

# INSTALLATION INSTRUCTION



STATIONARY & SOLAR LEAD ACID BATTERIES

BATTERIES / STANDS / CABINETS

	Observe the operating instructions! Work on batteries under instruction of skilled personnel only, observing commissioning instructions and operating instructions for use!		Explosion and fire hazard, avoid short circuits! Caution! Metal parts of the batteries are always live, do not place tools or other objects on the battery!
	When working on batteries wear protective glasses and clothing! Observe the accident prevention rules as well as DIN VDE 0510, VDE 0105 part 1!		Electrolyte is strongly corrosive. Under normal operating conditions exposure to electrolyte is impossible. Should the casing be destroyed, the fixed electrolyte released is as corrosive as liquid electrolyte.
	Smoking prohibited! Do not expose the battery to open flame glowing embers or sparks as explosion and fire hazard exists!		Block batteries and cells are extremely heavy! Ensure secure installation! Only use suitable handling equipment, tools and measuring equipment!
	Acid splashes in the eyes or on the skin must be washed out or off with plenty of water. Then consult a doctor immediately. Clothing contaminated with acid should be washed with water!		Dangerous voltage!

## 1. Requirements and preparations for installation

1.1. Before installation ensure that the battery room is clean and dry and is furnished with a lockable door. The battery room must be set out and marked according to DIN VDE 0510, Part 2. Particular attention must be paid to the following:

- floor load-carrying capacity and nature (conveying paths and battery room)
- electrolyte resistance of battery installation surface
- no ignitable sources (e.g. open flame, glowing objects, electric switches) near the cell openings (500 mm thread measure)
- ventilation conditions

To ensure smooth operation, coordination between other persons working in the same room is necessary.

1.2. Check deliveries for completeness and damage. If necessary, clean all parts before assembling.

1.3. Observe all documentation included with the delivery (e. g. battery-, rack-, cabinet-assembly drawings).

1.4. Before renewing old batteries ensure that all electric leads are switched of (separator, fuses, switches). This must be carried out by qualified personnel.

### **CAUTION: Do not carry out unauthorised switching!**

1.5. Open-circuit voltage measurements of individual cells or block batteries. Ensure correct polarity. With unfilled, dry charged batteries these measurements can only be carried out after putting into operation. Fully charged cells have the following open-circuit voltages at an electrolyte temperature of 20 °C:

OPzS / PVS cells	DIN 40736	2.08 ± 0.01 [V/C]
OPzS / PVS block	DIN 40737	2.08 ± 0.01 [V/C]
OGi block	DIN 40739	2.08 ± 0,01 [V/C]
OGi cells	DIN 40734	2.08 ± 0.01 [V/C]
OGiV block	DIN 40741/1	2.08 – 2,14* [V/C]
OPzV / PVV cells	DIN 40742	2.08 – 2.12* [V/C]
OPzV- / PVV block	DIN 40744	2.08 – 2.12* [V/C]
PVSM		2.08 ± 0.01 [V/C]

\*According to manufacturers instructions

The open-circuit voltages of a battery's individual cells must not deviate from average more than + 0.02 V. Should greater deviations occur, consult the supplier.

The following maximum open-circuit voltage deviations for block batteries apply:

4 V	block batteries	0.03 V/block
6 V	block batteries	0.04 V/block
12 V	block batteries	0.05 V/block

Higher temperatures reduce, lower temperatures increase the open-circuit voltage. With a deviation of 10 K from the nominal temperature the open-circuit voltage changes by 0.003 V/cell.

## 2. Racks

2.1. Align the racks according to the installation drawing. Should an installation drawing be missing, the following minimum distances must be observed:

- From the wall: 100 mm on all sides for the cell or block container, or 50 mm for the rack.
- 1.5 metres with a nominal or component voltage > 120 V between non-insulated terminals or connectors and grounded parts (e. g. water pipes) or between the battery's end terminals. During installation it must be ensured that DIN VDE 0510, Part 2 is adhered to (e.g. cover electrically conductive parts with insulating mats).
- From ignitable sources: 500 mm (thread measure) from the nearest cell vent.
- From passageways: 1.5 x cell width (installation depth) but not less than 500 mm.

BAE PVSM solar battery cells have to be installed in trays or racks which are able to give pressure on the side walls of the cells to avoid excessive bulging.

2.2. Align racks horizontally using the levelling parts or adjustable insulators provided. The distances of the support profiles must correspond with the cell or block battery size. Check rack stability and ensure all screw and clamp connectors are firmly seated. If stipulated, ground the rack or parts thereof. Protect screw connectors from corrosion.

Please note that when using wooden racks a flexible connector must be fitted between each rack joint.

**2.3.** Check that cells or block batteries are perfect (visually, polarity).

**2.4.** Place each cell or block battery onto the rack with the correct polarity. Don't lift the cells on the poles. With large cells it is recommended that cell installation should commence from the middle of the rack:

- Arrange cells or batteries plumb and level, with the correct polarity.
- If necessary clean the contact surface of the terminals and connectors.
- Distance between the cells should be approx. 10 mm or according to the length of the connectors supplied.
- Fit cell or block connectors and tighten with an insulated torque wrench (for correct torque see operating instruction).
- Fit row, step, tier connectors and tighten observing the specified torque.
- Cable connectors have to be secured during mounting by cable holders. Order numbers: : 35mm<sup>2</sup> 485 2930, 50mm<sup>2</sup> 485 2931, 70mm<sup>2</sup> 485 2932, 95mm<sup>2</sup> 485 2933, 120mm<sup>2</sup> 485 2934.
- If necessary, fit insulating caps onto cell/block connectors and end terminals.
- Ensure short-circuit proof installation work. Wiring with a dielectric strength of at least 3 kV must be used, or a distance of approx. 10 mm between wiring and electrically conductive parts must be kept or the connectors must be furnished with additional insulation. Avoid mechanical stress on the cell/battery terminals.
- If applicable, remove transport plugs and replace with operation plugs.
- Check electrolyte level (observe operating instructions/ commissioning instructions).
- Measure the total voltage which should equal the total off-load voltages of the individual cells/block batteries.
- If necessary, number through visibly the cells or block batteries (from the battery's positive terminal to the negative terminal).
- Affix polarity labels for the battery connectors.

- After assembly completion affix nameplate integrated in operating instructions.
- Affix safety marking sign and operating instructions visibly.

If the cells/block batteries have to be cleaned please observe the operating instruction.

### **3. Cabinets**

#### **3.1. Cabinets with built-in battery:**

- The battery cabinet is assembled on site (observing the UVV).
- Take into account additional space needed or planned cable entries.
- Remove any transport safety devices from the built-in cells or block batteries.
- Check cells or block batteries for correct position and mechanical damage.

#### **3.2. Cabinets with separately delivered cells or block batteries:**

- Only filled and charged cells or block batteries (vented or sealed) are built into cabinets.
- Assemble cabinet, place in designated location and align (observing UVV).
- Place cells or block batteries into the cabinet according to assembly plan and spacing specified, connect them and mark (see item 2.4).

### **4. CE-marking**

From 01.01.97 an EC declaration of conformity under the low voltage regulation is required for batteries above 75 V nominal voltage with the corresponding CE labelling on the battery. The battery installer of the battery plant is responsible for issuing the declaration and affixing the CE label on or next to the battery's nameplate.

#### **CAUTION:**

**Before connecting to the charger ensure that all assembly work has been duly completed!**



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