GENERAL TECHNICAL PARTICULARS UPST 80

SL. NO.	DESCRIPTION	DETAILS
1	Capacity in Ah	
(a)	At 27 ° C	
(i)	Initial	80
(ii)	Rated	80
(iii)	End of Life	64
(b)	Rated Capacity(in Ah) at minimum ambient temperature of (as per IS 15549 : 2005)	Formula : $C_t = \{ 1+ 0.0043 (t-27) \}$
(c)	Rated Capacity(in Ah) at maximum ambient temperature of (as per IS 15549 : 2005)	Formula : $C_t = \{ 1+ 0.0043 (t-27) \}$

2 Capacity at Various Discharge Rates at 27°C

Period of Discharge	*Ah capacities*	*Discharge Current (Amps)*	*End Cell Voltage (Volts)*
10Hr	**80.00**	**8.0**	**1.75**
9Hr	78.32	8.7	1.75
8Hr	76.00	9.5	1.75
7Hr	73.36	10.5	1.75
6Hr	70.32	11.7	1.75
5Hr	66.64	13.3	1.75
4Hr	62.56	15.6	1.74
3Hr	57.36	19.1	1.74
2Hr	50.64	25.3	1.7
1Hr	40.00	40.0	1.7
50 min	37.36	44.8	1.7
40 min	34.40	51.7	1.7
30 min	32.00	64.0	1.7
20 min	28.80	86.5	1.7
15 min	23.90	95.6	1.7
10 min	17.46	105.2	1.7
5 min	9.83	118.0	1.7
1 min	2.94	176.9	1.7

3	Maximum Momentary Current for 1 min upto cut off voltage of 1.6 V		240	Amps
4	Expected Fault current at bus due to battery	(As per layout)	480	Amps
5 (i)	Short Circuit Current at Battery terminals		480	Amps
5 (ii)	Time for which the battery can withstand short circuit at terminals		5 Sec	

6	Type/No. of Negative Plates per cell	Flat pasted; 1(I) + 2(E)
7	Type/No. of Positive Plates per cell	Flat pasted;2
8	Size of negative plates, mm	315(L) x 140(W) x 2.65 (+/- 1) (Thk) (Inter) 315(L) x 140(W) x 1.9 (+/- 1) (Thk) (End)
9	Size of positive plates, mm	315(L) x 140(W) x 4.5 (+/- 1) (Thk)
10	Type of Connection between cells	Bolted rigid copper connectors
11	Type of Separators	Absorptive glass mat
12	Thickness of Separators	4.2 (2 layers of 2.1 mm each)
13	Dimensison of 2 volts cell (LXWXH) , mm	159 (+/-3) x 62 (+/-3) x 396 (+/- 5 mm)
14	Clearance between the bottom of the plates and container	5 mm
15	Material of Container	Polypropylene Co-polymer

16	Recommended Charging Rate		
(i)	Float Charging Voltage		
	between ambient temp. (-)5-14 ° C	2.27 +/- 0.02 VPC	
	between ambient temp. 15-24 ° C	2.25 +/- 0.02 VPC	
	between ambient temp. 25-34 ° C	2.23 +/- 0.02 VPC	
	between ambient temp. 35-40 ° C	2.20 +/- 0.02 VPC	
(ii)	Float Charging Current	12	Amps (Max)
(iii)	Trickle Charging Voltage	NA	
(iv)	Trickle Charging Current	NA	
(v)	Boost Charging Voltage	2.35	Volts
(vi)	Boost Charging Current	16	Amps.
(vii)	Time taken to full charge from 100%	72 Hrs (Min)	
	discharge state by constant voltage	2.1 volts(ocv)	
	charging & voltage at the end of this charge		
(viii)	Equalising Charging Current;Voltage	NA	
17	Guaranteed efficiencies at 10 hrs rate		
	(a) Ampere-hour efficiency	90%	
	(b) Watt-hour efficiency	80%	
18	Allowable voltage ripple	1.5 % RMS of the charging voltage(Bulk charging) 0.5 % RMS of the charging voltage(Float charging)	

19	Internal Resistance of each cell at Fully Charged Condition	0.91	milli ohms min

20	Total Resistance of Battery ; milliohms	Depending on system layout drawing
21	Overall Dimensions of each complete module (LxWxH) in mm	Length 758 +/- 5, Width 450 +/- 5, Height 235 +/- 5 (12 cell module)
22	Weight of unpacked and complete module with electrolyte ; Kgs	92.85 +/- 5% Kgs (Single 12 cell module)
23	Material of Modules	Powder coated MS

24	Whether explosion vents are offered	Yes, self re-sealing rubber safety valve with flame arrestor
25	Loss of capacity due to self discharge	< 0.5% per week of c-10 capacity
26	The period for which the battery should be stored after supply in charged conditions	If stored in Indian ambient temp of 30 deg C cells will need freshning charge once in every three months, however if stored at higher or lower temperature freshning charge to be provided as recommended.
27	Amount of Hydrogen evolved during normal normal float charging	Less than 200ppm normal float condition
28	Recommended interval at which battery should be discharged at 10 hr discharge rate	Once annually

29	No. of charge-discharge cycle battery can give during its entire life	
	at 20% DOD	4000 cycles
	at 50% DOD	1800 cycles
	at 80% DOD	1400 cycles
30	Expected Life of Battery in years	20 Yrs at 27 deg C in ideal float condition.

31	Applicable standard	IEC 60896 - 21 & 22, JIS : C 8704-2, : 1998 ANSI T1 330, GR/BAT-01/03-MARCH 2004, IS 15549 : 2005

GENERAL TECHNICAL PARTICULARS NEPST 120

SL. NO.	DESCRIPTION	DETAILS
1	Capacity in Ah	
(a)	At 27 ° C	
(i)	Initial	120
(ii)	Rated	120
(iii)	End of Life	96
(b)	Rated Capacity(in Ah) at minimum ambient temperature of (as per IS 15549 : 2005)	Formula : $C_t = \{ 1+ 0.0043 (t-27) \}$
(c)	Rated Capacity(in Ah) at maximum ambient temperature of (as per IS 15549 : 2005)	Formula : $C_t = \{ 1+ 0.0043 (t-27) \}$

2 Capacity at Various Discharge Rates at 27°C

Period of Discharge	*Ah capacities*	*Discharge Current (Amps)*	*End Cell Voltage (Volts)*
10Hr	**120.00**	**12.0**	**1.75**
9Hr	117.48	13.1	**1.75**
8Hr	114.00	14.3	1.75
7Hr	110.04	15.7	**1.75**
6Hr	105.48	17.6	**1.75**
5Hr	99.96	20.0	1.75
4Hr	93.84	23.5	1.74
3Hr	86.04	28.7	1.74
2Hr	75.96	38.0	1.7
1Hr	60.00	60.0	1.7
50 min	56.04	67.3	1.7
40 min	51.60	77.5	1.7
30 min	48.00	96.0	1.7
20 min	43.20	129.7	1.7
15 min	35.84	143.4	1.7
10 min	26.20	157.8	1.7
5 min	14.75	177.0	1.7
1 min	4.40	265.3	1.7

3	Maximum Momentary Current for 1 min upto cut off voltage of 1.6 V	360	Amps
4	Expected Fault at bus due to battery	720	Amps
5 (i)	Short Circuit Current at Battery terminals	720	Amps
5 (ii)	Time for which the battery can withstand short circuit at terminals	5 Sec	

6	Type/No. of Negative Plates per cell	Flat pasted; 2(I) + 2(E)
7	Type/No. of Positive Plates per cell	Flat pasted;3
8	Size of negative plates, mm	315(L) x 140(W) x 2.65 (+/- 1) (Thk) (Inter) 315(L) x 140(W) x 1.9 (+/- 1) (Thk) (End)
9	Size of positive plates, mm	315(L) x 140(W) x 4.5 (+/- 1) (Thk)
10	Type of Connection between cells	Bolted rigid copper connectors
11	Type of Separators	Absorptive glass mat
12	Thickness of Separators	4.2 (2 layers of 2.1 mm each)
13	Dimensison of 2 volts cell (LXWXH) , mm	159 (+/-3) x 62 (+/-3) x 396 (+/- 5 mm)
14	Clearance between the bottom of the plates and container	5 mm
15	Material of Container	Polypropylene Co-polymer

16	Recommended Charging Rate		
(i)	Float Charging Voltage		
	between ambient temp. (-)5-14 ° C	2.27 +/- 0.02 VPC	
	between ambient temp. 15-24 ° C	2.25 +/- 0.02 VPC	
	between ambient temp. 25-34 ° C	2.23 +/- 0.02 VPC	
	between ambient temp. 35-40 ° C	2.20 +/- 0.02 VPC	
(ii)	Float Charging Current	18	Amps (Max)
(iii)	Trickle Charging Voltage	NA	
(iv)	Trickle Charging Current	NA	
(v)	Boost Charging Voltage	2.35	Volts
(vi)	Boost Charging Current	24	Amps.
(vii)	Time taken to full charge from 100% discharge state by constant voltage charging & voltage at the end of this charge	72 Hrs (Min) 2.1 volts(ocv)	
(viii)	Equalising Charging Current;Voltage	NA	
17	Guaranteed efficiencies at 10 hrs rate		
	(a) Ampere-hour efficiency	90%	
	(b) Watt-hour efficiency	80%	
18	Allowable voltage ripple	1.5 % RMS of the charging voltage(Bulk charging) 0.5 % RMS of the charging voltage(Float charging)	

19	Internal Resistance of each cell at Fully Charged Condition	1.34	milli ohms min

20	Total Resistance of Battery ; milliohms	Depending on no. of cells
21	Overall Dimensions of each complete module (LxWxH) in mm	Length 758 +/- 5, Width 450 +/- 5, Height 235 +/- 5 (12 cell module)
22	Weight of unpacked and complete module with electrolyte ; Kgs	118.05 +/- 5% Kgs (Single 12 cell module)
23	Material of Modules	Powder coated MS

24	Whether explosion vents are offered	Yes, self re-sealing rubber safety valve with flame arrestor
25	Loss of capacity due to self discharge	< 0.5% per week of c-10 capacity
26	The period for which the battery should be stored after supply in charged conditions	If stored in Indian ambient temp of 30 deg C cells will need freshning charge once in every three months, however if stored at higher or lower temperature freshning charge to be provided as recommended.
27	Amount of Hydrogen evolved during normal normal float charging	Less than 200ppm normal float condition
28	Recommended interval at which battery should be discharged at 10 hr discharge rate	Once annually

29	No. of charge-discharge cycle battery can give during its entire life	
	at 20% DOD	4000 cycles
	at 50% DOD	1800 cycles
	at 80% DOD	1400 cycles
30	Expected Life of Battery in years	20 Yrs at 27 deg C in ideal float condition.

31	Applicable standard	IEC 60896 - 21 & 22, JIS : C 8704-2, : 1998 ANSI T1 330, GR/BAT-01/03-MARCH 2004, IS 15549 : 2005

GENERAL TECHNICAL PARTICULARS UPST 80

SL. NO.	DESCRIPTION	DETAILS
1	Capacity in Ah	
(a)	At 27 ° C	
(i)	Initial	80
(ii)	Rated	80
(iii)	End of Life	64
(b)	Rated Capacity(in Ah) at minimum ambient temperature of (as per IS 15549 : 2005)	Formula : $C_t = \{ 1+ 0.0043 (t-27) \}$
(c)	Rated Capacity(in Ah) at maximum ambient temperature of (as per IS 15549 : 2005)	Formula : $C_t = \{ 1+ 0.0043 (t-27) \}$

2 Capacity at Various Discharge Rates at 27°C

Period of Discharge	*Ah capacities*	*Discharge Current (Amps)*	*End Cell Voltage (Volts)*
10Hr	**80.00**	**8.0**	**1.75**
9Hr	78.32	8.7	1.75
8Hr	76.00	9.5	1.75
7Hr	73.36	10.5	1.75
6Hr	70.32	11.7	1.75
5Hr	66.64	13.3	1.75
4Hr	62.56	15.6	1.74
3Hr	57.36	19.1	1.74
2Hr	50.64	25.3	1.7
1Hr	40.00	40.0	1.7
50 min	37.36	44.8	1.7
40 min	34.40	51.7	1.7
30 min	32.00	64.0	1.7
20 min	28.80	86.5	1.7
15 min	23.90	95.6	1.7
10 min	17.46	105.2	1.7
5 min	9.83	118.0	1.7
1 min	2.94	176.9	1.7

3	Maximum Momentary Current for 1 min upto cut off voltage of 1.6 V		240	Amps
4	Expected Fault current at bus due to battery	(As per layout)	480	Amps
5 (i)	Short Circuit Current at Battery terminals		480	Amps
5 (ii)	Time for which the battery can withstand short circuit at terminals		5 Sec	

6	Type/No. of Negative Plates per cell	Flat pasted; 1(I) + 2(E)
7	Type/No. of Positive Plates per cell	Flat pasted;2
8	Size of negative plates, mm	315(L) x 140(W) x 2.65 (+/- 1) (Thk) (Inter) 315(L) x 140(W) x 1.9 (+/- 1) (Thk) (End)
9	Size of positive plates, mm	315(L) x 140(W) x 4.5 (+/- 1) (Thk)
10	Type of Connection between cells	Bolted rigid copper connectors
11	Type of Separators	Absorptive glass mat
12	Thickness of Separators	4.2 (2 layers of 2.1 mm each)
13	Dimensison of 2 volts cell (LXWXH) , mm	159 (+/-3) x 62 (+/-3) x 396 (+/- 5 mm)
14	Clearance between the bottom of the plates and container	5 mm
15	Material of Container	Polypropylene Co-polymer

16	Recommended Charging Rate		
(i)	Float Charging Voltage		
	between ambient temp. (-)5-14 ° C	2.27 +/- 0.02 VPC	
	between ambient temp. 15-24 ° C	2.25 +/- 0.02 VPC	
	between ambient temp. 25-34 ° C	2.23 +/- 0.02 VPC	
	between ambient temp. 35-40 ° C	2.20 +/- 0.02 VPC	
(ii)	Float Charging Current	12	Amps (Max)
(iii)	Trickle Charging Voltage	NA	
(iv)	Trickle Charging Current	NA	
(v)	Boost Charging Voltage	2.35	Volts
(vi)	Boost Charging Current	16	Amps.
(vii)	Time taken to full charge from 100%	72 Hrs (Min)	
	discharge state by constant voltage	2.1 volts(ocv)	
	charging & voltage at the end of this charge		
(viii)	Equalising Charging Current;Voltage	NA	
17	Guaranteed efficiencies at 10 hrs rate		
	(a) Ampere-hour efficiency	90%	
	(b) Watt-hour efficiency	80%	
18	Allowable voltage ripple	1.5 % RMS of the charging voltage(Bulk charging) 0.5 % RMS of the charging voltage(Float charging)	

19	Internal Resistance of each cell at Fully Charged Condition	0.91	milli ohms min

20	Total Resistance of Battery ; milliohms	Depending on system layout drawing
21	Overall Dimensions of each complete module (LxWxH) in mm	Length 758 +/- 5, Width 450 +/- 5, Height 235 +/- 5 (12 cell module)
22	Weight of unpacked and complete module with electrolyte ; Kgs	92.85 +/- 5% Kgs (Single 12 cell module)
23	Material of Modules	Powder coated MS

24	Whether explosion vents are offered	Yes, self re-sealing rubber safety valve with flame arrestor
25	Loss of capacity due to self discharge	< 0.5% per week of c-10 capacity
26	The period for which the battery should be stored after supply in charged conditions	If stored in Indian ambient temp of 30 deg C cells will need freshning charge once in every three months, however if stored at higher or lower temperature freshning charge to be provided as recommended.
27	Amount of Hydrogen evolved during normal normal float charging	Less than 200ppm normal float condition
28	Recommended interval at which battery should be discharged at 10 hr discharge rate	Once annually

29	No. of charge-discharge cycle battery can give during its entire life	
	at 20% DOD	4000 cycles
	at 50% DOD	1800 cycles
	at 80% DOD	1400 cycles
30	Expected Life of Battery in years	20 Yrs at 27 deg C in ideal float condition.

31	Applicable standard	IEC 60896 - 21 & 22, JIS : C 8704-2, : 1998 ANSI T1 330, GR/BAT-01/03-MARCH 2004, IS 15549 : 2005

GENERAL TECHNICAL PARTICULARS UPST 100

SL. NO.	DESCRIPTION	DETAILS
1	Capacity in Ah	
(a)	At 27 ° C	
(i)	Initial	100
(ii)	Rated	100
(iii)	End of Life	80
(b)	Rated Capacity(in Ah) at minimum ambient temperature of (as per IS 15549 : 2005)	Formula : $C_t = \{ 1+ 0.0043 (t-27) \}$
(c)	Rated Capacity(in Ah) at maximum ambient temperature of (as per IS 15549 : 2005)	Formula : $C_t = \{ 1+ 0.0043 (t-27) \}$

2 Capacity at Various Discharge Rates at 27°C

Period of Discharge	*Ah capacities*	*Discharge Current (Amps)*	*End Cell Voltage (Volts)*
10Hr	**100.00**	**10.0**	**1.75**
9Hr	97.90	10.9	1.75
8Hr	95.00	11.9	1.75
7Hr	91.70	13.1	1.75
6Hr	87.90	14.7	1.75
5Hr	83.30	16.7	1.75
4Hr	78.20	19.6	1.74
3Hr	71.70	23.9	1.74
2Hr	63.30	31.7	1.7
1Hr	50.00	50.0	1.7
50 min	46.70	56.1	1.7
40 min	43.00	64.6	1.7
30 min	40.00	80.0	1.7
20 min	36.00	108.1	1.7
15 min	29.87	119.5	1.7
10 min	21.83	131.5	1.7
5 min	12.29	147.5	1.7
1 min	3.67	221.1	1.7

3	Maximum Momentary Current for 1 min upto cut off voltage of 1.6 V	300	Amps
4	Expected Fault at bus due to battery	600	Amps
5 (i)	Short Circuit Current at Battery terminals	600	Amps
5 (ii)	Time for which the battery can withstand short circuit at terminals	5 Sec	

6	Type/No. of Negative Plates per cell	Flat pasted;8
7	Type/No. of Positive Plates per cell	Flat pasted;7
8	Size of negative plates, mm	176.5(L) x 148(W) x 1.85 (+/- 1) (Thk)
9	Size of positive plates, mm	176.5(L) x 148(W) x 2.8 (+/- 1) (Thk)
10	Type of Connection between cells	Bolted rigid copper connectors
11	Type of Separators	Absorptive glass mat
12	Thickness of Separators	4.2 (2 layers of 2.1 mm each)
13	Dimensison of 2 volts cell (LXWXH) , mm	163.5 (+/-3) x 65.5 (+/-3) x 233.5 (+/- 5 mm)
14	Material of Container	Polypropylene Co-polymer

15	Recommended Charging Rate		
(i)	Float Charging Voltage		
	between ambient temp. (-)5-14 ° C	2.27 +/- 0.02 VPC	
	between ambient temp. 15-24 ° C	2.25 +/- 0.02 VPC	
	between ambient temp. 25-34 ° C	2.23 +/- 0.02 VPC	
	between ambient temp. 35-40 ° C	2.20 +/- 0.02 VPC	
(ii)	Float Charging Current	15	Amps (Max)
(iii)	Trickle Charging Voltage	NA	
(iv)	Trickle Charging Current	NA	
(v)	Boost Charging Voltage	2.35	Volts
(vi)	Boost Charging Current	20	Amps.
(vii)	Time taken to full charge from 100% discharge state by constant voltage charging & voltage at the end of this charge	72 Hrs (Min) 2.1 volts(ocv)	
(viii)	Equalising Charging Current;Voltage	NA	
16	Guaranteed efficiencies at 10 hrs rate		
	(a) Ampere-hour efficiency	90%	
	(b) Watt-hour efficiency	80%	
17	Allowable voltage ripple	1.5 % RMS of the charging voltage(Bulk charging) 0.5 % RMS of the charging voltage(Float charging)	

18	Internal Resistance of each cell at Fully Charged Condition	0.91	milli ohms min

19	Total Resistance of Battery ; milliohms	Depending on no. of cells
20	Resistance of inter cell connectors;milliohms	Depending on no. of cells
21	Overall Dimensions of each complete battery bank (HxWxL) in mm	Depending on system voltage
22	Overall Dimensions of each complete module (LxWxH) in mm	Length 769 +/- 5, Width 243 +/- 5, Height 247 +/- 5 (12 cells module)
23	Weight of unpacked and complete module with electrolyte ; Kgs	82.2 +/- 5% Kgs (Single 12 cell module)
24	Material of Modules	Powder coated MS

25	Whether explosion vents are offered	Yes, self re-sealing rubber safety valve with flame arrestor
26	Loss of capacity due to self discharge	< 0.5% per week of c-10 capacity
27	The period for which the battery should be stored after supply in charged conditions	If stored in Indian ambient temp of 30 deg C cells will need freshning charge once in every three months, however if stored at higher or lower temperature freshning charge to be provided as recommended.
28	Amount of Hydrogen evolved during normal normal float charging	Less than 200ppm normal float condition
29	Recommended interval at which battery should be discharged at 10 hr discharge rate	Once annually

30	No. of charge-discharge cycle battery can give during its entire life	
	at 20% DOD	2000 cycles
	at 50% DOD	900 cycles
	at 80% DOD	700 cycles
31	Expected Life of Battery in years	10 Yrs at 27 deg C in ideal float condition.

32	Applicable standard	IEC 60896 - 21 & 22, JIS : C 8704-2, : 1998 ANSI T1 330, GR/BAT-01/03-MARCH 2004, IS 15549 : 2005

GENERAL TECHNICAL PARTICULARS UPST 120

EXIDE INDUSTRIES LIMITED

SL. NO.	DESCRIPTION	DETAILS
1	Capacity in Ah	
(a)	At 27 ° C	
(i)	Initial	120
(ii)	Rated	120
(iii)	End of Life	96
(b)	Rated Capacity(in Ah) at minimum ambient temperature of (as per IS 15549 : 2005)	Formula : $C_t = \{ 1+ 0.0043 (t-27) \}$
(c)	Rated Capacity(in Ah) at maximum ambient temperature of (as per IS 15549 : 2005)	Formula : $C_t = \{ 1+ 0.0043 (t-27) \}$

2 Capacity at Various Discharge Rates at 27°C

Period of Discharge	*Ah capacities*	*Discharge Current (Amps)*	*End Cell Voltage (Volts)*
10Hr	**120.00**	**12.0**	**1.75**
9Hr	117.48	13.1	**1.75**
8Hr	114.00	14.3	1.75
7Hr	110.04	15.7	**1.75**
6Hr	105.48	17.6	**1.75**
5Hr	99.96	20.0	1.75
4Hr	93.84	23.5	1.74
3Hr	86.04	28.7	1.74
2Hr	75.96	38.0	1.7
1Hr	60.00	60.0	1.7
50 min	56.04	67.3	1.7
40 min	51.60	77.5	1.7
30 min	48.00	96.0	1.7
20 min	43.20	129.7	1.7
15 min	35.84	143.4	1.7
10 min	26.20	157.8	1.7
5 min	14.75	177.0	1.7
1 min	4.40	265.3	1.7

3	Maximum Momentary Current for 1 min upto cut off voltage of 1.6 V	360	Amps
4	Expected Fault at bus due to battery	720	Amps
5 (i)	Short Circuit Current at Battery terminals	720	Amps
5 (ii)	Time for which the battery can withstand short circuit at terminals	5 Sec	

6	Type/No. of Negative Plates per cell	Flat pasted;9
7	Type/No. of Positive Plates per cell	Flat pasted;8
8	Size of negative plates, mm	181.5(L) x 148(W) x 1.85 (+/- 1) (Thk)
9	Size of positive plates, mm	181.5(L) x 148(W) x 2.8 (+/- 1) (Thk)
10	Type of Connection between cells	Bolted rigid copper connectors
11	Type of Separators	Absorptive glass mat
12	Thickness of Separators	4.4 (2 layers of 2.2 mm each)
13	Dimensison of 2 volts cell (LXWXH) , mm	167.0 (+/-3) x 76 (+/-3) x 236 (+/- 5 mm)
14	Material of Container	Polypropylene Co-polymer

15	Recommended Charging Rate		
(i)	Float Charging Voltage		
	between ambient temp. (-)5-14 ° C	2.27 +/- 0.02 VPC	
	between ambient temp. 15-24 ° C	2.25 +/- 0.02 VPC	
	between ambient temp. 25-34 ° C	2.23 +/- 0.02 VPC	
	between ambient temp. 35-40 ° C	2.20 +/- 0.02 VPC	
(ii)	Float Charging Current	18	Amps (Max)
(iii)	Trickle Charging Voltage	NA	
(iv)	Trickle Charging Current	NA	
(v)	Boost Charging Voltage	2.35	Volts
(vi)	Boost Charging Current	24	Amps.
(vii)	Time taken to full charge from 100% discharge state by constant voltage charging & voltage at the end of this charge	72 Hrs (Min) 2.1 volts(ocv)	
(viii)	Equalising Charging Current;Voltage	NA	
16	Guaranteed efficiencies at 10 hrs rate		
	(a) Ampere-hour efficiency	90%	
	(b) Watt-hour efficiency	80%	
17	Allowable voltage ripple	1.5 % RMS of the charging voltage(Bulk charging) 0.5 % RMS of the charging voltage(Float charging)	

18	Internal Resistance of each cell at Fully Charged Condition	1.34	milli ohms min

19	Total Resistance of Battery ; milliohms	Depending on no. of cells
20	Resistance of inter cell connectors;milliohms	Depending on no. of cells
21	Overall Dimensions of each complete battery bank (HxWxL) in mm	Depending on system voltage
22	Overall Dimensions of each complete module (LxWxH) in mm	Length 779 +/- 5, Width 245 +/- 5, Height 278.5 +/- 5 (12 cells module)
23	Weight of unpacked and complete module with electrolyte ; Kgs	94.8 +/- 5% Kgs (Single 12 cell module)
24	Material of Modules	Powder coated MS

25	Whether explosion vents are offered	Yes, self re-sealing rubber safety valve with flame arrestor
26	Loss of capacity due to self discharge	< 0.5% per week of c-10 capacity
27	The period for which the battery should be stored after supply in charged conditions	If stored in Indian ambient temp of 30 deg C cells will need freshning charge once in every three months, however if stored at higher or lower temperature freshning charge to be provided as recommended.
28	Amount of Hydrogen evolved during normal normal float charging	Less than 200ppm normal float condition
29	Recommended interval at which battery should be discharged at 10 hr discharge rate	Once annually

30	No. of charge-discharge cycle battery can give during its entire life	
	at 20% DOD	2000 cycles
	at 50% DOD	900 cycles
	at 80% DOD	700 cycles
31	Expected Life of Battery in years	10 Yrs at 27 deg C in ideal float condition.

32	Applicable standard	IEC 60896 - 21 & 22, JIS : C 8704-2, : 1998 ANSI T1 330, GR/BAT-01/03-MARCH 2004, IS 15549 : 2005

GENERAL TECHNICAL PARTICULARS UPST 120

SL. NO.	DESCRIPTION	DETAILS
1	Capacity in Ah	
(a)	At 27 ° C	
(i)	Initial	120
(ii)	Rated	120
(iii)	End of Life	96
(b)	Rated Capacity(in Ah) at minimum ambient temperature of (as per IS 15549 : 2005)	Formula : $C_t = \{ 1+ 0.0043 (t-27) \}$
(c)	Rated Capacity(in Ah) at maximum ambient temperature of (as per IS 15549 : 2005)	Formula : $C_t = \{ 1+ 0.0043 (t-27) \}$

2 Capacity at Various Discharge Rates at 27°C

Period of Discharge	*Ah capacities*	*Discharge Current (Amps)*	*End Cell Voltage (Volts)*
10Hr	**120.00**	**12.0**	**1.75**
9Hr	117.48	13.1	**1.75**
8Hr	114.00	14.3	1.75
7Hr	110.04	15.7	**1.75**
6Hr	105.48	17.6	**1.75**
5Hr	99.96	20.0	1.75
4Hr	93.84	23.5	1.74
3Hr	86.04	28.7	1.74
2Hr	75.96	38.0	1.7
1Hr	60.00	60.0	1.7
50 min	56.04	67.3	1.7
40 min	51.60	77.5	1.7
30 min	48.00	96.0	1.7
20 min	43.20	129.7	1.7
15 min	35.84	143.4	1.7
10 min	26.20	157.8	1.7
5 min	14.75	177.0	1.7
1 min	4.40	265.3	1.7

3	Maximum Momentary Current for 1 min upto cut off voltage of 1.6 V	360	Amps
4	Expected Fault at bus due to battery	720	Amps
5 (i)	Short Circuit Current at Battery terminals	720	Amps
5 (ii)	Time for which the battery can withstand short circuit at terminals	5 Sec	

6	Type/No. of Negative Plates per cell	Flat pasted; 2(l) + 2(E)
7	Type/No. of Positive Plates per cell	Flat pasted;3
8	Size of negative plates, mm	315(L) x 140(W) x 2.65 (+/- 1) (Thk) (Inter) 315(L) x 140(W) x 1.9 (+/- 1) (Thk) (End)
9	Size of positive plates, mm	315(L) x 140(W) x 4.5 (+/- 1) (Thk)
10	Type of Connection between cells	Bolted rigid copper connectors
11	Type of Separators	Absorptive glass mat
12	Thickness of Separators	4.2 (2 layers of 2.1 mm each)
13	Dimensison of 2 volts cell (LXWXH) , mm	159 (+/-3) x 62 (+/-3) x 396 (+/- 5 mm)
14	Clearance between the bottom of the plates and container	5 mm
15	Material of Container	Polypropylene Co-polymer

16	Recommended Charging Rate		
(i)	Float Charging Voltage		
	between ambient temp. (-)5-14 ° C	2.27 +/- 0.02 VPC	
	between ambient temp. 15-24 ° C	2.25 +/- 0.02 VPC	
	between ambient temp. 25-34 ° C	2.23 +/- 0.02 VPC	
	between ambient temp. 35-40 ° C	2.20 +/- 0.02 VPC	
(ii)	Float Charging Current	18	Amps (Max)
(iii)	Trickle Charging Voltage	NA	
(iv)	Trickle Charging Current	NA	
(v)	Boost Charging Voltage	2.35	Volts
(vi)	Boost Charging Current	24	Amps.
(vii)	Time taken to full charge from 100% discharge state by constant voltage charging & voltage at the end of this charge	72 Hrs (Min) 2.1 volts(ocv)	
(viii)	Equalising Charging Current;Voltage	NA	
17	Guaranteed efficiencies at 10 hrs rate		
	(a) Ampere-hour efficiency	90%	
	(b) Watt-hour efficiency	80%	
18	Allowable voltage ripple	1.5 % RMS of the charging voltage(Bulk charging) 0.5 % RMS of the charging voltage(Float charging)	

19	Internal Resistance of each cell at Fully Charged Condition	1.34	milli ohms min

20	Total Resistance of Battery ; milliohms	Depending on no. of cells
21	Overall Dimensions of each complete module (LxWxH) in mm	Length 758 +/- 5, Width 450 +/- 5, Height 235 +/- 5 (12 cell module)
22	Weight of unpacked and complete module with electrolyte ; Kgs	118.05 +/- 5% Kgs (Single 12 cell module)
23	Material of Modules	Powder coated MS

24	Whether explosion vents are offered	Yes, self re-sealing rubber safety valve with flame arrestor
25	Loss of capacity due to self discharge	< 0.5% per week of c-10 capacity
26	The period for which the battery should be stored after supply in charged conditions	If stored in Indian ambient temp of 30 deg C cells will need freshning charge once in every three months, however if stored at higher or lower temperature freshning charge to be provided as recommended.
27	Amount of Hydrogen evolved during normal normal float charging	Less than 200ppm normal float condition
28	Recommended interval at which battery should be discharged at 10 hr discharge rate	Once annually

29	No. of charge-discharge cycle battery can give during its entire life	
	at 20% DOD	4000 cycles
	at 50% DOD	1800 cycles
	at 80% DOD	1400 cycles
30	Expected Life of Battery in years	20 Yrs at 27 deg C in ideal float condition.

31	Applicable standard	IEC 60896 - 21 & 22, JIS : C 8704-2, : 1998 ANSI T1 330, GR/BAT-01/03-MARCH 2004, IS 15549 : 2005

GENERAL TECHNICAL PARTICULARS — UPST 125

EXIDE INDUSTRIES LIMITED

SL. NO.	DESCRIPTION	DETAILS
1	Capacity in Ah	
(a)	At 27 ° C	
(i)	Initial	125
(ii)	Rated	125
(iii)	End of Life	100
(b)	Rated Capacity(in Ah) at minimum ambient temperature of (as per IS 15549 : 2005)	Formula = { 1+ 0.0043 (27-t) }
(c)	Rated Capacity(in Ah) at maximum ambient temperature of (as per IS 15549 : 2005)	Formula = { 1+ 0.0043 (27-t) }

2 Capacity at Various Discharge Rates at 27°C

Period of Discharge	*Ah capacities*	*Discharge Current (Amps)*	*End Cell Voltage (Volts)*
10Hr	125.00	12.5	1.75
9Hr	122.38	13.6	1.75
8Hr	118.75	14.8	1.75
7Hr	114.63	16.4	1.75
6Hr	109.88	18.3	1.75
5Hr	104.13	20.8	1.75
4Hr	97.75	24.4	1.74
3Hr	89.63	29.9	1.74
2Hr	79.13	39.6	1.7
1Hr	62.50	62.5	1.7
50 min	58.38	70.1	1.7
40 min	53.75	80.7	1.7
30 min	50.00	100.0	1.7
20 min	45.00	135.1	1.7
15 min	37.34	149.4	1.7
10 min	27.29	164.4	1.7
5 min	15.36	184.4	1.7
1 min	4.59	276.4	1.7

3	Maximum Momentary Current for 1 min upto cut off voltage of 1.6 V	375	Amps
4	Expected Fault at bus due to battery	750	Amps
5 (i)	Short Circuit Current at Battery terminals	750	Amps
5 (ii)	Time for which the battery can withstand short circuit at terminals	5 Sec	

6	Type/No. of Negative Plates per cell	Flat pasted; 2(I) + 2(E)
7	Type/No. of Positive Plates per cell	Flat pasted;3
8	Size of negative plates, mm	315(L) x 140(W) x 2.65 (+/- 1) (Thk) (Inter) 315(L) x 140(W) x 1.9 (+/- 1) (Thk) (End)
9	Size of positive plates, mm	315(L) x 140(W) x 4.5 (+/- 1) (Thk)
10	Type of Connection between cells	Bolted rigid copper connectors
11	Type of Separators	Absorptive glass mat
12	Thickness of Separators	4.2 (2 layers of 2.1 mm each)
13	Dimensison of 2 volts cell (LXWXH) , mm	159 (+/-3) x 62 (+/-3) x 396 (+/- 5 mm)
14	Clearance between the bottom of the plates and container	5 mm
15	Material of Container	Polypropylene Co-polymer

16	Recommended Charging Rate		
(i)	Float Charging Voltage		
	between ambient temp. (-)5-14 ° C	2.27 +/- 0.02 VPC	
	between ambient temp. 15-24 ° C	2.25 +/- 0.02 VPC	
	between ambient temp. 25-34 ° C	2.23 +/- 0.02 VPC	
	between ambient temp. 35-40 ° C	2.20 +/- 0.02 VPC	
(ii)	Float Charging Current	18.75	Amps (Max)
(iii)	Trickle Charging Voltage	NA	
(iv)	Trickle Charging Current	NA	
(v)	Boost Charging Voltage	2.35	Volts
(vi)	Boost Charging Current	25	Amps.
(vii)	Time taken to full charge from 100% discharge state by constant voltage charging & voltage at the end of this charge	72 Hrs (Min) 2.1 volts(ocv)	
(viii)	Equalising Charging Current;Voltage	NA	
17	Guaranteed efficiencies at 10 hrs rate		
	(a) Ampere-hour efficiency	90%	
	(b) Watt-hour efficiency	80%	
18	Allowable voltage ripple	1.5 % RMS of the charging voltage(Bulk charging) 0.5 % RMS of the charging voltage(Float charging)	

19	Internal Resistance of each cell at Fully Charged Condition	1.34	milli ohms

20	Total Resistance of Battery ; milliohms	Depending on no. of cells
21	Overall Dimensions of each complete module (LxWxH) in mm	Length 758 +/- 5, Width 450 +/- 5, Height 235 +/- 5 (12 cell module)
22	Weight of unpacked and complete module with electrolyte ; Kgs	118.05 +/- 5% Kgs (Single 12 cell module)
23	Material of Modules	Powder coated MS

24	Whether explosion vents are offered	Yes, self re-sealing rubber safety valve with flame arrestor
25	Loss of capacity due to self discharge	< 0.5% per week of c-10 capacity
26	The period for which the battery should be stored after supply in charged conditions	If stored in Indian ambient temp of 30 deg C cells will need freshning charge once in every three months, however if stored at higher or lower temperature freshning charge to be provided as recommended.
27	Amount of Hydrogen evolved during normal normal float charging	Less than 200ppm normal float condition
28	Recommended interval at which battery should be discharged at 10 hr discharge rate	Once annually

29	No. of charge-discharge cycle battery can give during its entire life	
	at 20% DOD	4000 cycles
	at 50% DOD	1800 cycles
	at 80% DOD	1400 cycles
30	Expected Life of Battery in years	20 Yrs at 27 deg C in ideal float condition.

31	Applicable standard	IEC 60896 - 21 & 22, JIS : C 8704-2, : 1998 ANSI T1 330, GR/BAT-01/03-MARCH 2004, IS 15549 : 2005

GENERAL TECHNICAL PARTICULARS UPST 165

SL. NO.	DESCRIPTION	DETAILS
1	Capacity in Ah	
(a)	At 27 ° C	
(i)	Initial	165
(ii)	Rated	165
(iii)	End of Life	132
(b)	Rated Capacity(in Ah) at minimum ambient temperature of (as per IS 15549 : 2005)	Formula : $C_t = \{ 1+ 0.0043 (t-27) \}$
(c)	Rated Capacity(in Ah) at maximum ambient temperature of (as per IS 15549 : 2005)	Formula : $C_t = \{ 1+ 0.0043 (t-27) \}$

2 Capacity at Various Discharge Rates at 27°C

Period of Discharge	*Ah capacities*	*Discharge Current (Amps)*	*End Cell Voltage (Volts)*
10Hr	**165.00**	**16.5**	**1.75**
9Hr	161.54	17.9	**1.75**
8Hr	156.75	19.6	1.75
7Hr	151.31	21.6	**1.75**
6Hr	145.04	24.2	**1.75**
5Hr	137.45	27.5	1.75
4Hr	129.03	32.3	1.74
3Hr	118.31	39.4	1.74
2Hr	104.45	52.2	1.7
1Hr	82.50	82.5	1.7
50 min	77.06	92.5	1.7
40 min	70.95	106.5	1.7
30 min	66.00	132.0	1.7
20 min	59.40	178.4	1.7
15 min	49.29	197.1	1.7
10 min	36.02	217.0	1.7
5 min	20.28	243.4	1.7
1 min	6.06	364.8	1.7

3	Maximum Momentary Current for 1 min upto cut off voltage of 1.6 V	495	Amps
4	Expected Fault at bus due to battery	990	Amps
5 (i)	Short Circuit Current at Battery terminals	990	Amps
5 (ii)	Time for which the battery can withstand short circuit at terminals	5 Sec	

6	Type/No. of Negative Plates per cell	Flat pasted, 3(I) + 2(E)
7	Type/No. of Positive Plates per cell	Flat pasted 4
8	Size of negative plates, mm	315(L) x 140(W) x 2.65 (+/- 1) (Thk) (Inter) 315(L) x 140(W) x 1.9 (+/- 1) (Thk) (End)
9	Size of positive plates, mm	315(L) x 140(W) x 4.5 (+/- 1) (Thk)
10	Type of Connection between cells	Bolted rigid copper connectors
11	Type of Separators	Absorptive glass mat
12	Thickness of Separators	4.2 (2 layers of 2.1 mm each)
13	Dimensison of 2 volts cell (LXWXH) , mm	167(+/-3) x 87(+/-3) x 394 (+/- 5 mm)
14	Clearance between the bottom of the plates and container	5 mm
15	Material of Container	Polypropylene Co-polymer

16	Recommended Charging Rate		
(i)	Float Charging Voltage		
	between ambient temp. (-)5-14 ° C	2.27 +/- 0.02 VPC	
	between ambient temp. 15-24 ° C	2.25 +/- 0.02 VPC	
	between ambient temp. 25-34 ° C	2.23 +/- 0.02 VPC	
	between ambient temp. 35-40 ° C	2.20 +/- 0.02 VPC	
(ii)	Float Charging Current	24.75	Amps (Max)
(iii)	Trickle Charging Voltage	NA	
(iv)	Trickle Charging Current	NA	
(v)	Boost Charging Voltage	2.35	Volts
(vi)	Boost Charging Current	33	Amps.
(vii)	Time taken to full charge from 100% discharge state by constant voltage charging & voltage at the end of this charge	72 Hrs (Min) 2.1 volts(ocv)	
(viii)	Equalising Charging Current;Voltage	NA	
17	Guaranteed efficiencies at 10 hrs rate		
	(a) Ampere-hour efficiency	90%	
	(b) Watt-hour efficiency	80%	
18	Allowable voltage ripple	1.5 % RMS of the charging voltage(Bulk charging) 0.5 % RMS of the charging voltage(Float charging)	

19	Internal Resistance of each cell at Fully Charged Condition	1.28	milli ohms min

20	Total Resistance of Battery ; milliohms	Depending on no. of cells
21	Overall Dimensions of each complete module with Top Cover(LxWxH) in mm	Length 588 +/- 5, Width 415 +/- 5(w/o base member), Width 452 +/-5 (with base member), Height 210 +/- 5; (6 cells module);
22	Weight of unpacked and complete module with electrolyte ; Kgs	75.0 +/- 5% Kgs (Single 6 cell module)
23	Material of Modules	Powder coated MS

24	Whether explosion vents are offered	Yes, self re-sealing rubber safety valve with flame arrestor
25	Loss of capacity due to self discharge	< 0.5% per week of c-10 capacity
26	The period for which the battery should be stored after supply in charged conditions	If stored in Indian ambient temp of 30 deg C cells will need freshning charge once in every three months, however if stored at higher or lower temperature freshning charge to be provided as recommended.
27	Amount of Hydrogen evolved during normal normal float charging	Less than 200ppm normal float condition
28	Recommended interval at which battery should be discharged at 10 hr discharge rate	Once annually

29	No. of charge-discharge cycle battery can give during its entire life	
	at 20% DOD	4000 cycles
	at 50% DOD	1800 cycles
	at 80% DOD	1400 cycles
30	Expected Life of Battery in years	20 Yrs at 27 deg C in ideal float condition.

31	Applicable standard	IEC 60896 - 21 & 22, JIS : C 8704-2, : 1998 ANSI T1 330, GR/BAT-01/03-MARCH 2004, IS 15549 : 2005

GENERAL TECHNICAL PARTICULARS UPST 200

SL. NO.	DESCRIPTION	DETAILS
1	Capacity in Ah	
(a)	At 27 ° C	
(i)	Initial	200
(ii)	Rated	200
(iii)	End of Life	160
(b)	Rated Capacity(in Ah) at minimum ambient temperature of (as per IS 15549 : 2005)	Formula : $C_t = \{ 1+ 0.0043 (t-27) \}$
(c)	Rated Capacity(in Ah) at maximum ambient temperature of (as per IS 15549 : 2005)	Formula : $C_t = \{ 1+ 0.0043 (t-27) \}$

2 Capacity at Various Discharge Rates at 27°C

Period of Discharge	*Ah capacities*	*Discharge Current (Amps)*	*End Cell Voltage (Volts)*
10Hr	**200.00**	**20.0**	**1.75**
9Hr	195.80	21.8	**1.75**
8Hr	190.00	23.8	1.75
7Hr	183.40	26.2	**1.75**
6Hr	175.80	29.3	**1.75**
5Hr	166.60	33.3	1.75
4Hr	156.40	39.1	1.74
3Hr	143.40	47.8	1.74
2Hr	126.60	63.3	1.7
1Hr	100.00	100.0	1.7
50 min	93.40	112.1	1.7
40 min	86.00	129.1	1.7
30 min	80.00	160.0	1.7
20 min	72.00	216.2	1.7
15 min	59.74	239.0	1.7
10 min	43.66	263.0	1.7
5 min	24.58	295.1	1.7
1 min	7.34	442.2	1.7

3	Maximum Momentary Current for 1 min upto cut off voltage of 1.6 V	600	Amps
4	Expected Fault at bus due to battery	1200	Amps
5 (i)	Short Circuit Current at Battery terminals	1200	Amps
5 (ii)	Time for which the battery can withstand short circuit at terminals	5 Sec	

6	Type/No. of Negative Plates per cell	Flat pasted, 4(I) + 2(E)
7	Type/No. of Positive Plates per cell	Flat pasted 5
8	Size of negative plates, mm	315(L) x 140(W) x 2.65 (+/- 1) (Thk) (Inter) 315(L) x 140(W) x 1.9 (+/- 1) (Thk) (End)
9	Size of positive plates, mm	315(L) x 140(W) x 4.5 (+/- 1) (Thk)
10	Type of Connection between cells	Bolted rigid copper connectors
11	Type of Separators	Absorptive glass mat
12	Thickness of Separators	4.2 (2 layers of 2.1 mm each)
13	Dimensison of 2 volts cell (LXWXH) , mm	167(+/-3) x 87(+/-3) x 394 (+/- 5 mm)
14	Clearance between the bottom of the plates and container	5 mm
15	Material of Container	Polypropylene Co-polymer

16	Recommended Charging Rate		
(i)	Float Charging Voltage		
	between ambient temp. (-)5-14 ° C	2.27 +/- 0.02 VPC	
	between ambient temp. 15-24 ° C	2.25 +/- 0.02 VPC	
	between ambient temp. 25-34 ° C	2.23 +/- 0.02 VPC	
	between ambient temp. 35-40 ° C	2.20 +/- 0.02 VPC	
(ii)	Float Charging Current	30	Amps (Max)
(iii)	Trickle Charging Voltage	NA	
(iv)	Trickle Charging Current	NA	
(v)	Boost Charging Voltage	2.35	Volts
(vi)	Boost Charging Current	40	Amps.
(vii)	Time taken to full charge from 100% discharge state by constant voltage charging & voltage at the end of this charge	72 Hrs (Min) 2.1 volts(ocv)	
(viii)	Equalising Charging Current;Voltage	NA	
17	Guaranteed efficiencies at 10 hrs rate		
	(a) Ampere-hour efficiency	90%	
	(b) Watt-hour efficiency	80%	
18	Allowable voltage ripple	1.5 % RMS of the charging voltage(Bulk charging) 0.5 % RMS of the charging voltage(Float charging)	

19	Internal Resistance of each cell at Fully Charged Condition	0.99	milli ohms min

20	Total Resistance of Battery ; milliohms	Depending on no. of cells
21	Overall Dimensions of each complete module with Top Cover(LxWxH) in mm	Length 588 +/- 5, Width 415 +/- 5(w/o base member), Width 452 +/-5 (with base member), Height 210 +/- 5; (6 cells module);
22	Weight of unpacked and complete module with electrolyte ; Kgs	83.1 +/- 5% Kgs (Single 6 cell module)
23	Material of Modules	Powder coated MS

24	Whether explosion vents are offered	Yes, self re-sealing rubber safety valve with flame arrestor
25	Loss of capacity due to self discharge	< 0.5% per week of c-10 capacity
26	The period for which the battery should be stored after supply in charged conditions	If stored in Indian ambient temp of 30 deg C cells will need freshning charge once in every three months, however if stored at higher or lower temperature freshning charge to be provided as recommended.
27	Amount of Hydrogen evolved during normal normal float charging	Less than 200ppm normal float condition
28	Recommended interval at which battery should be discharged at 10 hr discharge rate	Once annually

29	No. of charge-discharge cycle battery can give during its entire life	
	at 20% DOD	4000 cycles
	at 50% DOD	1800 cycles
	at 80% DOD	1400 cycles
30	Expected Life of Battery in years	20 Yrs at 27 deg C in ideal float condition.

31	Applicable standard	IEC 60896 - 21 & 22, JIS : C 8704-2, : 1998 ANSI T1 330, GR/BAT-01/03-MARCH 2004, IS 15549 : 2005

GENERAL TECHNICAL PARTICULARS UPST 250

SL. NO.	DESCRIPTION	DETAILS
1	Capacity in Ah	
(a)	At 27 ° C	
(i)	Initial	250
(ii)	Rated	250
(iii)	End of Life	200
(b)	Rated Capacity(in Ah) at minimum ambient temperature of (as per IS 15549 : 2005)	Formula : $C_t = \{ 1+ 0.0043 (t-27) \}$
(c)	Rated Capacity(in Ah) at maximum ambient temperature of (as per IS 15549 : 2005)	Formula : $C_t = \{ 1+ 0.0043 (t-27) \}$

2 Capacity at Various Discharge Rates at 27°C

Period of Discharge	*Ah capacities*	*Discharge Current (Amps)*	*End Cell Voltage (Volts)*
10Hr	**250.00**	**25.0**	**1.75**
9Hr	244.75	27.2	**1.75**
8Hr	237.50	29.7	1.75
7Hr	229.25	32.8	**1.75**
6Hr	219.75	36.6	**1.75**
5Hr	208.25	41.7	1.75
4Hr	195.50	48.9	1.74
3Hr	179.25	59.8	1.74
2Hr	158.25	79.1	1.7
1Hr	125.00	125.0	1.7
50 min	116.75	140.2	1.7
40 min	107.50	161.4	1.7
30 min	100.00	200.0	1.7
20 min	90.00	270.3	1.7
15 min	74.68	298.7	1.7
10 min	54.58	328.8	1.7
5 min	30.73	368.8	1.7
1 min	9.18	552.7	1.7

3	Maximum Momentary Current for 1 min upto cut off voltage of 1.6 V	750	Amps
4	Expected Fault at bus due to battery	1500	Amps
5 (i)	Short Circuit Current at Battery terminals	1500	Amps
5 (ii)	Time for which the battery can withstand short circuit at terminals	5 Sec	

6	Type/No. of Negative Plates per cell	Flat pasted; 7
7	Type/No. of Positive Plates per cell	Flat pasted; 6
8	Size of negative plates, mm	315(L) x 140(W) x 2.65 (+/- 1) (Thk)
9	Size of positive plates, mm	315(L) x 140(W) x 4.5 (+/- 1) (Thk)
10	Type of Connection between cells	Bolted rigid copper connectors
11	Type of Separators	Absorptive glass mat
12	Thickness of Separators	4.2 (2 layers of 2.1 mm each)
13	Dimensison of 2 volts cell (LXWXH) , mm	167 (+/-3) mm x 126 (+/-3) mm x 394 (+/- 5) mm
14	Clearance between the bottom of the plates and container	5 mm
15	Material of Container	Polypropylene Co-polymer

16	Recommended Charging Rate		
(i)	Float Charging Voltage		
	between ambient temp. (-)5-14 ° C	2.27 +/- 0.02 VPC	
	between ambient temp. 15-24 ° C	2.25 +/- 0.02 VPC	
	between ambient temp. 25-34 ° C	2.23 +/- 0.02 VPC	
	between ambient temp. 35-40 ° C	2.20 +/- 0.02 VPC	
(ii)	Float Charging Current	37.5	Amps (Max)
(iii)	Trickle Charging Voltage	NA	
(iv)	Trickle Charging Current	NA	
(v)	Boost Charging Voltage	2.35	Volts
(vi)	Boost Charging Current	50	Amps.
(vii)	Time taken to full charge from 100%	72 Hrs (Min)	
	discharge state by constant voltage	2.1 volts(ocv)	
	charging & voltage at the end of this charge		
(viii)	Equalising Charging Current;Voltage	NA	
17	Guaranteed efficiencies at 10 hrs rate		
	(a) Ampere-hour efficiency	90%	
	(b) Watt-hour efficiency	80%	
18	Allowable voltage ripple	1.5 % RMS of the charging voltage(Bulk charging) 0.5 % RMS of the charging voltage(Float charging)	

19	Internal Resistance of each cell at Fully Charged Condition	0.86	milli ohms min

20	Total Resistance of Battery ; milliohms	Depending on no. of cells
21	Overall Dimensions of each complete module (LxWxH) in mm	Length 588 +/- 5, Width 460 +/- 5, Height 288 +/- 5 (6 cell module)
22	Weight of unpacked and complete module with electrolyte ; Kgs	100 +/- 5% Kgs (Single 6 cell module)
23	Material of Modules	Powder coated MS

24	Whether explosion vents are offered	Yes, self re-sealing rubber safety valve with flame arrestor
25	Loss of capacity due to self discharge	< 0.5% per week of c-10 capacity
26	The period for which the battery should be stored after supply in charged conditions	If stored in Indian ambient temp of 30 deg C cells will need freshning charge once in every three months, however if stored at higher or lower temperature freshning charge to be provided as recommended.
27	Amount of Hydrogen evolved during normal normal float charging	Less than 200ppm normal float condition
28	Recommended interval at which battery should be discharged at 10 hr discharge rate	Once annually

29	No. of charge-discharge cycle battery can give during its entire life	
	at 20% DOD	4000 cycles
	at 50% DOD	1800 cycles
	at 80% DOD	1400 cycles
30	Expected Life of Battery in years	20 Yrs at 27 deg C in ideal float condition.

31	Applicable standard	IEC 60896 - 21 & 22, JIS : C 8704-2, : 1998 ANSI T1 330, GR/BAT-01/03-MARCH 2004, IS 15549 : 2005

GENERAL TECHNICAL PARTICULARS UPST 300

SL. NO.	DESCRIPTION	DETAILS
1	Capacity in Ah	
(a)	At 27 ° C	
(i)	Initial	300
(ii)	Rated	300
(iii)	End of Life	240
(b)	Rated Capacity(in Ah) at minimum ambient temperature of (as per IS 15549 : 2005)	Formula : $Ct = C27/\{1 + 0.0043(27-t)\}$
(c)	Rated Capacity(in Ah) at maximum ambient temperature of (as per IS 15549 : 2005)	Formula : $Ct = C27/\{1 + 0.0043(27-t)\}$

2 Capacity at Various Discharge Rates at 27°C

Period of Discharge	*Ah capacities*	*Discharge Current (Amps)*	*End Cell Voltage (Volts)*
10Hr	**300.00**	**30.0**	**1.75**
9Hr	293.70	32.6	**1.75**
8Hr	285.00	35.6	1.75
7Hr	275.10	39.3	**1.75**
6Hr	263.70	44.0	**1.75**
5Hr	249.90	50.0	1.75
4Hr	234.60	58.7	1.74
3Hr	215.10	71.7	1.74
2Hr	189.90	95.0	1.7
1Hr	150.00	150.0	1.7
50 min	140.10	168.2	1.7
40 min	129.00	193.7	1.7
30 min	120.00	240.0	1.7
20 min	108.00	324.3	1.7
15 min	89.61	358.4	1.7
10 min	65.49	394.5	1.7
5 min	36.87	442.6	1.7
1 min	11.01	663.3	1.7

3	Maximum Momentary Current for 1 min upto cut off voltage of 1.6 V	900	Amps
4	Expected Fault at bus due to battery	1800	Amps
5 (i)	Short Circuit Current at Battery terminals	1800	Amps
5 (ii)	Time for which the battery can withstand short circuit at terminals	5 Sec	

6	Type/No. of Negative Plates per cell	Flat pasted; 9
7	Type/No. of Positive Plates per cell	Flat pasted; 8
8	Size of negative plates, mm	315(L) x 140(W) x 2.65 (+/- 1) (Thk)
9	Size of positive plates, mm	315(L) x 140(W) x 4.5 (+/- 1) (Thk)
10	Type of Connection between cells	Bolted rigid copper connectors
11	Type of Separators	Absorptive glass mat
12	Thickness of Separators	4.2 (2 layers of 2.1 mm each)
13	Dimensison of 2 volts cell (LXWXH) , mm	167 (+/-3) mm x 126 (+/-3) mm x 394 (+/- 5) mm
14	Clearance between the bottom of the plates and container	5 mm
15	Material of Container	Polypropylene Co-polymer

16	Recommended Charging Rate		
(i)	Float Charging Voltage		
	between ambient temp. (-)5-14 ° C	2.27 +/- 0.02 VPC	
	between ambient temp. 15-24 ° C	2.25 +/- 0.02 VPC	
	between ambient temp. 25-34 ° C	2.23 +/- 0.02 VPC	
	between ambient temp. 35-40 ° C	2.20 +/- 0.02 VPC	
(ii)	Float Charging Current	45	Amps (Max)
(iii)	Trickle Charging Voltage	NA	
(iv)	Trickle Charging Current	NA	
(v)	Boost Charging Voltage	2.35	Volts
(vi)	Boost Charging Current	60	Amps.
(vii)	Time taken to full charge from 100% discharge state by constant voltage charging & voltage at the end of this charge	72 Hrs (Min) 2.1 volts(ocv)	
(viii)	Equalising Charging Current;Voltage	NA	
17	Guaranteed efficiencies at 10 hrs rate		
	(a) Ampere-hour efficiency	90%	
	(b) Watt-hour efficiency	80%	
18	Allowable voltage ripple	1.5 % RMS of the charging voltage(Bulk charging) 0.5 % RMS of the charging voltage(Float charging)	

19	Internal Resistance of each cell at Fully Charged Condition	0.72	milli ohms min

20	Total Resistance of Battery ; milliohms	Depending on no. of cells
21	Overall Dimensions of each complete module without Terminal Cap (LxWxH) in mm	Length 588 +/- 5, Width 460 +/- 5, Height 288 +/- 5 (6 cell module)
22	Weight of unpacked and complete module with electrolyte ; Kgs	125 +/- 5% Kgs (Single 6 cell module)
23	Material of Modules	Powder coated MS

24	Whether explosion vents are offered	Yes, self re-sealing rubber safety valve with flame arrestor
25	Loss of capacity due to self discharge	< 0.5% per week of c-10 capacity
26	The period for which the battery should be stored after supply in charged conditions	If stored in Indian ambient temp of 30 deg C cells will need freshning charge once in every three months, however if stored at higher or lower temperature freshning charge to be provided as recommended.
27	Amount of Hydrogen evolved during normal normal float charging	Less than 200ppm normal float condition
28	Recommended interval at which battery should be discharged at 10 hr discharge rate	Once annually

29	No. of charge-discharge cycle battery can give during its entire life	
	at 20% DOD	4000 cycles
	at 50% DOD	1800 cycles
	at 80% DOD	1400 cycles
30	Expected Life of Battery in years	20 Yrs at 27 deg C in ideal float condition.

31	Applicable standard	IEC 60896 - 21 & 22, JIS : C 8704-2, : 1998 ANSI T1 330, GR/BAT-01/03-MARCH 2004, IS 15549 : 2005

GENERAL TECHNICAL PARTICULARS UPST360

SL. NO.	DESCRIPTION	DETAILS
1	Capacity in Ah	
(a)	At 27 ° C	
(i)	Initial	360
(ii)	Rated	360
(iii)	End of Life	288
(b)	Rated Capacity(in Ah) at minimum ambient temperature of (as per IS 15549 : 2005)	Formula : $C_t = \{ 1+ 0.0043 (t-27) \}$
(c)	Rated Capacity(in Ah) at maximum ambient temperature of (as per IS 15549 : 2005)	Formula : $C_t = \{ 1+ 0.0043 (t-27) \}$

2 Capacity at Various Discharge Rates at 27°C

Period of Discharge	*Ah capacities*	*Discharge Current (Amps)*	*End Cell Voltage (Volts)*
10Hr	**360.00**	**36.0**	**1.75**
9Hr	352.44	39.2	**1.75**
8Hr	342.00	42.8	1.75
7Hr	330.12	47.2	**1.75**
6Hr	316.44	52.7	**1.75**
5Hr	299.88	60.0	1.75
4Hr	281.52	70.4	1.74
3Hr	258.12	86.0	1.74
2Hr	227.88	113.9	1.7
1Hr	180.00	180.0	1.7
50 min	168.12	201.8	1.7
40 min	154.80	232.4	1.7
30 min	144.00	288.0	1.7
20 min	129.60	389.2	1.7
15 min	107.53	430.1	1.7
10 min	78.59	473.4	1.7
5 min	44.24	531.1	1.7
1 min	13.21	795.9	1.7

3	Maximum Momentary Current for 1 min upto cut off voltage of 1.6 V	1080	Amps
4	Expected Fault at bus due to battery	2160	Amps
5 (i)	Short Circuit Current at Battery terminals	2160	Amps
5 (ii)	Time for which the battery can withstand short circuit at terminals	5 Sec	

6	Type/No. of Negative Plates per cell	Flat pasted; 10
7	Type/No. of Positive Plates per cell	Flat pasted; 9
8	Size of negative plates, mm	315(L) x 140(W) x 2.65 (+/- 1) (Thk)
9	Size of positive plates, mm	315(L) x 140(W) x 4.5 (+/- 1) (Thk)
10	Type of Connection between cells	Bolted rigid copper connectors
11	Type of Separators	Absorptive glass mat
12	Thickness of Separators	4.5 (2 layers of 2.25 mm each)
13	Dimensison of 2 volts cell (LXWXH) , mm	167 (+/-3) mm x 172 (+/-3) mm x 378 (+/- 5) mm
14	Clearance between the bottom of the plates and container	5 mm
15	Material of Container	Polypropylene Co-polymer

16	Recommended Charging Rate		
(i)	Float Charging Voltage		
	between ambient temp. (-)5-14 ° C	2.27 +/- 0.02 VPC	
	between ambient temp. 15-24 ° C	2.25 +/- 0.02 VPC	
	between ambient temp. 25-34 ° C	2.23 +/- 0.02 VPC	
	between ambient temp. 35-40 ° C	2.20 +/- 0.02 VPC	
(ii)	Float Charging Current	54	Amps (Max)
(iii)	Trickle Charging Voltage	NA	
(iv)	Trickle Charging Current	NA	
(v)	Boost Charging Voltage	2.35	Volts
(vi)	Boost Charging Current	72	Amps.
(vii)	Time taken to full charge from 100% discharge state by constant voltage charging & voltage at the end of this charge	72 Hrs (Min) 2.1 volts(ocv)	
(viii)	Equalising Charging Current;Voltage	NA	
17	Guaranteed efficiencies at 10 hrs rate		
	(a) Ampere-hour efficiency	90%	
	(b) Watt-hour efficiency	80%	
18	Allowable voltage ripple	1.5 % RMS of the charging voltage(Bulk charging) 0.5 % RMS of the charging voltage(Float charging)	

19	Internal Resistance of each cell at Fully Charged Condition	0.48	milli ohms min

20	Total Resistance of Battery ; milliohms	Depending on no. of cells
21	Overall Dimensions of each complete module (LxWxH) in mm	Length 619 +/- 5, Width 445 +/- 5, Height 388 +/- 5 (6 cell module)
22	Weight of unpacked and complete module with electrolyte ; Kgs	147 +/- 5% Kgs (Single 6 cell module)
23	Material of Modules	Powder coated MS

24	Whether explosion vents are offered	Yes, self re-sealing rubber safety valve with flame arrestor
25	Loss of capacity due to self discharge	< 0.5% per week of c-10 capacity
26	The period for which the battery should be stored after supply in charged conditions	If stored in Indian ambient temp of 30 deg C cells will need freshning charge once in every three months, however if stored at higher or lower temperature freshning charge to be provided as recommended.
27	Amount of Hydrogen evolved during normal normal float charging	Less than 200ppm normal float condition
28	Recommended interval at which battery should be discharged at 10 hr discharge rate	Once annually

29	No. of charge-discharge cycle battery can give during its entire life	
	at 20% DOD	4000 cycles
	at 50% DOD	1800 cycles
	at 80% DOD	1400 cycles
30	Expected Life of Battery in years	20 Yrs at 27 deg C in ideal float condition.

31	Applicable standard	IEC 60896 - 21 & 22, JIS : C 8704-2, : 1998 ANSI T1 330, GR/BAT-01/03-MARCH 2004, IS 15549 : 2005

GENERAL TECHNICAL PARTICULARS **UPST 400**

SL. NO.	DESCRIPTION	DETAILS
1	Capacity in Ah	
(a)	At 27 ° C	
(i)	Initial	400
(ii)	Rated	400
(iii)	End of Life	320
(b)	Rated Capacity(in Ah) at minimum ambient temperature of (as per IS 15549 : 2005)	Formula : $C_t = \{ 1+ 0.0043 (t-27) \}$
(c)	Rated Capacity(in Ah) at maximum ambient temperature of (as per IS 15549 : 2005)	Formula : $C_t = \{ 1+ 0.0043 (t-27) \}$

2 Capacity at Various Discharge Rates at 27°C

Period of Discharge	*Ah capacities*	*Discharge Current (Amps)*	*End Cell Voltage (Volts)*
10Hr	**400.00**	**40.0**	**1.75**
9Hr	391.60	43.5	**1.75**
8Hr	380.00	47.5	1.75
7Hr	366.80	52.4	**1.75**
6Hr	351.60	58.6	**1.75**
5Hr	333.20	66.6	1.75
4Hr	312.80	78.2	1.74
3Hr	286.80	95.6	1.74
2Hr	253.20	126.6	1.7
1Hr	200.00	200.0	1.7
50 min	186.80	224.2	1.7
40 min	172.00	258.3	1.7
30 min	160.00	320.0	1.7
20 min	144.00	432.4	1.7
15 min	119.48	477.9	1.7
10 min	87.32	526.0	1.7
5 min	49.16	590.2	1.7
1 min	14.68	884.3	1.7

3	Maximum Momentary Current for 1 min upto cut off voltage of 1.6 V	1200	Amps
4	Expected Fault at bus due to battery	2400	Amps
5 (i)	Short Circuit Current at Battery terminals	2400	Amps
5 (ii)	Time for which the battery can withstand short circuit at terminals	5 Sec	

6	Type/No. of Negative Plates per cell	Flat pasted; 11
7	Type/No. of Positive Plates per cell	Flat pasted; 10
8	Size of negative plates, mm	315(L) x 140(W) x 2.65 (+/- 1) (Thk)
9	Size of positive plates, mm	315(L) x 140(W) x 4.5 (+/- 1) (Thk)
10	Type of Connection between cells	Bolted rigid copper connectors
11	Type of Separators	Absorptive glass mat
12	Thickness of Separators	4.5 (2 layers of 2.25 mm each)
13	Dimensison of 2 volts cell (LXWXH) , mm	167 (+/-3) mm x 172 (+/-3) mm x 378 (+/- 5) mm
14	Clearance between the bottom of the plates and container	5 mm
15	Material of Container	Polypropylene Co-polymer

16	Recommended Charging Rate		
(i)	Float Charging Voltage		
	between ambient temp. (-)5-14 ° C	2.27 +/- 0.02 VPC	
	between ambient temp. 15-24 ° C	2.25 +/- 0.02 VPC	
	between ambient temp. 25-34 ° C	2.23 +/- 0.02 VPC	
	between ambient temp. 35-40 ° C	2.20 +/- 0.02 VPC	
(ii)	Float Charging Current	60	Amps (Max)
(iii)	Trickle Charging Voltage	NA	
(iv)	Trickle Charging Current	NA	
(v)	Boost Charging Voltage	2.35	Volts
(vi)	Boost Charging Current	80	Amps.
(vii)	Time taken to full charge from 100% discharge state by constant voltage charging & voltage at the end of this charge	72 Hrs (Min) 2.1 volts(ocv)	
(viii)	Equalising Charging Current;Voltage	NA	
17	Guaranteed efficiencies at 10 hrs rate		
	(a) Ampere-hour efficiency	90%	
	(b) Watt-hour efficiency	80%	
18	Allowable voltage ripple	1.5 % RMS of the charging voltage(Bulk charging) 0.5 % RMS of the charging voltage(Float charging)	

19	Internal Resistance of each cell at Fully Charged Condition	0.42	milli ohms min

20	Total Resistance of Battery ; milliohms	Depending on no. of cells
21	Overall Dimensions of each complete module (LxWxH) in mm	Length 619 +/- 5, Width 445 +/- 5, Height 388 +/- 5 (6 cell module)
22	Weight of unpacked and complete module with electrolyte ; Kgs	156.3 +/- 5% Kgs (Single 6 cell module)
23	Material of Modules	Powder coated MS

24	Whether explosion vents are offered	Yes, self re-sealing rubber safety valve with flame arrestor
25	Loss of capacity due to self discharge	< 0.5% per week of c-10 capacity
26	The period for which the battery should be stored after supply in charged conditions	If stored in Indian ambient temp of 30 deg C cells will need freshning charge once in every three months, however if stored at higher or lower temperature freshning charge to be provided as recommended.
27	Amount of Hydrogen evolved during normal normal float charging	Less than 200ppm normal float condition
28	Recommended interval at which battery should be discharged at 10 hr discharge rate	Once annually

29	No. of charge-discharge cycle battery can give during its entire life	
	at 20% DOD	4000 cycles
	at 50% DOD	1800 cycles
	at 80% DOD	1400 cycles
30	Expected Life of Battery in years	20 Yrs at 27 deg C in ideal float condition.

31	Applicable standard	IEC 60896 - 21 & 22, JIS : C 8704-2, : 1998 ANSI T1 330, GR/BAT-01/03-MARCH 2004, IS 15549 : 2005;

GENERAL TECHNICAL PARTICULARS UPST/NEPST 100

SL. NO.	DESCRIPTION	DETAILS
1	Capacity in Ah	
(a)	At 27 ° C	
(i)	Initial	100
(ii)	Rated	100
(iii)	End of Life	80
(b)	Rated Capacity(in Ah) at minimum ambient temperature of (as per IS 15549 : 2005)	Formula : $C_t = \{ 1+ 0.0043 (t-27) \}$
(c)	Rated Capacity(in Ah) at maximum ambient temperature of (as per IS 15549 : 2005)	Formula : $C_t = \{ 1+ 0.0043 (t-27) \}$

2	Capacity at Various Discharge Rates at 27°C			
	Period of Discharge	***Ah capacities***	***Discharge Current (Amps)***	***End Cell Voltage (Volts)***
	10Hr	**100.00**	**10.0**	**1.75**
	9Hr	97.90	10.9	1.75
	8Hr	95.00	11.9	1.75
	7Hr	91.70	13.1	1.75
	6Hr	87.90	14.7	1.75
	5Hr	83.30	16.7	1.75
	4Hr	78.20	19.6	1.74
	3Hr	71.70	23.9	1.74
	2Hr	63.30	31.7	1.7
	1Hr	50.00	50.0	1.7
	50 min	46.70	56.1	1.7
	40 min	43.00	64.6	1.7
	30 min	40.00	80.0	1.7
	20 min	36.00	108.1	1.7
	15 min	29.87	119.5	1.7
	10 min	21.83	131.5	1.7
	5 min	12.29	147.5	1.7
	1 min	3.67	221.1	1.7

3	Maximum Momentary Current for 1 min upto cut off voltage of 1.6 V	300	Amps
4	Expected Fault at bus due to battery	600	Amps
5 (i)	Short Circuit Current at Battery terminals	600	Amps
5 (ii)	Time for which the battery can withstand short circuit at terminals	5 Sec	

6	Type/No. of Negative Plates per cell	Flat pasted; 2(I) + 2(E)
7	Type/No. of Positive Plates per cell	Flat pasted;3
8	Size of negative plates, mm	315(L) x 140(W) x 2.65 (+/- 1) (Thk) (Inter) 315(L) x 140(W) x 1.9 (+/- 1) (Thk) (End)
9	Size of positive plates, mm	315(L) x 140(W) x 4.5 (+/- 1) (Thk)
10	Type of Connection between cells	Bolted rigid copper connectors
11	Type of Separators	Absorptive glass mat
12	Thickness of Separators	4.2 (2 layers of 2.1 mm each)
13	Dimensison of 2 volts cell (LXWXH) , mm	159 (+/-3) x 62 (+/-3) x 396 (+/- 5 mm)
14	Clearance between the bottom of the plates and container	5 mm
15	Material of Container	Polypropylene Co-polymer

16	Recommended Charging Rate		
(i)	Float Charging Voltage		
	between ambient temp. (-)5-14 ° C	2.27 +/- 0.02 VPC	
	between ambient temp. 15-24 ° C	2.25 +/- 0.02 VPC	
	between ambient temp. 25-34 ° C	2.23 +/- 0.02 VPC	
	between ambient temp. 35-40 ° C	2.20 +/- 0.02 VPC	
(ii)	Float Charging Current	15	Amps (Max)
(iii)	Trickle Charging Voltage	NA	
(iv)	Trickle Charging Current	NA	
(v)	Boost Charging Voltage	2.35	Volts
(vi)	Boost Charging Current	20	Amps.
(vii)	Time taken to full charge from 100%	72 Hrs (Min)	
	discharge state by constant voltage	2.1 volts(ocv)	
	charging & voltage at the end of this charge		
(viii)	Equalising Charging Current;Voltage	NA	
17	Guaranteed efficiencies at 10 hrs rate		
	(a) Ampere-hour efficiency	90%	
	(b) Watt-hour efficiency	80%	
18	Allowable voltage ripple	1.5 % RMS of the charging voltage(Bulk charging) 0.5 % RMS of the charging voltage(Float charging)	

19	Internal Resistance of each cell at Fully Charged Condition	0.91	milli ohms min

20	Total Resistance of Battery ; milliohms	Depending on no. of cells
21	Overall Dimensions of each complete module (LxWxH) in mm	Length 758 +/- 5, Width 450 +/- 5, Height 235 +/- 5 (12 cell module)
22	Weight of unpacked and complete module with electrolyte ; Kgs	118.05 +/- 5% Kgs (Single 12 cell module)
23	Material of Modules	Powder coated MS

24	Whether explosion vents are offered	Yes, self re-sealing rubber safety valve with flame arrestor
25	Loss of capacity due to self discharge	< 0.5% per week of c-10 capacity
26	The period for which the battery should be stored after supply in charged conditions	If stored in Indian ambient temp of 30 deg C cells will need freshning charge once in every three months, however if stored at higher or lower temperature freshning charge to be provided as recommended.
27	Amount of Hydrogen evolved during normal normal float charging	Less than 200ppm normal float condition
28	Recommended interval at which battery should be discharged at 10 hr discharge rate	Once annually

29	No. of charge-discharge cycle battery can give during its entire life	
	at 20% DOD	4000 cycles
	at 50% DOD	1800 cycles
	at 80% DOD	1400 cycles
30	Expected Life of Battery in years	20 Yrs at 27 deg C in ideal float condition.

31	Applicable standard	IEC 60896 - 21 & 22, JIS : C 8704-2, : 1998 ANSI T1 330, GR/BAT-01/03-MARCH 2004, IS 15549 : 2005

GENERAL TECHNICAL PARTICULARS UPST / NEPST 200

SL. NO.	DESCRIPTION	DETAILS
1	Capacity in Ah	
(a)	At 27 ° C	
(i)	Initial	200
(ii)	Rated	200
(iii)	End of Life	160
(b)	Rated Capacity(in Ah) at minimum ambient temperature of (as per IS 15549 : 2005)	Formula : $C_t = \{ 1+ 0.0043 (t-27) \}$
(c)	Rated Capacity(in Ah) at maximum ambient temperature of (as per IS 15549 : 2005)	Formula : $C_t = \{ 1+ 0.0043 (t-27) \}$

2 Capacity at Various Discharge Rates at 27°C

Period of Discharge	*Ah capacities*	*Discharge Current (Amps)*	*End Cell Voltage (Volts)*
10Hr	**200.00**	**20.0**	**1.75**
9Hr	195.80	21.8	**1.75**
8Hr	190.00	23.8	1.75
7Hr	183.40	26.2	**1.75**
6Hr	175.80	29.3	**1.75**
5Hr	166.60	33.3	1.75
4Hr	156.40	39.1	1.74
3Hr	143.40	47.8	1.74
2Hr	126.60	63.3	1.7
1Hr	100.00	100.0	1.7
50 min	93.40	112.1	1.7
40 min	86.00	129.1	1.7
30 min	80.00	160.0	1.7
20 min	72.00	216.2	1.7
15 min	59.74	239.0	1.7
10 min	43.66	263.0	1.7
5 min	24.58	295.1	1.7
1 min	7.34	442.2	1.7

3	Maximum Momentary Current for 1 min upto cut off voltage of 1.6 V	600	Amps
4	Expected Fault at bus due to battery	1200	Amps
5 (i)	Short Circuit Current at Battery terminals	1200	Amps
5 (ii)	Time for which the battery can withstand short circuit at terminals	5 Sec	

6	Type/No. of Negative Plates per cell	Flat pasted, 4(I) + 2(E)
7	Type/No. of Positive Plates per cell	Flat pasted 5
8	Size of negative plates, mm	315(L) x 140(W) x 2.65 (+/- 1) (Thk) (Inter) 315(L) x 140(W) x 1.9 (+/- 1) (Thk) (End)
9	Size of positive plates, mm	315(L) x 140(W) x 4.5 (+/- 1) (Thk)
10	Type of Connection between cells	Bolted rigid copper connectors
11	Type of Separators	Absorptive glass mat
12	Thickness of Separators	4.2 (2 layers of 2.1 mm each)
13	Dimensison of 2 volts cell (LXWXH) , mm	167(+/-3) x 87(+/-3) x 394 (+/- 5 mm)
14	Clearance between the bottom of the plates and container	5 mm
15	Material of Container	Polypropylene Co-polymer

16	Recommended Charging Rate		
(i)	Float Charging Voltage		
	between ambient temp. (-)5-14 ° C	2.27 +/- 0.02 VPC	
	between ambient temp. 15-24 ° C	2.25 +/- 0.02 VPC	
	between ambient temp. 25-34 ° C	2.23 +/- 0.02 VPC	
	between ambient temp. 35-40 ° C	2.20 +/- 0.02 VPC	
(ii)	Float Charging Current	30	Amps (Max)
(iii)	Trickle Charging Voltage	NA	
(iv)	Trickle Charging Current	NA	
(v)	Boost Charging Voltage	2.35	Volts
(vi)	Boost Charging Current	40	Amps.
(vii)	Time taken to full charge from 100% discharge state by constant voltage charging & voltage at the end of this charge	72 Hrs (Min) 2.1 volts(ocv)	
(viii)	Equalising Charging Current;Voltage	NA	
17	Guaranteed efficiencies at 10 hrs rate		
	(a) Ampere-hour efficiency	90%	
	(b) Watt-hour efficiency	80%	
18	Allowable voltage ripple	1.5 % RMS of the charging voltage(Bulk charging) 0.5 % RMS of the charging voltage(Float charging)	

19	Internal Resistance of each cell at Fully Charged Condition	0.99	milli ohms min

20	Total Resistance of Battery ; milliohms	Depending on no. of cells
21	Overall Dimensions of each complete module with Top Cover(LxWxH) in mm	Length 588 +/- 5, Width 415 +/- 5(w/o base member), Width 452 +/-5 (with base member), Height 210 +/- 5; (6 cells module);
22	Weight of unpacked and complete module with electrolyte ; Kgs	83.1 +/- 5% Kgs (Single 6 cell module)
23	Material of Modules	Powder coated MS

24	Whether explosion vents are offered	Yes, self re-sealing rubber safety valve with flame arrestor
25	Loss of capacity due to self discharge	< 0.5% per week of c-10 capacity
26	The period for which the battery should be stored after supply in charged conditions	If stored in Indian ambient temp of 30 deg C cells will need freshning charge once in every three months, however if stored at higher or lower temperature freshning charge to be provided as recommended.
27	Amount of Hydrogen evolved during normal normal float charging	Less than 200ppm normal float condition
28	Recommended interval at which battery should be discharged at 10 hr discharge rate	Once annually

29	No. of charge-discharge cycle battery can give during its entire life	
	at 20% DOD	4000 cycles
	at 50% DOD	1800 cycles
	at 80% DOD	1400 cycles
30	Expected Life of Battery in years	20 Yrs at 27 deg C in ideal float condition.

31	Applicable standard	IEC 60896 - 21 & 22, JIS : C 8704-2, : 1998 ANSI T1 330, GR/BAT-01/03-MARCH 2004, IS 15549 : 2005

GENERAL TECHNICAL PARTICULARS **UPST/NEPST 240**

SL. NO.	DESCRIPTION		DETAILS	
1	Capacity in Ah			
(a)	At 27 ° C			
(i)	Initial		240	
(ii)	Rated		240	
(iii)	End of Life		192	
(b)	Rated Capacity(in Ah) at minimum ambient temperature of (as per IS 15549 : 2005)		Formula : $C_t = \{ 1+ 0.0043 (t-27) \}$	
(c)	Rated Capacity(in Ah) at maximum ambient temperature of (as per IS 15549 : 2005)		Formula : $C_t = \{ 1+ 0.0043 (t-27) \}$	
2	Capacity at Various Discharge Rates at 27°C			
	Period of Discharge	***Ah capacities***	***Discharge Current (Amps)***	***End Cell Voltage (Volts)***
	10Hr	**240.00**	**24.0**	**1.75**
	9Hr	234.96	26.1	**1.75**
	8Hr	228.00	28.5	1.75
	7Hr	220.08	31.4	**1.75**
	6Hr	210.96	35.2	**1.75**
	5Hr	199.92	40.0	1.75
	4Hr	187.68	46.9	1.74
	3Hr	172.08	57.4	1.74
	2Hr	151.92	76.0	1.7
	1Hr	120.00	120.0	1.7
	50 min	112.08	134.5	1.7
	40 min	103.20	155.0	1.7
	30 min	96.00	192.0	1.7
	20 min	86.40	259.5	1.7
	15 min	71.69	286.8	1.7
	10 min	52.39	315.6	1.7
	5 min	29.50	354.1	1.7
	1 min	8.81	530.6	1.7

3	Maximum Momentary Current for 1 min upto cut off voltage of 1.6 V	720	Amps
4	Expected Fault at bus due to battery	1440	Amps
5 (i)	Short Circuit Current at Battery terminals	1440	Amps
5 (ii)	Time for which the battery can withstand short circuit at terminals	5 Sec	

6	Type/No. of Negative Plates per cell	Flat pasted; 7
7	Type/No. of Positive Plates per cell	Flat pasted; 6
8	Size of negative plates, mm	315(L) x 140(W) x 2.65 (+/- 1) (Thk)
9	Size of positive plates, mm	315(L) x 140(W) x 4.5 (+/- 1) (Thk)
10	Type of Connection between cells	Bolted rigid copper connectors
11	Type of Separators	Absorptive glass mat
12	Thickness of Separators	4.2 (2 layers of 2.1 mm each)
13	Dimensison of 2 volts cell (LXWXH) , mm	167 (+/-3) mm x 126 (+/-3) mm x 394 (+/- 5) mm
14	Clearance between the bottom of the plates and container	5 mm
15	Material of Container	Polypropylene Co-polymer

16	Recommended Charging Rate		
(i)	Float Charging Voltage		
	between ambient temp. (-)5-14 ° C	2.27 +/- 0.02 VPC	
	between ambient temp. 15-24 ° C	2.25 +/- 0.02 VPC	
	between ambient temp. 25-34 ° C	2.23 +/- 0.02 VPC	
	between ambient temp. 35-40 ° C	2.20 +/- 0.02 VPC	
(ii)	Float Charging Current	36	Amps (Max)
(iii)	Trickle Charging Voltage	NA	
(iv)	Trickle Charging Current	NA	
(v)	Boost Charging Voltage	2.35	Volts
(vi)	Boost Charging Current	48	Amps.
(vii)	Time taken to full charge from 100% discharge state by constant voltage charging & voltage at the end of this charge	72 Hrs (Min) 2.1 volts(ocv)	
(viii)	Equalising Charging Current;Voltage	NA	
17	Guaranteed efficiencies at 10 hrs rate		
	(a) Ampere-hour efficiency	90%	
	(b) Watt-hour efficiency	80%	
18	Allowable voltage ripple	1.5 % RMS of the charging voltage(Bulk charging) 0.5 % RMS of the charging voltage(Float charging)	

19	Internal Resistance of each cell at Fully Charged Condition	0.86	milli ohms min

20	Total Resistance of Battery ; milliohms	Depending on no. of cells
21	Overall Dimensions of each complete module (LxWxH) in mm	Length 588 +/- 5, Width 460 +/- 5, Height 288 +/- 5 (6 cell module)
22	Weight of unpacked and complete module with electrolyte ; Kgs	100 +/- 5% Kgs (Single 6 cell module)
23	Material of Modules	Powder coated MS

24	Whether explosion vents are offered	Yes, self re-sealing rubber safety valve with flame arrestor
25	Loss of capacity due to self discharge	< 0.5% per week of c-10 capacity
26	The period for which the battery should be stored after supply in charged conditions	If stored in Indian ambient temp of 30 deg C cells will need freshning charge once in every three months, however if stored at higher or lower temperature freshning charge to be provided as recommended.
27	Amount of Hydrogen evolved during normal normal float charging	Less than 200ppm normal float condition
28	Recommended interval at which battery should be discharged at 10 hr discharge rate	Once annually

29	No. of charge-discharge cycle battery can give during its entire life	
	at 20% DOD	4000 cycles
	at 50% DOD	1800 cycles
	at 80% DOD	1400 cycles
30	Expected Life of Battery in years	20 Yrs at 27 deg C in ideal float condition.

31	Applicable standard	IEC 60896 - 21 & 22, JIS : C 8704-2, : 1998 ANSI T1 330, GR/BAT-01/03-MARCH 2004, IS 15549 : 2005

GENERAL TECHNICAL PARTICULARS — UPST/NEPST 300

SL. NO.	DESCRIPTION	DETAILS
1	Capacity in Ah	
(a)	At 27 ° C	
(i)	Initial	300
(ii)	Rated	300
(iii)	End of Life	240
(b)	Rated Capacity(in Ah) at minimum ambient temperature of (as per IS 15549 : 2005)	Formula : $Ct = C27/\{1 + 0.0043(27-t)\}$
(c)	Rated Capacity(in Ah) at maximum ambient temperature of (as per IS 15549 : 2005)	Formula : $Ct = C27/\{1 + 0.0043(27-t)\}$

2 Capacity at Various Discharge Rates at 27°C

Period of Discharge	*Ah capacities*	*Discharge Current (Amps)*	*End Cell Voltage (Volts)*
10Hr	**300.00**	**30.0**	**1.75**
9Hr	293.70	32.6	**1.75**
8Hr	285.00	35.6	1.75
7Hr	275.10	39.3	**1.75**
6Hr	263.70	44.0	**1.75**
5Hr	249.90	50.0	1.75
4Hr	234.60	58.7	1.74
3Hr	215.10	71.7	1.74
2Hr	189.90	95.0	1.7
1Hr	150.00	150.0	1.7
50 min	140.10	168.2	1.7
40 min	129.00	193.7	1.7
30 min	120.00	240.0	1.7
20 min	108.00	324.3	1.7
15 min	89.61	358.4	1.7
10 min	65.49	394.5	1.7
5 min	36.87	442.6	1.7
1 min	11.01	663.3	1.7

3	Maximum Momentary Current for 1 min upto cut off voltage of 1.6 V	900	Amps
4	Expected Fault at bus due to battery	1800	Amps
5 (i)	Short Circuit Current at Battery terminals	1800	Amps
5 (ii)	Time for which the battery can withstand short circuit at terminals	5 Sec	

6	Type/No. of Negative Plates per cell	Flat pasted; 9
7	Type/No. of Positive Plates per cell	Flat pasted; 8
8	Size of negative plates, mm	315(L) x 140(W) x 2.65 (+/- 1) (Thk)
9	Size of positive plates, mm	315(L) x 140(W) x 4.5 (+/- 1) (Thk)
10	Type of Connection between cells	Bolted rigid copper connectors
11	Type of Separators	Absorptive glass mat
12	Thickness of Separators	4.2 (2 layers of 2.1 mm each)
13	Dimensison of 2 volts cell (LXWXH) , mm	167 (+/-3) mm x 126 (+/-3) mm x 394 (+/- 5) mm
14	Clearance between the bottom of the plates and container	5 mm
15	Material of Container	Polypropylene Co-polymer

16	Recommended Charging Rate		
(i)	Float Charging Voltage		
	between ambient temp. (-)5-14 ° C	2.27 +/- 0.02 VPC	
	between ambient temp. 15-24 ° C	2.25 +/- 0.02 VPC	
	between ambient temp. 25-34 ° C	2.23 +/- 0.02 VPC	
	between ambient temp. 35-40 ° C	2.20 +/- 0.02 VPC	
(ii)	Float Charging Current	45	Amps (Max)
(iii)	Trickle Charging Voltage	NA	
(iv)	Trickle Charging Current	NA	
(v)	Boost Charging Voltage	2.35	Volts
(vi)	Boost Charging Current	60	Amps.
(vii)	Time taken to full charge from 100% discharge state by constant voltage charging & voltage at the end of this charge	72 Hrs (Min) 2.1 volts(ocv)	
(viii)	Equalising Charging Current;Voltage	NA	
17	Guaranteed efficiencies at 10 hrs rate		
	(a) Ampere-hour efficiency	90%	
	(b) Watt-hour efficiency	80%	
18	Allowable voltage ripple	1.5 % RMS of the charging voltage(Bulk charging) 0.5 % RMS of the charging voltage(Float charging)	

19	Internal Resistance of each cell at Fully Charged Condition	0.72	milli ohms min

20	Total Resistance of Battery ; milliohms	Depending on no. of cells
21	Overall Dimensions of each complete module without Terminal Cap (LxWxH) in mm	Length 588 +/- 5, Width 460 +/- 5, Height 288 +/- 5 (6 cell module)
22	Weight of unpacked and complete module with electrolyte ; Kgs	125 +/- 5% Kgs (Single 6 cell module)
23	Material of Modules	Powder coated MS

24	Whether explosion vents are offered	Yes, self re-sealing rubber safety valve with flame arrestor
25	Loss of capacity due to self discharge	< 0.5% per week of c-10 capacity
26	The period for which the battery should be stored after supply in charged conditions	If stored in Indian ambient temp of 30 deg C cells will need freshning charge once in every three months, however if stored at higher or lower temperature freshning charge to be provided as recommended.
27	Amount of Hydrogen evolved during normal normal float charging	Less than 200ppm normal float condition
28	Recommended interval at which battery should be discharged at 10 hr discharge rate	Once annually

29	No. of charge-discharge cycle battery can give during its entire life	
	at 20% DOD	4000 cycles
	at 50% DOD	1800 cycles
	at 80% DOD	1400 cycles
30	Expected Life of Battery in years	20 Yrs at 27 deg C in ideal float condition.

31	Applicable standard	IEC 60896 - 21 & 22, JIS : C 8704-2, : 1998 ANSI T1 330, GR/BAT-01/03-MARCH 2004, IS 15549 : 2005

GENERAL TECHNICAL PARTICULARS — NEPST / UPST 320

EXIDE INDUSTRIES LIMITED

SL. NO.	DESCRIPTION	DETAILS
1	Capacity in Ah	
(a)	At 27 ° C	
(i)	Initial	320
(ii)	Rated	320
(iii)	End of Life	256
(b)	Rated Capacity(in Ah) at minimum ambient temperature of (as per IS 15549 : 2005)	Formula : $C_t = \{ 1+ 0.0043 (t-27) \}$
(c)	Rated Capacity(in Ah) at maximum ambient temperature of (as per IS 15549 : 2005)	Formula : $C_t = \{ 1+ 0.0043 (t-27) \}$

2 Capacity at Various Discharge Rates at 27°C

Period of Discharge	*Ah capacities*	*Discharge Current (Amps)*	*End Cell Voltage (Volts)*
10Hr	**320.00**	**32.0**	**1.75**
9Hr	313.28	34.8	**1.75**
8Hr	304.00	38.0	1.75
7Hr	293.44	41.9	**1.75**
6Hr	281.28	46.9	**1.75**
5Hr	266.56	53.3	1.75
4Hr	250.24	62.6	1.74
3Hr	229.44	76.5	1.74
2Hr	202.56	101.3	1.7
1Hr	160.00	160.0	1.7
50 min	149.44	179.4	1.7
40 min	137.60	206.6	1.7
30 min	128.00	256.0	1.7
20 min	115.20	345.9	1.7
15 min	95.58	382.3	1.7
10 min	69.86	420.8	1.7
5 min	39.33	472.1	1.7
1 min	11.74	707.5	1.7

3	Maximum Momentary Current for 1 min upto cut off voltage of 1.6 V	960	Amps
4	Expected Fault at bus due to battery	1920	Amps
5 (i)	Short Circuit Current at Battery terminals	1920	Amps
5 (ii)	Time for which the battery can withstand short circuit at terminals	5 Sec	

6	Type/No. of Negative Plates per cell	Flat pasted; 9
7	Type/No. of Positive Plates per cell	Flat pasted; 8
8	Size of negative plates, mm	315(L) x 140(W) x 2.65 (+/- 1) (Thk)
9	Size of positive plates, mm	315(L) x 140(W) x 4.5 (+/- 1) (Thk)
10	Type of Connection between cells	Bolted rigid copper connectors
11	Type of Separators	Absorptive glass mat
12	Thickness of Separators	4.2 (2 layers of 2.1 mm each)
13	Dimensison of 2 volts cell (LXWXH) , mm	167 (+/-3) mm x 126 (+/-3) mm x 394 (+/- 5) mm
14	Clearance between the bottom of the plates and container	5 mm
15	Material of Container	Polypropylene Co-polymer

16	Recommended Charging Rate		
(i)	Float Charging Voltage		
	between ambient temp. (-)5-14 ° C	2.27 +/- 0.02 VPC	
	between ambient temp. 15-24 ° C	2.25 +/- 0.02 VPC	
	between ambient temp. 25-34 ° C	2.23 +/- 0.02 VPC	
	between ambient temp. 35-40 ° C	2.20 +/- 0.02 VPC	
(ii)	Float Charging Current	48	Amps (Max)
(iii)	Trickle Charging Voltage	NA	
(iv)	Trickle Charging Current	NA	
(v)	Boost Charging Voltage	2.35	Volts
(vi)	Boost Charging Current	64	Amps.
(vii)	Time taken to full charge from 100% discharge state by constant voltage charging & voltage at the end of this charge	72 Hrs (Min) 2.1 volts(ocv)	
(viii)	Equalising Charging Current;Voltage	NA	
17	Guaranteed efficiencies at 10 hrs rate		
	(a) Ampere-hour efficiency	90%	
	(b) Watt-hour efficiency	80%	
18	Allowable voltage ripple	1.5 % RMS of the charging voltage(Bulk charging) 0.5 % RMS of the charging voltage(Float charging)	

19	Internal Resistance of each cell at Fully Charged Condition	0.72	milli ohms min

20	Total Resistance of Battery ; milliohms	Depending on no. of cells
21	Overall Dimensions of each complete module without Terminal Cap (LxWxH) in mm	Length 588 +/- 5, Width 460 +/- 5, Height 288 +/- 5 (6 cell module)
22	Weight of unpacked and complete module with electrolyte ; Kgs	125 +/- 5% Kgs (Single 6 cell module)
23	Material of Modules	Powder coated MS

24	Whether explosion vents are offered	Yes, self re-sealing rubber safety valve with flame arrestor
25	Loss of capacity due to self discharge	< 0.5% per week of c-10 capacity
26	The period for which the battery should be stored after supply in charged conditions	If stored in Indian ambient temp of 30 deg C cells will need freshning charge once in every three months, however if stored at higher or lower temperature freshning charge to be provided as recommended.
27	Amount of Hydrogen evolved during normal normal float charging	Less than 200ppm normal float condition
28	Recommended interval at which battery should be discharged at 10 hr discharge rate	Once annually

29	No. of charge-discharge cycle battery can give during its entire life	
	at 20% DOD	4000 cycles
	at 50% DOD	1800 cycles
	at 80% DOD	1400 cycles
30	Expected Life of Battery in years	20 Yrs at 27 deg C in ideal float condition.

31	Applicable standard	IEC 60896 - 21 & 22, JIS : C 8704-2, : 1998 ANSI T1 330, GR/BAT-01/03-MARCH 2004, IS 15549 : 2005

GENERAL TECHNICAL PARTICULARS **NEPST/UPST 380**

SL. NO.	DESCRIPTION	DETAILS
1	Capacity in Ah	
(a)	At 27 ° C	
(i)	Initial	380
(ii)	Rated	380
(iii)	End of Life	304
(b)	Rated Capacity(in Ah) at minimum ambient temperature of (as per IS 15549 : 2005)	Formula : $C_t = \{ 1+ 0.0043 (t-27) \}$
(c)	Rated Capacity(in Ah) at maximum ambient temperature of (as per IS 15549 : 2005)	Formula : $C_t = \{ 1+ 0.0043 (t-27) \}$

2 Capacity at Various Discharge Rates at 27°C

Period of Discharge	*Ah capacities*	*Discharge Current (Amps)*	*End Cell Voltage (Volts)*
10Hr	**380.00**	**38.0**	**1.75**
9Hr	372.02	41.3	**1.75**
8Hr	361.00	45.1	1.75
7Hr	348.46	49.8	**1.75**
6Hr	334.02	55.7	**1.75**
5Hr	316.54	63.3	1.75
4Hr	297.16	74.3	1.74
3Hr	272.46	90.8	1.74
2Hr	240.54	120.3	1.7
1Hr	190.00	190.0	1.7
50 min	177.46	213.0	1.7
40 min	163.40	245.3	1.7
30 min	152.00	304.0	1.7
20 min	136.80	410.8	1.7
15 min	113.51	454.0	1.7
10 min	82.95	499.7	1.7
5 min	46.70	560.6	1.7
1 min	13.95	840.1	1.7

3	Maximum Momentary Current for 1 min upto cut off voltage of 1.6 V	1140	Amps
4	Expected Fault at bus due to battery	2280	Amps
5 (i)	Short Circuit Current at Battery terminals	2280	Amps
5 (ii)	Time for which the battery can withstand short circuit at terminals	5 Sec	

6	Type/No. of Negative Plates per cell	Flat pasted; 11
7	Type/No. of Positive Plates per cell	Flat pasted; 10
8	Size of negative plates, mm	315(L) x 140(W) x 2.65 (+/- 1) (Thk)
9	Size of positive plates, mm	315(L) x 140(W) x 4.5 (+/- 1) (Thk)
10	Type of Connection between cells	Bolted rigid copper connectors
11	Type of Separators	Absorptive glass mat
12	Thickness of Separators	4.5 (2 layers of 2.25 mm each)
13	Dimensison of 2 volts cell (LXWXH) , mm	167 (+/-3) mm x 172 (+/-3) mm x 378 (+/- 5) mm
14	Clearance between the bottom of the plates and container	5 mm
15	Material of Container	Polypropylene Co-polymer

16	Recommended Charging Rate		
(i)	Float Charging Voltage		
	between ambient temp. (-)5-14 ° C	2.27 +/- 0.02 VPC	
	between ambient temp. 15-24 ° C	2.25 +/- 0.02 VPC	
	between ambient temp. 25-34 ° C	2.23 +/- 0.02 VPC	
	between ambient temp. 35-40 ° C	2.20 +/- 0.02 VPC	
(ii)	Float Charging Current	57	Amps (Max)
(iii)	Trickle Charging Voltage	NA	
(iv)	Trickle Charging Current	NA	
(v)	Boost Charging Voltage	2.35	Volts
(vi)	Boost Charging Current	76	Amps.
(vii)	Time taken to full charge from 100% discharge state by constant voltage charging & voltage at the end of this charge	72 Hrs (Min) 2.1 volts(ocv)	
(viii)	Equalising Charging Current;Voltage	NA	
17	Guaranteed efficiencies at 10 hrs rate		
	(a) Ampere-hour efficiency	90%	
	(b) Watt-hour efficiency	80%	
18	Allowable voltage ripple	1.5 % RMS of the charging voltage(Bulk charging) 0.5 % RMS of the charging voltage(Float charging)	

19	Internal Resistance of each cell at Fully Charged Condition	0.42	milli ohms min

20	Total Resistance of Battery ; milliohms	Depending on no. of cells
21	Overall Dimensions of each complete module (LxWxH) in mm	Length 619 +/- 5, Width 445 +/- 5, Height 388 +/- 5 (6 cell module)
22	Weight of unpacked and complete module with electrolyte ; Kgs	156.3 +/- 5% Kgs (Single 6 cell module)
23	Material of Modules	Powder coated MS

24	Whether explosion vents are offered	Yes, self re-sealing rubber safety valve with flame arrestor
25	Loss of capacity due to self discharge	< 0.5% per week of c-10 capacity
26	The period for which the battery should be stored after supply in charged conditions	If stored in Indian ambient temp of 30 deg C cells will need freshning charge once in every three months, however if stored at higher or lower temperature freshning charge to be provided as recommended.
27	Amount of Hydrogen evolved during normal normal float charging	Less than 200ppm normal float condition
28	Recommended interval at which battery should be discharged at 10 hr discharge rate	Once annually

29	No. of charge-discharge cycle battery can give during its entire life	
	at 20% DOD	4000 cycles
	at 50% DOD	1800 cycles
	at 80% DOD	1400 cycles
30	Expected Life of Battery in years	20 Yrs at 27 deg C in ideal float condition.

31	Applicable standard	IEC 60896 - 21 & 22, JIS : C 8704-2, : 1998 ANSI T1 330, GR/BAT-01/03-MARCH 2004, IS 15549 : 2005;

GENERAL TECHNICAL PARTICULARS — UPST / NEPST 400

EXIDE INDUSTRIES LIMITED

SL. NO.	DESCRIPTION	DETAILS
1	Capacity in Ah	
(a)	At 27 ° C	
(i)	Initial	400
(ii)	Rated	400
(iii)	End of Life	320
(b)	Rated Capacity(in Ah) at minimum ambient temperature of (as per IS 15549 : 2005)	Formula : $C_t = \{ 1+ 0.0043 (t-27) \}$
(c)	Rated Capacity(in Ah) at maximum ambient temperature of (as per IS 15549 : 2005)	Formula : $C_t = \{ 1+ 0.0043 (t-27) \}$

2 Capacity at Various Discharge Rates at 27°C

Period of Discharge	*Ah capacities*	*Discharge Current (Amps)*	*End Cell Voltage (Volts)*
10Hr	**400.00**	**40.0**	**1.75**
9Hr	391.60	43.5	**1.75**
8Hr	380.00	47.5	1.75
7Hr	366.80	52.4	**1.75**
6Hr	351.60	58.6	**1.75**
5Hr	333.20	66.6	1.75
4Hr	312.80	78.2	1.74
3Hr	286.80	95.6	1.74
2Hr	253.20	126.6	1.7
1Hr	200.00	200.0	1.7
50 min	186.80	224.2	1.7
40 min	172.00	258.3	1.7
30 min	160.00	320.0	1.7
20 min	144.00	432.4	1.7
15 min	119.48	477.9	1.7
10 min	87.32	526.0	1.7
5 min	49.16	590.2	1.7
1 min	14.68	884.3	1.7

3	Maximum Momentary Current for 1 min upto cut off voltage of 1.6 V	1200	Amps
4	Expected Fault at bus due to battery	2400	Amps
5 (i)	Short Circuit Current at Battery terminals	2400	Amps
5 (ii)	Time for which the battery can withstand short circuit at terminals	5 Sec	

6	Type/No. of Negative Plates per cell	Flat pasted; 11
7	Type/No. of Positive Plates per cell	Flat pasted; 10
8	Size of negative plates, mm	315(L) x 140(W) x 2.65 (+/- 1) (Thk)
9	Size of positive plates, mm	315(L) x 140(W) x 4.5 (+/- 1) (Thk)
10	Type of Connection between cells	Bolted rigid copper connectors
11	Type of Separators	Absorptive glass mat
12	Thickness of Separators	4.5 (2 layers of 2.25 mm each)
13	Dimensison of 2 volts cell (LXWXH) , mm	167 (+/-3) mm x 172 (+/-3) mm x 378 (+/- 5) mm
14	Clearance between the bottom of the plates and container	5 mm
15	Material of Container	Polypropylene Co-polymer

16	Recommended Charging Rate		
(i)	Float Charging Voltage		
	between ambient temp. (-)5-14 ° C	2.27 +/- 0.02 VPC	
	between ambient temp. 15-24 ° C	2.25 +/- 0.02 VPC	
	between ambient temp. 25-34 ° C	2.23 +/- 0.02 VPC	
	between ambient temp. 35-40 ° C	2.20 +/- 0.02 VPC	
(ii)	Float Charging Current	60	Amps (Max)
(iii)	Trickle Charging Voltage	NA	
(iv)	Trickle Charging Current	NA	
(v)	Boost Charging Voltage	2.35	Volts
(vi)	Boost Charging Current	80	Amps.
(vii)	Time taken to full charge from 100%	72 Hrs (Min)	
	discharge state by constant voltage	2.1 volts(ocv)	
	charging & voltage at the end of this charge		
(viii)	Equalising Charging Current;Voltage	NA	
17	Guaranteed efficiencies at 10 hrs rate		
	(a) Ampere-hour efficiency	90%	
	(b) Watt-hour efficiency	80%	
18	Allowable voltage ripple	1.5 % RMS of the charging voltage(Bulk charging) 0.5 % RMS of the charging voltage(Float charging)	

19	Internal Resistance of each cell at Fully Charged Condition	0.42	milli ohms min

20	Total Resistance of Battery ; milliohms	Depending on no. of cells
21	Overall Dimensions of each complete module (LxWxH) in mm	Length 619 +/- 5, Width 445 +/- 5, Height 388 +/- 5 (6 cell module)
22	Weight of unpacked and complete module with electrolyte ; Kgs	156.3 +/- 5% Kgs (Single 6 cell module)
23	Material of Modules	Powder coated MS

24	Whether explosion vents are offered	Yes, self re-sealing rubber safety valve with flame arrestor
25	Loss of capacity due to self discharge	< 0.5% per week of c-10 capacity
26	The period for which the battery should be stored after supply in charged conditions	If stored in Indian ambient temp of 30 deg C cells will need freshning charge once in every three months, however if stored at higher or lower temperature freshning charge to be provided as recommended.
27	Amount of Hydrogen evolved during normal normal float charging	Less than 200ppm normal float condition
28	Recommended interval at which battery should be discharged at 10 hr discharge rate	Once annually

29	No. of charge-discharge cycle battery can give during its entire life	
	at 20% DOD	4000 cycles
	at 50% DOD	1800 cycles
	at 80% DOD	1400 cycles
30	Expected Life of Battery in years	20 Yrs at 27 deg C in ideal float condition.

31	Applicable standard	IEC 60896 - 21 & 22, JIS : C 8704-2, : 1998 ANSI T1 330, GR/BAT-01/03-MARCH 2004, IS 15549 : 2005;

GENERAL TECHNICAL PARTICULARS UPST 100

SL. NO.	DESCRIPTION	DETAILS
1	Capacity in Ah	
(a)	At 27 ° C	
(i)	Initial	100
(ii)	Rated	100
(iii)	End of Life	80
(b)	Rated Capacity(in Ah) at minimum ambient temperature of (as per IS 15549 : 2005)	Formula : $C_t = \{ 1+ 0.0043 (t-27) \}$
(c)	Rated Capacity(in Ah) at maximum ambient temperature of (as per IS 15549 : 2005)	Formula : $C_t = \{ 1+ 0.0043 (t-27) \}$

2 Capacity at Various Discharge Rates at 27°C

Period of Discharge	*Ah capacities*	*Discharge Current (Amps)*	*End Cell Voltage (Volts)*
10Hr	**100.00**	**10.0**	**1.75**
9Hr	97.90	10.9	1.75
8Hr	95.00	11.9	1.75
7Hr	91.70	13.1	1.75
6Hr	87.90	14.7	1.75
5Hr	83.30	16.7	1.75
4Hr	78.20	19.6	1.74
3Hr	71.70	23.9	1.74
2Hr	63.30	31.7	1.7
1Hr	50.00	50.0	1.7
50 min	46.70	56.1	1.7
40 min	43.00	64.6	1.7
30 min	40.00	80.0	1.7
20 min	36.00	108.1	1.7
15 min	29.87	119.5	1.7
10 min	21.83	131.5	1.7
5 min	12.29	147.5	1.7
1 min	3.67	221.1	1.7

3	Maximum Momentary Current for 1 min upto cut off voltage of 1.6 V	300	Amps
4	Expected Fault at bus due to battery	600	Amps
5 (i)	Short Circuit Current at Battery terminals	600	Amps
5 (ii)	Time for which the battery can withstand short circuit at terminals	5 Sec	

6	Type/No. of Negative Plates per cell/ Material	Flat pasted;8, Lead Calcium Tin Alloy Grid
7	Type/No. of Positive Plates per cell	Flat pasted;7, Lead Calcium Tin Alloy Grid
8	Size of negative plates, mm	176.5(L) x 148(W) x 1.85 (+/- 1) (Thk)
9	Size of positive plates, mm	176.5(L) x 148(W) x 2.8 (+/- 1) (Thk)
10	Type of Connection between cells	Bolted rigid copper connectors
11	Type of Separators	Absorptive glass mat
12	Thickness of Separators	4.2 (2 layers of 2.1 mm each)
13	Dimensison of 2 volts cell (LXWXH) , mm	163.5 (+/-3) x 65.5 (+/-3) x 233.5 (+/- 3 mm)
14	Material of Container	Polypropylene Co-polymer

15	Recommended Charging Rate		
(i)	Float Charging Voltage		
	between ambient temp. (-)5-14 ° C	2.27 +/- 0.02 VPC	
	between ambient temp. 15-24 ° C	2.25 +/- 0.02 VPC	
	between ambient temp. 25-34 ° C	2.23 +/- 0.02 VPC	
	between ambient temp. 35-40 ° C	2.20 +/- 0.02 VPC	
(ii)	Float Charging Current	15	Amps (Max)
(iii)	Trickle Charging Voltage	NA	
(iv)	Trickle Charging Current	NA	
(v)	Boost Charging Voltage	2.35	Volts
(vi)	Boost Charging Current	20	Amps.
(vii)	Time taken to full charge from 100% discharge state by constant voltage charging & voltage at the end of this charge	72 Hrs (Min) 2.1 volts(ocv)	
(viii)	Equalising Charging Current;Voltage	NA	
16	Guaranteed efficiencies at 10 hrs rate		
	(a) Ampere-hour efficiency	90%	
	(b) Watt-hour efficiency	80%	
17	Allowable voltage ripple	1.5 % RMS of the charging voltage(Bulk charging) 0.5 % RMS of the charging voltage(Float charging)	

18	Internal Resistance of each cell at Fully Charged Condition	0.91	milli ohms min

19	Total Resistance of Battery ; milliohms	Depending on no. of cells
20	Resistance of inter cell connectors;milliohms	Depending on no. of cells
21	Overall Dimensions of each complete battery bank (HxWxL) in mm	Depending on system voltage
22	Overall Dimensions of each complete module (LxWxH) in mm	Length 769 +/- 5, Width 243 +/- 5, Height 247 +/- 5 (12 cells module)
23	Weight of unpacked and complete module with electrolyte ; Kgs	82.2 +/- 5% Kgs (Single 12 cell module)
24	Material of Modules	Powder coated MS

25	Whether explosion vents are offered	Yes, self re-sealing rubber safety valve with flame arrestor
26	Loss of capacity due to self discharge	< 0.5% per week of c-10 capacity
27	The period for which the battery should be stored after supply in charged conditions	If stored in Indian ambient temp of 30 deg C cells will need freshning charge once in every three months, however if stored at higher or lower temperature freshning charge to be provided as recommended.
28	Amount of Hydrogen evolved during normal normal float charging	Less than 200ppm normal float condition
29	Recommended interval at which battery should be discharged at 10 hr discharge rate	Once annually

30	No. of charge-discharge cycle battery can give during its entire life	
	at 20% DOD	2000 cycles
	at 50% DOD	900 cycles
	at 80% DOD	700 cycles
31	Expected Life of Battery in years	10 Yrs at 27 deg C in ideal float condition.

32	Applicable standard	IEC 60896 - 21 & 22, JIS : C 8704-2, : 1998 ANSI T1 330, GR/BAT-01/03-MARCH 2004, IS 15549 : 2005

GENERAL TECHNICAL PARTICULARS UPST 165

SL. NO.	DESCRIPTION	DETAILS
1	Capacity in Ah	
(a)	At 27 ° C	
(i)	Initial	165
(ii)	Rated	165
(iii)	End of Life	132
(b)	Rated Capacity(in Ah) at minimum ambient temperature of (as per IS 15549 : 2005)	Formula : $C_t = \{ 1+ 0.0043 (t-27) \}$
(c)	Rated Capacity(in Ah) at maximum ambient temperature of (as per IS 15549 : 2005)	Formula : $C_t = \{ 1+ 0.0043 (t-27) \}$

2 Capacity at Various Discharge Rates at 27°C

Period of Discharge	*Ah capacities*	*Discharge Current (Amps)*	*End Cell Voltage (Volts)*
10Hr	**165.00**	**16.5**	**1.75**
9Hr	161.54	17.9	**1.75**
8Hr	156.75	19.6	1.75
7Hr	151.31	21.6	**1.75**
6Hr	145.04	24.2	**1.75**
5Hr	137.45	27.5	1.75
4Hr	129.03	32.3	1.74
3Hr	118.31	39.4	1.74
2Hr	104.45	52.2	1.7
1Hr	82.50	82.5	1.7
50 min	77.06	92.5	1.7
40 min	70.95	106.5	1.7
30 min	66.00	132.0	1.7
20 min	59.40	178.4	1.7
15 min	49.29	197.1	1.7
10 min	36.02	217.0	1.7
5 min	20.28	243.4	1.7
1 min	6.06	364.8	1.7

3	Maximum Momentary Current for 1 min upto cut off voltage of 1.6 V	495	Amps
4	Expected Fault at bus due to battery	990	Amps
5 (i)	Short Circuit Current at Battery terminals	990	Amps
5 (ii)	Time for which the battery can withstand short circuit at terminals	5 Sec	

6	Type/No. of Negative Plates per cell / Material	Flat pasted, 3(I) + 2(E), Lead Calcium Tin Alloy Grid
7	Type/No. of Positive Plates per cell / Material	Flat pasted ,4, Lead Calcium Tin Alloy Grid
8	Size of negative plates, mm	315(L) x 140(W) x 2.65 (+/- 1) (Thk) (Inter) 315(L) x 140(W) x 1.9 (+/- 1) (Thk) (End)
9	Size of positive plates, mm	315(L) x 140(W) x 4.5 (+/- 1) (Thk)
10	Type of Connection between cells	Bolted rigid copper connectors
11	Type of Separators	Absorptive glass mat
12	Thickness of Separators	4.2 (2 layers of 2.1 mm each)
13	Dimensison of 2 volts cell (LXWXH) , mm	167(+/-3) x 87(+/-3) x 394 (+/- 5 mm)
14	Clearance between the bottom of the plates and container	5 mm
15	Material of Container	Polypropylene Co-polymer

16	Recommended Charging Rate		
(i)	Float Charging Voltage		
	between ambient temp. (-)5-14 ° C	2.27 +/- 0.02 VPC	
	between ambient temp. 15-24 ° C	2.25 +/- 0.02 VPC	
	between ambient temp. 25-34 ° C	2.23 +/- 0.02 VPC	
	between ambient temp. 35-40 ° C	2.20 +/- 0.02 VPC	
(ii)	Float Charging Current	24.75	Amps (Max)
(iii)	Trickle Charging Voltage	NA	
(iv)	Trickle Charging Current	NA	
(v)	Boost Charging Voltage	2.35	Volts
(vi)	Boost Charging Current	33	Amps.
(vii)	Time taken to full charge from 100% discharge state by constant voltage charging & voltage at the end of this charge	72 Hrs (Min) 2.1 volts(ocv)	
(viii)	Equalising Charging Current;Voltage	NA	
17	Guaranteed efficiencies at 10 hrs rate		
	(a) Ampere-hour efficiency	90%	
	(b) Watt-hour efficiency	80%	
18	Allowable voltage ripple	1.5 % RMS of the charging voltage(Bulk charging) 0.5 % RMS of the charging voltage(Float charging)	

19	Internal Resistance of each cell at (Fully Charged Condition	1.28	milli ohms min

20	Total Resistance of Battery ; milliohms	Depending on no. of cells
21	Overall Dimensions of each complete module with Top Cover(LxWxH) in mm	Length 588 +/- 5, Width 415 +/- 5(w/o base member), Width 452 +/-5 (with base member), Height 210 +/- 5; (6 cells module);
22	Weight of unpacked and complete module with electrolyte ; Kgs	75.0 +/- 5% Kgs (Single 6 cell module)
23	Material of Modules	Powder coated MS

24	Whether explosion vents are offered	Yes, self re-sealing rubber safety valve with flame arrestor
25	Loss of capacity due to self discharge	< 0.5% per week of c-10 capacity
26	The period for which the battery should be stored after supply in charged conditions	If stored in Indian ambient temp of 30 deg C cells will need freshning charge once in every three months, however if stored at higher or lower temperature freshning charge to be provided as recommended.
27	Amount of Hydrogen evolved during normal normal float charging	Less than 200ppm normal float condition
28	Recommended interval at which battery should be discharged at 10 hr discharge rate	Once annually

29	No. of charge-discharge cycle battery can give during its entire life	
	at 20% DOD	4000 cycles
	at 50% DOD	1800 cycles
	at 80% DOD	1400 cycles
30	Expected Life of Battery in years	20 Yrs at 27 deg C in ideal float condition.

31	Applicable standard	IEC 60896 - 21 & 22, JIS : C 8704-2, : 1998 ANSI T1 330, GR/BAT-01/03-MARCH 2004, IS 15549 : 2005