

# Technical Specifications for Batteries

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## 1- Introduction :

This specifications define the technical requirements of batteries which will be used as a backup power source in telecommunication equipments in Yemen mobile Company.

One group of batteries or two groups should be connect to the output terminals of Rectifier/ charger to provide D.C power supply for BTS Equipments without break when the power off.

## 2- Sites conditions :

- at altitudes varying from sea level up to 2500 meters .
- The ambient temperature up to 60 degrees C .
- The relative humidity up to 98% .

The tenderer should take into account any derating involved and the apparent capacity required in quoting for the nominal capacities at the different ambient conditions.

## 3- General specification:

- The type of batteries shall be a maintenance free, valve regulated lead acid (VRLA), gel and monoblock cells (2V/cell) .
- A set of batteries consist of 24 cells, giving a total nominal output voltage of 48 volts DC.
- The capacity of batteries must be 800 Ah @ 10hr to 1.8V per cell above.
- Design life of batteries must be at least 20 years on 25 °C and cycle life must be at least 1200 times in 80% DOD (Depth of discharge) term.
- The self discharge rate of the battery shall be minimum and extremely low.
- The date of manufacture should be not more than three months before delivery.
- The battery bank supplies the full or partial load when the mains power fails or when the load exceeds the design capacity of the charger/ charger. The battery is charged automatically when the main power is restored or when the load current returns to a level below the capacity of the float rectifier.



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### 4- Physical Requirements :

- The battery shall be supplied complete with connectors between cells and at the main positive and negative terminals. The connectors shall be of robust construction of adequate size to minimize voltage drop and be made of flexible insulated copper conductor cable. The inter-connectors and terminals shall be fully insulated.
- The rack of batteries shall be from a high quality, strong metal material and the width of battery rack should not exceed 65cm (width).
- The container of battery cell shall be from high quality, strong material, and the cover shall be securely fixed to the container.
- The cells, when shipped, shall be fully charged, ready to be installed at site and should give a capacity of not less than 90% of rated value when tested at site at any time up to 6 months of its receipt .

### 5- Information to be supplied with the offer :

The tenderer shall give the manufacturer technical with his offer, including the following:

- Model No.
- No. of poles per cell.
- Dimensions (length, width, and height) for cell.
- Weight (sealed and fully charged).
- Type and volume electrolyte, composition, number and thickness of plates.
- Type and dimensions of racks for batteries.
- Internal Pressure which the container can stand .
- Charge, discharge characteristics, and values for boost, float, equalization modes.
- Maximum internal resistance of the battery.
- Maximum discharge current and recharge voltage.
- The cycle life with DOD (Depth of discharge) characteristics.
- Temperature effects on performance and capacity.
- Self-discharge characteristics.
- Storage conditions and relationship curves between remaining capacity and storage with different capacity at different temperature.
- Relationship curves between OCV and DOD .



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- List of free spare cells, tools, etc. should be required for next three years.
- The tables attached should be supplied by the tenderer.

### **6- Materials for Complete Installation :**

- a) The tenderer shall supply all the following Documentations, for all sets:
- Installation guide for the set.
  - Operation and maintenance instructions for the set .
  - Technical specification, testing data and Installation circuit diagram.
- b) The tenderer shall provide List for all accessories and installation materials which used.

### **7- Warranty:**

The supplier shall warrant that the batteries are free of manufacturing and design defects. If any failure due to manufacturing /design defect is noticed within 18 months from the date of receipt at site, the failure one shall be replaced by the tenderer.

### **8- Packing & Transportation:**

The equipment shall be packed suitably to withstand sea and road transportation without any damage. If any damage occurs due to miss packing or transportation, the miss one must be replaced / repaired by the supplier free of charge.

### **9- Factory test :**

- make the test factory by testing company for the battery in the original country, that shall be done by attending two engineers from Yemen Mobile Company and it shall be on tenderer cost.and it shall be done for a week at least.



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Capacity for 10hrs (Ahr)	Type of cell	Height of cell(mm)	Width of cell (mm)	Length of Cell (mm)	Weigh of Cell (mm)

Permissible intensities cells at 25 C° in operation.

Minimum Voltage	Discharge times				
	100hr	10hr	8hr	3hr	1hr
800Ahr					
1.85 V					
1.80 V					
1.70 V					
1.65 V					

Capability of returning a deep discharged battery to its initial state in a recharge operation:

Discharge rate %	Recharge voltage	Recharge current C/10	Recharge time (hr)	Final (S.G)	Cell Temp. Degree (C°)	Percent recharge %
80	2.50	0-C/10				
70	2.40	0-C/10				
50	2.35	0-C/10				
30	2.30	0-C/10				
10	2.25	0-C/10				

Sealed type cells for a daily depth of discharge rate as shown below are operated in accordance with the manufacturer's instructions:

Discharge rate%	Discharge time (hr)	Cell life in cycles
0%	0 hours	
10%	1 hours	
10%	3 hours	
10%	5 hours	
30%	1 hours	
30%	3 hours	
30%	5 hours	
80%	1 hours	
80%	2 hours	

