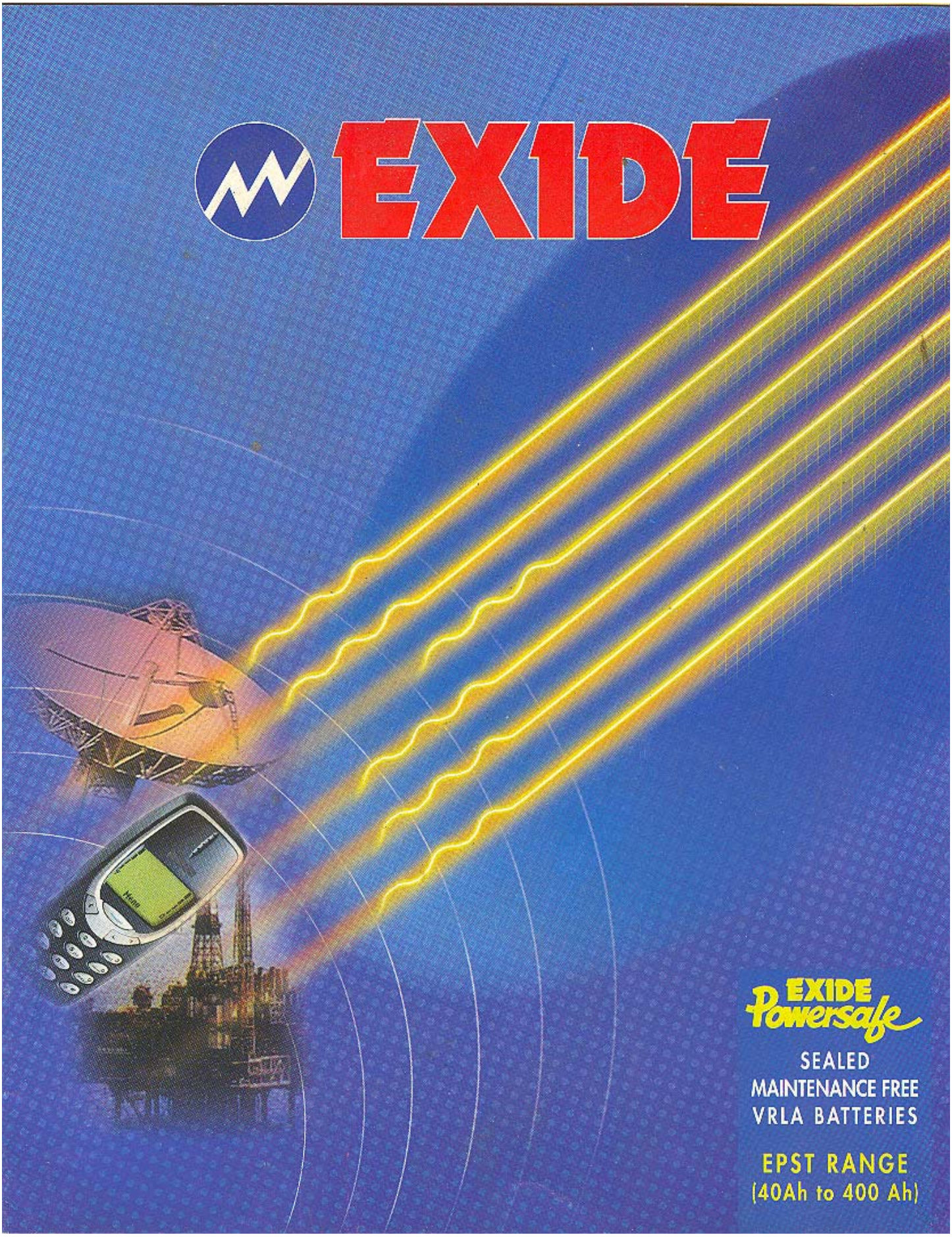
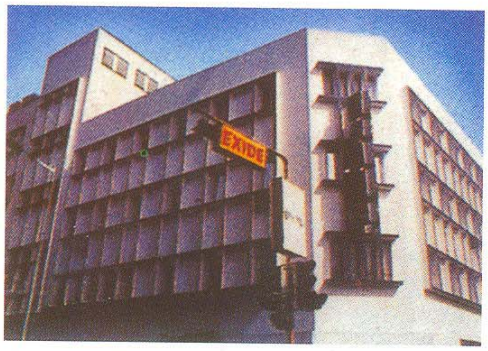

EXIDE
EXIDE Powersafe
SEALED
MAINTENANCE FREE
VRLA BATTERIES
EPST RANGE
(40Ah to 400 Ah)

EXIDE Powersafe

INTRODUCTION

For over 75 years, Exide Industries Ltd. has pioneered battery technology in India. Formerly known as Chloride Industries Limited, the Company was a part of the Chloride Group PLC UK. The leader in packaged power technology, Exide is today India's largest storage battery company with global affiliations and internationally reputed brands having 9 factories strategically located all over India.



A tie-up with Shin-Kobe of Japan, leading global manufacturers of the renowned Hitachi brand of batteries and state-of-the-art highly automated factories at Hosur and Haldia, give us the technology edge. Recognition of our pursuit of quality was achieved when RWTUV of Germany awarded us the ISO 9001 followed by ISO 14001. Technology and quality combine together in **Exide Powersafe** series of Maintenance Free batteries, bringing you the best power back-up for usage in standby and solar power applications.

Vision

To win our customer, stakeholders and employees by transferring Quality into a performance oriented business which will secure market leadership and profitable growth through effective fulfilment of customer needs.

Performance Characteristics Conforming

JIS : C8707

TEC Specification No. : G/BAT-01/02 MARCH 2000 With Latest Amendment

RDSO Specification No. : IRS:S93-96 With Latest Amendment

APPLICATION

Telecommunication System

Off-shore Platform

Cellular Phones & Pagers (Base Stations & Transmitters)

Solar Photo-voltaic Systems

Power Station

Railway Signalling & Telecom Equipment

- Electronic PABX Systems
- UPS Systems
- Office Automation Equipment
- Cable Television Equipment
- Geophysical Equipment

Technical Details :

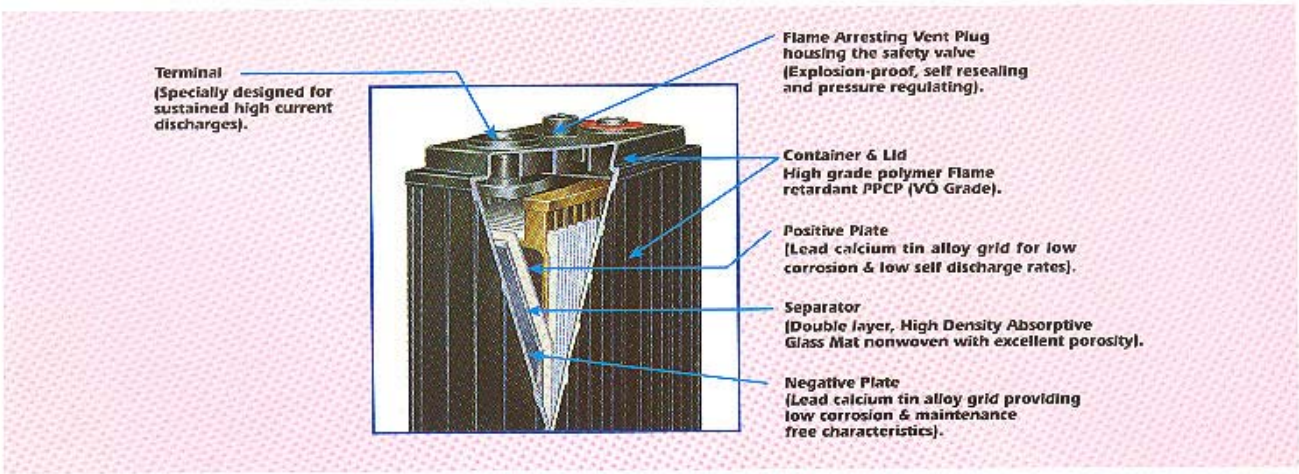
- **Maintenance Free**
  No topping up is required.
- **Enhanced Performance**
  - Computer aided grid design for high power density
  - Excellent deep discharge recovery
  - Better thermal management in the module
  - Resistance to thermal runaway
- **Ready-to-use**
  Supplied in factory charged condition.
- **State-of-the-art technology**
  - Argon arc welding employed
  - Heat sealing checked by Helium Ion Tester
  - Flame arrestor fitted safety valve
- **Eco-friendly**
  - No emission of corrosive fumes or gases under normal operating conditions.
  - Cadmium free
- **Easy handling & no installation constraints**
  Compact, easily transportable and can be used in any orientation without leakage or spillage of electrolyte.
- **Saving in floor space**
  Horizontally stackable modules, low foot-print.
- **User friendly**
  - Front access design
  - Easy cell replacement
  - Can be used in any orientation
- **Life Expectancy in float condition**
  20 years at 27°C and following proper charging conditions.
- **Life Expectancy in Cycling conditions at 27°C**
  4000 cycles at 20% DOD
  1800 cycles at 50% DOD
  1200 cycles at 80% DOD
- **Recommended Float Voltages**

AMBIENT TEMP (°C)	RECOMMENDED FLOAT VOLTAGE PER CELL (VOLT)	MAXIMUM CHARGING CURRENT (AMPERE)
-5 to 14	2.27+/-0.01	0.15C
15 to 24	2.25+/-0.01	0.15C
25 to 24	2.23+/-0.01	0.15C
35 to 40	2.20+/-0.01	0.15C

C : Nominal 10 hr. capacity of the battery at 27°C

Mechanism

Construction

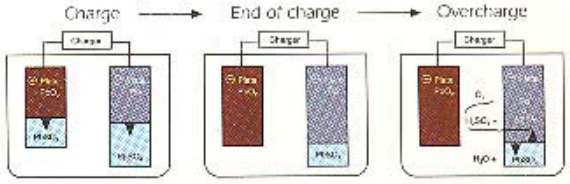


Recombination Principle

This recombination principle may be expressed as a :

Negative plate (charged)		O_2 gas generated from the positive plate	Negative plate	Electrolyte	Negative plate (discharged)		for Electrolyte
Pb	+	$1/2\ O_2$	$\longrightarrow$ (PbO)	$\rightarrow$ (PbO) + H_2SO_4	$\longrightarrow$ $PbSO_4$	+	(H_2O)
Spongy lead		Oxygen gas	Lead monoxide	Sulphuric acid	Lead sulphate		Water

This recombination principle is illustrated in Figure.



EXIDE Powersafe

TECHNICAL SPECIFICATIONS
(As per TEC Specification No. G/BAT – 01/02 MARCH 2000 With Latest Amendment)

Battery Model	Nominal Voltage (V)	Rated Capacity (Ah)				Dimensions(mm)			Weight
		10 Hr. 1.75v/cell	5 Hr. 1.75v/cell	3 Hr. 1.70v/cell	1 Hr. 1.67v/cell	L±5	D±5	H±5	(Kg) ±5%
6 EPST 40	12	40	33.3	28.7	20	1154	409	82	35
6 EPST 80	12	80	66.6	57.4	40	1154	409	82	49
6 EPST 100	12	100	83.3	71.7	50	1154	409	82	57
6 EPST 120	12	120	100.0	86.0	60	1154	409	82	62
3 EPST 165	6	165	137.4	118.3	82.5	700	408	157	51
3 EPST 200	6	200	166.6	143.4	100	700	408	157	58
3 EPST 240	6	240	199.9	172.1	120	700	408	157	66
3 EPST 250	6	250	208.3	179.3	125	700	408	157	66
3 EPST 260	6	260	216.6	186.4	130	700	408	157	67
4 EPST 300	8	300	249.9	215.1	150	822	395	184	101
4 EPST 330	8	330	274.9	236.6	165	822	395	184	101
4 EPST 340	8	340	283.2	243.8	170	824	395	217	115
4 EPST 360	8	360	299.9	258.1	180	824	395	217	115
4 EPST 400	8	400	333.2	286.8	200	824	395	217	124

DETAILS OF 48V SYSTEMS IN MODULAR CONSTRUCTION :

System	Model	Stacking	Overall Dimensions (mm)			Foot Print Area (Sq. m.)	Weight (Kg) ±5%
			L±10	D±10	H		
48V40AH	4X6 EPST 40	1 stack, 4 mods/stack	1154	409	403+/-10	0.472	141.3
48V80AH	4X6 EPST 80	1 stack, 4 mods/stack	1154	409	403+/-10	0.472	196.5
48V100AH	4X6 EPST 100	1 stack, 4 mods/stack	1154	409	403+/-10	0.472	230.1
48V120AH	4X6 EPST 120	1 stack, 4 mods/stack	1154	409	403+/-10	0.472	251.7
48V165AH	8X3 EPST 165	1 stack, 8 mods/stack	700	408	1377+/-20	0.286	409.3
48V200AH	8X3 EPST 200	1 stack, 8 mods/stack	700	408	1377+/-20	0.286	469.3
48V240AH	8X3 EPST 240	1 stack, 8 mods/stack	700	408	1377+/-20	0.286	529.3
48V250AH	8X3 EPST 250	1 stack, 8 mods/stack	700	408	1377+/-20	0.286	529.3
48V260AH	8X3 EPST 260	1 stack, 8 mods/stack	700	408	1377+/-20	0.286	541.3
48V300AH	6X4 EPST 300	1 stack, 6 mods/stack	822	395	1204+/-15	0.325	609.2
48V330AH	6X4 EPST 330	1 stack, 6 mods/stack	822	395	1204+/-15	0.325	609.2
48V340AH	6X4 EPST 340	1 stack, 6 mods/stack	824	395	1402+/-15	0.325	693.8
48V360AH	6X4 EPST 360	1 stack, 6 mods/stack	824	395	1402+/-15	0.325	693.8
48V400AH	6X4 EPST 400	1 stack, 6 mods/stack	824	395	1402+/-15	0.325	749.0

NOTE :

- Batteries with other intermediate capacities for specific application shall be provided on request.
- Dimensions given are as per horizontal stacking arrangement.

DISCHARGE PERFORMANCE AT 27°C

Battery Type	End Voltage per cell	Discharge current in Amperes (temp. 27°C)							
		10 hr.	8 hr.	5 hr.	4 hr.	3 hr.	2 hr.	1 hr.	30 min
40	1.8	4.040	4.720	6.720	8.000	9.720	13.120	20.800	30.800
	1.7	–	–	7.280	8.680	10.720	14.520	23.480	37.000
	1.6	–	–	–	–	–	–	25.280	41.600
80	1.8	8.080	9.440	13.440	16.000	19.440	26.240	41.600	61.600
	1.7	–	–	14.560	17.360	21.440	29.040	46.960	74.000
	1.6	–	–	–	–	–	–	50.560	83.200
100	1.8	10.100	11.800	16.800	20.000	24.300	32.800	52.000	77.000
	1.7	–	–	18.200	21.700	26.800	36.300	58.700	92.500
	1.6	–	–	–	–	–	–	63.200	104.000
120	1.8	12.120	14.160	20.160	24.000	29.160	39.360	62.400	92.400
	1.7	–	–	21.840	26.040	32.160	43.560	70.440	111.000
	1.6	–	–	–	–	–	–	75.840	124.800
165	1.8	16.670	19.470	27.720	33.000	40.100	54.120	85.800	127.050
	1.7	–	–	30.030	35.810	44.220	59.900	96.860	152.630
	1.6	–	–	–	–	–	–	104.280	171.600
200	1.8	20.200	23.600	33.600	40.000	48.600	65.600	104.000	154.000
	1.7	–	–	36.400	43.400	53.600	72.600	117.400	185.000
	1.6	–	–	–	–	–	–	126.400	208.000
240	1.8	24.240	28.320	40.320	48.000	58.320	78.720	124.800	184.800
	1.7	–	–	43.680	52.080	64.320	87.120	140.880	222.000
	1.6	–	–	–	–	–	–	151.680	249.600
250	1.8	25.250	29.500	42.000	50.000	60.750	82.000	130.000	192.500
	1.7	–	–	45.500	54.250	67.000	90.750	146.750	231.250
	1.6	–	–	–	–	–	–	158.000	260.000
260	1.8	26.260	30.680	43.680	52.000	63.180	85.280	135.200	200.200
	1.7	–	–	47.320	56.420	69.680	94.380	152.620	240.500
	1.6	–	–	–	–	–	–	164.320	270.400
300	1.8	30.300	35.400	50.400	60.000	72.90	98.400	156.000	231.000
	1.7	–	–	54.600	65.100	80.40	108.900	176.100	277.500
	1.6	–	–	–	–	–	–	189.600	312.000
330	1.8	33.330	38.940	55.440	66.000	80.190	108.240	171.600	254.100
	1.7	–	–	60.060	71.610	88.440	119.790	193.710	305.250
	1.6	–	–	–	–	–	–	208.560	343.200
340	1.8	34.340	40.120	57.120	68.000	82.620	111.520	176.800	261.800
	1.7	–	–	61.880	73.780	91.120	123.420	199.580	314.500
	1.6	–	–	–	–	–	–	214.880	353.600
360	1.8	36.360	42.480	60.480	72.000	87.480	118.080	187.200	277.200
	1.7	–	–	65.520	78.120	96.480	130.680	211.320	333.000
	1.6	–	–	–	–	–	–	227.520	374.400
400	1.8	40.400	47.200	67.200	80.000	97.200	131.200	208.000	308.000
	1.7	–	–	72.800	86.800	107.200	145.200	234.800	370.000
	1.6	–	–	–	–	–	–	252.800	416.000

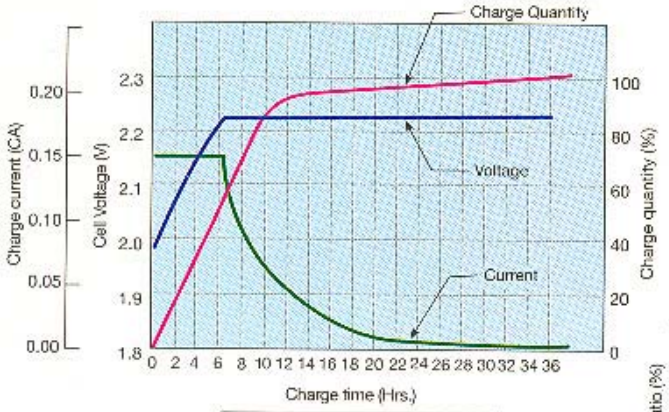
Note :

1) The available current output for each duration is dependent upon the end of discharge voltage level required by the system. Increase in specified end volts will increase battery size. The quoted end of discharge voltage relates to battery terminal voltage. Hence, voltage drop due to cable resistance between battery terminals and load circuit needs to be allowed for in the system calculation, particularly where a high current load for short duration is involved.

2) Batteries are shipped at 90% of their rated capacity. 100% capacity will be achieved by cycling the battery or after 3 months of float service.

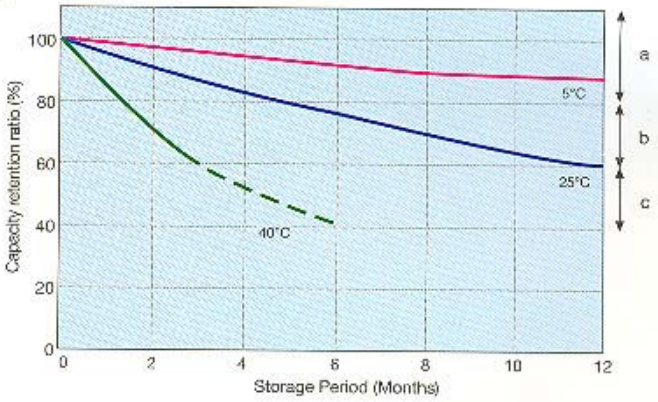
CHARACTERISTICS OF EPST BATTERIES

Charge Characteristics



Temperature	:	27°C
Discharge	:	100% C10 rate
Recharge	:	2.23 vpc 0.15C Amps

Capacity Retention Characteristics

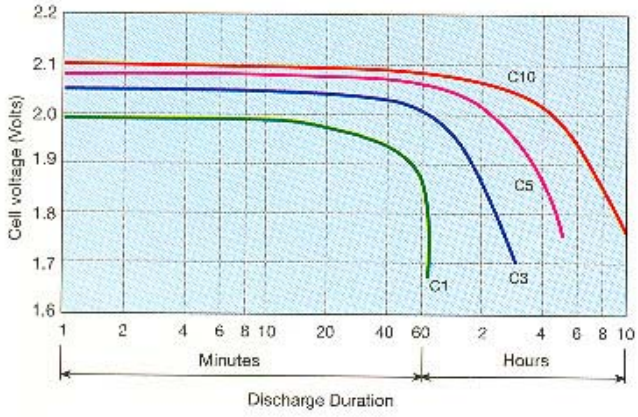


a. No supplementary charge is required (carry out supplementary charge before use if 100% capacity is required).

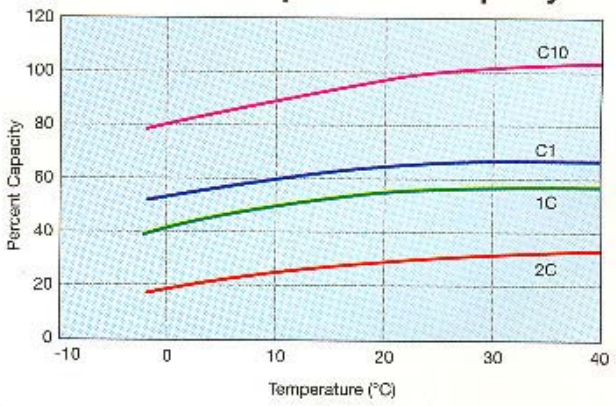
b. Supplementary charge required before use. This charge will help to recover the capacity & should be done as early as possible.

c. Supplementary charge may often fail to recover the capacity. The battery should never be left standing till this state is reached.

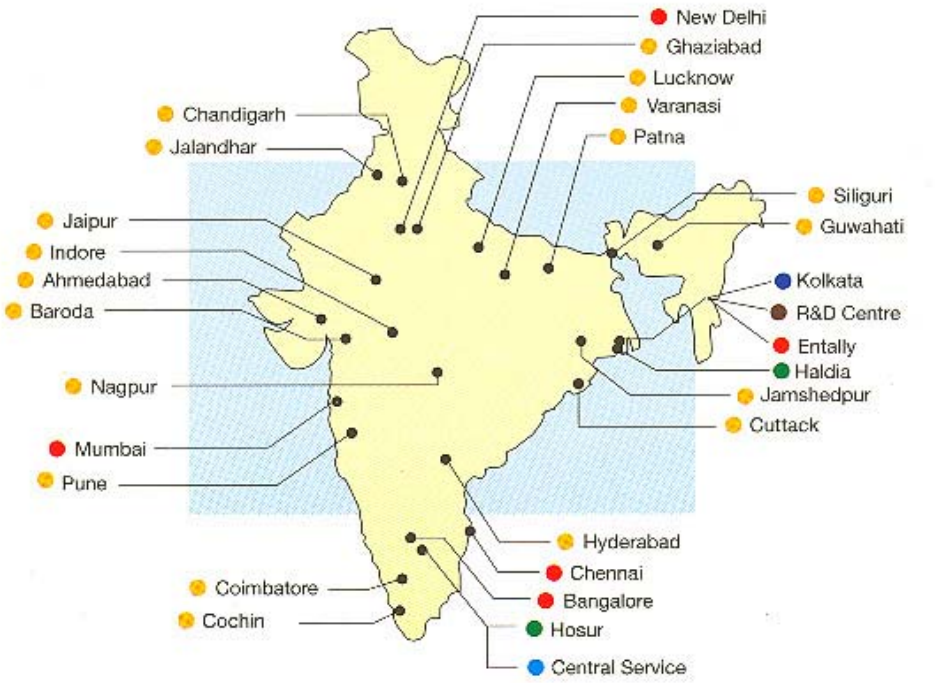
Discharge Performance Curves



Effect of Temperature on Capacity



NETWORK



For more information please contact us:

Head Office : Exide Industries Ltd., Exide House, 59E, Chowringhee Road, Kolkata 700 020, Ph : (033) 247 8320/8326-29, Fax : (033) 247 9819, 240 7831; **Factory Address : Hosur** Survey No. 246,Chinchurakanapalli Village, Sevaganapally Panchayat, Hosur Taluk, Dharmapuri Dist, Tamil Nadu - 635 103 Ph: (04344) 51252-58 Fax: (04344) 51251 **Haldia** Exide Industries Limited, Durgachak, Haldia - 721 602, Dist. Midnapur, West Bengal Ph : (03224) 52140/145/296/253 Fax: (03224) 52145 **R&D Address :** 217, Nazrul Islam Avenue, Kolkata - 700 059 Ph : (033) 5591458/4225/1660 Fax : (033) 5515545 **Central Service** Survey No. 246, Chinchurakanapalli Village, Sevaganapally Panchayat, Hosur Taluk, Dharmapuri Dist, Tamil Nadu - 635 103 Ph : (04344) 51252-58 Fax : (04344) 51251 Contact No. : 98450 44422 (24 hrs.)

Regional Offices : Kolkata, 6A, Hatibagan Road, Kolkata 700 014, Ph : 246 4560/4566, 284 3137, Fax : (033) 244 6555; **New Delhi,** Exide House, 3E/1 Jhandelwalan Extension, Link Road, New Delhi 110 055, Ph : (011) 355 5702, 362 7096, 362 7097, Fax : (011) 355 5703; **Mumbai,** 'Rahejas', 5th Floor, 8C Main Avenue, V.P. Road, Santa Cruz (West), Mumbai 400 054, Ph : (022) 646 5283/84, Fax : (022) 646 5042; **Chennai (South I),** 21/22, Alandur Road, Guindy, Chennai – 600 032, Ph. : (044) 234 1136/37/38/8031, Fax : (044) 234 6894; **Bangalore (South II),** 85 Ulsoor Road, Bangalore 560 042, Ph : (080) 559 8153/3683, Fax : (080) 559 9624; **Branch Offices : Baroda,** Ph : (0265) 33 1998, Fax : (265) 33 6063; **Chandigarh,** Ph : (0172) 65 7409/4387/4553, Fax : (0172) 65 4395; **Coimbatore,** Ph : (0422) 211737/1846/1997; **Cuttack,** Telefax : (0671) 62 0272; **Ghaziabad,** Ph : (0120) 483 2172, 2173; **Guwahati,** Ph : (0361) 544317; **Hyderabad,** Ph : (040) 331 4826/4830, Fax : (040) 339 9050; **Indore,** Ph : (0731) 49 1337/3395, Fax : (0731) 49 3395; **Jaipur,** Ph : (0141) 210 799, 218 004/007, Fax : (0141) 37 2409; **Jalandhar,** Ph : (0181) 223452/225774, Fax : (0181) 59 571; **Jamshedpur,** Ph : (0657) 426847, Fax : (0657) 42 8349; **Kochi,** Ph : (0484) 53 4868/69, Fax : (0484) 53 4869; **Lucknow,** Ph : (0522) 22 0722, 22 6971, Fax : (0522) 21 8089; **Mumbai,** Ph : (022) 207 2188/89/7918/7533, Fax : (022) 207 8631; **Nagpur,** Ph : (0712) 53 2722, 52 8461, Fax : (0712) 54 1479; **Patna,** Ph : (0612) 23 1569; **Pune,** Ph : (020) 635 5951, Fax : (020) 634 9315.

Do's

1. Read the manual carefully before use.
2. When the battery is not in use, store it in a cool place. Charge the battery atleast once in six months.
3. Keep sparks, flames, lighted cigarettes away from battery.
4. While charging the VRLA battery, use a dedicated charger and follow our charging conditions.
5. Make sure that you connect VRLA batteries by their proper polarity.
6. Make sure that VRLA batteries are operated in the following temperature range

   Discharge -20 to 50°C

   Charge 0 to 40°C

   Storage -20 to 40°C
7. After discharge, recharge the battery as soon as possible.
8. Erection to be completed at one go.

Don'ts

1. Never place the battery near or in fire
2. Never short-circuit the terminals.
3. Never disassemble or reassemble the battery.
4. Do not connect or disconnect any cell without switching off circuit.
5. Never use scouring powder or any solvent to clean battery surface.
6. Do not ever discharge a battery below 1.6 vpc.
7. Do not unpack, erect or assemble part by part.
8. Do not use the VRLA battery together with other types of batteries.
9. Never connect the VRLA battery directly to a power supply socket without using charger as a medium.
10. Do not solder directly on to the terminals of the VRLA battery.
11. Do not apply strong shock by dropping it or hitting it against objects.
12. Do not operate without proper safety measures.
13. Used batteries are recycled, so do not dispose them.

EXIDE INDUSTRIES LIMITED

Exide Industrial, Exide Industries Limited – An ISO 9001 Company
Exide House, 59E, Chowringhee Road, Kolkata – 700 020
Tel : (033) 247 8320/8326/27/28/29, Fax : (033) 247 9819, 240 7831
Visit us at www.exideindustries.com

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Our policy is one of continued improvement and we reserve the right to change details without prior notice.

CATALOGUE REF : EXIDE/EPST/04/2002

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