

# Sonnenschein battery EPzV for EnergyStoreGel

## Operating Instructions

### Maintenance free lead acid batteries with positive tubular plates

#### Nominal Data

- Battery type : see type plate
- Nominal voltage  $U_N$  : 2.0 V x number of cells
- Nominal capacity  $C_N = C_5$  : 5h discharge (see type plate and technical data in these instructions)
- Nominal discharge current  $I_N = I_5$  :  $C_N / 5h$
- Final discharge current  $U_f$  : see technical data in these instructions
- Nominal temperature  $T_N$  : 30° C

Battery type : \_\_\_\_\_ Number of cells \_\_\_\_\_

Commissioned by: \_\_\_\_\_ date: \_\_\_\_\_



- Respect the operation instruction and display it close to the battery.
- Work on batteries have to be carried out by skilled personnel only!



- Use protective glasses and clothes when working on batteries.
- Obey to the accident prevention rules as well as DIN EN 50272-3, DIN EN 50110-1!



- No smoking!
- Do not expose batteries to naked flames, glowing embers or sparks, there is the risk that the battery explodes.



- Acid splashes into the eyes or on the skin must be washed immediately with an abundance of clear water. In case of accident consult a doctor immediately!
- Clothing contaminated by acid should be washed in water.



- Risk of explosion and fire, avoid short circuits!
- Avoid electrostatic charges and discharges/sparks!



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



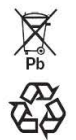
- Batteries and cells are heavy.
- Ensure secure installation! Use only suitable handling equipment e.g. lifting gear in accordance with VDI 3616.



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

**Non-compliance with operating instructions, installations or repairs made with other than original accessories and spare parts or with accessories and spare parts not recommended by the battery manufacturer or repairs made without authorization (e.g. opening of valves) render the warranty void.**

**For batteries in classes (Ex) I and (Ex) II the instructions for maintaining the appropriate protection class during operation must be complied with (see relevant certificate).**



Spent batteries have to be collected and recycled separately from normal household wastes (EWC 160601). The handling of spent batteries is described in the EU Battery Directive (2006/66/EC) and their national transitions (UK: HS Regulation 1994 No. 232, Ireland: Statutory Instrument No. 73/2000). Contact your supplier to agree upon the recollection and recycling of your spent Batteries or contact a local and authorized Waste Management Company.

EPzV batteries are valve-regulated batteries with an immobilised electrolyte and where a water refilling isn't permitted during the whole battery life.

Instead of a vent plug there are valves used, who will be destroyed when they are opened. When operating valve-regulated lead-acid batteries the same safety requirements as for vented cells apply to protect against hazards from electric current, from explosion of electrolytic gas and in case of the cell container is damaged, from the corrosive electrolyte.

#### 1. Commissioning

The battery should be inspected to ensure it is in perfect physical condition.

The battery end cables must have a good contact to terminals, check that the polarity is correct. Otherwise battery, vehicle or charger could be destroyed.

The battery has to be charged according to item 2.2.

The specified torque loading for the pole screws of the end cables and connectors are:

M 10	9 to 23 ± 1 Nm
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#### 2. Operation

DIN EN 50272-3 is the standard which applies to the operation of the EPzV batteries.

Cells must be operated in an upright position.

#### 2.1 Discharging

Ventilation openings must not be sealed or covered.

Electrical connections (e.g. plugs) must only be made or broken in the open circuit condition.

To achieve the optimum life for the battery, operating discharges of more than 60% of the rated capacity should be avoided (deep discharge). They reduce the battery life considerable. To measure the state of discharge use only the battery manufacturer recommended discharge indicators. Discharged batteries must be recharged immediately and must not be left discharged. This also applies to partially discharged batteries.

#### 2.2 Charging

Only direct current must be used for charging. Charging procedures according to DIN 41773 must only be applied in the manufacturer approved modifications. Therefore only battery manufacturer approved chargers must be used. Only connect the battery assigned to a charger, suitable for the size of battery, in order to avoid overloading of the electric cables and contacts and unacceptable gassing of the cells.

EPzV batteries have a low gas emission.

When charging, proper provision must be made for venting of the charging gases.

With the charger switched off connect up the battery, ensuring that the polarity is correct (positive to positive, negative to negative). Now switch on the charger. When charging the temperature of the battery rises by about 10°C, so charging should only begin if the battery temperature is below 35°C.

The battery temperature should be at least +15°C before charging otherwise a full charge will not be achieved. Are the temperatures a longer time higher than +40°C or lower than +15°C, so the chargers need a temperatures regulated voltage.

The correction factor is -0,004 V/c and Kelvin.

*Special instructions for the Operation of batteries in hazardous areas.*

This concerns batteries which are used in accordance with EN 50 014, DIN VDE 0170 / 0171 Ex I (in areas with a firedamp hazard) or Ex II

(in potentially explosive areas). The attention pictograms has to be respected.

### 2.3 Equalising charge

Equalising charges are used to safeguard the life of the battery and to maintain its capacity. Equalising charges are carried out following normal charging.

They are necessary after deep discharges and repeated incomplete recharges. For the equalising charges has to be used only the battery manufacturer prescribed chargers.

#### Temperatur beachten!

### 2.4 Temperature

A battery temperature of 30°C is specified as the rated temperature. Higher temperatures shorten the life of the battery, lower temperatures reduce the available capacity.

45°C is the upper temperature limit and is not acceptable as an operating temperature.

### 2.5 Electrolyte

The electrolyte is immobilised in a gel.

The density of the electrolyte can not be measured.

## 3. Maintenance

Don't refill water!

### 3.1 Daily

Charge the battery immediately after every discharge.

### 3.2 Weekly

Visual inspection after recharging for signs of dirt and mechanical damage.

### 3.3 Quarterly

After the end of the charge and a rest time of 5 h following should be measured and recorded:

- the voltages of the battery
- the voltages of every cell

If significant changes from earlier measurements or differences between the cells are found, further testing and maintenance by the service department should be requested.

### 3.4 Annually

#### Annual visual checks:

- Screw connections
- Screw connections without locking device have to be checked for tightness.
- Battery installation and arrangement
- Ventilation

## 4. Care of the battery

Keep the battery clean and dry to avoid leakage currents. Plastic parts of the battery, especially containers, must be cleaned with pure water without additives.

## 5. Faults

Call the service agents immediately if faults in the battery or the charging unit are found. Recorded data as described in item 3. must be made available to the service agent. It is recommended that a service contract is taken out with your agent.

## 6. Storage and taking out of operation

To store or decommission cells/blocks for a longer Period of time they should be fully charged and stored in a dry and cold but frost-free room, away from direct sun light. To avoid damage the following charging methods can be chosen:

1. Maximum storage time is 17 months at  $\leq 20^{\circ}\text{C}$ . Equalizing charges will be required at higher temperatures, for instance, after 8.5 months at  $30^{\circ}\text{C}$ .
2. Float charging as detailed in 2.3.

Part Number	Type	Volts	Capacity Ah at 30°C				Dimensions in mm				Weight (kg)	SC Current Amps
			C/5	C/10	C/20	C/100	W (mm)	L (mm)	H1 (mm)	H2 (mm)		
2RPG570	6EPzV420	2	420	450	485	570	198	119	402	430	27.2	2169
2RPG700	6EPzV480	2	480	520	570	700	198	119	472	500	34.8	2480
2RPG830	6EPzV600	2	600	650	700	830	198	119	563	595	41.6	3030
2RPG1040	9EPzV720	2	720	780	850	1038	198	173	472	500	52.8	3640
2RPG1240	9EPzV900	2	900	970	1045	1240	198	173	533	585	57.2	4545
2RPG1350	8EPzV960	2	960	1035	1125	1350	198	155	672	704	63.7	5050
2RPG 1410	10EPzV1000	2	1000	1085	1175	1413	198	191	533	585	63.3	4848
2RPG1660	10EPzV1200	2	1200	1300	1400	1663	198	191	672	704	79.2	6050

## SOLAR REGULATORS

Settings for EnergystoreGel 2RP EPzV

Function	Default	Recommended Energystore Gel
BMAX (Boost voltage)	14.2V	14.7V
EMAX (Equalise voltage)	14.0V	14.7V
ETIM (Equalise time)	0 hrs	2 hrs
EFRQ (Equalise frequency)	45 days	30 days
ABSV (Absorption charge voltage)	14.0V	14.4V
ATIM (Absorption charge time)	2hrs	2 hrs
FLTV (Float voltage)	13.8V	13.8V
HYST (Optional hysteresis mode)	0.4V	0.4V
BRTN (Boost charge trigger voltage)	12.3V	12.3V
CHRG (Maximum charge current)	20-40A	20% C/10
BFRQ (Boost charge frequency)	15 days	15 day
TCMP (Temp compensation)	0	minus 4mV/degC/cell
BAT2 (Second battery charge voltage)	14.0V	13.8V
ALARM (Low level alarm)	11.4V	11.4V
LOFF (LVD cut-off)	11.3V	11.3V
LON (LVD reconnect)	12.8V	12.8V
LDEL (LVD delay from LOFF)	10 min	5 min

Voltages for 12V system upto 20% DOD. Scale voltages for larger systems.

These settings are recommended only. Every Solar application is different. Changes to Absorption, Equalise voltages may be necessary depending on application. For load specific settings please consult Exide.

# Maintenance Log



Owners Name:

Date:

Address:

No. of cells:

State:

Post Code:

Cell Type:

Date Installed:

Charge Output:

Battery Temp °C:

Total Battery Voltage:

Cell No.	Volts	Cell No.	Volts	Cell No.	Volts
1		9		17	
2		10		18	
3		11		19	
4		12		20	
5		13		21	
6		14		22	
7		15		23	
8		16		24	

Comments:

Readings taken by: