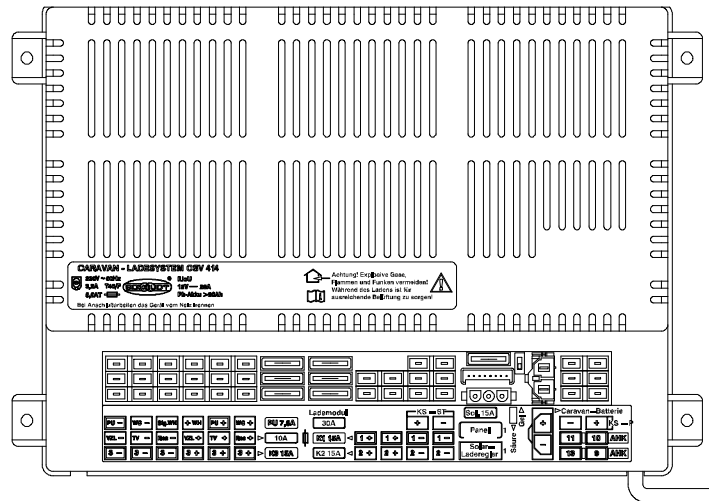


# Instruction Manual



## Caravan Charging System CSV 414

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

## 2 Safety information

### 2.1 Meaning of the 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.



#### **CAUTION!**

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



This symbol references recommendations or special features.

### 2.2 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 persons 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:

- The motorhome or caravan's electrical system must comply with DIN, VDE and ISO regulations.
- Never try to modify the electrical system.
- Do not try to modify the device.
- Only qualified electricians are permitted to make the electrical connections in accordance with the installation instructions supplied by Schaudt.
- Connection work may only be carried out after the power has been disconnected.
- Never try to start the device using a defective mains cable or a faulty connection.
- Never undertake maintenance on the device when it is live.



#### **DANGER !**

Incorrect installation

Electric shock or damage to connected devices:

- Install as shown in installation instructions.
- The mains connection line may only be replaced by an authorised customer service department or by those qualified.



### WARNING!

Hot components

Burns:

- Blown fuses may only be changed after the power to the system has been disconnected
- Blown fuses may only be replaced once the cause of the fault is known and has been rectified
- Never bypass or repair fuses
- The back of the device can get hot during operation. Do not touch them.
- Only use original fuses rated as specified on the device
- Never store heat sensitive objects close to the device (e.g. temperature sensitive clothes if the device has been installed in a wardrobe)

## 3 Operation



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

This device is intended for installation into a vehicle.



The caravan charging system is operated solely from the control and switch panel connected.

The CSV 414 caravan charging system does not require daily operation.

Initial setting is only needed after the type of battery (lead-acid or lead-gel) has been changed or during commissioning or when upgrading with accessories (see Section 3.3 and CSV 414 installation instructions).

### 3.1 Starting up the caravan charging system

#### Battery



#### CAUTION!

An incorrect setting on the caravan charging system will result in damage to the battery connected. Ensure therefore that prior to start-up the battery selector switch (Fig. 3, Pos. 10) is in the correct position for the battery installed.

#### Generator operation and passenger vehicle ferries



#### CAUTION!

The caravan charging system, 12V consumers and connected devices can be damaged if the thresholds for the 230V supply are exceeded. So therefore:

- Do not connect a generator until it is running smoothly.
- It is essential that the generator conforms to the specifications of the mains supply.
- Do not connect the caravan charging system to the onboard mains voltage on car ferries (non-problematic mains voltage cannot always be guaranteed on car ferries). The use of an upstream overvoltage protection device is recommended.

## Operation with solar regulator



### CAUTION!

When connecting a solar regulator, note that the buffer function of the battery is an absolute requirement, i.e. the battery must be connected before a solar regulator is connected.

## Operation on towing vehicle



### CAUTION!

Switch off the ignition when the towing vehicle is parked (when the caravan is connected to the towing vehicle). Otherwise the starter battery of the towing vehicle will discharge.

## 3.2 Switching on and off

Control and switch panels of type LT ... are supplied with a separate operating manual (kept with the vehicle). Please refer to this manual for instructions on operation.

Activating the 12V main switch (12V ON) on the operating panel connected enables/disables the following electrical circuits:

Pos.	Circuit	Fuse with
1	Pump/WC	7.5 A, connected via switch input Signal Tap
2	WC/Pump	7A with Polyswitch (self-healing fuse)
3	Circuit 1	15 A
4	Circuit 2	15 A
5	Circuit 3	15 A
6	Awning light	10 A
7	TV	
8	Spare	

## 3.3 Changing the battery



### CAUTION!

The use of incorrect battery types or incorrectly designed batteries can damage the battery itself or devices connected to the caravan charging system. So therefore:

- Batteries may only be changed by qualified personnel.
- Follow the battery manufacturer's instructions.
- The caravan charging system is to be used solely for connecting the 12 V power supply to 6-cell lead-gel or lead-acid batteries. Never use non-approved battery types such as NiMH batteries.



Normally only batteries of the same type and capacity should be used, i.e. the 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

Proceed as follows for a battery change:

- Disconnect the battery from the caravan charging system by switching the main 12 V switch off.
- Disconnect the caravan charging system from the 230 V supply.
- Unhitch the caravan from the towing vehicle.
- Replace the battery.
- After changing the battery, recheck which type of battery has been inserted.



### DANGER !

Incorrectly setting the battery selector switch poses a risk of explosion (by the formation of detonating gas). Move the battery selector switch to the correct position.

- Move the battery selector switch (Fig. 3, Pos. 10) to the correct position using a thin object (e.g. 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

- Start up the system as described in Section 3.1.

## 4 Application and function

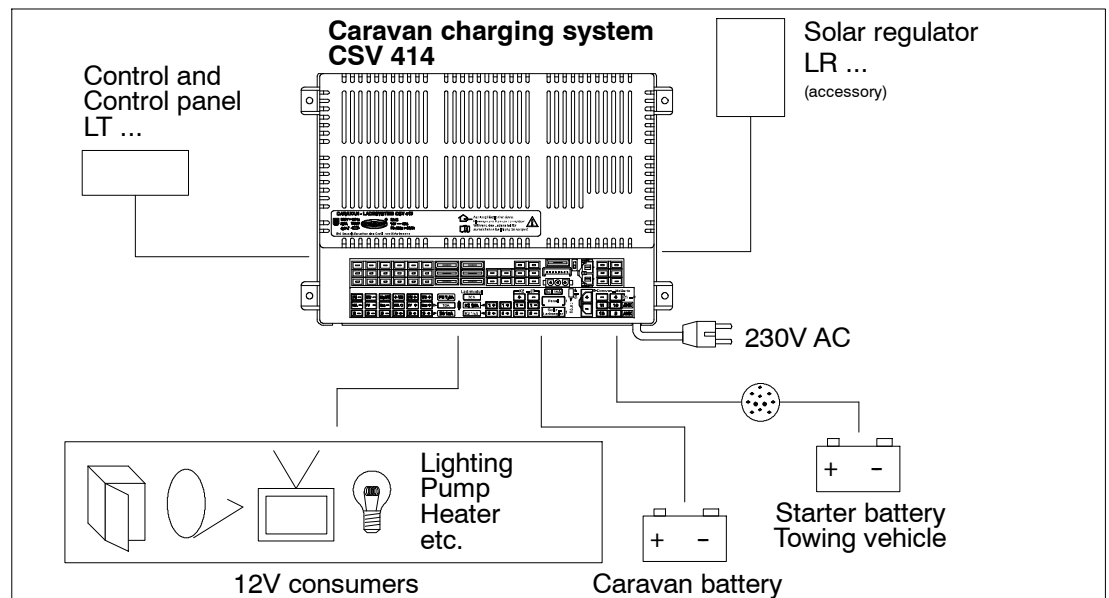


Fig. 1 On-board power supply system

The CSV 414 caravan charging system is the central power supply unit for all 12 V consumers connected to the caravan's electrical system. It is usually located in a cupboard or storage area and is accessible from the front in order to change fuses.

The caravan charging system has been designed solely for connecting to a 12 V onboard supply.

Connected units can be supplied from the caravan battery or the towing vehicle's battery if a mains supply is not available.

Because the device provides a hum-free, stabilised output voltage, sensitive consumers such as transistor lights and radios can be connected and powered.

## Operating manual for caravan charging system CSV 414

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- Modules** The CSV 414 caravan charging system consists of:
- a charge module for charging all batteries connected
  - a main switch relay to switch certain consumers on and off
  - the complete 12V distribution system
  - fuses for the 12V circuits
  - a battery booster

**Actuation** A control panel (such as a LT 4XX) is connected for operation.

Connections provided for:

- Operator and control panel
- Solar charge regulator (optional)

Flat vehicle fuses protect the various circuits.

- Protective circuits**
- Excess temperature
  - Overload
  - Short circuit

**Mains** 230V AC  $\pm 10\%$ , 47 - 63 Hz sinusoidal, protection class I

**Current** 12V outputs may only be loaded up to a maximum of 90% of the rated current of the associated fuse (see block diagram or nameplate).

All consumers together may not exceed the following load:

- Mains operation: 28 A
- Operation with towing vehicle, ignition ON: 8 A

### 4.1 Battery functions

**Batteries** 6-cell lead acid or lead gel batteries, 80 Ah and above

**Battery charging when vehicle is moving** Charging the caravan battery whilst driving; increasing the supply voltage coming from the towing vehicle via the battery booster

Maximum charging current	8 A
--------------------------	-----

<b>Battery charging with mains connector</b>	<b>Caravan battery</b>	
	Characteristic charging curve	IUoU
	End of charge voltage	14.3V
	Charging current	28 A
	Voltage for float charge	13.8V with automatic switch function

**12V main switch** The main 12V switch on the operator and control panel connected isolates certain 12V consumers from the caravan battery (see also Page 4).

This prevents the caravan battery from being slowly discharged by standby currents.

The batteries can continue to be charged by the caravan charging system, the towing vehicle or the solar charge regulator (if available), even when the main battery switch is OFF.

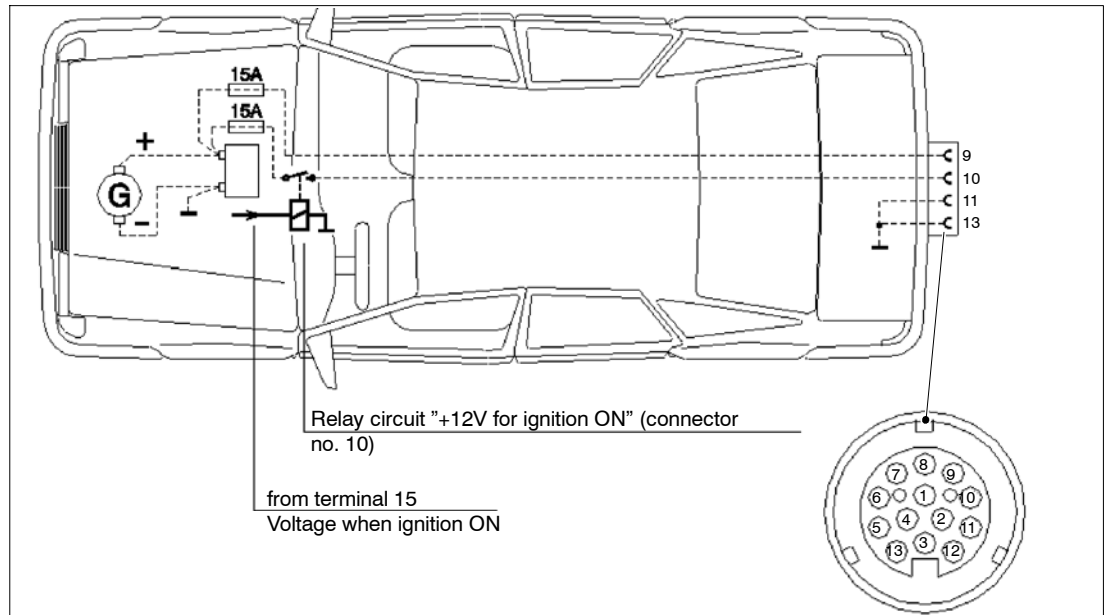


Fig. 2 Connector for towing vehicle power socket



For the "Automatic shutoff" and "Towing vehicle battery standby current" functions to be guaranteed in line with the following specifications, both the 13-pin connector of the caravan, and the socket of the towing vehicle must be assigned as per EN 1648-1 (see Fig. 2).

**Autom. switch-off**

Consumers are switched off (with the exception of these with a continual supply, see Page 4) when the caravan is hitched to the towing vehicle and the ignition is switched on (power on terminal 10 of trailer hitch TH). Consumers can be switched on again at any time (the automatic disconnecter does not prevent this).

**Towing vehicle-battery standby current**

No standby current when the towing vehicle ignition is OFF, plus power consumption of control electronics of refrigerator (see documentation from refrigerator manufacturer and other consumers with a continual supply, see Page 4); measurement taken when all consumers in the caravan are switched off.

## 4.2 Additional functions

**Refrigerator controller**

This output supplies the control electronics of a fridge:

- From the caravan battery
- From the towing vehicle's battery when the ignition is switched on
- From the mains supply when it is connected up



The refrigerator only operates on 12 V when the caravan is hitched to the towing vehicle and the ignition is switched on.

**CAUTION!**

The caravan / towing vehicle battery is damaged beyond repair by a total discharge. So therefore:

- Avoid continuous 12V operation.  
The refrigerator only operates on 12V when the caravan is hitched to the towing vehicle and its ignition is ON.



**Water pump**

The water pump is connected directly to the CSV 414 (output Pump/WC). The supply voltage to the pump is enabled from the Pump switch on the operator and control panel. The pump is switched on when a control voltage of 12V is applied to input "Water Tap Signal" (via a switch in the water tap). The other output (WC/Pump) is provided parallel.

# Operating manual for caravan charging system CSV 414

**Battery charging with solar charging regulator** Maximum permitted charge current 14 A, protected with 15 A

## 5 Layout

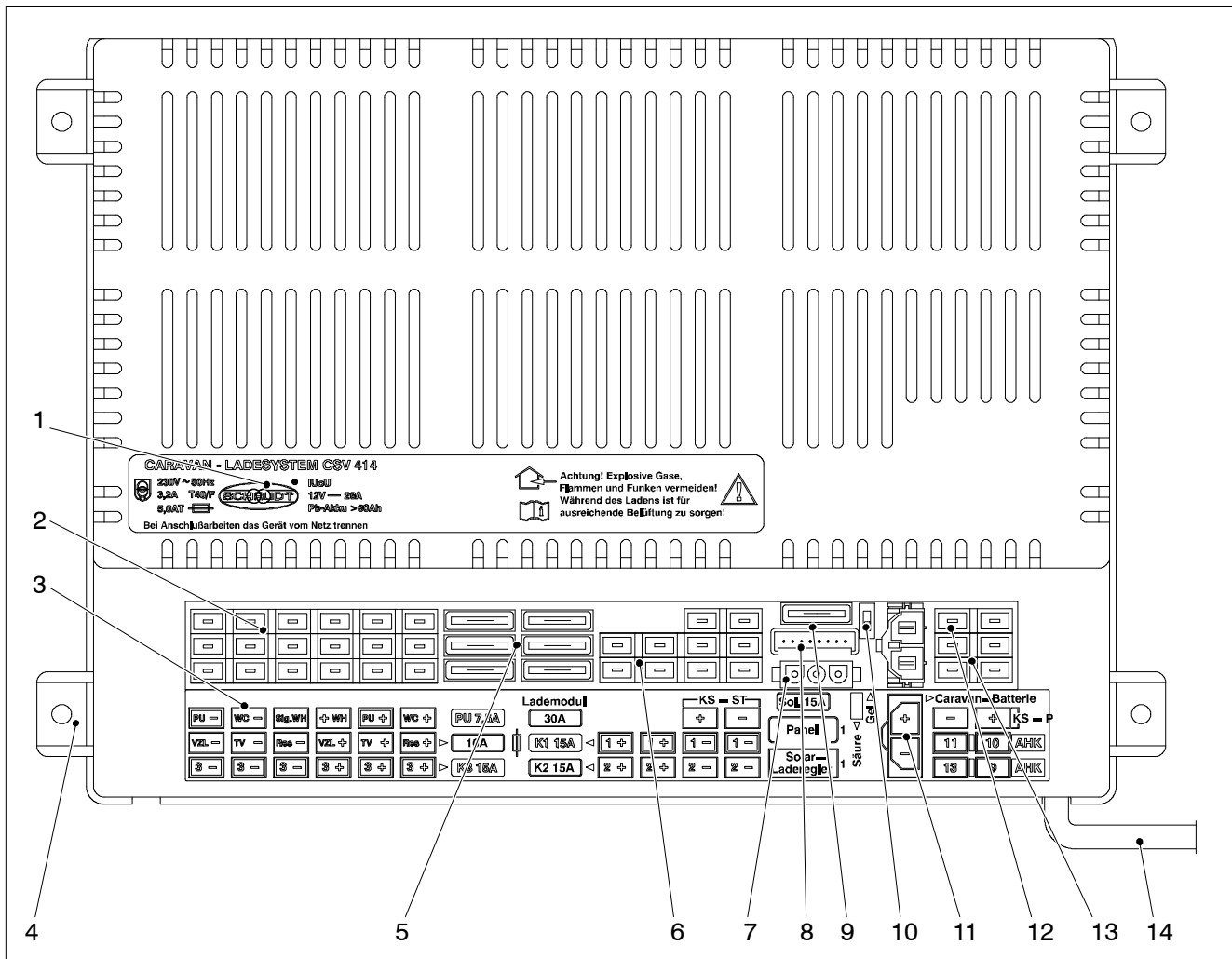


Fig. 3 Front view of CSV 414 caravan charging system

- |   |   |
|---|---|
| 1 Adhesive label for details                          | 8 Operator and control panel                      |
| 2 Connectors for consumers/pump/water taps            | 9 Flat vehicle fuse LR ...                        |
| 3 Adhesive label for functions                        | 10 Selector switch for lead-gel/lead-acid battery |
| 4 Housing   | 11 Connector for caravan battery                  |
| 5 Flat vehicle fuses                                  | 12 Connector for refrigerator supply              |
| 6 Connectors for circuits 1 and 2 / fridge controller | 13 Trailer coupling connector plug                |
| 7 Connector for solar charge regulator LR ...         | 14 Mains cable                                    |



## 5.1 Faults

### Flat vehicle fuses

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

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 caravan charging system 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 will not accept any liability for damage resulting from such repairs.

Fault	Possible cause	Remedy
Caravan battery is not charged during 230 V operation	No mains voltage	Switch on the automatic circuit breaker in the vehicle; check the mains voltage
	Defective caravan charging system	Contact customer service
Caravan battery is not charged whilst driving	Defective alternator	Have the alternator checked
	No voltage applied to "Ignition ON" input or permanent plus	Have the fuse and cabling checked Check the towing vehicle plug connection
	Defective caravan charging system	Contact customer service
Solar charger is not working (mains supply off)	Solar charge regulator not plugged in	Plug in solar charge regulator
	Defective fuse or cabling	Have the fuse and cabling checked
	Solar charge regulator defective	Have solar charge regulator checked
12V supply does not work in the leisure area	12V main switch is switched off	12V main switch must be switched on
	Defective fuse or cabling	Have the fuse and cabling checked
	Defective caravan charging system	Contact customer service
Caravan charging system cannot be switched on from the control panel.	Defective caravan charging system	Contact customer service
	No supply voltage	Check the battery or mains connection
	Rocker switch is defective	Contact customer service
Pump does not switch on when a water tap is opened.	Pump supply not switched on from control panel	Switch on pump supply (see operating instructions for relevant control panel)
	Fuse blown	Replace the fuse
	Water tap switch or cabling for water tap defective	Contact customer service
	Pump supply not switched on from control panel	Switch on pump supply (see operating instructions for relevant control panel)



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.

## 5.2 Shutting down the system

- Switch off the main 12V switch on the control panel connected.

## 5.3 Closing down the system



### CAUTION!

Total discharge causes damage to the caravan battery. So therefore:

- Fully charge the caravan 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 24 and 36 hours respectively.



### CAUTION!

Connected consumers can be damaged on exceeding the input voltages permitted. So therefore:

- Do not operate any connected Schaudt LR ... solar charge regulator without battery.
- When the battery is replaced or removed, unplug the "Caravan battery" connector on the CSV 414 beforehand (or unplug the "+ Solar cell" connector on the solar charge regulator).

**Closing down the system for up to 6 months**

- Fully charge the caravan battery before closing down the system.

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

**Closing down the system for more than 6 months**

- Fully charge the caravan battery before closing down the system.
- Unplug the "Solar charge regulator" connector on the CSV 414 (or unplug the "+ Solar cell" connector on the solar charge regulator).
- Unplug the "Caravan battery" connector on the CSV 414 (or remove the clamps from the battery terminals).

## 6 Maintenance

The CSV 414 caravan charging system requires no maintenance.

Clean the caravan charging system using a soft, slightly damp cloth and mild detergent. Never use spirit, thinners or similar substances. Do not allow fluid to ingress the caravan charging system.

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## Appendix

### A EC Declaration of Conformity

Schaudt GmbH hereby confirms that the design of the CSV 414 caravan charging system complies with the following relevant regulations:

The original EC declaration of conformity is available for reference at any time.

**Manufacturer** Schaudt GmbH, Elektrotechnik & Apparatebau  
Planckstraße 8  
88677 Markdorf  
Germany

### B Special fittings/accessories

**Solar-charge regulator** Schaudt solar charger LR ... model for solar modules with a total current of 14A, including 0.5 m connection cable and connector plug

### 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](http://www.schaudt-gmbh.de)

**Send in device** Returning a faulty device:

- Always use well-padded packaging.
- Complete and enclose the fault report, see Appendix D.
- Send it to the addressee (free delivery).

## D 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:

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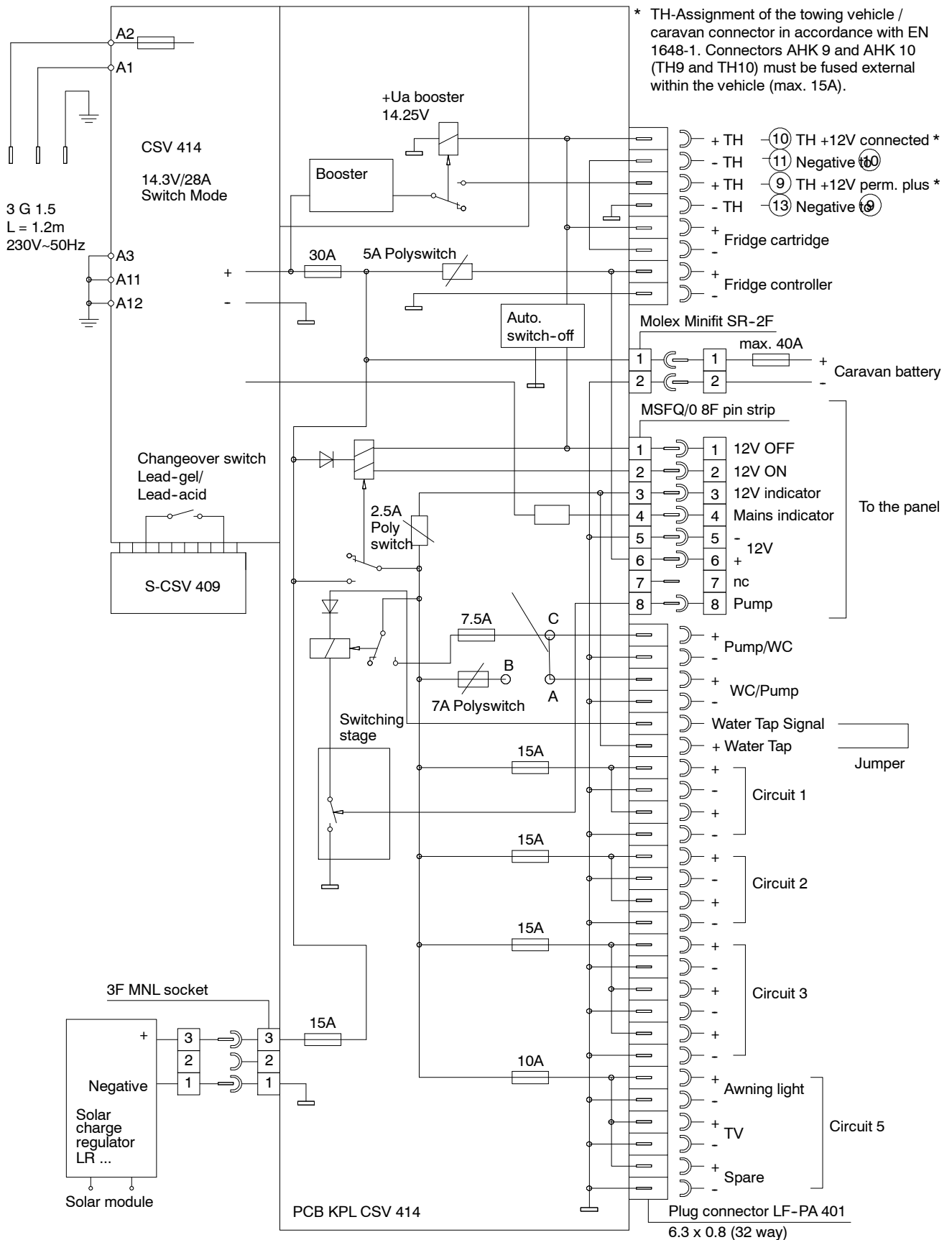
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## E Block diagram/wiring diagram



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