

## Lead Acid 2V OPzV Tubular Gel UPS Battery

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### ALA-GT Series



- Lead-acid tubular gel battery
- 20 years lifetime at +20 °C
- High energy density and operational reliability
- Compatible with standard telecom equipment
- High strength, flame resistant ABS container
- High discharge performance
- Easy to install
- Flexible design

Ascent's ALA series Lead Acid 2V VRLA UPS batteries are widely used in standby power applications for telecommunications, UPS, military, broadcast, and television system purposes.

The ABS container uses flame resistant material and horizontal installation design makes ALA GT series popular products with easy installation and convenient maintenance. ALA series is specially designed for telecom and UPS applications as a premium low self-discharge battery.

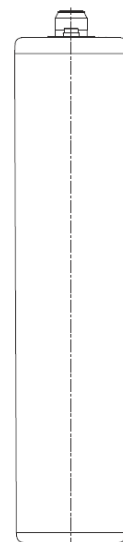
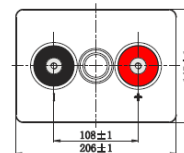
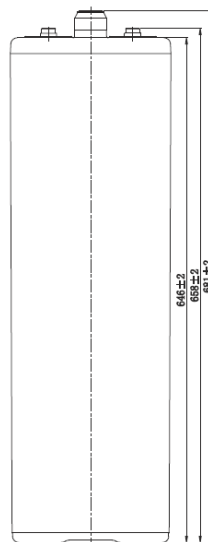
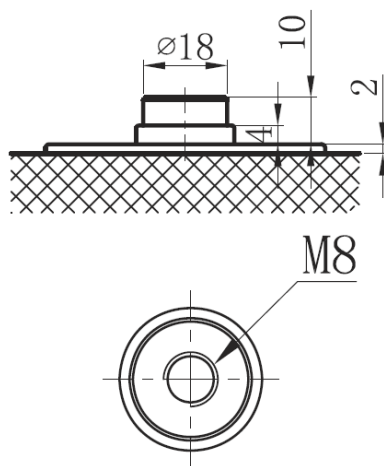
These batteries are highly reliable making them ideal for backup power generation. The design life for these batteries is 20 years. They feature a flexible lightweight design, and have a strong degree of environmental adaptability.

## Key Features

- Positive plate uses a tubular plate which can prevent active material failures
- Multi-component alloy frame
- Corrosion-resistant with long service life
- Negative plate features a special radiated structure
- Micro-pore PVC-SiO<sub>2</sub> separator with high porosity and low resistance
- High discharge performance
- High gas recombination efficiency
- Maximum charge efficiency
- Low self-discharge rate
- Easy installation and handling

## Outline Diagram

### T11 Terminal



## Specifications

### ALA-GT-600-12

| Item                                | Description  |
|-------------------------------------|--|
| Nominal Voltage                     | 2 V  |
| Nominal Capacity (10 h, 1.8 V/cell) | 600.0 Ah   |
| Rated Capacity (+25 °C)             | 10 h rate (60.0 A, 1.80 V): 600 Ah<br>5 h rate (104 A, 1.75 V): 520 Ah<br>3 h rate (152 A, 1.75 V): 456 Ah<br>1 h rate (341 A, 1.60 V): 341 Ah |
| Internal Resistance                 | Approx. 0.62 mΩ  |
| Maximum Discharge Current           | 4800 A/5s  |
| Cycle Use (+25 °C)                  | Initial Charging Current: ≤150.0 A<br>Voltage: 2.40 V to 2.50 V<br>Temp. coefficient: -5 mV/°C   |
| Standby Use (+25 °C)                | No limit on Initial Charging Current<br>Voltage: 2.25 V to 2.30 V<br>Temp. coefficient: -3 mV/°C   |
| Self-Discharge (+20 °C)             | <2 % per month   |
| Container Material                  | ABS  |
| Operating Temperature               | Discharge: -20 °C to +55 °C<br>Charge: 0 °C to +40 °C<br>Storage: -20 °C to +50 °C   |
| Nominal Operating Temperature       | 25 °C ± 3 °C   |
| Dimensions (L × W × H)              | 145 mm × 206 mm × 646 mm (681 mm total height)   |
| Approx. Weight                      | Approx. 46.0 kg  |

## Discharge Data

### Constant Current Discharge Data (+20 °C, A)

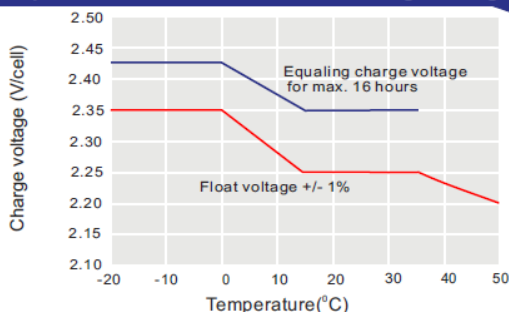
| End Volt | 10 min | 15 min | 30 min | 1 h | 2 h | 3 h | 5 h  | 8 h  | 10 h |
|----------|--------|--------|--------|-----|-----|-----|------|------|------|
| 1.60     | 750    | 628    | 469    | 341 | 212 | 160 | 108  | 74.1 | 62.7 |
| 1.65     | 717    | 607    | 458    | 335 | 209 | 158 | 107  | 73.5 | 62.3 |
| 1.70     | 668    | 574    | 440    | 325 | 205 | 156 | 105  | 72.6 | 61.6 |
| 1.75     | 595    | 526    | 416    | 313 | 200 | 152 | 104  | 71.7 | 60.9 |
| 1.80     | 503    | 470    | 390    | 301 | 195 | 149 | 102  | 70.5 | 60.0 |
| 1.85     | 409    | 389    | 335    | 267 | 177 | 137 | 94.2 | 65.8 | 56.2 |

### Constant Power Discharge Data (+20 °C, W/cell)

| End Volt | 10 min | 15 min | 30 min | 1 h | 2 h | 3 h | 5 h | 8 h | 10 h |
|----------|--------|--------|--------|-----|-----|-----|-----|-----|------|
| 1.60     | 1276   | 1098   | 853    | 637 | 402 | 306 | 208 | 145 | 124  |
| 1.65     | 1243   | 1076   | 840    | 631 | 399 | 304 | 207 | 144 | 123  |
| 1.70     | 1178   | 1034   | 816    | 617 | 393 | 300 | 205 | 143 | 122  |
| 1.75     | 1069   | 962    | 779    | 598 | 385 | 295 | 202 | 141 | 121  |
| 1.80     | 919    | 871    | 738    | 578 | 376 | 290 | 199 | 139 | 119  |
| 1.85     | 761    | 730    | 640    | 517 | 344 | 268 | 185 | 130 | 112  |

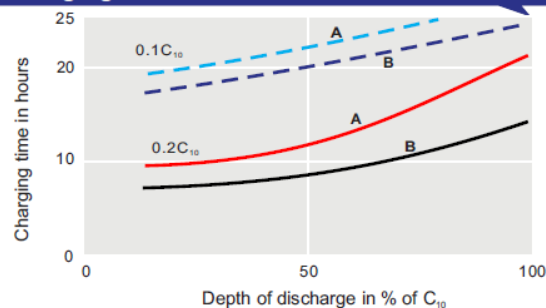
## Performance Curves

Temperature Effects in Relation to Charge Voltage



For continuous charging we recommend a voltage of 2.25 V.  
The charging voltage must be compensated to the curve for continuously different battery ambient temperature.

Charging Characteristics



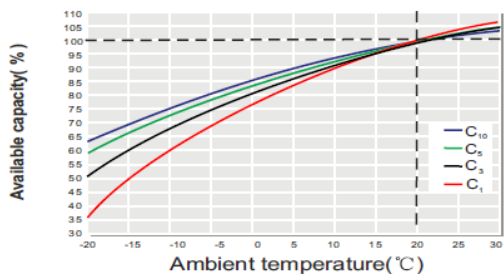
Charge voltage:

A—2.25 V/cell

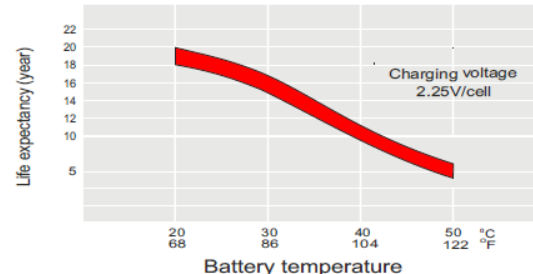
B—2.40 V/cell

--- State of charge 100% — State of charge 90%

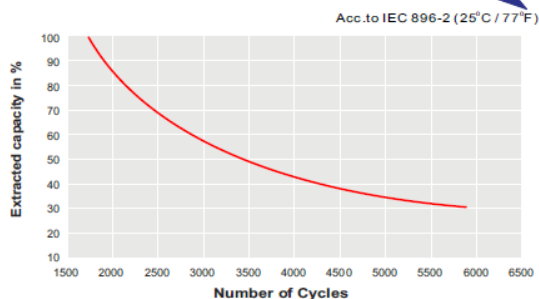
Temperature Effects in Relation to Battery Capacity



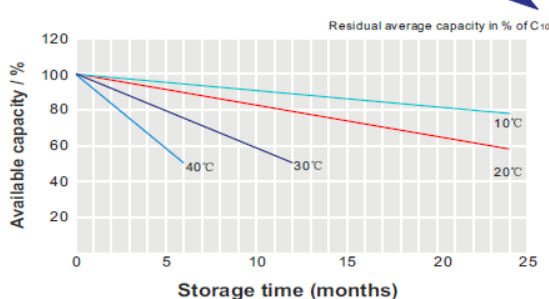
Effect of Temperature on Long Term Float Life



Cycle Life in Relation to Depth of Discharge



General Relation of Capacity VS. Storage Time



## Additional Specifications

| Item   | Description   |
|--|---|
| <b>Voltage and operation conditions</b>  |   |
| Nominal voltage  | 2 V DC  |
| Number of cells/battery  | 1 Cell  |
| <b>Operation environment</b>   |   |
| Operation temperature  | -15 °C to 50 °C or higher   |
| Operation humidity (+40 °C ± 2 °C)   | 90%   |
| Atmospheric pressure   | 70 kPa to 106 kPa   |
| <b>Capacity</b>  |   |
| Capacity at 10 h discharge mode (+25 °C)   |   |
| Rated capacity at 10 h discharge mode, discharge current: 0.10 C, end of voltage: 1.80 V/block   | ≥600 Ah   |
| Actual capacity at first discharge   | ≥95 %C <sub>rt</sub>  |
| Actual capacity at second discharge  | ≥100 %C <sub>rt</sub>   |
| Maximum actual capacity for the first-fifth discharge times  | ≤120 %C <sub>rt</sub>   |
| <b>Actual capacity at other modes (+25 °C)</b>   |   |
| Actual capacity for first 2 discharge times at 5 h mode, discharge current: 0.20 C, end of voltage: 1.80 V/block   | ≥85 %C <sub>rt</sub>  |
| Actual capacity for first 2 discharge times at 3 h mode, discharge current: 0.25 C, end of voltage: 1.70 V/block   | ≥75 %C <sub>rt</sub>  |
| Actual capacity for first 3 discharge times at 1 h mode, discharge current: 0.55 C, end of voltage: 1.60 V/block   | ≥55 %C <sub>rt</sub>  |
| <b>Rated capacity change by temperature table</b>  |   |
| Capacity at +40 °C   | ≥105 %C <sub>rt</sub>   |
| Capacity at +25 °C   | ≥100 %C <sub>rt</sub>   |
| Capacity at +20 °C   | ≥97 %C <sub>rt</sub>  |
| Self-discharge when stored at +25 °C for one month   | ≤3 %  |
| <b>Battery lifetime</b>  |   |
| Lifetime at standby mode (+20 °C to +25 °C)  | 20 years  |
| <b>Life cycle according to number of charge-discharge cycles</b>   |   |
| Life cycle curve and number of cycles according to DOD (100%, 80%, 50%) at +25 °C before remaining capacity is <60% rated capacity.  | 1500 cycles at 100 %DOD<br>2200 cycles at 80 %DOD<br>3400 cycles at 50 %DOD |
| Life cycles at 100 %DOD capacity at +25 °C   | ≥1200 cycles  |
| Life cycles at 50 %DOD capacity at +25 °C  | ≥2800 cycles  |
| <b>Durability characteristics</b>  |   |
| <b>Short-circuit performance</b>   |   |
| Discharge at 10 h mode until voltage approaches 3 V/block, then short connect 2 terminals for 24 h, charge battery for 24 h (float voltage is 14.52 V/block and maximum current is 0.15 C). Repeat five times. Capacity at 10 h mode at the fifth discharging time | ≥90 %C <sub>rt</sub>  |

## Charge with high float voltage

|   |  |
|---|--|
| Discharge at 10 h mode then charge battery (float voltage: 14.7 V/block, maximum current: 0.25 C) for 72 h.   | No acid leakage, battery dimensions change <2 mm after testing |
| Evaluate lifetime by using life cycles at 100 %DOD at +40 °C at 10 h. Test with 27 charge-discharge cycles (the first 5 cycles determine first capacity at 10 h mode, 20 cycles at 5 h mode estimate durability characteristics, and the last 2 cycles determine remaining capacity at 10 h mode) |  |
| After 20 cycles charge-discharge at 5 h mode, difference between the remaining capacity and the starting capacity   | ≤2 %   |
| Change in battery dimensions in 20 charge-discharge cycles at +40 °C  | ≤2 mm  |
| Change in battery dimensions after 20 cycles at 5h mode. The temperature of the battery will be decreased from 40 °C to 25 °C within no less than 48 h  | ≤0.5 mm  |

## Parameters in charge-discharge process

|   |   |
|---|---|
| Maximum charging current  | 0.25 C <sub>10</sub>  |
| Boost and float voltage at 25 °C  | Boost voltage: 2.4 V to 2.5 V<br>Float voltage: 2.25 V to 2.3 V |
| Internal resistance (+20 °C to +25 °C, battery fully charged)   | Approx. 0.62 mΩ   |
| Deviation of internal resistance after each full charging   | ≤10 %   |
| Maximum difference between internal resistance of each block and average internal resistance of string when the string is fully charged | ≤15 %   |
| Maximum deviation of battery voltage in string when string stands at float mode for at least 24 h                                       | ≤0.2 V  |
| Maximum deviation of battery voltage in string when string discharges at 10 h mode  | ≤0.2 V  |
| Ampere-hour efficiency of battery at 10 h mode (charge-discharge)   | ≥95 %   |

## Other information

### Battery quality certifications

|   |   |
|---|---|
| Certificate of quality management and environment                         | ISO-9001 and ISO 14001 standard complaint |
| Certificate of battery testing in accordance with international standards | IEC 60896-21&22, 2004                     |
| Safety battery standard   | IEC 60896                                 |

### Marking

|  |  |
|--|--|
| The following information shall be indelibly and durably marked in template or container | <ul style="list-style-type: none"> <li>- Nominal voltage</li> <li>- Manufacture's name, type, and trade name</li> <li>- Capacity at 10 h mode</li> <li>- Boost voltage, float voltage operation at +25°C</li> <li>- Temperature compensation coefficient</li> <li>- Month and year of manufacture</li> </ul> |
|--|--|

## Structure of battery

Type

Technology used

Purity of lead

Electrolyte

## Structure of positive plate

Structure and chemical component of plate

Thickness of plate

Number of plate

## Structure of negative plate

Structure and chemical component of plate

Thickness of plate

Number of plate

## Structure of separator

Water absorption of separator

Material of separator

The acid retention capacity of separator

The thickness of separator

Material of container

## Safety valve

Opening range pressure of valve

Closing range pressure of valve

Recombination efficiency

## Terminal

Material of terminal

Terminal markings

Dimensions of 1 battery (L × W × H)

Weight of 1 battery

Shape

Stacking or mounting arrangement

## Accessories

Connector

Sample

- Country of origin

- Serial number of block

- Name of customer

- Other information

VRLA

Tubular GEL

≥99.994 %

Dilute sulfuric acid + SiO<sub>2</sub>

Tubular plate; main component PbO<sub>2</sub>

9.2 mm

Positive plate: 6 pcs

Flat plate; main component Pb

4.2 mm

Negative plate: 7 pcs

Tubular GEL

≤1.5 %

PVC-SiO<sub>2</sub>/AMER-SIL

PVC-SiO<sub>2</sub>/AMER-SIL

≤1.5 %

3.4 mm

UL 94V-0

10 kPa to 20 kPa. The valve won't operate when battery charges with 0.2 C current or discharges with >0.333 C current.

3 kPa to 13 kPa

Recombination efficiency ≥97% for charging with 0.1 C current under standard conditions

Copper

Positive and negative terminals are colored red and black

145 mm × 206 mm × 681 mm

Approx. 46.5 kg

Battery designed for top connection

Vertical or horizontal

Thickness >1 mm

Lead coating of connector is <0.025 mm

8 blocks 2 V

## Ordering Information

| Item           | Description   |
|----------------|---|
| ALA-GT-600-02R | ALA Series Lead acid VRLA Tubular Gel battery 2 V, 600 Ah, for telecom UPS system backup applications |

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