.

1.04 SUBMITTALS

- A. Load calculations of each dc and ac load. Submit calculations identifying normal and worst-case conditions for each load.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MATERIALS

- A. SPL Batteries: Batteries conforming to the requirements specified herein as manufactured by Saft America, Inc. or Engineer approved equal.
 - 1. Model (SPL 340, 340AH)
 - 2. Model (SPL 380, 380AH)
- B. National Railway Supply Battery Charger: Charger conforming to the requirements specified herein or Engineer approved equal:

1. Model ERBC (24/30 1/36V, 30A)
2. Model ERBC (12/40 1/20V, 40A)
3. Model ERBC (12/20 1/20V, 20A)

2.02 EQUIPMENT DETAILS

- A. Battery charging equipment shall be designed for continuous operation.
- B. Battery charging equipment shall be designed to deliver rated outputs with input voltage of 100 V to 130 V at 60 Hz, single phase, two wire input.
- C. Battery charging equipment shall have a reserve capacity of at least 25 percent above the calculated high load requirements.
- D. Each charger shall be provided with programmable output voltage adjustment.
- E. Terminal markings for ac and dc terminals shall be permanent.
- F. The charger shall provide a stabilized output voltage, temperature compensated with output current limiting. The capacity of the battery charger shall be determined by the Contractor and approved by the Engineer. The charger shall adjust its output current automatically, according to the load and to the demand on the battery.
- G. Battery charger shall conform to requirements in AREMA C&S Manual Part 9.2.1. The output of the charger shall be sufficiently filtered to be compatible with the input voltage requirements of the solid-state interlocking units, and all other electronic equipment for the signaling system.
- H. Batteries shall be recombination pocket plate nickel cadmium.
- I. Batteries shall be capable of a minimum of 1,500 charge-discharge cycles to 80 percent discharge without loss of capacity. Totally discharged batteries, even if polarity has reversed, shall be capable of being recharged to rated capacity with charging voltage of no more than 1.60 volts per cell.

2.03 MISCELLANEOUS MATERIALS

- A. Furnish all mounting hardware, terminals, and terminators, and similar items for mounting chargers and batteries in wayside cases and signal instrument shelters.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Install batteries and battery charging systems as shown on the Contract Drawings.

3.02 TESTS

- A. Perform tests specified in Section 18600, Signal Systems Testing, ensuring system operation.
- B. Test batteries and battery chargers in accordance with the manufacturer's standard when installed.

END OF SECTION