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Specification of Valve Regulated Lead-Acid Battery

TYPE : PE12V40

GS Yuasa International Ltd.

## SPECIFICATION OF VALVE REGULATED LEAD-ACID BATTERY "PE12V40"

## 1. SCOPE

This specification covers valve regulated lead-acid battery shown in the section 2.

## 2. TYPE

PE12V40

## 3. CHARACTERISTIC OF THE BATTERY

The outline of the battery applied to this specification is shown in the Table below.

Type		PE12V40
Nominal Voltage (V)		12
Rated Capacity (Ah/20hR)		40.0
Dimensions (mm)	Length	197±2
	Width	163±2
	Height	174±2
	Total height	174±2
Terminal Position		Please refer to the attached drawing outline
Weight Approx. (kg)		13
Terminal Type		M6 Bolt Nut

## 4. CONSTRUCTION

## 4-1 General

The battery shall consist of positive plates, negative plates, separators, container, cover, safety valves, electrolyte etc. and shall be equipped with a positive terminal and a negative terminal.

## 4-2 Gas Recombination

The battery shall be designed and manufactured with a sealing mechanism capable of suppressing the gas produced in the battery and eliminating water loss by means of the gas recombination system on the negative plates.

## 5. PERFORMANCE

## 5-1 Operating temperature

Temperature of tested battery shall be 25±2°C, if not specified.

## 5-2 Rated capacity (20h-rate)

The duration time of fully charged battery shall be at least 20 hours within 5 cycles under the conditions as below.

Discharge current (A)	Final voltage (V)
2.0	10.5

## 5-3 High rate discharge characteristics

High rate discharge of fully charged battery shall be at least 18.0 Ah within 5 cycles under the conditions as below.

Discharge current (A)	Final voltage (V)
40	9.6

## 5-4 Withstand current characteristics

The battery shall have no such abnormalities as obvious damage or leakage of electrolyte, when a fully charged battery is subjected to the following discharge.

Discharge current (A)	Time (s)
80	300
600	5

## 5-5 Charge retention characteristics

When a fully charged battery is stored for 4 months in open circuit, residual capacity of the battery is higher than or equal to 75% of actual capacity.

## 5-6 Trickle (Float) life

Under the temperature of  $25^{\circ}\text{C}\pm 2^{\circ}\text{C}$ , the life shall be at least 3 years until the discharge duration time decreases to less than 2.0 hours when the battery is continuously charged at  $13.65\pm 0.15$  V and discharged at 10.0 A until the terminal voltage falls to 10.2 V every 2 months.

## 6. CHARGING

Set the charging conditions according to the following table.

Method	Predetermined Voltage (V)	Maximum charging current (A)	Special condition
Trickle Float	$13.65\pm 0.15$	10.0 or less	When to constantly use at below $5^{\circ}\text{C}$ or above $35^{\circ}\text{C}$ , temperature compensation of $-18\text{mV}/^{\circ}\text{C}/\text{batt.}$ shall be applied with $25^{\circ}\text{C}$ as a center point.

## 7. MAXIMUM DISCHARGE CURRENT

The maximum discharge current of the battery applied to this specification is subjected to the following discharge.

Continuous current (A)	120
Max discharge (for 5 seconds) (A)	600

## 8. OPERATING TEMPERATURE

The battery shall be capable of being operated in the following temperature ranges.

Discharge (°C)	-15~40
Charge (°C)	-15~40
Storage (°C)	-15~40

## 9. STORAGE PERIOD WITHOUT CHARGING

The battery shall be capable of being stored in the following period at each temperature range.

Storage temperature /°C	Storage max. period /month
25 $\geq$	6
30 $\geq$	4
35 $\geq$	3
40 $\geq$	2
40<	Avoid storage

## 10. MECHANICAL CHARACTERISTICS

### 10-1 Vibration resistance characteristics

The battery shall have more than nominal voltage without such abnormalities as obvious damage or leakage of electrolyte, when a fully charged battery is subjected to the following vibration test.

Peak to peak amplitude	: 4 mm
Frequency	: 16.7 Hz
Duration	: Continuous 60 min
Direction	: Horizontal and Vertical

### 10-2 Shock resistance characteristics

The battery shall have more than nominal voltage without such abnormalities as obvious damage or leakage of electrolyte, when a fully charged battery is dropped from the height of 20 cm (measured from the battery bottom) onto a flat hardwood plate of at least 10 mm in thickness.

## 11. INSTALLATION

- When using the battery in a cubicle, provide vents both in the top and bottom sections of the cubicle for ventilation.
- Arrange the battery container not to form a leakage circuit even if electrolyte should leak from the container when broken.  
Furthermore, arrange an insulating sheet or tray that is heat- and acid-resistant and will not be damaged by tightening stress, or put the battery in an insulating bag so that the battery will not come in direct contact with the cubicle or the fixing frame. Do not use the insulation which oils and fats attach to on the surface and organic matter begins to be blurred from the inside.
- Do not cover the battery with a vinyl sheet or other material that may contain plasticizer.

## 12. MARKING

The battery shall be marked with the following information using an appropriate method.

- (1)Type
- (2)Rated capacity and nominal voltage
- (3)Polarity
- (4)Manufacturing date code
- (5)Manufacture's name or its abbreviation

However, the description will have possibility to change without announcement.

## 13. OTHERS

13-1 The battery shall be repaired or replace free of charge in case of occurring failure obvious defects in materials or workmanship within one year from date of shipment.

13-2 Please understand beforehand that we are not responsible for accidents such as smoke, fire or other accidents from the battery because of following matter.

- A) When you use the battery which is not listed in this specification and instruction manual.
- B) When the processing or repair was added to the battery.
- C) In stand-by use, when the battery was used in a different way from the installed state written in this specification.
- D) If the battery has been used over replacement time (3 years for this battery) Written in instruction manual.  
In addition, storage battery replace time shows the case of 25°C or less.  
When exceeding this temperature, whenever it exceeds 10°C, exchange time comes to be short 1/2.  
Replace the battery with a new one before the replacement time specified in the manual or on the equipment is reached. Not only the battery will lose its function, but cause electrolyte leakage, fire or explosion because of the container damaged.

13-3 When the cause of failure has not become clear, we have the right to investigate the battery system and its condition that are equipped with failed battery.

13-4 When there are any questions or inconveniences to the specification, it shall be revised or changed through consultation between the customer and the vendor.

13-5 Others shall be applied to JIS C 8702-1 : 2009.