

# Total Solutions System

**VRLA BATTERIES**



# WINNER<sup>®</sup>

BATTERY



**SUPERIOR QUALITY PRODUCT**



**WINNER®**

# Total Solutions System

*Winner VRLA  
Solutions industry can rely on*

**Winner** is a revolutionary series that offers a "**Total Solutions System**" to every customer, with state-of-the-art technologies for industrial use and the right battery for every type of vehicle. A superior quality product designed to meet the spectrum of customer needs, **Winner** incorporates the full advantages of excellent reliability and long life to provide total customer satisfaction. **Winner VRLA** is a "**Total Solution**" created to meet the different needs of today's industry. Designed for excellence, **VRLA batteries** cover a wide range of industrial applications for every use.

## TECHNICAL FEATURES

- Sealed construction**  
The sealed construction guarantee leak proof operation in any position with no adverse effect to capacity or service life
- Maintenance free operation**  
Absolutely no need for ever maintenance or addition of water, due to built-in design for the recombination of the gasses produced during the float service of the battery.
- Low pressure valve regulated system**  
The batteries equipped with safety release valves, designed to operate between 2 – 5 psi and automatically release. Hence, there is never an excessive accumulation of gas within the battery.
- Electrolyte suspension system**  
This is consisting of a high porosity, glass fiber material which in conjunction with plates, absorb and contain totally the electrolyte. Silicon gels are used in MERCURY and NEPTUNE series.
- Heavy duty grids**  
The lead calcium tin alloy grids provide an extra performance and service life in either float or cyclic applications, even after repeated over discharges.
- Low Self discharge – Long Self life**  
The use of pure Pb – Ca alloy at the grids permits the minimum self discharge to approximately less than 3% of rated capacity per month at 20°C.

- Deep discharge recovery**  
The advanced grid alloys and the special electrolyte suspension system ensure recovery of the battery capacity even after repeated deep discharges.



- Service life**  
Under cyclic use, the batteries can realize more than 1.000 cycles, dependent on the average depth of discharge. Under float use, APOLLO series up to 22AH have an expected life span up to 6 years; 24AH capacities and above have an expected life span up to 10 years. At MERCURY series the expected life span is 10~12 years. For NEPTUNE series, the design is 15 years life expectancy.
- Operating temperature**  
The batteries can be operated over a broad range of ambient temperatures.

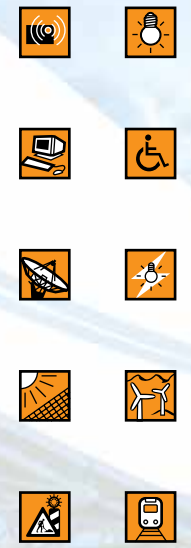
## CONSTRUCTION

- Positive plates**  
Composed by a grid frame of lead-tin-calcium alloy and active material of porous lead dioxide
- Negative plates**  
Composed by a grid frame of lead-tin-calcium alloy and active material of spongy lead
- Electrolyte**  
Used diluted sulfuric acid for conducting ions during the electrochemical reaction of the battery
- Separators**  
Made by non-woven fabric of fine glass fibers, chemically stable in the electrolyte sulfuric acid. Being highly porous, absorbs fully the electrolyte and prevent shorting between positive and negative plates.
- One way safety valves**  
Made by neoprene material opens to release excessive pressure in the battery, from gasses generated under extreme overcharge condition, due to erroneous charging or charger malfunction.
- Electrode terminals**  
Are protected by a structure which secure long adhesive-embedded paths and by the adoption of strong epoxy material. Depend on the battery type, the terminals can be

- fast on tab type, bolt on fastening type, threaded post type or lead wire type.
- Battery case material**  
Made by ABS material, flame retardant, shock resistant.

## APPLICATIONS

- UNDER FLOAT SERVICE**
  - Security systems
  - Fire Alarm devices
  - U.P.S systems
  - Telecommunication equipment
  - Solar power devices
  - Emergency lighting
  - Office machines
  - Cash registers
- UNDER CYCLIC SERVICE**
  - Portable audio & video equipment
  - Portable lights
  - Electric wheelchairs
  - Portable test instruments
  - Power Tools & Toys
  - Geophysical equipment
  - Medical equipment





## CERTIFICATIONS SPECIFICATIONS

ISO 9001 Quality System Certification. Conformable with EN 50081-1/1994, EN50082-1/1997, EN 55014, EN 61000-3-2/-3. Also JIS C 8702 for APOLLO and MERCURY series. JIS C 8707 for NEPTUNE series. UL 1989 certification. CE certification.



“NONSPILLABLE BATTERY”. All of our lead acid batteries are unregulated for air transportation because they meet the requirements of Special Provision-“A67” as promulgated by the International Civil Aviation Association (IATA) and the International Civil Aviation Association (ICAO). They also meet the Vibration and Pressure Differential Tests of the International Maritime Dangerous Goods (IMDG) regulations.

range may result in a marked decrease of discharge capacity or reduction in the number of times of repeatable discharge. With some types of SLA batteries which have a built-in thermostat, the thermostat may automatically cut off the circuit when discharge current exceeds 4 A at the ambient temperature of 40°C; therefore, the maximum discharge current value should be the smaller one of either 4 A or 2 CA.

### d) Depth of discharge

Depth of discharge is the state of discharge of batteries expressed by the ration of ammount of capacity discharged to the rated capacity.

## Storage

### a) Storage condition

Observe the following condition when the battery needs to be stored.

- (1) Ambient temperature: -15°C to 40°C (preferably below 30°C).
- (2) Relative humidity: 25 to 85%.
- (3) Storage place free from vibration, dust, direct sunlight and moisture.

### b) Self discharge and refresh charge

During storage, batteries gradually lose their capacity due to self discharge, therefore the capacity after storage is lower than the initial capacity. For the recovery of capacity, repeat charge/discharge several times for the battery in cycle use; for the battery in trickle use, continue charging the battery as loaded in the equipment for 48 to 72 hours.

### c) Refresh charge (Auxiliary charge)

When it is unavoidable to store the battery for 3 months or longer, periodically recharge the battery at the intervals recommended in the table below depending on ambient

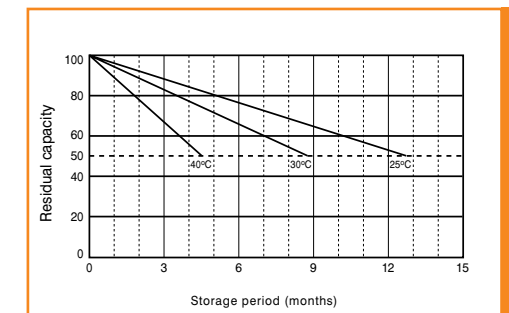
Storage temperature	Interval of auxiliary charge (refresh charge)
Below 20°C	9 months
20°C to 30°C	6 months
30°C to 40°C	3 months

temperature. Avoid storing the battery for more than 12 months.

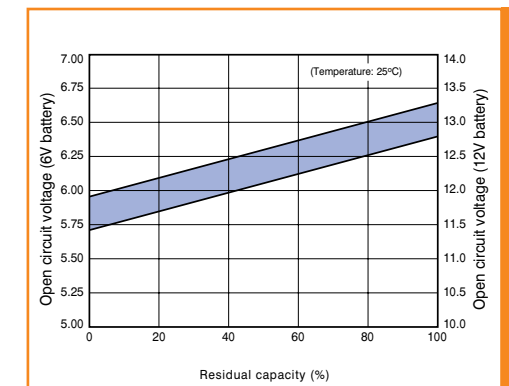
### d) Residual capacity after storage

The result of testing the residual capacity of the battery which after fully charged, has been left standing in the open-circuit state for a specific period at a specific ambient temperature is shown in the figure below. The self discharge rate is very much dependent on the ambient temperature of storage.

The higher the ambient temperature, the less the residual capacity after storage for a specific period. The self discharge rate almost doubles by each 10°C rise of storage temperature.



Residual capacity test result



Open circuit voltage vs. Residual capacity 25°C

## TRANSPORTATION

All of our lead acid batteries are unregulated by DOT for transportation by truck, rail, ocean and air transportation because they meet the requirements of 49 CFR 173.159 (d). The only transportation requirements are: 1) The battery must be securely packaged in such a way to prevent the possibility of short ciruiting. 2) The battery and the outer most packaging must by lebeled “NONSPILLABLE” or

## CHARACTERISTICS

### Charging

In order to fully utilize the characteristics of SLA batteries, constant-voltage charging is recommended.

### Discharging

#### a) Discharge current and discharge cut-off voltage

Recommended cut-off voltages for 6V and 12V batteries consistent with discharge rates are given in the figure below. With small discharge currents, the active materials in the battery work effectively, therefor discharge cut-off voltages are set to the higher side for controlling overdischarge. For larger discharge currents, on the contrary, cut-off voltages are set to the lower side. Discharge cut-off voltages given are recommended values.

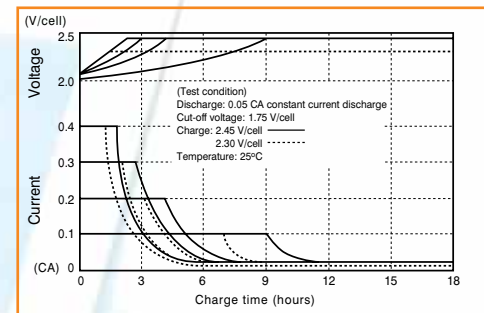
#### b) Discharge temperature

(1) Control the ambient temperature during discharge within the range from -15°C to 50°C for the reason described below.

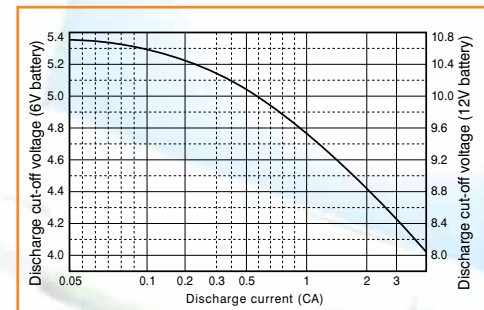
(2) Batteries operate on electrochemical reaction which converts chemical energy to electric energy. The electrochemical reaction is reduced as the temperature lowers, thus, available discharge capacity is greatly reduced at temperatures as low as -15°C. For the high temperature side, on the other hand, the discharge temperature should not exceed 50°C in order to prevent deformation of resin materials which house the battery or deterioration of service life.

#### c) Discharge current

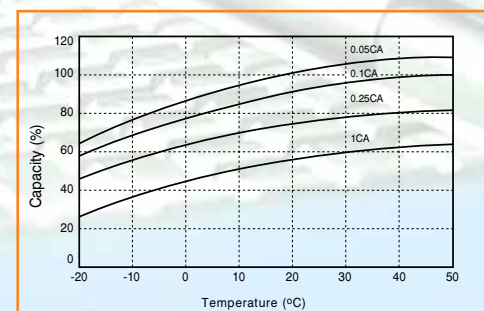
Discharge capability of batteries is expressed by the 20 hour rate (rated capacity). Select the battery for specific equipment so that the discharge current during use of the equipment falls within the range between 1/20 of the 20 hour rate value and 3 times that (1/20 CA to 3 CA): discharging beyond this



Example of constant-voltage charge characteristics by current



Discharge current vs. Cut-off voltage



Discharge capacity by temperature and by discharge current



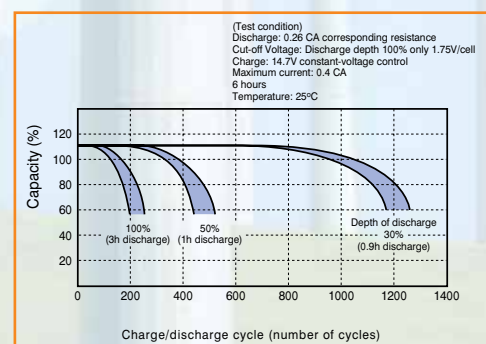


## Battery life

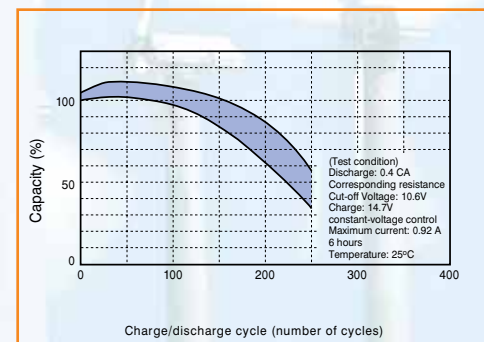
### a) Cycle life

Cycle life (number of cycles) of the battery is depended on the depth of discharge in each cycle. The deeper the discharge is, the shorter the cycle life (smaller number of cycles), providing the same discharge current.

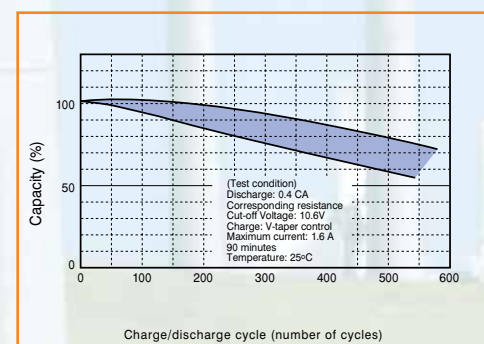
The cycle life (number of cycles) of the battery is also related to such factors as the type of the battery, charge method, ambient temperature and rest period between charge and discharge. Typical cycle-life characteristics of the battery by different charge/discharge conditions are shown by the below figures. This data is typical and tested at a well-equipped laboratory. Cycle times are different for each battery model. Cycle times are also different from this data when using batteries under real conditions.



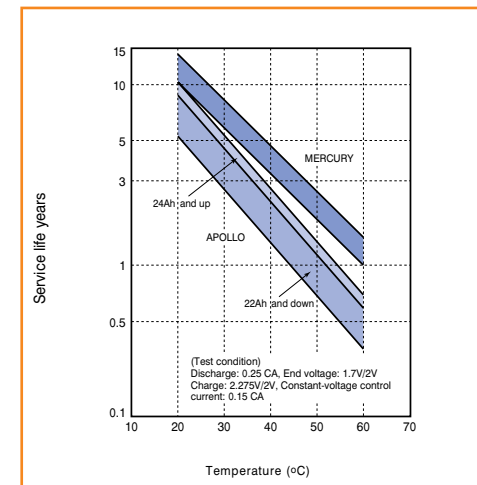
Cycle life vs. Depth of discharge



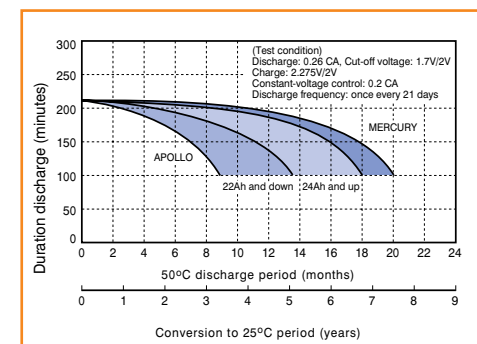
Constant-voltage cycle life characteristics (Apollo 2.3-12)



Rapid-charge cycle life characteristics (Apollo 2.3-12)



Influence of Temperature on Trickle life



Trickle life characteristics at 50°C



### b) Trickle (Float) life

Trickle life of the battery is largely dependent on the temperature condition of the equipment in which the battery is used and also related to the type of the battery, charge voltage and discharge current. The respective Figures show the influence of temperature on trickle life of the battery, an example of trickle (float) life characteristics of the battery and the test result of the battery life in an emergency lamp.

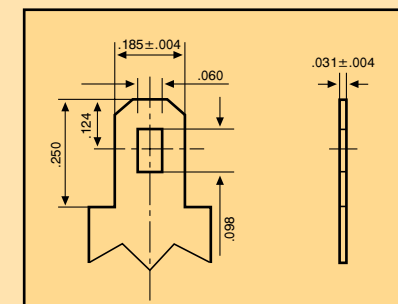
## Temperature conditions

Recommended temperature ranges for charging, discharging and storing the battery are tabulated below.

Charge	0°C ~ 40°C
Discharge	-15°C ~ 50°C
Storage	-15°C ~ 40°C

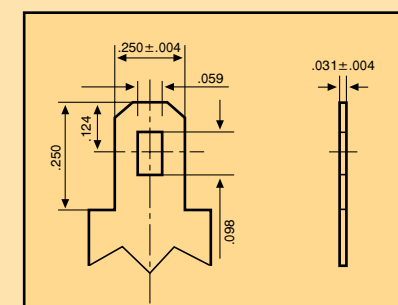
## BATTERY TERMINAL

F1



INCH=MM	
.250	6.35
.185	4.70
.124	3.15
.098	2.50
.060	1.52
.031	0.79
.004	0.10

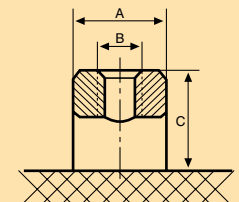
F2



INCH=MM	
.250	6.35
.124	3.15
.098	2.50
.031	0.97

Type	A	B	C	D	E
F3	12.0	∅5.5	5.0	11.5	2.0
F4	16.5	∅6.5	8.0	16.0	8.0
F5	16.5	∅8.0	7.5	16.5	6.5
F6	18.5	∅6.5	8.0	19.0	8.0
F7	26.0	∅8.5	11.0	23.0	8.5
F8	25.0	∅10.0	12.5	28.0	8.0
F9	26.0	∅9.0	9.0	19.5	8.5
F10	26.5	∅9.0	12.5	25.5	8.2
F11	24.0	∅10.5	12.5	25.5	8.0

Type	A	B	C
F12	∅10	M5	5.0
F13	∅14	M6	5.0
F14	∅15	M6	5.0
F15	∅16	M6	5.0
F16	∅20	M6	6.0
F17	∅20	M8	7.0



**WINNER®****APOLLO**

APOLLO Series: AGM Batteries

DESIGNED SERVICE LIFE: 22AH AND DOWN - UP TO 6 YEARS IN FLOAT SERVICE  
24AH AND UP - UP TO 10 YEARS IN FLOAT SERVICE

Type	Volt	AH / 20HR	Length		Width		Height		Total Height		Weight (Approx.)		Terminal Type	Assembly Figure		
			mm	in	mm	in	mm	in	mm	in	kg	pound				
1	4-2	2	4	47	1.85	25	0.98	101	3.98	107	4.21	0.32	0.71	F1	-	+
2	50-2	2	50	161	6.34	49	1.93	166	6.54	180	7.09	3.20	7.05	F20	+	-
3	100-2	2	100	172	6.77	72	2.83	206	8.11	229	9.02	6.60	14.55	F7	+	-
4	150-2	2	150	172	6.77	102	4.02	206	8.11	231	9.09	9.20	20.28	F10	+	-
5	4.5-4	4	4.5	47	1.85	47	1.85	101	3.98	107	4.21	0.61	1.34	F1	-	+
6	7-4	4	7	64	2.52	53	2.09	94	3.70	100	3.94	0.88	1.94	F1	+	-
7	9-4	4	9	102	4.02	44	1.73	95	3.74	101	3.98	1.20	2.65	F1	+	-
8	10-4	4	10	102	4.02	50	1.97	95	3.74	101	3.98	1.36	3.00	F1	+	-
9	20-4	4	20	149	5.87	43	1.69	154	6.06	161	6.34	2.70	5.95	F2	-	+
10	1.0-6A	6	1	50	1.97	42	1.65	51	2.01	57	2.24	0.26	0.57	F1	+	-
11	1.0-6B	6	1	131	5.16	25	0.98	37	1.46	43	1.69	0.27	0.60	F1	+	-
12	1.3-6	6	1.3	97	3.82	24	0.94	52	2.05	58	2.28	0.32	0.71	F1	+	-
13	2.3-6	6	2.3	42	1.65	37	1.46	76	2.99	76	2.99	0.35	0.77	TC	+	-
14	2.8-6	6	2.8	67	2.64	34	1.34	99	3.90	105	4.13	0.59	1.30	F1	+	-
15	3.2-6A	6	3.2	134	5.28	34	1.34	61	2.40	67	2.64	0.71	1.57	F1	+	-
16	3.2-6B	6	3.2	67	2.64	34	1.34	116	4.57	122	4.80	0.71	1.57	F1	+	-
17	3.2-6C	6	3.2	125	4.92	34	1.34	61	2.40	67	2.64	0.68	1.50	F1	+	-
18	3.5-6A	6	3.5	195	7.68	25	0.98	50	1.97	56	2.20	0.67	1.48	F1	+	-
19	3.5-6B	6	3.5	195	7.68	25	0.98	56	2.20	56	2.20	0.67	1.48	Special	+	-
20	4-6B	6	4	70	2.76	47	1.85	106	4.17	106	4.17	0.83	1.83	Special	+	-
21	5-6A	6	5	70	2.76	47	1.85	101	3.98	107	4.21	0.93	2.05	F1	+	-
22	5-6B	6	5	67	2.64	67	2.64	97	3.82	115	4.53	0.92	2.03	Spring	+	-
23	5-6C	6	5	170	6.69	35	1.38	72	2.83	78	3.07	0.93	2.05	F1	+	-
24	6-6A	6	6	85	3.35	48	1.89	112	4.41	118	4.65	1.26	2.78	F1	+	-
25	6-6B	6	6	98	3.86	56	2.20	113	4.45	119	4.69	1.26	2.78	F1	+	-
26	7-6	6	7	151	5.94	34	1.34	95	3.74	101	3.98	1.35	2.98	F1	+	-
27	7.5-6	6	7.5	151	5.94	34	1.34	95	3.74	101	3.98	1.40	3.09	F1	+	-
28	8-6	6	8	99	3.90	57	2.24	115	4.53	115	4.53	1.71	3.77	F1	-	+
29	9-6	6	9	151	5.94	34	1.34	95	3.74	101	3.98	1.60	3.53	F1	+	-
30	12-6	6	12	151	5.94	50	1.97	95	3.74	101	3.98	2.07	4.56	F1	+	-
31	14-6CQ	6	14	108	4.25	71	2.80	140	5.51	140	5.51	2.80	6.17	CQ	+	-
32	14-6TS	6	14	108	4.25	71	2.80	140	5.51	140	5.51	2.80	6.17	TS	+	-
33	14-6TH	6	14	108	4.25	71	2.80	140	5.51	140	5.51	2.80	6.17	TH	+	-
34	14-6PL	6	14	108	4.25	71	2.80	140	5.51	140	5.51	2.80	6.17	PL	+	-
35	20-6	6	20	157	6.18	83	3.27	125	4.92	125	4.92	4.00	8.82	F3	+	-
36	42-6	6	42	162	6.38	88	3.46	163	6.42	170	6.69	7.20	15.87	F2	+	-
37	60-6	6	60	184	7.24	112	4.41	188.5	7.42	212	8.35	9.70	21.38	F6	-	+
38	100-6A	6	100	194	7.64	170	6.69	204	8.03	210	8.27	18.50	40.78	F17	+	-
39	100-6B	6	100	281	11.06	128	5.04	189	7.44	204	8.03	18.80	41.45	F17	-	+
40	150-6	6	150	260	10.24	180	7.09	245	9.65	251	9.88	27.00	59.52	F17	+	-
41	160-6	6	160	298	11.73	172	6.77	227	8.94	231	9.09	28.20	62.17	F17	+	-
42	180-6A	6	180	306	12.05	169	6.65	220	8.66	226	8.90	30.30	66.80	F17	+	-
43	180-6B	6	180	260	10.24	180	7.09	245	9.65	251	9.88	32.10	70.77	F17	-	+
44	190-6	6	190	244	9.61	190	7.48	275	10.83	275	10.83	29.30	64.59	Special	-	+

Type	Volt	AH / 20HR	Length		Width		Height		Total Height		Weight (Approx.)		Terminal Type	Assembly Figure		
			mm	in	mm	in	mm	in	mm	in	kg	pound				
45	200-6A	6	200	322	12.68	177	6.97	226	8.90	230	9.06	34.00	74.96	F17	+	-
46	200-6B	6	200	397	15.63	176	6.93	216	8.50	250	9.84	36.00	79.37	F8	+	-
47	220-6	6	220	322	12.68	177	6.97	226	8.90	230	9.06	36.00	79.37	F17	+	-
48	3.2-8	8	3.2	68	2.68	48	1.89	90	3.54	90	3.54	0.82	1.81	Special	+	-
49	3.5-8	8	3.5	134	5.28	36	1.42	63	2.48	69	2.72	0.87	1.92	F1	+	-
50	4.5-8	8	4.5	141	5.55	33	1.30	102	4.02	108	4.25	1.34	2.95	F1	+	-
51	20-8	8	20	121	4.76	85	3.35	141	5.55	141	5.55	5.00	11.02	Bolt-A	-	+
52	30-8	8	30	156	6.14	85	3.35	152	5.98	152	5.98	7.60	16.75	Bolt-A	-	+
53	0.8-12	12	0.8	96	3.78	25	0.98	61	2.40	61	2.40	0.34	0.75	Special	+	-
54	1.3-12	12	1.3	97	3.82	43	1.69	52	2.05	58	2.28	0.62	1.37	F1	+	-
55	2.0-12B	12	2	150	5.91	20	0.79	90	3.54	90	3.54	0.75	1.65	Special	+	-
56	2.0-12TU	12	2	143	5.63	24	0.94	65	2.56	65	2.56	0.70	1.54	TU	+	-
57	2.2-12	12	2.2	177	6.97	35	1.38	61	2.40	67	2.64	0.92	2.03	F1	+	-
58	2.3-12A	12	2.3	177	6.97	35	1.38	61	2.40	67	2.64	0.92	2.03	F1	+	-
59	2.3-12B	12	2.3	70	2.76	47	1.85	99	3.90	105	4.13	0.87	1.92	F1	+	-
60	2.5-12TU	12	2.5	182	7.17	24	0.94	61	2.40	61	2.40	0.72	1.59	TU	+	-
61	2.6-12A	12	2.6	178	7.01	35	1.38	60	2.36	66	2.60	1.02	2.25	F1	+	-
62	2.6-12C	12	2.6	103	4.06	48	1.89	70	2.76	70	2.76	1.10	2.43	Special	+	-
63	2.8-12	12	2.8	66	2.60	66	2.60	97	3.82	103	4.06	1.16	2.56	F1	+	-
64	2.9-12	12	2.9	132	5.20	33	1.30	98	3.86	104	4.09	1.16	2.56	F1	+	-
65	3-12	12	3	90	3.54	70	2.76	77	3.03	83	3.27	1.36	3.00	F1	+	-
66	3.2-12	12	3.2	134	5.28	67	2.64	61	2.40	67	2.64	1.44	3.17	F1	+	-
67	3.5-12TA	12	3.5	179	7.05	35	1.38	68	2.68	68	2.68	1.60	3.53	Wire	+	-
68	4.5-12	12	4.5	90	3.54	70	2.76	101	3.98	107	4.21	1.75	3.86	F1	+	-
69	5-12A	12	5	90	3.54	70	2.76	101	3.98	107	4.21	1.83	4.03	F1	+	-
70	5-12B	12	5	151	5.94	53	2.09	95	3.74	101	3.98	2.28	5.03	F1	+	-
71	5.1-12A	12	5.1	140	5.51	48	1.89	101	3.98	107	4.21	2.00	4.41	F1	+	-
72	5.1-12B	12	5.1	140	5.51	48	1.89	103	4.06	104	4.09	2.00	4.41	Special	+	-
73	7-12A	12	7	151	5.94	65	2.56	95	3.74	101	3.98	2.64	5.82	F1	+	-
74	7-12B	12	7	140	5.51	48	1.89	126	4.96	127	5.00	2.60	5.73	Special	+	-
75	7.2-12	12	7.2	151	5.94	65	2.56	95	3.74	101	3.98	2.70	5.95	F1	+	-
76	7.5-12	12	7.5	151	5.94	65	2.56	95	3.74	101	3.98	2.73	6.02	F1	+	-
77	8.5-12	12	8.5	151	5.94	65	2.56	95	3.74	101	3.98	3.01	6.64	F1	+	-
78	9-12	12	9	151	5.94	65	2.56	111	4.37	117	4.61	3.20	7.05	F1	+	-
79	10-12B	12	10	137	5.39	109	4.29	141	5.55	141	5.55	4.30	9.48	Special	+	-
80	12-12	12	12	151	5.94	99	3.90	95	3.74	101	3.98	4.20	9.26	F1	+	-
81	17-12	12	17	181	7.13	77	3.03	167	6.57	167	6.57	6.22	13.71	F3	-	+
82	18-12	12	18	181	7.13	77	3.03	167	6.57	167	6.57	6.30	13.89	F3	-	+
83	20-12	12	20	181	7.13	77	3.03	167	6.57	167	6.57	6.44	14.20	F12	-	+
84	22-12	12	22	181	7.13	77	3.03	167	6.57	167	6.57	6.70	14.77	F12	-	+
85	24-12A	12	24	166	6.54	126	4.96	174	6.85	178	7.01	8.50	18.74	F4	-	+
86	24-12B	12	24	165												

Type	Volt	AH / 20HR	Length		Width		Height		Total Height		Weight (Approx.)		Terminal Type	Assembly Figure	
			mm	in	mm	in	mm	in	mm	in	kg	pound			
97	50-12B	12	50	278	10.94	106	4.17	223	8.78	223	8.78	17.50	38.58	F13	+
98	55-12	12	55	229	9.02	138	5.43	208	8.19	212	8.35	18.00	39.68	F15	+ -
99	60-12	12	60	229	9.02	138	5.43	208	8.19	212	8.35	18.30	40.34	F15	+ -
100	70-12A	12	70	351	13.82	167	6.57	176	6.93	176	6.93	24.60	54.23	F15	- +
101	70-12B	12	70	260	10.24	169	6.65	211	8.31	215	8.46	25.00	55.11	F15	+ -
102	70-12C	12	70	260	10.24	170	6.69	221	8.70	221	8.70	25.00	55.11	F15	+ -
103	75-12A	12	75	260	10.24	169	6.65	211	8.31	215	8.46	28.20	62.17	F15	+ -
104	75-12B	12	75	260	10.24	170	6.69	221	8.70	221	8.70	28.20	62.17	F15	+ -
105	75-12C	12	75	562	22.13	114	4.49	188	7.40	188	7.40	28.50	62.83	Bolt-B	+
106	80-12A	12	80	260	10.24	169	6.65	211	8.31	215	8.46	28.50	62.83	F15	+ -
107	80-12B	12	80	351	13.82	167	6.57	179	7.05	183	7.20	24.8	54.67	F22	- +
108	90-12A	12	90	307	12.09	169	6.65	211	8.31	215	8.46	30.60	67.46	F15	+ -
109	90-12B	12	90	331	13.03	175	6.89	214	8.43	239	9.41	31.00	68.34	F11	- +
110	100-12A	12	100	407	16.02	174	6.85	210	8.27	240	9.45	34.60	76.28	F7	+ -
111	100-12B	12	100	328	12.91	172	6.77	214	8.43	220	8.66	34.20	75.40	F17	+ -
112	100-12C	12	100	331	13.03	175	6.89	214	8.43	239	9.41	34.30	75.62	F11	- +
113	100-12D	12	100	508	20.00	111	4.37	223	8.78	235	9.25	36.30	80.03	F16	+
114	100-12E	12	100	394	15.51	110	4.33	285	11.22	285	11.22	37.00	81.57	F17	+
115	120-12A	12	120	407	16.02	174	6.85	210	8.27	240	9.45	40.30	88.84	F17	+ -
116	120-12B	12	120	331	13.03	175	6.89	214	8.43	239	9.41	35.00	77.16	F11	- +
117	120-12C	12	120	435	17.13	108	4.25	317	12.48	317	12.48	46.00	101.41	F17	+
118	140-12	12	140	341	13.43	173	6.81	281	11.06	287	11.30	47.50	104.72	F17	+ -
119	160-12A	12	160	484	19.06	171	6.73	241	9.49	241	9.49	49.60	109.35	F9	+ -
120	160-12B	12	160	550	21.65	110	4.33	287	11.30	287	11.30	51.70	113.98	F17	+
121	160-12C	12	160	544	21.42	125	4.92	317	12.48	317	12.48	51.70	113.98	F17	+
122	180-12	12	180	530	20.87	209	8.23	214	8.43	218	8.58	58.50	128.97	F17	+
123	200-12	12	200	530	20.87	209	8.23	214	8.43	218	8.58	65.50	144.40	F17	+
124	210-12	12	210	522	20.55	242	9.53	218	8.58	243	9.57	69.30	152.78	F10	+
125	230-12	12	230	522	20.55	242	9.53	218	8.58	222	8.74	76.50	168.65	F17	+
126	240-12	12	240	520	20.47	269	10.59	204	8.03	208	8.19	78.00	171.96	F17	+
127	260-12	12	260	521	20.51	269	10.59	220	8.66	224	8.82	89.00	196.21	F17	+

Type	Volt	AH / 5HR	AH / 20HR	Length		Width		Height		Total Height		Weight (Approx.)		Terminal Type	Assembly Figure	
				mm	in	mm	in	mm	in	mm	in	kg	pound			
6	200-6A	6	160	200	244	9.61	190	7.48	275	10.83	275	10.83	29.30	64.59	Special	- +
7	200-6B	6	170	200	322	12.68	177	6.97	226	8.90	230	9.06	36.00	79.37	F17	+ -
8	225-6	6	180	225	244	9.61	190	7.48	275	10.83	275	10.83	32.00	70.55	Special	- +
9	24-12A	12	20	24	166	6.54	126	4.96	174	6.85	174	6.85	9.10	20.06	F13	+ -
10	24-12B	12	20	24	165	6.50	176	6.93	125	4.92	125	4.92	9.20	20.28	F13	- +
11	26-12	12	22	26	166	6.54	126	4.96	174	6.85	174	6.85	10.20	22.49	F13	+ -
12	31-12	12	26	31	196	7.72	131	5.16	155	6.10	180	7.09	11.00	24.25	F15	+ -
13	40-12	12	34	40	198	7.80	166	6.54	174	6.85	174	6.85	16.20	35.71	F13	- +
14	50-12	12	43	50	229	9.02	138	5.43	208	8.19	212	8.35	18.00	39.68	F15	+ -
15	60-12	12	51	60	260	10.24	169	6.65	211	8.31	215	8.46	24.00	52.91	F15	+ -
16	65-12	12	55	65	351	13.82	167	6.57	176	6.93	176	6.93	24.60	54.23	F15	- +
17	73-12A	12	62	73	260	10.24	169	6.65	211	8.31	215	8.46	28.20	62.17	F15	+ -
18	73-12B	12	62	73	260	10.24	170	6.69	221	8.70	221	8.70	28.20	62.17	F15	+ -
19	86-12	12	73	86	307	12.09	169	6.65	211	8.31	215	8.46	30.60	67.46	F15	+ -
20	95-12	12	81	95	328	12.91	172	6.77	214	8.43	220	8.66	34.20	75.40	F17	+ -
21	100-12A	12	85	100	407	16.02	174	6.85	210	8.27	240	9.45	34.60	76.28	F17	+ -
22	100-12B	12	85	100	331	13.03	175	6.89	214	8.43	218	8.58	35.00	77.16	F17	+ -
23	135-12	12	115	135	341	13.43	173	6.81	281	11.06	287	11.30	47.50	104.72	F17	+ -
24	150-12	12	128	150	484	19.06	171	6.73	241	9.49	241	9.49	49.60	109.35	F17	+ -
25	170-12	12	145	170	530	20.87	209	8.23	214	8.43	218	8.58	58.50	128.97	F17	+
26	180-12	12	155	180	522	20.55	242	9.53	218	8.58	222	8.74	69.30	152.78	F17	+
27	200-12A	12	170	200	522	20.55	242	9.53	218	8.58	222	8.74	76.50	168.65	F17	+
28	200-12B	12	170	200	520	20.47	269	10.59	204	8.03	208	8.19	78.00	171.96	F17	+
29	225-12	12	190	225	521	20.51	269	10.59	220	8.66	224	8.82	89.00	196.21	F17	+

# WINNER® NEPTUNE



NEPTUNE Series: Gel Stationary Batteries  
DESIGNED: 15 YEARS IN FLOAT SERVICE

# WINNER® MERCURY



MERCURY Series: Gel Batteries  
DESIGNED SERVICE LIFE: 10~12 YEARS IN FLOAT SERVICE

Type	Volt	AH / 5HR	AH / 20HR	Length		Width		Height		Total Height		Weight (Approx.)		Terminal Type	Assembly Figure	
				mm	in	mm	in	mm	in	mm	in	kg	pound			
1	100-6	6	85	100	281	11.06	128	5.04	189	7.44	204	8.03	18.80	41.45	F17	- +
2	160-6A	6	135	160	306	12.05	169	6.65	220	8.66	226	8.90	30.30	66.80	F17	+ -
3	160-6B	6	135	160	260	10.24	180	7.09	245	9.65	251	9.88	32.10	70.77	F17	- +
4	180-6A	6	155	180	322	12.68	177	6.97	226	8.90	230	9.06	34.00	74.96	F17	+ -
5	180-6B	6	155	180	260	10.24	180	7.09	245	9.65	251	9.88	32.10	70.77	F17	- +

Type	Volt	AH / 20HR	Length		Width		Height		Total Height		Weight (Approx.)		Terminal Type	Assembly Figure	
			mm	in	mm	in	mm	in	mm	in	kg	pound			
1	150-2A	2	150	172	6.77	102	4.02	206	8.11	231	9.09	9.20	20.28	F10	+
2	150-2B	2	150	172	6.77	110	4.33	330	12.99	365	14.37	12.00	26.46	F17	+
3	200-2	2	200	172	6.77	110	4.33	330	12.99	365	14.37	16.00	35.27	F17	+
4	300-2	2	300	172	6.77	150	5.91	330	12.99	365	14.37	22.60	49.82	F17	+
5	400-2	2	400	211	8.31	175	6.89	330	12.99	367	14.45	32.50	71.65	F17	++
6	500-2	2	500	241	9.49	172	6.77	330	12.99	365	14.37	37.20	82.01	F17	+++
7	600-2	2	600	301	11.85	175	6.89	330	12.99	365	14.37	45.00	99.21	F17	+++
8	800-2	2	800	411	16.18	175	6.89	330	12.99	365	14.37	61.50	135.58	F17	++++
9	1000-2	2	1000	474	18.66	175	6.89	328	12.91	366	14.41	73.50	162.04	F17	++++
10	1600-2	2	1600	401	15.79	347	13.66	342	13.46	378	14.88	110.00	242.50	F17	++++
11	2000-2	2	2000	490	19.29	349	13.74	342	13.46	382	15.04	146.00	321.87	F17	++++
12	3000-2	2	3000	711	27.99	353	13.90	342	13.46	382	15.04	220.00	485.01	F17	++++

VALVE REGULATED LEAD ACID



Factory

**WINNER**®  
BATTERY



Marketed and distributed exclusively in Greece by:

178 Iera Odos • 122 42 Aegaleo, Athens • Tel.: +30 210 3474444 • Fax: +30 210 3479931  
<http://www.viosy.gr> • e-mail: [info@viosy.gr](mailto:info@viosy.gr)