

## Lead-acid batteries with closed grid plate cells (trak<sup>®</sup> bloc)

### Rated values

- |                       |  |
|-----------------------|--|
| 1. Rated capacity:    | see type plate                               |
| 2. Rated voltage:     | see type plate                               |
| 3. Discharge current: | C <sub>5</sub> /5 h or C <sub>20</sub> /20 h |
| 4. Rated temperature: | 30 °C  |

trak<sup>®</sup> bloc batteries are closed batteries with suspended electrolytes that **must not be topped up with water** for the entire duration of the service life. Pressure relief valves are used as sealing plugs. These valves stop oxygen getting into the cells and drain off any excess charging gases. The valves must not be removed. During operation, the same safety requirements apply to the closed batteries as to batteries with liquid electrolyte in order to prevent electric shock and explosion of the electrolytic charging gases and to avoid the risk of corrosive electrolytes if the cell container is destroyed.



Observe the usage instructions and install in a visible position at the charging bay. Only trained personnel may perform work on batteries.



Wear protective goggles, protective gloves and protective clothing when working on batteries! Observe the accident prevention regulations as well as DIN EN 50110-1 and IEC 62485-3. During installation/commissioning, maintenance, cleaning and disassembly wear additional face protection (impact-resistant visor according to EN 166 Class F).



Smoking is prohibited. There must be no naked flames, embers or sparks in the vicinity of the battery, as this poses a risk of explosion and a fire hazard.



Keep children away from batteries!



Rinse eyes or skin splashed with acid using plenty of clean water. Then consult a doctor immediately. Wash clothing contaminated with acid with plenty of water.



Electrolyte is highly corrosive. Contact with electrolyte is not possible during normal operation.



Risk of explosion and fire, avoid short circuits!



Only use approved lifting and transportation equipment, e. g. lifting gear in accordance with VDI 3616. Lifting hooks must not cause any damage to cells, connectors or connecting cables.



Dangerous electrical voltage.

Attention: Metallic parts of the battery cells are always live. Therefore, no foreign objects or tools may be placed on the batteries.

**Warranty claims will no longer be valid in the event of non-observance of the usage instructions, repairs using non-original spare parts or unauthorised intervention.**

### 1. Start-up

The battery must be checked to ensure that it is in mechanically perfect condition. The installation area must be cleaned prior to installation.

Only interconnect battery blocks with the same charge state (same open-circuit voltage, tolerance as per the following table). Never power electrical consumers via a part of the battery.

The battery terminal end must be connected with the correct polarity and with reliable contact. Otherwise, the batteries, the vehicle or the charging device may be destroyed. Following assembly, the terminals must be greased to protect against corrosion. The battery must be recharged as per item.

Rated voltage module [V]	Maximum deviation from mean value - U <sub>bloc</sub> [V]
6	± 0,035
12	± 0,049

Tightening torque for pole screws on the terminal ends and connectors:

Cone terminal	8 ± 1 Nm
Screw terminal M6/M8	20 ± 1 Nm
Flat terminal M6	6 ± 1 Nm

### 2. Operation

The regulations in accordance with Standard EN 62485 – Safety requirements for secondary batteries and battery installations – Part 3 apply for the operation of vehicle batteries. Traction batteries for electric vehicles.

#### 2.1 Discharging

The battery valves must not be closed or covered. Electrical connections (e. g. plug connectors) must only be opened or closed when in de-energised state.

In order to achieve an optimal service life, discharge of over 60 % of the rated capacity should be avoided. Discharge of over 80 % of the rated capacity is a deep discharge and is not permissible. These significantly reduce the service life of the battery. Only those discharge state indicators that have been approved by the battery manufacturer may be used.

Discharged batteries must be charged immediately and must not remain in discharged state. This also applies to batteries in a state of deep discharge. Otherwise, the service life of the battery will be significantly reduced. The battery may freeze when in discharged state.

#### 2.2 Charging

Batteries must only be charged with direct current. The charging methods in accordance with DIN 41773-1 must only be applied in the modification approved by the manufacturer HOPPECKE. Therefore, only those chargers that have been approved by the battery manufacturer HOPPECKE may be used. In order to prevent overloading of the electrical cables and contacts and impermissible gas formation, the battery must only be connected to the allocated charger that is permissible for the respective battery size.

**trak® bloc batteries have low gas emissions but are not completely free from gas emissions.**

It must be ensured that the charging gases are drained off effectively during charging. Covers on battery installation spaces must be opened or removed.

The battery must be connected to the charger with the correct polarity (positive to positive and negative to negative) when the charger is switched off. The charger must then be switched on.

During charging, the temperature in the battery increases by approx. 10 K.

Therefore, charging should only be started when the temperature is below 35 °C. The temperature prior to charging must be at least 15 °C, as otherwise the battery will not reach a sufficient level of charge during the prescribed charge time.

If temperatures are consistently higher than 40 °C or lower than 15 °C, the charger will need to undergo constant voltage regulation dependent upon the temperature.

A correction factor of  $-0.003 \text{ V/Z per K}$  should be applied here.

### 2.3 Equalising charge

Equalisation charging is used to guarantee the service life and to preserve the capacity. Equalisation charging must be carried out following normal charging.

This type of charging must be carried out following deep discharge and repeated insufficient charging. Only those chargers that have been approved by the battery manufacturer may be used for equalisation charging. It is also recommended that equalisation charging be carried out with constant current once every quarter. The charging current can be a maximum of 0.8 A per 100 Ah  $C_5$  rated capacity, and must be deactivated after a maximum of 5 hours.

The charge voltage must not exceed 2,6 V per cell. Observe the limit temperature!

Charging must be interrupted if the limit temperature is exceeded.

### 2.4 Temperature

30 °C battery temperature is considered the rated temperature. Higher temperatures reduce the service life, while lower temperatures reduce the available capacity.

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

Therefore, trak® bloc batteries must not be exposed to sunlight without protection.

### 2.5 Electrolyte

The electrolyte takes the form of suspended sulphuric acid. The density of the electrolytes cannot be measured.

### 3. Maintenance

Do not top up with water!  
Never open or remove the valves.

#### 3.1 Daily

Charge the battery immediately after every discharge.

#### 3.2 Weekly

Carry out a visual inspection for contamination and mechanical damage.

#### 3.3 Quarterly

The following must be measured and recorded once the battery has been fully charged, after a waiting time of at least 12 hours:

- Total voltage
- Individual voltage of the block batteries

If significant changes to previous measurements or differences between the block batteries are identified, then Customer Service must be contacted for further testing or repairs.

#### 3.4 Yearly

##### (only for batteries in a steel trough)

In accordance with EN 62485-3, the insulation resistance of the vehicle and the battery must be checked by a specialised electrician.

The battery insulation resistance check must be performed in accordance with EN 1987-1.

The established battery insulation resistance must not be below 50 Ohm per Volt of rated voltage.

For batteries with a rated voltage of 20 V, the minimum value would be 1000 Ohm.

### 4. Care

The battery must always be kept clean and dry in order to prevent leakage currents. Cleaning must be performed in accordance with the ZVEI data sheet „Cleaning batteries“.

### 5. Storage

If batteries are taken out of operation for extended periods, then they must be stored fully charged in a dry and frost-free location. In order to ensure that these batteries stay ready for operation, the following charging procedures must be applied:

Quarterly full charging as per Item 2.2.

If consumers such as measuring or control equipment are connected, it may be necessary to carry out a full charge every 14 days.

In general, self-discharge of 2 % per month is to be expected.

The storage time should be taken into account in any service life estimates.

### 6. Faults

If any faults are detected on the battery or charger, contact Customer Service immediately.

HOPPECKE Service:  
+49 (0) 2963 61-591

Measured data as per Item 3.3 make troubleshooting and fault rectification easier.

A service contract with HOPPECKE makes it easier to detect faults in good time, to prevent faults and to remedy any faults that may occur.

### 7. REACH Statement Pb-Metal:

According to REACH regulation we inform that, PzS- and PzB Batteries are containing the SVHC substances Lead-metal (CAS. Nr. 7439-92-1) with more than 0.1 weight %.

MSDS is available upon request from your account manager.

For further information regarding REACH please refer to <https://echa.europa.eu>.



Used lead-acid batteries constitute waste for recycling that requires special monitoring. These batteries, which feature the recycling logo and a crossed-out dustbin, must not be disposed of with household waste. The method of return and recycling must be agreed upon with the manufacturer in accordance with Section 8 of the German Battery Ordinance (BattV).