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ISO45001

LEOCH *POWER* THE GALAXY

VRLA-AGM BATTERIES



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- **LP SERIES GENERAL PURPOSE**
- **LCP SERIES-PUNCH BATTERY**
- **LPL SERIES LONG LIFE STANDBY**
- **LPF SERIES FRONT TERMINAL**
- **LPC SERIES CYCLE APPLICATION**

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Stock Code:00842.HK



About LEOCH BATTERY

Established in 1999, LEOCH BATTERY (stock code: 00842.HK) is a globally recognized leader in power solutions.

Our headquarter is located in the dynamic business hub of Singapore, where we actively contribute to the development of various international industrial standards.

With an extensive global presence, LEOCH BATTERY operates 21 state-of-the-art manufacturing facilities spanning a total area of 2 million square meters. Our global footprint includes over 80 local service companies, and we are proud to be a home to a dedicated workforce of 15,000 employees, including more than 1,500 highly skilled R&D and technical experts.

LEOCH BATTERY is your trusted partner for industrial and commercial energy storage solutions. Our expertise covers every aspect of the industry, from cutting-edge research and development to top-notch manufacturing, robust sales, and comprehensive services. We proudly serve clients in over 150 countries and regions worldwide.

At LEOCH BATTERY, we specialize in delivering tailored power solutions for a wide spectrum of industrial and commercial applications across the globe. Our product and service portfolio is strategically designed to meet the diverse needs of our clients, including:

- Energy Storage Systems
- Telecom & Data Center Power Solutions
- Starting Power Solutions
- Motive Power Solutions
- Battery Recycling

With a commitment to excellence, innovation, and sustainability, LEOCH BATTERY is dedicated to empowering businesses around the world with reliable, cutting-edge power solutions.

PRODUCTION BASES



Jiangsu



Zhaoqing



Anhui UPLUS



Anhui



Malaysia



India I , II



Anhui Dahua



Jiangsu II



Vietnam I , II , III



Anhui Lithium



Malaysia II , III



Mexico I , II



Global Leader in
Battery Manufacturing

21

Production Bases

3000+

Products Categories

150+

Countries and Regions

15000+

Employees Worldwide

LEOCH VRLA-AGM BATTERY FEATURES

INTRODUCTION

LEOCH VRLA-AGM batteries are Valve-Regulated Lead-Acid batteries with Absorbed Glass Mat (AGM) separators. Since 1994, LEOCH has made rapid progress by using matured technology invented more than half a century ago. LEOCH is now able to design, build and market high quality, long life VRLA-AGM batteries from 2V to 24v, and 0.5AH to 3500AH. LEOCH produces batteries from scratch and is capable of engineering tools and molds upon our customer's request. LEOCH is now one of the fastest developing lead-acid battery manufacturers in the world.

APPLICATIONS

LEOCH VRLA-AGM batteries are designed and categorized into six series for different applications as listed below.

LP Series, General Purpose Applications:

- All Purpose Battery Needs
- UPS
- EPS
- Emergency Light
- DC Power Supply
- Tele-communication
- Network Communication
- Security System
- Electronic Equipment
- Power System
- Signal

LCP SERIES-PUNCH BATTERY

- UPS
- Alarm and security system
- Emergency backup power supply
- Auto control system
- Communication power supply
- DC power supply

LPL Series, Long Life Standby Applications:

- Communication DC Power
- UPS
- EPS
- Emergency Light
- Marine
- Tele-Communication
- Network Communication
- Railway Signal
- Electronic Apparatus
- Power System Communication

LPF Series, Front Terminal/Telecom Applications:

- For Standard 19 inch or 23 Inch Power Cabinets
- UPS
- Network Connection Equipment
- Power Station Systems
- Railway and Marine Systems

LPC series, Cycle Application:

- Electric Tools
- Mobility Scooter
- Golf Trolleys
- Electric Toys
- Portable Power
- Electric Wheelchair
- Portable Lights and Instruments

DEFINITIONS OF VRLA-AGM BATTERY

A VRLA-AGM battery is an electric storage lead-acid battery.

- Sealed with special compound epoxy and using pressure controlled vent valves.
- Starved electrolyte design - acid solution is absorbed in separators.
- Using a recombination reaction to prevent the escape of hydrogen and oxygen gases.
- Non-spillable - can be operated in any position however upside down installation is not recommended.
- Maintenance free. But connections must be retouched and the batteries should be cleaned periodically.

A VRLA-AGM battery uses recombinant technology. The oxygen produced from the positive plates of the battery is absorbed by the negative plates. This suppresses the generation of hydrogen at the negative plates. The recombination of oxygen and hydrogen leads to Water (H₂O), retaining the electrolyte amount within the battery. Water filling is never required. Battery should never be opened as this would damage the battery with additional oxygen from the air. The warranty will be void if the battery is opened.

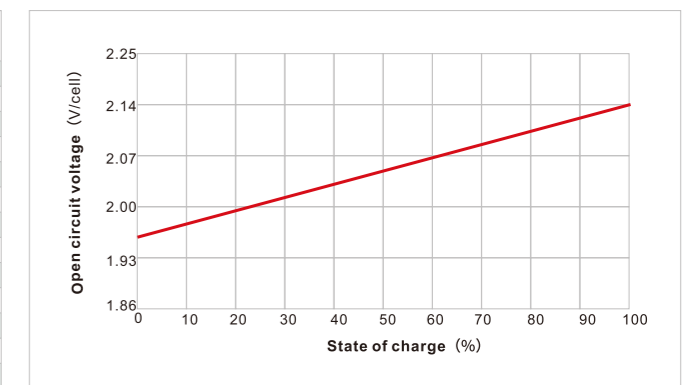
FEATURES

- Maintenance-free, no water adding required
- Sealed Valve-Regulated
- Spill proof / leak proof
- Deep discharge protection
- Plate grids from lead-calcium alloy, free of antimony
- No corrosion
- Installs vertically or horizontally
- Low gassing (unless overcharged)
- Good cycling and stationary performance
- Good high rate discharges
- Long shelf life
- Rugged and vibration-resistant

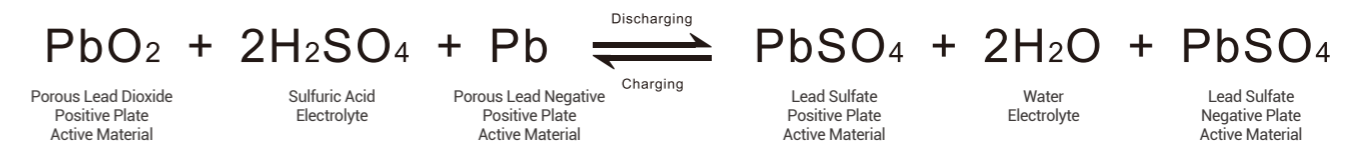
Charge Voltages and Temperature Ranges

Temp (°F)	Boost Charge (V/cell)		Float Charge (V/cell)		Temp (°C)
	Optimum	Maximum	Optimum	Maximum	
≥120	2.23	2.28	2.15	2.18	≥49
110-120	2.27	2.32	2.17	2.22	43-49
100-110	2.28	2.33	2.18	2.23	38-43
90-100	2.30	2.35	2.20	2.25	32-38
80-90	2.32	2.37	2.22	2.27	27-32
70-80	2.35	2.40	2.25	2.30	21-27
60-70	2.38	2.43	2.28	2.33	16-21
50-60	2.40	2.45	2.30	2.35	10-16
40-50	2.43	2.48	2.33	2.38	4-10
30-40	2.46	2.51	2.34	2.39	(-1)-4
20-30	2.49	2.54	2.36	2.41	(-6)-(-1)
10-20	2.53	2.58	2.38	2.43	(-12)-(-6)
≤10	2.58	2.63	2.39	2.44	≤-12

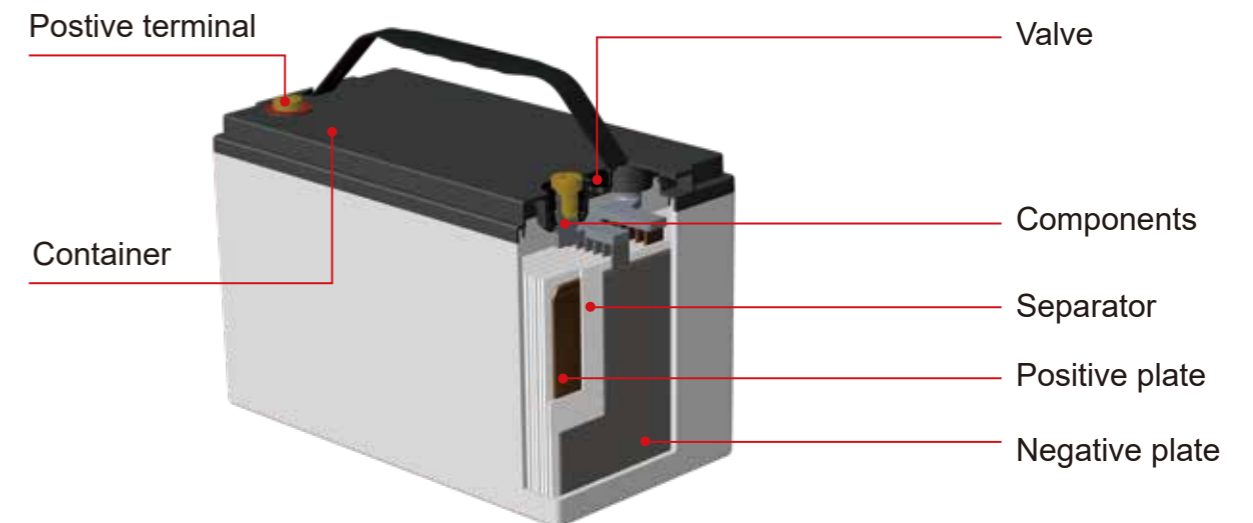
State of charge vs. Open circuit voltage



◆ BATTERY OPERATION THEORY



◆ VRLA BATTERY CONSTRUCTION



LEOCH VRLA-GEL BATTERY TERMINAL OPTIONS

Unit:mm[inch]

T1 Terminal FASTON TYPE (Copper) quick disconnect tabs; silver coating for better conductivity

Technical drawing shows dimensions: 3.2 [0.126], 6.35 [0.25], 4.75 [0.187], 0.6 [0.031]. 3D view shows a black battery with a red terminal.

T2 Terminal FASTON TYPE (Copper) quick disconnect tabs; silver coating for better conductivity

Technical drawing shows dimensions: 3.4 [0.134], 7.95 [0.313], 6.35 [0.25], 0.8 [0.031]. 3D view shows a black battery with a red terminal.

T3 Terminal Brass Coated With Tin
Torque: 3.9 ~ 5.4 N*m(34.39 ~ 47.75 in*lbs)

Technical drawing shows dimensions: 14 [0.551], 2 [0.079], 4.5 [0.177], 13 [0.512], 6 [0.236]. 3D view shows a black battery with a red terminal.

T4 Terminal Brass Coated With Tin

Technical drawing shows dimensions: 1.2 [0.047], 4.75 [0.187], 10 [0.394]. 3D view shows a black battery with a red terminal.

T5 Terminal Lead
Torque: 3.9 ~ 5.4 N*m(34.39 ~ 47.75 in*lbs)

Technical drawing shows dimensions: 16 [0.63], 7.5 [0.295], 6.5 [0.256], 6.2 [0.244], 6.5 [0.256]. 3D view shows a black battery with a red terminal.

T6 Terminal Brass Coated With Tin; Threaded Insert 6mm STUD
Torque: 3.9 ~ 5.4 N*m(34.39 ~ 47.75 in*lbs)

Technical drawing shows dimensions: 16 [0.63], 6 [0.236], M6 [0.236]. 3D view shows a black battery with a red terminal.

T7 Terminal Brass Coated With Tin; Threaded Insert 6mm STUD
Torque: 3.9 ~ 5.4 N*m(34.39 ~ 47.75 in*lbs)

Technical drawing shows dimensions: 18 [0.709], 6 [0.236], M6 [0.236]. 3D view shows a black battery with a red terminal.

T9 Terminal Lead
Torque: 11 ~ 14.7 N*m(97.28 ~ 130.0 in*lbs)

Technical drawing shows dimensions: 18 [0.709], 20 [0.787], 8 [0.315], 13 [0.512]. 3D view shows a black battery with a red terminal.

A SPLENDID FUTURE THROUGH THE EFFORTS OF ALL

Unit:mm[inch]

T10 Terminal Lead
Torque: 3.9 ~ 5.4 N*m(34.39 ~ 47.75 in*lbs)

Technical drawing shows dimensions: 17 [0.669], 8 [0.315], 16 [0.63], 8.5 [0.335], 6 [0.236]. 3D view shows a black battery with a red terminal.

T11 Terminal Brass Coated With Tin; Threaded Insert 8mm STUD
Torque: 11~14.7 N*m(97.28 ~ 130.0 in*lbs)

Technical drawing shows dimensions: 20 [0.787], 6 [0.236], M8 [0.315]. 3D view shows a black battery with a red terminal.

T12 Terminal Brass Coated With Tin; Threaded Insert 5mm STUD
Torque: 2.0 ~ 3.0 N*m(17.69 ~ 26.53 in*lbs)

Technical drawing shows dimensions: 12 [0.472], 6 [0.236], M5 [0.197]. 3D view shows a black battery with a red terminal.

T13 Terminal Brass Coated With Tin; Threaded Insert 6mm STUD
Torque: 3.9 ~ 5.4 N*m(34.39 ~ 47.75 in*lbs)

Technical drawing shows dimensions: 19 [0.748], 4 [0.157], M6 [0.236], 21 [0.827]. 3D view shows a black battery with a red terminal.

T14-1 Positive Lead
Torque: 11 ~ 14.7 N*m(97.28 ~ 130.0 in*lbs)

Technical drawing shows dimensions: 17.4 [0.685], 13 [0.512], 10 [0.394], 18 [0.709], 22 [0.866], 8.5 [0.335], 9 [0.354]. 3D view shows a black battery with a red terminal.

T14-2 Negative Lead
Torque: 11 ~ 14.7 N*m(97.28 ~ 130.0 in*lbs)

Technical drawing shows dimensions: 15.9 [0.626], 13 [0.512], 10 [0.394], 18 [0.709], 22 [0.866], 8.5 [0.335], 9 [0.354]. 3D view shows a black battery with a red terminal.

Spring Terminal Spring Steel Fully Collapsible

Technical drawing shows dimensions: 9 [0.354], 18 [0.708]. 3D view shows a black battery with a red terminal and a spring.

Connector Toy Battery Connector H-Connector

Technical drawing shows dimensions: 13.5, 8.6, 22, 20. 3D view shows a black battery with a red terminal and a connector.

Note: the figures below just show the appearance and dimension.
For the positioning on each battery model, please check the specification on www.leoch.com.

VALVE REGULATED LEAD-ACID BATTERY, RECHARGABLE

MAINTENANCE-FREE, SEALED WITH AGM SEPARATOR

LP SERIES GENERAL PURPOSE



General Features

- ◆ **Wide capacity coverage:** battery capacity from 0.8Ah to 3000Ah;
- ◆ **Using oxygen recombination technology:** maintenance-free;
- ◆ Grid use multi element lead-calcium alloy, with less water loss and long battery life;
- ◆ The battery pole adopt the patented technology of multi-layer sealing, the terminals are sealed reliably;
- ◆ **High quality AGM separator:** extend cycle life and prevent micro short circuit;
- ◆ **ABS material:** increase the strength of battery container. (Flame-retardant ABS is optional);
- ◆ **High purity raw material:** ensure low self discharge rate and Low energy consumption;
- ◆ Silver-coated copper terminals (T1, T2 terminal), brass insert terminals and lead terminals improve the electric conductivity.

Typical Applications

- ◆ All Purpose
- ◆ Emergency Light
- ◆ Aircraft Signal
- ◆ DC Power Supply
- ◆ Uninterruptable Power Supply (UPS)
- ◆ Emergency Backup Power Supply
- ◆ Electronic Apparatus and Equipment
- ◆ Communication Power Supply
- ◆ Electric Power System (EPS)
- ◆ Railway Signal
- ◆ Alarm and Security System
- ◆ Auto Control System

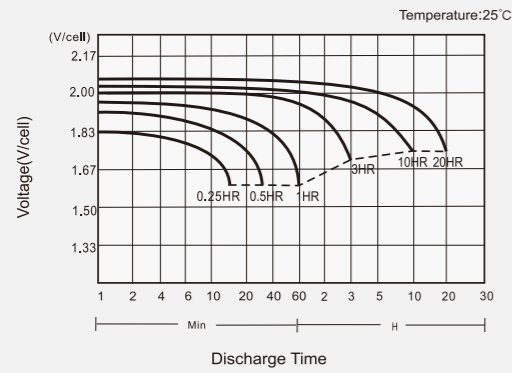
LP Models and Parameters (Small Size)

Model	Rated Voltage (V)	Rated Capacity (Ah)	Approx Dimension								Gross Weight		Type
			Length		Width		Height		Total Height				
		20HR	1.75V/cell	mm	in.	mm	in.	mm	in.	mm	in.	Kg	
LP4-4.0	4	4	47.5	1.87	47.5	1.87	100	3.94	106	4.17	0.48	1.06	T1
LP4-4.5	4	4.5	52.5	2.07	48	1.89	94	3.70	100	3.94	0.6	1.32	T1/T2
LP4-10	4	10	101.5	4.00	50	1.97	93	3.66	99	3.90	1.14	2.51	T1/T2
LP6-1.0	6	1	51	2.01	42	1.65	51	2.01	57	2.24	0.25	0.55	T1
LP6-1.2	6	1.2	97	3.82	24	0.94	51.5	2.03	57.5	2.26	0.29	0.64	T1
LP6-2.0	6	2	43	1.69	37	1.46	76	2.99	76	2.99	0.33	0.73	/
LP6-2.8	6	2.8	66	2.60	33	1.30	97	3.82	103	4.06	0.55	1.21	T1
LP6-3.2	6	3.5	134	5.28	34	1.34	60	2.36	66	2.60	0.6	1.32	T1
LP6-4.0	6	4	70	2.76	47	1.85	100	3.94	106	4.17	0.65	1.43	T1/T2
LP6-4.5	6	4.5	70	2.76	47	1.85	100	3.94	106	4.17	0.74	1.63	T1/T2
LP6-4.5H	6	4.5	70	2.76	47	1.85	100	3.94	106	4.17	0.72	1.59	T1/T2
LP6-4.5S	6	4.5	67	2.64	67	2.64	96	3.78	109	4.29	0.78	1.72	Spring
LP6-5.0	6	5	169.5	6.67	34.5	1.36	70	2.76	74	2.91	0.89	1.96	T1
LP6-5.4	6	5.4	70	2.76	47	1.85	100	3.94	106	4.17	0.8	1.76	T1/T2
LP6-6.0	6	6	70	2.76	47	1.85	100	3.94	106	4.17	0.9	1.98	T1/T2
LP6-7.0	6	7	150	5.91	34	1.34	94	3.70	100	3.94	1	2.20	T1/T2
LP6-7.2	6	7.2	150	5.91	34	1.34	94	3.70	100	3.94	1.05	2.31	T1/T2
LP6-7.5	6	7.5	150	5.91	34	1.34	94	3.70	100	3.94	1.26	2.78	T1/T2

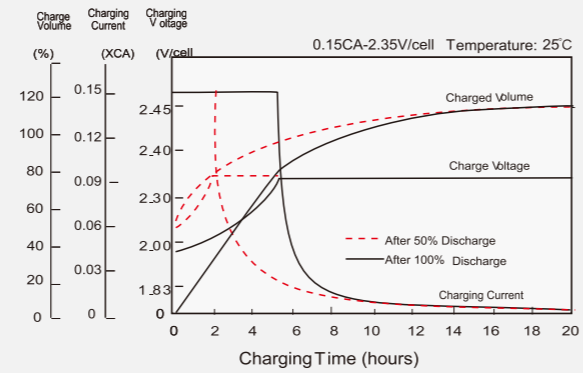
Model	Rated Voltage (V)	Rated Capacity (Ah)	Approx Dimension								Gross Weight		Type
			Length		Width		Height		Total Height				
		20HR	1.75V/cell	mm	in.	mm	in.	mm	in.	mm	in.	Kg	
LP6-7.8	6	8	150	5.91	34	1.34	94	3.70	100	3.94	1.28	2.82	T1/T2
LP6-8.5	6	8.5	150	5.91	34	1.34	94	3.70	100	3.94	1.2	2.65	T1/T2
LP6-8.5H	6	8.5	98	3.86	56	2.20	118	4.65	119.5	4.70	1.42	3.13	T1/T2
LP6-10	6	10	151	5.94	50.5	1.99	94	3.70	100	3.94	1.54	3.40	T1/T2
LP6-12	6	12	151	5.94	50.5	1.99	94	3.70	100	3.94	1.6	3.53	T1/T2
LP6-13	6	13	107.5	4.23	70	2.76	140	5.51	140	5.51	2.24	4.94	NT1/PT2
LP6-14	6	14	151	5.94	50.5	1.99	94	3.70	100	3.94	1.9	4.19	T1/T2
LP6-20	6	20	157	6.18	83	3.27	125	4.92	125	4.92	3.3	7.28	T3-A
LP6-36	6	36	161	6.34	87	3.43	163	6.42	169	6.65	5.12	11.29	T2
LP8-3.2	8	3.2	134	5.28	36.5	1.44	63	2.48	69	2.72	0.75	1.65	T1
LP12-0.8	12	0.8	96	3.78	25	0.98	62	2.44	62	2.44	0.33	0.73	/
LP12-1.2	12	1.2	97	3.82	43	1.69	52	2.05	58	2.28	0.52	1.15	T1
LP12-1.9	12	1.9	178	7.01	35	1.38	60	2.36	66	2.60	0.85	1.87	T1
LP12-2.2	12	2.2	70.5	2.78	47.5	1.87	97	3.82	103	4.06	0.78	1.72	T1
LP12-2.3	12	2.3	178	7.01	35	1.38	60	2.36	66	2.60	0.93	2.05	T1
LP12-2.8	12	2.8	132.5	5.22	33.5	1.32	98	3.86	104	4.09	1.1	2.43	T1
LP12-2.9	12	2.9	79	3.11	56	2.20	99	3.90	105	4.13	1.1	2.43	T1
LP12-3.5	12	3.5	134	5.28	67	2.64	59.5	2.34	65.5	2.58	1.19	2.62	T1/T2
LP12-4.0	12	4	90	3.54	70	2.76	101	3.98	107	4.21	1.26	2.78	T1/T2
LP12-4.0L	12	4	195	7.68	47	1.85	70	2.76	76	2.99	1.5	3.30	T1/T2
LP12-4.5	12	4.5	90	3.54	70	2.76	101	3.98	107	4.21	1.44	3.17	T1/T2
LP12-5.0	12	5	151	5.94	53	2.09	93	3.66	99	3.90	1.73	3.81	T1/T2
LP12-5.4	12	5.4	90	3.54	70	2.76	101	3.98	107	4.21	1.72	3.79	T1/T2
LP12-6.0	12	6	90	3.54	70	2.76	101	3.98	107	4.21	1.82	4.01	T1/T2
LP12-6.5	12	6.5	151	5.94	51	2.01	93	3.66	99	3.90	1.82	4.01	T1/T2
LP12-7.0E	12	6	151	5.94	65	2.56	93.5	3.68	99.5	3.92	1.81	3.99	T1/T2
LP12-7.0	12	7	151	5.94	65	2.56	93.5	3.68	99.5	3.92	2.03	4.47	T1/T2
LP12-7.5	12	7.5	151	5.94	65	2.56	93.5	3.68	99.5	3.92	2.28	5.03	T1/T2
LP12-8.0	12	8	151	5.94	65	2.56	93.5	3.68	99.5	3.92	2.5	5.51	T1/T2
LP12-8.5	12	8.5	151	5.94	65	2.56	93.5	3.68	99.5	3.92	2.45	5.40	T1/T2
LP12-9.0	12	9	151	5.94	65	2.56	93.5	3.68	99.5	3.92	2.52	5.56	T1/T2
LP12-10	12	10	151	5.94	98	3.86	95	3.74	101	3.98	3.06	6.75	T1/T2
LP12-10H	12	10	151	5.94	65	2.56	111	4.37	117	4.61	3.07	6.77	T1/T2
LP12-12	12	12	151	5.94	98	3.86	95	3.74	101	3.98	3.24	7.14	T1/T2
LP12-14	12	14	151	5.94	98	3.86	95	3.74	101	3.98	3.78	8.33	T1/T2
LP12-15	12	15	181.5	7.15	76.5	3.01	167.5	6.59	167.5	6.59	4.7	10.36	T3/T2
LP12-18	12	18	181.5	7.15	76.5	3.01	167.5	6.59	167.5	6.59	4.85	10.69	T12(M5)
LP12-20	12	20	181.5	7.15	76.5	3.01	167.5	6.59	167.5	6.59	5.65	12.46	T12/T12-I(M5)
LP12-24	12	24	166	6.54	175	6.89	125	4.92	125	4.92	7.2	15.87	T3
LP12-24H	12	24	164	6.46	125	4.92	174	6.85	174	6.85	7.6	16.75	T12-I(M5)
LP12-26	12	26	166	6.54	175	6.89	125	4.92	125	4.92	7.8	17.20	T12/T12-I(M5)
LP12-28	12	28	166	6.54	175	6.89	125	4.92	125	4.92	8.2	18.08	T3
LP12-28H	12	28	164	6.46	125	4.92	174	6.85	174	6.85	9.1	20.06	T12/T12-I(M5)
LP12-30	12	30	195	7.68	130	5.12	164	6.46	167	6.57	9.3	20.50	T6-I(M6)
LP12-30H	12	30	195	7.68	130	5.12	164	6.46	178	7.01	9.3	20.50	T5
LP12-33	12	33	195	7.68	130	5.12	164	6.46	167	6.57	9.8	21.61	T6-I(M6)
LP12-35	12	35	195	7.68	130	5.12	164	6.46	178	7.01	10.7	23.59	T5

Characteristics curves

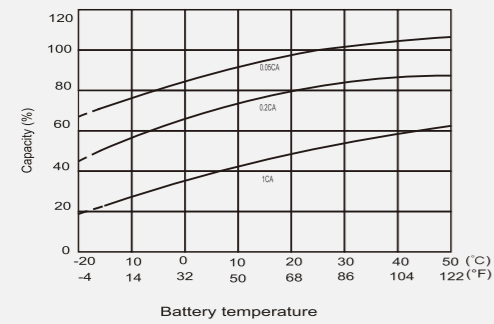
DISCHARGE CHARACTERISTICS



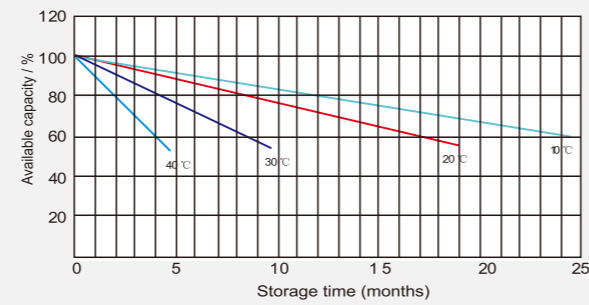
CHARGING CHARACTERISTICS



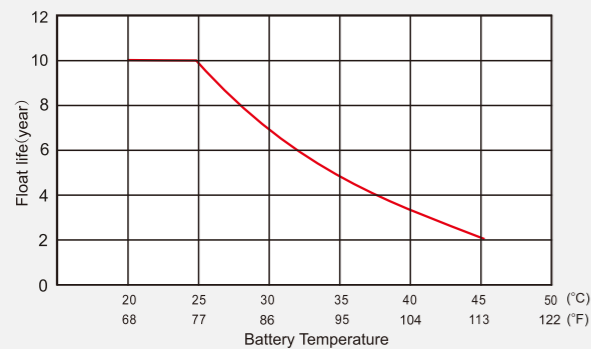
EFFECTS OF TEMPERATURE ON CAPACITY



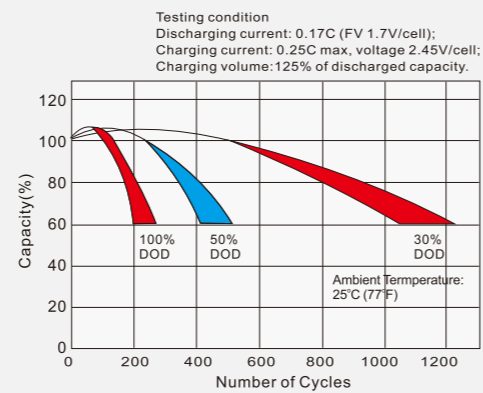
SELF DISCHARGE CHARACTERISTICS



FLOAT SERVICE LIFE



CYCLE SERVICE LIFE IN RELATION TO THE DEPTH OF DISCHARGE



LP Models and Parameters(Middle Size)

Typical Applications

- ◆ Data Center
- ◆ Communication System
- ◆ Electricity
- ◆ UPS/EPS
- ◆ Rail Transport
- ◆ Energy Storage

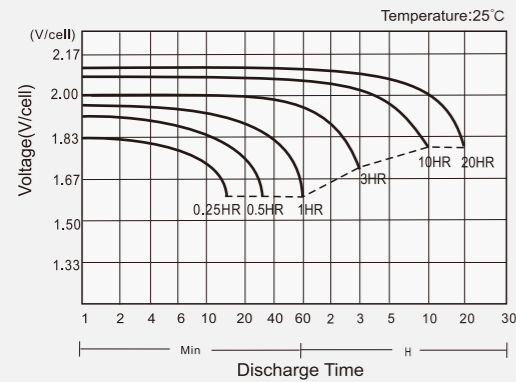
Model	Rated Voltage (V)	Rated Capacity(Ah)		Approx Dimension						Gross Weight		Type		
		10HR	20HR	Length		Width		Height		Total Height				
				mm	in.	mm	in.	mm	in.	mm	in.		Kg	Lbs.
LP6-60	6	60	61.8	185	7.28	112	4.41	205	8.07	205	8.07	9.1	20.06	T2
LP6-200	6	200	208	322	12.68	178	7.01	226	8.90	232	9.13	30.3	66.80	T11(M8)
LP12-38	12	38	40	197	7.76	165	6.50	170	6.69	170	6.69	12	26.46	T6(M6)
LP12-40	12	40	42	197	7.76	165	6.50	170	6.69	170	6.69	13.7	30.20	T6(M6)
LP12-45	12	45	47.8	197	7.76	165	6.50	170	6.69	170	6.69	14.2	31.31	T6(M6)
LP12-50	12	50	52.6	257	10.12	132	5.20	200	7.87	200	7.87	15.7	34.61	T6(M6)
LP12-55	12	55	57.8	229	9.02	138	5.43	205	8.07	211	8.31	16.2	35.71	T6(M6)
LP12-60	12	60	62.4	260	10.24	168	6.61	208	8.19	214	8.43	18.4	40.56	T6(M6)
LP12-65	12	65	69	348	13.70	167	6.57	178	7.01	178	7.01	19.2	42.33	T6(M6)
LP12-70	12	70	73.6	348	13.70	167	6.57	178	7.01	178	7.01	21.4	47.18	T6(M6)
LP12-75	12	75	78.2	260	10.24	168	6.61	208	8.19	214	8.43	22.3	49.16	T6(M6)
LP12-80	12	80	85.6	260	10.24	168	6.61	208	8.19	214	8.43	27.6	52.47	T6(M6)
LP12-90	12	90	99	330	12.99	173	6.81	212	8.34	220	8.66	27.8	61.29	T11(M8)
LP12-100	12	100	103	330	12.99	173	6.81	213	8.39	220	8.66	28.5	62.83	T11(M8)
LP12-120	12	120	123.4	408	16.06	177	6.97	225	8.86	225	8.86	35	77.16	T11(M8)
LP12-140	12	140	144	345	13.58	172	6.77	274	10.79	280	11.02	42.1	92.81	T11(M8)
LP12-150	12	150	157.6	483	19.02	170	6.69	238.5	9.39	238.5	9.39	42.7	94.13	T11(M8)
LP12-180	12	180	189	520	20.47	207	8.15	220	8.66	226	8.90	50.3	110.89	T11(M8)
LP12-200	12	200	208	522	20.55	240	9.45	220	8.66	226	8.90	59	130.07	T11(M8)
LP12-225	12	225	242	522	20.55	240	9.45	220	8.66	226	8.90	63.5	139.99	T11(M8)
LP12-250	12	250	262	522	20.55	268	10.55	220	8.66	226	8.90	70.6	155.64	T11(M8)

**SUCCESS FROM HARD WORK
BUSINESS NEEDS GOOD MORALITY**

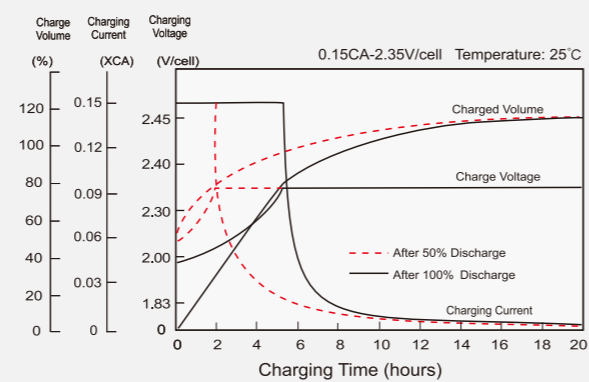


Characteristics curves

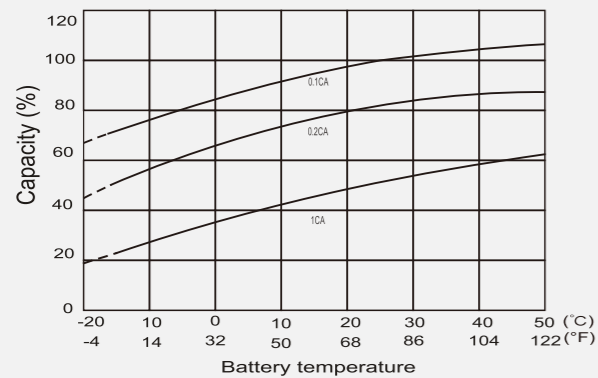
DISCHARGE CHARACTERISTICS



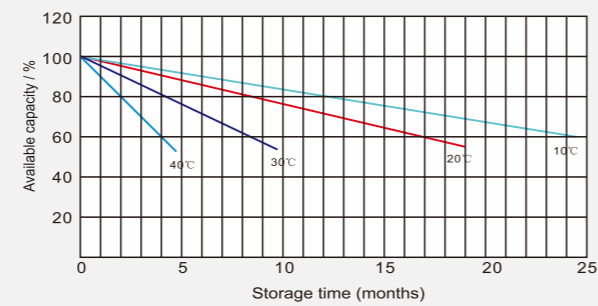
CHARGING CHARACTERISTICS



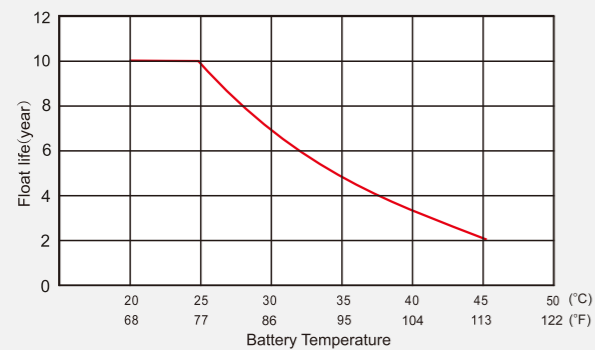
EFFECTS OF TEMPERATURE ON CAPACITY



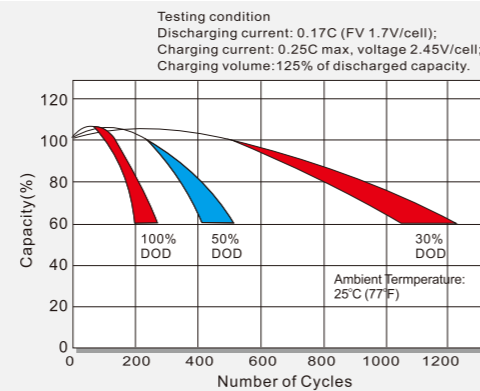
SELF DISCHARGE CHARACTERISTICS



EFFECT OF TEMPERATURE ON LONG TERM FLOAT LIFE



CYCLE SERVICE LIFE IN RELATION TO THE DEPTH OF DISCHARGE



LP II Models and Parameters(2V Series)

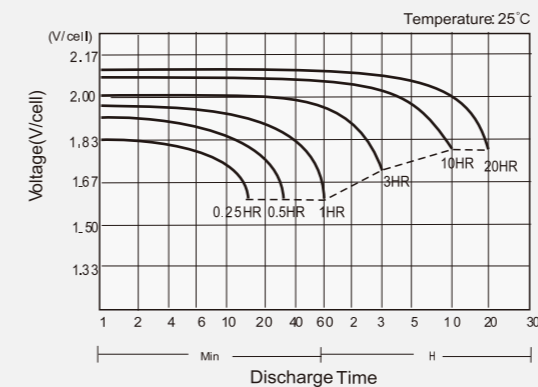
Typical Applications

- ◆ Data Center
- ◆ Communication System
- ◆ Electricity
- ◆ UPS/EPS
- ◆ Rail Transport
- ◆ Energy Storage

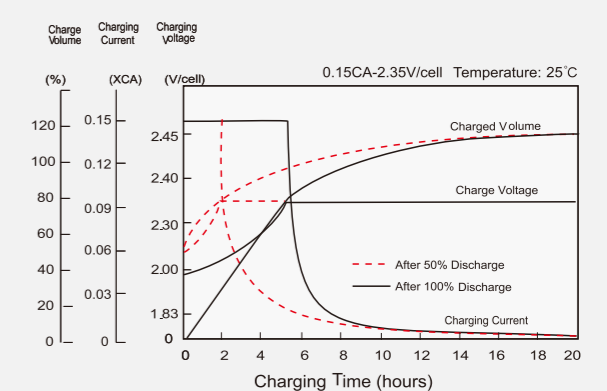
Model	Rated Voltage (V)	Rated Capacity (Ah)	Approx Dimension								Gross Weight		Type
			Length		Width		Height		Total Height		Kg	Lbs.	
			10HR	mm	in.	mm	in.	mm	in.	mm			
LP2-65	2	65	170	6.69	72	2.83	205	8.07	214	8.43	4.2	9.26	T6(M6)
LP2-100	2	100	170	6.69	72	2.83	205	8.07	214	8.43	5.7	12.57	T6(M6)
LP2-120	2	120	170	6.69	98	3.86	205	8.07	214	8.43	7	15.43	T7(M6)
LP2-150	2	150	170	6.69	98	3.86	205	8.07	214	8.43	8.4	18.51	T7(M6)
LP2-200	2	200	170	6.69	110	4.33	328	12.91	348	13.70	12.4	27.33	T11(M8)
LP2-250	2	250	170	6.69	110	4.33	328	12.91	350	13.78	14	30.86	T11(M8)
LP2-300	2	300	170	6.69	150	5.91	328	12.91	348	13.70	17.3	38.13	T11(M8)
LP2-350	2	350	170	6.69	150	5.91	328	12.91	348	13.70	19.2	42.32	T11(M8)
LP2-400	2	400	210	8.27	175	6.89	330	12.99	350	13.78	23.8	52.47	T11(M8)
LP2-450	2	450	210	8.27	175	6.89	330	12.99	350	13.78	26	57.32	T11(M8)
LP2-500	2	500	240	9.45	175	6.89	330	12.99	350	13.78	28.3	62.39	T11(M8)
LP2-600	2	600	300	11.81	175	6.89	330	12.99	350	13.78	35	77.16	T11(M8)
LP2-800	2	800	410	16.14	175	6.89	330	12.99	350	13.78	47.4	104.49	T11(M8)
LP2-1000	2	1000	475	18.70	175	6.89	328	12.91	350	13.78	56.5	124.56	T11(M8)
LP2-1200	2	1200	475	18.70	175	6.89	328	12.91	350	13.78	63.8	140.65	T11(M8)
LP2-2500	2	2500	490	19.29	350	13.78	339	13.35	349	13.74	133	293.21	T11(M8)

Characteristics curves

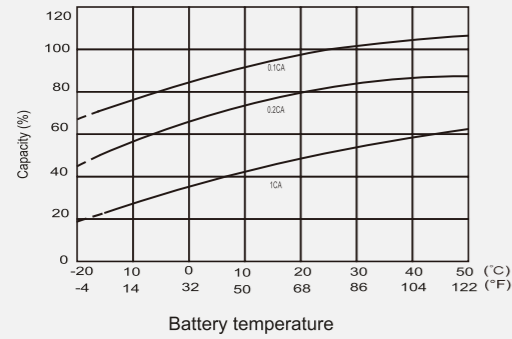
DISCHARGE CHARACTERISTICS



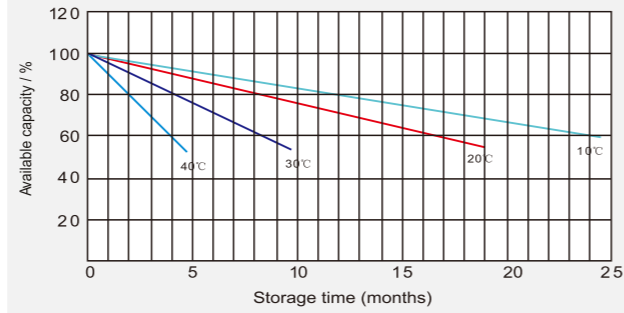
CHARGING CHARACTERISTICS



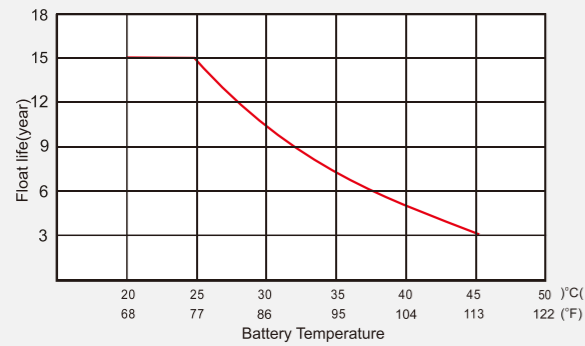
EFFECTS OF TEMPERATURE ON CAPACITY



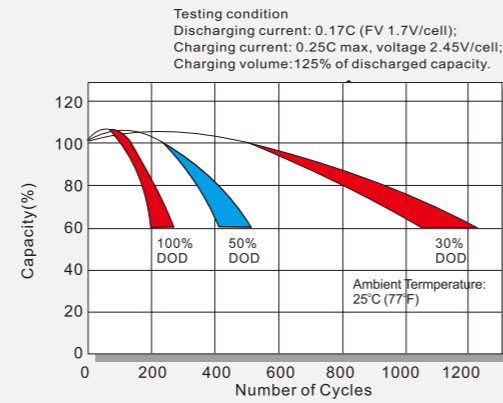
SELF DISCHARGE CHARACTERISTICS



EFFECT OF TEMPERATURE ON LONG TERM FLOAT LIFE



CYCLE SERVICE LIFE IN RELATION TO THE DEPTH OF DISCHARGE



LCP SERIES-PUNCH BATTERY

General Features

- ◆ Punching structure grid, with strong current conduction capability
- ◆ Better battery consistency, suitable for group connection use
- ◆ High power density, stronger overcurrent capability, and good high-power discharge performance
- ◆ High tin alloy grid, improve corrosion resistance, extend battery life

Typical Applications

- ◆ UPS
- ◆ Alarm and security system
- ◆ Emergency backup power supply
- ◆ Auto control system
- ◆ Communication power supply
- ◆ DC power supply

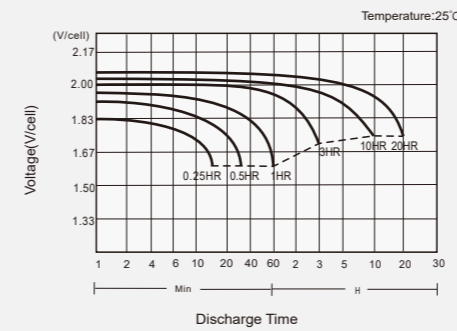


LCP Models and Parameters

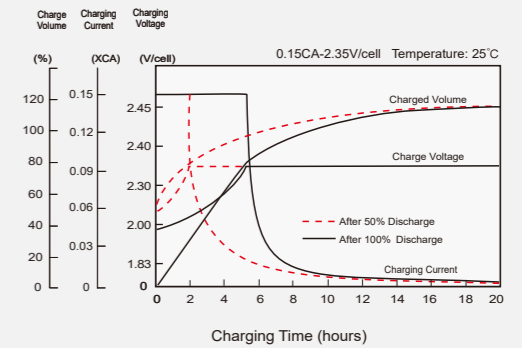
Model	Rated Voltage (V)	W15min @1.67 V/cell	20hr@ 1.75V/cell	Approx Dimension				Gross Weight (Kg)	IR(mΩ)	Type
				Length (mm)	Width (mm)	Height (mm)	Total Height (mm)			
LCP6-22W	6	22	7	150	34	94	100	1	17	T1/T2
LCP6-24W	6	24	7	150	34	94	100	1.07	15	T1/T2
LCP12-19W	12	19	5.5	151	51	93	99	1.75	30	T1/T2
LCP12-22W	12	22	7	151	65	93.5	99.5	1.82	34	T1/T2
LCP12-24W	12	24	7	151	65	93.5	99.5	2.13	31	T1/T2
LCP12-26W	12	26	7	151	65	93.5	99.5	2.17	25	T1/T2
LCP12-28W	12	28	7.5	151	65	93.5	99.5	2.24	23	T1/T2
LCP12-32W	12	32	8	151	65	93.5	99.5	2.31	19	T1/T2
LCP12-34W	12	34	8	151	65	93.5	99.5	2.35	21	T1/T2
LCP12-36W	12	36	9	151	65	93.5	99.5	2.46	16	T1/T2
LCP12-40W	12	40	12	151	98	95	101	3.38	18	T1/T2
LCP12-42W	12	42	12	151	98	95	101	3.48	17	T1/T2
LCP12-50W	12	50	14	151	98	95	101	3.58	16	T1/T2

Characteristics curves

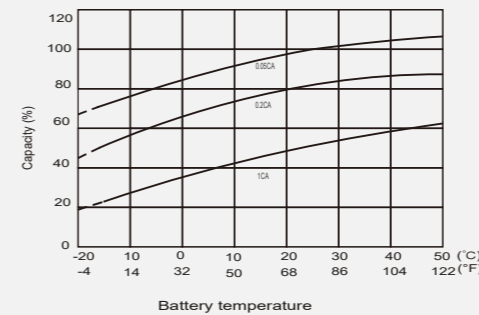
DISCHARGE CHARACTERISTICS



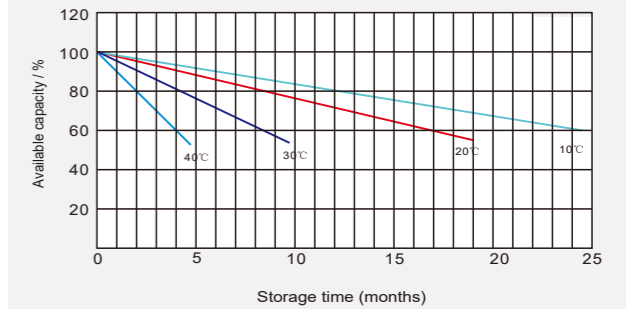
CHARGING CHARACTERISTICS



EFFECTS OF TEMPERATURE ON CAPACITY



SELF DISCHARGE CHARACTERISTICS



LPL SERIES LONG LIFE STANDBY

General Features

- ◆ Special grid alloy and high purity raw material ensure less gassing, less self-discharging
- ◆ Grid refining technology and the thicker plates are used to extend the battery standby life and reduce the plate grid corrosion speed
- ◆ Lower acid density, excess of electrolyte and larger distance between plates to keep battery at low temperature and slow down plate grid corrosion speed
- ◆ **Using oxygen recombination technology:** maintenance-free
- ◆ **ABS material:** increase the strength of battery container. (Flame-retardant ABS is optional)
- ◆ **Unique vent valve design:** control water losing, prevent air and spark going inside



Typical Applications

- ◆ UPS and EPS
- ◆ Emergency lightp
- ◆ Railway signal and aircraft signal system
- ◆ Marine and power stations
- ◆ Alarm and security system
- ◆ Communication power supply, DC power supply
- ◆ Electronic apparatus and equipment

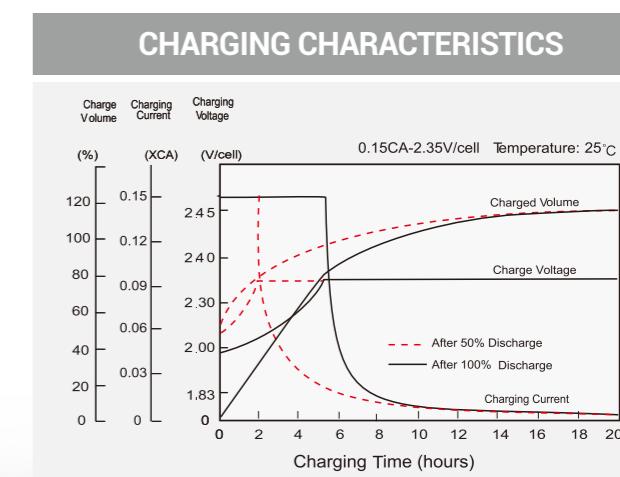
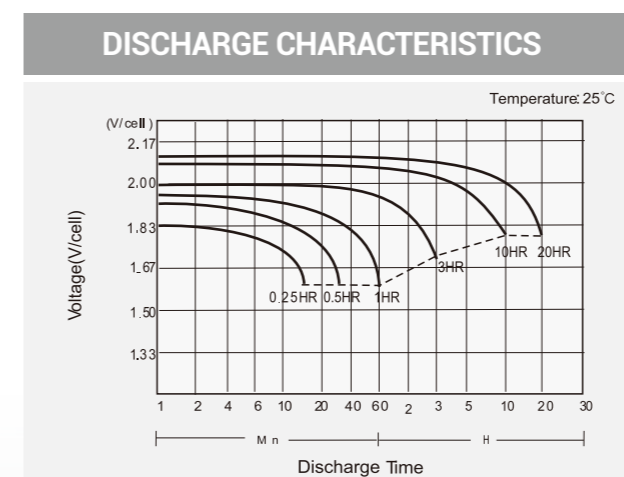
LPL Models and Parameters(Small Size)

Model	Rated Voltage (V)	Rated Capacity (Ah)	Approx Dimension								Gross Weight		Type
			Length		Width		Height		Total Height		Kg	Lbs.	
			mm	in.	mm	in.	mm	in.	mm	in.			
LPL6-6.5	6	6.5	150	5.91	34	1.34	94	3.70	100	3.94	1.26	2.78	T1/T2
LPL6-9.0	6	9	151	5.94	50.5	1.99	94	3.70	100	3.94	1.70	3.75	T1/T2
LPL6-11	6	11	151	5.94	50.5	1.99	94	3.70	100	3.94	1.95	4.30	T1/T2
LPL6-18	6	18	157	6.18	83	3.27	125	4.92	125	4.92	3.30	7.28	T3-A
LPL12-7.0	12	7	151	5.94	65	2.56	93.5	3.68	99.5	3.92	2.43	5.36	T1/T2
LPL12-12	12	12	151	5.94	98	3.86	95	3.74	101	3.98	3.87	8.53	T1/T2
LPL12-18	12	18	181.5	7.15	76.5	3.01	167.5	6.59	167.5	6.59	5.70	12.57	T3
LPL12-24	12	24	166	6.54	175	6.89	125	4.92	125	4.92	7.60	16.75	T12/T12-I(M5)
LPL12-28H	12	28	164	6.46	125	4.92	176	6.93	176	6.93	9.10	20.06	T3-A/T2
LPL12-28	12	28	166	6.54	175	6.89	125	4.92	125	4.92	8.20	18.08	T12/T12-I(M5)

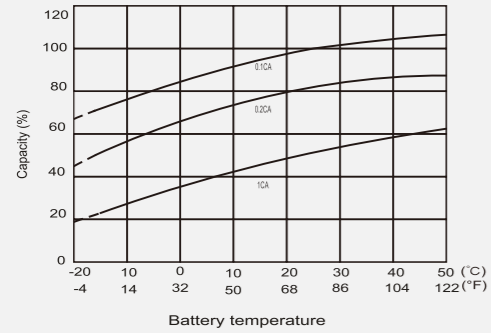
LPL Models and Parameters(Small Size)

Model	Rated Voltage (V)	Rated Capacity (Ah)	Approx Dimension								Gross Weight		Type
			Length		Width		Height		Total Height		Kg	Lbs.	
			mm	in.	mm	in.	mm	in.	mm	in.			
LPL6-180	6	180	306	12.05	168	6.61	222	8.74	228	8.98	30.3	66.80	T8(M6)
LPL12-38	12	38	197	7.76	165	6.50	170	6.69	170	6.69	12.7	28.00	T6(M6)
LPL12-40	12	40	197	7.76	165	6.50	170	6.69	170	6.69	14.5	31.97	T6(M6)
LPL12-45	12	45	197	7.76	165	6.50	170	6.69	170	6.69	14.2	31.31	T6(M6)
LPL12-55	12	55	229	9.02	138	5.43	210	8.27	230	9.06	18	39.68	T9
LPL12-60	12	60	260	10.24	168	6.61	210	8.27	216	8.50	20.7	45.64	T6(M6)
LPL12-65	12	65	348	13.70	167	6.57	178	7.01	178	7.01	21	46.30	T6(M6)
LPL12-70	12	70	348	13.70	167	6.57	178	7.01	178	7.01	23.1	50.93	T6(M6)
LPL12-90(P)	12	90	330	12.99	173	6.81	213	8.39	220	8.66	27.1	59.74	T11(M8)
LPL12-100(P)	12	100	330	12.99	173	6.81	213	8.39	220	8.66	28.2	62.17	T11(M8)
LPL12-75	12	75	260	10.24	168	6.61	208	8.19	214	8.43	22.7	50.04	T6(M6)
LPL12-90H	12	90	330	12.99	173	6.81	212	8.35	220	8.66	29.5	65.04	T11(M8)
LPL12-100	12	100	330	12.99	173	6.81	212	8.35	220	8.66	30.5	67.24	T11(M8)
LPL12-120	12	120	408	16.06	177	6.97	225	8.86	225	8.86	36.3	80.03	T11(M8)
LPL12-150	12	150	483	19.02	170	6.69	238.5	9.39	238.5	9.39	46.5	102.51	T11(M8)
LPL12-200	12	200	522	20.55	240	9.45	218	8.58	224	8.82	62.3	137.35	T11(M8)
LPL12-225	12	225	522	20.55	268	10.55	220	8.66	226	8.90	70.5	155.42	T11(M8)
LPL12-250	12	250	522	20.55	268	10.55	220	8.66	226	8.90	76.5	168.65	T11(M8)

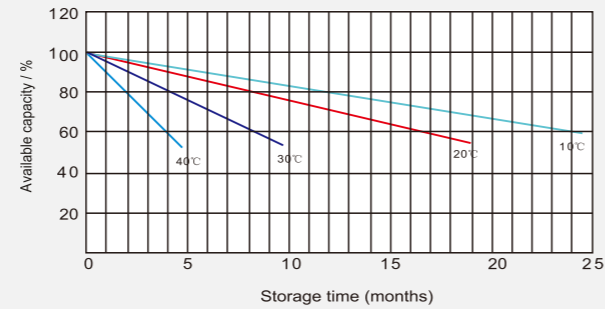
Characteristics curves



EFFECTS OF TEMPERATURE ON CAPACITY

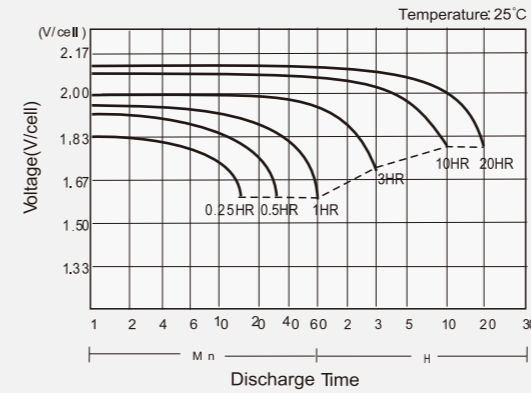


SELF DISCHARGE CHARACTERISTICS

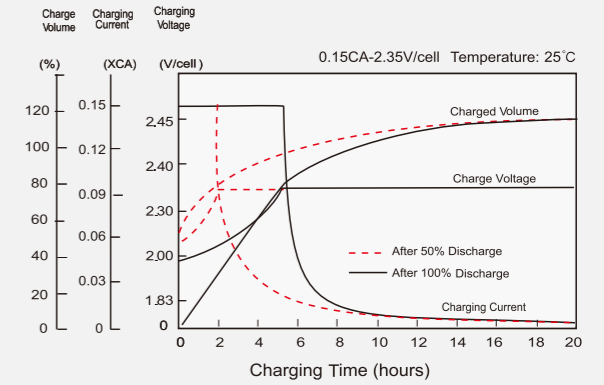


Characteristics curves

DISCHARGE CHARACTERISTICS



CHARGING CHARACTERISTICS

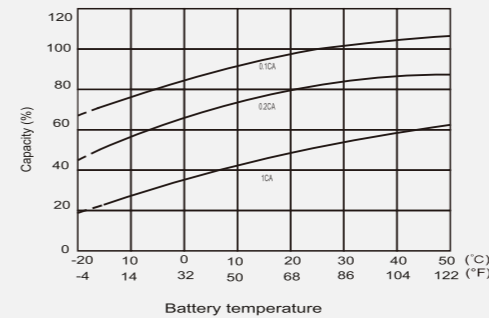


LPL II Models and Parameters(2V Series)

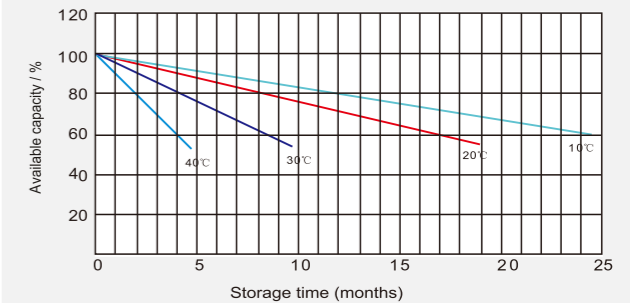
Typical Applications

- ◆ Tele-communication central station(wired or cellular)
- ◆ Network communication including: data transmission, television signal transmission, etc.
- ◆ Power system communication, military communication, etc.
- ◆ Uninterruptable Power System(UPS- for Telecom)
- ◆ EPS

EFFECTS OF TEMPERATURE ON CAPACITY



SELF DISCHARGE CHARACTERISTICS



Model	Rated Voltage (V)	Rated Capacity (Ah)	Approx Dimension								Gross Weight		Type
			Length		Width		Height		Total Height		Kg	Lbs.	
			10HR	1.80V/cell	mm	in.	mm	in.	mm	in.			
LPL2-100	2	100	170	6.69	72	2.83	205	8.07	214	8.43	5.70	12.57	T6(M6)
LPL2-200	2	200	170	6.69	110	4.33	328	12.91	348	13.70	13.40	29.54	T11(M8)
LPL2-300	2	300	170	6.69	150	5.91	328	12.91	348	13.70	18.60	41.01	T11(M8)
LPL2-400	2	400	210	8.27	175	6.89	330	12.99	350	13.78	25.50	56.22	T11(M8)
LPL2-500	2	500	240	9.45	175	6.89	330	12.99	350	13.78	30.00	66.14	T11(M8)
LPL2-600	2	600	300	11.81	175	6.89	330	12.99	350	13.78	37.00	81.57	T11(M8)
LPL2-800	2	800	410	16.14	175	6.89	330	12.99	350	13.78	50.40	111.11	T11(M8)
LPL2-1000	2	1000	475	18.70	175	6.89	328	12.91	350	13.78	60.00	132.28	T11(M8)
LPL2-200M	2	200	90	3.54	181	7.13	350	13.78	365	14.37	12.40	27.34	T11(M8)
LPL2-300M	2	300	124	4.88	181	7.13	350	13.78	365	14.37	18.00	39.68	T11(M8)
LPL2-400M	2	400	158	6.22	181	7.13	350	13.78	365	14.37	22.70	50.04	T11(M8)
LPL2-500M	2	500	191	7.52	181	7.13	350	13.78	365	14.37	28.40	62.61	T11(M8)
LPL2-600M	2	600	225	8.86	181	7.13	350	13.78	365	14.37	33.10	72.97	T11(M8)
LPL2-800M	2	800	303	11.93	181	7.13	350	13.78	365	14.37	44.50	98.10	T11(M8)
LPL2-1000M	2	1000	370	14.57	181	7.13	350	13.78	365	14.37	55.80	123.02	T11(M8)
LPL2-1500M	2	1500	355	13.98	337	13.27	330	12.99	342	13.46	89.70	197.75	T11(M8)
LPL2-1600M	2	1600	355	13.98	337	13.27	330	12.99	342	13.46	91.70	202.16	T11(M8)
LPL2-2000M	2	2000	476	18.74	337	13.27	330	12.99	342	13.46	118.70	261.69	T11(M8)
LPL2-3000M	2	3000	697	27.44	340	13.39	330	12.99	342	13.46	179.10	394.84	T11(M8)

**SUCCESS FROM HARD WORK
BUSINESS NEEDS GOOD MORALITY**



LPF SERIES FRONT TERMINAL

General Features

- ◆ Specifically ideal for 19 inch or 23 inch power cabinets
- ◆ Front terminals make the installation, maintenance and supervision easy
- ◆ Shield designs protect terminals from short circuit and show good appearance
- ◆ Unique vent valve design: reduce water losing and prevent air/spark going inside
- ◆ Thick plates, special formula of paste and plate making process for a long service life
- ◆ ABS material: increase the strength of battery container (Flame-retardant ABS is optional)



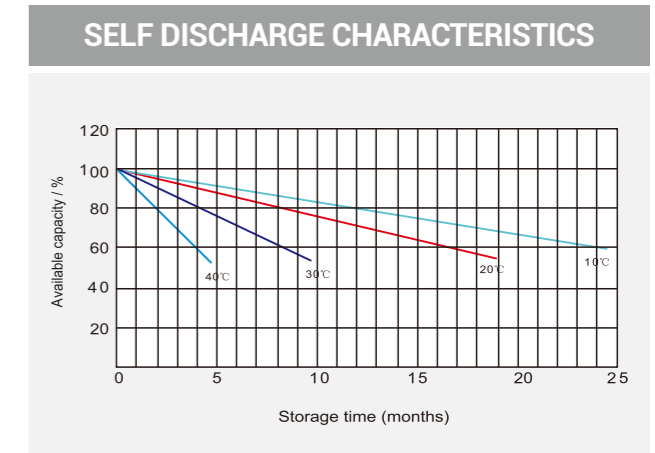
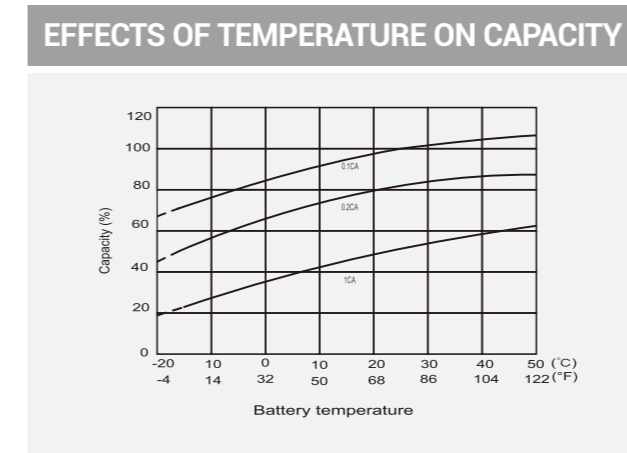
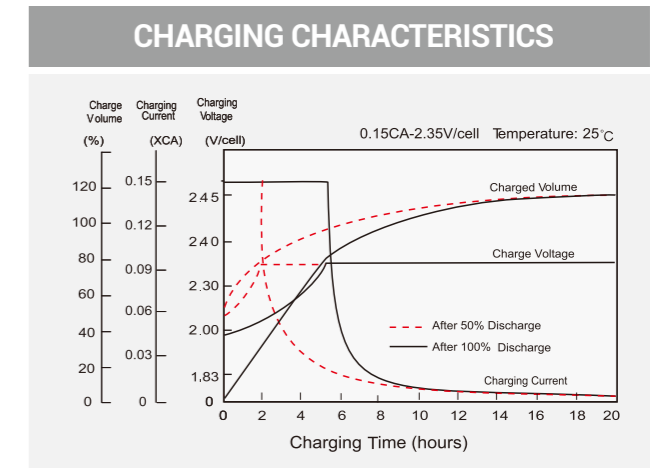
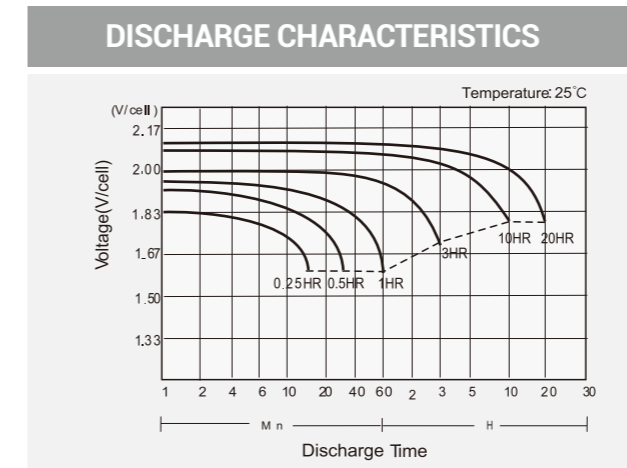
Typical Applications

- ◆ Power system of special network of local area network
- ◆ Network connection equipment of communication system
- ◆ Power station systems
- ◆ For standard power cabinet
- ◆ UPS

LPF Models and Parameters

Model	Rated Voltage (V)	Rated Capacity (Ah)	Approx Dimension								Gross Weight		Type
			Length		Width		Height		Total Height				
			10HR		mm	in.	mm	in.	mm	in.	mm	in.	
LPF12-40	12	40	277	10.91	106	4.17	222	8.74	222	8.74	14.6	32.2	T6(M6)
LPF12-50	12	50	390	15.35	105	4.13	200	7.87	200	7.87	18.5	40.8	T6(M6)
LPF12-55	12	55	277	10.91	106	4.17	222	8.74	222	8.74	17.3	38.1	T6(M6)
LPF12-70	12	70	564	22.20	114	4.49	187	7.36	187	7.36	25.5	56.2	T6(M6)
LPF12-75	12	75	564	22.20	114	4.49	187	7.36	187	7.36	26.0	57.3	T6(M6)
LPF12-90	12	90	394	15.51	110	4.33	285	11.22	285	11.22	31.0	68.3	T6(M6)
LPF12-100	12	100	394	15.51	110	4.33	286	11.26	286	11.26	31.0	68.3	T6(M6)
LPF12-100A	12	100	508	20.00	110	4.33	238.5	9.39	238.5	9.39	32.0	70.5	T13(M6)
LPF12-100(P)	12	100	405.4	15.96	108	4.25	287	11.30	287	11.30	29.8	65.7	T8(M6)
LPF12-125	12	125	551	21.69	110	4.33	288	11.34	288	11.34	41.5	91.5	T6(M6)
LPF12-150	12	150	551	21.69	110	4.33	288	11.34	288	11.34	44.8	98.8	T6(M6)
LPF12-150V	12	150	550	21.65	125	4.92	281.5	11.08	281.5	11.08	50.6	111.6	T8(M6)
LPF12-170	12	170	550	21.65	125	4.92	281.5	11.08	281.5	11.08	51.0	112.4	T8(M6)/T11(M8)
LPF12-190	12	190	560	22.05	126	4.96	320	12.60	320	12.60	57.0	125.7	T8(M6)
LPF12-190(P)	12	190	559	22.01	125	4.92	320	12.60	320	12.60	56.8	125.2	T8(M6)
LPF12-200	12	200	560	22.05	126	4.96	320	12.60	320	12.60	61.0	134.5	T11(M8)

Characteristics curves



LPC SERIES CYCLE APPLICATION

General Features

- ◆ **Excellent cycle performance**
Enhanced over-charge endurance and over-dicharge recovery ability
- ◆ **Longer Service Life**
Unique plate group configuration, high quality AGM separator and battery management system ensure battery with a longer service life
- ◆ **Upgraded Technology**
Lower acid density, excess of electrolyte and larger distance between plates to keep battery at low temperature and slow down plate grid corrosion speed
- ◆ **Maintenance-free**
Using oxygen recombination technology:maintenance-free



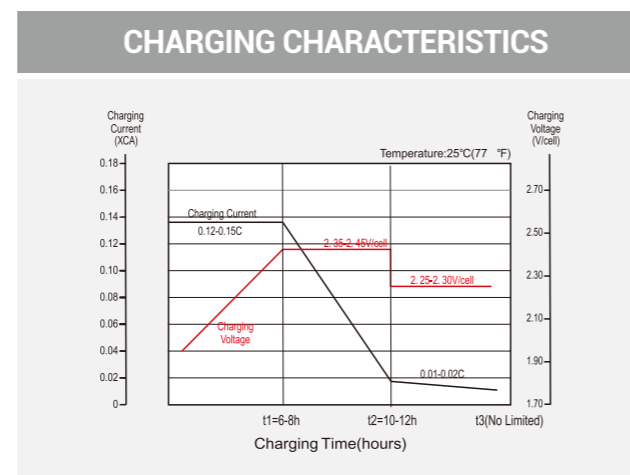
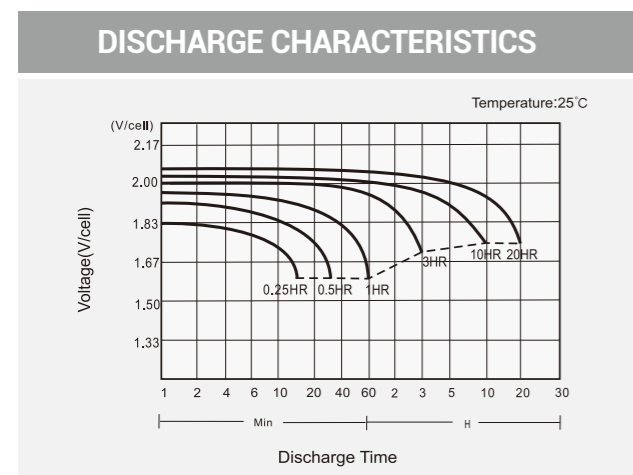
Typical Applications

- ◆ Electric wheelchair
- ◆ Mobility Scooter
- ◆ Golf trolleys
- ◆ Electric toys
- ◆ Portable power
- ◆ Portable lights and instruments

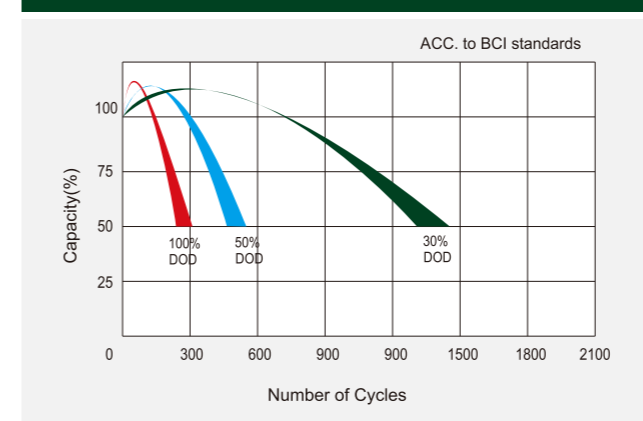
LPC Models and Parameters

Model	Rated Voltage (V)	Rated Capacity(Ah)		Approx Dimension								Gross Weight		Type
		10HR	20HR	Length		Width		Height		Total Height		Kg	Lbs.	
				1.80V/cell	1.75V/cell	mm	in.	mm	in.	mm	in.			
LPC6-5.6	6	/	5.5	70	2.76	47	1.85	100	3.94	106	4.17	0.90	1.98	T1/T2
LPC6-13	6	/	14	151	5.94	50.5	1.99	94	3.70	100	3.94	1.90	4.19	T1/T2
LPC12-3.5	12	/	3.5	134	5.28	67	2.64	59.5	2.34	65.5	2.58	1.19	2.62	T1/T2
LPC12-5.6	12	/	5.4	90	3.54	70	2.76	101	3.98	107	4.21	1.80	3.97	T1/T2
LPC12-8.0	12	/	8	151	5.94	65	2.56	93.5	3.68	99.5	3.92	2.50	5.51	T1/T2
LPC12-12	12	/	12	151	5.94	98	3.86	95	3.74	101	3.98	3.43	7.56	T1/T2
LPC12-13	12	/	14	151	5.94	98	3.86	95	3.74	101	3.98	3.78	8.33	T1/T2(P0.315/NT2)
LPC12-18	12	/	20	181.5	7.15	76.5	3.01	167.5	6.59	167.5	6.59	5.65	12.46	T3
LPC12-20	12	/	20	181.5	7.15	76.5	3.01	167.5	6.59	167.5	6.59	6.00	13.23	T12/T12-I(M5)
LPC12-24	12	/	26	166	6.54	175	6.89	126	4.96	126	4.96	8.20	18.08	T12(M5)
LPC12-24H	12	/	28	164	6.46	125	4.92	176	6.93	176	6.93	9.10	20.06	T3-A/T2
LPC12-26	12	/	26	166	6.54	175	6.89	125	4.92	125	4.92	7.80	17.20	T3
LPC12-33	12	/	33	195	7.68	130	5.12	164	6.46	178	7.01	10.2	22.38	T5
LPC12-38	12	38	/	197	7.76	165	6.50	170	6.69	170	6.69	12.0	26.46	T6(M6)
LPC12-42	12	42	/	197	7.76	165	6.50	170	6.69	170	6.69	14.6	32.19	T6(M6)
LPC12-50	12	50	/	257	10.12	132	5.20	200	7.87	200	7.87	17.6	38.80	T6(M6)
LPC12-55	12	55	/	229	9.02	138	5.43	205	8.07	211	8.31	16.2	35.71	T6(M6)
LPC12-75	12	75	/	260	10.24	168	6.61	208	8.19	214	8.43	22.3	49.16	T6(M6)
LPC12-90	12	90	/	306	12.05	168	6.61	208	8.19	214	8.43	26.8	59.08	T6(M6)
LPC12-100	12	100	/	330	12.99	173	6.81	212	8.35	220	8.66	30.6	67.46	T11(M8)
LPC12-120	12	120	/	408	16.06	177	6.97	225	8.86	225	8.86	37.3	82.23	T11(M8)
LPC12-150	12	150	/	483	19.02	170	6.69	238.5	9.39	238.5	9.39	43.2	95.24	T11(M8)

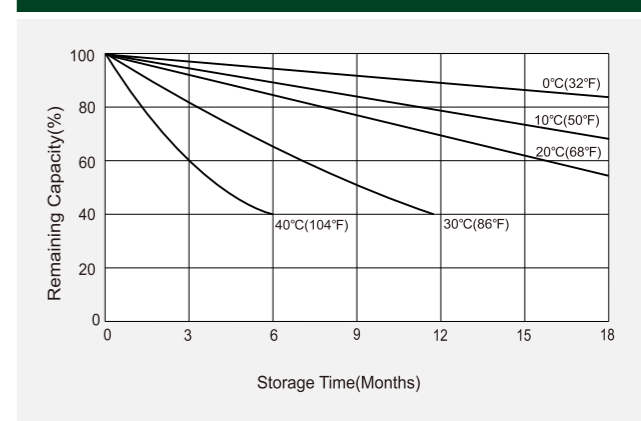
Characteristics curves



CYCLE LIFE IN RELATION TO DEPTH OF DISCHARGE



SELF DISCHARGE CHARACTERISTICS



BATTERY CARE AND MAINTENANCE

◆ Top-charge and precautions

Any VRLA-GEL battery will be damaged by continually undercharging or overcharging (Capacity is reduced and life is shortened), although LEOCH batteries accept a charge very well due to their low internal resistance. Overcharging is extremely harmful to any VRLA battery because of the sealed design. Overcharging dries out the electrolyte by driving the oxygen and hydrogen out of the battery through the pressure relief valves which will lead to less capacity and shorter lifetime. If a battery is continually undercharged, a barrier layer of sulfate will build up on the negative plate which will impact recharging acceptability. Premature plate shedding can also happen. Performance is reduced and life is shortened.

It is critical that a charger be used that limit voltage. The charger must be temperature-compensated to prevent under or overcharging due to ambient temperature changes (Please refer to the table titled as Charge Voltage and Temperature Ranges on Page 3). The warranty is void if improperly charged. Use a good constant potential, temperature-compensated, voltage-regulated charger. Constant current chargers should never be used on VRLA-GEL batteries.

◆ Battery storage

If the battery has high temperature or poor ventilation during storage and delivery, the self-discharge will increase. It is important to store the battery in a well ventilated area, away from fire or any heat supply. When storing the battery, take it off the charger and keep it in a dry and cool place. Please supplement charge before use when the battery has been stored for a long period of time.

◆ Cautions

- Keep batteries in a place, where children can not reach.
- Do not attempt to disassemble, revise, damage, impac, or dispose of batteries. The battery can leak, overheat, or explode.
- Do not dispose of the batteries in water or fire and do not heat the batteries.
- Do not short batteries.
- Do not put your face near the top of batteries. Please wear gloves and eye protection when you measure or repair batteries.
- There is sulfuric acid in the battery. Do not allow your shin, clothes, and especially your eyes to make contact with the sulfuric acid. If your eyes make contact with the sulfuric acid, please wash with a lot of clean water, and consult a physician immediately.
- The suitable temperature is -15°C~+50°C, but the battery will have a longer life in the temperature from +20°C~+30°C. The operation circumstances are defined as: discharging temperature range -15°C~+50°C; charging temperature range 0°C~+40°C.