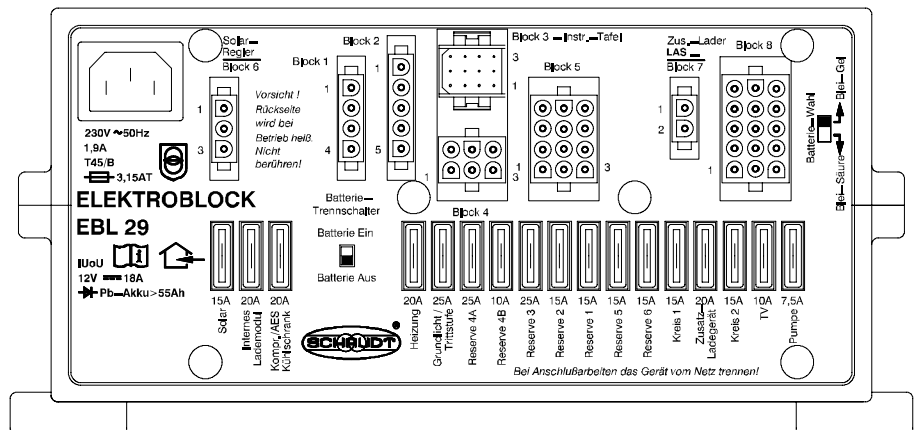


Instruction Manual



Electroblock EBL 29 EBL 29 with OVP

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1 Safety information

1.1 Meaning of the safety symbols



▲ DANGER!

Failure to comply with this sign may result in danger to life and 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 connected consumers.

1.2 General safety instructions

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

Do not use the device if it is not in perfect technical condition.

Any faults affecting the safety of people 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.



▲ WARNING!

Hot components!

Burns:

- Only change blown fuses when the device is fully de-energised.
- Blown fuses may only be replaced when 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).

2 Introduction

This instruction manual contains important information on safe operation of the device. Make sure you read and follow the safety instructions provided.

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

3 Operation

The electroblok is operated solely via the IT ... / LT ... control and switch panel connected.

For daily use, no operation is needed on the EBL 29 electroblok (exception: the battery cut-off switch should be disabled when the vehicle is not in use, see Section 3.4).

One-off adjustments only have to be made if the battery type is changed (lead-acid or lead-gel), during initial start-up or when retrofitting accessories (see Section 3.2 and the installation instructions for the EBL 29).

Overvoltage protection OVP

The EBL 29 with OVP electroblok is suitable for all applications in which the risk of overvoltage is particularly high. For example, lightning strikes on the national grid, generator operation and poor electronic installations at camping sites.

For this, an overvoltage protection unit is fitted in the electroblok between the mains connection and the charge module. In the event of over or under-voltage, this overvoltage protector isolates the electroblok from the 230V supply within just a few milliseconds. It remains cut off until the main voltage has normal values again.

3.1 Starting up the system



▲ ATTENTION!

Incorrect electroblok settings.

Damage to connected devices. Therefore prior to starting:

- Ensure the leisure area battery is connected.
- Ensure that the battery selector switch (Fig. 3, Pos. 10) is set to the correct position for the battery installed.
- ▶ Move the battery cut-off switch (see Fig. 3, Pos. 12) to the "Battery ON" position.
- ▶ Use the main 12V switch (see instruction manual of relevant control and switch panel) to switch on/off all the consumers and the control and switch panel.

The following outputs are exceptions:

- Floor light/step
- Heater
- Frost protection valve
- AES/compressor refrigerator
- Spare 4A
- Spare 4B

These outputs are not disabled via the main switch of the IT ... /LT control and display panel.

Please refer to the operating instructions of the IT ... /LT... control and switch panel for further information. .

3.2 Changing the battery



▲ ATTENTION!

Use of incorrect battery types or incorrectly rated batteries.
Damage to the battery or devices connected to the electroblock:

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



- ▲ Normally only batteries of the same type and capacity should be used, i.e. the same as those installed by the manufacturer.
- ▲ Lead-acid batteries can be swapped with lead-gel or AGM batteries. However, swapping from lead-gel or AGM batteries to lead-acid batteries is only possible in certain circumstances. Contact the vehicle manufacturer for more information.

Changing the battery

- ▶ Electrically isolate the battery from the electroblock. For this, switch off the battery separation switch on the EBL 29 electroblock (refer also to Section 3.4).
- ▶ Replace the 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:

- Move the battery selector switch to the correct position.
- ▶ Disconnect the electroblock from the mains before adjusting the battery selector switch.

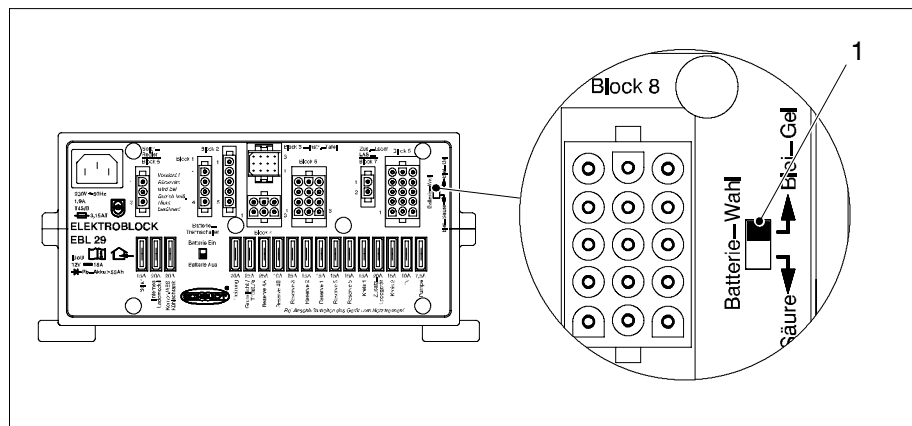


Fig. 1 Battery selector switch

- ▶ Move the battery selector switch (Fig. 1, Pos. 1) to the correct position using a thin object (e.g. a ballpoint pen):
 - Lead gel battery: Move the battery selector switch to "Lead-gel".
 - Lead-acid battery: Move the battery selector switch to "Lead-acid".
 - AGM battery: Schaudt GmbH recommends charging AGM batteries with their chargers in switch position "Lead-gel battery".

AGM batteries

We believe that AGM batteries can be charged perfectly this way. However, suitability must be checked using information from the battery supplier and the charging parameters of Schaudt equipment. The charging parameters are specified in the operating and installation instructions.

Starting up the system

- ▶ Start up the system as described in Section 3.1.

3.3 Faults

Flat vehicle fuses

A flat battery or defective fuse is the cause of most faults in the power supply system.

Discharged battery - start motor

If the battery is discharged, consumers can always be powered by starting the engine of the base vehicle.

Please contact our customer service team if you cannot rectify the fault using the following table.

If this is not possible, e.g. if you are abroad, you can have the electrobloc repaired at a specialist workshop. In this case you must ensure that the warranty is not invalidated by incorrect repairs being carried out. Schaudt GmbH accepts no liability for damage resulting from such repairs.

Fault	Possible cause	Remedy
Living area battery is not charged during 230V operation (battery voltage constantly below 13.3 V)	No mains voltage	Switch on the automatic circuit breaker in the vehicle; check the mains voltage
	Too many consumers are switched on	Switch off any consumers not required
	Defective electrobloc	Contact customer service
Living area battery is overcharged during 230V operation (battery voltage constantly above 14.5 V)	Defective electrobloc	Contact customer service
Starter battery is not charged during 230V operation (battery voltage constantly below 13.0 V)	No mains voltage	Switch on the automatic circuit breaker in the vehicle; check the mains voltage
	Too many consumers are switched on	Switch off any consumers not required
	Defective electrobloc	Contact customer service
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 the fuse and cabling
	Defective electrobloc	Contact customer service
The living area battery is overcharged during mobile operation (battery voltage constantly above 14.3 V)	Defective alternator	Check the alternator

Fault	Possible cause	Remedy
The refrigerator does not work during mobile operation	No power supply to the refrigerator	Check the fuse (20A of the supply; possibly 2A of the D+ signal) and cabling
	Defective electrobloc	Contact customer service
	Defective refrigerator	Check the refrigerator
Solar charging does not work	Solar charge regulator not plugged in	Plug in solar charge regulator
	Defective fuse or cabling	Check fuse and cabling
	Solar charge regulator defective	Check solar charge regulator
12V supply does not work in the living area	12V main switch for the living area battery is switched off	12V main switch for the living area battery must be switched on
	Not all plugs or fuses are plugged into the electrobloc	Plug in all connectors and fuses (correct ratings!) to the electrobloc
	Defective fuse or cabling	Check fuse and cabling
	Defective electrobloc	Contact customer service



- ▲ The charging current is reduced automatically if the device becomes too hot due to excessive ambient temperature or lack of ventilation. Always prevent the device from overheating nevertheless.
- ▲ If the automatic shutdown mechanism of the battery monitor is triggered, fully charge the living area battery.

3.4 Closing down the system

The battery is isolated by switching off the battery cut-off switch.



▲ ATTENTION!

Total discharge.

Damage to the living area battery:

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

Closing down

Disconnect the living area battery from the 12V power supply if the motor-home is not used for a longer period (during the winter for example).

- ▶ Fully charge the living area battery before closing down the system.
- ▶ Switch off from the main switch of the IT ... /LT... control and switch panel.
- ▶ Move the battery cut-off switch (see Fig. 3, Pos. 12) to the "Battery OFF" position. The following connections are isolated from the living area battery:
 - All 12V consumers
 - Frost protection valve

- Control and switch panel

The living area battery is then protected against total discharge. This only applies if the battery is intact. Follow the battery manufacturer's instructions.



- ▲ If the living area battery is isolated from the electroblok with the battery cut-off, the frost protection valve of the combination heater opens. A loss of water is possible (see the operating instructions for the combination heater).

4 Application and functions in detail

The EBL 29 electroblok is the central power supply unit for all 12V consumers in the vehicle's electrical system. It is usually located in a cupboard or storage area and is accessible from the front in order to change fuses.

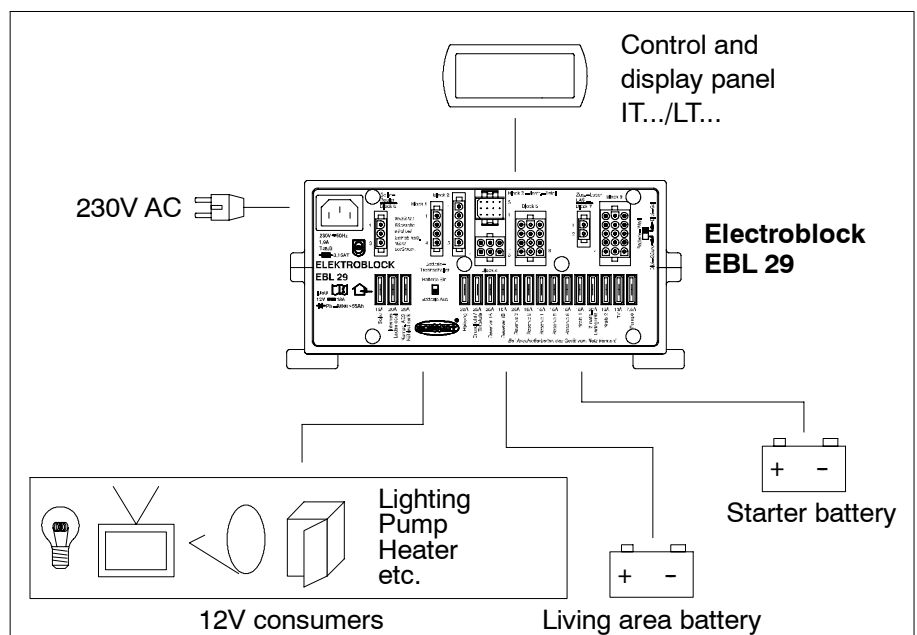


Fig. 2 On-board power supply system

Modules The EBL 29 electroblok contains:

- a charge module for charging all connected batteries
- the entire 12V distribution unit
- fusing for the 12V circuits
- a battery monitoring module
- control and monitoring functions

System devices An IT ... or LT ... control and switch panel must be connected for operation. These devices control the electrical functions in the vehicle's living area, including accessories.

There is also an option to connect an additional charger and a solar loading regulator.

Flat vehicle fuses protect the different circuits. The D+ output is an exception.

- Protective circuits of the charging module**
 - Excess temperature
 - Overload
 - Short circuit
- Mains connection** 230V AC \pm 10%, 47 to 63 Hz sinusoidal, protection class I
- Current-carrying capacity** 12V outputs may be loaded with max. 90% of the rated current of the respective fuse (also see front panel).

4.1 Battery functions

- Suitable batteries** 6-cell lead-acid, lead-gel or AGM batteries, 55 Ah and above
- Battery charging whilst moving** 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 is isolated with the battery cut-off switch.

This prevents the living area battery from slowly discharging due to closed circuit current while the vehicle is not in use.

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

- Standby current from Living area battery (without consumer currents)** With control and switch panel: approx. 5 - 20mA (depending on the control and switch panel used) under the following conditions:
 - No mains connection
 - Living area battery voltage 12.6V
 - 12V main switch "OFF"

Battery charging via mains connector	Living area battery	
	Characteristic charging curve	IUoU
	End of charge voltage	14.3V
	Charging current	18A
	Voltage for float charge	13.8V with automatic switch function

Starter battery	
Charging current float charge	max. 6 A

- Automatic disconnecter** The battery monitor compares the current of the living area battery with a reference current. As soon as the battery current drops below 10.5V, all 12V consumers are switched off via main switch relays 1 and 2.

Only the frost protection valve continues to be powered.

The automatic disconnecter is not triggered by short-term low voltage (shorter than 2 seconds), caused by high current when switching on consumers. If an overload or an insufficiently charged living area battery causes the voltage to fall so low that the automatic disconnecter is triggered, any non-essential consumers should be switched off.

If need be, the 12V supply can begin operation for a short time. For this, switch on the 12V main switch on the control and switch panel.

However, if the battery current remains below 11.0V, the 12V supply can not be switched on again. Fully charge the living area battery as soon as possible. For more information, see the description of "battery voltages".

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 refrigerator is powered by the living area battery when the vehicle engine is not running.

Mains charging of the starter battery

This feature provides an automatic max. 6 A float charge for the starter battery when the 230V mains is connected to the electrobloc.

Overvoltage protection for the EBL 29 with OVP

The electrobloc is isolated from the mains within 10ms in the event of a voltage greater than 265 V ~ eff. The electrobloc switches itself back on again by itself after the mains voltage has attained the normal value.

5 Maintenance

The EBL 29 electrobloc requires no maintenance.

Cleaning

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

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Appendix

A EG-conformity declaration

Schaudt GmbH hereby confirms that the design of EBL 29 electroblock complies with the following relevant regulations:

- DIRECTIVE 2006/95/EC OF THE EUROPEAN PARLIAMENT AND COUNCIL from 12.12.2006 for the harmonization of 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 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 (EMVG) from February 26th 2008

The original EC conformity declaration is available for reference and can be viewed at any time.

Manufacturer Schaudt GmbH, Elektrotechnik & Apparatebau

Address Planckstraße 8
88677 Markdorf
Germany

B Special fittings/accessories

Switch panel Schaudt IT ... / LT ... switch panel (required for operation)

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

Solar charge regulator Schaudt Solar charge regulator type LR ... for solar modules with a total current of 14A with 3-pole connection plug and connection cable

C Customer service

Customer service address Schaudt GmbH, Elektrotechnik & Apparatebau
Planckstraße 8
D-88677 Markdorf

Phone: +49 7544 9577-16 Email: kundendienst@schaudt-gmbh.de

Web: www.schaudt-gmbh.de

Send in device Returning a faulty device:

- ▶ Complete and enclose the fault report, see Appendix D.
- ▶ Send it to the addressee delivered free.

D Fault report

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

Device type: _____
Item 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 Design

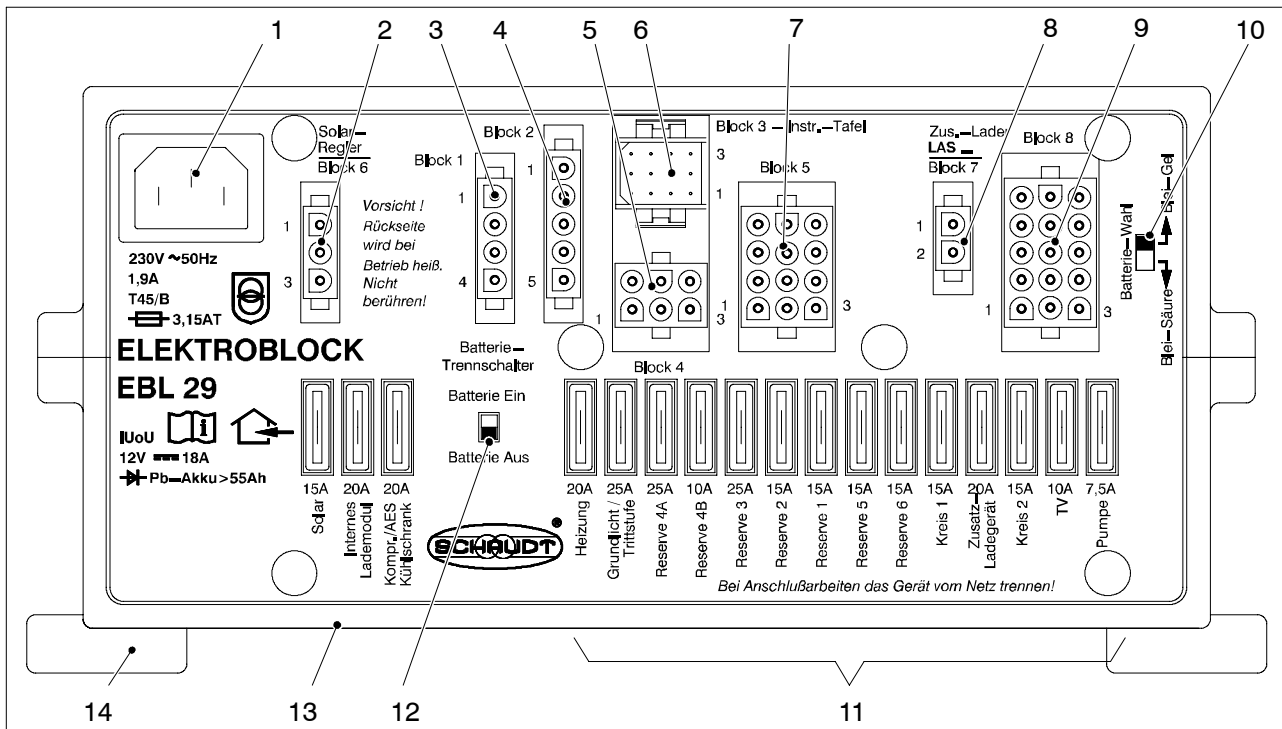


Fig. 3 Layout of the EBL 29 electroblock (front)

- | | |
|---|--|
| 1 Mains connector | 7 Connection block spare 2, 3, 4A, 4B |
| 2 Connection block, solar regulator | 8 Connection block, additional charger |
| 3 Connection block, refrigerator | 9 Connection block, TV, pump, consumers, spare 1, 5, 6 |
| 4 Connection block, refrigerator supply D+, battery sensor/control lines | 10 Selector switch for acid/gel/AGM battery |
| 5 Connection block, frost protection valve, heating and floor light/steps | 11 Flat vehicle fuses |
| 6 Connection, IT ... / LT ... control and switch panel | 12 Battery cut-off switch |
| | 13 Housing |
| | 14 Assembly flaps |

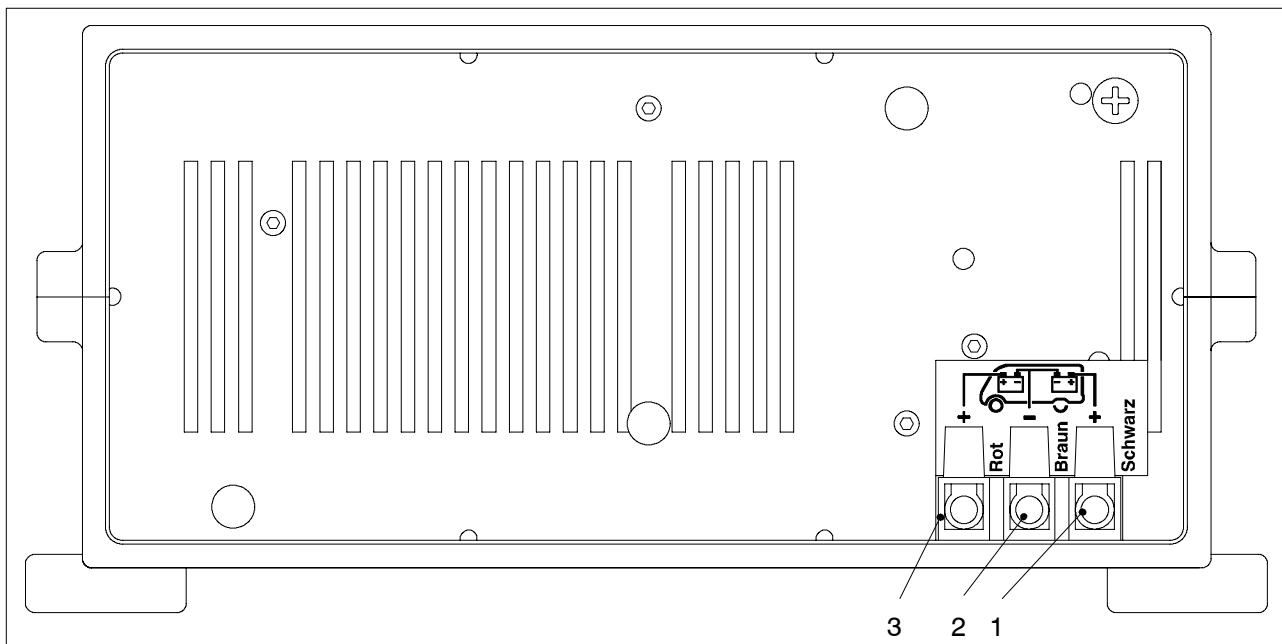
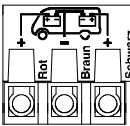


Fig. 4 Layout of the EBL 29 electroblock (rear)

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

F Connector assignment

Block	Pin	Signal	Use	Fuse	Colour code	Comment
5	9	+	Spare 4B	10 A	Red	
	12	-				
	1	+	Spare 4A	max. 25 A	White	
	4	+				
	5	-				
	10	-				
	2	+	Spare 3	max. 25 A	White	
	3	+				
	7	-				
	8	-	Spare 2	max. 15 A	blue	
6	+					
11	-					
6	3	WB	Solar charging, living area battery	15 A	blue	
	2	SB	Solar charging, starter battery	-	-	
	1	-	Negative, solar charger	-	-	
4	4	+	Frost protection valve	-	-	
	1	+	Heater	20 A	Yellow	
	5	-				
	2	+	Floor light	25 A	White	
	3	+	Step			
6	-	Floor light/step				
7	2	+	Auxiliary charger	20 A	Yellow	
	1	-				
Screw-type terminal, rear		+ Red	Positive, starter battery	50 A	Red	External fuse (maxi fuse)
		- Brown	Negative, living area battery	-	-	The - terminal of the living area bat. must be conn. externally to the - terminal of the starter bat.
		+ Black	Positive, living area battery	50 A	Red	External fuse (maxi fuse)
3	6		Mains indicator			
	4		Shunt battery	Polyswitch 2.5 A	-	Internal
	1		Shunt consumer	Polyswitch 2.5 A	-	Internal
	9		12V ON			
	12		12V OFF			
	5		12V indicator	Polyswitch 2.5 A	-	Internal
	2		Negative living area bat. sensor			
	11		+ Living area battery sensor			
	8		+ Starter battery	Polyswitch 2.5 A	-	Internal
	3		Not assigned			
2	5	+	Living area battery sensor	2 A	Grey	External fuse
	2	-		-	-	
	1	+	Starter battery for refrigerator	20 A	Yellow	External fuse
	3	D+	Engine running	2 A	Grey	External fuse
1	4	-	Starter battery for refrigerator			
	4	+	Compressor/AES refrigerator	-	-	
	1	+	Absorber refrigerator	-	-	
	2	D+	Output D+	-	-	
8	3	-	Refrigerator			
	6	+	TV	10 A	Red	
	12	-				
	9	+	Pump	7.5 A	brown	
	14	-				
	2	+	Circuit 1	15 A	blue	
	8	-				
	3	+	Circuit 2	15 A	blue	
	10	-				
	7	+	Spare 1	max. 15 A	blue	
	13	-				
	4	+	Spare 5	max. 15 A	blue	
	11	-				
1	+	Spare 6	max. 15 A	blue		
5	-					
15	n. a.				-	

G Block diagram/wiring diagram

