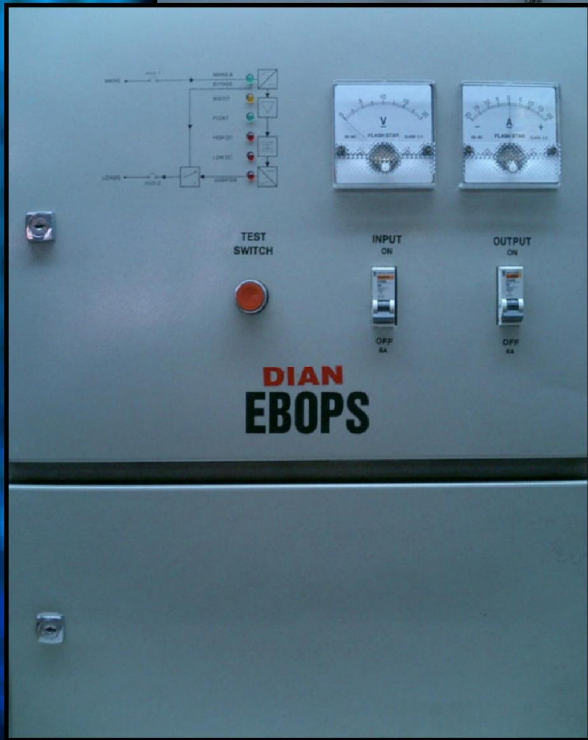




Power failure? Don't panic !

DIAN

EMERGENCY BATTERY OPERATED POWER SUPPLY (EBOPS)



OPERATION AND MAINTENANCE MANUAL

I/ GENERAL

THE EMERGENCY BATTERY OPERATED POWER SUPPLY (EBOPS) is specially designed for Lighting and Ventilation of the passenger lift in the event of power failure.

The EBOPS is a complete, enclosed unit assembly arranged for permanent connection consisting of a rechargeable battery, a battery charging facility and an inverter. It enables the batteries to be charged through the rectifier and at the same time provide supply to the loads during normal condition. The battery will restore its energy in the form of DC current to the inverter and inverter to an AC supply to loads when AC Mains supply failed.

II/ TECHNICAL SPECIFICATION

MODEL : AN24 – 19

- 24V system
- 230V 50Hz 1P
- EBOPS 120mins

1. CHARGER

Input Voltage	230VAC $\pm$ 10% ,Single Phase
Frequency	50Hz
Charging Method	Constant Voltage, Current limiting
Charging Current	1.5 - 2A
Float Charging Voltage	28 – 24.4V
Output Ripple	Less than 0.3%
Meter	Charging Current, Battery Voltage
Protection	Input MCB

2. INVERTER

Output Voltage	220VAC $\pm$ 6%
Frequency	50Hz $\pm$ 1%
Discharging Current	Max 25ADC
Wave Form	Sine modified
Overshoot	Less than 6% at rated resistive load
Meter	Discharging Current & Voltage
Rate load	120W
Backup Duration	Not less than 2 hours
Protection	Output MCB Battery low voltage auto cut-off Battery high voltage auto cut-off

3. PHYSICAL

Led Indicator	Mains ON, Inverter ON, Low DC, High DC
Ambient Temperature	40°C Max
Humidity	0 – 90% non – condensing
Dimension	900(H) x 400(W) x 300(D)mm
Weight with Battery	50Kg

4. BATTERY

Nominal Voltage	24V
Type & Capacitor	1.2V – 22AH
Brand	Apollon Diamond Ni-Cd Battery

III/ OPERATION AND MAINTENANCE INSTRUCTION

1. Check all external wiring are correctly and properly connected to the respective terminals.
2. Check and ensure that the mains supply and battery voltage are the same as the system rating.
3. Switch on the AC supply (Input MCB) and Switch on the Maintenance Switch, The Green LED on the control panel will light up indicating the mains supply is present.
4. The charging current and voltage will be shown on Ammeter and Voltmeter respectively on the control panel.
5. When the batteries is fully charged ,the charging current should not exceed 0.5 Amp and Mains light should light up.
6. Switch off AC supply (Input MCB) ,the Red LED will light up if the Inverter is in operation. It is recommended to test the Inverter with the loads present.
7. Ensure that the Batteries Terminals are tightened properly .The batteries must be kept dry and clean.

PARTS LIST

1.Main Transformer
Marking : ” DIAN “
Pri :N M L P S
Sec :A B O B A

2. Bridge Rectifier (SID)
Marking : MB 3506

3. SCR
Marking : BT152

4. Power and Control Board
Marking : AN12-01

5. H R C Fuse (HF)
Marking : DIXSEN
20Amps

6. LED Display Board
Marking : AN12-03

7. Terminal Block (TB) – 12Ways
Marking : TEND TB25-12
600V 25A

8.Heatsink H200xW180xD35

9. Test Switch (non)

10. Output mcb (mcb2)
Marking : MERLIN GERIN
Model number :Multi 9 C60N

11.MaintenanceSwitch(SW)
Marking :MEGAMAN CB25A

12. Voltmeter (V)
Marking :Flash Star SD -80
0-20V
Class 2.5

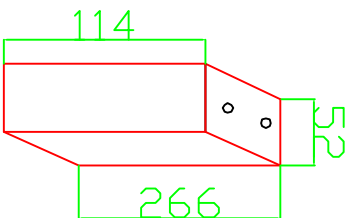
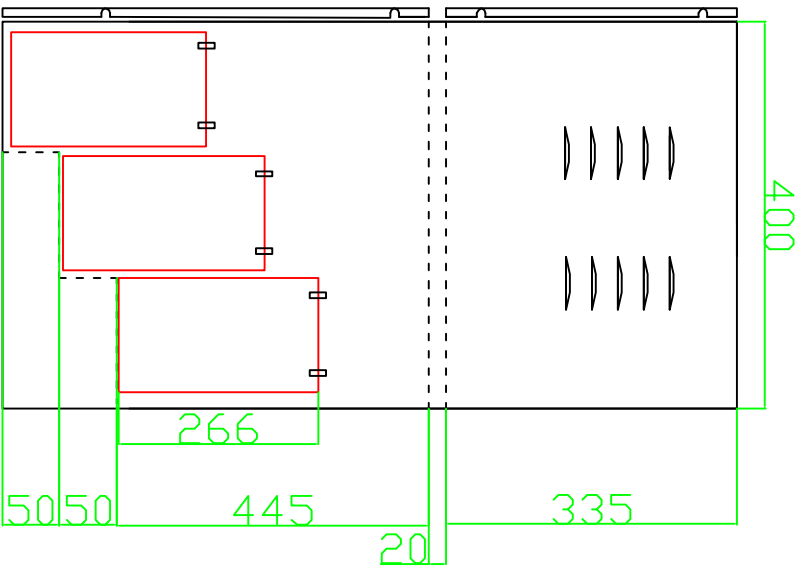
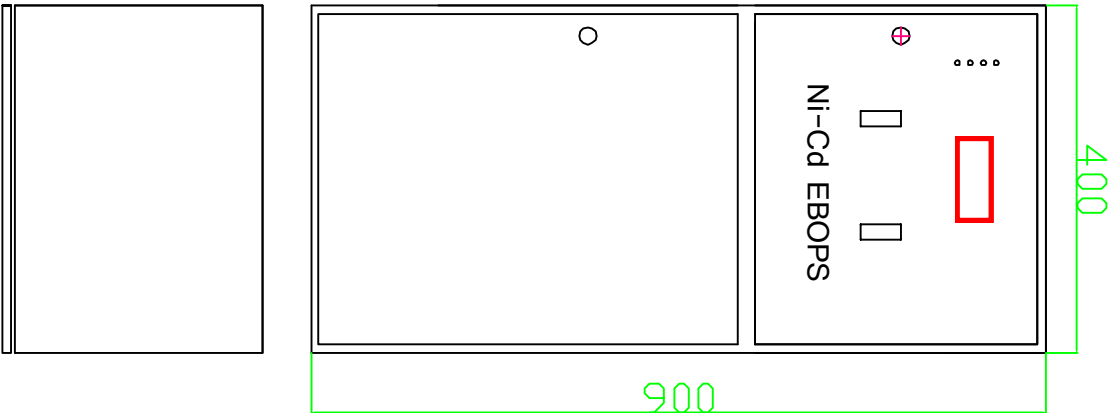
13.Ammeter (A)
Marking : Flash Star SD -80
+/- 20A
Class 2.5

14.Input mcb (mcb1)
Marking : MERLIN GERIN
Model number :Multi 9 C100N

15.Lock&key
Marking :
Model number:

16.Metal cubicle
Powder Coating
H700xW400xD300

EBOPS DIAGRAM



15	14	1
16	13	2
20	8	7

DIAN Ni-Cd EBOPS
Ni-Cd battery : 1.2V - 22Ah
Số lượng cell : 20pcs
Back up : 2H

Rev.	Remark	Day	Vô Hoài An	Manufacturer: DI AN ELECTRIC	PROJECT: Ni-Cd EBOPS	DWG File	Ref. Number	Sheet No:
1		10-02-2017						Rev.
2								
3								
4								
5								
6								
7								
8								



The reliable power source.



APOLLON-Diamond
Nickel Cadmium Alkaline Batteries



APOLLON-Diamond

Nickel Cadmium Alkaline Battery

APOLLON-Diamond Nickel Cadmium batteries are one of the most trusted and reliable sources of DC power in wide-ranging and critical applications ranging from switch gear tripping, to UPS, to engine starting. All APOLLON-Diamond Nickel Cadmium batteries are manufactured to fulfill the requirements stipulated by IEC 60623 and EN60623.

Long Life

Up to 15 - 20 years of operating life and the ability to withstand deep discharges. This means durability and low life cycle costs to end users.

Wide Range of Operating Temperatures

APOLLON-Diamond Nickel Cadmium batteries are designed to withstand a wide range of operating temperatures, of between -40 degrees Celsius to 50 degrees Celsius.

Long Shelf Life

No worries if you store up APOLLON-Diamond Nickel Cadmium batteries for long periods before using. The batteries offer unparalleled shelf life of up to several years under correct conditions, including under discharged state.

Low Maintenance

Not just easy storage, but also relatively carefree usage. Topping up of electrolyte is only required between 3 to 6 months under tropical climate, and between 6 to 12 months in temperate climate. Visual checking is easy with the fully transparent container that comes with APOLLON-Diamond Nickel Cadmium batteries. Furthermore, no active monitoring of electrolyte level is required if they are used with APOLLON-Diamond Battery Chargers with Electrolyte Level Sensor alarm.

High Reliability

High reliability for assured backup in mission critical applications. APOLLON-Diamond Nickel Cadmium batteries offer excellent resistance to over-charging and over-discharging. In addition, there is no risk of sudden death or thermal runaway.

Manufactured to withstand Rugged Treatment

Both MBS** and PP** casings offer excellent resistance against rugged treatment. Standard casings are also fire retardant to UL94. Additional protection can be ordered according to specifications.

APOLLON-Diamond Nickel Cadmium batteries are available in four series: Low Discharge Rate Series (HDS), Medium Discharge Rate Series (HDM), High Discharge Rate Series (HDH) and Very High Discharge Rate Series (HDV).

HDS Series

This series is specially designed for general purpose and stand-by applications, where discharge is not frequent and takes place over long periods. The typical operation condition is on float charge. Ideal applications include switchgear tripping, fire alarms, telecommunications and UPS.

HDM Series

This series is suitable for medium discharge periods of between 30 minutes and 5 hours, or for mixed loads which involve a mixture of high and low discharge rates. Ideal applications include stand-by and UPS.

HDH Series

These batteries come with very thin plates to achieve a higher performance through increased active material exposure. High capacity switchgear tripping, UPS, as well as engine starting are ideal applications. Best suited for very short discharge periods of 1 second to 60 minutes at very high discharge currents.

HDV Series

An improved high discharge rate range, which is ideally suited and designed for applications where the highest reliability and extremely high discharge currents in very short periods are required.

Where supplementary mechanical strength and additional shock or vibration resistance is required, such as in certain railway applications, APOLLON-Diamond Nickel Cadmium batteries can be installed into robust wooden or steel crates.

**MBS - Polymethacrylate Butadiene Styrene
PP - Polypropylene Homopolymer



Cell Capacities and Dimensions

HDS (LOW RATE TYPE)						
CELL TYPE	NOMINAL CAPACITY	CELL DIMENSIONS (MM)			CELL WEIGHT	ELECTROLYTE VOLUME (ℓ)
		WIDTH	LENGTH	HEIGHT		
HDS22P	22	114	52	266	2.00	0.6
HDS30P	30	114	52	266	2.20	0.50
HDS40P	40	114	52	266	2.30	0.40
HDS50P	50	139	79	291	3.50	1.00
HDS60P	60	139	79	295	4.30	1.13
HDS70P	70	139	79	295	4.40	1.00
HDS80P	80	139	79	295	5.10	1.10
HDS100P	100	139	79	362	6.00	1.40
HDS120P	120	139	79	362	6.20	1.30
HDS125P	125	139	79	362	6.40	1.20
HDS150P	150	165	105	345	9.00	2.00
HDS200P	200	167	162	343	14.00	3.30
HDS250P	250	167	162	343	14.00	3.40
HDS300P	300	282	170	348	22.50	5.00
HDS350P	350	282	170	348	25.00	5.00
HDS400P	400	282	170	348	25.00	5.00
HDS500P	500	285	172	490	33.60	7.80
HDS600P	600	285	172	490	34.00	7.50
HDS700P	700	285	172	490	39.00	8.40
HDS800P	800	395	185	560	57.50	15.50
HDS900P	900	395	185	560	59.00	17.00
HDS1000P	1000	395	185	560	61.00	18.00

HDM (MEDIUM RATE TYPE)						
CELL TYPE	NOMINAL CAPACITY	CELL DIMENSIONS (MM)			CELL WEIGHT	ELECTROLYTE VOLUME (ℓ)
		WIDTH	LENGTH	HEIGHT		
HDM30P	30	114	52	266	2.40	0.60
HDM40P	40	114	52	266	3.60	1.00
HDM50P	50	139	79	291	5.00	1.20
HDM60P	60	139	79	291	5.30	1.20
HDM75P	75	139	79	295	6.50	1.10
HDM80P	80	139	79	295	6.50	1.15
HDM100P	100	139	79	362	9.30	1.80
HDM110P	110	139	79	362	9.30	1.80
HDM120P	120	165	105	345	9.50	2.00
HDM150P	150	167	162	345	12.50	2.70
HDM200P	200	167	162	345	13.50	2.70
HDM250P	250	282	170	348	22.00	4.80
HDM300P	300	282	170	348	26.00	6.00
HDM350P	350	285	172	490	28.00	6.00
HDM400P	400	285	172	490	32.00	7.00
HDM500P	500	285	172	490	36.50	8.50
HDM600P	600	395	185	560	39.00	10.00
HDM700P	700	395	185	560	66.00	15.00
HDM800P	800	395	185	560	66.00	15.00
HDM900P	900	395	185	560	66.00	15.00
HDM1100P	1100	395	185	560	68.00	12.50

Above cell dimensions are for batteries in MBS transparent containers.
 Other sizes and specifications available. Please enquire.
 Features and Specifications are subject to changes without prior notice.



Cell Capacities and Dimensions

HDH (HIGH RATE TYPE)						
CELL TYPE	NOMINAL CAPACITY	CELL DIMENSIONS			CELL WEIGHT	ELECTROLYTE VOLUME (ℓ)
		WIDTH	LENGTH	HEIGHT		
HDH30P	30	139	79	295	4.50	1.40
HDH40P	40	139	79	362	4.50	1.30
HDH50P	50	139	79	362	6.00	1.60
HDH60P	60	139	89	362	6.50	1.70
HDH70P	70	165	105	345	9.00	1.80
HDH80P	80	165	105	345	9.60	2.00
HDH100P	100	165	162	345	13.30	3.60
HDH120P	120	167	162	345	13.50	3.50
HDH150P	150	282	170	348	21.80	6.20
HDH200P	200	282	170	348	25.60	6.10
HDH250P	250	282	170	348	27.00	6.00
HDH300P	300	291	174	505	33.00	6.50
HDH350P	350	291	174	505	34.50	7.00
HDH400P	400	291	174	505	36.00	7.50
HDH500P	500	398	185	562	53.00	15.00

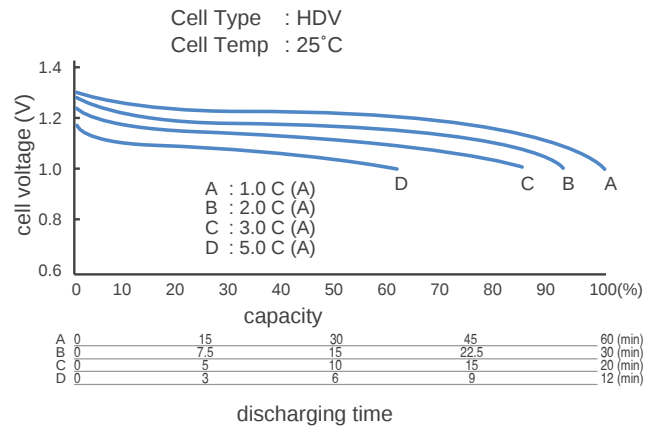
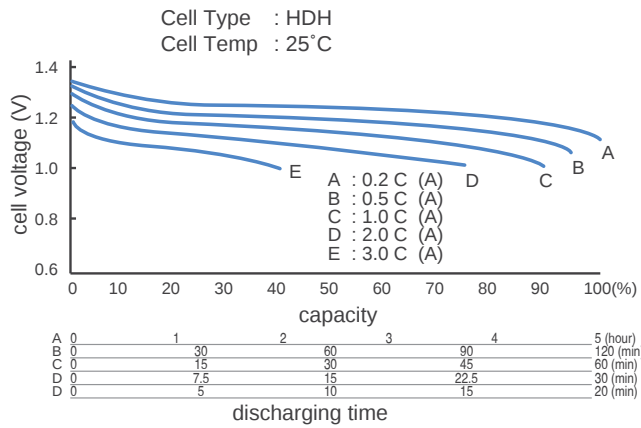
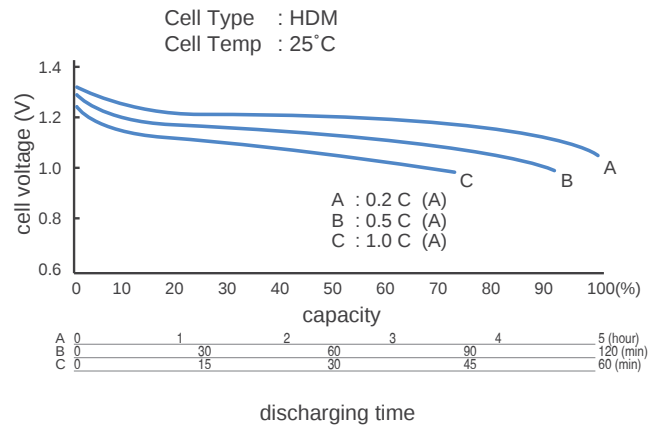
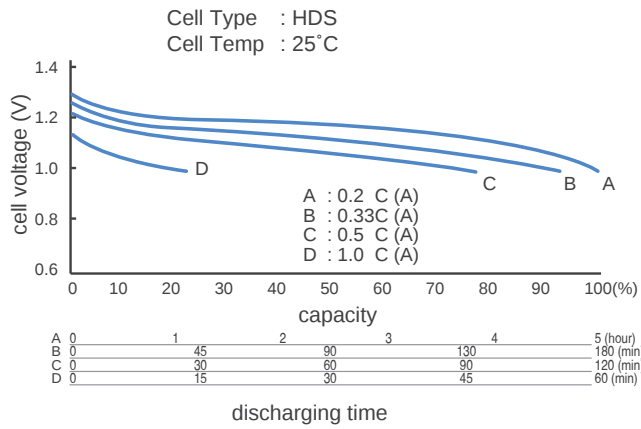
HDV (VERY HIGH RATE TYPE)						
CELL TYPE	NOMINAL CAPACITY	CELL DIMENSIONS (MM)			CELL WEIGHT	ELECTROLYTE VOLUME (ℓ)
		WIDTH	LENGTH	HEIGHT		
HDV5P	5	81	26	163	0.51	0.050
HDV10P	10	81	26	163	0.62	0.060
HDV20P	20	81	34	245	1.10	0.130
HDV30P	30	81	43	266	1.75	0.210
HDV40P	40	81	43	266	1.86	0.180
HDV50P	50	81	50	266	2.20	0.250
HDV60P	60	138	61	266	3.80	0.400
HDV70P	70	138	61	266	4.00	0.400
HDV80P	80	138	61	266	4.00	0.400
HDV90P	90	138	61	266	4.30	0.350
HDV100P	100	138	61	266	4.20	0.300
HDV120P	120	139	79	295	5.50	0.700
HDV140P	140	139	79	362	7.00	1.400
HDV170P	170	139	79	362	8.50	1.500
HDV190P	190	165	105	350	10.00	1.450
HDV210P	210	165	105	350	10.50	1.450
HDV230P	230	167	162	343	12.50	2.500
HDV250P	250	167	162	343	13.00	2.400

Above cell dimensions are for batteries in MBS transparent containers.
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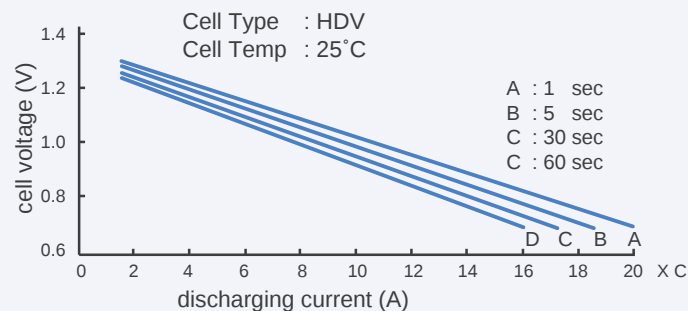
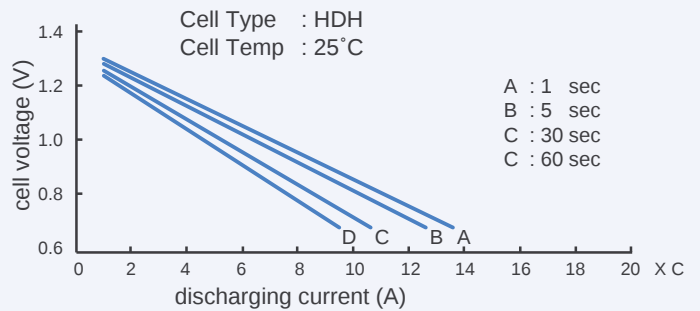
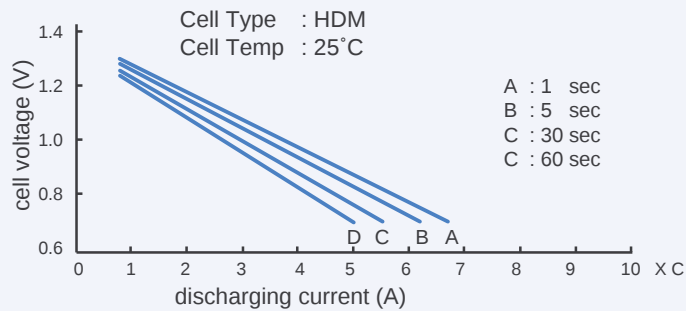


Discharge Graphs

Discharging



High Rate Discharging





Charging Information

The following per-cell charge voltage are recommended

CELL TYPE	FLOATING CHARGE	EQUALIZING CHARGE
HDS	1.41 ~ 1.45	1.55 ~ 1.60
HDM	1.41 ~ 1.45	1.55 ~ 1.60
HDH	1.40 ~ 1.43	1.55 ~ 1.60
HDV	1.36 ~ 1.38	1.50 ~ 1.55

Initial charging before putting into service:

To inject $2 \times C_5$ AH into the battery. The charging time should be adjusted according to the level of the charging current, as shown in the following example:

Example:

20 hours at current limit of $0.1 \times C_5$ (Amp)

10 hours at current limit of $0.2 \times C_5$ (Amp)

C_5 = The nominal capacity of the battery in ampere hours, 5 hour-rated

Battery Installation

Alkaline batteries are installed either by mounting on stands or installed in cubicles. Conditions of installation area are as follows:

- Avoid direct sunlight
- Avoid gases and dust
- No vibration and low humidity
- Keep temperature below 40° Celsius

We are ready to help you select the right type.

When you are selecting a battery or stand-by power system, you should carefully consider various performance requirements and the conditions under which it is expected to be used. Most important are the following three factors:

- 1 How much current is needed?
- 2 How long must the battery work?
- 3 What is the permissible end voltage?

Our Sales Engineers will help you select the right type of APOLLON-Diamond Nickel Cadmium Alkaline Battery for stand-by and other power supply system applications.



Battery Size Calculation

BASIC DATA REQUIRED FOR A PRECISE BATTERY SIZING CALCULATION:

- Maximum Voltage (For Charging)
- Minimum Voltage
- Standing Load Current (Amps)
- Intermittent Load Current
- Standby Period
- Nominal Voltage of the System
- Battery Layout and Available Space
- Physical Conditions



DETERMINATION OF THE NUMBER OF CELLS IN A BATTERY

The number of cells in a battery may be determined by simply dividing the minimum voltage of the system by the end voltage of a cell (1.1V), with following results:

SYSTEM VOLTAGE	NUMBER OF CELLS	SPREAD IN ACTUAL PRACTICE
24	20	18 - 21
30	23	23 - 25
48	40	32 - 42
110	86	84 - 93
220	172	180 - 186



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