VISION
Rechargeable Products
VRLA Battery

VISION

www.vision-batt.com

CP Series

Products Guide

Shenzhen Center Power Tech. Co., Ltd

One of the largest VRLA Battery manufacturers in the world

ISO9001:2000 1298-2004-AE-RGC-RvA MH25860 G4M19906-9202-E-16

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(Edition Apr 2008)

Contents

General features

Stable Quality & High Reliability

VISION battery is well-known for its stable and reliable performance.VISION batteries are easy to maintain;thus,permitting a safe and proper operation of the equipment that the battery powers.The battery can withstand overcharge,over discharge,vibration,and shock.It is also capable of extended storage.

Sealed Construction

VISION's unique construction and sealing technique guarantees that no electrolyte leakage can occur from the terminals or case of any VISION battery. This feature insures safe and efficient operation of VISION batteries in any position. VISION batteries are classified as "Non-Spillable" and will meet all requirements of the International Air Transport Association. (IATA Dangerors Goods Regulation,41# Edition,Section 4.5A,Special Provision:A67)

Long Service Life, Float or Cyclic

The VISION VRLA battery has a long life in float or cyclic service.

Maintenance-Free Operation

During the expected float service life of VISION batteries, there is no need to check the specific gravity of the electrolyte, or add water. In fact, there is no provision for these maintenance functions.

Low Pressure Venting System

VISION batteries are equipped with a safe low pressure venting system,which operates from 1 psi to 6 psi.The venting system is designed to release excess gas in the event that the gas pressure rises to a level above the normal rate.Afterwards,the venting system automatically re-seals itself when the gas pressure level returns its normal rate.This feature prevents excessive build up of gas in the batteries. This low pressure venting system, coupled with the extraordinarily high recombination efficiency, make VISION batteries the safest sealed lead-acid batteries available.

Heavy Duty Grids

The heavy-duty lead calcium-alloy grids in VISION batteries provide an extra margin of performance and service life in both float and cyclic applications, even in conditions of deep discharge.

Low Self Discharge

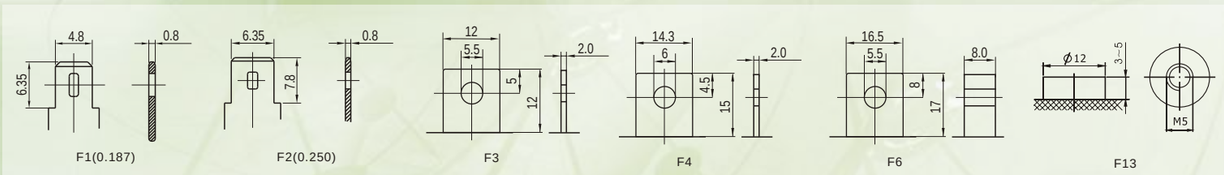
Because of the use of Lead Calcium grids alloy, VISION VRLA battery can be stored for long periods of time without recharge.

Application Fields

A partial list of common applications includes, but is not limited to, standby or primary power for:

- Alarm Systems
- Marine Equipment
- Cable Television
- Medical Equipment
- Communications Equipment
- Micro Processor Based Office Machines
- Control Equipment
- Portable Cine & Video Lights
- Computers
- Power Tools
- Electronic Cash Registers
- Solar Powered Systems
- Electronic Test Equipment
- Telecommunications Systems
- Electric powered Bicycle and Wheelchairs
- Television & Video Recorders
- Emergency Lighting Systems
- Toys
- Fire & Security Systems
- Uninterruptible Power Supplies
- Geophysical Equipment
- Vending Machines

Terminals



General Specifications

TYPE	Nominal Voltage(V)	20h Rate Capacity(Ah)	L(mm)	L(inch)	W(mm)	W(inch)	H(mm)	H(inch)	TH(mm)	TH(inch)	Wt.(Kg)	Wt.(lbs)	Terminal type
CP260	2	6	51	2.01	33	1.30	99	3.90	104	4.09	0.44	0.97	F1
CP445	4	4.5	48	1.89	48	1.89	102	4.02	108	4.25	0.54	1.19	F1/F2
CP445S	4	4.5	48	1.89	52	2.05	94	3.70	99	3.9	0.60	1.32	F1/F2
CP495	4	9.5	102	4.02	44	1.73	95	3.74	101	3.98	1.00	2.20	F1/F2
CP4200	4	20	149	5.87	43	1.69	154	6.06	159	6.26	2.55	5.62	F2
CP612	6	1.2	97	3.82	24	0.94	52	2.05	58	2.28	0.31	0.68	F1
CP620S	6	2	43	1.69	37	1.46	83	3.27	83	3.27	0.35	0.77	
CP628	6	2.8	66	2.60	33	1.30	97	3.82	104	4.09	0.64	1.34	F1
CP632	6	3.2	134	5.28	34	1.34	61	2.40	67	2.64	0.71	1.57	F1
CP632S	6	3.2	194	7.64	25	0.98	50	1.97	56	2.20	0.65	1.43	F1
CP632SA	6	3.2	67	2.64	34	1.34	118	4.65	124	4.88	0.71	1.57	F1
CP640LE	6	4	70	2.76	47	1.85	101	3.98	101	3.98	0.65	1.43	F1
CP642	6	4.2	70	2.76	47	1.85	101	3.98	107	4.21	0.76	1.68	F1
CP642L	6	4.2	70	2.76	47	1.85	101	3.98	101	3.98	0.72	1.59	F1
CP645L	6	4.5	70	2.76	47	1.85	101	3.98	101	3.98	0.75	1.72	F1
CP645T	6	4.5	70	2.76	47	1.85	101	3.98	101	3.98	0.78	1.72	
CP645	6	4.5	70	2.76	47	1.85	101	3.98	107	4.21	0.78	1.72	F1/+F2/-F1
CP645LA	6	4.5	70	2.76	47	1.85	101	3.98	101	3.98	0.76	1.72	F1
CP645H	6	4.5	70	2.76	47	1.85	101	3.98	107	4.21	0.85	1.87	F1/+F2/-F1
CP650S	6	4.6	67	2.64	67	2.64	96	3.78	109	4.29	0.85	1.87	F1
CP650	6	5	70	2.76	47	1.85	101	3.98	107	4.21	0.92	2.03	F1/F2
CP656	6	5.6	70	2.76	47	1.85	101	3.98	107	4.21	0.96	2.12	F1/F2
CP665E	6	6.5	151	5.94	34	1.34	94	3.70	100	3.94	1.10	2.43	F1/F2
CP672	6	7.2	151	5.94	34	1.34	94	3.70	100	3.94	1.36	2.96	F1/F2
CP677	6	7.7	151	5.94	34	1.34	94	3.70	97	3.82	1.34	2.95	F1
CP680S	6	8	98	3.86	56	2.2	117	4.61	117	4.61	1.69	3.72	F1/F2
CP6100	6	10	151	5.94	50	1.97	94	3.70	100	3.94	1.67	3.68	F1/F2
CP6100TS	6	10	108	4.25	71	2.8	140	5.51	140	5.51	2.02	4.45	
CP6120	6	12	151	5.94	50	1.97	94	3.70	100	3.94	2.00	4.63	F1/F2
CP6140T	6	14	108	4.25	71	2.80	140	5.51	140	5.51	2.37	5.22	F1
CP6140TS	6	14	108	4.25	71	2.80	140	5.51	140	5.51	2.37	5.22	
CP820	8	2	69	2.72	49	1.93	65	2.56	65	2.56	0.56	1.22	
CP832	8	3.2	68	2.68	49	1.93	91	3.58	91	3.58	0.78	1.72	
CP832S	8	3.2	134	5.28	36	1.42	63	2.48	69	2.72	0.80	1.76	F1
CP1208	12	0.8	96	3.78	25	0.98	62	2.44	62	2.44	0.34	0.75	
CP1212	12	1.2	97	3.82	43	1.69	52	2.05	58	2.28	0.61	1.34	F1
CP1212S	12	1.2	97	3.82	48	1.89	52	2.05	58	2.28	0.63	1.39	F1
CP1220C	12	1.6	144	5.67	24	0.94	65	2.56	65	2.56	0.60	1.32	
CP1220M	12	1.6	150	5.91	20	0.79	90	3.54	90	3.54	0.68	1.50	
CP1223C	12	1.8	182	7.17	24	0.94	61	2.40	61	2.40	0.71	1.57	
CP1222S	12	2.2	103	4.06	46	1.81	70	2.76	70	2.76	0.98	2.16	
CP1219	12	1.9	178	7.01	35	1.38	61	2.40	67	2.64	0.80	1.76	F1
CP1223	12	2.3	178	7.01	35	1.38	61	2.40	67	2.64	0.99	2.18	F1
CP1223H	12	2.3	178	7.01	35	1.38	61	2.40	67	2.64	0.99	2.18	F1
CP1223E	12	2.3	178	7.01	35	1.38	61	2.40	67	2.64	0.85	1.87	F1

General Specifications

TYPE	Nominal Voltage(V)	20h Rate Capacity(Ah)	L(mm)	L(inch)	W(mm)	W(inch)	H(mm)	H(inch)	TH(mm)	TH(inch)	Wt.(Kg)	Wt.(lbs)	Terminal type
CP1225	12	2.5	104	4.09	48	1.89	70	2.76	70	2.76	0.93	2.05	
CP1225S	12	2.5	104	4.09	48	1.89	70	2.76	70	2.76	0.93	2.05	
CP1226S	12	2.6	70	2.76	48	1.89	98	3.88	104	4.11	0.91	2.01	F1
CP1226	12	2.6	178	7.01	35	1.38	61	2.40	67	2.64	0.99	2.18	F1
CP1229	12	2.9	79	3.11	55	2.19	98	3.88	104	4.09	1.18	2.60	F1
CP1232	12	3.2	134	5.28	67	2.64	61	2.40	67	2.64	1.40	3.09	F1/F2
CP1232S	12	3.2	134	5.28	67	2.64	60	2.36	66	2.60	1.40	3.09	F1/F2
CP1240L	12	4	90	3.54	70	2.76	101	3.98	101	3.98	1.55	3.42	F1
CP1240SL	12	4	90	3.54	70	2.76	101	3.98	101	3.98	1.55	3.42	F1
CP1245	12	4.5	90	3.54	70	2.76	101	3.98	107	4.21	1.72	3.79	F1
CP1245H	12	4.5	90	3.54	70	2.76	101	3.98	107	4.21	1.72	3.79	F1
CP1245S	12	4.5	140	5.51	48	1.89	102	4.02	103	4.06	1.83	4.03	F1
CP1250	12	5	90	3.54	70	2.76	101	3.98	107	4.21	1.80	3.97	F1/F2
CP1250H	12	5	90	3.54	70	2.76	101	3.98	107	4.21	1.80	3.97	F1/F2
CP1260	12	6	151	5.94	52	2.05	94	3.70	99	3.90	2.18	4.80	F1/F2
CP1265E	12	6.5	151	5.94	65	2.56	94	3.70	100	3.94	2.14	4.72	F1/F2
CP1270	12	7	151	5.94	65	2.56	93.5	3.68	100	3.94	2.43	5.36	F1/F2
CP1270A	12	7	151	5.94	65	2.56	93.5	3.68	101	3.98	2.33	5.14	F2
CP1270L	12	7	151	5.94	65	2.56	93.5	3.68	94	3.70	2.53	5.58	F1
CP1270SL	12	7	151	5.94	65	2.56	93.5	3.68	94	3.70	2.48	5.47	F1
CP1272	12	7.2	151	5.94	65	2.56	94	3.70	100	3.94	2.50	5.51	F1/F2
CP1280H	12	8	151	5.94	65	2.56	94	3.70	100	3.94	2.62	5.78	F1/F2
CP1290L	12	9	151	5.94	65	2.56	94	3.70	94	3.70	2.80	6.17	F1
CP1290	12	9	151	5.94	65	2.56	94	3.70	100	3.94	2.80	6.17	F1/F2
CP12100E	12	10	151	5.94	98	3.86	95	3.74	101	3.98	3.50	7.72	F1/F2
CP12100S	12	10	151	5.94	65	2.56	111	4.37	117	4.61	3.25	7.16	F1/F2
CP12100	12	10	151	5.94	98	3.86	95	3.74	101	3.98	3.70	8.16	F1/F2
CP12100M	12	10	151	5.94	98	3.86	95	3.74	107	4.21	3.45	7.61	
CP12120	12	12	151	5.94	98	3.86	95	3.74	101	3.98	3.90	8.60	F1/F2
CP12150	12	15	181	7.13	77	3.03	167	6.57	167	6.57	5.08	11.2	F3/F4
CP12170	12	17	181	7.13	77	3.03	167	6.57	167	6.57	5.70	12.6	F2/F3/F4
CP12170X	12	17	181	7.13	77	3.03	167	6.57	167	6.57	5.70	12.6	F13
CP12170H	12	17	181	7.13	77	3.03	167	6.57	167	6.57	5.90	13.0	F3/F4
CP12170HX	12	17	181	7.13	77	3.03	167	6.57	167	6.57	5.90	13.0	F13
CP12200	12	20	181	7.13	77	3.03	167	6.57	167	6.57	5.90	13.0	F3/F4
CP12200HD	12	20	181	7.13	77	3.03	167	6.57	167	6.57	6.70	14.8	
CP12240S	12	24	165	6.5	125	4.92	175	6.89	182	7.17	8.50	18.7	F2/F6
CP12240	12	24	166	6.54	175	6.89	125	4.92	125	4.92	8.60	19.0	F3/F4
CP12240X	12	24	166	6.54	175	6.89	125	4.92	125	4.92	8.60	19.0	F13
CP12240H	12	24	166	6.54	175	6.89	125	4.92	125	4.92	9.20	20.3	F3/F4
CP12240HX	12	24	166	6.54	175	6.89	125	4.92	125	4.92	9.20	20.3	F13
CP12280S	12	28	165	6.50	125	4.92	175	6.89	182	7.17	9.95	21.9	F2/F6
CP2445	24	4.5	207	8.15	78	3.07	74	2.91	74	2.91	3.20	7.05	
CP2480	24	8	180	7.09	160	6.30	72	2.83	72	2.83	5.60	12.3	

VISION
Rechargeable Products
Lead-Acid Battery

www.vision-batt.com

FM Series

General Purpose Applications

One of the largest Sealed Lead Acid Battery manufacturers in the world

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(Edition Sep 2006)

Shenzhen Center Power Tech. Co., Ltd

General purpose application batteries

FM Series
General Purpose Applications

VISION FM series are designed for general-purpose applications, such as UPS, telecom, and electrical utilities.
With 10 years design life, the batteries comply to the most popular international standards, such as IEC60896-21/22, BS6290-4, Eurobat Guide. The battery container and cover are available both in V0 class flame retardant ABS or HBO ABS plastics.
With more than 15 years of production experience, VISION FM series of VRLA batteries are recognized as the most reliable and high quality battery system in the industry.

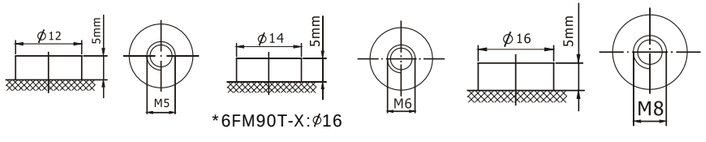
General Specifications

TYPE	Nominal Voltage(V)	Capacity(Ah) 1.8Vpc@10hr,25℃	Capacity(Ah) 1.75Vpc@20hr,25℃	L(mm)	L(inch)	W(mm)	W(inch)	H(mm)	H(inch)	TH(mm)	TH(inch)	Terminal	Layout	Wt.(Kg)	Wt.(lbs)
6FM17-X	12	17	18.2	181	7.13	77	3.03	167	6.57	167	6.57	M5	B	5.7	12.6
6FM24-X	12	24	25.2	166	6.54	175	6.89	125	4.92	125	4.92	M5	B	8.6	19.0
6FM33-X	12	33	35.6	195	7.68	130	5.12	155	6.10	168	6.61	M6	A	10.2	22.5
6FM40-X	12	40	43.0	197	7.76	165	6.50	170	6.69	170	6.69	M6	B	13.5	29.8
6FM45-X	12	45	47.4	197	7.76	165	6.50	170	6.69	170	6.69	M6	B	13.8	30.4
6FM55SG-X	12	55	57.2	229	9.02	138	5.43	208	8.19	213	8.39	M6	A	19.5	43.0
6FM60-X	12	60	65.8	258	10.2	166	6.54	206	8.11	215	8.46	M6	A	24.0	52.9
6FM65-X	12	65	70.0	350	13.8	167	6.57	179	7.05	179	7.05	M6	A	23.4	51.6
6FM75-X	12	75	81.0	258	10.2	166	6.54	206	8.11	215	8.46	M6	A	24.0	52.9
6FM80-X	12	80	85.2	350	13.8	167	6.57	179	7.05	179	7.05	M6	A	24.0	52.9
6FM90T-X	12	90	97.6	306	12.0	169	6.65	210	8.27	215	8.46	M6	A	30.0	66.2
6FM100-X	12	100	107	330	13.0	171	6.73	215	8.46	222	8.74	M6	A	32.0	70.6
6FM120-X	12	120	126	410	16.1	176	6.93	227	8.94	227	8.94	M8	A	38.0	83.8
6FM134R	12	134	144	342	13.5	172	6.77	273	10.7	277	10.9	M8	A	42.5	93.7
6FM150-X	12	150	162	485	19.1	172	6.77	240	9.45	240	9.45	M8	A	47.0	104
6FM175	12	175	185	530	20.9	209	8.23	215	8.47	240	9.45	M10	C	55.5	122.4
6FM200-X	12	200	216	522	20.6	238	9.37	218	8.58	223	8.78	M8	C	65.0	143
6FM230-X	12	230	243	520	20.5	269	10.6	203	8.00	208	8.19	M8	C	72.6	160.1
3FM225-X	6	225	234	320	12.6	176	6.93	225	8.86	247	9.72	M8	D	30.5	67.3

More battery types are available on website: http://www.vision-batt.com

Position of terminals

Terminal



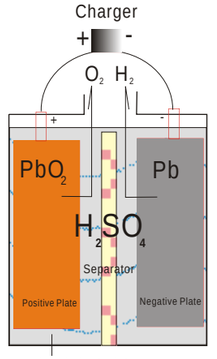
Principle of VRLA batteries

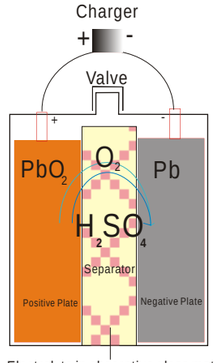
During conventional lead Acid battery charging , water electrolysis occurs at the final stage and hydrogen generates from the negative plates and oxygen from the positive plates. This causes water loss and periodic watering is needed. However, evolution of oxygen and hydrogen gases does not occur simultaneously, because the recharge of the positive plates is not as efficient as the negative ones. This means that oxygen is evolved from the positive plate before hydrogen is evolved from the negative plate.
At the same time that oxygen is evolved from the positive plate, a substantial amount of highly active spongy lead exists on the negative plate before it commences hydrogen evolution. Therefore, providing oxygen can be transported to the negative plates, conditions are ideal for a rapid reaction between lead and oxygen, i.e. oxygen is electrochemically reduced on the negative plate according to the following formula,

$$2e^- + 2H^+ + 1/2O_2 \rightarrow H_2O$$

and the final product is water.
The current flowing through the negative plate drives this reaction instead of hydrogen evolution, which occurs, in a conventional battery.
This process is called gas recombination. If this process were 100% efficient no water would be lost from the battery. By careful design and selection of battery components, gas recombination efficiency is from 95% to 99%.

Principle of the oxygen reduction cycle





Recombination efficiency

Recombination efficiency is determined under specific conditions by measuring the volume of hydrogen emitted from the battery and converting this into its ampere-hour equivalent. This equivalent value is then subtracted from the total ampere-hours taken by the battery during the test period, and the remainder is the battery's recombination efficiency and is usually expressed as a percentage.

As recombination is never 100%, some hydrogen gas is emitted from batteries through the safety valve. The volume of gas emitted is very small and typical average values on constant potential float at 25ºC are as follows:

VISION FM hydrogen emissions	
Float Voltage (V/cell)	Volume of gas emitted (ml/cell/C_{10}Ah/month)
2.23~2.28	3.8
2.40~2.45	25

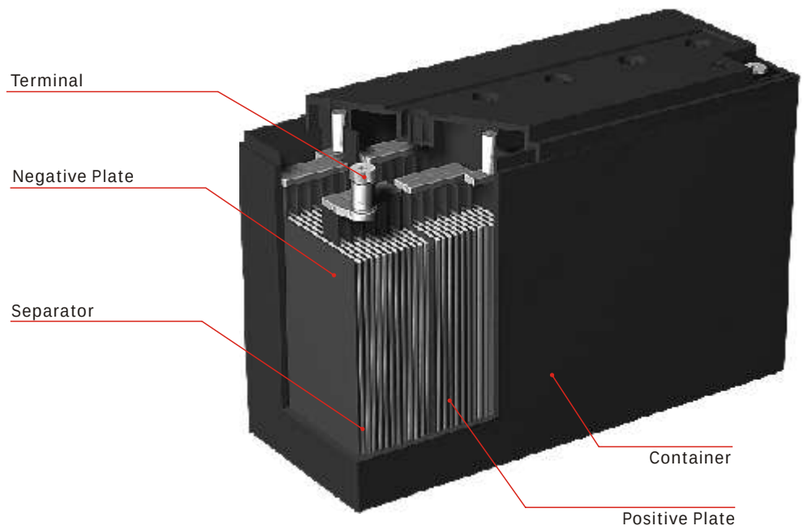
Conventional Cell
Oxygen and hydrogen escape to the atmosphere.
VISION FM
Oxygen from the positive plate transfers to the negative and recombines with lead to form water.

Charge characteristics

Construction :

These reactions can take place only by using :

- Plates composed of special alloy with several components which provide the plate grids with high mechanical strength and a high level of hydrogen over voltage.
- An appropriate ratio between positive and negative active materials.
- Fiberglass separators manufactured from borosilicate, giving them excellent resistance to high temperatures and to sulphuric acid. The high level of porosity of these separators is used to retain the quantity of electrolyte necessary for cell operation, but without any free electrolyte.
- A pressure relief valve which allows gas to be released if necessary in the case of an accidental overcharge.



The cells in the VISION FM product range must be charged at a constant voltage at an ambient temperature of 25ºC, the batteries should be charged at 2.23-2.28 volts per cell. It is not necessary to limit the current, as this will be governed by the maximum output available from the charger until the voltage limit is reached. The charging voltage of 2.23-2.28 volts should also be used for float charging. To achieve nominal performance characteristics, it is recommended to adjust this value to suit the ambient temperature, as indicated in the following table:

Temperature	Float charge voltage
0ºC	2.31 - 2.36 V
10ºC	2.28 - 2.33 V
20ºC	2.25 - 2.30 V
25ºC	2.23 - 2.28 V
30ºC	2.22 - 2.27 V
35ºC	2.20 - 2.25 V

Under these conditions a full recharge will be completed in approximately 48 hours.

Fast recharge:

Increasing the charge voltage to 2.40 Volts per cell can reduce recharge time and it is possible, depending on the depth of discharge, to halve the recharge time. Under these conditions, however, the charge must be monitored and must be terminated when the charge current remains reasonably steady for 3 hours after the voltage limit has been reached. At the beginning of charge the current must be limited to $0.3C_{10}$ (A).

Ripple current:

The ripple content of the charging current affects the life of the battery. It is recommended to limit the continuous ripple current to $0.05\ C_{10}$ (in amperes) as recommended value (never exceed $0.10C_{10}$). Transient and other ripple type voltage excursions can be accommodated provided that, with the battery disconnected, the system peak to peak voltage including regulation limits falls within ±2.5% of the recommended float voltage of the battery.