



# OPERATING INSTRUCTIONS

for stationary vented lead-acid OPzS, Ca OPzS, OGi, UPS and SOLAR (TOPzS) batteries

## SAFETY REQUIREMENTS ACCORDING TO EN 50272-3.

### 2.8 Temperature-related charge voltage

A temperature-related adjustment of the charge voltage within the operating temperature of 15°C to 25°C is not necessary. Should the temperature range be lower than 15°C and/or higher than 25°C, a temperature related adjustment of the charge voltage should be made. The temperature correction factor is (-0.004 V/Cell per °K). Should the temperature constantly rise above 40°C then the factor is (-0.003 V/Cell per °K).

### 2.9 Electrolyte

The electrolyte is diluted sulphuric acid. The nominal electrolyte density is based on 20°C and the nominal electrolyte level when fully charged with maximum deviation  $\pm 0.01$  kg/l. Higher temperatures reduce the electrolyte density; lower temperatures increase the electrolyte density. The associated correction factor is 0.0007 kg/l per °K. Example: electrolyte density of 1.23 kg/l at 35°C corresponds to a density of 1.24 kg/l at 20°C or electrolyte density of 1.25 kg/l at 5°C corresponds to a density of 1.24 kg/l at 20°C.

### 3. BATTERY MAINTENANCE AND CONTROL

The electrolyte level must be checked regularly. If it drops to the lowest electrolyte level mark, purified water must be added as under DIN 43530 Part 4, maximum conductivity 30  $\mu$ S/cm. To avoid leakage currents keep the battery clean and dry (especially inter cell connections). Plastic battery components, in particular the vent caps, must only be cleaned with water that contains no additives. At least every 6 months the following must be measured and recorded:

- + Battery voltage
  - + Voltage of a few selected cells/mono block batteries
  - + Electrolyte density of a few selected cells/ mono block batteries
  - + Electrolyte temperature of a few selected cells/mono block batteries.
- In case float charge voltage in one cell deviates for more than +0.1V or -0.05V from average values (see point 2.3) equalizing charge must be submitted. The following must be measured and recorded annually:
- + Voltage of all cells/mono block batteries
  - + Electrolyte density of all cells/mono block batteries
  - + Electrolyte temperature of a few selected cells/mono block batteries
  - + Should the float charge voltage in one cell deviate more than +0.1 V or -0.05 V from the average value (see 2.3), equalizing charging should be done (see 2.4).
- Annual visual checks:
- + On bolted connectors (check that unsecured bolt connectors are firmly seated)
  - + On battery installation or arrangement
  - + On ventilation of battery room.

### 4. TESTS

Tests must be performed on fully charged batteries according to EN 60896-1. In addition, special test instructions such as EN 50272-2 must be observed.

### 5. FAULTS

Should faults be detected in the battery or the charging device, customer services should be called in immediately. Measurement records under Section 3 are necessary for fast fault detection and removal.

### 6. Storage and taking out of operation

Should cells/batteries be stored or taken out of operation for a longer period of time, they must be stored fully charged in a dry, frost-free room with max. temperature of 25°C. Direct sunlight or other heat sources must be avoided. To avoid damage the following charging methods can be chosen:

- 6.1 **Equalizing charges** on a quarterly basis as under Section 2.4. In average, ambient temperatures of more than 30°C monthly equalizing charges may be necessary.
- 6.1 **Float charging** as under Section 2.3. above.

### 7. TRANSPORT

Batteries, wet, filled with acid require transport under demands of European Agreement concerning the international carriage of dangerous goods (ADR and RID). ADR special provision No. 598: New batteries are not subject to the requirements of ADR, when:

- + they are secured in such a way that they can not slip, fall or be damaged;
- + they are provided with carrying devices, unless they are suitably stacked, e.g. on pallets;
- + there are no dangerous traces of alkalis or acids on the outside;
- + they are protected against short circuits.

### 8. TECHNICAL DATA

The nominal voltage, the number of blocks, the nominal capacity (C10 = CN) and the battery type are obtained from the type plate.

#### 8.1 EXAMPLE

Type: 6V 4 OPzS 200

Date on type plate: 6 V 6 OPzS 300

Key:

- + 6 V = Nominal voltage of the blocks battery (with individual cells the nominal voltage is 2V)
- + 6 = Number of positive plates
- + OPzS = Type
- + 300 = Nominal capacity C10 under EN 60896-1. Capacity with discharge period of 10 h (t10) to final discharge voltage 1,80 V/cell. Other capacities at different discharge currents with the corresponding discharge times and final discharge voltage can be found in technical data sheet for TAB OPzS stationary batteries.



Pay attention to the operating instructions and keep them close to the battery. Work on batteries should be carried out by skilled personnel only!



No smoking! Do not expose batteries to naked flames, glowing embers or sparks, as it may cause the battery to explode.



Use protective glasses and clothes when working on batteries. Pay attention to the accident prevention rules as well as EN 50272-3 and EN 50110-1.



Risk of explosion and fire, avoid short circuits! Caution: metal parts of the battery are always live. Do not place tools or other metal objects on the battery! Do not remove the plugs.



Electrolyte is highly corrosive. In the normal operation of this battery contact with acid isn't possible. If the cell containers are damaged, the immobilised electrolyte (gelled sulphuric acid) is corrosive like liquid electrolyte.



Batteries and cells are heavy. Ensure secure installation! Use only suitable handling equipment. Lifting hooks must not damage the cells, connectors or cables.



Dangerous voltage! Caution: Metal parts of the battery are always live - avoid contact and short circuits. Do not place tools or other metal object on the battery!



Acid splashes into the eyes or on the skin must be washed with plenty of water. In case of accident after abundant flushing consult a doctor immediately! Clothing contaminated by acid should be washed in water.

IGNORING THE OPERATING INSTRUCTIONS, REPAIR WITH NON-ORIGINAL PARTS WILL RENDER WITH WARRANTY VOID.

Spent batteries must be COLLECTED SEPARATELY and recycled.

