

GP Batteries

Product Specifications

Model No.:GP312G

Document Number: G007

Revision:02

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1. APPLICABILITY

This specification is applicable to GP Greencell, GP312G (No mercury added).

2. GENERAL

2.1	Type designation	: 3R12 (IEC/JIS)
2.2	Nominal voltage	: 4.5V
2.3	Shape and dimension	: Refer to Drawing 1.
2.4	Typical weight	: 115g
2.5	Warranty period	: 24 months
2.7	Jacket	: Plastic case, plastic cover with paper warping and a paper seal across terminal.

3. APPEARANCE

There shall be no dirt, scratch or deformation detrimental to practical service in appearance.

4. CELL VOLTAGE

4.1 Test method

Method of sampling	: MIL-STD-105E level II single sampling normal inspection.
Voltmeter	: Digital Voltmeter (DVM) with the precision of 1mV (internal resistance not less than 1 Megohm)
Test temperature	: 20±2°C

4.2 Off Load Voltage

At shipping	12 months after manufactured
Above 4.8V	Above 4.6V

4.3 On Load Voltage

Initial	12 months after manufactured
Above 3.8V	Above 3.6V

Load resistance : 6.2 ohm± 0.5% (measure time : 0.3 seconds)

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5. SERVICE OUTPUT

5.1 Test method

- (1) The resistance of external discharge circuit shall be as specified plus or minus 0.5%.
- (2) The duration of discharge time periods shall be as specified plus or minus 1%.
- (3) Storage shall be at $20\pm 2^{\circ}\text{C}$, $65\pm 20\%\text{RH}$ and discharge tests shall be at $20\pm 2^{\circ}\text{C}$, $65\pm 20\%\text{RH}$.

5.2 Service Life

	Test Mode	Application	Initial (Nominal)	Initial (Minimum)	12 months storage at 20°C (Nominal)
Service life at 20±2°C	220 4H/D (EPV=2.7)	Transistor radio	129H	119H	103H
	20 1H/D (EPV=2.7)	Portable lighting	10.5H	9H	8.4H

M: minute H: hour D: day EPV: end point voltage

*The initial discharge test shall commence within 30 days of manufacture. During this period, the cells shall be stored under room temperature conditions.
($20\pm 2^{\circ}\text{C}$ and $65\pm 20\%$ relative humidity)

6. ELECTROLYTE LEAKAGE

6.1 Leakage on arrival at warehouse.

Leakage shall be checked with naked eye. No leakage shall be observed with the naked eye; and no bulging exceeding the maximum dimensions shall result.

6.2 Leakage at room temperature

After storing for 12 months at $20 \pm 15^{\circ}\text{C}$, $65\pm 20\%\text{RH}$, no leakage shall be observed with the naked eye; and no bulging exceeding the maximum dimensions shall result.

6.3 Leakage at high temperature

Within thirty days of manufacture, the cell shall be stored for 30 days at $45\pm 2^{\circ}\text{C}$ and below 70% relative humidity, no leakage shall be observed with the naked eye; and no bulging exceeding the maximum dimensions shall result.

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6.4 Leakage of over discharge

After loading with 3.9 Ohm continuously down to 1.8V at $20\pm 2^{\circ}\text{C}$, $65\pm 20\%\text{RH}$, no leakage shall be observed with the naked eye; and no bulging exceeding the maximum dimensions shall result.

7. QUALITY ASSURANCE

DESCRIPTION	SAMPLING PLAN
Battery dimensions	0.65% (Note 5)
Appearance	1.0% (Note 5)
Off load voltage	0.65% (Note 5)
On load voltage	1.0% (Note 5)
Service output	Note 1 (Note 5)
Leakage 6.1	0.65% (Note 2 & 5)
6.2	Note 3
6.3	Note 4
6.4	Note 4

Note 1 : Acceptance / rejection in accordance with IEC publication 60086-1 (2007), Sub-clause 5.3.

- 1) Test nine batteries.
- 2) Calculate the average without the exclusion of any result.
- 3) If this average is equal to or greater than the specified figure and no more than one battery has a service output of less than 80% of the specified figure, the batteries are considered to conform for service output.
- 4) If this average is less than the specified figure and/or more than one battery has a service output of less than 80% of the specified figure, repeat the test on another sample of nine batteries and calculate the average as previously.
- 5) If the average of this second test is equal to or greater than the specified figure and no more than one battery has a service output of less than 80% of the specified figure, the batteries are considered to conform for service output.
- 6) If the average of second test is less than the specified figure and/or more than one battery has a service output of less than 80% of the specified figure, the batteries are considered not to conform and no further testing is permitted.

Note 2: Leakage on arrival at warehouse is within two months after shipping.

Note 3: Sample size : n=20
Judgement : Ac=1 Re=2

Note 4: Sample size :n=20
Judgement :Ac=0, Re=1

Note 5: AQL General Inspection level II, single sampling plan.

8. PACKAGING

Packaging shall be a form agreed by both parties.

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Precaution & Handling

- 1) Do not disassemble or short-circuit batteries.
- 2) Do not recharge batteries.
- 3) Do not dispose of batteries in fire.
- 4) Do not allow metal objects to contact the battery terminals.
- 5) Do not mix with used or other battery type (such as alkaline with carbon zinc).
- 6) Do not solder the batteries directly. If soldering or welding connection to the battery is required, consult our engineer for proper methods.
- 7) Do not over-discharge batteries. Force discharging batteries by external power source in a series may cause explosion.
- 8) To install or remove batteries, follow the equipment manufacturer's instructions.
- 9) Keep battery away from small children. If swallowed, consult a physician at once.
- 10) Remove batteries from device when it is not in use.

Storage

- 1) Store in a cool, dry place before use.
- 2) Do not keep batteries at temperature of 45°C or above.
- 3) Do not keep batteries at relative humidity of 75% or above.

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Drawing 1

