BINDAL

(ISO 9001:2008)
(ISO 14001:2004)

STATIONARY CELLS

INSTRUTIONAL MANUAL FOR FIRST CHARGE OPERATION
&
MAINTENANCE OF BINDAL STATIONARY CELLS

(AS PER IS 1651:1991)

Bindal & Bidnal Batteries Pvt. Ltd

INSTRUCTIONAL MANUAL

INTRODUCTION

Bindal Stationery cells are designed for rugged service and a minimum attention . the cells are specially designed to meet normal application, high performance and low maintenance as per specific requirements conforming to relevant specifications. they consist essentially of Tubular Positive Plates, Pasted Negative plates, P.E Envelop Separators, P.P container, cover and ceramic vent plug with float level indicator.

CONSTRUCTION OF BINDAL STATIONARY CELL :

TUBULAR POSITVE PLATE
Bindal Tubular Positive plate consists of an integrally pressure cast spine, woven gauntlet tubes, acid resistant plastic bottom bar and high capacity active material. By pressure casting Bindal has obtained a high density positive spine. Higher density provides grater conductivity. The positive grid spines have heavy duty tapered areas at the top bottom. This tapered areas assure maximum conductivity, guaranteeing extra long cell life.

The gauntlet bags having large numbers of minute pores allow the electrolyte to pass through quite freely, while preventing effectively any loss of the active material. The active material in the positive plates of the cell expands on discharging, but the tubes are strong enough to resist this expansion, thus eliminating shedding, the round tube with uniformly packed active material and centrally located spines, lowers internal resistance and increases surface exposure with more exposure of active material ionic exchange activity in increased, which maintains high power out put. The frame and spines of positive plates grid are cast from corrosion resistant lead alloy. An acid resistant plastic bar seals the gauntlet bags at the bottom and locks the spines of grids.

NEGATIVE PLATE:
The Negative pasted plates are designed to match the power and long life of the positive plates .the active material of negative plate is blended with special expanders for long life and peak power, it is retained firmly in place by sturdy grids, designed to lock it. Plates are so designed that positive and negative have the same commercial life.

SEPARATOR:
The life of any cell depends very much on the quality of the separators used between the positive and negative plates. The Separators are made from specially blended raw materials and carefully processed to give maximum porosity, low electrical resistance, better pore structure tp allow free ionic mobility of electrolyte, they form permanent insulating diaphragms between plates to prevent short circuits.

CONTAINER:
The containers are made of Poly Propylene with high insulating strength and resistance to acid.

TERMINAL CONNECTOR :
Terminal connectors are marked positive (+) and negative (-) for easy identification at the time of commissioning .

INTERCELL CONNECTORS:
Intercell Connectors are lead coated aluminum strips which are flexible for easy intercell .
Connections . these connectors are easily replaced. Lead plated bolts, nuts and washers are used for connections.

TO PREPARE 20 LITRES (APPROX.) OF DILUTE ELECTROLYTE :
Battery grade sulphuric acid is usually available in 1.840 or 1.400 sp. gr. Concentration . To change the sp.gr. to another value, it is necessary to mix it slowly with distilled water . the table given may be used as a guide to prepare 20 Litre approximately dilute acid from 1.840 sp. gr. acid.

3.74	17.34	1.200
4.72	16.32	1.240
5.00	16.66	1.260

CAUTIONS :

1. The dilution and mixing of 1.840 acid should preferably be done in lead lined tank or polypropylene jar Tank.
2. Add acid slowly to water, while mixing, especially, when using high gravity acid NEVER ADD WATER TO ACID. While keeping the mixing is completed, After complete mixing allow the acid to cool down to the ambient temperature.
3. Store sulphuric acid only in plastic or lead lined container,
4. Always wear goggles, rubber hand gloves and apron while handling acid. Be extremely careful not to spil or splash acid.

NOTE : THE CONCENTRATED ACID SHOULD ALWAYS BE POURED INTO THE WATER , AND IT IS DANGEROUS TO POUR WATER INTO CONCENTRATED ACID.

TROUBLES SHOOTING CHART

S.NO.	SYMPTOMES	CAUSES	REMEDIES
1.	Excessive gassing and progressive increase in sp. gr. During float.	Float voltage set too high.	Reduce float voltage to lower value and check the accuracy of voltmeter in charger.
2.	Progressive decline in value of sp. gr. during floating.	Float voltage set too low.	Increase float voltage to 2.15 to 2.20 V/ Cell check accuracy of voltmeter in charger.
3.	Cell getting discharged.	Leakage of current through grounded circuit.	Check for leakage of Electrolyte or grounding of current carrying conductors in charger or battery circuit.
4.	Rapid fall in cell voltage.	Loose connection or corroded terminals.	Clean corroded parts with warm distilled water and smear with petroleum jelly.
5.	Continuously low electrolyte level.	1. Leakage of elec--trolyte. 2. Loss of water in electrolyte due to evaporation by way of highfloating voltage or excessive charging.	1. In case of breakage, replace container. 2. Add D. M. Water to maintain electrolyte level . check and adjust float voltage.
6.	Continued low reading of sp. gr., loss of capacity after full charge, low O.C.V.	1. Internal short circuit. 2. Sulphation.	1. Open the cells, and examine the accidental contacts, missing or punctured separator. 2. Sulphated cell should be given special charge..
7.	Premature gassing.	Sulphation causing low capacity in Negative plates.	Prolonged charge @ 3% of the cell capacity.
8.	Cell over flowing.	Increase in Electrolyte level.	Adjust electrolyte level to correct height.

INITIAL FILLING

Remove the Vent Plugs and fill the Cells with previously prepared and cooled electrolyte of 1.190 Sp. Gr. Till the lower marking on the float indicator stem first appears above the float plugs. Before dilling ensure to stir electrolyte properly.

a) After filling the electrolyte, allow the cells to rest for a period of 12 to 24 Hrs.
b) During the rest period, if the level of the electrolyte falls slightly (being absorbed in to the plates and separators) restore level be adding of same Sp. Gr electrolyte as originally filled, before putting the cells on first charge.
c) Now the cells are ready for first charge.

FIRST CHARGE

a) The recommended first charge current is given in table ' A BIRD'S EYE VIEW OF BINDAL GAUNTLET TUBULAR STATIONARY CELLS'.
b) Select a D.C Source of 50% higher voltage and current capacities as compared to battery voltage and maximum current requirement.
c) The cells are to be connected in series. The positive terminal and negative terminal should be correctly connected to the corresponding positive and negative terminals of D.C source.
d) Record the open circuit voltage of every cell. As soon as the cells are on charge take another set of voltage reading to check for any reverse connections.
e) While charging individual cell voltage sp gr / temperature readings should be recorded every four Hrs.
f) During charging it is not advisable to allow the temperature of the electrolyte exceed 50 Deg. C. so should it cross 45 Deg. Cel. Reduce the charging reate to half the value and increase time proportionally, if the temperature continues to rise towards 50 Deg. C, stop charging immediately and recommences only after the electrolyte has cooled down below 50 Deg. Cel increasing charging time proportionately.
g) While charging there will be some fall in the level of electrolyte due to loss of water by gassing. Restore this by adding required quantity of distilled water.

OPERATION AND MAINENANCE:

a) The battery and surrounding area should be clean and dry, and make sure battery room is well ventilated
b) All electrical connections should be tight to avoid heating up and short circuit.
c) If the battery is to stand idle for a month, a refreshing charge must be given once in a month.
d) Always keep the top surface of the battery clean and dry. The joint and cell connections should also be kept clean and smeared with petroleum jelly.
e) If any cell container is broken, the group should be kept immersed in distilled water till the container is replaced.
f) Care should be taken not to short circuit cells while using spanner etc.
g) Do not exceed finishing rate during recharge when cells start gassing.

h) Normal charging can be done in two ways, a constant current can be applied or 2.4 Volt per cell high rate can be maintained and later a lower rate till the end of charge as shown in A Birds Eye View of Bindal Gauntlet Tubular Stationary Cells.
i) When cells are not regularly undergoing discharge cycle, but maintained in charged condition by trickle charge or float charge, gravity of acid should be correctly measured from which actual state of charge can found out. About three cells, one at centre and two at ends, may be chosen for this purpose for recording daily voltage, specific gravity and temperature.
j) Records must be maintained perfectly and if any cells show weakening, Bindal Batteries Head Office must be informed immediately.

CAUTION:

a) Never allow a naked flame, lighted pipe or cigarette near the cells.
b) Keep the cell top clean and dry.
c) Keep the cleaned vent plug in position.
d) See that the connectors are clean and tight.
e) Do not keep any loose metallic part on the cell top.
f) Do not keep filled cell idle for a long period without charging.
g) Remember always that electrolyte is highly corrosive.
h) Do not permit the electrolyte level to go below the minimum permissible level.
i) Topping up with D.M water should be done, so that atleast two hours of charging at gassing rate could be done and topping up should not be done just before starting discharge.
j) Never use acid for topping up. Use only D.M water
k) Attend to weak cells immediately.

SPECIAL FEATURES:

a) Longer Service life on account of its well designed tubular positive construction using corrosion resistant spine and grids.
b) Reduced maintenance and self discharge looses on account of well established acid volume and active material.
c) Deep Discharge capability.
d) Optimum cell performance due to minimum voltage drop across the cell terminals and lead plated inter cell connectors with high conductivity and greater resistance to corrosion.
e) Easy maintenance due to the use of unique level indicators permitting instant visual checks of the electrolyte level.
f) Compact cell design facilitates accommodation under space constraints.

A BIRDS EYE VIEW OF BINDAL GAUNTLET TUBULAR STATIONARY CELLS

Type of Battery	**Capacity at 10hr. rate at 27 C**	**Discharge Current at 10hr. rate (Amp)**	**Rate of Initial Charge for 75 hr. (Amp)**	**Normal Rate of Charging**		**Dry weight (Kgs) +/- 5%**	**Overall Dimensions (+/- 5mm)**		
				Up to 2.4V Amp	Till End Amp		**L**	**W**	**H**
2BT 60Ah	60Ah	6.0	3.0	7.2	3.6	5.5	175	125	285
2BT 80Ah	80Ah	8.0	4.0	9.6	4.8	6.8	175	125	285
2BT 100Ah	100Ah	10.0	5.0	12.0	6.0	9.0	175	125	285
2BT 120Ah	120Ah	12.0	6.0	14.0	7.0	10.2	175	125	285
2BT 150Ah	150Ah	15.0	7.5	18.0	9.0	11.0	160	170	485
2BT 200Ah	200Ah	20.0	10.0	24.0	12.0	12.5	160	170	485
2BT 300Ah	300 Ah	30.0	15.0	36.0	18.0	16.0	160	170	485
2BT 400AH	400 AH	40.0	20.0	48.0	24.0	19.8	160	170	485
2BT 600AH	600 Ah	60.0	30.0	72.0	36.0	28.5	399	191	510
2BT 800AH	800 AH	80.0	40.0	96.0	48.0	34.0	399	191	510
2BT 1000AH	1000 AH	100.0	50.0	120.0	60.0	42.5	345	207	525
2BT 1200 AH	1200 AH	120.0	60.0	144.0	72.0	48.5	345	207	525

BINDAL STATIONARY CELL
(TO RECORD THE STATUS OF CELL)

Date:
Cell Type:
Name of Destination:
Date of Commissioning:

Cell No:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
Cell Voltage																								
Specific Gravity																								
Temp of Cell																								
Level of Electrolyte																								
Abnormalities, If any																								

Note:

1) It is necessary to record daily reading of three cells, taken from two ends and the middle of the battery bank.
2) Use accurate voltmeter and hydrometer.

For Further Clarification Contact:

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