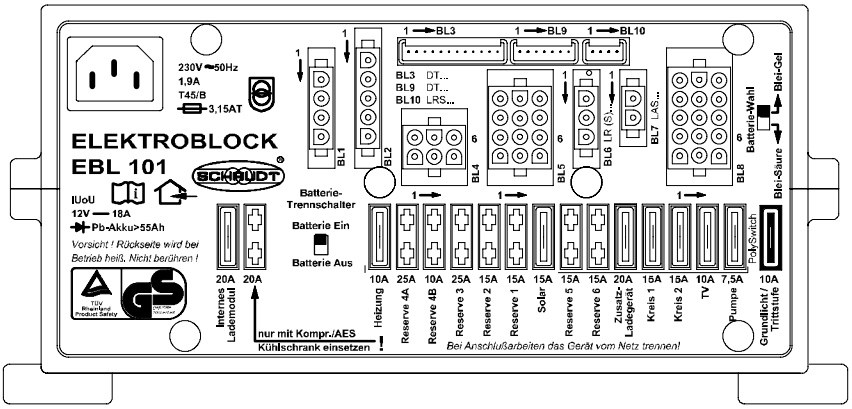
Instruction Manual



Electrobloc EBL 101 C

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1 Safety Information

1.1 Meaning of safety symbols



▲ DANGER!
Failure to heed this warning may result in death or serious injury.



▲ WARNING!
Failure to heed this warning may result in personal injuries.



▲ ATTENTION!
Failure to heed this warning may result in damage to the device or connected consumers.

1.2 General safety information

The device is state-of-the-art and complies with approved safety regulations. Nonetheless, personal injuries or damage to the device may occur if the safety instructions contained herein are not followed.

Ensure that the device is in perfect working order before use.

Any technical faults which may impact personal safety or the safety of the device must be rectified immediately by qualified personnel.



▲ DANGER!
230 V mains voltage carrying parts.
Danger of death 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 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 qualified persons.



▲ WARNING!
Hot components!
Burns:

- Only change blown fuses when the device is completely de-energised.
- Only replace blown fuses once the cause of the fault has been identified and 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.
- Never store heat sensitive objects close to the device (e.g. temperature sensitive clothes if the device has been installed in a wardrobe).

2 Introduction

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

The instruction manual should be kept in the vehicle at all times. Ensure that other users are made aware of the safety regulations.



▲ This device is not intended to be used by persons (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 are to be supervised so as to ensure they do not play with the device.

This device is intended for installation into a vehicle.

3 Operation

The Electrobloc is operated solely from the DT ... control and switch panel connected (apart from battery isolation).

The EBL Electrobloc 101 C does not require daily operation.

Initial settings are only required after the type of battery (lead-acid or lead-gel) has been changed or during commissioning or when upgrading with accessories (see section 3.2 and EBL 101 C installation instructions for details).

3.1 Switching system on/off



▲ **ATTENTION!**

Incorrect Electrobloc settings.

Damage to connected devices. Therefore prior to starting:

- Ensure the leisure battery is connected.
- Ensure that the battery selector switch (Fig. 1, Pos. 1) is set to the correct position for the inserted battery.
- Ensure that the AES fuse (Fig. 4, Pos. 16) is only inserted if an AES refrigerator is connected to the system. Otherwise, the leisure battery may totally discharge. Damage to the battery is possible.

12 V main switch (on DT ... control and switch panel)

Disable battery isolation on Electrobloc:

➤ Move slide switch (see Fig. 4, Pos. 15) into position ”Battery ON”

➤ After disabling the battery cut-off switch or after changing batteries: 12 V main switch on the DT ... control and switch panel must be turned on briefly to start up the consumers.

Use the 12 V main switch (see instruction manual of relevant control and switch panel) to switch on/off all the consumers and the control and switch panel.

Exceptions:

- Heater
- Step
- Frost protection valve
- AES/compressor refrigerator
- Spare 4

For more information, see the DT ... control and switch panel instruction manual.

Step switch

The supply to the step is protected by a self-resetting fuse. This is why the step switch may only be activated briefly.



▲ **ATTENTION!**

Activating the step switch too long results in too high a current.

Self-resetting fuse can activate:

- Only press the step switch briefly.

➤ If the self-resetting fuse has triggered, it needs about one minute to reset before the step switch can be pressed again.

Operation with solar regulator



▲ **ATTENTION!**

No battery buffer function!

Damage to connected devices:

- Do not operate solar regulator without battery connected.

3.2 Changing the battery



▲ **ATTENTION!**

Use of incorrect battery types or incorrectly rated batteries.

Damage to the battery or devices connected to the electronic block:

- Batteries should only be changed by qualified personnel.
- Follow the instructions of the battery manufacturer.
- Only connect the electronic block to 12 V power supplies with rechargeable 6-cell lead gel or lead acid batteries. Do not use any unsuitable battery types.



▲ Only batteries of the same type and capacity should normally be used, i.e. same as those installed by the manufacturer.

▲ It is possible to swap lead acid batteries with lead gel batteries. Changing from lead gel batteries to lead acid batteries is not possible without overhead. Contact the vehicle manufacturer for more information.

Changing the battery

➤ Disconnect the battery from the Electrobloc by activating the battery isolation on the DT ... control and switch panel (see also section 3.4).

➤ Remove ”+ solar cell” connector on the solar charge regulator (if available).

➤ Isolate Electrobloc from the mains voltage (230 V AC).

➤ Replace battery.

➤ After changing the battery, recheck which type of battery has been inserted.

▲ DANGER!

Incorrect setting of the battery selector switch.

Risk of explosion due to build up of explosive gases:

- Set the battery selector switch to the correct position.

▲ ATTENTION!

Incorrect setting of the battery selector switch.

Damage to the battery.

- Set the battery selector switch to the correct position.

➤ Disconnect the electronic block from the mains before adjusting the battery selector switch.

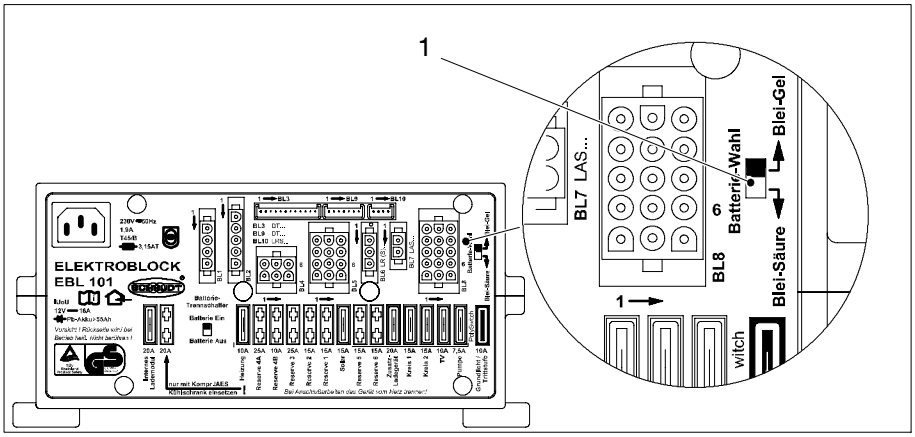

Fig. 1 Battery selector switch

➤ Set the battery selector switch (Fig. 1, Pos. 1) to the correct position using a thin object (such as a ballpoint pen):

- Lead gel battery: Set the battery selector switch to ”Lead-gel”.
- Lead acid battery: Set the battery selector switch to ”Lead-acid”.

Starting up the System

➤ Remove ”+ solar cell” connector on the solar charge regulator (if available).

➤ Start up the system as described in section 3.1.

3.3 System Faults

Flatvehicle fuses

A fault in the power supply system is usually caused by a blown fuse.

Self-resetting fuses

The following functions are protected by a self-resetting fuse:

- Exit step
- Sensor lines to the DT ... control and switch panel

If there is a fault with the step, it must not be operated for a period of 1 minute. This fuse resets automatically during this period.

For faults to the DT ... control and switch panel, the entire system is to be switched off via the battery cut-off and turned on again after about 1 minute.

Please contact our customer service address if you are unable to rectify the fault using the following table.

If this is not possible, e.g. if you are abroad, you can have the electronic bloc repaired at a specialist workshop. Please note that the warranty will become void if incorrect repair work is carried out. Schaudt GmbH shall not accept liability for any damages resulting from such repairs.



▲ The use of an overvoltage protection OVP is recommended.

Fault	Possible cause	Remedy
Living area battery is not charged during 230 V operation (battery voltage constantly below 13.3 V)	No mains voltage	Switch on the automatic fuse in the vehicle
		Have the mains voltage checked
	Defective electronic block	Contact the customer service department
Living area battery is overcharged during 230 V operation (battery voltage constantly above 14.5 V)	Defective electronic block	Contact the customer service department
Starter battery is not charged during 230 V operation (battery voltage constantly below 13.0 V)	No mains voltage	Switch on the automatic fuse in the vehicle
		Have the mains voltage checked
	Defective electronic block	Contact the customer service department
Living area battery is not charged during mobile operation (battery voltage below 13.0 V)	Defective alternator	Check the alternator
	No voltage on D+ input	Check fuses and wiring
	Defective electronic block	Contact the customer service department
The living area battery is overcharged during mobile operation (battery voltage constantly above 14.3 V)	Defective alternator	Check the alternator
The refrigerator does not work during mobile operation	No power supply to the refrigerator	Check fuse and wiring
	Defective electronic block	Contact the customer service department
	Defective refrigerator	Check the refrigerator

Fault	Possible cause	Remedy
Solar charger does not work (power supply and engine are off)	Solar panel in (partial) shade or covered (snow or dirt)	Move solar panel out of shade or clean.
	Solar charge regulator not plugged in	Plug in solar charge regulator
	Defective fuse or wiring	Check fuse and wiring
	Solar charge regulator defective	Check solar charge regulator
12 V supply does not work in the living area	12 V main switch for the living area battery is switched off	12 V main switch for the living area battery must be switched on
	Activate battery isolation on the DT ... control and switch panel	Activate battery isolation on the DT ... control and switch panel
	Defective fuse or wiring	Check fuse and wiring
	Defective electronic block	Contact the customer service department
The Electrobloc cannot be operated from the DT ... control and switch panel	Defective electronic block	Contact the customer service department

▲ If the device becomes too hot due to excessive ambient temperature or lack of ventilation, the charging current is automatically reduced. Nevertheless, always prevent the device from overheating.

▲ If the automatic shutdown mechanism of the battery monitor is triggered, fully charge the living area battery.

3.4 Closing down the System

▲ **ATTENTION!**

Total discharge.

Damage to the living area battery:

- Fully charge the living area battery before and after closing down the system. (Connect a vehicle with an 80 Ah battery and a vehicle with a 160 Ah battery to the mains for at least 12 and 24 hours respectively).

▲ **ATTENTION!**

Permitted input voltages exceeded.

Damage to connected consumers:

- Do not operate any connected Schaudt solar charge regulator without battery.
- If the battery is to be changed or removed, first remove ”+ solar cell” connector on the solar charge regulator.

Shutdown of system up to 6 months

➤ Fully charge the living area battery before closing down the system.

The living area battery is then protected against total discharge. This only applies if the battery is intact. Follow the instructions of the battery manufacturer. The shut down system requires approx. 4 Ah per month.

Disconnect the living area battery from the 12 V power supply

Disconnect the living area battery from the 12 V power supply if the motorhome is not used for a longer period (during the winter for example). For this, the system has a battery cut-off mechanism that isolates the living area battery from the vehicle. Battery isolation is activated from the DT ... control and switch panel (see DT ... control and switch panel instruction manual).

➤ 12 V main switch on the DT ... control and switch panel must be switched off.

➤ Move battery cut-off switch (sliding switch, see Fig. 4, Pos. 15) to position ”Battery OFF”.

The battery cut-off switch isolates the following connections from the living area battery:

- 12 V consumers
- Frost protection valve
- Control and switch panel

▲ The living area battery can also be charged using the internal charger module, an auxiliary battery charging unit, the solar charge regulator and the alternator when the battery cut-off switch is switched off.

Shutdown period longer than 6 months

➤ Fully charge the living area battery before closing down the system.

➤ Remove the ”+ solar cell” connector on the solar charge regulator.

➤ Remove the clamps from the battery poles.

▲ The battery alarm is no longer active.

▲ The frost protection valve opens for certain heater systems when the living area battery is isolated from the Electroblock via the battery cut-off. The boiler and water tank empty when the frost protection valve is open. For more information, see the instruction manual of the heater system.

4 Application and Functions in Detail

▲ This device is intended solely for installation in a vehicle.

The EBL 101 C is the central energy supply unit for all 12 V consumers in the electrical system on board the motorhome or caravan. It is normally fitted inside a cabinet or a stowage space and can be accessed from the front to change a fuse.

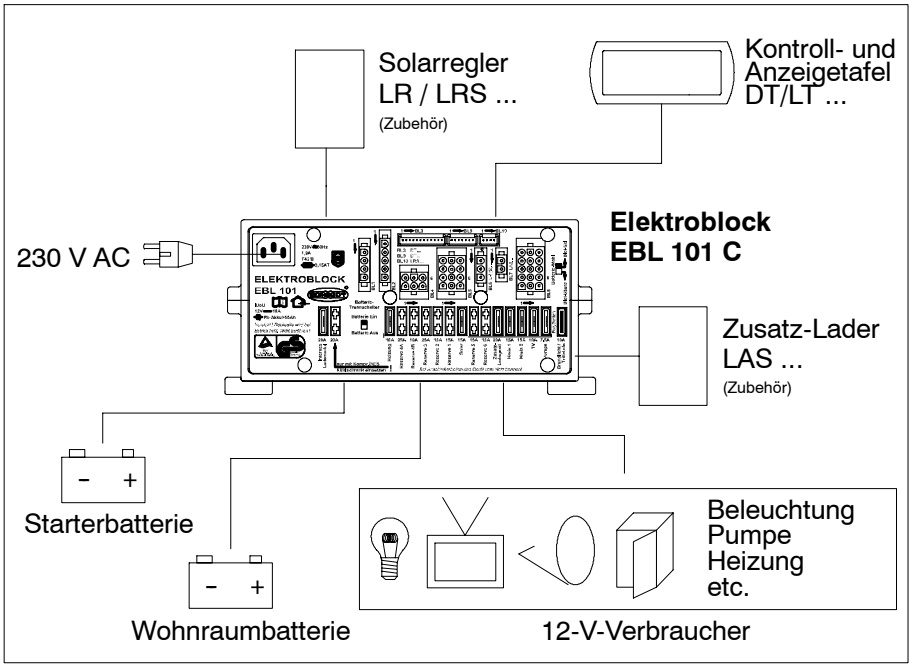

Fig. 2 On-board power supply system

Modules

The EBL 101 C Electrobloc contains:

- a charge module for charging all connected batteries
- the complete 12 V distribution
- the fuses for the 12 V circuits
- a main switch module
- other control and monitoring functions

System devices

A DT ... control and switch panel must be connected for operation. These devices control the electrical functions in the motorhome's living area as well as the accessories.

There are connections for an additional battery charger and a solar charge regulator.

Flat vehicle fuses protect the various circuits. Exceptions here are the step and the frost protection valve.

Protective circuits

- Excess temperature
- Overload
- Short circuit

Mains connection

230 V AC ± 10 %, 47 to 63 Hz sinusoidal, protection class I

Current-carrying capacity

12 V outputs may be loaded with max. 90% of the rated current of the respective fuse (see also installation instructions or front panel).

4.1 Battery functions

Suitable batteries

6-cell lead acid or lead gel batteries, 55 Ah and above

Battery charging during mobile operation

Simultaneous charging of the starter battery and the living area battery via the alternator, parallel connection of the batteries via a cut-off relay

Battery isolation

The battery cut-off (at the battery cut-off switch of the Electrobloc, see Fig. 4, Pos. 15, see also section 3.4) isolates the following connections from the living area battery:

- all 12 V consumers
- the frost protection valve

This prevents slow discharge of the living area battery by the standby current during shutdown of the vehicle (discharge with approx. 4 Ah in month).

The batteries can still be charged using the Electrobloc, the alternator, an auxiliary charging unit or the solar charge regulator, even when the battery cut-off switch is switched off.

Battery selector switch

The switching option provided by the battery selector switch ensures optimum charging of the two battery types, lead gel and lead acid.

Battery monitor with automatic disconnect

The battery monitor of the DT ... control and switch panel constantly monitors the living area battery with dynamic voltage threshold. Lower discharge currents cut off ”earlier” than with larger currents. This provides improved total discharge protection. Monitoring is also performed in the switched-off state. A warning message is displayed below 12.0 V (dependent on current drain).

If the voltage of the living area battery sinks further, falling below 10.5 V, the battery monitor immediately switches off all 12 V consumers. The control and switch panel also switches itself off. Only the frost protection valve continues to be powered (so it stays closed). Before switch-off, all switch states and the value of the battery capacity are stored and restored after power-on.

If an overload or an insufficiently charged living area battery causes the voltage to fall so low that the automatic disconnector is triggered, any non-essential consumers should be switched off.

If need be, the 12 V supply can begin operation for a short time. In this case the 12 V main switch on the DT ... control and switch panel must be switched on.

However, if the battery voltage remains below 11.0 V, the 12 V power supply can not be turned back on.

Fully charge the living area battery as soon as possible. For more information, see the ”Battery voltages” description in the associated DT ... control and switch panel instruction manual.

4.2 Additional functions

Automatic switch function for AES/compressor refrigerator

This relay supplies the AES/compressor refrigerator with power from the starter battery when the vehicle engine is running and the D+ connection is live. An AES/compressor refrigerator is powered by the living area battery when the vehicle engine is not running.

Step fuse

The step output is protected by a self-resetting 15 A fuse.

If a fault occurs, such as overcurrent, the self-resetting fuse interrupts the relevant circuit.

After rectification of the fault, the fuse automatically resets after approx. 1 minute.

Battery charging with solar charging regulator

Maximum permitted charge current 14 A, protected with 15 A
Depending on the solar charge regulator used, either only the living area battery is charged or the living area battery and the starter battery.

4.3 Use as an exchange device

The EBL 101 C can be used as an exchange device for the EBL 100. The plug-and-socket connections of the old device can all be used.

Some additional functions and plug connections of the EBL 101 C will however remain without a function.

5 Maintenance

The Electrobloc requires no maintenance.

Cleaning

Clean the electronic block with a soft, slightly damp cloth and mild detergent. Never use spirit, thinners or similar substances. Do not allow liquids to enter the electronic block.

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Appendix

A EC Declaration of Conformity

Schaudt GmbH hereby confirms that the EBL 101 C Electrobloc de

- DIRECTIVE 2006/95/EC OF THE EUROPEAN PARLIAMENT AND COUNCIL from 12.12.2006 for the harmonization of the legal provisions of member states in regard to electrical equipment for use within particular voltage limits
- DIRECTIVE 2004/108/EC OF THE EUROPEAN PARLIAMENT AND COUNCIL from 15.12.2004 for the harmonization of the legal provisions of member states in regard to electromagnetic compatibility and for the annulment of directive 89/336/EEC
- Law on the electromagnetic compatibility of equipment from February 26th 2008

Manufacturer Schaudt GmbH, Elektrotechnik & Apparatebau

Address Daimlerstrasse 5
88677 Markdorf
Germany

B Special fittings/accessories

Switch panel Schaudt DT ... switch panel (required for operation)

Additional charger Schaudt battery charger LAS ... with max. 18 A charge currency, including suitable connection cable (MNL).

Solar charge regulator Schaudt Solar charge regulator, type LR ... (or LRS ... ; required if the solar current is to be displayed) for solar modules with an overall current of 14 A with 3-pin connector and connector cable (LRS ... with 2 connectors)

C Customer service

Customer service address Schaudt GmbH, Elektrotechnik & Apparatebau
Daimlerstrasse 5
D-88677 Markdorf

tel.: +49 7544 9577-16 e-mail: kundendienst@schaudt-gmbh.de

Office hours	Mon to Thurs	08.00 – 12.00, 13.00 – 16.00
	Fri	08.00 – 12.00

Send in the device Returning a defective device:

➤ Fill in and enclose the fault report, see Appendix D.

➤ Send it to the addresse (free of charge).

D Fault report

In the event of damage, please return the defective device together with the completed fault report to the manufacturer.

Device type: _____
Article no.: _____
Vehicle: Manufacturer: _____
Model: _____
Own installation? Yes ❑ No ❑
Upgrade? 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 remarks:

E Technical data

Mains connection
230 V AC ± 10%, 47 to 63 Hz sinusoidal, protection class I

Current consumption
1.9 A

Standby current from living area battery
Depending on the control and switch panel: approx. 5 – 20 mA, plus consumption of controller electronics of refrigerator

Measurement approx. 10 minutes after disconnection from the mains:

- not connected to mains
- 12.6 V battery voltage
- Battery isolation not enabled
- Control and switch panel lighting off
- 12 V main switch off

D+ loading
Loading of D+ output of the alternator by the Electrobloc approx. 200 mA without current consumption on D+ point

Current-carrying capacity

12 V outputs	A maximum of 90% of the nominal current of the relevant fuse may be drawn.

	Frost protection valve output	max. 0.1 A
	D+ point	max 1 A
Battery charging, living area battery with mains connection	Characteristic charging curve Final charging voltage Charge current	IUoU 14.3 V 18 A in the entire mains voltage range, electronically limited, minus the charge current into the vehicle battery
	Voltage for float charge	13.8 V with automatic switchover
	New charge cycle, Switchover to main charging	with battery voltage below 13.8 V with a few seconds delay

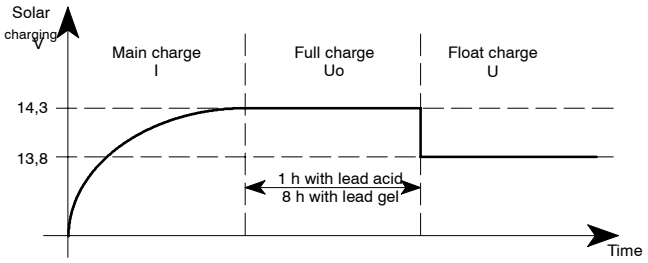

Fig. 3 Example of the charging voltage curve on the EBL 101 C Electrobloc

I Main charge with maximum 18 A charging current, electronically limited, up to final charging voltage. Start of charge also for totally discharged batteries.

Uo Automatic changeover to full charge with constant 14.3 V. The duration of the fully charge phase depends on the type of battery and can be adjusted at the device:

U Automatic changeover to trickle charge with constant 13.8 V. In the trickle charge phase, the voltage at the output of the charging module is constant.

Start of a new charging cycle by switching over to main charge, if the battery voltage falls below 13.8 V for more than 5 seconds when loaded. Start of charge also for totally discharged batteries. The internal charge module can also be operated without living area battery.

Battery charging, starter battery with mains connection

For mains operation, the starter battery is also charged (with maximum charge current of 6 A).

Battery charging via solar charge regulator

Maximum permitted charge current 14 A, protected with 15 A;
Depending on the solar charge regulator used, either only the living area battery is charged or the living area battery and the starter battery.

Battery charging during mobile operation

Simultaneous loading of living area battery by alternator
Batteries connected in parallel via a cut-off relay

Battery monitor

Switch-off voltage:	dynamic, controlled by control and switch panel
Minimum battery voltage for Switch-on via the 12 V main switch on the control and switch panel:	approx. 11.0 V

F Design

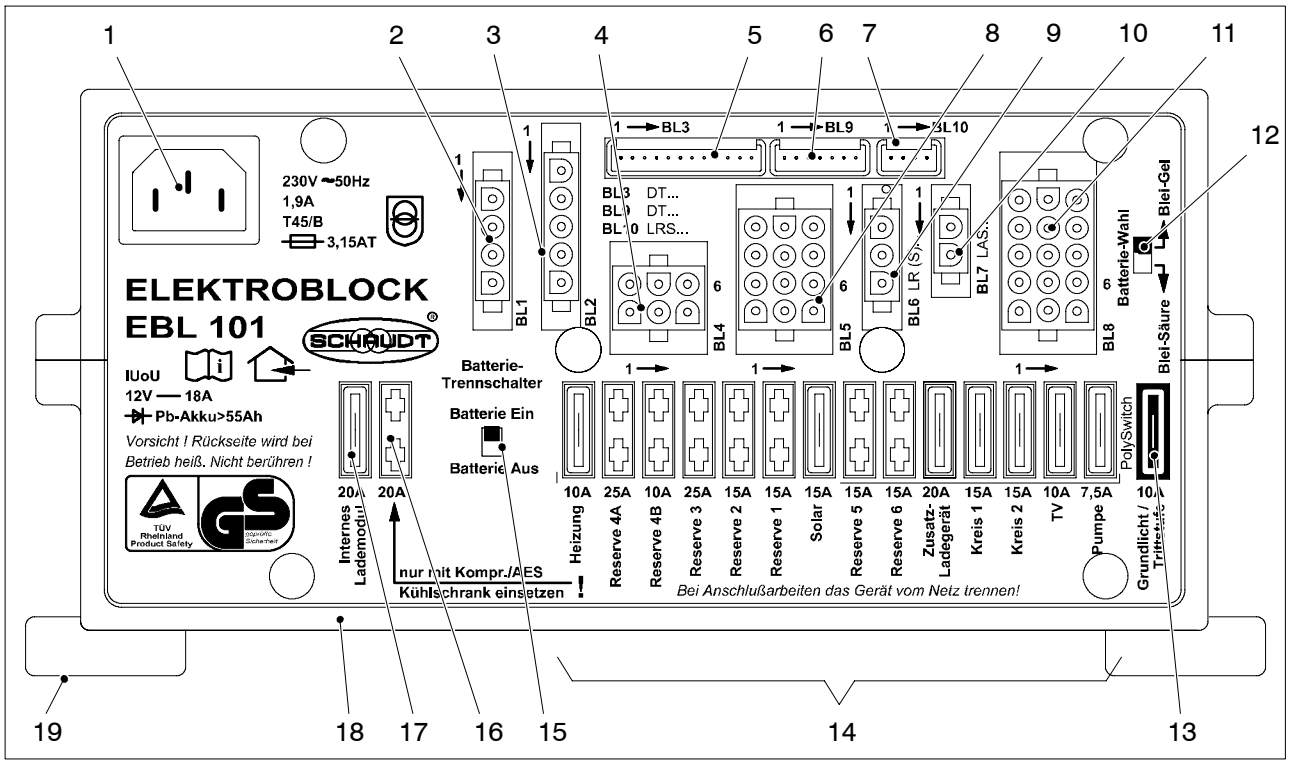

Fig. 4 Design of the EBL 101 C Electrobloc (front)

1 Mains connector
2 Connection block, refrigerator supply
3 Connector block, refrigerator supply D+, Battery sensor/control lines
4 Connector block, heating, floor light, step
5 Connector, DT ... control and switch panel
6 Connector, DT ... control and switch panel
7 Connection block, solar regulator (measurement signal)
8 Connection block, reserve
9 Connection block, solar regulator (supply)
10 Connection block, additional charger
11 Connection block TV, pump, consumers
12 Selector switch acid/gel battery
13 Self resetting step fuse (internal)
14 Flat vehicle fuses, consumers
15 Battery cut-off switch
16 AES refrigerator fuse
17 Flat vehicle fuse, internal charger module
18 Housing
19 Assembly flaps

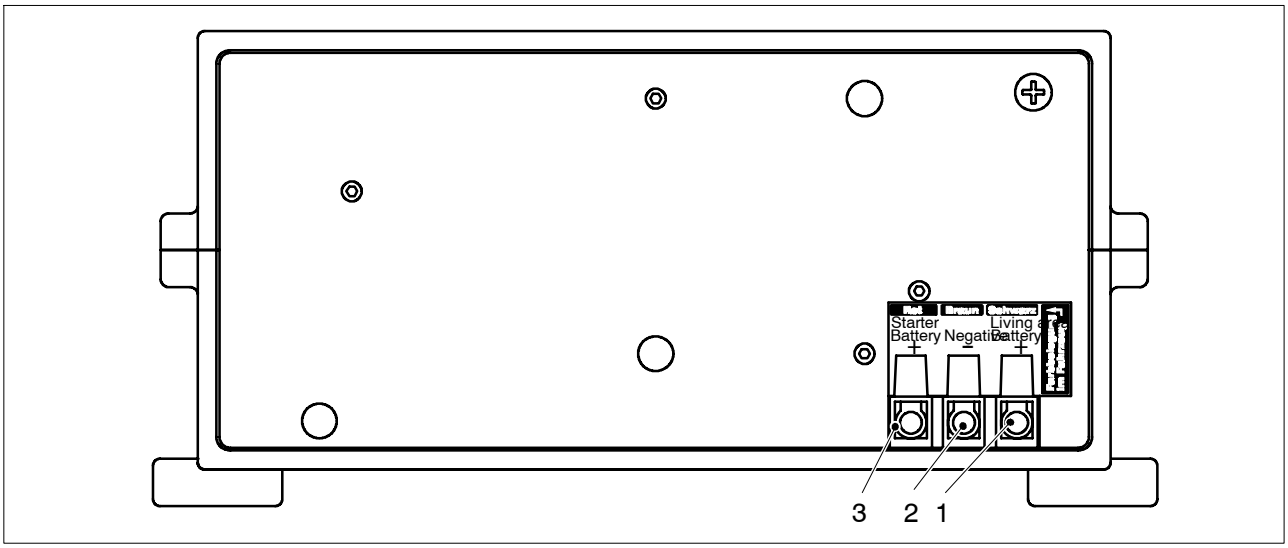

Fig. 5 Design of the EBL 101 C Electrobloc (rear)

1 Connection, living area battery
2 Connection, earth
3 Connection, starter battery

G Block diagram/connection diagram

