

## A: Battery Storage

Store batteries at dry, clean, well-ventilated area. Batteries can be stored at 0–35°C for 6 months

with recharge. Recharge the batteries once if storage period exceeds 6 months.

## B: Battery Use

### 1 Floating charge

#### ◆ Charging parameters

- ◇ Voltage 2.23–2.30V/cell (25°C) (set point of 2.25V/cell is recommended).
- ◇ Max. initial current 0.30C<sub>10</sub>
- ◇ Temp. compensation coefficient -3mV/°C. Per cell (from 25°C)
- ◇ Voltage deviation allowed: ±0.02V/cell.

#### & 📖 Note

1). The initial deviations of battery voltages in a group will reduce to a low level after a period of service, for example, after a half year.

2). Effects of lower or higher voltages

Higher voltage → overcharge → Shorten battery life.

Lower voltage → under-charge → Low battery capacity and shorten battery life.

### 2 Equalization charging

#### ◆ Parameters

- ◇ Voltage 2.35–2.40V/cell (25°C) (set point of 2.35V/cell recommended)
- ◇ Max. initial current 0.30C<sub>10</sub>
- ◇ Temp. compensation coefficient -3mV/°C.cell (from 25°C)
- ◇ Voltage deviation allowed: ±0.02V/cell.

#### ◆ Condition of terminating equalization charge

Charging current drop to 0.01C<sub>10</sub>.

#### & 📖 Note

Only perform an equalization when

· Discharge capacity 20% lower than nominal value.

· Storage period more than 3 months.

· Individual floating voltage less than 2.18V/cell.

· Low capacity battery is found after 3 through 6 months' floating service.

· After one year of floating service.

· Recharge after installation & before service.

· Recharge after capacity test.

### 3 Cyclic charging

#### ◆ Parameters

- ◇ Voltage 2.40–2.45V/cell (25°C) (Set point of 2.45V/cell is recommended).
- ◇ Max. initial current 0.30C<sub>10</sub>
- ◇ Temp. compensation coefficient -5mV/°C.per cell (from 25°C)
- ◇ Voltage deviation allowed: ±0.02V/cell

- ✧ Recharge amount 1.1~1.2 times of the discharged capacity □ upper level of recharge amount is selected when ambient temp. below 5°. If discharge capacity is not sure, recharge the batteries as table four □

Table four

Ambient temp. □□□	Charging voltage □V/cell□	Charging time □h□
5	2.31	7
	2.46	4
20	2.25	7
	2.40	4
35	2.21	7
	2.34	4

&  Note □

- 1 □ Charging time in table four means charging period after voltage reach the specified value, initial max. current is less than 0.03C.
- 2 □ Follow above charging specifications, otherwise batteries will be overcharged or undercharged, service life of batteries will shorten.
- 3 □ Charge the batteries as per cyclic charging parameters after capacity test discharge.

**Cautions**

- ✧ Measure the output voltage of equipment once every 2 hours for new installations for the initial 72 hours, to make sure the stable output of charging voltage. The output voltage should also be confirmed during yearly maintenance check preventing the deviations due to aging.
- ✧ If a current value at final charging stage is over 0.05C<sub>10</sub>A, damage on battery service life may occurred.
- ✧ For cycle charging, timer is recommended to switchover to trickle charging mode, preventing over-charging.
- ✧ For temperature other than 25° □ charge voltage setting need to be compensated as formula □  

$$U_T = U_{25} - K \times (T - 25) \quad T \text{—actual temperature } \square K \text{—compensation coefficient } \square$$
- ✧ Judging on completion of charging  
 When one of the following conditions occurs, charging is considered be completed.
  - 1 □ Charging amount reaches 1.1~1.2 times of discharged value.
  - 2 □ Charging current is less than 0.005C<sub>10</sub>A at final stage of charging.
  - 3 □ Charging current keeps stable for 3 hours.