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01-2013

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Landport Europe is an all-round, internationally-operating, trading company, mainly specialized in batteries of the most versatile applications. With over 25 years purchasing experience in the Far East, Landport is in a position to be able to satisfy its clients' most diverse requirements. Thanks to its direct cooperation with manufacturers, Landport can supply the products required with the right quality at the right price. Using its extensive network in the world, Landport can also play an important role in meeting the demand for other automotive and two-wheel related products. The young and enthusiastic team is always ready to satisfy the wishes of its most demanding clients. The long-term relationships that have been built up with both customers and manufacturers are proof of the professional and particularly service-oriented approach.

Landport guarantees its quality through constant monitoring during the production process and also thereafter. As an Original Equipment supplier, Landport works exclusively with carefully selected and ISO certified partners on the basis of a "joint venture" structure. Flexibility, product knowledge, customer friendliness and service orientation are all qualities that are of paramount importance to every Landport employee. Registered trademarks and private labels are also daily concepts for them.

Alongside the extensive product information available in catalogues, the website ([www.landportbv.com](http://www.landportbv.com)) is updated on a daily basis in order to provide both the trade sector and the end user with up-to-date information.

Airport/runway emergency illumination

## LANDPORT VRLA-AGM-GEL BATTERY FEATURES

### APPLICATIONS

- Landport VRLA-AGM Batteries are designed and categorized into seven series for different applications as below:
- LP series, General Purpose Applications:
    - All Purpose Battery Needs • UPS • EPS • Emergency Light • Signal • Security System • Electronic Equipment
    - DC Power Supply • Tele-communication • Power System • Network Communication
  - LPC series, Deep Cycle Applications:
    - Electric Tools • Lawn Mowers • Golf Trolleys • Portable Apparatus • Electric Toys • Illumination Light
    - Wheel chairs • Medical Equipments
  - LPG series, General Purpose Application
    - Golf trolleys • Solar and wind mill units • Portable equipments • Emergency lights signal systems
    - Power plants • Computer back-up(high power) • Radar and satellite stations
    - SOS Pillars • Street signs • Boats or Buoys • Communication Systems
  - LPS series, Solar /Wind /Hydro Power System Applications:
    - Green Energy Systems (solar,wind, hydro, etc) • Measurement Stations • Pump Systems • Signal Station
    - Emergency Lighting • Railway Crossing • Traffic Lights • Street Lightening • Lawn Lamp
    - SOS Pillars • Camping • Boats or Buoys • Communication Systems
  - LPL series, Long Life Standby Applications:
    - UPS • EPS • Emergency Light • Railway Signal • Electronic Apparatus • Communication DC Power
    - Tele-Communication • Power System Communication • Network Communication • Marine
  - LPX series, High Rate Discharging /UPS Applications:
    - UPS(High rate) • High Power Backup • Starting System • Power Tools • Emergency Lighting • Electric Startin
  - LPF series, Front Terminal /Telecom Applications:
    - For Standard 19 Inch or 23 Inch Power Cabinets • Network Connection Equipment • UPS
    - Power Station Systems • Railway and Marine Systems

### 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. But, upside-down installation is not recommended.
- Maintenance free. But connections must be retorqued 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 ( $H_2O$ ), 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
- Installation 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) Optimum Maximum	Float Charge(V/cell) Optimum Maximum	Temp (°C)
120	2.23	2.28	2.15
110-120	2.27	2.32	2.17
100-11	2.28	2.33	2.18
90-100	2.30	2.35	2.20
80-90	2.32	2.37	2.22
70-80	2.35	2.40	2.25
60-70	2.38	2.43	2.28
50-60	2.40	2.45	2.30
40-50	2.43	2.48	2.33
30-40	2.46	2.51	2.34
20-30	2.49	2.54	2.36
10-20	2.53	2.58	2.38
10	2.58	2.63	2.39

State of charge VS.open circuit voltage

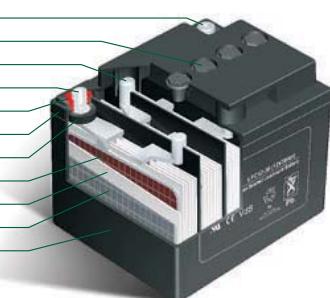


### BATTERY OPERATION THEORY



### VRLA BATTERY CONSTRUCTION

1. Negative Terminal Post
2. Safe Vent Valve
3. Inter-cell Connector
4. Positive Terminal Post
5. Sealing Compound Epoxy
6. Container Cover
7. Sealing O-Ring
8. Positive Plate
9. AGM Separator
10. Negative Plate
11. Case



## FUNDAMENTAL BASICS OF VRLA GEL BATTERIES:

### What is gel?

Gel is usually produced by homogeneous dispersion of pyrogenic silica in diluted sulfuric acid. Pyrogenic silica is a kind of powder of very well dispersed  $\text{SiO}_2$ , which absorb more than 10 times of its weight liquids, producing gel. Because of the thixotropic properties of gel (liquid by stirring and solid by resting), after a certain gelling time, the agglomerates are connecting themselves together to form a network which keeps the liquid inside and gives the gel structure. This form can be broken by stirring to single agglomerates giving again a liquid form.

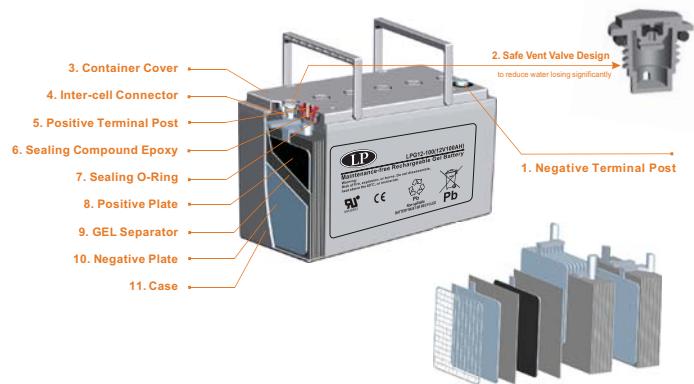
### Main difference from AGM batteries

- Using gel SOL as electrolyte
- Using the extra microporous separator which can: reduce the depolarization of the negative electrode and avoid the PCL 3 effect (premature capacity loss due to negative plate sulphation); significantly decreases thermal runaway; during deep discharge or pole reversal, help to prevent short circuits by dendrite growth between the plates
- Plate thickness tolerance is not critical since the high compression of plate group assembly is not required
- More electrolytes for better contact with plates and active materials and container walls, good for releasing internal heat and cooling battery temperature
- Better vent valve design to lower gassing rate and water losing rate to extend battery lifetime

## ADVANTAGE OF GEL BATTERIES

- No electrolyte adjustment needed
- Do not need quick recharging after discharging
- Insensitive to occasional deep discharge. Deep discharging resistance is high and much higher than in case of AGM since AGM has less electrolyte (only about 66% in comparison to gel)
- Extremely low gas extraction during charging
- Low self-discharge: 50% of the nominal capacity after a 12 months' storage in room temperature
- High charge acceptance
- High energy at low temperature
- Higher operating reliability and longer lifetime, as mistakes due to wrong maintenance will not occur
- The tendency to thermo-runaway-effect is strongly reduced for gel batteries since the higher electrolyte content than AGM (b/c the contact between plates and container walls for heat dispersion through the surrounding gel)
- Can be stored and used in upright or on side position (side position may give less capacity)
- No pollution problems if container is damaged
- Approved for air transport (IATA)
- Almost no acid stratification which can occur in AGM and conventional wet cells, especially on the tall batteries
- Self-resealing valves with adapter to reduce severe water losing and extend battery life
- Low cost rate (cost vs. life time and cost vs. Cycles)

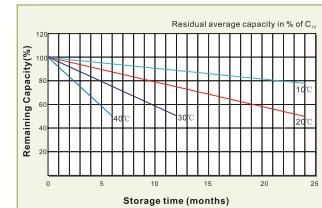
## VRLA GEL BATTERY CONSTRUCTION



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
100-11	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	2.45	2.51	2.34	2.39	(-4)-4
20-30	2.47	2.54	2.36	2.41	(-16)-(-1)
10-20	2.53	2.58	2.38	2.43	(-12)(-6)
≤10	2.58	2.63	2.39	2.44	≤-12

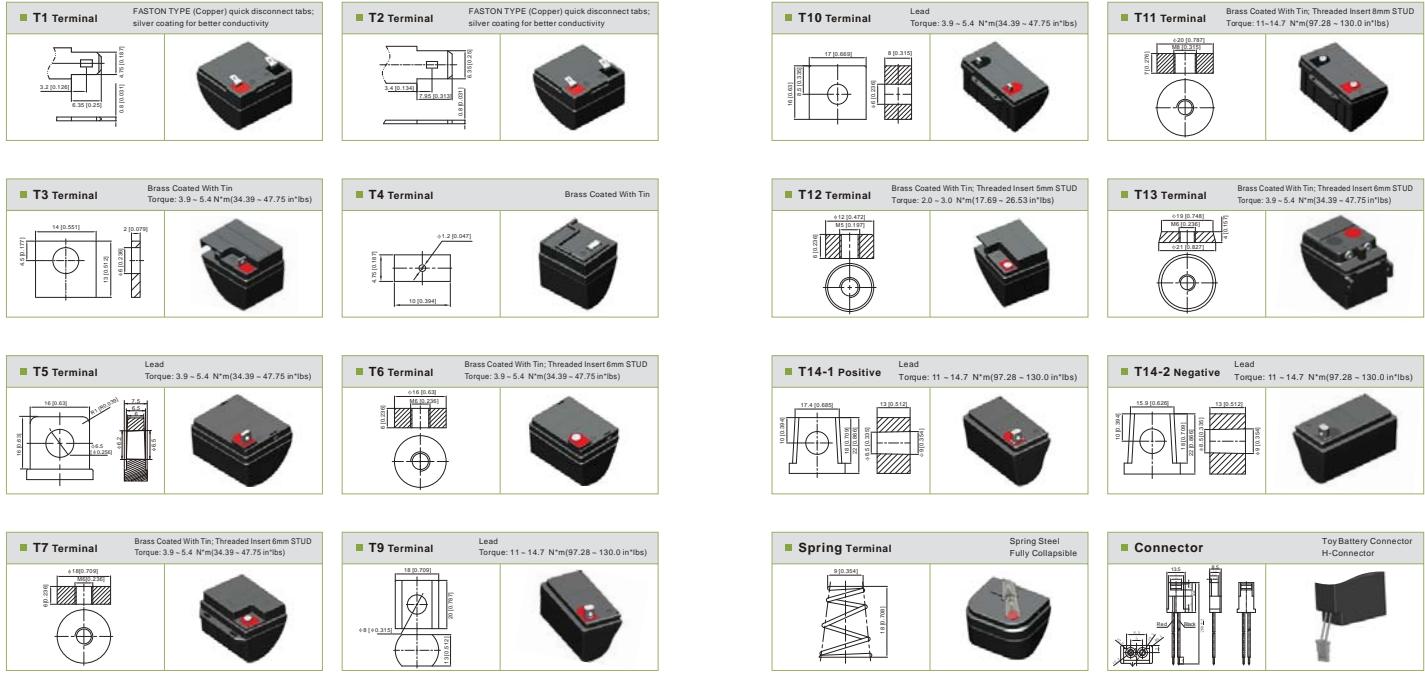
General relation of Capacity vs. Storage time



## LANDPORT VRLA-AGM-GEL BATTERY TERMINAL OPTIONS

Note: the figures below just show the appearance and dimension.  
For the positioning on each battery model, please check the specification on [www.landportbv.com](http://www.landportbv.com)

Unit:mm[inch]



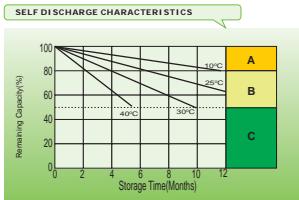
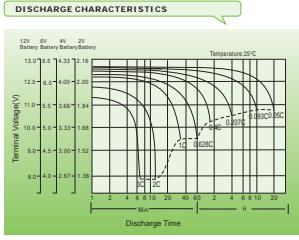
### VALVE REGULATED LEAD-ACID BATTERY, RECHARGEABLE

### MAINTENANCE-FREE, SEALED WITH AGM SEPARATOR



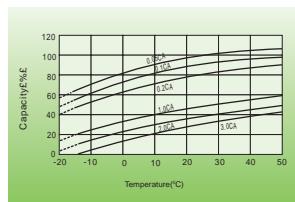
Model	VDS	Nom. Volt. (V)	Rated Capacity(AH)				Approx Dimension					Approx Weight	Terminal type				
			20HR		10HR	5HR	1HR	Length mm	Width in.	Height mm	Total Height in.						
			1.80V/cell	1.80V/cell	1.75V/cell	1.60V/cell											
LP12-24	✓	12	24.0	22.1	19.9	14.1	165.5	6.56	175	6.89	125	4.92	T12/T3/T10				
LP12-24H		12	24.0	22.32	20.40	15.07	165	6.50	125	4.92	175	6.89	17.6	T10/T12			
LP12-26	✓	12	26.0	24.18	22.10	16.33	166.0	6.53	175	6.89	125	4.92	17.6	T3/T12			
LP12-28		12	28.0	26.04	23.80	17.58	166.5	6.56	175	6.88	125	4.92	18.5	T12/T3			
LP12-28H		12	28.0	26.04	23.80	17.58	165	6.50	125	4.92	175	6.89	20.9	T10/T12/T3			
LP12-30		12	30.0	27.90	25.50	18.84	166.5	6.56	175	6.88	125	4.92	19.4	T12/T3			
LP12-30H		12	30.0	27.90	25.50	18.84	165	6.50	125	4.92	180	7.09	20.5	T6/T12/T5			
LP12-33		12	33.0	30.69	28.05	20.72	195	7.68	130	5.12	164	6.46	180	T6/T12/T5			
LP12-35		12	35.0	32.55	29.75	21.98	195	7.68	130	5.12	164	6.46	180	7.09	11.20	24.7	T6/T12/T5
LP24-1.3		24	1.30	1.21	1.11	0.82	194	7.64	44	1.73	52	2.05	58	2.28	1.10	2.43	T1
LP24-3.5		24	3.50	3.26	2.98	2.20	185	7.28	73	2.87	70	2.76	70	2.60	5.73	/	
LP24-4.0		24	4.00	3.72	3.40	2.51	300	11.8	67	2.64	62	2.44	68	2.68	3.10	6.84	T1/T2

#### LP Performance Characteristics (Small size)

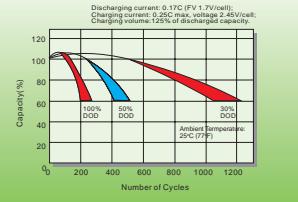


- A:** No supplementary charge required.  
• Carry out a 4-hour charge before use of 100% capacity is desired.)
- B:** Supplementary charge required before use. Optimal charging way as below:  
1.Charged for above 5 days at limited current 6.25CA and constant voltage 2.25V/cell.  
2.Charged for above 20hours at limited current 6.25CA and constant voltage 2.45V/cell.  
3.Charged for above 200hrs at limited current 6.25CA and constant voltage 2.45V/cell.
- C:** Supplementary charge may often fail to recover the capacity.  
• The battery should never be left standing till this is reached.

TEMPERATURE EFFECTS IN RELATION TO BATTERY CAPACITY



CYCLE SERVICE LIFE IN RELATION TO THE DEPTH OF DISCHARGE



#### LP Models and Parameters (Middle size)

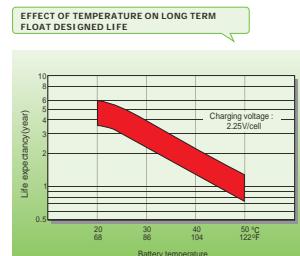
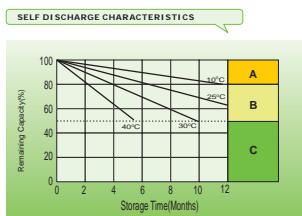
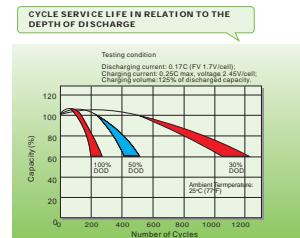
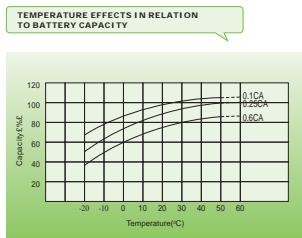
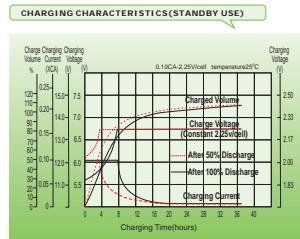
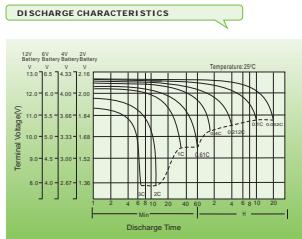
##### Typical Applications

- ♦ All purpose ♦ Uninterruptable Power Supply (UPS) ♦ Electric Power System (EPS)
- ♦ Emergency backup power supply ♦ Emergency light ♦ Railway signal ♦ Aircraft signal
- ♦ Alarm and security system ♦ Electronic apparatus and equipment ♦ Communication power supply
- ♦ DC power supply ♦ Auto control system

Model	VDS	Nom. Volt. (V)	Rated Capacity (AH)				Approx Dimension					Approx Weight	Terminal type	
			20HR	10HR	5HR	1HR	Length mm	Width in.	Height mm	Total Height in.	kg	lbs		
LP6-60	6	62.0	60.0	51.6	36.6	185	7.28	112	4.41	205	8.07	9.1	20.07	
LP6-100	6	104.0	100.0	86.0	61.0	195	7.68	170	6.69	206.5	8.13	15.6	34.40	
LP6-120	6	124.8	120.0	103.2	73.2	280	11.02	128	5.04	203	7.99	16.8	37.04	
LP6-150	6	156.0	150.0	129.0	91.5	260	10.24	180	7.09	247	9.96	21.2	46.75	
LP6-200	6	208.0	200.0	172.0	122.0	322	12.68	178	7.01	228	8.98	234	9.21	
LP12-38	✓	12.0	38.0	36.1	31.1	22.0	1.97	7.76	16.5	6.50	170	6.69	170	6.69
LP12-40	12	41.6	40.0	34.4	24.4	255	10.04	97	3.82	203	7.99	20.0	7.99	
LP12-45	✓	12	45.0	42.8	36.8	26.1	1.97	7.76	16.5	6.50	170	6.69	170	6.69
LP12-50	12	52.0	50.0	43.0	30.5	257	10.12	132	5.20	200	7.87	16.0	35.28	
LP12-55	12	57.2	55.0	47.3	33.6	228	8.98	138	5.43	208	8.19	228	8.98	
LP12-60H	12	62.4	60.0	51.6	36.6	259	10.2	168	6.61	208	8.19	214	8.43	
LP12-65	✓	12	65.0	61.8	53.0	37.7	348	13.70	167	6.57	178	7.01	178	7.01
LP12-70	12	72.8	70.0	60.2	42.7	348	13.70	167	6.57	178	7.01	178	7.01	
LP12-75	12	78.0	75.0	64.5	45.8	348	13.70	167	6.57	178	7.01	178	7.01	
LP12-75H	12	80.0	77.0	66.0	47.0	259	10.20	168	6.61	208	8.19	214	8.43	
LP12-80	12	83.2	80.0	68.8	48.8	259	10.20	168	6.61	208	8.19	214	8.43	
LP12-90	12	93.6	90.0	77.4	54.9	330	12.99	173	6.81	212	8.35	220	8.66	
LP12-90H	12	93.6	90.0	77.4	54.9	306	12.05	168	6.61	210	8.27	216	8.50	
LP12-100	12	104.0	100.0	86.0	61.0	330	12.99	173	6.81	212	8.35	220	8.66	
LP12-120	12	124.8	120.0	103.2	73.2	410	16.14	177	6.97	225	8.88	225	8.86	
LP12-135	12	140.4	135.0	116.1	82.4	344	13.54	171	6.73	274	10.79	280	11.02	
LP12-150	12	156.0	150.0	129.0	91.5	485	19.09	171	6.69	240	9.45	240	9.45	
LP12-200	12	208.0	200.0	172.0	122.0	522	20.55	240	9.45	218	8.58	224	8.82	
LP12-250	12	260.0	250.0	215.0	152.5	522	20.55	268	10.55	220	8.66	226	8.90	

Specifications subject to change without notice.

## LP Performance Characteristics (Middle size)



**A** No supplementary charge required  
(Carry out supplementary charge before use if 100% capacity is required.)  
**B** Supplementary charge required before use. Optimal charging way as below:  
1. Charged for above 3 days at limited current 0.25CA and constant voltage 2.25V/cell.  
2. Charged for above 20hours at limited current 0.25CA and constant voltage 2.45V/cell.  
**C** Optimal charge after use.

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

## LP II Models and Parameters (2V Series)

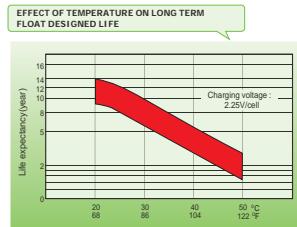
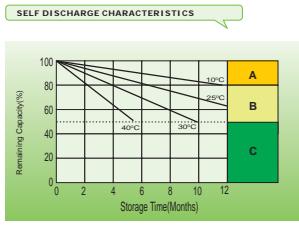
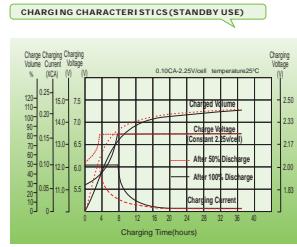
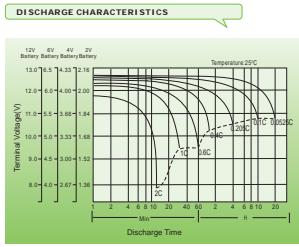
## Typical Applications

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

Model	Nominal Voltage (V)	Rated Capacity (AH)	Approx Dimension				Approx Weight	Terminal type								
			20HR	10HR	5HR	1HR										
LP2-65	2	68.3	65.0	55.6	39.0	170	6.69	72	2.83	205	8.07	212	8.35	5.00	11.0	T6
LP2-72	2	75.6	72.0	61.6	43.2	170	6.69	72	2.83	205	8.07	212	8.35	5.50	12.1	T6
LP2-100	2	105.0	100.0	85.5	60.0	170	6.69	72	2.83	205	8.07	212	8.35	6.00	13.2	T6
LP2-120	2	126.0	120.0	102.6	72.0	170	6.69	98	3.86	205	8.07	212	8.35	7.60	16.8	T7
LP2-130	2	136.5	130.0	111.2	78.0	170	6.69	98	3.86	205	8.07	212	8.35	8.00	17.6	T7
LP2-150	2	157.5	150.0	128.3	90.0	170	6.69	98	3.86	205	8.07	212	8.35	8.50	18.7	T7
LP2-200	2	210.0	200.0	171.0	120.0	170	6.69	110	4.33	328	12.91	350	13.78	12.7	28.0	T11
LP2-250	2	262.5	250.0	213.8	150.0	170	6.69	110	4.33	328	12.91	350	13.78	14.0	30.9	T11
LP2-300	2	315.0	300.0	256.5	180.0	170	6.69	150	5.91	328	12.91	350	13.78	17.7	39.0	T11
LP2-350	2	367.5	350.0	299.3	210.0	170	6.69	150	5.91	328	12.91	350	13.78	19.0	41.9	T11
LP2-400	2	420.0	400.0	342.0	240.0	210	8.27	175	6.89	330	12.99	350	13.78	25.7	56.7	T11
LP2-450	2	472.5	450.0	384.8	270.0	210	8.27	175	6.89	330	12.99	350	13.78	27.0	59.5	T11
LP2-500	2	525.0	500.0	427.5	300.0	249	9.45	175	6.89	330	12.99	350	13.78	28.5	62.8	T11
LP2-600	2	630.0	600.0	513.0	360.0	300	11.81	175	6.89	330	12.99	350	13.78	35.0	77.2	T11
LP2-700	2	735.0	700.0	598.5	420.0	300	11.81	175	6.89	330	12.99	350	13.78	38.1	84.0	T11
LP2-800	2	840.0	800.0	684.0	480.0	410	16.14	175	6.89	330	12.99	351	13.82	50.0	110.3	T11
LP2-900	2	945.0	900.0	769.5	540.0	410	16.14	175	6.89	330	12.99	351	13.82	52.5	115.8	T11
LP2-1000	2	1050.0	1000.0	855.0	600.0	475	18.70	175	6.89	328	12.91	350	13.78	57.0	125.7	T11
LP2-1200	2	1260.0	1200.0	1026.0	720.0	475	18.70	175	6.89	328	12.91	350	13.78	63.0	138.9	T11
LP2-1500	2	1575.0	1500.0	1282.5	900.0	403	15.87	354	13.94	339	13.35	349	13.74	94.0	207.3	T11
LP2-1800	2	1890.0	1800.0	1538.0	1080.0	403	15.87	354	13.94	339	13.35	349	13.74	100.8	222.3	T11
LP2-2000	2	2100.0	2000.0	1710.0	1200.0	490	19.29	350	13.78	338	13.35	349	13.74	116.0	255.8	T11
LP2-2500	2	2625.0	2500.0	2137.5	1500.0	490	19.29	350	13.78	338	13.35	349	13.74	132.0	291.1	T11
LP2-3000	2	3150.0	3000.0	2565.0	1800.0	709	27.91	350	13.78	337	13.27	349	13.74	174.5	384.8	T11
LP2-3500	2	3675.0	3500.0	2992.5	2100.0	709	27.91	350	13.78	337	13.27	349	13.74	190.0	419.0	T11



## LP II Performance Characteristics



**A** No supplementary charge required  
(Carry out supplementary charge before use if 100% capacity is required)

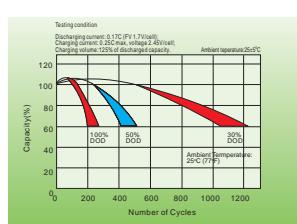
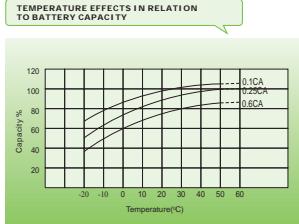
Supplementary charge required before use. Optional charging way as below:

**B** 1.Charged for above 3 days at limited current 0.25CA and constant voltage 2.25V/cell.

2.Charged for 12 hours at limited current 0.25CA and constant voltage 2.45V/cell.

**C** Supplementary charge may often fail to recover the capacity.

The battery should never be left standing till this is reached.



## LPC SERIES - DEEP CYCLE



### General Features

- Using oxygen recombination technology: maintenance-free
- Special grid alloy: less gassing, less self-discharging
- For longer cycle life: special paste formula, over dimensioned negative plate, optimised manufacturing process, additives for deep discharge
- Thermal management system (optional)
- Special anti-vibration design (optional)
- 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)

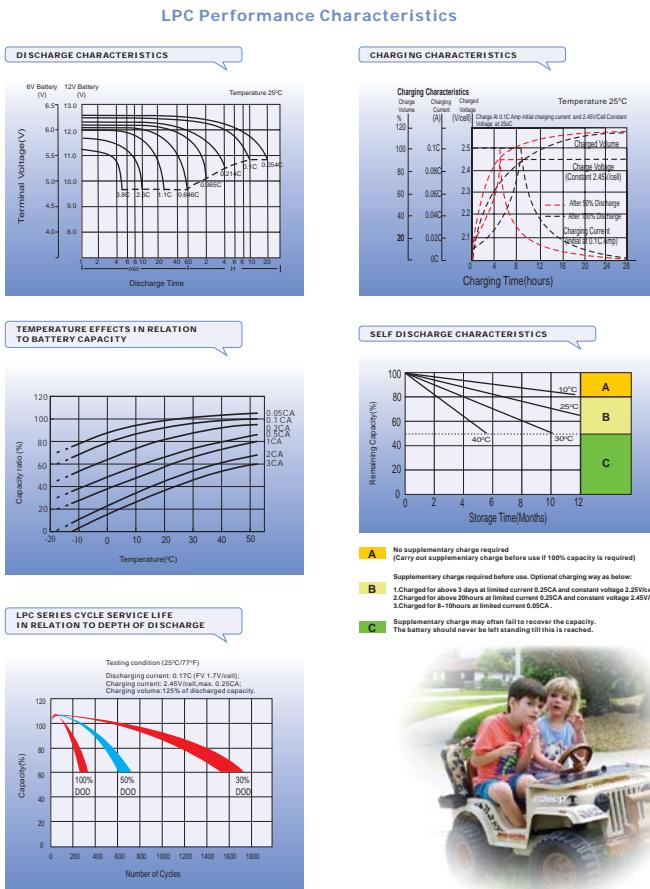
### LPC Models and Parameters

#### Typical Applications

Electric tools	Vehicle in place of walking	Lawn mowers	Golf trolleys and golf cart
Portable apparatus, lights and instruments	Electric toys	Illumination light	
Fire alarms	Portable power	Wheelchairs	Medical equipments.

Model	Nominal Voltage (V)	Rated Capacity(AH) 10HR 1.80V/cell	Approx Dimension				Approx Weight		Terminal type				
			Length		Width	Height	Total Height						
			mm	in.	mm	mm	in.	kg	lbs				
LPC6-5.6	6	6.0	70	2.76	47	1.85	106	3.94	1.06	4.17	0.93	2.05	T1/T2
LPC6-13	6	13.0	151	5.94	51	2.01	94	3.70	100	3.94	2.05	4.52	T1/T2
LPC12-3.5	12	3.5	134	5.28	67	2.64	60.5	2.38	66.5	2.62	1.35	2.98	T1
LPC12-6.6	12	5.6	90	3.54	70	2.76	101	3.98	107	4.21	1.80	3.97	T1/T2
LPC12-7.2	12	7.2	151	5.94	65	2.56	94.5	3.72	100	3.94	2.50	5.51	T1/T2
LPC12-8.0	12	8.0	151	5.94	65	2.56	94.5	3.72	100	3.94	2.75	6.06	T1/T2
LPC12-13	12	13.0	151	5.94	98	3.86	95	3.74	101	3.98	4.20	9.26	T1/T2
LPC12-18	12	18.0	181.5	7.15	77	3.03	167.5	6.59	167.5	6.59	6.00	13.23	T12/T3
LPC12-20	12	20.0	181.5	7.15	77	3.03	167.5	6.59	167.5	6.59	6.60	14.55	T12/T3
LPC12-24	12	24.0	166.5	6.56	175	6.89	125	4.92	125	4.92	8.80	19.40	T12
LPC12-24H	12	24.0	165	6.50	125	4.92	175	6.89	175	6.89	9.50	20.95	T12
LPC12-26	12	26.0	166.5	6.56	175	6.89	125	4.92	125	4.92	9.80	21.6	T12/T3
LPC12-28	12	28.0	167	6.57	175	6.89	126	4.98	126	4.98	9.10	20.04	T12/T12P/T3
LPC12-33	12	33.0	195	7.68	130	5.12	164	6.46	180	7.09	11.2	24.70	T12/T5/T6
LPC12-38	12	38.0	197	7.76	165	6.50	170	6.69	170	6.69	14.5	31.97	T6
LPC12-50	12	50.0	257	10.12	132	5.20	200	7.87	200	7.87	18.1	39.91	T6
LPC12-55	12	55.0	228	8.98	137	5.39	210	8.27	230	9.06	17.7	39.03	T9
LPC12-75H	12	75.0	260	10.24	168	6.61	208	8.19	214	8.43	21.0	46.31	T6/T4
LPC12-100	12	100.0	330	12.99	173	6.81	212	8.35	220	8.66	30.0	66.15	T6
LPC12-120	12	120.0	410	16.14	177	6.97	225	8.86	225	8.86	37.6	82.91	T11
LPC12-150	12	150.0	485	19.09	170	6.69	240	9.45	240	9.45	42.5	93.71	T11
LPC12-200	12	200.0	522	20.55	240	9.45	218	8.58	224	8.82	62.5	137.81	T11

Specifications subject to change without notice.



## LPG SERIES - GENERAL PURPOSE GEL



LP

### General Features

- Long discharge time
- Suitable for standby power and energy storage power use
- Special plate design, long cycle lifetime
- Using special lead-calcium alloy to boost up the grid anti-corrosive performance and extend the battery using lifetime
- Special separator to boost up the battery internal performance
- High thermal capacity, reduce the risk of thermal runaway and drying up, can be used in poor environment
- High gas recombination efficiency
- Little water losing, no electrolyte stratification phenomenon
- Long storage time
- Good deep discharge resilience performance
- Using nano-fumed silica, with small particle size, and big specific surface area.

### Typical Applications

- Cycle applications
  - Golf trolleys
  - Garden equipments
  - Portable equipments
  - Wheel chairs
  - Solar and wind mill units
  - Medical equipments
  - Flash units also for mining (head flash)
  - Portable video/radio
  - Military
  - Railway crossing
  - Traffic lights
  - Street signs
  - Boats or buoys
  - Cottage camping
  - SOS pillars
  - Toys and hobby applications
  - Portable equipments for communication, testing, distance measuring etc.
  - Pump system
- Standby applications
  - Telecommunication backup
  - Power plants
  - Burglar alarms
  - Medical equipments (stationary and portable i.e. X-ray)
  - Computer back-up (high power)
  - Communication systems
  - Fire alarm systems
  - Transmitter systems
  - Cash register systems
  - Emergency lights signal systems
  - Telephone systems
  - Clocks systems
  - Uninterrupted power supplies
  - Elevators emergency power supply (skyscrapers)
  - Solar applications
  - Mobile stations
  - Airport / runway emergency illumination
  - Emergency power supply for hospitals
  - Radar and satellite stations

### LPG Models and Parameters

Model	Nominal Voltage (V)	Rated Capacity(AH)	Approx Dimension								Approx Weight	Terminal type				
			20HR		10HR		5HR		1HR		Length	Width	Height			
			1.89V/cell	1.75V/cell	1.75V/cell	1.67V/cell	mm	in.	mm	in.						
NSA.LPG12-31	12	30	27.9	24.0	17.1	195	7.68	130	5.12	164	6.46	180	7.09	10.7	23.59	T5/T6
NSA.LPG12-38	12	38	35.3	30.4	20.9	197	7.76	165	6.50	170	6.69	170	6.69	13.5	29.77	T6
NSA.LPG12-50	12	50	48.5	40.0	27.5	229	9.02	138	5.43	205	8.07	211	8.31	16.6	36.60	T6
NSA.LPG12-50D	12	54.8	51.0	43.8	30.1	276	10.86	174	6.85	190	7.48	190	7.48	20.4	45.0	T6
NSA.LPG12-60H	12	60	55.8	48.0	33.0	259	10.2	168	6.61	208	8.19	214	8.43	19.7	43.44	T6
NSA.LPG12-60S	12	65.8	61.2	52.5	36.2	260	10.2	174	6.85	173	6.81	179	7.05	19.0	41.9	T6
NSA.LPG12-70H	12	70.0	65.1	56.0	38.5	259	10.2	168	6.61	208	8.19	214	8.43	23.0	50.72	T6
NSA.LPG12-85	12	85.0	78.0	68.0	46.8	305	12.01	168	6.61	207	8.15	213	8.39	27.1	59.76	T6
NSA.LPG12-100	12	96.0	90.0	80.0	55.0	330	12.99	173	6.81	212	8.35	218	8.58	31.0	68.36	T11
NSA.LPG12-125	12	130	120.0	104	71.5	345	13.58	172	6.77	274	10.79	280	11.02	47.3	104.30	T11
NSA.LPG12-140	12	135	125.6	108	74.3	485	19.09	170	6.69	240	9.45	240	9.45	44.2	97.46	T11
NSA.LPG12-200	12	200	186.0	160	110	522	20.55	240	9.45	218	8.58	224	8.82	62.9	138.69	T11

## LPS SERIES - SOLAR POWER



### General Features

- Good cyclic property. Enhanced overcharge endurance and overdischarge recovery property
- High purity raw material; ensure low self discharge rate
- Using oxygen recombination technology: maintenance-free
- Lower acid density, excess of electrolyte and larger distance between plates to keep battery at low temperature and slow down plate grid corrosion speed
- ABS material: increase the strength of battery container. (Flame-retardant ABS is optional)
- Unique plate group configuration, high quality AGM separator and battery management system ensure battery with a longer service life
- Special vent valve design: control water losing, prevent air and spark going inside

### LPS Models and Parameters (6V, 12V Series)

#### Typical Applications

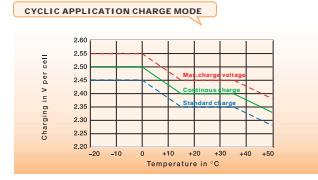
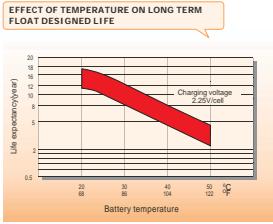
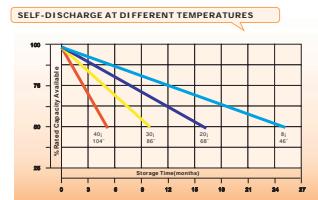
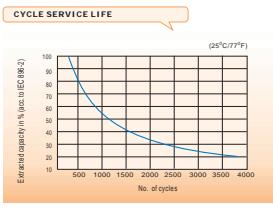
Green energy systems (solar, wind, hydro, etc) • Solar power stations  
Telecommunications installations • Measurement stations • Pump systems • Signal station  
Survey and Mapping system • Emergency lighting • Railway crossing • Traffic lights  
Street lightening • Lawn lamp • Street signs • SOS pillars • Alarm installations  
Weekend cottage camping • Caravans • Boats or buoys

Model	Nominal Voltage (V)	Rated Capacity (AH)					Approx Dimension					Approx Weight	Terminal type				
		100HR	20HR	10HR	5HR	1HR	Length mm	Width mm	Height mm	Total Height mm							
LPS12-7.5	12	7.48	6.8	6.5	5.79	4.16	151	5.94	65	2.56	94.5	3.72	100	3.94	2.45	5.40	T1/T2
LPS12-18	12	18.4	16.8	16.0	14.2	9.76	181.5	7.15	77	3.03	167.5	6.59	5.7	12.57	T3/T12		
LPS12-20	12	20.7	18.9	18.0	16.0	11.5	181.5	7.15	77	3.03	167.5	6.59	6.00	13.2	T3		
LPS12-30	12	29.9	27.3	26.0	23.1	16.7	165	6.50	125	4.92	175	6.89	17.5	6.89	9.50	20.9	T12
LPS12-36	12	36.8	33.6	32.0	28.5	20.5	195	7.68	130	5.12	164	6.46	180	7.09	11.2	24.7	T5
LPS6-115	6	115.0	105.0	100	87.3	60.8	195	7.68	170	6.69	206.5	8.13	212.5	8.37	16.5	38.4	T6
LPS6-170	6	172.5	157.5	150	130.9	91	260.0	10.24	180	7.09	247	9.72	253	9.96	23.0	50.7	T7
LPS6-230	6	230.0	210.0	200	174.5	121	322	12.68	178	7.01	228	8.98	234	9.21	32.5	71.7	T11
LPS6-40	12	43.7	39.9	38.0	33.2	23.1	197	7.76	165	6.50	170	6.69	170	6.69	13.2	29.1	T6
LPS12-45FT	12	46.0	42.0	40.0	34.9	24.3	277	10.91	106	4.17	222	8.74	222	8.74	15.5	34.2	T6
LPS12-50	12	51.8	47.3	45.0	39.3	27.3	197	7.76	165	6.50	170	6.69	14.5	32.0	T6		
LPS12-55	12	57.5	52.5	50.0	43.6	30.4	257	10.12	132	5.20	200	7.87	200	7.87	18.1	39.9	T6
LPS12-60FT	12	63.3	57.8	55.0	48.0	33.4	277	10.91	106	4.17	222	8.74	222	8.74	18.0	39.7	T6
LPS12-75	12	74.8	68.3	65.0	56.7	39.5	348	13.70	167	6.57	178	7.01	178	7.01	21.0	46.3	T6

Specifications subject to change without notice.



## LPSII Performance 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

## LPL Models and Parameters (4V, 6V, 12V Series)

## Typical Applications

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

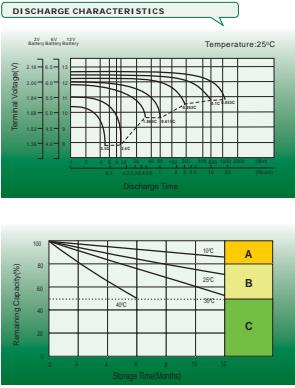
Model	Nominal Voltage (V)	Rated Capacity (AH)			Approx Dimension				Approx Weight	Terminal type						
		20HR	10HR	5HR	1HR	Length mm	Width mm	Height mm								
		1.80V/cell	1.80V/cell	1.75V/cell	1.60V/cell	in.	in.	in.	kg	lbs						
LPL4-8.0	4	8.48	8.00	6.94	4.92	102	4.02	44	1.73	95	3.74	101	3.98	1.05	2.32	T2
LPL6-6.5	6	6.89	6.50	5.64	4.00	151	5.94	34	1.34	94	3.70	100	3.94	1.26	2.78	T1/T2
LPL6-9.0	6	9.54	9.00	7.81	5.54	151	5.94	51	2.01	94	3.70	100	3.94	1.70	3.75	T1/T2
LPL6-11	6	11.7	11.0	9.5	6.77	151	5.94	51	2.01	94	3.70	100	3.94	1.95	4.30	T1/T2
LPL6-18	6	19.1	18.0	15.6	11.1	157	6.18	83	3.27	125	4.92	128	4.92	3.21	7.08	T3
LPL12-4.5	12	4.77	4.50	3.90	2.77	151	5.94	53	2.09	93	3.66	99	3.90	1.90	4.19	T1/T2
LPL12-6.0	12	6.36	6.00	5.21	3.69	151	5.94	65	2.56	94.5	3.72	100	3.94	2.30	5.07	T1/T2
LPL12-7.0	12	7.42	7.00	6.07	4.31	151	5.94	65	2.56	95	3.70	100	3.94	2.45	5.40	T1/T2
LPL12-12	12	12.7	12.0	10.4	7.38	151	5.94	98	3.86	95	3.74	101	3.98	3.80	8.38	T1/T2
LPL12-18	12	19.1	18.0	15.6	11.1	181.5	7.15	77	3.03	167.5	6.59	167.5	6.59	5.70	12.57	T3/T12
LPL12-24H	12	25.4	24.0	20.8	14.8	165	6.50	125	4.92	175	6.88	175	6.89	8.70	19.18	T1/T2/T12
LPL12-24	12	25.4	24.0	20.8	14.8	166.5	6.56	175	6.89	125	4.92	126	4.92	8.10	17.86	T2/T3/T12
LPL12-26	12	27.6	26.0	22.6	16.0	166.5	6.56	175	6.89	125	4.92	125	4.92	8.40	18.52	T3/T12
LPL12-28H	12	29.7	28.0	24.3	17.2	165	6.50	125	4.92	175	6.89	175	6.89	9.50	20.95	T3/T10/T12
LPL12-28	12	29.7	28.0	24.3	17.2	166.5	6.56	175	6.89	125	4.92	125	4.92	8.80	19.40	T3
LPL6-100	6	107.0	100.0	87.0	62.0	195	7.68	170	6.69	206.5	8.14	212.5	8.37	16.5	36.38	T6
LPL6-150	6	160.5	150.0	130.5	93.0	260	10.24	180	7.09	247	9.72	253	9.96	23.0	50.72	T7

Focusing on the environmental friendly development, Landport commits on the harmony between human being and the ecosystem of the earth, and delivering rechargeable electricity storage products for green energy systems. We know that the earth we are living on is borrowed from the next generation...

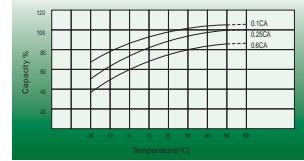
**ENVIRONMENTAL FRIENDLY**

Model	Nominal Voltage (V)	Rated Capacity (AH)		Approx Dimension				Approx Weight	Terminal type		
				Length	Width	Height	Total Height				
		20HR	10HR	5HR	1HR	mm	in.	mm	in.	kg	lbs
LPL12-200	6	214.0	200.0	174.0	124.0	322	12.68	178	7.01	228	8.98
LPL12-38	12	40.7	38.0	33.1	23.6	197	7.76	165	6.50	170	6.69
LPL12-45	12	48.2	45.0	39.2	27.9	197	7.76	165	6.50	170	6.69
LPL12-55	12	58.9	55.0	47.9	34.1	228	8.98	137	5.39	210	8.27
LPL12-60H	12	64.2	60.0	52.2	37.2	260	10.24	168	6.61	210	8.27
LPL12-65	12	69.6	65.0	56.6	40.3	344	13.70	167	6.57	178	7.01
LPL12-70	12	74.9	70.0	60.9	43.4	348	13.70	167	6.57	178	7.01
LPL12-75H	12	80.3	75.0	65.3	46.5	260	10.24	168	6.61	210	8.27
LPL12-80H	12	96.3	90.0	78.3	55.8	300	12.05	168	6.61	210	8.27
LPL12-100	12	107.0	100.0	87.0	62.0	330	12.99	173	6.81	212	8.35
LPL12-120	12	128.4	120.0	104.4	74.4	410	16.14	177	6.97	225	8.86
LPL12-140	12	149.8	140.0	121.8	86.8	344	13.54	171	6.73	274	10.79
LPL12-150	12	160.5	150.0	130.5	93.0	485	19.09	170	6.69	240	9.45
LPL12-200	12	214.0	200.0	174.0	124.0	522	20.55	240	9.45	218	8.58
LPL12-250	12	267.5	250.0	217.5	155.0	522	20.55	268	10.55	220	8.66

### LPL Performance Characteristics (4V, 6V, 12V Series)



TEMPERATURE EFFECTS IN RELATION TO BATTERY CAPACITY



EFFECT OF TEMPERATURE ON LONG TERM FLOAT DESIGNED LIFE



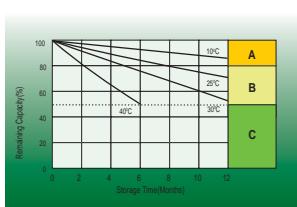
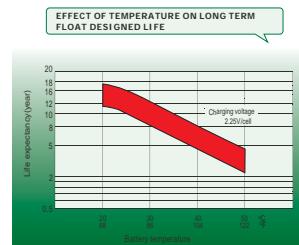
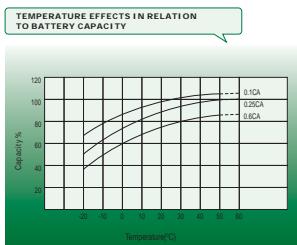
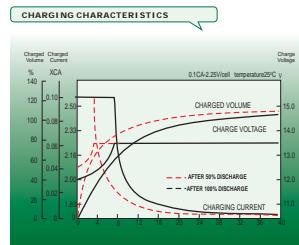
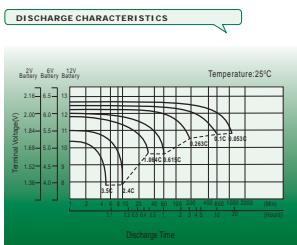
### LPL II Models and Parameters (2V Series)

#### Typical Applications

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

Model	Nominal Voltage (V)	Rated Capacity (AH)				Approx Dimension				Approx Weight	Terminal type
		20HR	10HR	5HR	1HR	Length	Width	Height	Total Height		
		1.80V/cell	1.80V/cell	1.75V/cell	1.60V/cell	mm	in.	mm	in.	kg	lbs
LPL2-100	2	107.0	100	87.0	62.0	170	6.69	72	2.83	205	8.07
LPL2-150	2	160.5	150	130.5	93	170	6.69	98	3.86	205	8.07
LPL2-200	2	214.0	200	174.0	124.0	170	6.69	110	4.33	328	12.91
LPL2-250	2	267.5	250	217.5	155	170	6.69	110	4.33	328	12.91
LPL2-300	2	321.0	300	261.0	186	170	6.69	150	5.91	328	12.91
LPL2-350	2	374.5	350	304.5	217	170	6.69	150	5.91	328	12.91
LPL2-400	2	428.0	400	348.0	248	210	8.27	175	6.89	330	12.99
LPL2-450	2	481.5	450	391.5	279	210	8.27	175	6.89	330	12.99
LPL2-500	2	535.0	500	435.0	310	240	9.45	175	6.89	330	12.99
LPL2-600	2	642.0	600	522.0	372	300	11.81	175	6.89	330	12.99
LPL2-700	2	749.0	700	609.0	434	300	11.81	175	6.89	330	12.99
LPL2-800	2	856.0	800	696.0	496	410	16.14	175	6.89	330	12.99
LPL2-900	2	963.0	900	783.0	558	475	18.70	175	6.89	328	12.91
LPL2-1000	2	1070	1000	870.0	620	475	18.70	175	6.89	328	12.91
LPL2-1200	2	1284	1200	1044	744	475	18.70	175	6.89	328	12.91
LPL2-1500	2	1605	1500	1305	930	403	15.67	354	13.94	339	13.35
LPL2-1800	2	1926	1800	1566	1116	403	15.67	354	13.94	339	13.35
LPL2-2000	2	2140	2000	1740	1240	490	19.29	355	13.78	339	13.35
LPL2-2500	2	2675	2500	2175	1550	490	19.29	355	13.78	339	13.35
LPL2-3000	2	3210	3000	2610	1860	709	27.91	350	13.78	337	13.27
LPL2-3500	2	3745	3500	3045	2170	709	27.91	350	13.78	337	13.27

### LPL II Performance Characteristics



#### SELF DISCHARGE CHARACTERISTICS AND COMPLEMENTARY CHARGE METHODS

- A** No supplementary charge required  
(Carry out supplementary charge before use if 100% capacity is required)
- B** Supplementary charge required before use. Optional charging way as below:  
1.Charged for above 3 days at limited current 0.25CA and constant voltage 2.25V/cell.  
2.Charged for above 8 hours at limited current 0.5CA and constant voltage 2.45V/cell.  
3.Charged for 8~10hours at limited current 0.95CA.
- C** Supplementary charge may often fail to recover the capacity.  
The battery should never be left standing till this is reached.

### LPX SERIES - HIGH RATE / UPS



#### General Features

- ♦ Silver-coated copper terminals (T1, T2 terminal), brass insert terminals and lead terminals improve the electric conductivity
- ♦ Thin plate technology, special grid design, unique paste formula and plate curing process optimize high rate performance
- ♦ High quality AGM separators with less electrical resistance improve high current discharging properties
- ♦ ABS material: Increase the strength of battery container (Flame-retardant ABS is optional)

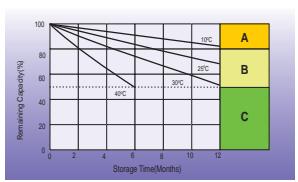
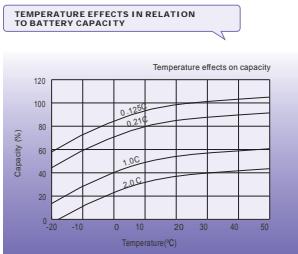
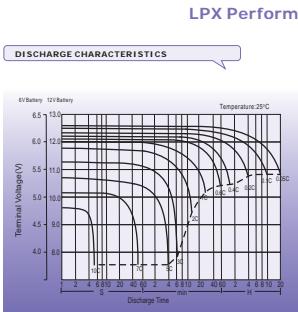
#### LPX Models and Parameters

##### Typical Applications

- |                   |                            |                          |
|-------------------|----------------------------|--------------------------|
| ♦ UPS (High rate) | ♦ High power backup supply | ♦ Emergency power supply |
| ♦ Starting system | ♦ Power tools              | ♦ Emergency lighting     |
|                   |                            | ♦ Electric starting      |

Model (W/cell)	Nominal Voltage (V)	Watts in 15min	Rated Capacity (AH)			Approx Dimension						Approx Weight kg	Terminal type			
			8HR	5HR	1HR	Length			Width							
						mm	in.	mm	in.	mm	in.	mm	in.			
LPX12-2.2	12	7.89	2.20	1.96	1.57	178	7.01	35.0	1.38	60	2.36	66	2.60	1.00	2.21	T1
LPX12-3.2	12	11.50	3.20	2.85	2.28	134	5.28	67.0	2.64	60.5	2.38	66.5	2.62	1.35	2.98	T1
LPX12-5.4	12	19.40	5.40	4.81	3.85	99	3.54	70.0	2.76	101	3.98	107	4.21	1.80	3.97	T1/T2
LPX12-6.0	12	21.50	6.00	5.34	4.28	151	5.94	65.0	2.56	94.5	3.72	107	3.94	2.05	4.52	T1/T2
LPX12-6.5	12	23.30	6.50	5.79	4.64	151	5.94	65.0	2.09	93	3.68	99	3.90	2.10	4.63	T1/T2
LPX12-7.0	12	25.10	7.00	6.23	5.00	151	5.94	65.0	2.56	94.5	3.72	100	3.94	2.50	5.51	T1/T2
LPX12-7.6	12	27.30	7.60	6.76	5.42	151	5.94	65.0	2.56	94.5	3.72	100	3.94	2.75	6.06	T1/T2
LPX12-12	12	43.00	12.0	10.7	8.56	151	5.94	98.0	3.86	95	3.74	101	3.98	4.20	9.26	T1/T2
LPX12-17	12	61.01	17.0	15.1	12.1	181.5	7.15	77.0	3.03	167.5	6.59	167.5	6.59	5.80	12.79	T12
LPX12-18	12	64.60	18.0	16.0	12.8	181.5	7.15	77.0	3.03	167.5	6.59	167.5	6.59	6.00	13.23	T3
LPX12-20	12	71.70	20.0	17.8	14.3	181.5	7.15	77.0	3.03	167.5	6.59	167.5	6.59	6.60	14.55	T3
LPX12-24	12	86.10	24.0	21.4	17.1	166.5	6.56	175.0	6.89	125.0	4.92	125	4.92	8.80	19.40	T3/T12
LPX12-35	12	125.6	35.0	31.1	24.9	195	7.68	130.0	5.12	164.0	6.46	180	7.09	10.5	23.15	T10
LPX12-38	12	133.0	38.0	33.8	25.0	197	7.76	165.0	6.50	170.0	6.69	170	6.69	13.20	29.11	T6/T10/T12
LPX12-65	12	227.5	65.0	57.9	42.7	348	13.70	167.0	6.57	178.0	7.01	178	7.01	21.00	46.31	T6/T11
LPX12-72H	12	252.0	72.0	64.1	47.3	259	10.20	168.0	6.61	208.0	8.18	228	8.98	21.00	46.31	T6/T9/T14
LPX12-100	12	350.0	100.0	89.0	65.7	330	12.99	173.0	6.81	212.0	8.35	220	8.66	30.00	66.15	T11
LPX12-120	12	420.0	120.0	106.8	78.8	410	16.14	177.0	6.97	225.0	8.86	225	8.86	37.60	82.90	T11
LPX12-150	12	524.9	150.0	133.5	98.6	485	19.09	170.0	6.69	242.0	9.53	242	9.53	42.50	93.71	T11
LPX12-200	12	699.9	200.0	178.0	131.4	522	20.55	240.0	9.45	218.0	8.58	224	8.82	62.50	137.81	T11
LPX12-250	12	884.9	250.0	222.5	164.3	522	20.55	268.0	10.6	220.0	8.68	228	8.90	73.00	160.97	T11
LPX6-100	6	350.0	100.0	89.0	65.7	195	7.68	170.0	6.69	206.5	8.13	212.5	8.37	15.60	34.40	T6
LPX6-150	6	524.9	150.0	133.5	98.6	260	10.24	180.0	7.09	247.0	9.72	253	9.96	21.20	46.75	T7
LPX6-200	6	699.9	200.0	178.0	131.4	322	12.68	178.0	7.01	228.0	8.98	234	9.21	30.50	67.25	T11

Specifications subject to change without notice.



LP

## 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)

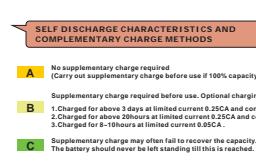
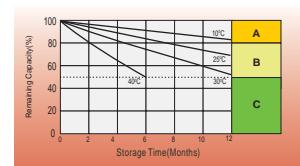
### LPF Models and Parameters

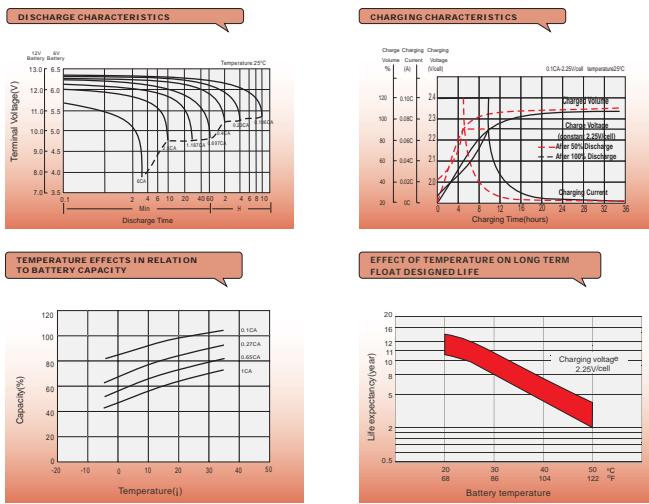
#### Typical Applications

- For standard 19 inch or 23 inch power cabinets
- Network connection equipment of communication system
- Power system of special network or local area network
- UPS, standby power supply
- Power station systems
- Railway and marine systems

Model	Nominal Voltage (V)	Rated Capacity(AH)	Approx Dimension						Approx Weight	Terminal type						
			10HR	8HR	5HR	1HR	Length mm.	Width mm.	Height in.							
LPF12-40	12	41.5	40.0	37.8	27.7	277	10.9	106	4.17	222	8.74	15.5	34.2	T6		
LPF12-55	12	57.1	55.0	51.9	38.1	277	10.9	106	4.17	222	8.74	18.0	39.7	T6		
LPF12-70	12	72.7	70.0	66.1	48.5	564	22.2	114	4.49	187	7.36	187	7.36	25.0	55.1	T6
LPF12-75	12	77.9	75.0	70.8	51.9	564	22.2	114	4.49	187	7.36	187	7.36	26.0	57.3	T6
LPF12-90	12	93.4	90.0	85.0	62.3	508	20.0	110	4.33	238.5	9.39	238.5	9.39	31.0	68.4	T13
LPF12-90H	12	93.4	90.0	85.0	62.3	394	15.5	110	4.33	285	11.2	285	11.2	32.6	71.9	T6
LPF12-100A	12	103.8	100.0	94.5	69.2	508	20.0	110	4.33	238.5	9.39	238.5	9.39	35.6	78.5	T13
LPF12-100B	12	103.8	100.0	94.5	69.2	560	22.0	110	4.33	233	9.17	233	9.17	35.6	78.5	T13
LPF12-100H	12	103.8	100.0	94.5	69.2	394	15.5	110	4.33	285	11.2	285	11.2	34.5	76.1	T6
LPF12-125	12	129.8	125.0	118.3	86.5	551	21.7	111	4.33	287	11.3	287	11.3	40.5	89.3	T6
LPF12-150A	12	155.7	150.0	141.7	103.8	551	21.7	110	4.33	287	11.3	287	11.3	46.0	101	T6
LPF12-150B	12	155.7	150.0	141.7	103.8	560	22.0	110	4.33	280	11.0	280	11.0	46.0	101	T13
LPF12-180	12	180.0	173.0	163.7	120.0	560	22.0	126	4.96	280	11.0	280	11.0	54.0	119	T13

### LPF Performance Characteristics





## BATTERY CARE AND MAINTENANCE



### Top-charge and precautions

Any VRLA-AGM battery will be damaged by continual undercharging or overcharging (Capacity is reduced and life is shortened), although Landport 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 positive 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 limits 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 batteries. (Landport also manufactures chargers dedicated for VRLA batteries. For detailed information about Landport Lead Acid Battery Chargers, please contact with Landport sales.)

### Battery storage

If the battery has high temperature or poor ventilation during storage and delivery, the self-discharge will increase. So, keep good ventilation and keep away from fire, flame, heat supply etc. When storing the battery, take it off from the charger and load and keep it in the dry and cool place. Please supplement charge before use when the battery has been kept for a long time.

### Cautions:

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

## LANDPORT CUSTOMER CARE STATEMENT

We, at Landport Europe B.V. take great pride in serving our customers in a courteous and professional manner, while supplying a quality product at competitive prices, delivered in an efficient, timely manner. At Landport, we strongly feel that our customer care is one of our greatest strengths. Each of our customer service representatives undergoes an intensive training program, and learns the latest in customer support techniques, and supported as well with state of the art customer management systems software. We are in the business of fulfilling our customer's "wants and needs", whether that would be providing general information, or detailed order updates, and post order follow up. We will go the "extra mile" to earn your business, transaction after transaction.

For more information, please visit our website [www.landportbv.com](http://www.landportbv.com)

## Handling precautions

### 1 Installation and Connection

- (1) When the batteries are mounted in the equipment, exercise caution to insure easy checking, maintenance and battery replace ability. In addition, the batteries should be located in the lowest part of the equipment as possible.
- (2) Study and test the material and shape of the battery connectors which form the interface between the batteries and the application, including life test.
- (3) Set the batteries firmly, so they do not move freely in the equipment. This avoids unexpected vibration and/or shock.
- (4) Avoid locating the batteries near a heat generating device (such as a transformer).
- (5) Do not locate the batteries near a device that may cause sparks(such as a switch and a fuse). And do not bring fire close to the batteries.
- (6) In applications requiring more than one battery, first make batteries mutual connections properly, and then connect the batteries strings with the charger or the load. Be careful to connect the + pole of the batteries to + terminal of either the charger or the load.
- (7) Provide enough insulation about lead wires between the batteries and the application.

### 2 Daily Handling

#### 2.1 Charge

- (1) Study any new charging method and condition of the batteries which is not written in this specification.
- (2) It is recommended that a battery will be incorporated into the charger.
- (3) Do not charge the batteries in a place where there is direct sunshine.
- (4) Do not charge the batteries near a heater or the like where heat accumulation may occur.
- (5) Charge the batteries for the time shown by the specification, or to the time when the charge indication lamp shows the end of charge.
- (6) Avoid charging fully charged batteries frequently, it will shorten lifetime.
- (7) Do not continue to charge the batteries over 24 hours in cyclic operation.
- (8) Avoid parallel charge in cyclic operations.

#### 2.2 Discharge

- (1) The cut off voltage of discharge varies higher or lower depending upon the discharge current. The relationship between the discharge current and the recommended cut-off voltage is shown on page 3, Figure 1. Do not discharge the batteries lower than this recommended cut-off voltage.
- (2) It is important to avoid over discharge, and charge the battery immediately after discharge. The OEM's instruction manuals should show that over discharge should be avoided and that the battery should be charged immediately after discharge.

#### 2.3 Check and Maintenance

- It is advisable to periodically do check and maintenance.
- (1) Measure the total voltage of the batteries during trickle charge(or float charge).If the charge equipment provides a irregular (incorrect) read out, be sure to investigate the reason behind any deviations from the specified voltage range.
  - (2) Check the batteries for any sign of irregularities in appearance. If any damage such as a crack and deformation, or electrolyte leakage is found on the case, cover, etc., the batteries must be replaced with a new one. Also, clean the batteries if these are found dirty due to dirt and dust.

### 3 Exchange of the Batteries

- (1) Exchange the batteries from current ones to the new ones, when there is any abnormality in appearance or characteristic of the batteries. When the batteries are connected in series, the batteries in one string should be exchanged at once.
- (2) Exchange the batteries to new ones before they are used for the years shown on page 7 in 5.1 in trickle charge(or float charge) below 77°F (25°C) around them. The interval of this exchange should be shortened by temperature increase of ever 50°F (10°C).

### 4 Storage

- (1) Store the batteries in a stable position, and away from any metallic or other conductive material including dropping material.
- (2) Store the batteries starting from the fully charged state.
- (3) Charge the batteries, at least once, every six months during storage below 77°F (25°C).Use the charging method which is shown on page5, in 4.2.4.The interval of this charge must be shortened to half by temperature rising of every 50°F (10°C).
- (4) They should be used as quick as possible.

### 5 Transportation

- (1) Handle the batteries carefully to avoid injuries. They are heavy and must be handled properly.
- (2) Avoid moisture or rain on the batteries.
- (3) Keep the batteries up in the upright position while in transportation. Avoid abnormally strong shock and/or vibration on the batteries.

### 6 Recycling

- (1) Because of its importance, please consider placing written information of recycling the battery on: the product(application), the package, the carton and the battery, especially in countries where there are legal or voluntary regulations on recycling of batteries.
- (2) When designing the product, make the battery easily removable, and accessible in order to make its replacement and recycling or proper disposal easy for the customer.

### Notice to readers

It is the responsibility of each user to ensure that each battery application system is adequately designed, safe and compatible with all conditions encountered during use, and in conformance with existing standards and requirements. The circuits are illustrative only and each user must ensure that each circuit is safe and otherwise completely appropriate of the desired application.

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