


GENERAL TECHNICAL PARTICULARS UPST/NEPST 415



SL. NO.	DESCRIPTION	DETAILS																																																																												
1	Capacity in Ah At 27 ° C																																																																													
(a)	Initial	415																																																																												
(ii)	Rated	415																																																																												
(iii)	End of Life	332																																																																												
(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																																																																													
	<table border="1"> <thead> <tr> <th>Period of Discharge</th> <th>Ah capacities</th> <th>Discharge Current (Amps)</th> <th>End Cell Voltage (Volts)</th> </tr> </thead> <tbody> <tr> <td>10Hr</td> <td>415.00</td> <td>41.5</td> <td>1.75</td> </tr> <tr> <td>9Hr</td> <td>406.29</td> <td>45.1</td> <td>1.75</td> </tr> <tr> <td>8Hr</td> <td>394.25</td> <td>49.3</td> <td>1.75</td> </tr> <tr> <td>7Hr</td> <td>380.56</td> <td>54.4</td> <td>1.75</td> </tr> <tr> <td>6Hr</td> <td>364.79</td> <td>60.8</td> <td>1.75</td> </tr> <tr> <td>5Hr</td> <td>345.70</td> <td>69.1</td> <td>1.75</td> </tr> <tr> <td>4Hr</td> <td>324.53</td> <td>81.1</td> <td>1.74</td> </tr> <tr> <td>3Hr</td> <td>297.56</td> <td>99.2</td> <td>1.74</td> </tr> <tr> <td>2Hr</td> <td>262.70</td> <td>131.3</td> <td>1.7</td> </tr> <tr> <td>1Hr</td> <td>207.50</td> <td>207.5</td> <td>1.7</td> </tr> <tr> <td>50 min</td> <td>193.81</td> <td>232.7</td> <td>1.7</td> </tr> <tr> <td>40 min</td> <td>178.45</td> <td>267.9</td> <td>1.7</td> </tr> <tr> <td>30 min</td> <td>166.00</td> <td>332.0</td> <td>1.7</td> </tr> <tr> <td>20 min</td> <td>149.40</td> <td>448.6</td> <td>1.7</td> </tr> <tr> <td>15 min</td> <td>123.96</td> <td>495.8</td> <td>1.7</td> </tr> <tr> <td>10 min</td> <td>90.59</td> <td>545.8</td> <td>1.7</td> </tr> <tr> <td>5 min</td> <td>51.00</td> <td>612.3</td> <td>1.7</td> </tr> <tr> <td>1 min</td> <td>15.23</td> <td>917.5</td> <td>1.7</td> </tr> </tbody> </table>	Period of Discharge	Ah capacities	Discharge Current (Amps)	End Cell Voltage (Volts)	10Hr	415.00	41.5	1.75	9Hr	406.29	45.1	1.75	8Hr	394.25	49.3	1.75	7Hr	380.56	54.4	1.75	6Hr	364.79	60.8	1.75	5Hr	345.70	69.1	1.75	4Hr	324.53	81.1	1.74	3Hr	297.56	99.2	1.74	2Hr	262.70	131.3	1.7	1Hr	207.50	207.5	1.7	50 min	193.81	232.7	1.7	40 min	178.45	267.9	1.7	30 min	166.00	332.0	1.7	20 min	149.40	448.6	1.7	15 min	123.96	495.8	1.7	10 min	90.59	545.8	1.7	5 min	51.00	612.3	1.7	1 min	15.23	917.5	1.7	
Period of Discharge	Ah capacities	Discharge Current (Amps)	End Cell Voltage (Volts)																																																																											
10Hr	415.00	41.5	1.75																																																																											
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1 min	15.23	917.5	1.7																																																																											
3	Maximum Momentary Current for 1 min upto cut off voltage of 1.6 V	1245	Amps																																																																											
4	Expected Fault at bus due to battery	2490	Amps																																																																											
5 (i)	Short Circuit Current at Battery terminals	2490	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; 12																																																																												
7	Type/No. of Positive Plates per cell	Flat pasted; 11																																																																												
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																																																																												
12	Type of Separators	Absorptive glass mat																																																																												
13	Thickness of Separators	4.5 (2 layers of 2.25 mm each)																																																																												
14	Dimension of 2 volts cell (LXWXH) , mm	167 (+/-3) mm x 172 (+/-3) mm x 378 (+/- 5) mm																																																																												
15	Clearance between the bottom of the plates and container	5 mm																																																																												
16	Material of Container	Polypropylene Co-polymer																																																																												

17	(i)	Recommended Charging Rate				
		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		62.25		Amps (Max)
		(iii) Trickle Charging Voltage		NA		
		(iv) Trickle Charging Current		NA		
		(v) Boost Charging Voltage		2.35		Volts
(vi) Boost Charging Current		83	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			
18	Guaranteed efficiencies at 10 hrs rate					
	(a) Ampere-hour efficiency		90%			
	(b) Watt-hour efficiency		80%			
19	Allowable voltage ripple		1.5 % RMS of the charging voltage(Bulk charging) 0.5 % RMS of the charging voltage(Float charging)			

20	Internal Resistance of each cell at Fully Charged Condition		0.42	milli ohms min
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21	Total Resistance of Battery ; milliohms	Depending on no. of cells		
22	Overall Dimensions of each complete module (LxWxH) in mm	Length 619 +/- 5, Width 445 +/- 5, Height 388 +/- 5 (6 cell module)		
23	Weight of unpacked and complete module with electrolyte ; Kgs	156.3 +/- 5% Kgs (Single 6 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		4000 cycles 1800 cycles 1400 cycles	
	at 20% DOD			
	at 50% DOD			
	at 80% DOD			
31	Expected Life of Battery in years		20 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;		
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GENERAL TECHNICAL PARTICULARS UPST425



SL. NO.	DESCRIPTION	DETAILS
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1 (a) (i) (ii) (iii) (b) (c)	Capacity in Ah At 27 ° C Initial Rated End of Life Rated Capacity(in Ah) at minimum ambient temperature of (as per IS 15549 : 2005) Rated Capacity(in Ah) at maximum ambient temperature of (as per IS 15549 : 2005)	425 425 340 Formula : $C_t = \{ 1 + 0.0043 (t-27) \}$ Formula : $C_t = \{ 1 + 0.0043 (t-27) \}$
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2	Capacity at Various Discharge Rates at 27°C			
	<i>Period of Discharge</i>	<i>Ah capacities</i>	<i>Discharge Current (Amps)</i>	<i>End Cell Voltage (Volts)</i>
	10Hr	425.00	42.5	1.75
	9Hr	416.08	46.2	1.75
	8Hr	403.75	50.5	1.75
	7Hr	389.73	55.7	1.75
	6Hr	373.58	62.3	1.75
	5Hr	354.03	70.8	1.75
	4Hr	332.35	83.1	1.74
	3Hr	304.73	101.6	1.74
	2Hr	269.03	134.5	1.7
	1Hr	212.50	212.5	1.7
	50 min	198.48	238.3	1.7
	40 min	182.75	274.4	1.7
	30 min	170.00	340.0	1.7
	20 min	153.00	459.5	1.7
	15 min	126.95	507.8	1.7
	10 min	92.78	558.9	1.7
	5 min	52.23	627.0	1.7
	1 min	15.60	939.6	1.7

3	Maximum Momentary Current for 1 min upto cut off voltage of 1.6 V	1275	Amps
4	Expected Fault at bus due to battery	2550	Amps
5 (i)	Short Circuit Current at Battery terminals	2550	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; 12
7	Type/No. of Positive Plates per cell	Flat pasted; 11
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	Dimension 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	63.75	Amps (Max)
(iii)	Trickle Charging Voltage	NA	
(iv)	Trickle Charging Current	NA	
(v)	Boost Charging Voltage	2.35	Volts
(vi)	Boost Charging Current	85	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	0.46	milli ohms min
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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;	
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GENERAL TECHNICAL PARTICULARS UPST 430



SL. NO.	DESCRIPTION	DETAILS		
1	Capacity in Ah At 27 ° C			
(a)				
(i)	Initial	430		
(ii)	Rated	430		
(iii)	End of Life	344		
(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	430.00	43.0	1.75
	9Hr	420.97	46.8	1.75
	8Hr	408.50	51.1	1.75
	7Hr	394.31	56.3	1.75
	6Hr	377.97	63.0	1.75
	5Hr	358.19	71.6	1.75
	4Hr	336.26	84.1	1.74
	3Hr	308.31	102.8	1.74
	2Hr	272.19	136.1	1.7
	1Hr	215.00	215.0	1.7
	50 min	200.81	241.1	1.7
	40 min	184.90	277.6	1.7
	30 min	172.00	344.0	1.7
	20 min	154.80	464.9	1.7
	15 min	128.44	513.8	1.7
	10 min	93.87	565.5	1.7
	5 min	52.85	634.4	1.7
	1 min	15.78	950.7	1.7
3	Maximum Momentary Current for 1 min upto cut off voltage of 1.6 V		1290	Amps
4	Expected Fault at bus due to battery		2580	Amps
5 (i)	Short Circuit Current at Battery terminals		2580	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; 12		
7	Type/No. of Positive Plates per cell	Flat pasted; 11		
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		
12	Type of Separators	Absorptive glass mat		
13	Thickness of Separators	4.5 (2 layers of 2.25 mm each)		
14	Dimension of 2 volts cell (LXWXH) , mm	167 (+/-3) mm x 172 (+/-3) mm x 378 (+/- 5) mm		
15	Clearance between the bottom of the plates and container	5 mm		
16	Material of Container	Polypropylene Co-polymer		

17	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	64.5	Amps (Max)
(iii)	Trickle Charging Voltage	NA	
(iv)	Trickle Charging Current	NA	
(v)	Boost Charging Voltage	2.35	Volts
(vi)	Boost Charging Current	86	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	
18	Guaranteed efficiencies at 10 hrs rate		
	(a) Ampere-hour efficiency	90%	
	(b) Watt-hour efficiency	80%	
19	Allowable voltage ripple	1.5 % RMS of the charging voltage(Bulk charging) 0.5 % RMS of the charging voltage(Float charging)	



20	Internal Resistance of each cell at Fully Charged Condition	0.46	milli ohms min
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21	Total Resistance of Battery ; milliohms	Depending on no. of cells	
22	Overall Dimensions of each complete module (LxWxH) in mm	Length 619 +/- 5, Width 445 +/- 5, Height 388 +/- 5 (6 cell module)	
23	Weight of unpacked and complete module with electrolyte ; Kgs	156.3 +/- 5% Kgs (Single 6 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	4000 cycles	
	at 50% DOD	1800 cycles	
	at 80% DOD	1400 cycles	
31	Expected Life of Battery in years	20 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;	
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GENERAL TECHNICAL PARTICULARS UPST 440



SL. NO.	DESCRIPTION	DETAILS		
1	Capacity in Ah At 27 ° C			
(a)				
(i)	Initial	440		
(ii)	Rated	440		
(iii)	End of Life	352		
(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	440.00	44.0	1.75
	9Hr	430.76	47.9	1.75
	8Hr	418.00	52.3	1.75
	7Hr	403.48	57.6	1.75
	6Hr	386.76	64.5	1.75
	5Hr	366.52	73.3	1.75
	4Hr	344.08	86.0	1.74
	3Hr	315.48	105.2	1.74
	2Hr	278.52	139.3	1.7
	1Hr	220.00	220.0	1.7
	50 min	205.48	246.7	1.7
	40 min	189.20	284.1	1.7
	30 min	176.00	352.0	1.7
	20 min	158.40	475.7	1.7
	15 min	131.43	525.7	1.7
	10 min	96.05	578.6	1.7
	5 min	54.08	649.2	1.7
	1 min	16.15	972.8	1.7
3	Maximum Momentary Current for 1 min upto cut off voltage of 1.6 V	1320	Amps	
4	Expected Fault at bus due to battery	2640	Amps	
5 (i)	Short Circuit Current at Battery terminals	2640	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; 12		
7	Type/No. of Positive Plates per cell	Flat pasted; 11		
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		
12	Type of Separators	Absorptive glass mat		
13	Thickness of Separators	4.5 (2 layers of 2.25 mm each)		
14	Dimension of 2 volts cell (LXWXH) , mm	167 (+/-3) mm x 172 (+/-3) mm x 378 (+/- 5) mm		
15	Clearance between the bottom of the plates and container	5 mm		
16	Material of Container	Polypropylene Co-polymer		

17	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	66	Amps (Max)
(iii)	Trickle Charging Voltage	NA	
(iv)	Trickle Charging Current	NA	
(v)	Boost Charging Voltage	2.35	Volts
(vi)	Boost Charging Current	88	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	
18	Guaranteed efficiencies at 10 hrs rate		
	(a) Ampere-hour efficiency	90%	
	(b) Watt-hour efficiency	80%	
19	Allowable voltage ripple	1.5 % RMS of the charging voltage(Bulk charging) 0.5 % RMS of the charging voltage(Float charging)	



20	Internal Resistance of each cell at Fully Charged Condition	0.46	milli ohms min
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21	Total Resistance of Battery ; milliohms	Depending on no. of cells	
22	Overall Dimensions of each complete module (LxWxH) in mm	Length 619 +/- 5, Width 445 +/- 5, Height 388 +/- 5 (6 cell module)	
23	Weight of unpacked and complete module with electrolyte ; Kgs	156.3 +/- 5% Kgs (Single 6 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	4000 cycles	
	at 50% DOD	1800 cycles	
	at 80% DOD	1400 cycles	
31	Expected Life of Battery in years	20 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;	
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SL.NO.	DESCRIPTION	DETAILS		
1	Capacity in Ah At 27 ° C			
(a)				
(i)	Initial	500		
(ii)	Rated	500		
(iii)	End of Life	400		
(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	500.00	50.0	1.75
	9Hr	489.50	54.4	1.75
	8Hr	475.00	59.4	1.75
	7Hr	458.50	65.5	1.75
	6Hr	439.50	73.3	1.75
	5Hr	416.50	83.3	1.75
	4Hr	391.00	97.8	1.74
	3Hr	358.50	119.5	1.74
	2Hr	316.50	158.3	1.7
	1Hr	250.00	250.0	1.7
	50 min	233.50	280.3	1.7
	40 min	215.00	322.8	1.7
	30 min	200.00	400.0	1.7
	20 min	180.00	540.5	1.7
	15 min	149.35	597.4	1.7
	10 min	109.15	657.5	1.7
	5 min	61.45	737.7	1.7
	1 min	18.35	1105.4	1.7
3	Maximum Momentary Current for 1 min upto cut off voltage of 1.6 V	1500	Amps	
4	Expected Fault at bus due to battery	3000	Amps	
5 (i)	Short Circuit Current at Battery terminals	3000	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; 6		
7	Type/No. of Positive Plates per cell	Flat pasted; 5		
8	Size of negative plates, mm	528 +/-1 (L) x 170 +/-0.05 (W) x 3.5 (+/-0.15) (Thk)		
9	Size of positive plates, mm	528 +/-1 (L) x 170 +/-0.05 (W) x 5.9 (+/-0.15) (Thk)		
10	Type of Connection between cells	Bolted rigid copper connectors		
11	Type of Separators	Absorptive glass mat		
12	Thickness of Separators	5.3 (2 layers of 2.65 mm each)		
13	Dimension of 2 volts cell (LXWXH) , mm	199 (+/-3) x 120 (+/-3) x 578.5 (+/- 5)		
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	75		Amps (Max)
(iii)	Trickle Charging Voltage	NA		
(iv)	Trickle Charging Current	NA		
(v)	Boost Charging Voltage	2.35		Volts
(vi)	Boost Charging Current	100		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	0.49		milli ohms
20	Total Resistance of Battery ; milliohms	Depending on no. of cells		
21	Overall Dimensions of each complete module (LxWxH) in mm	Length 880 +/- 5, Width 605 +/- 5, Height 176 +/- 5 (4 cell module)		
22	Weight of unpacked and complete module with electrolyte ; Kgs	162.5 +/- 5% Kgs (Single 4 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		
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SL.NO.	DESCRIPTION	DETAILS		
1	Capacity in Ah At 27 ° C			
(a)				
(i)	Initial	510		
(ii)	Rated	510		
(iii)	End of Life	408		
(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			
	<i>Period of Discharge</i>	<i>Ah capacities</i>	<i>Discharge Current (Amps)</i>	<i>End Cell Voltage (Volts)</i>
	10Hr	510.00	51.0	1.75
	9Hr	499.29	55.5	1.75
	8Hr	484.50	60.6	1.75
	7Hr	467.67	66.8	1.75
	6Hr	448.29	74.7	1.75
	5Hr	424.83	85.0	1.75
	4Hr	398.82	99.7	1.74
	3Hr	365.67	121.9	1.74
	2Hr	322.83	161.4	1.7
	1Hr	255.00	255.0	1.7
	50 min	238.17	285.9	1.7
	40 min	219.30	329.3	1.7
	30 min	204.00	408.0	1.7
	20 min	183.60	551.4	1.7
	15 min	152.34	609.3	1.7
	10 min	111.33	670.7	1.7
	5 min	62.68	752.4	1.7
	1 min	18.72	1127.5	1.7
3	Maximum Momentary Current for 1 min upto cut off voltage of 1.6 V	1530	Amps	
4	Expected Fault at bus due to battery	3060	Amps	
5 (i)	Short Circuit Current at Battery terminals	3060	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; 6		
7	Type/No. of Positive Plates per cell	Flat pasted; 5		
8	Size of negative plates, mm	528 +/-1 (L) x 170 +/-0.05 (W) x 3.5 (+/-0.15) (Thk)		
9	Size of positive plates, mm	528 +/-1 (L) x 170 +/-0.05 (W) x 5.9 (+/-0.15) (Thk)		
10	Type of Connection between cells	Bolted rigid copper connectors		
11	Type of Separators	Absorptive glass mat		
12	Thickness of Separators	5.3 (2 layers of 2.65 mm each)		
13	Dimension of 2 volts cell (LXWXH) , mm	199 (+/-3) x 120 (+/-3) x 578.5 (+/- 5)		
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	76.5	Amps (Max)
(iii)	Trickle Charging Voltage	NA	
(iv)	Trickle Charging Current	NA	
(v)	Boost Charging Voltage	2.35	Volts
(vi)	Boost Charging Current	102	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	0.44	milli ohms
20	Total Resistance of Battery ; milliohms	Depending on no. of cells	
21	Overall Dimensions of each complete module (LxWxH) in mm	Length 880 +/- 5, Width 605 +/- 5, Height 176 +/- 5 (4 cell module)	
22	Weight of unpacked and complete module with electrolyte ; Kgs	162.5 +/- 5% Kgs (Single 4 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	
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SL. NO.	DESCRIPTION	DETAILS		
1	Capacity in Ah			
(a)	At 27 ° C			
(i)	Initial	600		
(ii)	Rated	600		
(iii)	End of Life	480		
(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	600.00	60.0	1.75
	9Hr	587.40	65.3	1.75
	8Hr	570.00	71.3	1.75
	7Hr	550.20	78.6	1.75
	6Hr	527.40	87.9	1.75
	5Hr	499.80	100.0	1.75
	4Hr	469.20	117.3	1.74
	3Hr	430.20	143.4	1.74
	2Hr	379.80	189.9	1.7
	1Hr	300.00	300.0	1.7
	50 min	280.20	336.4	1.7
	40 min	258.00	387.4	1.7
	30 min	240.00	480.0	1.7
	20 min	216.00	648.6	1.7
	15 min	179.22	716.9	1.7
	10 min	130.98	789.0	1.7
	5 min	73.74	885.2	1.7
	1 min	22.02	1326.5	1.7
3	Maximum Momentary Current for 1 min upto cut off voltage of 1.6 V	1800	Amps	
4	Expected Fault at bus due to battery	3600	Amps	
5 (i)	Short Circuit Current at Battery terminals	3600	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	440(L) x 140(W) x 3.2 (+/-1) (Thk)		
9	Size of positive plates, mm	440(L) x 140(W) x 5.3 (+/-1) (Thk)		
10	Type of Connection between cells	Bolted rigid copper connectors		
11	Type of Separators	Absorptive glass mat		
12	Thickness of Separators	5.3 (2 layers of 2.65 mm each)		
13	Dimensison of 2 volts cell (LXWXH) , mm	189 (+/-3) mm x 172 (+/-3) mm x 507 (+/- 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	90	Amps (Max)	
(iii)	Trickle Charging Voltage	NA		
(iv)	Trickle Charging Current	NA		
(v)	Boost Charging Voltage	2.35	Volts	
(vi)	Boost Charging Current	120	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	0.40	milli ohms min	
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20	Total Resistance of Battery ; milliohms	Depending on no. of cells		
21	Overall Dimensions of each complete module (LxWxH) in mm	Length 634 +/- 5, Width 580 +/- 5, Height 420 +/- 5 (6 cell module)		
22	Weight of unpacked and complete module with electrolyte ; Kgs	249.8 +/- 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		
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GENERAL TECHNICAL PARTICULARS


UPST 600



SL. NO.	DESCRIPTION	DETAILS		
1	Capacity in Ah			
(a)	At 27 ° C			
(i)	Initial	600		
(ii)	Rated	600		
(iii)	End of Life	480		
(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	594.06	59.4	1.8
	9Hr	587.40	65.3	1.75
	8Hr	570.00	71.3	1.75
	7Hr	550.20	78.6	1.75
	6Hr	527.40	87.9	1.75
	5Hr	499.80	100.0	1.75
	4Hr	469.20	117.3	1.74
	3Hr	430.20	143.4	1.74
	2Hr	379.80	189.9	1.7
	1Hr	300.00	300.0	1.7
	50 min	280.20	336.4	1.7
	40 min	258.00	387.4	1.7
	30 min	240.00	480.0	1.7
	20 min	216.00	648.6	1.7
	15 min	179.22	716.9	1.7
	10 min	130.98	789.0	1.7
	5 min	73.74	885.2	1.7
	1 min	22.02	1326.5	1.7
3	Maximum Momentary Current for 1 min upto cut off voltage of 1.6 V	1800	Amps	
4	Expected Fault at bus due to battery	3600	Amps	
5 (i)	Short Circuit Current at Battery terminals	3600	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	440(L) x 140(W) x 3.2 (+/-1) (Thk)		
9	Size of positive plates, mm	440(L) x 140(W) x 5.3 (+/-1) (Thk)		
10	Type of Connection between cells	Bolted rigid copper connectors		
11	Type of Separators	Absorptive glass mat		
12	Thickness of Separators	5.3 (2 layers of 2.65 mm each)		
13	Dimensison of 2 volts cell (LXWXH) , mm	189 (+/-3) mm x 172 (+/-3) mm x 507 (+/- 5) mm		
14	Clearance between the bottom of the plates and container	5 mm		
15	Material of Container	Polypropylene Co-polymer		

<p>16</p> <p>(i)</p> <p>(ii)</p> <p>(iii)</p> <p>(iv)</p> <p>(v)</p> <p>(vi)</p> <p>(vii)</p> <p>(viii)</p> <p>17</p> <p>(a)</p> <p>(b)</p> <p>18</p>	<p>Recommended Charging Rate</p> <p>Float Charging Voltage</p> <p> between ambient temp. (-)5-14 ° C</p> <p> between ambient temp. 15-24 ° C</p> <p> between ambient temp. 25-34 ° C</p> <p> between ambient temp. 35-40 ° C</p> <p>Float Charging Current</p> <p>Trickle Charging Voltage</p> <p>Trickle Charging Current</p> <p>Boost Charging Voltage</p> <p>Boost Charging Current</p> <p>Time taken to full charge from 100% discharge state by constant voltage charging & voltage at the end of this charge</p> <p>Equalising Charging Current;Voltage</p> <p>Guaranteed efficiencies at 10 hrs rate</p> <p>(a) Ampere-hour efficiency</p> <p>(b) Watt-hour efficiency</p> <p>Allowable voltage ripple</p>	 <p>2.27 +/- 0.02 VPC</p> <p>2.25 +/- 0.02 VPC</p> <p>2.23 +/- 0.02 VPC</p> <p>2.20 +/- 0.02 VPC</p> <p>90 (Max)</p> <p>NA</p> <p>NA</p> <p>2.35 Volts</p> <p>120 Amps.</p> <p>72 Hrs (Min)</p> <p>2.1 volts(ocv)</p> <p>NA</p> <p>90%</p> <p>80%</p> <p>1.5 % RMS of the charging voltage(Bulk charging)</p> <p>0.5 % RMS of the charging voltage(Float charging)</p>
<p>19</p>	<p>Internal Resistance of each cell at Fully Charged Condition</p>	<p>0.40 milli ohms min</p>
<p>20</p> <p>21</p> <p>22</p> <p>23</p>	<p>Total Resistance of Battery ; milliohms</p> <p>Overall Dimensions of each complete module (LxWxH) in mm</p> <p>Weight of unpacked and complete module with electrolyte ; Kgs</p> <p>Material of Modules</p>	<p>Depending on no. of cells</p> <p>Length 786 +/- 5, Width 510 +/- 5, Height 244 +/- 5 (4 cell module)</p> <p>171.5+/- 5% Kgs (Single 4 cell module)</p> <p>Powder coated MS</p>
<p>24</p> <p>25</p> <p>26</p> <p>27</p> <p>28</p>	<p>Whether explosion vents are offered</p> <p>Loss of capacity due to self discharge</p> <p>The period for which the battery should be stored after supply in charged conditions</p> <p>Amount of Hydrogen evolved during normal normal float charging</p> <p>Recommended interval at which battery should be discharged at 10 hr discharge rate</p>	<p>Yes, self re-sealing rubber safety valve with flame arrestor</p> <p>< 0.5% per week of c-10 capacity</p> <p>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.</p> <p>Less than 200ppm normal float condition</p> <p>Once annually</p>
<p>29</p> <p>30</p>	<p>No. of charge-discharge cycle battery can give during its entire life</p> <p> at 20% DOD</p> <p> at 50% DOD</p> <p> at 80% DOD</p> <p>Expected Life of Battery in years</p>	<p>4000 cycles</p> <p>1800 cycles</p> <p>1400 cycles</p> <p>20 Yrs at 27 deg C in ideal float condition.</p>
<p>31</p>	<p>Applicable standard</p>	<p>IEC 60896 - 21 & 22, JIS : C 8704-2, : 1998 ANSI T1 330, GR/BAT-01/03-MARCH 2004, IS 15549 : 2005</p>

SL. NO.	DESCRIPTION	DETAILS		
1	Capacity in Ah At 27 ° C			
(a)	Initial	650		
(ii)	Rated	650		
(iii)	End of Life	520		
(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	650.00	65.0	1.75
	9Hr	636.35	70.7	1.75
	8Hr	617.50	77.2	1.75
	7Hr	596.05	85.2	1.75
	6Hr	571.35	95.2	1.75
	5Hr	541.45	108.3	1.75
	4Hr	508.30	127.1	1.74
	3Hr	466.05	155.4	1.74
	2Hr	411.45	205.7	1.7
	1Hr	325.00	325.0	1.7
	50 min	303.55	364.4	1.7
	40 min	279.50	419.7	1.7
	30 min	260.00	520.0	1.7
	20 min	234.00	702.7	1.7
	15 min	194.16	776.6	1.7
	10 min	141.90	854.8	1.7
	5 min	79.89	959.0	1.7
	1 min	23.86	1437.0	1.7
3	Maximum Momentary Current for 1 min upto cut off voltage of 1.6 V	1950	Amps	
4	Expected Fault at bus due to battery	3900	Amps	
5 (i)	Short Circuit Current at Battery terminals	3900	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	528 ± 1 (L) x 170 ± 0.05 (W) x 3.5 ± 0.15 (Thk)		
9	Size of positive plates, mm	528 ± 1 (L) x 170 ± 0.05 (W) x 5.9 ± 0.15 (Thk)		
10	Type of Connection between cells	Bolted rigid copper connectors		
11	Type of Separators	Absorptive glass mat		
12	Thickness of Separators	5.3 (2 layers of 2.65 mm each)		
13	Dimension of 2 volts cell (LXWXH) , mm	199 (+/-3) mm x 120 (+/-3) mm x 578.5 (+/- 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		97.5	Amps (Max)
(iii)	Trickle Charging Voltage		NA	
(iv)	Trickle Charging Current		NA	
(v)	Boost Charging Voltage		2.35	Volts
(vi)	Boost Charging Current		130	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		0.45	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 880 +/- 5, Width 596 +/- 5, Height 176 +/- 5 (4 cell module)	
22	Weight of unpacked and complete module with electrolyte ; Kgs		171.7 +/- 5% Kgs (Single 4 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	
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SL. NO.	DESCRIPTION	DETAILS		
1	Capacity in Ah At 27 ° C			
(a)	Initial	650		
(ii)	Rated	650		
(iii)	End of Life	520		
(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	650.00	65.0	1.75
	9Hr	636.35	70.7	1.75
	8Hr	617.50	77.2	1.75
	7Hr	596.05	85.2	1.75
	6Hr	571.35	95.2	1.75
	5Hr	541.45	108.3	1.75
	4Hr	508.30	127.1	1.74
	3Hr	466.05	155.4	1.74
	2Hr	411.45	205.7	1.7
	1Hr	325.00	325.0	1.7
	50 min	303.55	364.4	1.7
	40 min	279.50	419.7	1.7
	30 min	260.00	520.0	1.7
	20 min	234.00	702.7	1.7
	15 min	194.16	776.6	1.7
	10 min	141.90	854.8	1.7
	5 min	79.89	959.0	1.7
	1 min	23.86	1437.0	1.7
3	Maximum Momentary Current for 1 min upto cut off voltage of 1.6 V	1950	Amps	
4	Expected Fault at bus due to battery	3900	Amps	
5 (i)	Short Circuit Current at Battery terminals	3900	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	528 ± 1 (L) x 170 ± 0.05 (W) x 3.5 ± 0.15 (Thk)		
9	Size of positive plates, mm	528 ± 1 (L) x 170 ± 0.05 (W) x 5.9 ± 0.15 (Thk)		
10	Type of Connection between cells	Bolted rigid copper connectors		
11	Type of Separators	Absorptive glass mat		
12	Thickness of Separators	5.3 (2 layers of 2.65 mm each)		
13	Dimension of 2 volts cell (LXWXH) , mm	199 (+/-3) mm x 120 (+/-3) mm x 578.5 (+/- 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	97.5		Amps (Max)
(iii)	Trickle Charging Voltage	NA		
(iv)	Trickle Charging Current	NA		
(v)	Boost Charging Voltage	2.35		Volts
(vi)	Boost Charging Current	130		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	0.45		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 880 +/- 5, Width 596 +/- 5, Height 176 +/- 5 (4 cell module)		
22	Weight of unpacked and complete module with electrolyte ; Kgs	171.7 +/- 5% Kgs (Single 4 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		
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GENERAL TECHNICAL PARTICULARS

UPST 680



SL. NO.	DESCRIPTION	DETAILS		
1	Capacity in Ah			
(a)	At 27 ° C			
(i)	Initial	680		
(ii)	Rated	680		
(iii)	End of Life	544		
(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	680.00	68.0	1.75
	9Hr	665.72	74.0	1.75
	8Hr	646.00	80.8	1.75
	7Hr	623.56	89.1	1.75
	6Hr	597.72	99.6	1.75
	5Hr	566.44	113.3	1.75
	4Hr	531.76	132.9	1.74
	3Hr	487.56	162.5	1.74
	2Hr	430.44	215.2	1.7
	1Hr	340.00	340.0	1.7
	50 min	317.56	381.2	1.7
	40 min	292.40	439.0	1.7
	30 min	272.00	544.0	1.7
	20 min	244.80	735.1	1.7
	15 min	203.12	812.5	1.7
	10 min	148.44	894.2	1.7
	5 min	83.57	1003.3	1.7
	1 min	24.96	1503.4	1.7
3	Maximum Momentary Current for 1 min upto cut off voltage of 1.6 V	2040	Amps	
4	Expected Fault at bus due to battery	4080	Amps	
5 (i)	Short Circuit Current at Battery terminals	4080	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;12		
7	Type/No. of Positive Plates per cell	Flat pasted;11		
8	Size of negative plates, mm	440(L) x 140(W) x 3.2 (+/-1) (Thk)		
9	Size of positive plates, mm	440(L) x 140(W) x 5.3 (+/-1) (Thk)		
10	Type of Connection between cells	Bolted rigid copper connectors		
12	Type of Separators	Absorptive glass mat		
13	Thickness of Separators	4.5 (2 layers of 2.25 mm each)		
14	Dimension of 2 volts cell (LXWXH) , mm	189 (+/-3) mm x 172 (+/-3) mm x 507 (+/- 5) mm		
15	Clearance between the bottom of the plates and container	5 mm		
16	Material of Container	Polypropylene Co-polymer		


<p>17</p> <p>(i)</p> <p>(ii)</p> <p>(iii)</p> <p>(iv)</p> <p>(v)</p> <p>(vi)</p> <p>(vii)</p> <p>(viii)</p> <p>18</p> <p>(a)</p> <p>(b)</p> <p>19</p>	<p>Recommended Charging Rate</p> <p>Float Charging Voltage</p> <p>between ambient temp. (-)5-14 ° C</p> <p>between ambient temp. 15-24 ° C</p> <p>between ambient temp. 25-34 ° C</p> <p>between ambient temp. 35-40 ° C</p> <p>Float Charging Current</p> <p>Trickle Charging Voltage</p> <p>Trickle Charging Current</p> <p>Boost Charging Voltage</p> <p>Boost Charging Current</p> <p>Time taken to full charge from 100% discharge state by constant voltage charging & voltage at the end of this charge</p> <p>Equalising Charging Current; Voltage</p> <p>Guaranteed efficiencies at 10 hrs rate</p> <p>(a) Ampere-hour efficiency</p> <p>(b) Watt-hour efficiency</p> <p>Allowable voltage ripple</p>	 <p>2.27 +/- 0.02 VPC</p> <p>2.25 +/- 0.02 VPC</p> <p>2.23 +/- 0.02 VPC</p> <p>2.20 +/- 0.02 VPC</p> <p>102</p> <p>NA</p> <p>NA</p> <p>2.35</p> <p>136</p> <p>72 Hrs (Min)</p> <p>2.1 volts(ocv)</p> <p>NA</p> <p>90%</p> <p>80%</p> <p>1.5 % RMS of the charging voltage(Bulk charging)</p> <p>0.5 % RMS of the charging voltage(Float charging)</p> <p>Amps (Max)</p> <p>Volts</p> <p>Amps.</p>
<p>20</p> <p>(i)</p> <p>21</p> <p>22</p> <p>23</p> <p>24</p>	<p>Internal Resistance of each cell at Fully Charged Condition</p> <p>Total Resistance of Battery ; milliohms</p> <p>Overall Dimensions of each complete module (LxWxH) in mm</p> <p>Weight of unpacked and complete module with electrolyte ; Kgs</p> <p>Material of Modules</p>	<p>0.46</p> <p>milli ohm</p> <p>Depending on no. of cells</p> <p>Length 634 +/- 5, Width 580 +/- 5, Height 420 +/- 5 (6 cell module)</p> <p>263.0 +/- 5% Kgs (Single 6 cell module)</p> <p>Powder coated MS</p>
<p>25</p> <p>26</p> <p>27</p> <p>28</p> <p>29</p>	<p>Whether explosion vents are offered</p> <p>Loss of capacity due to self discharge</p> <p>The period for which the battery should be stored after supply in charged conditions</p> <p>Amount of Hydrogen evolved during normal normal float charging</p> <p>Recommended interval at which battery should be discharged at 10 hr discharge rate</p>	<p>Yes, self re-sealing rubber safety valve with flame arrestor</p> <p>< 0.5% per week of c-10 capacity</p> <p>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.</p> <p>Less than 200ppm normal float condition</p> <p>Once annually</p>
<p>30</p> <p>31</p>	<p>No. of charge-discharge cycle battery can give during its entire life</p> <p>at 20% DOD</p> <p>at 50% DOD</p> <p>at 80% DOD</p> <p>Expected Life of Battery in years</p>	<p>4000 cycles</p> <p>1800 cycles</p> <p>1400 cycles</p> <p>20 Yrs at 27 deg C in ideal float condition.</p>
<p>32</p>	<p>Applicable standard</p>	<p>IEC 60896 - 21 & 22,</p> <p>JIS : C 8704-2, : 1998</p> <p>ANSI T1 330,</p> <p>GR/BAT-01/03-MARCH 2004,</p> <p>IS 15549 : 2005</p>

GENERAL TECHNICAL PARTICULARS

UPST 700



SL. NO.	DESCRIPTION	DETAILS		
1	Capacity in Ah At 27 ° C			
(a)	Initial	700		
(i)	Rated	700		
(ii)	End of Life	560		
(iii)				
(b)	Rated Capacity(in Ah) at minimum ambient temperature of (as per IS 15549 : 2005)	Formula : $C_t = C_{27} \{ 1 + 0.0043 (t-27) \}$		
(c)	Rated Capacity(in Ah) at maximum ambient temperature of (as per IS 15549 : 2005)	Formula : $C_t = C_{27} \{ 1 + 0.0043 (t-27) \}$		
2	Capacity at Various Discharge Rates at 27°C			
	Period of Discharge	Ah capacities	Discharge Current (Amps)	End Cell Voltage (Volts)
	10Hr	700.00	70.0	1.75
	9Hr	685.30	76.1	1.75
	8Hr	665.00	83.1	1.75
	7Hr	641.90	91.7	1.75
	6Hr	615.30	102.6	1.75
	5Hr	583.10	116.6	1.75
	4Hr	547.40	136.9	1.74
	3Hr	501.90	167.3	1.74
	2Hr	443.10	221.6	1.7
	1Hr	350.00	350.0	1.7
	50 min	326.90	392.4	1.7
	40 min	301.00	452.0	1.7
	30 min	280.00	560.0	1.7
	20 min	252.00	756.8	1.7
	15 min	209.09	836.4	1.7
	10 min	152.81	920.5	1.7
	5 min	86.03	1032.8	1.7
	1 min	25.69	1547.6	1.7
3	Maximum Momentary Current for 1 min upto cut off voltage of 1.6 V		2100	Amps
4	Expected Fault at bus due to battery		4200	Amps
5 (i)	Short Circuit Current at Battery terminals		4200	Amps
(ii)	Time for which the battery can withstand short circuit at terminals		5 Sec	
6	Type/No. of Negative Plates per cell	Flat pasted;13		
7	Type/No. of Positive Plates per cell	Flat pasted;12		
8	Size of negative plates, mm	440(L) x 140(W) x 3.2 (+/-1) (Thk)		
9	Size of positive plates, mm	440(L) x 140(W) x 5.3 (+/-1) (Thk)		
10	Type of Connection between cells	Bolted rigid copper connectors		
11	Type of Separators	Absorptive glass mat		
12	Thickness of Separators	5.3 (2 layers of 2.65 mm each)		
13	Dimension of 2 volts cell (LXWXH) , mm	303 (+/-3) mm x 172 (+/-3) mm x 507 (+/- 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 between ambient temp. 15-24 ° C between ambient temp. 25-34 ° C between ambient temp. 35-40 ° C (ii) Float Charging Current (iii) Trickle Charging Voltage (iv) Trickle Charging Current (v) Boost Charging Voltage (vi) Boost Charging Current (vii) Time taken to full charge from 100% discharge state by constant voltage charging & voltage at the end of this charge (viii) Equalising Charging Current; Voltage		2.27 +/- 0.02 VPC	Amps (Max) Volts Amps.
			2.25 +/- 0.02 VPC	
			2.23 +/- 0.02 VPC	
			2.20 +/- 0.02 VPC	
			105	
			NA	
			NA	
			2.35	
140				
72 Hrs (Min)	OCV 2.1 volts (Min.)			
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	Total Resistance of Battery ; milliohms	Depending on no. of cells
20	Overall Dimensions of each complete module (LxWxH) in mm	Length 462 +/- 5, Width 510 +/- 5, Height 363 +/- 5 (mm) (2 cell module)
21	Weight of unpacked and complete module with electrolyte ; Kgs	121.7 +/- 5% Kgs (Single 2 cell module)
22	Material of Modules	Powder coated MS

23	Whether explosion vents are offered	Yes, self re-sealing rubber safety valve with flame arrestor
24	Loss of capacity due to self discharge	< 0.5% per week of c-10 capacity
25	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 freshening charge once in every three months, however if stored at higher or lower temperature freshening charge to be provided as recommended.
26	Amount of Hydrogen evolved during normal normal float charging	Less than 200ppm normal float condition
27	Recommended interval at which battery should be discharged at 10 hr discharge rate	Once annually


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

30	Applicable standard	IEC 60896 - 21 & 22, JIS : C 8704-2, : 1998 ANSI T1 330, GR/BAT-01/03-MARCH 2004, IS 15549 : 2005
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GENERAL TECHNICAL PARTICULARS UPST 1000



SL. NO.	DESCRIPTION	DETAILS		
1	Capacity in Ah At 27 ° C			
(a)				
(i)	Initial	1000		
(ii)	Rated	1000		
(iii)	End of Life	800		
(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	1000.00	100.0	1.75
	9Hr	979.00	108.8	1.75
	8Hr	950.00	118.8	1.75
	7Hr	917.00	131.0	1.75
	6Hr	879.00	146.5	1.75
	5Hr	833.00	166.6	1.75
	4Hr	782.00	195.5	1.74
	3Hr	717.00	239.0	1.74
	2Hr	633.00	316.5	1.7
	1Hr	500.00	500.0	1.7
	50 min	467.00	560.6	1.7
	40 min	430.00	645.6	1.7
	30 min	400.00	800.0	1.7
	20 min	360.00	1081.1	1.7
	15 min	298.70	1194.8	1.7
	10 min	218.30	1315.1	1.7
	5 min	122.90	1475.4	1.7
	1 min	36.70	2210.8	1.7
3	Maximum Momentary Current for 1 min upto cut off voltage of 1.6 V	3000		Amps
4	Expected Fault at bus due to battery	6000		Amps
5 (i)	Short Circuit Current at Battery terminals	6000		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;18		
7	Type/No. of Positive Plates per cell	Flat pasted;17		
8	Size of negative plates, mm	440(L) x 140(W) x 3.2 (+/-1) (Thk)		
9	Size of positive plates, mm	440(L) x 140(W) x 5.3 (+/-1) (Thk)		
10	Type of Connection between cells	Bolted rigid copper connectors		
11	Type of Separators	Absorptive glass mat		
12	Thickness of Separators	5.3 (2 layers of 2.65 mm each)		
13	Dimensison of 2 volts cell (LXWXH) , mm	303 (+/-3) mm x 172 (+/-3) mm x 507 (+/- 5) mm		
14	Clearance between the bottom of the plates and container	5 mm		
15	Material of Container	Polypropylene Co-polymer		


16	<p>Recommended Charging Rate</p> <p>(i) Float Charging Voltage between ambient temp. (-)5-14 ° C between ambient temp. 15-24 ° C between ambient temp. 25-34 ° C between ambient temp. 35-40 ° C</p> <p>(ii) Float Charging Current</p> <p>(iii) Trickle Charging Voltage</p> <p>(iv) Trickle Charging Current</p> <p>(v) Boost Charging Voltage</p> <p>(vi) Boost Charging Current</p> <p>(vii) Time taken to full charge from 100% discharge state by constant voltage charging & voltage at the end of this charge</p> <p>(viii) Equalising Charging Current;Voltage</p> <p>17 Guaranteed efficiencies at 10 hrs rate (a) Ampere-hour efficiency (b) Watt-hour efficiency</p> <p>18 Allowable voltage ripple</p>	 <p>2.27 +/- 0.02 VPC 2.25 +/- 0.02 VPC 2.23 +/- 0.02 VPC 2.20 +/- 0.02 VPC</p> <p>150 NA NA 2.35 200</p> <p>72 Hrs (Min) OCV 2.1 volts (Min.)</p> <p>NA</p> <p>90% 80%</p> <p>1.5 % RMS of the charging voltage(Bulk charging) 0.5 % RMS of the charging voltage(Float charging)</p> <p>Amps (Max) Volts Amps.</p>
19	Internal Resistance of each cell at Fully Charged Condition	0.30 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 462 +/- 5, Width 510 +/- 5, Height 363 +/- 5 (mm) (2 cell module)
22	Weight of unpacked and complete module with electrolyte ; Kgs	142.1 +/- 5% Kgs (Single 2 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 at 50% DOD at 80% DOD	4000 cycles 1800 cycles 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

PPST 480



SL. NO.	DESCRIPTION	DETAILS		
1	Capacity in Ah At 27 ° C			
(a)	Initial	480		
(i)	Rated	480		
(ii)	End of Life	384		
(iii)				
(b)	Rated Capacity(in Ah) at minimum ambient temperature of (as per IS 15549 : 2005)	Formula : $C_t = (1 + 0.0043 (27-t))$		
(c)	Rated Capacity(in Ah) at maximum ambient temperature of (as per IS 15549 : 2005)	Formula : $C_t = (1 + 0.0043 (27-t))$		
2	Capacity at Various Discharge Rates at 27°C			
	Period of Discharge	Ah capacities	Discharge Current (Amps)	End Cell Voltage (Volts)
	10Hr	480.00	48.0	1.75
	9Hr	469.92	52.2	1.75
	8Hr	456.00	57.0	1.75
	7Hr	440.16	62.9	1.75
	6Hr	421.92	70.3	1.75
	5Hr	399.84	80.0	1.75
	4Hr	375.36	93.8	1.74
	3Hr	344.16	114.7	1.74
	2Hr	303.84	151.9	1.7
	1Hr	240.00	240.0	1.7
	50 min	224.16	269.1	1.7
	40 min	206.40	309.9	1.7
	30 min	192.00	384.0	1.7
	20 min	172.80	518.9	1.7
	15 min	143.38	573.5	1.7
	10 min	104.78	631.2	1.7
	5 min	58.99	708.2	1.7
	1 min	17.62	1061.2	1.7
3	Maximum Momentary Current for 1 min upto cut off voltage of 1.6 V	1440	Amps	
4	Expected Fault at bus due to battery	2880	Amps	
5 (i)	Short Circuit Current at Battery terminals	2880	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	470 ± 1 (H) x 150 ± 0.05 (W) x 3.6 ± 0.15 (Thk)		
9	Size of positive plates, mm	470 ± 1 (H) x 150 ± 0.05 (W) x 5.7 ± 0.15 (Thk)		
10	Type of Connection between cells	Bolted rigid copper connectors		
11	Type of Separators	Absorptive glass mat		
12	Thickness of Separators	5.4 (2 layers of 2.7 mm each)		
13	Dimension of 2 volts cell (LXWXH) , mm	183.0 (+/-3) mm x 162.0 (+/-3) mm x 529 (+/- 5) mm		
14	Clearance between the bottom of the plates and container	5 mm		
15	Material of Container	Polypropylene Co-polymer		

16	(i)	Recommended Charging Rate				
		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		72		Amps (Max)
		(iii) Trickle Charging Voltage		NA		
		(iv) Trickle Charging Current		NA		
		(v) Boost Charging Voltage		2.35		Volts
(vi) Boost Charging Current		96	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	Total Resistance of Battery ; milliohms	Depending on no. of cells
20	Overall Dimensions of each complete module (LxWxH) in mm	Length 637.0 ^{+/-5} , Width 581.0 ^{+/-5} , Height 360.0 ^{+/-5} (mm) (6 cell module)
21	Weight of unpacked and complete module with electrolyte ; Kgs	204.4 +/- 5% Kgs (Single 6 cell module)
22	Material of Modules	Powder coated MS

23	Whether explosion vents are offered	Yes, self re-sealing rubber safety valve with flame arrestor
24	Loss of capacity due to self discharge	< 0.5% per week of c-10 capacity
25	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 freshening charge once in every three months, however if stored at higher or lower temperature freshening charge to be provided as recommended.
26	Amount of Hydrogen evolved during normal normal float charging	Less than 200ppm normal float condition
27	Recommended interval at which battery should be discharged at 10 hr discharge rate	Once annually

28	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
29	Expected Life of Battery in years	20 Yrs at 27 deg C in ideal float condition.


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

PPST 500



SL. NO.	DESCRIPTION	DETAILS		
1	Capacity in Ah At 27 ° C			
(a)	Initial	500		
(i)	Rated	500		
(ii)	End of Life	400		
(iii)				
(b)	Rated Capacity(in Ah) at minimum ambient temperature of (as per IS 15549 : 2005)	Formula : $C_t = (1 + 0.0043 (27-t))$		
(c)	Rated Capacity(in Ah) at maximum ambient temperature of (as per IS 15549 : 2005)	Formula : $C_t = (1 + 0.0043 (27-t))$		
2	Capacity at Various Discharge Rates at 27°C			
	Period of Discharge	Ah capacities	Discharge Current (Amps)	End Cell Voltage (Volts)
	10Hr	500.00	50.0	1.75
	9Hr	489.50	54.4	1.75
	8Hr	475.00	59.4	1.75
	7Hr	458.50	65.5	1.75
	6Hr	439.50	73.3	1.75
	5Hr	416.50	83.3	1.75
	4Hr	391.00	97.8	1.74
	3Hr	358.50	119.5	1.74
	2Hr	316.50	158.3	1.7
	1Hr	250.00	250.0	1.7
	50 min	233.50	280.3	1.7
	40 min	215.00	322.8	1.7
	30 min	200.00	400.0	1.7
	20 min	180.00	540.5	1.7
	15 min	149.35	597.4	1.7
	10 min	109.15	657.5	1.7
	5 min	61.45	737.7	1.7
	1 min	18.35	1105.4	1.7
3	Maximum Momentary Current for 1 min upto cut off voltage of 1.6 V	1500	Amps	
4	Expected Fault at bus due to battery	3000	Amps	
5 (i)	Short Circuit Current at Battery terminals	3000	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	470 ± 1 (H) x 150 ± 0.05 (W) x 3.6 ± 0.15 (Thk)		
9	Size of positive plates, mm	470 ± 1 (H) x 150 ± 0.05 (W) x 5.7 ± 0.15 (Thk)		
10	Type of Connection between cells	Bolted rigid copper connectors		
11	Type of Separators	Absorptive glass mat		
12	Thickness of Separators	5.4 (2 layers of 2.7 mm each)		
13	Dimension of 2 volts cell (LXWXH) , mm	183.0 (+/-3) mm x 162.0 (+/-3) mm x 529 (+/- 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 between ambient temp. 15-24 ° C between ambient temp. 25-34 ° C between ambient temp. 35-40 ° C	2.27 +/- 0.02 VPC 2.25 +/- 0.02 VPC 2.23 +/- 0.02 VPC 2.20 +/- 0.02 VPC	
(ii)	Float Charging Current		75	
(iii)	Trickle Charging Voltage		NA	
(iv)	Trickle Charging Current		NA	
(v)	Boost Charging Voltage		2.35	Volts
(vi)	Boost Charging Current		100	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	Total Resistance of Battery ; milliohms		Depending on no. of cells	
20	Overall Dimensions of each complete module (LxWxH) in mm		Length 637.0 ^{+/-5} , Width 581.0 ^{+/-5} , Height 360.0 ^{+/-5} (mm) (6 cell module)	
21	Weight of unpacked and complete module with electrolyte ; Kgs		204.4 +/- 5% Kgs (Single 6 cell module)	
22	Material of Modules		Powder coated MS	

23	Whether explosion vents are offered		Yes, self re-sealing rubber safety valve with flame arrestor	
24	Loss of capacity due to self discharge		< 0.5% per week of c-10 capacity	
25	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 freshening charge once in every three months, however if stored at higher or lower temperature freshening charge to be provided as recommended.	
26	Amount of Hydrogen evolved during normal normal float charging		Less than 200ppm normal float condition	
27	Recommended interval at which battery should be discharged at 10 hr discharge rate		Once annually	

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

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

PPST 535



SL. NO.	DESCRIPTION	DETAILS		
1	Capacity in Ah At 27 ° C			
(a)	Initial	535		
(i)	Rated	535		
(ii)	End of Life	428		
(iii)				
(b)	Rated Capacity(in Ah) at minimum ambient temperature of (as per IS 15549 : 2005)	Formula : $C_t = (1 + 0.0043 (27-t))$		
(c)	Rated Capacity(in Ah) at maximum ambient temperature of (as per IS 15549 : 2005)	Formula : $C_t = (1 + 0.0043 (27-t))$		
2	Capacity at Various Discharge Rates at 27°C			
	Period of Discharge	Ah capacities	Discharge Current (Amps)	End Cell Voltage (Volts)
	10Hr	535.00	53.5	1.75
	9Hr	523.77	58.2	1.75
	8Hr	508.25	63.5	1.75
	7Hr	490.60	70.1	1.75
	6Hr	470.27	78.4	1.75
	5Hr	445.66	89.1	1.75
	4Hr	418.37	104.6	1.74
	3Hr	383.60	127.9	1.74
	2Hr	338.66	169.3	1.7
	1Hr	267.50	267.5	1.7
	50 min	249.85	299.9	1.7
	40 min	230.05	345.4	1.7
	30 min	214.00	428.0	1.7
	20 min	192.60	578.4	1.7
	15 min	159.80	639.2	1.7
	10 min	116.79	703.6	1.7
	5 min	65.75	789.3	1.7
	1 min	19.63	1182.8	1.7
3	Maximum Momentary Current for 1 min upto cut off voltage of 1.6 V	1605	Amps	
4	Expected Fault at bus due to battery	3210	Amps	
5 (i)	Short Circuit Current at Battery terminals	3210	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	470 ± 1 (H) x 150 ± 0.05 (W) x 3.6 ± 0.15 (Thk)		
9	Size of positive plates, mm	470 ± 1 (H) x 150 ± 0.05 (W) x 5.7 ± 0.15 (Thk)		
10	Type of Connection between cells	Bolted rigid copper connectors		
11	Type of Separators	Absorptive glass mat		
12	Thickness of Separators	5.4 (2 layers of 2.7 mm each)		
13	Dimension of 2 volts cell (LXWXH) , mm	183.0 (+/-3) mm x 162.0 (+/-3) mm x 529 (+/- 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 between ambient temp. 15-24 ° C between ambient temp. 25-34 ° C between ambient temp. 35-40 ° C	2.27 +/- 0.02 VPC 2.25 +/- 0.02 VPC 2.23 +/- 0.02 VPC 2.20 +/- 0.02 VPC	
(ii)	Float Charging Current		80.25	Amps (Max)
(iii)	Trickle Charging Voltage		NA	
(iv)	Trickle Charging Current		NA	
(v)	Boost Charging Voltage		2.35	Volts
(vi)	Boost Charging Current		107	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	Total Resistance of Battery ; milliohms		Depending on no. of cells	
20	Overall Dimensions of each complete module (LxWxH) in mm		Length 637.0 ^{+/-5} , Width 581.0 ^{+/-5} , Height 360.0 ^{+/-5} (mm) (6 cell module)	
21	Weight of unpacked and complete module with electrolyte ; Kgs		222.4 +/- 5% Kgs (Single 6 cell module)	
22	Material of Modules		Powder coated MS	

23	Whether explosion vents are offered		Yes, self re-sealing rubber safety valve with flame arrestor	
24	Loss of capacity due to self discharge		< 0.5% per week of c-10 capacity	
25	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 freshening charge once in every three months, however if stored at higher or lower temperature freshening charge to be provided as recommended.	
26	Amount of Hydrogen evolved during normal normal float charging		Less than 200ppm normal float condition	
27	Recommended interval at which battery should be discharged at 10 hr discharge rate		Once annually	

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


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

PPST 650



SL. NO.	DESCRIPTION	DETAILS		
1	Capacity in Ah At 27 ° C			
(a)	Initial	650		
(ii)	Rated	650		
(iii)	End of Life	520		
(b)	Rated Capacity(in Ah) at minimum ambient temperature of (as per IS 15549 : 2005)	Formula : $C_t = (1 + 0.0043 (27-t))$		
(c)	Rated Capacity(in Ah) at maximum ambient temperature of (as per IS 15549 : 2005)	Formula : $C_t = (1 + 0.0043 (27-t))$		
2	Capacity at Various Discharge Rates at 27°C			
	Period of Discharge	Ah capacities		
	Discharge Current (Amps)	End Cell Voltage (Volts)		
	10Hr	650.00	65.0	1.75
	9Hr	636.35	70.7	1.75
	8Hr	617.50	77.2	1.75
	7Hr	596.05	85.2	1.75
	6Hr	571.35	95.2	1.75
	5Hr	541.45	108.3	1.75
	4Hr	508.30	127.1	1.74
	3Hr	466.05	155.4	1.74
	2Hr	411.45	205.7	1.7
	1Hr	325.00	325.0	1.7
	50 min	303.55	364.4	1.7
	40 min	279.50	419.7	1.7
	30 min	260.00	520.0	1.7
	20 min	234.00	702.7	1.7
	15 min	194.16	776.6	1.7
	10 min	141.90	854.8	1.7
	5 min	79.89	959.0	1.7
	1 min	23.86	1437.0	1.7
3	Maximum Momentary Current for 1 min upto cut off voltage of 1.6 V	1950	Amps	
4	Expected Fault at bus due to battery	3900	Amps	
5 (i)	Short Circuit Current at Battery terminals	3900	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	470 ± 1 (H) x 150 ± 0.05 (W) x 3.6 ± 0.15 (Thk)		
9	Size of positive plates, mm	470 ± 1 (H) x 150 ± 0.05 (W) x 5.7 ± 0.15 (Thk)		
10	Type of Connection between cells	Bolted rigid copper connectors		
11	Type of Separators	Absorptive glass mat		
12	Thickness of Separators	5.4 (2 layers of 2.7 mm each)		
13	Dimension of 2 volts cell (LXWXH) , mm	183.0 (+/-3) mm x 162.0 (+/-3) mm x 529 (+/- 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 between ambient temp. 15-24 ° C between ambient temp. 25-34 ° C between ambient temp. 35-40 ° C	2.27 +/- 0.02 VPC 2.25 +/- 0.02 VPC 2.23 +/- 0.02 VPC 2.20 +/- 0.02 VPC	
(ii)	Float Charging Current		97.5	
(iii)	Trickle Charging Voltage		NA	
(iv)	Trickle Charging Current		NA	
(v)	Boost Charging Voltage		2.35	Volts
(vi)	Boost Charging Current		130	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	Total Resistance of Battery ; milliohms		Depending on no. of cells	
20	Overall Dimensions of each complete module (LxWxH) in mm		Length 637.0 ^{+/-5} , Width 581.0 ^{+/-5} , Height 360.0 ^{+/-5} (mm) (6 cell module)	
21	Weight of unpacked and complete module with electrolyte ; Kgs		240.4 +/- 5% Kgs (Single 6 cell module)	
22	Material of Modules		Powder coated MS	

23	Whether explosion vents are offered		Yes, self re-sealing rubber safety valve with flame arrestor	
24	Loss of capacity due to self discharge		< 0.5% per week of c-10 capacity	
25	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 freshening charge once in every three months, however if stored at higher or lower temperature freshening charge to be provided as recommended.	
26	Amount of Hydrogen evolved during normal normal float charging		Less than 200ppm normal float condition	
27	Recommended interval at which battery should be discharged at 10 hr discharge rate		Once annually	

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


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

PPST 750



SL. NO.	DESCRIPTION	DETAILS		
1	Capacity in Ah At 27 ° C			
(a)	Initial	750		
(i)	Rated	750		
(ii)	End of Life	600		
(iii)				
(b)	Rated Capacity(in Ah) at minimum ambient temperature of (as per IS 15549 : 2005)	Formula : $C_t = (1 + 0.0043 (27-t))$		
(c)	Rated Capacity(in Ah) at maximum ambient temperature of (as per IS 15549 : 2005)	Formula : $C_t = (1 + 0.0043 (27-t))$		
2	Capacity at Various Discharge Rates at 27°C			
	Period of Discharge	Ah capacities	Discharge Current (Amps)	End Cell Voltage (Volts)
	10Hr	750.00	75.0	1.75
	9Hr	734.25	81.6	1.75
	8Hr	712.50	89.1	1.75
	7Hr	687.75	98.3	1.75
	6Hr	659.25	109.9	1.75
	5Hr	624.75	125.0	1.75
	4Hr	586.50	146.6	1.74
	3Hr	537.75	179.3	1.74
	2Hr	474.75	237.4	1.7
	1Hr	375.00	375.0	1.7
	50 min	350.25	420.5	1.7
	40 min	322.50	484.2	1.7
	30 min	300.00	600.0	1.7
	20 min	270.00	810.8	1.7
	15 min	224.03	896.1	1.7
	10 min	163.73	986.3	1.7
	5 min	92.18	1106.5	1.7
	1 min	27.53	1658.1	1.7
3	Maximum Momentary Current for 1 min upto cut off voltage of 1.6 V	2250	Amps	
4	Expected Fault at bus due to battery	4500	Amps	
5 (i)	Short Circuit Current at Battery terminals	4500	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	470 ± 1 (H) x 150 ± 1 (W) x 3.6 ± 0.5 (Thk)		
9	Size of positive plates, mm	470 ± 1 (H) x 150 ± 1 (W) x 5.7 ± 0.5 (Thk)		
10	Type of Connection between cells	Bolted rigid copper connectors		
11	Type of Separators	Absorptive glass mat		
12	Thickness of Separators	5.4 (2 layers of 2.7 mm each)		
13	Dimension of 2 volts cell (LXWXH) , mm	183.0 (+/-3) mm x 217.0 (+/-3) mm x 529 (+/- 5) mm		
14	Clearance between the bottom of the plates and container	5 mm		
15	Material of Container	Polypropylene Co-polymer		

<p>16</p> <p>(i)</p> <p>(ii)</p> <p>(iii)</p> <p>(iv)</p> <p>(v)</p> <p>(vi)</p> <p>(vii)</p> <p>(viii)</p>	<p>Recommended Charging Rate</p> <p>Float Charging Voltage</p> <p> between ambient temp. (-)5-14 ° C</p> <p> between ambient temp. 15-24 ° C</p> <p> between ambient temp. 25-34 ° C</p> <p> between ambient temp. 35-40 ° C</p> <p>Float Charging Current</p> <p>Trickle Charging Voltage</p> <p>Trickle Charging Current</p> <p>Boost Charging Voltage</p> <p>Boost Charging Current</p> <p>Time taken to full charge from 100% discharge state by constant voltage charging & voltage at the end of this charge</p> <p>Equalising Charging Current;Voltage</p> <p>17 Guaranteed efficiencies at 10 hrs rate</p> <p>(a) Ampere-hour efficiency</p> <p>(b) Watt-hour efficiency</p> <p>18 Allowable voltage ripple</p>	 <p>2.27 +/- 0.02 VPC</p> <p>2.25 +/- 0.02 VPC</p> <p>2.23 +/- 0.02 VPC</p> <p>2.20 +/- 0.02 VPC</p> <p>112.5</p> <p>NA</p> <p>NA</p> <p>2.35</p> <p>150</p> <p>72 Hrs (Min)</p> <p>2.1 volts(ocv)</p> <p>NA</p> <p>90%</p> <p>80%</p> <p>1.5 % RMS of the charging voltage(Bulk charging)</p> <p>0.5 % RMS of the charging voltage(Float charging)</p> <p>Amps (Max)</p> <p>Volts</p> <p>Amps.</p>
<p>19</p> <p>20</p> <p>21</p> <p>22</p>	<p>Total Resistance of Battery ; milliohms</p> <p>Overall Dimensions of each complete module (LxWxH) in mm</p> <p>Weight of unpacked and complete module with electrolyte ; Kgs</p> <p>Material of Modules</p>	<p>Depending on no. of cells</p> <p>Length 659.0 ^{+/-5}, Width 632.0 ^{+/-5}, Height 463.0 ^{+/-5} (mm)</p> <p>(6 cell module)</p> <p>309 +/- 5% Kgs (Single 6 cell module)</p> <p>Powder coated MS</p>
<p>23</p> <p>24</p> <p>25</p> <p>26</p> <p>27</p>	<p>Whether explosion vents are offered</p> <p>Loss of capacity due to self discharge</p> <p>The period for which the battery should be stored after supply in charged conditions</p> <p>Amount of Hydrogen evolved during normal normal float charging</p> <p>Recommended interval at which battery should be discharged at 10 hr discharge rate</p>	<p>Yes, self re-sealing rubber safety valve with flame arrestor</p> <p>< 0.5% per week of c-10 capacity</p> <p>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.</p> <p>Less than 200ppm normal float condition</p> <p>Once annually</p>
<p>28</p> <p>29</p>	<p>No. of charge-discharge cycle battery can give during its entire life</p> <p> at 20% DOD</p> <p> at 50% DOD</p> <p> at 80% DOD</p> <p>Expected Life of Battery in years</p>	<p>4000 cycles</p> <p>1800 cycles</p> <p>1400 cycles</p> <p>20 Yrs at 27 deg C in ideal float condition.</p>
<p>30</p>	<p>Applicable standard</p>	<p>IEC 60896 - 21 & 22,</p> <p>JIS : C 8704-2; : 1998</p> <p>ANSI T1 330,</p> <p>GR/BAT-01/03-MARCH 2004,</p> <p>IS 15549 : 2005</p>

GENERAL TECHNICAL PARTICULARS

PPST 800



SL. NO.	DESCRIPTION	DETAILS		
1	Capacity in Ah At 27 ° C			
(a)	Initial	800		
(i)	Rated	800		
(ii)	End of Life	640		
(iii)				
(b)	Rated Capacity(in Ah) at minimum ambient temperature of (as per IS 15549 : 2005)	Formula : $C_t = (1 + 0.0043 (27-t))$		
(c)	Rated Capacity(in Ah) at maximum ambient temperature of (as per IS 15549 : 2005)	Formula : $C_t = (1 + 0.0043 (27-t))$		
2	Capacity at Various Discharge Rates at 27°C			
	Period of Discharge	Ah capacities	Discharge Current (Amps)	End Cell Voltage (Volts)
	10Hr	800.00	80.0	1.75
	9Hr	783.20	87.0	1.75
	8Hr	760.00	95.0	1.75
	7Hr	733.60	104.8	1.75
	6Hr	703.20	117.2	1.75
	5Hr	666.40	133.3	1.75
	4Hr	625.60	156.4	1.74
	3Hr	573.60	191.2	1.74
	2Hr	506.40	253.2	1.7
	1Hr	400.00	400.0	1.7
	50 min	373.60	448.5	1.7
	40 min	344.00	516.5	1.7
	30 min	320.00	640.0	1.7
	20 min	288.00	864.9	1.7
	15 min	238.96	955.8	1.7
	10 min	174.64	1052.0	1.7
	5 min	98.32	1180.3	1.7
	1 min	29.36	1768.7	1.7
3	Maximum Momentary Current for 1 min upto cut off voltage of 1.6 V	2400	Amps	
4	Expected Fault at bus due to battery	4800	Amps	
5 (i)	Short Circuit Current at Battery terminals	4800	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	470 ± 1 (H) x 150 ± 1 (W) x 3.6 ± 0.5 (Thk)		
9	Size of positive plates, mm	470 ± 1 (H) x 150 ± 1 (W) x 5.7 ± 0.5 (Thk)		
10	Type of Connection between cells	Bolted rigid copper connectors		
11	Type of Separators	Absorptive glass mat		
12	Thickness of Separators	5.4 (2 layers of 2.7 mm each)		
13	Dimension of 2 volts cell (LXWXH) , mm	183.0 (+/-3) mm x 217.0 (+/-3) mm x 529 (+/- 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 between ambient temp. 15-24 ° C between ambient temp. 25-34 ° C between ambient temp. 35-40 ° C	2.27 +/- 0.02 VPC 2.25 +/- 0.02 VPC 2.23 +/- 0.02 VPC 2.20 +/- 0.02 VPC	
(ii)	Float Charging Current		120	Amps (Max)
(iii)	Trickle Charging Voltage		NA	
(iv)	Trickle Charging Current		NA	
(v)	Boost Charging Voltage		2.35	Volts
(vi)	Boost Charging Current		160	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	Total Resistance of Battery ; milliohms		Depending on no. of cells	
20	Overall Dimensions of each complete module (LxWxH) in mm		Length 659.0 ^{+/- 5} , Width 632.0 ^{+/- 5} , Height 463.0 ^{+/- 5} (mm) (6 cell module)	
21	Weight of unpacked and complete module with electrolyte ; Kgs		310.25 +/- 5% Kgs (Single 6 cell module)	
22	Material of Modules		Powder coated MS	

23	Whether explosion vents are offered		Yes, self re-sealing rubber safety valve with flame arrestor	
24	Loss of capacity due to self discharge		< 0.5% per week of c-10 capacity	
25	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 freshening charge once in every three months, however if stored at higher or lower temperature freshening charge to be provided as recommended.	
26	Amount of Hydrogen evolved during normal normal float charging		Less than 200ppm normal float condition	
27	Recommended interval at which battery should be discharged at 10 hr discharge rate		Once annually	

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


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

PPST 850



SL. NO.	DESCRIPTION	DETAILS		
1	Capacity in Ah At 27 ° C			
(a)	Initial	850		
(i)	Rated	850		
(ii)	End of Life	680		
(iii)				
(b)	Rated Capacity(in Ah) at minimum ambient temperature of (as per IS 15549 : 2005)	Formula : $C_t = (1 + 0.0043 (27-t))$		
(c)	Rated Capacity(in Ah) at maximum ambient temperature of (as per IS 15549 : 2005)	Formula : $C_t = (1 + 0.0043 (27-t))$		
2	Capacity at Various Discharge Rates at 27°C			
	<i>Period of Discharge</i>	<i>Ah capacities</i>	<i>Discharge Current (Amps)</i>	<i>End Cell Voltage (Volts)</i>
	10Hr	850.00	85.0	1.75
	9Hr	832.15	92.5	1.75
	8Hr	807.50	100.9	1.75
	7Hr	779.45	111.4	1.75
	6Hr	747.15	124.5	1.75
	5Hr	708.05	141.6	1.75
	4Hr	664.70	166.2	1.74
	3Hr	609.45	203.2	1.74
	2Hr	538.05	269.0	1.7
	1Hr	425.00	425.0	1.7
	50 min	396.95	476.5	1.7
	40 min	365.50	548.8	1.7
	30 min	340.00	680.0	1.7
	20 min	306.00	918.9	1.7
	15 min	253.90	1015.6	1.7
	10 min	185.56	1117.8	1.7
	5 min	104.47	1254.1	1.7
	1 min	31.20	1879.2	1.7
3	Maximum Momentary Current for 1 min upto cut off voltage of 1.6 V	2550	Amps	
4	Expected Fault at bus due to battery	5100	Amps	
5 (i)	Short Circuit Current at Battery terminals	5100	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;12		
7	Type/No. of Positive Plates per cell	Flat pasted;11		
8	Size of negative plates, mm	470 ± 1 (H) x 150 ± 1 (W) x 3.6 ± 0.5 (Thk)		
9	Size of positive plates, mm	470 ± 1 (H) x 150 ± 1 (W) x 5.7 ± 0.5 (Thk)		
10	Type of Connection between cells	Bolted rigid copper connectors		
11	Type of Separators	Absorptive glass mat		
12	Thickness of Separators	5.4 (2 layers of 2.7 mm each)		
13	Dimension of 2 volts cell (LXWXH) , mm	183.0 (+/-3) mm x 217.0 (+/-3) mm x 529 (+/- 5) mm		
14	Clearance between the bottom of the plates and container	5 mm		
15	Material of Container	Polypropylene Co-polymer		


<p>16 (i) (ii) (iii) (iv) (v) (vi) (vii) (viii) 17 (a) (b) 18</p>	<p>Recommended Charging Rate Float Charging Voltage between ambient temp. (-)5-14 ° C between ambient temp. 15-24 ° C between ambient temp. 25-34 ° C between ambient temp. 35-40 ° C Float Charging Current Trickle Charging Voltage Trickle Charging Current Boost Charging Voltage Boost Charging Current Time taken to full charge from 100% discharge state by constant voltage charging & voltage at the end of this charge Equalising Charging Current; Voltage Guaranteed efficiencies at 10 hrs rate (a) Ampere-hour efficiency (b) Watt-hour efficiency Allowable voltage ripple</p>	 <p>2.27 +/- 0.02 VPC 2.25 +/- 0.02 VPC 2.23 +/- 0.02 VPC 2.20 +/- 0.02 VPC 127.5 NA NA 2.35 170 72 Hrs (Min) 2.1 volts(ocv) NA 90% 80% 1.5 % RMS of the charging voltage(Bulk charging) 0.5 % RMS of the charging voltage(Float charging)</p> <p>Amps (Max) Volts Amps.</p>
<p>19 20 21 22</p>	<p>Total Resistance of Battery ; milliohms Overall Dimensions of each complete module (LxWxH) in mm Weight of unpacked and complete module with electrolyte ; Kgs Material of Modules</p>	<p>Depending on no. of cells Length 659.0 ^{+/- 5}, Width 632.0 ^{+/- 5}, Height 463.0 ^{+/- 5} (mm) (6 cell module) 316.25 +/- 5% Kgs (Single 6 cell module) Powder coated MS</p>
<p>23 24 25 26 27</p>	<p>Whether explosion vents are offered Loss of capacity due to self discharge The period for which the battery should be stored after supply in charged conditions Amount of Hydrogen evolved during normal normal float charging Recommended interval at which battery should be discharged at 10 hr discharge rate</p>	<p>Yes, self re-sealing rubber safety valve with flame arrestor < 0.5% per week of c-10 capacity If stored in Indian ambient temp of 30 deg C cells will need freshening charge once in every three months, however if stored at higher or lower temperature freshening charge to be provided as recommended. Less than 200ppm normal float condition Once annually</p>
<p>28 29</p>	<p>No. of charge-discharge cycle battery can give during its entire life at 20% DOD at 50% DOD at 80% DOD Expected Life of Battery in years</p>	<p>4000 cycles 1800 cycles 1400 cycles 20 Yrs at 27 deg C in ideal float condition.</p>
<p>30</p>	<p>Applicable standard</p>	<p>IEC 60896 - 21 & 22, JIS : C 8704-2, : 1998 ANSI T1 330, GR/BAT-01/03-MARCH 2004, IS 15549 : 2005</p>

GENERAL TECHNICAL PARTICULARS

PPST 880



SL. NO.	DESCRIPTION	DETAILS		
1	Capacity in Ah At 27 ° C			
(a)	Initial	880		
(i)	Rated	880		
(ii)	End of Life	704		
(iii)				
(b)	Rated Capacity(in Ah) at minimum ambient temperature of (as per IS 15549 : 2005)	Formula : $C_t = (1 + 0.0043 (27-t))$		
(c)	Rated Capacity(in Ah) at maximum ambient temperature of (as per IS 15549 : 2005)	Formula : $C_t = (1 + 0.0043 (27-t))$		
2	Capacity at Various Discharge Rates at 27°C			
	Period of Discharge	Ah capacities	Discharge Current (Amps)	End Cell Voltage (Volts)
	10Hr	880.00	88.0	1.75
	9Hr	861.52	95.7	1.75
	8Hr	836.00	104.5	1.75
	7Hr	806.96	115.3	1.75
	6Hr	773.52	128.9	1.75
	5Hr	733.04	146.6	1.75
	4Hr	688.16	172.0	1.74
	3Hr	630.96	210.3	1.74
	2Hr	557.04	278.5	1.7
	1Hr	440.00	440.0	1.7
	50 min	410.96	493.3	1.7
	40 min	378.40	568.2	1.7
	30 min	352.00	704.0	1.7
	20 min	316.80	951.4	1.7
	15 min	262.86	1051.4	1.7
	10 min	192.10	1157.3	1.7
	5 min	108.15	1298.3	1.7
	1 min	32.30	1945.5	1.7
3	Maximum Momentary Current for 1 min upto cut off voltage of 1.6 V	2640	Amps	
4	Expected Fault at bus due to battery	5280	Amps	
5 (i)	Short Circuit Current at Battery terminals	5280	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;12		
7	Type/No. of Positive Plates per cell	Flat pasted;11		
8	Size of negative plates, mm	470 ± 1 (H) x 150 ± 0.05 (W) x 3.6 ± 0.15 (Thk)		
9	Size of positive plates, mm	470 ± 1 (H) x 150 ± 0.05 (W) x 5.7 ± 0.15 (Thk)		
10	Type of Connection between cells	Bolted rigid copper connectors		
12	Type of Separators	Absorptive glass mat		
13	Thickness of Separators	5.4 (2 layers of 2.7 mm each)		
14	Dimension of 2 volts cell (LXWXH) , mm	183.0 (+/-3) mm x 217.0 (+/-3) mm x 529 (+/- 5) mm		
15	Clearance between the bottom of the plates and container	5 mm		
16	Material of Container	Polypropylene Co-polymer		

17	Recommended Charging Rate			
(i)	Float Charging Voltage	between ambient temp. (-)5-14 ° C between ambient temp. 15-24 ° C between ambient temp. 25-34 ° C between ambient temp. 35-40 ° C	2.27 +/- 0.02 VPC 2.25 +/- 0.02 VPC 2.23 +/- 0.02 VPC 2.20 +/- 0.02 VPC	 Amps (Max)
(ii)	Float Charging Current		132	
(iii)	Trickle Charging Voltage		NA	Volts
(iv)	Trickle Charging Current		NA	
(v)	Boost Charging Voltage		2.35	Amps.
(vi)	Boost Charging Current		176	
(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	
18	Guaranteed efficiencies at 10 hrs rate			
	(a) Ampere-hour efficiency		90%	
	(b) Watt-hour efficiency		80%	
19	Allowable voltage ripple		1.5 % RMS of the charging voltage(Bulk charging) 0.5 % RMS of the charging voltage(Float charging)	

20	Total Resistance of Battery ; milliohms		Depending on no. of cells	
21	Overall Dimensions of each complete module (LxWxH) in mm		Length 659.0 ^{+/- 5} , Width 632.0 ^{+/- 5} , Height 463.0 ^{+/- 5} (mm) (6 cell module)	
22	Weight of unpacked and complete module with electrolyte ; Kgs		337.3 +/- 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 freshening charge once in every three months, however if stored at higher or lower temperature freshening 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 at 50% DOD at 80% DOD	4000 cycles 1800 cycles 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	
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GENERAL TECHNICAL PARTICULARS PPST 925



SL. NO.	DESCRIPTION	DETAILS		
1	Capacity in Ah			
(a)	At 27 ° C			
(i)	Initial	925		
(ii)	Rated	925		
(iii)	End of Life	740		
(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	925.00	92.5	1.75
	9Hr	905.58	100.6	1.75
	8Hr	878.75	109.8	1.75
	7Hr	848.23	121.2	1.75
	6Hr	813.08	135.5	1.75
	5Hr	770.53	154.1	1.75
	4Hr	723.35	180.8	1.74
	3Hr	663.23	221.1	1.74
	2Hr	585.53	292.8	1.7
	1Hr	462.50	462.5	1.7
	50 min	431.98	518.6	1.7
	40 min	397.75	597.2	1.7
	30 min	370.00	740.0	1.7
	20 min	333.00	1000.0	1.7
	15 min	276.30	1105.2	1.7
	10 min	201.93	1216.4	1.7
	5 min	113.68	1364.7	1.7
	1 min	33.95	2045.0	1.7
3	Maximum Momentary Current for 1 min upto cut off voltage of 1.6 V	2775		Amps
4	Expected Fault at bus due to battery	5550		Amps
5 (i)	Short Circuit Current at Battery terminals	5550		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;18		
7	Type/No. of Positive Plates per cell	Flat pasted;17		
8	Size of negative plates, mm	440(L) x 140(W) x 3.2 (+/-1) (Thk)		
9	Size of positive plates, mm	440(L) x 140(W) x 5.3 (+/-1) (Thk)		
10	Type of Connection between cells	Bolted rigid copper connectors		
11	Type of Separators	Absorptive glass mat		
12	Thickness of Separators	5.3 (2 layers of 2.65 mm each)		
13	Dimensison of 2 volts cell (LXWXH) , mm	303 (+/-3) mm x 172 (+/-3) mm x 507 (+/- 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 between ambient temp. 15-24 ° C between ambient temp. 25-34 ° C between ambient temp. 35-40 ° C (ii) Float Charging Current (iii) Trickle Charging Voltage (iv) Trickle Charging Current (v) Boost Charging Voltage (vi) Boost Charging Current (vii) Time taken to full charge from 100% discharge state by constant voltage charging & voltage at the end of this charge (viii) Equalising Charging Current; Voltage 17 Guaranteed efficiencies at 10 hrs rate (a) Ampere-hour efficiency (b) Watt-hour efficiency 18 Allowable voltage ripple	 2.27 +/- 0.02 VPC 2.25 +/- 0.02 VPC 2.23 +/- 0.02 VPC 2.20 +/- 0.02 VPC 138.75 Amps (Max) NA NA 2.35 Volts 185 Amps. 72 Hrs (Min) OCV 2.1 volts (Min.) NA 90% 80% 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	0.30 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 462 +/- 5, Width 510 +/- 5, Height 363 +/- 5 (mm) (2 cell module)
22	Weight of unpacked and complete module with electrolyte ; Kgs	142.1 +/- 5% Kgs (Single 2 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 at 50% DOD at 80% DOD	4000 cycles 1800 cycles 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/NMST 500



SL. NO.	DESCRIPTION	DETAILS		
1	Capacity in Ah			
(a)	At 27 ° C			
(i)	Initial	500		
(ii)	Rated	500		
(iii)	End of Life	400		
(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	500.00	50.0	1.75
	9Hr	489.50	54.4	1.75
	8Hr	475.00	59.4	1.75
	7Hr	458.50	65.5	1.75
	6Hr	439.50	73.3	1.75
	5Hr	416.50	83.3	1.75
	4Hr	391.00	97.8	1.74
	3Hr	358.50	119.5	1.74
	2Hr	316.50	158.3	1.7
	1Hr	250.00	250.0	1.7
	50 min	233.50	280.3	1.7
	40 min	215.00	322.8	1.7
	30 min	200.00	400.0	1.7
	20 min	180.00	540.5	1.7
	15 min	149.35	597.4	1.7
	10 min	109.15	657.5	1.7
	5 min	61.45	737.7	1.7
	1 min	18.35	1105.4	1.7
3	Maximum Momentary Current for 1 min upto cut off voltage of 1.6 V	1500	Amps	
4	Expected Fault at bus due to battery	3000	Amps	
5 (i)	Short Circuit Current at Battery terminals	3000	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	440(L) x 140(W) x 3.2 (+/-1) (Thk)		
9	Size of positive plates, mm	440(L) x 140(W) x 5.3 (+/-1) (Thk)		
10	Type of Connection between cells	Bolted rigid copper connectors		
11	Type of Separators	Absorptive glass mat		
12	Thickness of Separators	5.3 (2 layers of 2.65 mm each)		
13	Dimension of 2 volts cell (LXWXH) , mm	189 (+/-3) mm x 172 (+/-3) mm x 507 (+/- 5) mm		
14	Clearance between the bottom of the plates and container	5 mm		
15	Material of Container	Polypropylene Co-polymer		

<p>16</p> <p>(i)</p> <p>(ii)</p> <p>(iii)</p> <p>(iv)</p> <p>(v)</p> <p>(vi)</p> <p>(vii)</p> <p>(viii)</p> <p>17</p> <p>(a)</p> <p>(b)</p> <p>18</p>	<p>Recommended Charging Rate</p> <p>Float Charging Voltage</p> <p>between ambient temp. (-)5-14 ° C</p> <p>between ambient temp. 15-24 ° C</p> <p>between ambient temp. 25-34 ° C</p> <p>between ambient temp. 35-40 ° C</p> <p>Float Charging Current</p> <p>Trickle Charging Voltage</p> <p>Trickle Charging Current</p> <p>Boost Charging Voltage</p> <p>Boost Charging Current</p> <p>Time taken to full charge from 100% discharge state by constant voltage charging & voltage at the end of this charge</p> <p>Equalising Charging Current; Voltage</p> <p>Guaranteed efficiencies at 10 hrs rate</p> <p>(a) Ampere-hour efficiency</p> <p>(b) Watt-hour efficiency</p> <p>Allowable voltage ripple</p>	 <p>2.27 +/- 0.02 VPC</p> <p>2.25 +/- 0.02 VPC</p> <p>2.23 +/- 0.02 VPC</p> <p>2.20 +/- 0.02 VPC</p> <p>75</p> <p>NA</p> <p>NA</p> <p>2.35</p> <p>100</p> <p>72 Hrs (Min)</p> <p>2.1 volts(ocv)</p> <p>NA</p> <p>90%</p> <p>80%</p> <p>1.5 % RMS of the charging voltage(Bulk charging)</p> <p>0.5 % RMS of the charging voltage(Float charging)</p> <p>Amps (Max)</p> <p>Volts</p> <p>Amps.</p>
19	Internal Resistance of each cell at Fully Charged Condition	0.44 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 634 +/- 5, Width 580 +/- 5, Height 420 +/- 5 (6 cell module)
22	Weight of unpacked and complete module with electrolyte ; Kgs	236.6 +/- 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	4000 cycles 1800 cycles 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

SL. NO.	DESCRIPTION	DETAILS		
1	Capacity in Ah			
(a)	At 27 ° C			
(i)	Initial	600		
(ii)	Rated	600		
(iii)	End of Life	480		
(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	600.00	60.0	1.75
	9Hr	587.40	65.3	1.75
	8Hr	570.00	71.3	1.75
	7Hr	550.20	78.6	1.75
	6Hr	527.40	87.9	1.75
	5Hr	499.80	100.0	1.75
	4Hr	469.20	117.3	1.74
	3Hr	430.20	143.4	1.74
	2Hr	379.80	189.9	1.7
	1Hr	300.00	300.0	1.7
	50 min	280.20	336.4	1.7
	40 min	258.00	387.4	1.7
	30 min	240.00	480.0	1.7
	20 min	216.00	648.6	1.7
	15 min	179.22	716.9	1.7
	10 min	130.98	789.0	1.7
	5 min	73.74	885.2	1.7
	1 min	22.02	1326.5	1.7
3	Maximum Momentary Current for 1 min upto cut off voltage of 1.6 V	1800		Amps
4	Expected Fault at bus due to battery	3600		Amps
5 (i)	Short Circuit Current at Battery terminals	3600		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	440(L) x 140(W) x 3.2 (+/-1) (Thk)		
9	Size of positive plates, mm	440(L) x 140(W) x 5.3 (+/-1) (Thk)		
10	Type of Connection between cells	Bolted rigid copper connectors		
11	Type of Separators	Absorptive glass mat		
12	Thickness of Separators	5.3 (2 layers of 2.65 mm each)		
13	Dimensison of 2 volts cell (LXWXH) , mm	189 (+/-3) mm x 172 (+/-3) mm x 507 (+/- 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	90	Amps (Max)
(iii)	Trickle Charging Voltage	NA	
(iv)	Trickle Charging Current	NA	
(v)	Boost Charging Voltage	2.35	Volts
(vi)	Boost Charging Current	120	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	0.40	milli ohms min
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20	Total Resistance of Battery ; milliohms	Depending on no. of cells	
21	Overall Dimensions of each complete module (LxWxH) in mm	Length 634 +/- 5, Width 580 +/- 5, Height 420 +/- 5 (6 cell module)	
22	Weight of unpacked and complete module with electrolyte ; Kgs	249.8 +/- 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	
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GENERAL TECHNICAL PARTICULARS

NMST/UPST 800



SL. NO.	DESCRIPTION	DETAILS		
1	Capacity in Ah At 27 ° C			
(a)	Initial	800		
(i)	Rated	800		
(ii)	End of Life	640		
(iii)				
(b)	Rated Capacity(in Ah) at minimum ambient temperature of (as per IS 15549 : 2005)	Formula : $C_t = C_{27} \{ 1 + 0.0043 (t-27) \}$		
(c)	Rated Capacity(in Ah) at maximum ambient temperature of (as per IS 15549 : 2005)	Formula : $C_t = C_{27} \{ 1 + 0.0043 (t-27) \}$		
2	Capacity at Various Discharge Rates at 27°C			
	Period of Discharge	Ah capacities	Discharge Current (Amps)	End Cell Voltage (Volts)
	10Hr	800.00	80.0	1.75
	9Hr	783.20	87.0	1.75
	8Hr	760.00	95.0	1.75
	7Hr	733.60	104.8	1.75
	6Hr	703.20	117.2	1.75
	5Hr	666.40	133.3	1.75
	4Hr	625.60	156.4	1.74
	3Hr	573.60	191.2	1.74
	2Hr	506.40	253.2	1.7
	1Hr	400.00	400.0	1.7
	50 min	373.60	448.5	1.7
	40 min	344.00	516.5	1.7
	30 min	320.00	640.0	1.7
	20 min	288.00	864.9	1.7
	15 min	238.96	955.8	1.7
	10 min	174.64	1052.0	1.7
	5 min	98.32	1180.3	1.7
	1 min	29.36	1768.7	1.7
3	Maximum Momentary Current for 1 min upto cut off voltage of 1.6 V	2400		Amps
4	Expected Fault at bus due to battery	4800		Amps
5 (i)	Short Circuit Current at Battery terminals	4800		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;15		
7	Type/No. of Positive Plates per cell	Flat pasted;14		
8	Size of negative plates, mm	440(L) x 140(W) x 3.2 (+/-1) (Thk)		
9	Size of positive plates, mm	440(L) x 140(W) x 5.3 (+/-1) (Thk)		
10	Type of Connection between cells	Bolted rigid copper connectors		
11	Type of Separators	Absorptive glass mat		
12	Thickness of Separators	5.3 (2 layers of 2.65 mm each)		
13	Dimension of 2 volts cell (LXWXH) , mm	303 (+/-3) mm x 172 (+/-3) mm x 507 (+/- 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 between ambient temp. 15-24 ° C between ambient temp. 25-34 ° C between ambient temp. 35-40 ° C (ii) Float Charging Current (iii) Trickle Charging Voltage (iv) Trickle Charging Current (v) Boost Charging Voltage (vi) Boost Charging Current (vii) Time taken to full charge from 100% discharge state by constant voltage charging & voltage at the end of this charge (viii) Equalising Charging Current; Voltage			
		2.27 +/- 0.02 VPC		
		2.25 +/- 0.02 VPC		
		2.23 +/- 0.02 VPC		
		2.20 +/- 0.02 VPC		
		120	Amps (Max)	
		NA		
		NA		
2.35	Volts			
160	Amps.			
72 Hrs (Min)				
OCV 2.1 volts (Min.)				
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		
	(i) Fully Charged Condition	1.60	milli ohms min
	(ii) Fully Discharged Condition	1.80	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 462 +/- 5, Width 510 +/- 5, Height 363 +/- 5 (mm) (2 cell module)
22	Weight of unpacked and complete module with electrolyte ; Kgs	121.7 +/- 5% Kgs (Single 2 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 freshening charge once in every three months, however if stored at higher or lower temperature freshening 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
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GENERAL TECHNICAL PARTICULARS

NMST 850




SL. NO.	DESCRIPTION	DETAILS		
1	Capacity in Ah At 27 ° C			
(a)	Initial	850		
(i)	Rated	850		
(ii)	End of Life	680		
(iii)				
(b)	Rated Capacity(in Ah) at minimum ambient temperature of (as per IS 15549 : 2005)	Formula : $C_t = C_{27} (1 + 0.0043 (t-27))$		
(c)	Rated Capacity(in Ah) at maximum ambient temperature of (as per IS 15549 : 2005)	Formula : $C_t = C_{27} (1 + 0.0043 (t-27))$		
2	Capacity at Various Discharge Rates at 27°C			
	<i>Period of Discharge</i>	<i>Ah capacities</i>	<i>Discharge Current (Amps)</i>	<i>End Cell Voltage (Volts)</i>
	10Hr	850.00	85.0	1.75
	9Hr	832.15	92.5	1.75
	8Hr	807.50	100.9	1.75
	7Hr	779.45	111.4	1.75
	6Hr	747.15	124.5	1.75
	5Hr	708.05	141.6	1.75
	4Hr	664.70	166.2	1.74
	3Hr	609.45	203.2	1.74
	2Hr	538.05	269.0	1.7
	1Hr	425.00	425.0	1.7
	50 min	396.95	476.5	1.7
	40 min	365.50	548.8	1.7
	30 min	340.00	680.0	1.7
	20 min	306.00	918.9	1.7
	15 min	253.90	1015.6	1.7
	10 min	185.56	1117.8	1.7
	5 min	104.47	1254.1	1.7
	1 min	31.20	1879.2	1.7
3	Maximum Momentary Current for 1 min upto cut off voltage of 1.6 V		2550	Amps
4	Expected Fault at bus due to battery		5100	Amps
5 (i)	Short Circuit Current at Battery terminals		5100	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;15		
7	Type/No. of Positive Plates per cell	Flat pasted;14		
8	Size of negative plates, mm	440(L) x 140(W) x 3.2 (+/-1) (Thk)		
9	Size of positive plates, mm	440(L) x 140(W) x 5.3 (+/-1) (Thk)		
10	Type of Connection between cells	Bolted rigid copper connectors		
11	Type of Separators	Absorptive glass mat		
12	Thickness of Separators	5.3 (2 layers of 2.65 mm each)		
13	Dimension of 2 volts cell (LXWXH) , mm	303 (+/-3) mm x 172 (+/-3) mm x 507 (+/- 5) mm		
14	Clearance between the bottom of the plates and container	5 mm		
15	Material of Container	Polypropylene Co-polymer		

<p>16</p> <p>(i)</p> <p>(ii)</p> <p>(iii)</p> <p>(iv)</p> <p>(v)</p> <p>(vi)</p> <p>(vii)</p> <p>(viii)</p>	<p>Recommended Charging Rate</p> <p>Float Charging Voltage between ambient temp. (-)5-14 ° C between ambient temp. 15-24 ° C between ambient temp. 25-34 ° C between ambient temp. 35-40 ° C</p> <p>Float Charging Current</p> <p>Trickle Charging Voltage</p> <p>Trickle Charging Current</p> <p>Boost Charging Voltage</p> <p>Boost Charging Current</p> <p>Time taken to full charge from 100% discharge state by constant voltage charging & voltage at the end of this charge</p> <p>Equalising Charging Current; Voltage</p> <p>17 Guaranteed efficiencies at 10 hrs rate (a) Ampere-hour efficiency (b) Watt-hour efficiency</p> <p>18 Allowable voltage ripple</p>	 <p>2.27 +/- 0.02 VPC 2.25 +/- 0.02 VPC 2.23 +/- 0.02 VPC 2.20 +/- 0.02 VPC</p> <p>127.5 NA NA 2.35 170 72 Hrs (Min) OCV 2.1 volts (Min.) NA</p> <p>Amps (Max) Volts Amps.</p> <p>90% 80%</p> <p>1.5 % RMS of the charging voltage(Bulk charging) 0.5 % RMS of the charging voltage(Float charging)</p>
<p>19</p> <p>20</p> <p>21</p> <p>22</p>	<p>Total Resistance of Battery ; milliohms</p> <p>Overall Dimensions of each complete module (LxWxH) in mm</p> <p>Weight of unpacked and complete module with electrolyte ; Kgs</p> <p>Material of Modules</p>	<p>Depending on no. of cells</p> <p>Length 462 +/- 5, Width 527 +/- 5, Height 363 +/- 5 (mm) (2 cell module)</p> <p>121.7 +/- 5% Kgs (Single 2 cell module)</p> <p>Powder coated MS</p>
<p>23</p> <p>24</p> <p>25</p> <p>26</p> <p>27</p>	<p>Whether explosion vents are offered</p> <p>Loss of capacity due to self discharge</p> <p>The period for which the battery should be stored after supply in charged conditions</p> <p>Amount of Hydrogen evolved during normal normal float charging</p> <p>Recommended interval at which battery should be discharged at 10 hr discharge rate</p>	<p>Yes, self re-sealing rubber safety valve with flame arrestor</p> <p>< 0.5% per week of c-10 capacity</p> <p>If stored in Indian ambient temp of 30 deg C cells will need freshening charge once in every three months, however if stored at higher or lower temperature freshening charge to be provided as recommended.</p> <p>Less than 200ppm normal float condition</p> <p>Once annually</p>
<p>28</p> <p>29</p>	<p>No. of charge-discharge cycle battery can give during its entire life</p> <p>at 20% DOD at 50% DOD at 80% DOD</p> <p>Expected Life of Battery in years</p>	<p>4000 cycles 1800 cycles 1400 cycles</p> <p>20 Yrs at 27 deg C in ideal float condition.</p>
<p>30</p>	<p>Applicable standard</p>	<p>IEC 60896 - 21 & 22, JIS : C 8704-2, : 1998 ANSI T1 330, GR/BAT-01/03-MARCH 2004, IS 15549 : 2005</p>

GENERAL TECHNICAL PARTICULARS UPST/NMST 925




SL. NO.	DESCRIPTION	DETAILS		
1	Capacity in Ah			
(a)	At 27 ° C			
(i)	Initial	925		
(ii)	Rated	925		
(iii)	End of Life	740		
(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	925.00	92.5	1.75
	9Hr	905.58	100.6	1.75
	8Hr	878.75	109.8	1.75
	7Hr	848.23	121.2	1.75
	6Hr	813.08	135.5	1.75
	5Hr	770.53	154.1	1.75
	4Hr	723.35	180.8	1.74
	3Hr	663.23	221.1	1.74
	2Hr	585.53	292.8	1.7
	1Hr	462.50	462.5	1.7
	50 min	431.98	518.6	1.7
	40 min	397.75	597.2	1.7
	30 min	370.00	740.0	1.7
	20 min	333.00	1000.0	1.7
	15 min	276.30	1105.2	1.7
	10 min	201.93	1216.4	1.7
	5 min	113.68	1364.7	1.7
	1 min	33.95	2045.0	1.7
3	Maximum Momentary Current for 1 min upto cut off voltage of 1.6 V	2775		Amps
4	Expected Fault at bus due to battery	5550		Amps
5 (i)	Short Circuit Current at Battery terminals	5550		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;18		
7	Type/No. of Positive Plates per cell	Flat pasted;17		
8	Size of negative plates, mm	440(L) x 140(W) x 3.2 (+/-1) (Thk)		
9	Size of positive plates, mm	440(L) x 140(W) x 5.3 (+/-1) (Thk)		
10	Type of Connection between cells	Bolted rigid copper connectors		
11	Type of Separators	Absorptive glass mat		
12	Thickness of Separators	5.3 (2 layers of 2.65 mm each)		
13	Dimensison of 2 volts cell (LXWXH) , mm	303 (+/-3) mm x 172 (+/-3) mm x 507 (+/- 5) mm		
14	Clearance between the bottom of the plates and container	5 mm		
15	Material of Container	Polypropylene Co-polymer		

<p>16</p> <p>(i)</p> <p>(ii)</p> <p>(iii)</p> <p>(iv)</p> <p>(v)</p> <p>(vi)</p> <p>(vii)</p> <p>(viii)</p>	<p>Recommended Charging Rate</p> <p>Float Charging Voltage</p> <p>between ambient temp. (-)5-14 ° C</p> <p>between ambient temp. 15-24 ° C</p> <p>between ambient temp. 25-34 ° C</p> <p>between ambient temp. 35-40 ° C</p> <p>Float Charging Current</p> <p>Trickle Charging Voltage</p> <p>Trickle Charging Current</p> <p>Boost Charging Voltage</p> <p>Boost Charging Current</p> <p>Time taken to full charge from 100% discharge state by constant voltage charging & voltage at the end of this charge</p> <p>Equalising Charging Current;Voltage</p> <p>17 Guaranteed efficiencies at 10 hrs rate</p> <p>(a) Ampere-hour efficiency</p> <p>(b) Watt-hour efficiency</p> <p>18 Allowable voltage ripple</p>	 <p>2.27 +/- 0.02 VPC</p> <p>2.25 +/- 0.02 VPC</p> <p>2.23 +/- 0.02 VPC</p> <p>2.20 +/- 0.02 VPC</p> <p>138.75</p> <p>NA</p> <p>NA</p> <p>2.35</p> <p>185</p> <p>72 Hrs (Min)</p> <p>OCV 2.1 volts (Min.)</p> <p>NA</p> <p>90%</p> <p>80%</p> <p>1.5 % RMS of the charging voltage(Bulk charging)</p> <p>0.5 % RMS of the charging voltage(Float charging)</p> <p>Amps (Max)</p> <p>Volts</p> <p>Amps.</p>
<p>19</p>	<p>Internal Resistance of each cell at Fully Charged Condition</p>	<p>0.30</p> <p>milli ohms min</p>
<p>20</p> <p>21</p> <p>22</p> <p>23</p>	<p>Total Resistance of Battery ; milliohms</p> <p>Overall Dimensions of each complete module (LxWxH) in mm</p> <p>Weight of unpacked and complete module with electrolyte ; Kgs</p> <p>Material of Modules</p>	<p>Depending on no. of cells</p> <p>Length 462 +/- 5, Width 510 +/- 5, Height 363 +/- 5 (mm) (2 cell module)</p> <p>142.1 +/- 5% Kgs (Single 2 cell module)</p> <p>Powder coated MS</p>
<p>24</p> <p>25</p> <p>26</p> <p>27</p> <p>28</p>	<p>Whether explosion vents are offered</p> <p>Loss of capacity due to self discharge</p> <p>The period for which the battery should be stored after supply in charged conditions</p> <p>Amount of Hydrogen evolved during normal normal float charging</p> <p>Recommended interval at which battery should be discharged at 10 hr discharge rate</p>	<p>Yes, self re-sealing rubber safety valve with flame arrestor</p> <p>< 0.5% per week of c-10 capacity</p> <p>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.</p> <p>Less than 200ppm normal float condition</p> <p>Once annually</p>
<p>29</p> <p>30</p>	<p>No. of charge-discharge cycle battery can give during its entire life</p> <p>at 20% DOD</p> <p>at 50% DOD</p> <p>at 80% DOD</p> <p>Expected Life of Battery in years</p>	<p>4000 cycles</p> <p>1800 cycles</p> <p>1400 cycles</p> <p>20 Yrs at 27 deg C in ideal float condition.</p>
<p>31</p>	<p>Applicable standard</p>	<p>IEC 60896 - 21 & 22, JIS : C 8704-2, : 1998 ANSI T1 330, GR/BAT-01/03-MARCH 2004, IS 15549 : 2005</p>

GENERAL TECHNICAL PARTICULARS UPST/NMST 1000



SL. NO.	DESCRIPTION	DETAILS		
1	Capacity in Ah At 27 ° C			
(a)				
(i)	Initial	1000		
(ii)	Rated	1000		
(iii)	End of Life	800		
(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	1000.00	100.0	1.75
	9Hr	979.00	108.8	1.75
	8Hr	950.00	118.8	1.75
	7Hr	917.00	131.0	1.75
	6Hr	879.00	146.5	1.75
	5Hr	833.00	166.6	1.75
	4Hr	782.00	195.5	1.74
	3Hr	717.00	239.0	1.74
	2Hr	633.00	316.5	1.7
	1Hr	500.00	500.0	1.7
	50 min	467.00	560.6	1.7
	40 min	430.00	645.6	1.7
	30 min	400.00	800.0	1.7
	20 min	360.00	1081.1	1.7
	15 min	298.70	1194.8	1.7
	10 min	218.30	1315.1	1.7
	5 min	122.90	1475.4	1.7
	1 min	36.70	2210.8	1.7
3	Maximum Momentary Current for 1 min upto cut off voltage of 1.6 V	3000		Amps
4	Expected Fault at bus due to battery	6000		Amps
5 (i)	Short Circuit Current at Battery terminals	6000		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;18		
7	Type/No. of Positive Plates per cell	Flat pasted;17		
8	Size of negative plates, mm	440(L) x 140(W) x 3.2 (+/-1) (Thk)		
9	Size of positive plates, mm	440(L) x 140(W) x 5.3 (+/-1) (Thk)		
10	Type of Connection between cells	Bolted rigid copper connectors		
11	Type of Separators	Absorptive glass mat		
12	Thickness of Separators	5.3 (2 layers of 2.65 mm each)		
13	Dimensison of 2 volts cell (LXWXH) , mm	303 (+/-3) mm x 172 (+/-3) mm x 507 (+/- 5) mm		
14	Clearance between the bottom of the plates and container	5 mm		
15	Material of Container	Polypropylene Co-polymer		

16	<p>Recommended Charging Rate</p> <p>(i) Float Charging Voltage between ambient temp. (-)5-14 ° C between ambient temp. 15-24 ° C between ambient temp. 25-34 ° C between ambient temp. 35-40 ° C</p> <p>(ii) Float Charging Current</p> <p>(iii) Trickle Charging Voltage</p> <p>(iv) Trickle Charging Current</p> <p>(v) Boost Charging Voltage</p> <p>(vi) Boost Charging Current</p> <p>(vii) Time taken to full charge from 100% discharge state by constant voltage charging & voltage at the end of this charge</p> <p>(viii) Equalising Charging Current;Voltage</p> <p>17 Guaranteed efficiencies at 10 hrs rate (a) Ampere-hour efficiency (b) Watt-hour efficiency</p> <p>18 Allowable voltage ripple</p>	 <p>2.27 +/- 0.02 VPC 2.25 +/- 0.02 VPC 2.23 +/- 0.02 VPC 2.20 +/- 0.02 VPC</p> <p>150 NA NA 2.35 200</p> <p>72 Hrs (Min) OCV 2.1 volts (Min.)</p> <p>NA</p> <p>90% 80%</p> <p>1.5 % RMS of the charging voltage(Bulk charging) 0.5 % RMS of the charging voltage(Float charging)</p> <p>Amps (Max) Volts Amps.</p>
19	Internal Resistance of each cell at Fully Charged Condition	0.30 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 462 +/- 5, Width 510 +/- 5, Height 363 +/- 5 (mm) (2 cell module)
22	Weight of unpacked and complete module with electrolyte ; Kgs	142.1 +/- 5% Kgs (Single 2 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 at 50% DOD at 80% DOD	4000 cycles 1800 cycles 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