

# GP Batteries

## Product Specifications

Model No.:GP24AUP

Document Number: AUP004

Revision:02

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## 1. APPLICABILITY

This specification is applicable to GP Ultra Plus Alkaline Cell, GP24AU(No mercury added).

## 2. GENERAL

- 2.1 Type designation : LR03 (IEC/JIS), 24A (ANSI)
- 2.2 Nominal voltage : 1.5V
- 2.3 Shape and dimension : Refer to Drawing 1.
- 2.4 Typical weight : 12g
- 2.5 Warranty period : 36 months
- 2.6 Jacket : Foil jacket

## 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	Within 12 months after manufactured
Above 1.57V	Above 1.55V

### 4.3 On Load Voltage

Initial	Within 12 months after manufactured
Above 1.41V	Above 1.37V

Load resistance : 3.9 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  $20\pm 2^{\circ}\text{C}$ ,  $60\pm 15\%\text{RH}$  and discharge tests shall be at  $20\pm 2^{\circ}\text{C}$ ,  $60\pm 15\%\text{RH}$ .

### 5.2 Service Life

	Test Mode	Application	Standard	Initial (Nominal)	Initial (Minimum)	12 months storage at $20^{\circ}\text{C}$ (Nominal)
Service life at $20\pm 2^{\circ}\text{C}$	5.1 $\Omega$ 4M/H, 8H/D (EPV=0.9V)	Portable lighting	IEC/ANSI	265M	230M	248M
	5.1 $\Omega$ 1H/D, (EPV=0.8)	Toy	IEC	285M	260M	265M
	75 $\Omega$ 4H/D (EPV=0.9V)	Transistor radios	IEC	77.5H	73.0H	74.5H
	600mA 10s on 50s off 1H/D (EPV=0.9V)	Photo Flash	IEC/ANSI	480cycles	410cycles	455cycles
	24 $\Omega$ 15s/m, 8h/d (EPV=1.0V)	Remote control	IEC/ANSI	22.0H	20.5H	21.7H
	20 $\Omega$ 24H/D (EPV=0.9V)	Reference test		19.8H	18.4H	18.8H
	600mA 24H/D (EPV=0.9V)			47M	40M	42M

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  $60\pm 15\%$  relative humidity)

5.3 Operating temperature:  $-18^{\circ}\text{C}$  to  $50^{\circ}\text{C}$  ( $60\pm 15\%\text{RH}$ )

5.4 Storage temperature:  $-30^{\circ}\text{C}$  to  $45^{\circ}\text{C}$  ( $60\pm 15\%\text{RH}$ )

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## 6. ELECTROLYTE LEAKAGE

	Test Items	Test Conditions	Requirements
6.1	Arrival at warehouse	Within two months after shipping	There shall be no leakage observed with naked eye and no bulging or deformation of batteries in excess of dimensions on shown in the Drawing 1
6.2	Long term storage	Within storing for 12 months at 20 ±15°C, 65±20%RH	
6.3	High Temperature	Test specimens shall be kept standing at 45±2°C and below 70% RH or less for 30days	
6.4	Over-discharge	20 Ohm continuously discharge down to 0.6V at 20±2°C, 60±15%RH	

## 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 (2011), 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.

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## 8. PACKAGING

Packaging shall be a form agreed by both parties.

### Precaution & Handling

1. Do not attempt to take batteries apart or subject them to pressure or impact. Heat may be generated or fire may result. The alkaline electrolyte is harmful to eyes and skin, and it may damage clothing upon contact.
2. Keep away from children. If swallowed, contact a physician at once.
3. Do not mix GP batteries with other battery brands or batteries of a different chemistry such as alkaline and zinc carbon.
4. Do not short circuit batteries, permanent damage to batteries may result.
5. Do not incinerate or mutilate batteries, may burst or release toxic material.
6. Do not solder directly to cells or batteries.
7. Store batteries in a cool dry place.
8. If find any noise, excessive temperature or leakage from a battery, please stop its use.
9. When not using a battery, disconnect it from the device.
10. Do not mix new batteries in use with semi-used batteries.
11. When find battery power down during use, please switch off the device and take batteries out.
12. Never put a battery into water or seawater.
13. Do not recharge batteries.

## 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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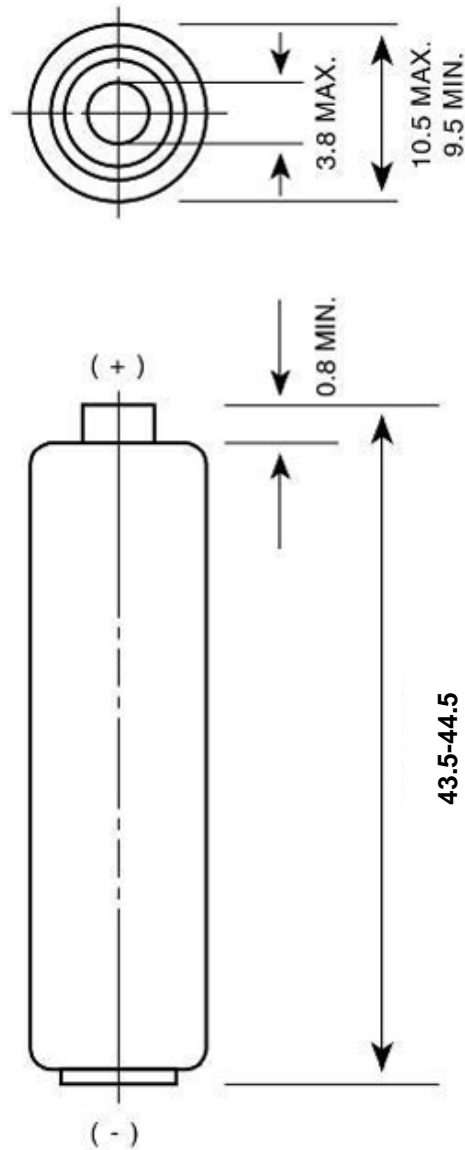
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Drawing 1



Unit: mm