

HANDLING PRECAUTIONS FOR VANADIUM PENTOXIDE LITHIUM (VL SERIES) RECHARGEABLE BATTERIES

Use caution in setting charge voltage

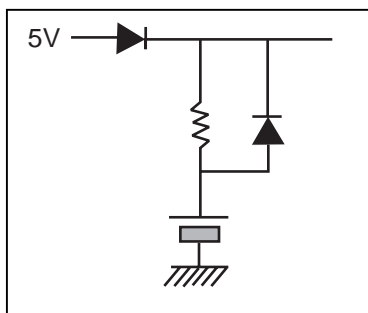
Observe the following precautions for **SAFE** use of vanadium lithium secondary batteries.

1. Charge voltage range

- In fixed-voltage charging, observe the specified charge voltage value.
Specified value (guarantee value) in the range of -20°C to 60°C is 3.4 ± 0.15 V (effective value is 3.4 ± 0.20 V).
 - * If the charge voltage exceeds the upper limit of the specified range, internal resistance of batteries may increase, causing deterioration of batteries. Also, with a charge voltage around 4 V, corrosion of the (+) terminal (case) may occur, causing leakage (see next page).
 - * If the charge voltage is below the lower limit of the specified range, complete recovery of the battery capacity becomes infeasible.
- In fixed-current charging, observe the specified charge current with circuit design so as not to allow the battery voltage to exceed the above-described upper limit of the specified voltage range.

2. Trickle charging

- Do not use trickle charging (illustrated below) which is applied to nickel cadmium batteries, as this will allow VL battery voltage to rise to about 5 V, causing deterioration of the batteries.



3. Use in series

- When using two or more batteries in series, be sure to contact us.

4. Inversed connection of (+) and (-) terminals to devices

- The (-) terminal (gasket) may be corroded, causing leakage.

5. Mixed use

- Avoid mixed use of VL rechargeable batteries and lithium primary batteries or other secondary batteries. Also, avoid mixed use of new and old batteries even if they belong to the same series. The mixed use of batteries may cause battery deterioration causing damage to devices due to differences in voltage and capacity of batteries.

6. Soldering

- Do not apply solder directly to batteries, as this will heat batteries, thus causing damage to resin materials such as gasket and separator, and lead to leakage or battery rupture. Usual automatic dip-soldering is applicable, but do not use reflow soldering.

7. Others

- Do not throw into fire, heat to 100°C or higher, or disassemble the batteries, as this will pose a danger.

INFLUENCE OF CHARGE VOLTAGE OF VANADIUM PENTOXIDE LITHIUM RECHARGEABLE BATTERIES

