



# **ABU DHABI SEWERAGE SERVICES COMPANY (ADSSC)**

## **GENERAL SPECIFICATION FOR ELECTRICAL WORKS**

### **DIVISION 16 ELECTRICAL**

#### **SECTION 16170 BATTERY AND BATTERY CHARGER**

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**DOCUMENT CONTROL SHEET**

Revision No.	Date	Revision Description / Purpose of Issue
01	April 2008	First Issue.
02		
03		
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## 1. GENERAL

- a) All items described within this section shall comply with the provisions of Section 15001: General M&E Requirements.
- b) Batteries and their associated chargers shall be used as back-up power sources for uninterruptible and bumpless operation of controls, instrumentation, alarm and monitoring equipment.
- c) Where alternate ac supplies are available, provide for taking the supply to the battery charger from either source (e.g. from either side of the bus-section switch) with facilities for automatic changeover from one source to the other in the event of failure of the supply system.
- d) The battery and charger unit shall be housed in the Common Control Section of the Motor Control Centre as described in Section 16020: Factory Built Assembly (FBA).
- e) A separate, sheet steel, floor-standing, Form 2 compartment, having adequate ventilation and separate compartments for the batteries (lower compartment) and chargers (upper compartment), with associated control and protection devices and accessories, may be used in a standalone capacity for large units where it is difficult to accommodate within a dedicated section of the Motor Control Centre.
- f) When used as standalone, access to the batteries shall be via lockable, hinged doors, and to the chargers via removable covers.
- g) Batteries and charger units shall be suitable for the intended service under the prevailing climate and environments conditions in Abu Dhabi as specified in Section 15001: General M&E Requirements.
- h) At the discretion of ADSSC, for pumping stations of capacity of less than 200kW capacity, they may be provided with a simplex battery charger with all functionality except float and boost charge.

## 2. BATTERIES

- a) Nickel Cadmium sealed batteries shall be used confirming to BS EN/IEC 60623.
- b) Batteries shall be maintenance-free long-life Nickel Cadmium sealed type with a nominal output of 24V, and be of adequate capacity to maintain full operation of the relevant load plus an additional 20% for a period of 4 hours during mains failure, assuming a normal charge condition at the start of the mains failure.
- c) All batteries shall be protected from mechanical damage and any accidental electric shorting. They shall be supplied in banks sized for easy handling. All interconnections shall be included. Batteries shall not

be housed above charger units or any other equipment and shall be so ventilated that gases do not permeate into adjacent equipment.

### 3. BATTERY CHARGERS

- a) Battery chargers shall conform to BS EN 60146-1.
- b) Battery chargers, complete with associated controls, shall be provided and mounted on its own chassis and housed in one section of the MCC, standalone panel or in a separate enclosure, as applicable.

The front panel for each charger unit shall include:

- i. 1No. "ON/OFF" Mains switch.
- ii. 1No. Lamp to indicate "A.C. Supply On" (White).
- iii. 1No. Charger Ammeter.
- iv. 1No. Lamp to indicate "Boost Charge" (Red).
- v. 1No. Lamp to indicate "Float Charge" (White).
- vi. 1No. Lamp to indicate "Charger Failed" (Amber).
- vii. 1No. Lamp test push button.

Each charger unit shall also be provided with:

- i. 1No. "Float/Boost" selector switch, mounted internally.
  - ii. 1No. Set of a.c. supply fuses.
  - iii. 1No. volt-free contact for 'Charger Failed' alarm.
  - iv. 1No. volt-free contact for 'Low dc Output Voltage' alarm.
  - v. 1No. volt-free contact for 'Loss of dc Output Voltage' alarm.
  - vi. 1No. dc Output voltmeter, scaled to indicate regions of "Low", "Normal" and "High" output voltages, by the use of different coloured sectors.
  - vii. 1No. dc Output switch.
  - viii. 1No. dc Output Ammeter.
  - ix. 1No. set of full capacity rated output dc terminals and fuses.
- c) Suitable means shall be provided, to the approval of ADSSC, to protect the batteries from deep discharge and over-charging.
  - d) In the event of failure of the charger, the batteries shall ensure operation of controls, instrumentation, alarm and monitoring equipment for at least 4 hours. A separate relay contact shall be provided to indicate "Critical Alarm Condition – Charger Fail".
  - e) The charger shall be of the constant potential type, and be designed to regulate the charger output voltage to within  $\pm 1\%$ .
  - f) The dc terminal voltage shall be regulated such that under "Float" or "Boost" charge condition, the dc voltage does not rise more than 10% above nominal.

- g) The charger unit shall be provided with both short circuit and reverse polarity functions.
- h) The charger, when selected to “Float”, shall be capable of restoring the battery to 75% capacity within 8 hours.
- i) Under “Boost” conditions, the charger shall be capable of restoring a fully discharged battery to 75% capacity within 5 hours.
- j) A wiring diagram, identifying all outgoing terminals, components and fuses, shall be fixed inside the cubicle. A warning label in both Arabic and English shall also be affixed along with appropriate maintenance and safety instructions.

#### 4. SOURCE QUALITY CONTROL AND TESTS

- a) The charger unit to be tested at manufacturer’s works as described under Section 15001: General M&E Requirements.
- b) A suitable integrated functional test, including a discharge test at the full rated load for 4 hours, shall be conducted at the manufacturer’s works to ensure satisfactory operation of the equipment. The tests shall be witnessed by ADSSC prior to acceptance.

**END OF SECTION**