Matsushita Electric Industrial Co., Ltd.
Shenyang Matsushita Storage Battery Co., Ltd

May 8, 2003
No. 03-094

Battery Specifications

Model: LC-XD1217P

Customer: PIE

Application: TRICKLE USE

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1. Specifications for the rechargeable valve regulated (sealed) lead-acid battery.
2. Drawings.
3. Precautions for handling the rechargeable valve regulated (sealed) lead acid batteries.

Please return a copy of these specifications to SLMB (Shenyang Matsushita Storage Battery Co., Ltd.) with the customer's signature of approval.

Signature for Approval:	:	Date
	:	
	:	
Written by	: Checked by	: Checked by
Zhou Yang	: Wu Jing Min	: M. Ide
Zhou Yang	: Wu Jing Min	: M. Ide

Shenyang Matsushita Storage Battery Co., Ltd.

SPECIFICATIONS FOR THE RECHARGEABLE VALVE REGULATED (SEALED) LEAD-ACID BATTERY

Model No. LC-XD1217P

1. Scope

These specifications pertain to Shenyang Matsushita Lead-Acid Battery Co.,Ltd.`s ( SLMB`S) Rechargeable Valve Regulated (Sealed) Lead-Acid Battery, type LC-XD1217P, hereafter referred to as the "battery". This document only describes the performance of the battery. The price, delivery date and other matters should be dealt with in other mutual agreements.

2. Requirements

Voltage, capacity, mass and dimensions for this model are shown in Table1.

Table 1 requirements

Model	LC-XD1217P
Nominal Voltage	12V
Rated Capacity at 20hour-rate(Ah)	17
Mass(approx. Kg)	6.5
Dimensions	shown in the attached drawing

3. Structure

The battery consists mainly of positive plates, negative plates, separators, electrolyte, valves, a container and a cover. The electrolyte is absorbed in both positive/negative plate and separators.

4. Characteristics

The following characteristics are for the batteries, which are manufactured within 6 months, independently.

4.1 Capacity

If the battery is discharged at 4.25A to the end voltage of 10.5V per battery after a full charge, followed by standing of one hour at an ambient temperature of 25±2? , the discharge duration time should exceed 3 hours within the first 3 times of the charge and discharge cycles.

4.2 Shelf life characteristics

The duration time should be more than 80 minutes when the battery, which has been stored at an ambient temperature of 40±2? for 4 months, then stored at an ambient temperature of 25±2? for 24 hours and is then discharged at 4.25A to the end voltage of 10.5V per battery.

4.3 Trickle life

If the battery is fully charged with a constant voltage charger with the controlled voltage of 13.7 ±0. 10V at an ambient temperature of 25±2? , and every 3 months the battery is discharged at a constant current of 4.25A to 10.5V at an ambient temperature of 25±2? , the battery shall have a trickle life of over 3 years with a discharge duration of over 1.5hours.
(Expected design life with trickle: More than 10 years when discharging 0.25CA at 20°C)

Note: the expected life of the battery shall decrease by one-half with each rise in temperature of 10? . In particular, the life of the battery will shorten remarkably at about 40? . Therefore careful consideration must be taken not to use the battery at high temperature. Also, as mentioned in 4.3 above, the life of battery will vary depending on the charge/discharge conditions. For example, a non-flat current may shorten the life of the battery. Thus if special charge and/or

discharge methods not described in this specification will be used, please confirm the battery characteristics with the actual application equipment before designing the charger.

As the period of use of VRLA (SLA) battery becomes longer, the run time of the battery gradually becomes shortened. While the battery reaches the end of life with the shortened run time, such phenomena as gradual decrease of electrolyte and corrosion of the positive grid occur inside of the battery. If the battery of this condition continues to be used, it may suffer from thermal runaway (a vicious circle of increasing charge current and rising temperature) and electrolyte leakage as its capacity reaches 0. We strongly recommend taking proper preventive measures such as replacing batteries before any of these phenomena are found. In addition, if the case is made of metal, please be sure that the battery is insulated against its metal case with acid-and heat-resistant insulating material so that the battery can not touch the metal case directly. If the battery continues to be used without proper replacement, or if it is not insulated properly, it may generate fire. In case you can not replace batteries for some serious reason, please take some other preventive actions such as stopping charging. Please see 'Recommended timing for battery replacement for backup applications' for more detailed information.

4.4 Vibration Resistance Characteristics

Vibration resistance characteristics are tested such that a fully charged battery, being in a right side up position, is subjected to vibrations under the conditions given below. The battery is then checked visually for damage such as deformation or leakage of electrolyte, and checked electronically for existence of a short circuit or the terminal voltage being lower than the nominal voltage.

(1) Direction of vibration	**Vertical**
(2) Peak to peak Amplitude	**4 mm**
(3) Vibration Frequency	**16.7Hz**
(4) Duration of Vibration	**Continuously for 1 hour**
(5) Ambient temperature	**25±2? throughout the test**

Note: The battery being tested must be firmly fixed on the vibration board.

5. Usage Conditions

5.1 Discharge

Discharge current rang	**0.85A to 51.0A**
Temperature range	**-15? to 50?**
Recommended cut-off voltage	**Shown in Table 2**

Table 2 Recommended cut-off Voltage

Discharge Current	Recommended Cut-off Voltage
Below 0.2CA(3.4A)	10.5V
0.2CA to 0.5CA(3.4A to 8.5A)	10.2V
0.5CA to 1.0CA(8.5A to 17.0A)	9.90V
1.0CA to 2.0CA(17.0A to 34.0A)	9.30V
2.0CA to 3.0CA(34.0A to 51.0A)	8.70V

Do not allow the batteries to discharge below the recommended cut-off voltage.

5.2 Charge

Current limited, constant voltage charge

Initial charge current for trickle use	**less than 2.55A**
Temperature range	**0? to 40?**
Charge voltage	**shown in Table 3**

Table 3 Charge Voltage

Ambient Temperature	Charge Voltage(a) Trickle Type
0?	14.00 to 14.20V
25?	13.60 to 13.80V
40?	13.30 to 13.50V

Notes:

(a) **Charge voltage refers to the voltage remaining at the end of charge.**

(b) **When the initial charging current is bigger than 2.55A, please consult us.**

5.3 Ambient Temperature Range of Storage

The ambient temperature range of storage shall be -15 to 40? . But for the short-time (about 0.5month) storage, temperature range shall be -40 to 60? . Also, for the long-time (about 12 months) storage, temperature range is desirably shall be -15 to 25? .

6. Limited Warranty

The following limitations apply to SLMB`S warranty:

(1) **The battery is covered by warranty for a period of 1 year from the date of production if defective materials or production mistakes originating from SLMB are the cause of any battery problem.**

(2) **The warranty limits SLMB to supplying a new battery to replace the defective battery.**

(3) **The warranty does not apply if the problem has been caused by one of the following:**
   - (a) **The battery has been used for purposes not specified by SLMB; or**
   - (b) **The battery has been modified in any way.**

(4) **If the cause of the problem is not clear, SLMB reserves the right to investigate the actual application in which the battery was subjected.**

- **Please keep the next "Precautions in handling the Rechargeable Valve Regulated (Sealed) Lead Acid Batteries", to get full performances and operate them safety.**
- **Making design especially recycle symbol will be changed by individual country recycle circumstances such as law and/or voluntary. If you intend to export this battery another country, please consult Panasonic sales person.**

Commercial Tolerance	Sym.	Date	Revision	Signed	Checked
	△				
	△				

Panasonic

Valve Regulated Lead-Acid Battery
Model No. **LC-XD1217P**
(12V 17Ah/20HR)

Constant Voltage Charge
Voltage regulation
Cycle use : 14.5V~14.9V (25℃)
(Initial current: less than 6.8A)
Standby use : 13.6V~13.8V (25℃)
NONSPILLABLE
IN THE U.S.A. CALL 1-800-SAV-LEAD
BATTERY MUST BE RECYCLED.

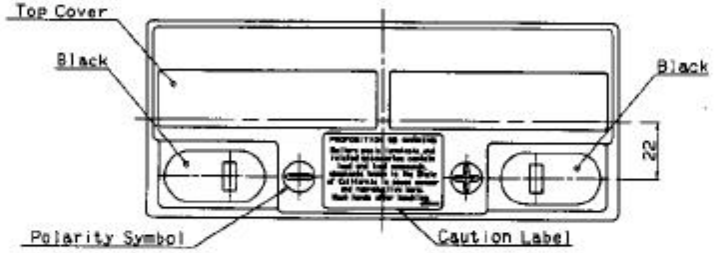
CAUTION
- Do not charge in a gas tight container.
- Do not short the battery terminals.
- Do not incinerate.
- Flush with water at once if contact is made with electrolyte (Acid).

Manufactured for Matsushita Battery Industrial Co., Ltd. Osaka Japan
Made in China

LEAD RETURN RECYCLE

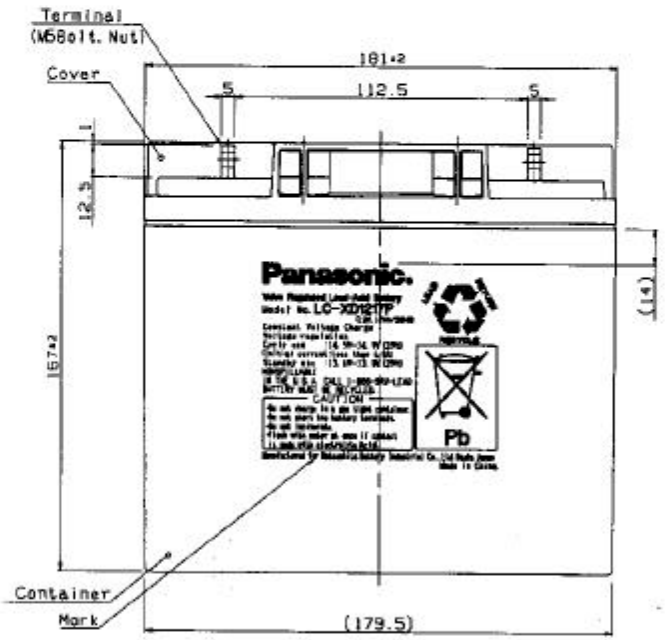
Pb

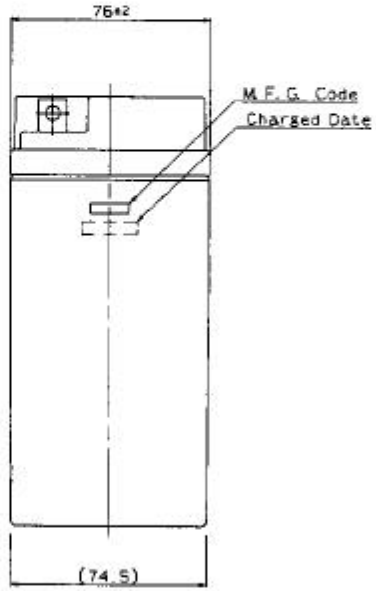
Mark



PROPOSITION 65 WARNING
Battery posts, terminals and related accessories contain lead and lead compounds, chemicals known to the State of California to cause cancer and reproductive harm. Wash hands after handling.
OK2P65

Caution Label





	OUTWARD DRAWING	ABS			
Sym	Item or Code No.	Material & Size	qt.	Process	Remark

Scale	Designed	Drawn	Checked	Checked	Approved
~	Sumiyoshi	C.Bai			
	Jan 25'03	Jan 25'03	Apr 23'03	Apr 23'03	Apr 23'03

LC-XD1217P

Name: OUTWARD DRAWING

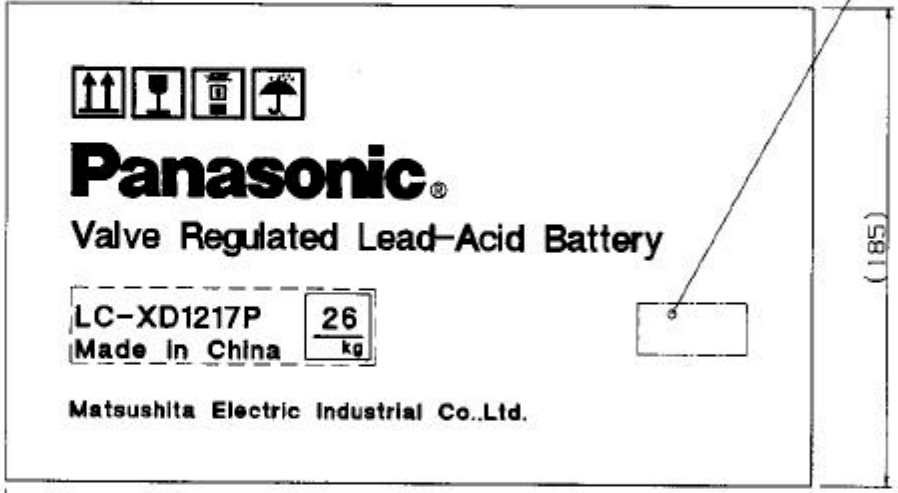
No. MSXD1217P-E

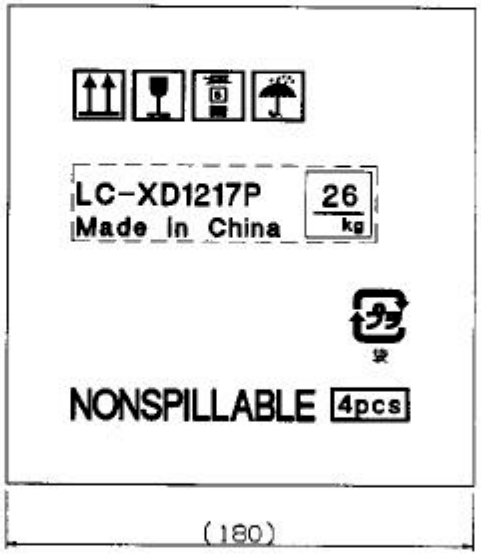
A3

Commercial Tolerance	Sym.	Dt.	Revision	Signed	Checked
	△				
	△				

FRAGILE

Charged Date Stamp





Sym.	OUTER CARTON Item or Code No.	Material & Size	qt.	Process	Remark

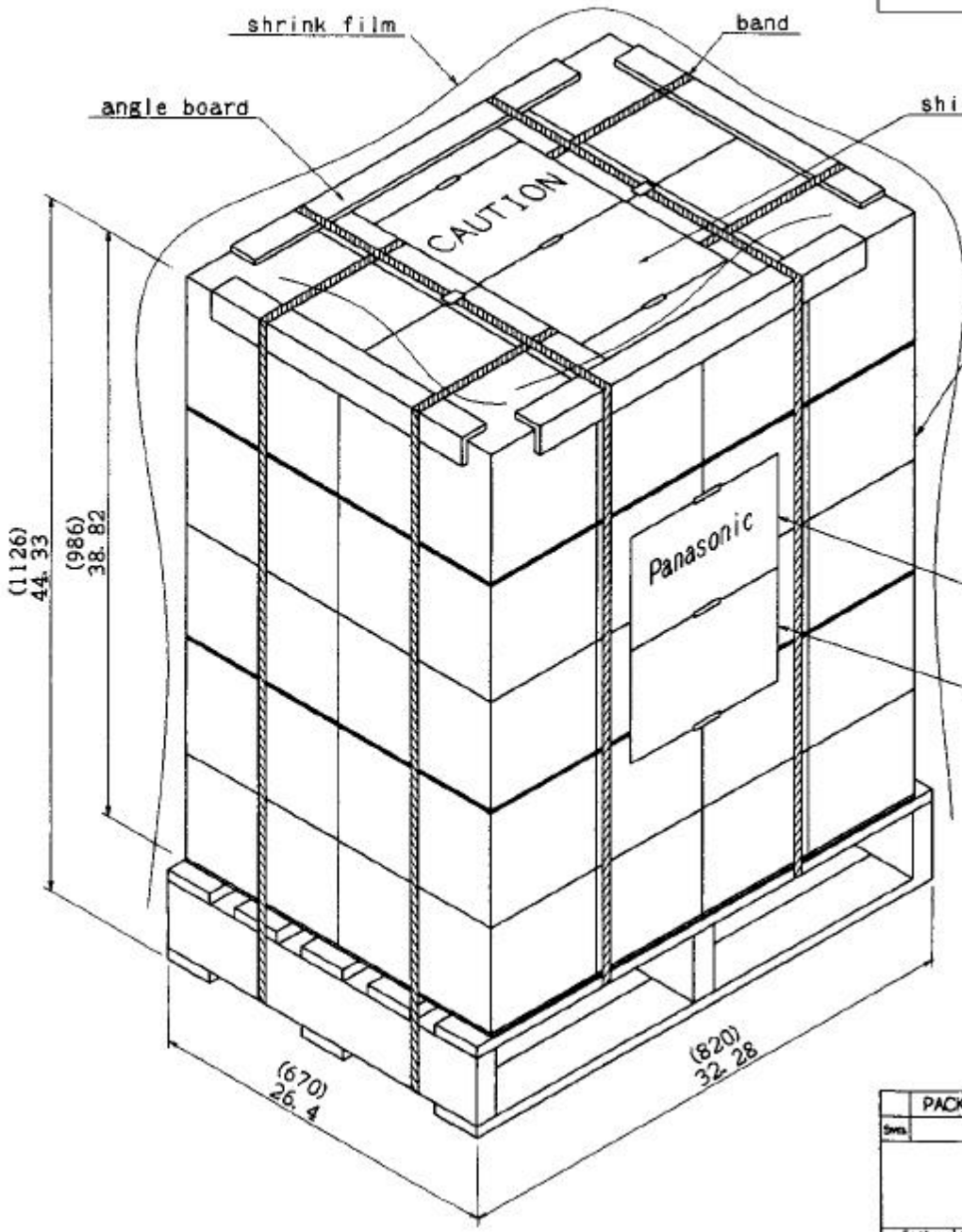
Scale	Designed	Drawn	Checked	Checked	Approved
~	Sumiya Liu		C.Bai		

LC-XD1217P

Name: OUTER CARTON

No: CR1XD1217P-F

Commercial Tolerance	Sym.	Date	Revision	Signed	Checked



160pieces (40carton boxes)
(4pcs/carton box)
GRS weight: 1060kg

PACKAGING SPECIFICATION					
Sym.	Item or Code No.	Material & Size	qt.	Process	Remark

				LC-RD1217, LC-PD1217	
				Name	PACKAGING SPECIFICATION
Scale	Designed	Drawn	Checked	Checked	Approved
~	Feb.10.05	Feb.10.05	C. Bai Feb.10.05	Feb.10.05	Feb.10.05
				No.	PPRD1217B-E