

## **Technical Specifications for GEL Batteries: GROUP (B) 600Ah (80 set) & GROUP (C) 800Ah (60 set)**

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**The bidder shall furnish the following specifications with the documentary proof as an essential part of technical bid in the sealed envelope super-scribed as "Technical Bid":**

### **1- Introduction :**

- This specifications define the technical requirements of batteries which will be used as a backup power source in telecommunication equipment 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 Equipment without break when the power off.
- (Battery Set) means the total group of cells which gives the total 48V required.

### **2- Sites conditions :**

- At altitudes varying from sea level up to 2500 meters.
- Applicable operating temperature range:  $-40^{\circ}\text{C}$  to  $70^{\circ}\text{C}$ .
- Ideal operating temperature range:  $+25^{\circ}\text{C}$  to  $40^{\circ}\text{C}$ .
- 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:**
  - Maintenance free.
  - Valve regulated lead acid (VRLA).
  - GEL Type.
  - Monoblock cells (2V/cell).
- **A set of batteries consist of:**
  - 24 cells
  - Total nominal output voltage of 48 volts DC.
- **The capacity of batteries must be:**
  - **Group (B) 600 Ah @ 10hr (C10) to 1.8V per cell.**
  - **Group (C) 800 Ah @ 10hr (C10) to 1.8V per cell.**

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- **Design life of batteries must be:**
  - At least 15 years on 25 °C for both groups.
  - Cycle life must be greater than 1800 times (For 600Ah batteries) & 1600 times (For 800Ah batteries) in (C10) & 80% DOD (Depth of discharge).
  - Deep cycle Type.
- The self-discharge rate of the battery must be 2% or less.
- Internal resistance when fully charged should be **less than**: (0.5 mΩ for 600Ah batteries) & (0.4 mΩ for 800Ah batteries).
- A weight of cell should not be less than 46Kg (For 600Ah batteries) & 60Kg (For 800Ah batteries).
- **The date of manufacture should be not more than three months before delivery (Very Important).**
- The battery bank supplies the full or partial load when the mains power source fails or when the load exceeds the design capacity of the charger regulator. The battery is charged automatically when the main power source is restored or when the load current returns to a level below the capacity of the charger regulator.

### **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 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 .
- The rack of batteries shall be from a high quality, strong metal material and the width of battery rack should not exceed 80cm (width) or according to the manufacturers design.

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

VRLA Battery				
	Item	Unit	Requirement	Bidder's Specifications
1	Model	-----	Specify	
2	Manufacture	-----	Specify	
3	Country of origin	-----	Specify	
4	Standard	-----	European code	
5	Date of manufacturing	-----	Specify	
6	Type of batteries	-----	Specify	
7	Ratted capacity @ (C10) to 1.80V at 25C°	Ah	Specify	
8	Normal voltage per cell	V	2V	
9	No of cells per set	-----	24	
10	No of poles per cell	-----	Specify	
11	Expectancy life @25C°	years	≥15 years	
12	Relative humidity	%	Specify	
13	Ambient temperature	C°	Specify	
14	Dimensions (L×W×H)	Mm	Specify	
15	Weight (sealed and fully charged)	Kg	Specify	
16	Type of electrolyte	-----	Specify	
17	Volume of electrolyte	-----	Specify	
18	No of plates	-----	Specify	
19	cycle life of battery at 80% DOD@C <sub>100</sub>	-----	Specify	
20	cycle life of battery at 80% DOD@C <sub>10</sub>	-----	Specify	
21	Cycle life with DOD characteristics		must be attached all technical data & curves	
22	Internal pressure of container	Kpa	Specify	
23	Charge and discharge characteristics		must be attached all technical data & curves	
24	Boost voltage( Vpc)	V	Specify	
25	Float voltage( Vpc)	V	Specify	
26	Equalization voltage( Vpc)	V	Specify	
27	Maximum internal resistance	mΩ	Specify	
28	Maximum discharge current	A	Specify	

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29	Maximum recharge voltage	V	Specify	
30	Temperature effects on performance and capacity (curve or table)	must be attached all technical data & curves		
31	Self-discharge rate	%	Specify	
32	Relationship curves between remaining capacity and storage with different capacity at different temperature.	must be attached all curves		
33	Relationship curves between OCV and DOD.	must be attached all curves		
34	Type of connectors between cells	Flexible insulated Copper conductor cable		
35	Installation circuit & block diagram	must be attached		
36	List contain all accessories & installation materials	must be attached		
37	List of free spare cells and tools	must be attached list contain		
38	Installation guide, operation manual, and maintenance manual	must be attached all technical data		
39	Type of rack		Specify	
40	Dimensions of racks(L×W×H)	mm	Specify	
41	Tables attached by tenderer			
42	Warranty period	months	18 after installation	

### **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, installation circuit and block diagrams.
- b) The tenderer shall provide List for all accessories and installation materials which used.

**7- The bidder must distribute list price between the two groups, i.e. 600Ah list price alone & 800 Ah list price alone.**

**8- The bidder must submit a technical and financial offer separately for each group of batteries. It is not mandatory for Yemen Mobile Company to accept all battery packs**

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from a single supplier, perhaps it will be purchased from more than one supplier based on specifications and prices.

- 9- Standards Compliance:** The quoted product should meet out International Industry standards, and should meet European Codes and standards for Batteries.

All pages of the original Tender Document are to be signed and enclosed with the Technical Bid without cutting.

### **11-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.

### **12- 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.

### **13- Acceptance test certificates from the factory (Very important)..**

#### **Notes:**

- 1- The bidder must be fill all attachment tables with all technical data and documents required. If the bidder did not fill the tables his offer will be ignored.
- 2- The bidder must provide (One Test device) for every one batteries group of two groups for measurement purposes such as (capacity-internal resistance,....., etc).
- 3- The bidder must provide tools with each (11) set of the batteries such as (screwdriver, proper insulated wrench, etc.).
- 4- The bidder must ensure that serial numbers of the batteries in each set must be serialized and on a specified date.
- 5- The bidder must ensure that the serial numbers and date of manufacturing are stamped on the each battery cell body and are not removable.
- 6- The bidder must attach a list of the quantities of batteries containing the number, serial numbers and date of manufacturing from the factory, upon delivery.

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**Group (B) 600Ah**

Capacity for 10hrs (C <sub>10</sub> )	Type of cell	Height of cell(mm)	Width of cell (mm)	Length of Cell (mm)	Weigh of Cell (kg)

Permissible intensities cells at 25 C° in operation.

Minimum Voltage	Discharge times				
	100hr	10hr	5hr	3hr	1hr
600Ah					
1.85 V					
1.80 V					
1.70 V					
1.65 V					

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	

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**Group (C) 800Ah**

Capacity for 10hrs (C <sub>10</sub> )	Type of cell	Height of cell(mm)	Width of cell (mm)	Length of Cell (mm)	Weigh of Cell (kg)

Permissible intensities cells at 25 C° in operation.

Minimum Voltage	Discharge times				
	100hr	10hr	5hr	3hr	1hr
800Ah					
1.85 V					
1.80 V					
1.70 V					
1.65 V					

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	