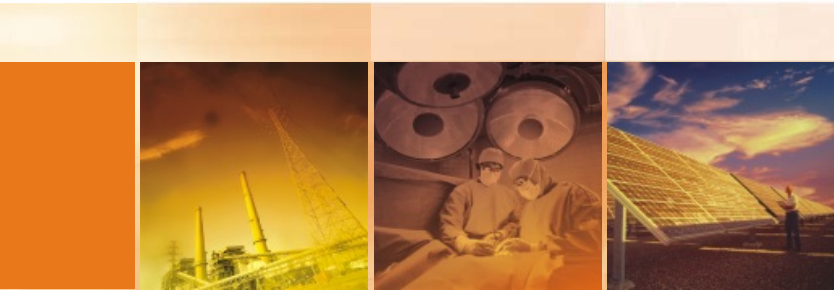


VISION  
Rechargeable Products  
Lead-Acid Battery



[www.vision-batt.com](http://www.vision-batt.com)



# FM Series

General Purpose Applications

## Product Guide

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 IEC896-2, BS6290-4, Eurobat Guide.

The battery container and cover are available both in V0 class flame retardant ABS or HBOABS 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

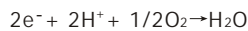
TYPE	Nominal Voltage(V)	Capacity(Ah) 1.8V@10hr,25°C	L(mm)	L(inch)	W(mm)	W(inch)	H(mm)	H(inch)	TH(mm)	TH(inch)	Terminal	Layout	Wt.(Kg)	Wt.(lbs)
6FM17-X	12	17	181	7.13	77	3.03	167	6.57	167	6.57	M5	B	5.7	12.6
6FM24-X	12	24	166	6.54	175	6.89	125	4.92	125	4.92	M5	B	8.6	19.0
6FM33-X	12	33	195	7.68	130	5.12	155	6.10	168	6.61	M6	A	10.2	22.5
6FM40-X	12	40	197	7.76	165	6.50	170	6.69	170	6.69	M6	B	13.5	29.8
6FM45-X	12	45	197	7.76	165	6.50	170	6.69	170	6.69	M6	B	13.8	30.4
6FM55SG-X	12	55	229	9.02	138	5.43	208	8.19	213	8.39	M6	A	19.5	43.0
6FM60-X	12	60	258	10.2	166	6.54	206	8.11	215	8.46	M6	A	24.0	52.9
6FM65-X	12	65	350	13.8	167	6.57	179	7.05	179	7.05	M6	A	23.4	51.6
6FM75-X	12	75	258	10.2	166	6.54	206	8.11	215	8.46	M6	A	24.0	52.9
6FM80-X	12	80	350	13.8	167	6.57	179	7.05	179	7.05	M6	A	24.0	52.9
6FM90T-X	12	90	306	12.0	169	6.65	210	8.27	215	8.46	M6	A	30.0	66.2
6FM100-X	12	100	330	13.0	171	6.73	215	8.46	222	8.74	M6	A	32.0	70.6
6FM120-X	12	120	410	16.1	176	6.93	227	8.94	227	8.94	M8	A	38.0	83.8
6FM134R	12	134	342	13.5	172	6.77	273	10.7	277	10.9	M8	A	42.5	93.7
6FM150-X	12	150	485	19.1	172	6.77	240	9.45	240	9.45	M8	A	47.0	104
6FM200-X	12	200	522	20.6	238	9.37	218	8.58	223	8.78	M8	C	65.0	143
3FM225-X	6	225	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>

# Principle of VRLA batteries

During charging of conventional lead acid battery, electrolyse is of water 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,

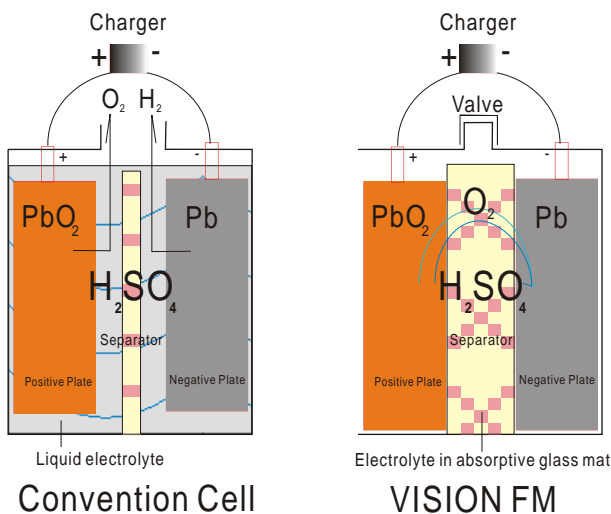


and the final product is water.

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 20°C are as follows:

VISION FM hydrogen emissions	
Float Voltage (V/cell)	Volume of gas emitted (ml/cell/C <sub>10</sub> /month)
2.27~2.30	3.8
2.40~2.45	25

## Conventional Cell

Oxygen and hydrogen escape to the atmosphere.

## VISION FM

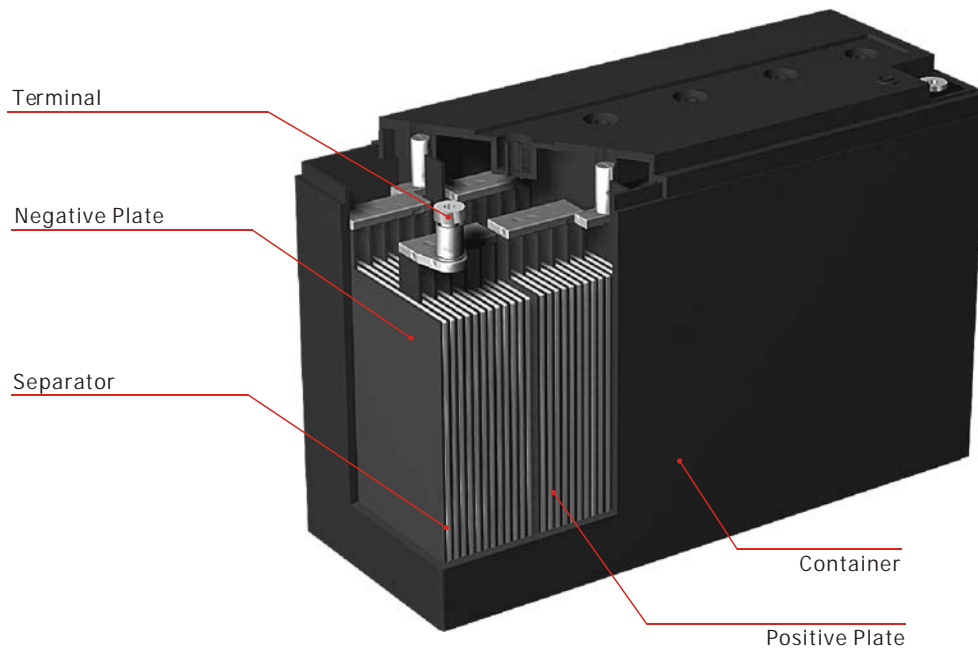
Oxygen from the positive plate transfers to the negative and recombines with lead to form water.

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.





RM 1801, 18/F, Cangsong Bldg., Terra 6 Rd, Chegongmiao, Futian District, Shenzhen 518040 China

Tel: 86 755 8343 5688 Fax: 86 755 8384 9585

E-mail: [sales@vision-batt.com](mailto:sales@vision-batt.com)

Website: <http://www.vision-batt.com>

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