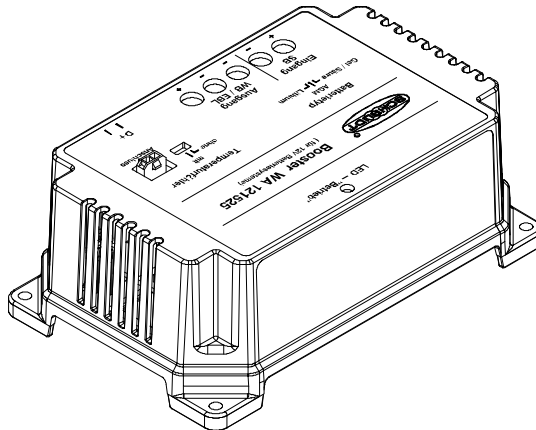


Operating and Installation Instructions



Booster WA 121525

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1 Safety information

1.1 Meaning of safety symbols



▲ DANGER!

Failure to comply with this sign may result in danger to life or physical condition.



▲ WARNING!

Failure to comply with this sign may result in injury.



▲ ATTENTION!

Failure to comply with the sign may result in damage to equipment or other connected consumers.

1.2 General safety instructions

The design of the device is state-of-the-art and complies with approved safety regulations. Failure to observe the safety instructions may nonetheless lead to injury or damage to the device.

Only use the device when it is in perfect technical condition.

Any faults affecting the safety of individuals or the proper functioning of the device must be repaired immediately by specialists.



▲ DANGER!

230V units carrying mains voltage.

Risk of fatal injury due to electric shock or fire:

- Do not carry out maintenance or repair work on the device
- If cables or the device housing are damaged, no longer use the device and isolate it from the power supply
- Ensure that no liquids enter the device
- The mains connection line may only be replaced by an authorised customer service department or by those qualified.



▲ WARNING!

Hot components

Burns:

- Only change blown fuses when the device is fully de-energised
- Blown fuses may only be replaced once the cause of the fault is known and has been rectified
- Never bypass or repair fuses
- Only use original fuses rated as specified on the device
- Device parts can become hot during operation. Do not touch them.
- Never store heat sensitive objects close to the device (e.g. temperature sensitive clothes if the device has been installed in a wardrobe)

1.3 Liability limitation

All technical information, details and instructions for installation, operation and maintenance were up-to-date at the time of print, and are provided in good faith and in due consideration of our experience and knowledge gained to date.

No claims can be derived from the specifications, figures and descriptions in these instructions. The manufacturer assumes no liability for damage due to:

- failure to comply with these instructions
- non-intended use
- improper repairs
- technical modifications
- use of non-approved spare parts

Translations are carried out in good faith. We assume no liability for translation mistakes, neither when translations are performed by ourselves nor on our behalf. Only the original German text remains binding.

2 Introduction

This instruction manual contains important information for the safe operation of equipment supplied by Schaudt. Make sure you read and follow the safety instructions provided.

The operating instructions should always be kept in the vehicle. All safety information must be passed on to other users.



- ▲ This device is not intended to be used by those (including children) with limited physical, sensory or mental aptitude or lack of experience and/or knowledge unless they are supervised by a person responsible for their safety or have received instruction from this person as to how the device is used.

Children must be supervised to ensure they do not play with the device.

This device is intended for installation into a vehicle.

3 Application and functions in detail

The WA 121525 booster is used for the optimum charging of leisure area batteries of types lead-acid, lead-gel, AGM and lithium (each can be set) in vehicles whilst they are moving (such as in motorhomes) with 12 V systems.

Generatorvoltages

Generators with energy-saving charge strategies are often fitted in EURO 6 vehicles. The charge voltage for these generators varies greatly depending on the driving state (between 12.6 V and 15.0 V on the MB Sprinter for example).

Without a booster, this prevent optimum charging of the leisure area battery. There is even a risk of discharge for a battery fully charged from the 230 V mains for example.

Given this situation, the use of a booster in such vehicles is an absolute necessity.

Function

Here the leisure area battery connected is charged independently of the generator voltage. The switchover to trickle charge is automatic and dependent on current. When an optionally available battery temperature sensor is connected, the charge voltages are aligned to the battery temperature.

For conventional generators, leisure area battery charging is also improved greatly by using the WA 121525 booster. The charge current is very much higher, especially for long charge cables. The use of a booster is indispensable for AGM batteries requiring a charge voltage of 14.7 V.

Function

The WA 121525 booster is a clocked upward/downward converter which equalises the fluctuating generator voltage and makes available a high charge current. When generator signal "D+" is applied to the booster, the booster starts working automatically.

The very high efficiency of the booster means that very compact and lightweight design is possible. The fan fitted is very quiet and only runs at high capacities.

4 Operation

Operation of the booster is not required for daily use.

Only when the battery type is changed (for possible battery types, refer to Section 5.1), during initial start-up or when retrofitting accessories do one-time settings have to be configured (see Section 8).

5 Technical details

5.1 Electrical details

Charging curve	IUoU (current-dependent switchover to trickle charge)
Battery types	3 curves, settable from sliding switch: Lead-acid / 14.4V / 13.8V lead-gel battery: AGM battery: 14.7V / 13.7V Lithium battery: 14.4V constant (Voltages without/with temperature sensor at 25 °C)
Switchover of charging / trickle charge	Switchover to trickle charge at: $I < 2.0 \text{ A} \pm 0.5 \text{ A}$ Switch back to charging at: $I > 2.5 \text{ A} \pm 0.5 \text{ A}$
Temperature compensation	In conjunction with optional temperature sensor activated from sliding switch; -24 mV/ °C @ 25 °C Max. charge voltage (UL) limited to 15.1V
Input voltage (U_e)	12.0 to 15.0V (for max. charge current)
Max. charge current	20A @ $U_e = 12.2 \text{ V}$ and $U_L = 14.7 \text{ V}$ 24A @ $U_e = 12.2 \text{ V}$ and $U_L = 12.5 \text{ V}$ 25A @ $U_e = 14.6 \text{ V}$ and $U_L = 14.7 \text{ V}$ 30A @ $U_e = 14.6 \text{ V}$ and $U_L = 12.5 \text{ V}$ Measurement: Vehicle with LiMa voltage 12.6V to 15.0V; voltage drop on the cable to the starter battery: 0.4V; Leisure area battery: 14,7 V (almost fully charged) or 12.5V (almost flat)
Maximum input current	28 A
Efficiency	$\geq 4\%$ (for max. charge current)
Charge current limitation	Max. charge current of 100% @ $U_e \geq 11.7 \text{ V}$ to 0% @ $U_e \leq 11.0 \text{ V}$
Back current from battery	When "Engine OFF": Starter battery: < 0.1 mA Leisure area battery: < 0.4 mA
Control current	When "Engine ON": "D+" connector: < 1mA

5.2 Mechanical details

Connections	Batteries: Screw-type terminals for wires to max. 16mm ² "D+" connector: Rast 5; 2-pin or 6.3 mm AMP flat connector Temperature sensor: MicroFit 3.0; 2-pin.
Casing	Synthetic material, 130 x 47 x 90 mm (W x H x D); can be screwed onto flat surface
Weight	410g
Installation position	Any

6 Installation

The device is designed for wall or floor installation.

- Environment** ▶ Select a dry place for installation.
- Minimum clearance** ▶ Ensure a minimum clearance to the surrounding fixtures and fittings:
- Maintain a gap of at least 5 cm on all sides (except mounted side).
 - Maintain a gap of at least 80 mm upwards (projection for the connector of an optional temperature sensor).
 - Whilst in operation, the ambient temperature must not exceed +45 °C, measured 1cm away from the fans opposite side of the device.

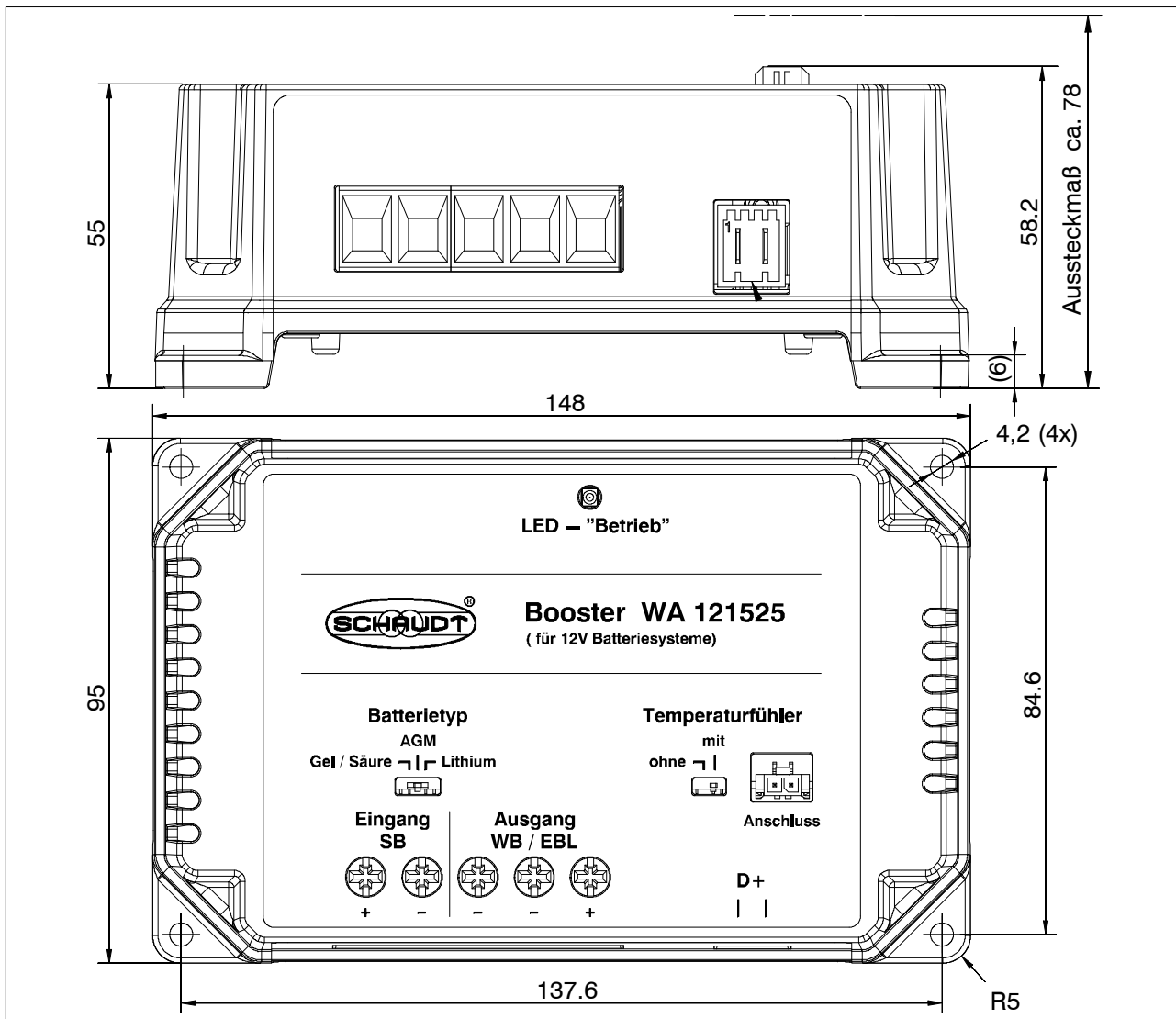


Fig. 1 Dimension diagram for WA 121525Booster

- Fitting** ▶ Screw the Booster onto a firm, flat base with two suitable screws (4mm diameter) at the two fitting holes provided.

7 Electrical connection

The connection scenario in the vehicle must be known before the booster is integrated into it. A distinction between the following scenarios is required:

- Vehicles with Schaudt EBL ..., for which the ground cables to both batteries on the EBL ... are accessible individually. Refer also to Section 7.1.



- ▲ The connection shown in Section 7.1 is the preferred scenario for best possible distribution of currents.

- Vehicles with Schaudt EBL ..., for which the ground connection between the two batteries is in the vehicle itself, and only a single ground cable is connected to the EBL This single ground cable is usually connected at an inaccessible place at the vehicle-side ground connection of the two batteries. Refer also to Section 7.2
- Vehicles with power supplies from other manufacturers. Here the booster is connected directly to the batteries and a D+ signal. Refer also to Section 7.3.



▲ DANGER!

The different connection scenarios have a direct bearing on the maximum currents possible, and so the fusing required. The fusing values specified may never be exceeded.

Every fuse must be connected in the direct vicinity of the voltage source (so the respective battery or terminal D+ on the generator).



- ▲ The temperature sensor also shown in the figures is available as an option. When this sensor is connected, charging of the leisure area battery connected is controlled depending on the temperature of the leisure area battery.

Procedure

The main procedure is essentially the same for all three connection variants:

- ▶ Fully disconnect both batteries (remove all cables from both terminals).
- ▶ Establish all cable connections as in Figure 2, 3 or 4. Ensure the cables have the cross sections required and that the fuse holders are installed correctly. Do not yet insert the fuses into the holders.



▲ ATTENTION!

The ends of the cables connected to the screw-type terminals of the booster must **NOT** have wire end sleeves. Tighten the screw-type terminals to a torque of 1.2 Nm.

- ▶ Also connect the battery sensor (if available) to the negative terminal of the leisure area battery.
- ▶ Set the battery type (see Section 8.1) and switch for the temperature sensor (Section 8.2).
- ▶ Reconnect the battery terminals of both batteries. A small electric arc might occur because capacitors in the booster are charged.
- ▶ Finish off as described in Section 7.5.
- ▶ Insert the fuses.

7.1 Booster connector for EBLs with separate grounds

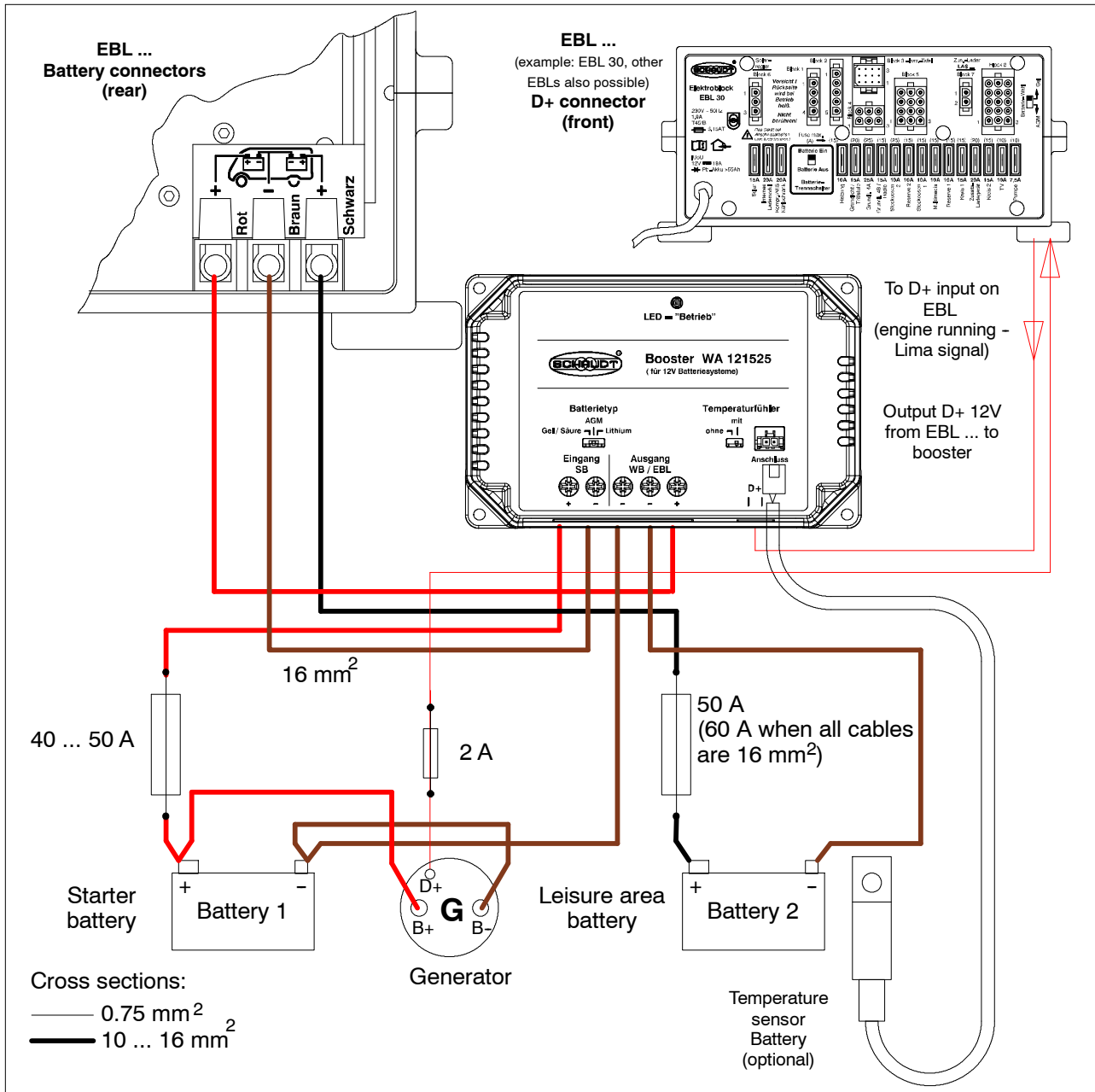


Fig. 2 Vehicles with Schaudt EBL ... - ground on booster

For vehicles in which the cabling can be as shown in Figure 2, the ground connection on the booster between the leisure area battery and the starter battery is an absolute requirement. The two batteries may not be directly connected (e.g. inside the vehicle's cabling). If they are, the wiring **must** be as in Figure 3.



▲ ATTENTION!

The ground cable between the EBL and booster must have a cross section of 16 mm² (no smaller).

7.2 Booster connector for EBLs and vehicle-side grounds for batteries

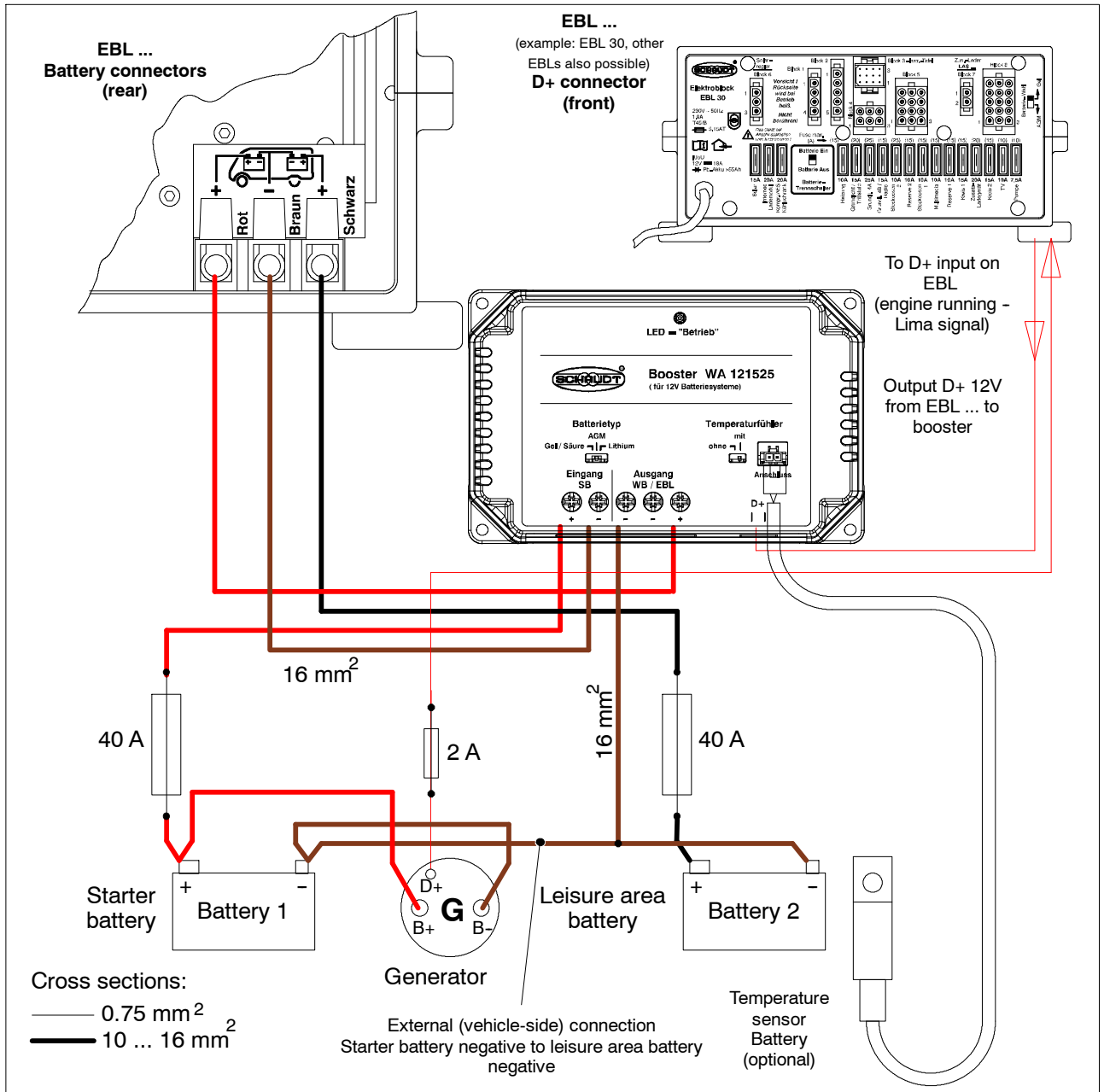


Fig. 3 Vehicles with Schaudt EBL ... - external ground

If the ground cable of the two negative terminals has fixed routing through the vehicle, and there is only one tap to the booster at this ground connection, the cabling looks as in Figure 3.



▲ ATTENTION!

The ground cable between the EBL and booster, and between the booster and ground connection of the batteries, must have a cross section of 16 mm² (no smaller). The maximum fusing for the two batteries may be 40 A each.

7.3 Booster connector in vehicles without EBL ...

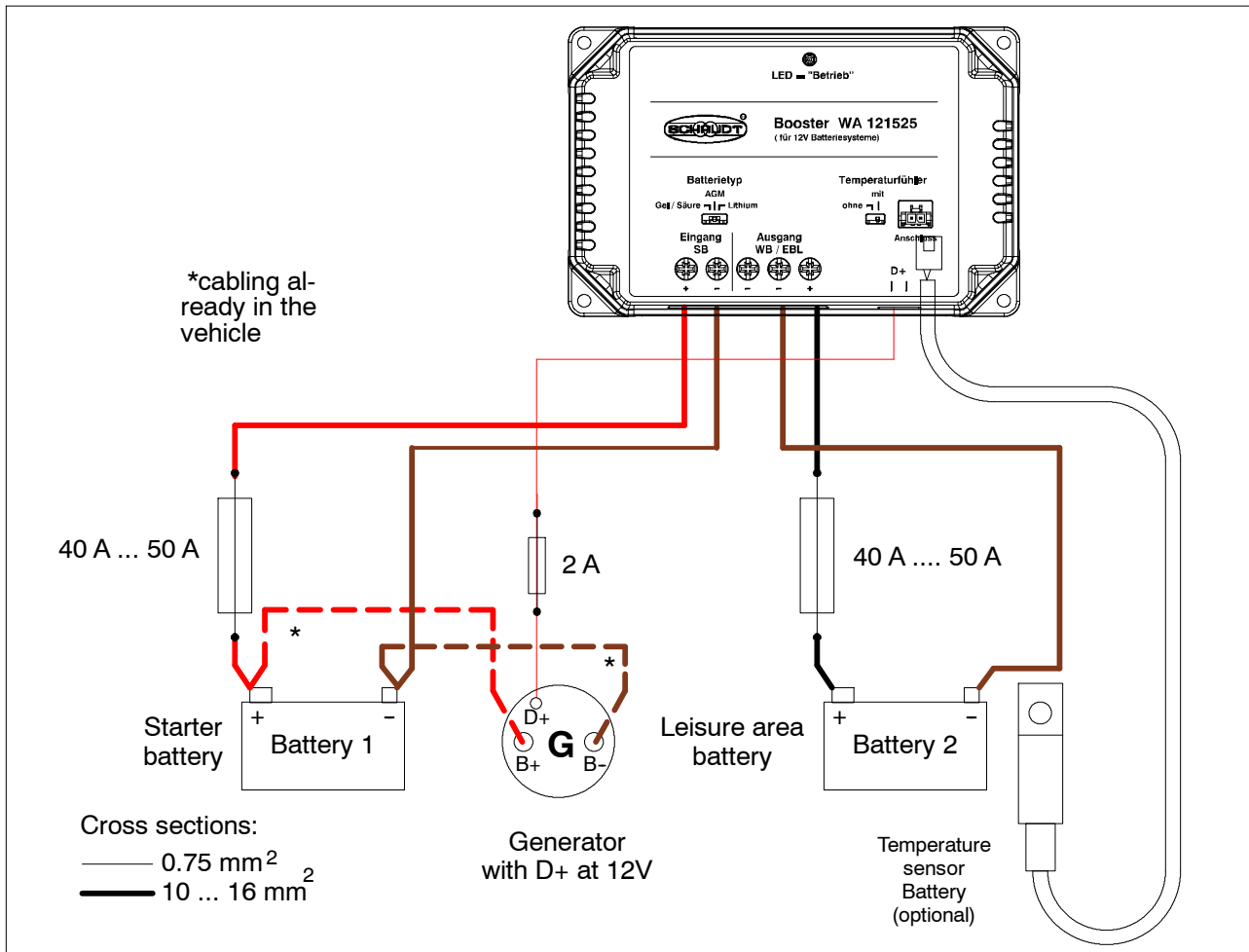


Fig. 4 Vehicles with power supplies without Schaudt EBL ...

Vehicles without EBL (third party devices of any makes) must be retrofitted as in Figure 4.

The connections shown in fig. 4 must also be affixed to the existing connectors on the batteries, and be fused as in the figure.



▲ ATTENTION!

The maximum fusing for the two batteries may be 50 A each.

In cases where an existing booster is replaced, the old booster must be removed complete with its cabling.

The connection is then analogous to the retrofit shown above.

7.4 Booster connector on systems with SDTBUS (Schaudt) or third party systems (with bypass function)

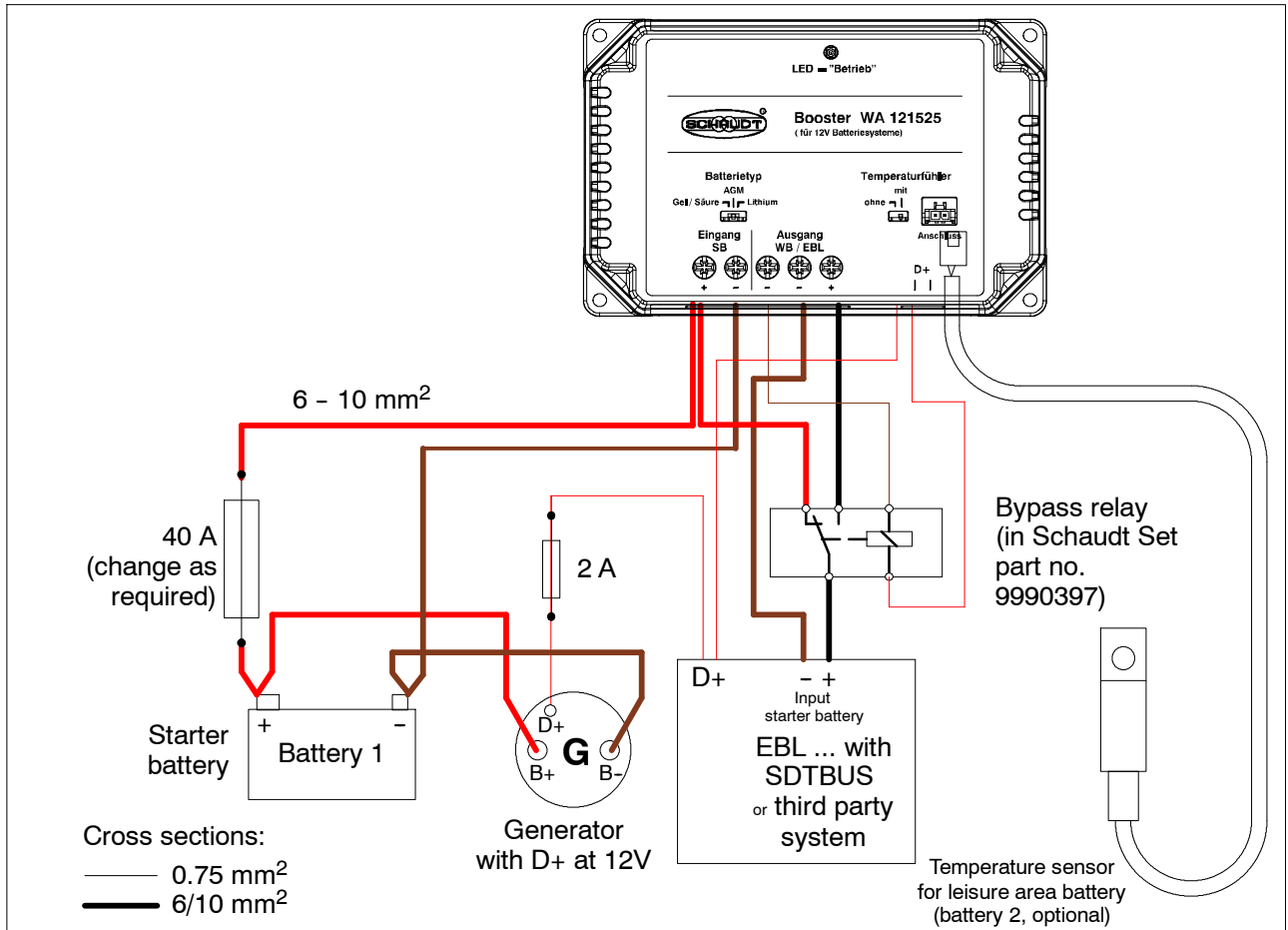


Fig. 5 Vehicles with SDTBUS systems or power supplies without Schaudt EBL ...

Schaudt systems with SDTBUS

For vehicles with SDTBUS, the booster connector shown in Fig. 5 is required for charging of the starter battery when mains voltage or solar current is powering the electroblock. This also enables the starter battery voltage on the system to be displayed.



Third party systems

▲ On conventional systems, the supply cable of the fridge is used to charge the starter battery for mains operation. The connection as in Fig. 2 or 3 is required. No additional bypass relay is required.

On third party systems, permanently connecting the starter battery to the system might be required. For example, the connector in Figure 5 has the benefit (compared to the connector in Figure 4) that the voltage of the starter battery in the third party system can also be displayed when the vehicle engine is stationary (when a display is provided there).

7.5 Finishing off



▲ ATTENTION!

The 10 mm²- and 16 mm²- cables to the batteries are relatively heavy and potentially exert high loading on the terminals.

► The cables must be secured with suitable strain relief so that no high tensile forces or pressure loads are exerted onto the connector terminals of the booster.

8 Adjustments



▲ ATTENTION!

A small screwdriver must be used to move the switches. Exercise care when moving the switches to prevent damaging them. To gain a sense for the notch positions, the recommendation is to slide the switch left and right a few times to the end position before making the final settings.

After making the setting, check the position again in adequate lighting.

8.1 Battery type



▲ ATTENTION!

Incorrectly setting the device or using unsuitable leisure area battery types can damage the battery or devices connected to the leisure area battery. So therefore:

- Batteries may only be changed by qualified personnel.
- Follow the battery manufacturer's instructions.
- Only use the booster to connect to 12V power supplies with rechargeable 6 cell lead-gel, lead-acid, AGM or lithium batteries. Do not use any unsuitable battery types.



- ▲ Normally only batteries of the same type and rating should be used, i.e. the same as those originally installed by the manufacturer. It is possible to swap from lead-acid batteries to other battery types. Switching to lead-acid batteries is only possible in certain circumstances. Contact the vehicle manufacturer for more information.



▲ DANGER!

Incorrectly setting the battery selector switch poses a risk of explosion (through the formation of detonating gas). So therefore:

- Move the battery selector switch to the correct position

Changing the battery ► Electrically isolate both batteries from the booster

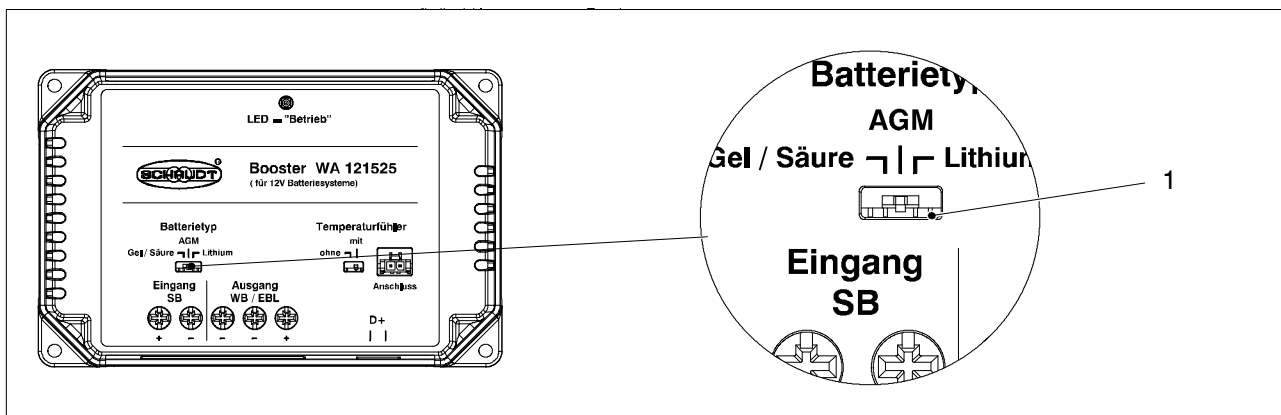


Fig. 6 Battery selector switch

- Move the battery selector switch (Fig. 6, Pos. 1) to the correct position:

Battery type used	Switch position	Charge voltage	Trickle charge voltage
Lead-acid batteries	Left	14.4 V	13.8 V
Lead-gel batteries AGM1 batteries	Left	14.4 V	13.8 V
AGM2 batteries	Middle	14.7 V	13.7 V
Lithium batteries	Right	14.4 V	14.4 V

- After changing the battery, check again the type of battery used and then ensure that the battery selector switch is in the correct position.

8.2 Enabling/disabling the temperature sensor

The booster is able to control charging of the leisure area battery by temperature. The optional temperature sensor is required for this.

This function must be enabled once the sensor is connected to the booster.

Changing the battery

- Connect the temperature sensor to the negative terminal of the leisure area battery.
- Route the temperature sensor cable through the vehicle to the booster.
- Plug the connector into the booster (Figure 7, Pos. 1).

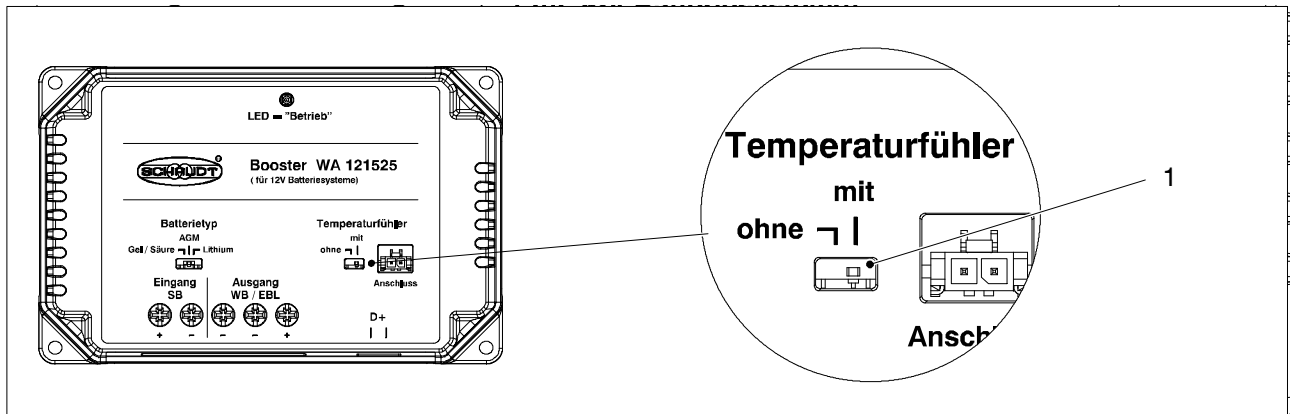


Fig. 7 Temperature sensor: Connection and setting

- Adjust the sliding switch on the booster (Figure 7, Pos. 2).

Temperature sensor	Switch position	Function
Not present	Left ("without")	Fixed charge voltage / trickle charge voltage
Present	Right ("with")	Assuming 25 °C, the charge voltage is compensated with -24 mV/°C until the maximum charge voltage of 15.1 V is reached



- ▲ If the selector switch for the temperature sensor is in Position "with" without a temperature sensor connected, the booster has no effect because the output voltage in this case does not exceed 7.5 V. This means the leisure area battery is no longer charged.

8.3 Faults

Flat vehicle fuses A flat battery or defective fuse is the cause of most faults in the 12V system. When it is not possible to rectify a fault based on the following table, please contact Schaudt customer service (for address, see Page 15).

Fault	Possible cause	Remedy
Leisure area battery not charged when vehicle is moving (battery voltage does not rise after some time).	The switch position for the temperature sensor is in Position "with" although no temperature sensor is connected.	Move the switch to the "without" position.
	Too many consumers are switched on.	Switch off any consumers not required.
	When the temperature sensor is connected: Connector not plugged in properly.	Plug the connector in properly.
	When the temperature sensor is connected: Sensor cable break.	Unplug the temperature sensor connector and move the switch (Figure 7, Pos. 2) into Position "without"; then contact Customer service.
	The device has an excessively high temperature.	Improve the ventilation; clean dirty fan as required.
The voltage rises to above 14.7 V (possible also above 15.1 V).	When the temperature sensor is connected: The sensor cable may be short-circuited or damaged.	Unplug the temperature sensor connector and move the switch (Figure 7, Pos. 2) into Position "without"; then contact Customer service. Note: Charging is no longer temperature-based.
LED on booster not lighting.	Vehicle engine idle - no battery charging.	No fault - start vehicle engine as required.
	Vehicle engine running: No input voltage due to defective fuse or defective cabling.	Replace fuse as necessary. Cabling: Contact customer service.
	Vehicle engine running: No D+ signal from the generator due to defective fuse or fault in vehicle or in cabling.	Replace fuse as necessary. Cabling/fault in vehicle: Contact customer service.

9 Maintenance

The WA 121525 Booster requires no maintenance.

Cleaning Clean the device with a soft, slightly moistened cloth. Never use spirit, thinners or similar substances. Do not allow liquids to enter the device. If required, clean the fan with a soft brush.

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Appendix

A Customer service

Customer service Schaudt GmbH, Elektrotechnik & Apparatebau
 Planckstraße 8
 88677 Markdorf, Germany
 Phone: +49 7544 9577-16
 Email: kundendienst@schaudt.gmbh
 Website: www.schaudt.gmbh



▲ Before returning a device, we recommend taking a look at the frequently asked questions (FAQs) on website "www.schaudt-gmbh.de". This may give you some pointers towards fault rectification, or perhaps even also incorrect operation.

Send in device Returning a faulty device:

- ▶ If possible: Fill in the pre-registration in the relevant area on the "www.schaudt-gmbh.de" website.
- ▶ Fill in and enclose the fault report, see Appendix C.
- ▶ Send it to the addressee (free delivery).

B Layout

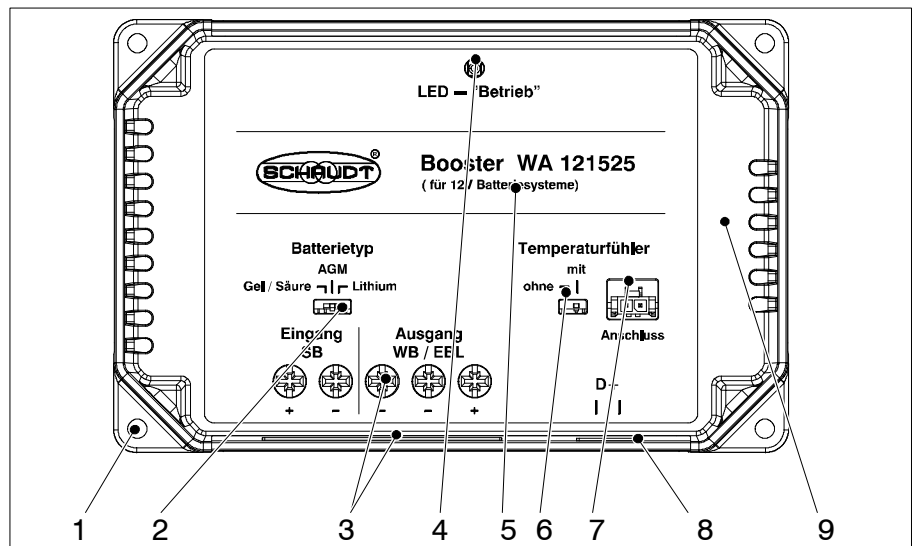


Fig. 8 Layout of the WA 121525Booster

- 1 Fixing hole
- 2 Sliding switch for battery type setting
- 3 Screw-type terminals for battery connectors
- 4 LED operation
- 5 Adhesive label
- 6 Sliding switch for temperature sensor setting
- 7 Temperature sensor connector plug
- 8 RAST 5 connector, D+
- 9 Fan

C Fault report

In the event of damage, please fill in the fault report and send it with the faulty device to the manufacturer.

Device type: _____
Item no.: _____
Vehicle: _____
Manufacturer: _____
Model: _____
Own installation? Yes No
Upgrade? Yes No
Upstream overvoltage protection? Yes No

Following fault has occurred (please tick):

- Electrical consumers do not work - which?
(please specify below)
- Switching on and off not possible
- Persistent fault
- Intermittent fault/loose contact

Other comments:
