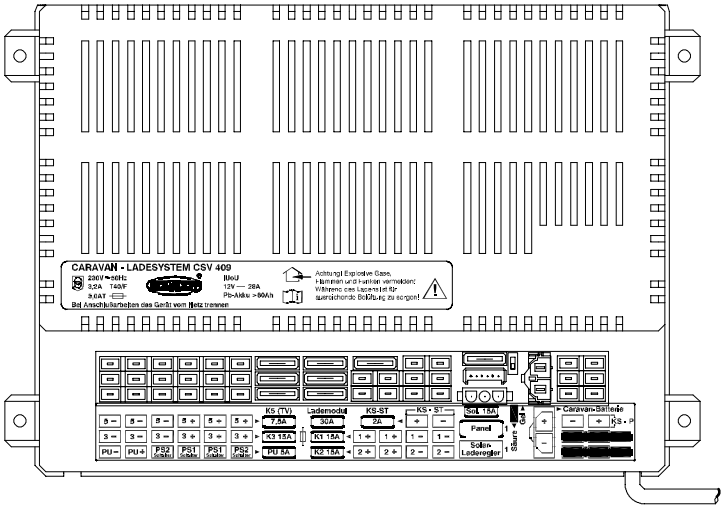
Instruction manual



CSV 409 A caravan charging system

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1 Introduction

This instruction manual contains important information for the safe operation of equipment supplied by Schaudt. It is imperative that you read and follow this safety information.

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 Significance of the warning signs

▲ DANGER!
Failure to comply with this sign may result in danger to life and limb.

▲ WARNING!
Failure to comply with this sign may result in somebody being injured.

▲ ATTENTION!
Failure to comply with this sign may damage the device or the connected consumers.

▲ This sign indicates recommendations or special features.

2.2 General safety instructions

The design of the device is state-of-the-art and complies with the approved safety technology. Nevertheless, somebody might be injured or the device might be damaged if you do not abide by the safety information given in this instruction manual.

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

Any technical faults affecting the personal safety or the device must be dealt with immediately by qualified personnel.

▲ DANGER!
230 V unit 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.
- Never try to modify the device.
- Only qualified electricians are permitted to make the electrical connections in accordance with the installation instructions supplied by Schaudt.
- The connection work must only be undertaken 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!
Electrical shock or damage to the connected device:

- The device must be installed in accordance with the installation instructions.
- The mains connection line may only be replaced by an authorised customer service department or by qualified persons.

▲ 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 when the cause of the fault is known and eliminated.
- Never bypass or repair fuses.
- The back of the device can get hot during operation. Do not touch.
- 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 Application and function

▲ 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 in a vehicle.

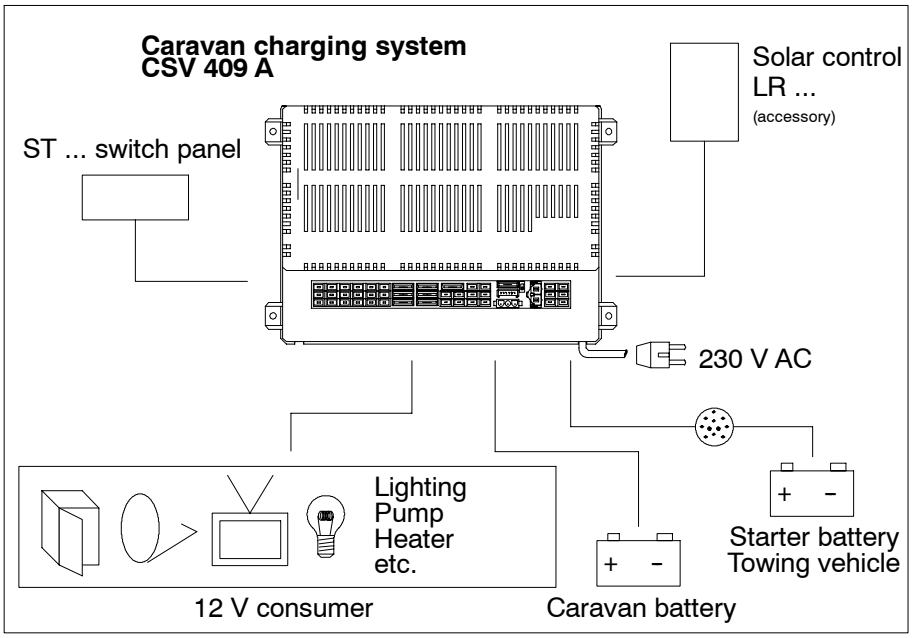

Fig. 1 Onboard power supply system

The CSV 409 A caravan charging system is the central power supply unit for all 12 V consumers connected to the caravan's electrical system. It is normally fitted inside a cabinet or a stowage space and can be accessed from the front to change a fuse.

The caravan charging system has been designed solely for connecting up 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.

Since the device provides a hum-free, stabilised output voltage, it is also possible to connect and supply power to sensitive consumers (e.g. transistor lamps or radios).

Modules

The CSV 409 A caravan charging system consists of:

- A charging module for recharging all of the connected batteries
- The complete 12 V distribution system
- The fuses for the 12 V power circuits
- A battery booster

Required control circuits

At least one switch panel ST ... has to be connected for operation.

Connection options are available for:

- Solar charger
- 12 V indicator
- Mains indicator
- 12 V supply to a control and display panel

Flat vehicle fuses are used to protect the various circuits.

Protective circuits

- Overtemperature
- Overload
- Short circuit

Mains connection

230 V AC voltage ±10 %, 47 – 63 Hz sinewave, protection class I

Current-carrying capacity

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

Maximum total current

All of the consumers must not exceed the following loads when combined:

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

3.1 Battery functions

Suitable batteries

6-cell lead-acid or lead-gel batteries from 80 Ah upwards

Battery charging whilst driving

Charging the caravan battery whilst driving; increasing the supply voltage coming from the towing vehicle via the battery booster

12 V main switch

The 12V main switch (rocker switch with neutral position on the control and switch panel) disconnects all 12V consumers from the caravan battery (except: the control electronics of a refrigerator).

This prevents the caravan battery from being slowly discharged by closed-circuit current.

The batteries can still be charged using the caravan charging system, the towing vehicle or the solar charger, even when the main battery-switch is switched off.

Battery selector switch

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

Automatic disconnector

The consumers are switched off (except for the refrigerator) when the caravan is hitched to the towing vehicle and the ignition is switched on (power at terminal 10 and trailer hitch TH). The consumers can be switched back on at any time. (The automatic disconnector does not prevent switching back on).

Closed-circuit current coming from towing vehicle battery

No closed circuit current when the ignition of the towing vehicle is switched off; additional current consumption by the fridge's control electronics (see documentation supplied by the fridge manufacturer);
measured when all of the consumers inside the caravan are switched off

Battery charging from mains connection

Caravan battery	
Charging curve	IUoU
Final charging voltage	14.3 V
Charging current	28 A
Trickle charge voltage	13.8 V with automatic switching

Battery charging from towing vehicle operation

Maximum charging current	8 A

3.2 Additional functions

Fridge controller

This output supplies the control electronics in 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

▲ 12V operation of the refrigerator only works if the caravan is connected to a towing vehicle with the engine running.

▲ ATTENTION!

Total discharge!

Damages the caravan battery/towing vehicle battery:

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

Battery charging via solar charger

Maximum permitted charging current 14 A, protected by a 15 A fuse

4 Design

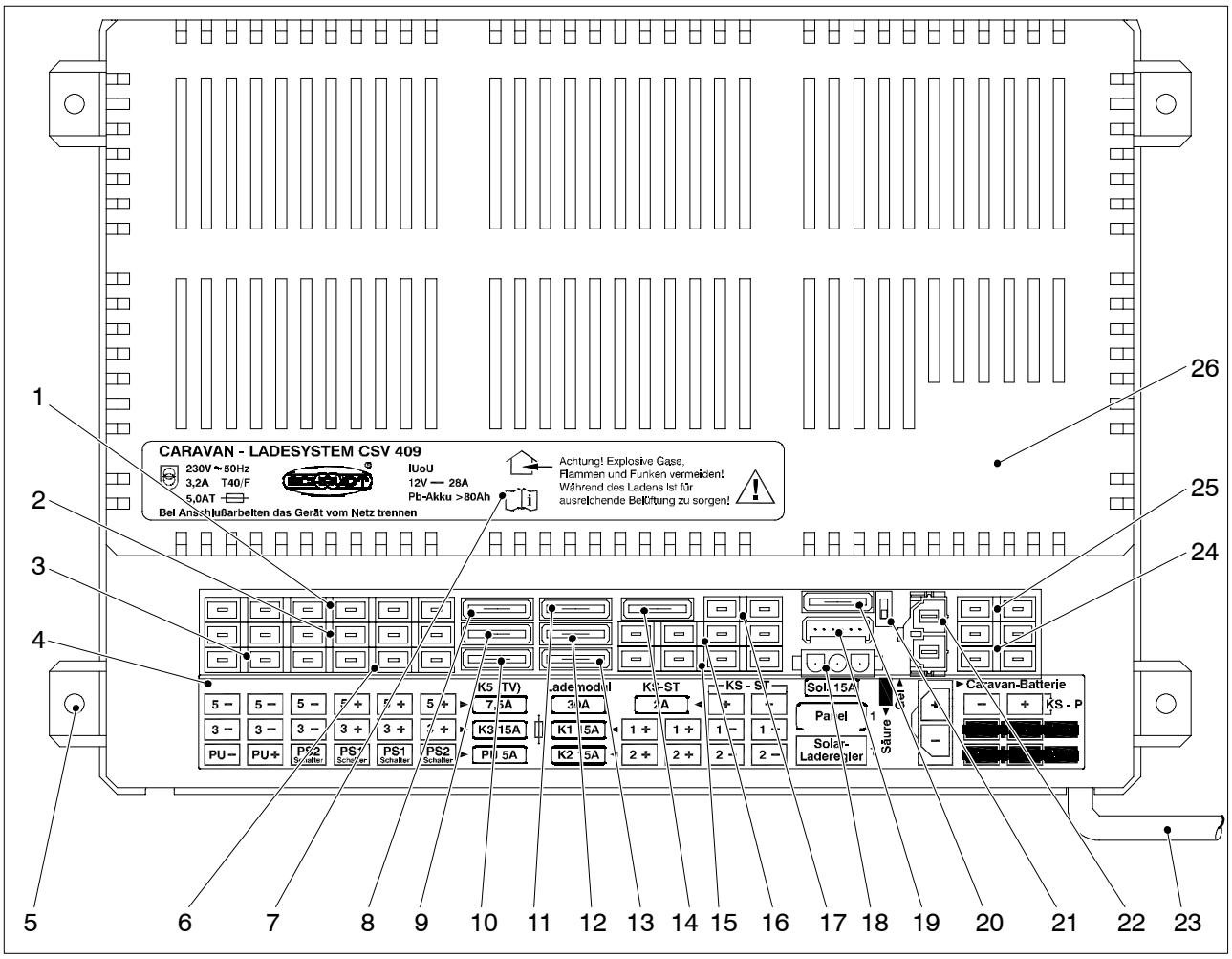

Fig. 2 CSV 409 A caravan charging system viewed from front

1 Circuit 5 connections
2 Circuit 3 connections
3 Pump connections
4 Adhesive label
5 Fixing lug with drilled hole
6 Switch 1 and 2 pump connections
7 Adhesive label
8 Circuit 5 flat vehicle fuse
9 Circuit 3 flat vehicle fuse
10 Flat vehicle fuse for pump
11 Flat vehicle fuse for charger module
12 Circuit 1 flat vehicle fuse
13 Circuit 2 flat vehicle fuse
14 Flat vehicle fuse for fridge controller
15 Circuit 2 connections
16 Circuit 1 connections
17 Fridge controller connection
18 LRS ... solar charger connection
19 Indicator and control connections
20 Solar flat fuse
21 Selector switch for selecting lead-gel/lead-acid battery
22 Caravan battery connection
23 Mains cable
24 Trailer hitch plug-in connection
25 Refrigerator supply connection
26 Housing

5 Operation

Operation of the caravan power supply occurs exclusively via the connected control and switch panel.

The CSV 409 A caravan charging system does not require daily operation.

Settings only have to be carried out once if the battery type is changed (lead-acid or lead-gel), during initial start-up or when retrofitting accessories (see chapter 5.3 and the CSV 409 A installation instructions).

5.1 Switching on and off

5.1.1 Control and switch panels of type LT ...

The control and switch panels of type LT ... are supplied with individual operating instructions included with the vehicle. Please refer to these instructions for operating information.

5.1.2 Switch panel ST 05

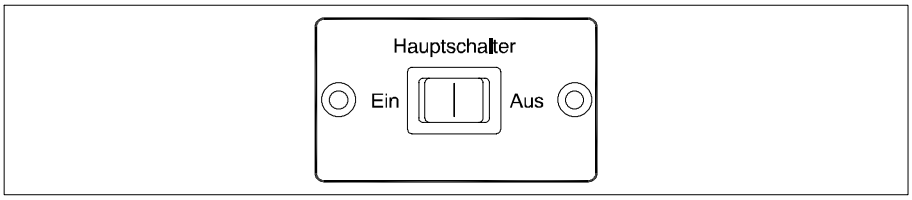

Fig. 3 Switch panel ST 05

In the simplest case, the switch panel ST 05 is connected to the caravan power supply. It simply has a rocker switch with neutral position.

The 12 V supply to the living area is switched on via the switch. Exception:

- Compressor/AES refrigerator control

▲ When starting these consumers for the first time after switching off the CSV 409 A caravan power supply, replacing the battery or reconnecting the leisure battery after a longer period, the 12 V main switch on the switch panel must be switched on briefly.

➤ Press the left-hand button briefly.

The 12 V power supply to the living area is switched on.

➤ Press the right-hand button briefly.

The 12 V power supply to the living area is switched off.

5.2 Starting the system

▲ ATTENTION!

Caravan charging system can be set up incorrectly!

The connected devices will be damaged. Therefore prior to starting:

- You must ensure that the battery selector switch (Fig. 2, Pos. 21) is set to the correct position for the type of battery being used.

12 V main switch

➤ Press the rocker switch so that it is briefly in the “ON” position.

The 12 V main switch switches all consumers on and off (exception: a fridge’s control electronics).

Generator operation and car ferries

▲ ATTENTION!

Violation of 230 V mains voltage limit!

Will damage the caravan charging system, 12 V consumers or other connected devices:

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

Solar charger operation

▲ ATTENTION!

Battery buffer function missing!

The connected devices will be damaged:

- Never run the solar charger without a battery being connected.

Towing vehicle operation

▲ ATTENTION!

Battery discharge!

Towing vehicle cannot be started:

- Switch off the ignition when the towing vehicle is at a standstill.

5.3 Changing the battery

▲ **ATTENTION!**

Wrong battery type or incorrectly connected battery!

Will damage the battery or the devices connected up to the caravan charging system:

- Batteries shall only be changed by qualified personnel.
- Follow the instructions of the battery manufacturer.
- 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 unapproved types of battery (e.g. NiMH batteries).

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

▲ You can change over from lead-acid to lead-gel batteries. You cannot change over from lead-gel to lead-acid batteries! Your vehicle manufacturer will provide you with information about this.

Changing the battery

➤ Disconnect the battery from the caravan charging system by switching the 12 V main switch off.

➤ Unhitch the caravan from the towing vehicle.

➤ Replace the battery.

➤ Check once more to ensure that you have fitted the correct type of battery afterwards.

▲ **DANGER!**

Battery selector switch set incorrectly!

Danger of explosion caused by the build up of oxyhydrogen gas.

- Set the battery selector switch to the correct position.

▲ **ATTENTION!**

Battery selector switch set incorrectly!

The battery will be damaged.

- Set the battery selector switch to the correct position.

➤ Disconnect the caravan charging system from the mains before resetting the battery selector switch.

➤ Move the battery selector switch (Fig. 2, Pos. 21) into the relevant position using a thin object (e. g. ball-point pen):

- Lead-gel battery: Set the battery selector switch to “Lead-gel” (Gel).
- Lead-acid battery: Set the battery selector switch to “Lead-acid” (Säure).

Starting up the system

➤ Start the system as instructed in Chapter 5.2.

5.4 Operating faults

Flat vehicle fuses

The majority of power supply system faults are caused by blown fuses.

Please contact our customer service address if you cannot eliminate 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 and Schaudt GmbH will not accept any liability for damage resulting from such repairs.

Fault	Possible causes	Remedy
Caravan battery is not charged during 230 V operation	No mains voltage	Switch the cut-out in the vehicle back on; check the mains voltage
	Defective caravan charging system	Call customer service
Caravan battery is not charged whilst driving	Defective alternator	Have the alternator checked
	No voltage supplied to “Ignition ON” input or permanent plus	Have the fuse and wiring checked
		Check the towing vehicle plug connection
	Defective caravan charging system	Call customer service
Solar charger is not working (mains supply off)	Solar charger not plugged in	Plug the solar charger in
	Defective fuse or wiring	Have the fuse and wiring checked
	Defective solar charger	Have the solar charger checked
12 V power supply in the living area does not work	12 V main switch is switched off	12 V main switch must be switched on
	Defective fuse or wiring	Have the fuse and wiring checked
	Defective caravan charging system	Call customer service
Caravan charging system cannot be switched on using the rocker switch	Defective caravan charging system	Call customer service
	No voltage supply	Check the battery or mains connection
	Defective rocker switch	Call customer service

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

5.5 Shutting down the system

➤ Press the rocker switch (12 V main switch) so that it is briefly in the “OFF” position.

5.6 Closing down the system

▲ ATTENTION!

Total discharge!

Damages the caravan battery:

- The caravan battery must be fully charged before closing down and before restarting the system. (Vehicle with an 80 Ah battery must be connected to the mains supply for at least 24 hours and a 160 Ah battery for up to 36 hours.)

▲ ATTENTION!

Permitted input voltage exceeded!

Will damage the consumers connected to the system:

- Never run a solar charger supplied by ’Schaudt’ without a battery being connected to the system.
- Unplug the “+ solar-cell” connector on the solar charger first if the battery is going to be changed or removed.

Closing down for up to 6 months

➤ Press the rocker switch (12 V main switch) so that it is briefly in the “OFF” position.

➤ The caravan battery must be fully charged before closing the system down.

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

Closing down for more than 6 months

➤ The caravan battery must be fully charged before closing the system down.

➤ Remove the clamps from the battery terminals.

➤ Remove the “+ solar-cell” connector on the solar charger.

6 Maintenance

The CSV 409 A caravan charging system requires no maintenance.

Cleaning

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 EU Conformity Declaration

Schaudt GmbH hereby confirms that the CSV 409 A caravan charging system design complies with the following relevant regulations:

EU low voltage directive

73/23/EEC edition with amendments issued on 22.07.93

Directive on electromagnetic compatibility

72/245/EEC with directive 2006/28/EC

This declaration is based on:

Type approval of *Kraftfahrt-Bundesamt*
(German Federal Motor Transport Authority)
Type approval no.: e1*72/245*2006/28*4965*00
EC approval no.: e1 03 4965

The original EU conformity declaration is available and can be referred to at any time.

Manufacturer Schaudt GmbH, Elektrotechnik & Apparatebau

Address Planckstraße 8
88677 Markdorf
Germany

B Special fittings/Accessories

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

C Customer service

Customer service address

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

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

Opening hours	Mon to Thur	08:00 – 12:00, 13:00 – 16:00 hours
	Fri	08:00 – 12:00 hours

Sending in the device Returning a defective device:

➤ Always use well-padded packaging.

➤ Fill out and enclose the fault report; see Appendix D.

➤ Send it to the addressee delivered free.

D Fault report

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

Device type: _____
Article no.: _____
Vehicle: Manufacturer: _____
Model: _____
Own installation? Yes ❑ No ❑
Upgrade? Yes ❑ No ❑
Is the over-voltage protection (OVP) (OVP) connected upstream? Yes ❑ No ❑

There is the following defect:
(please tick)

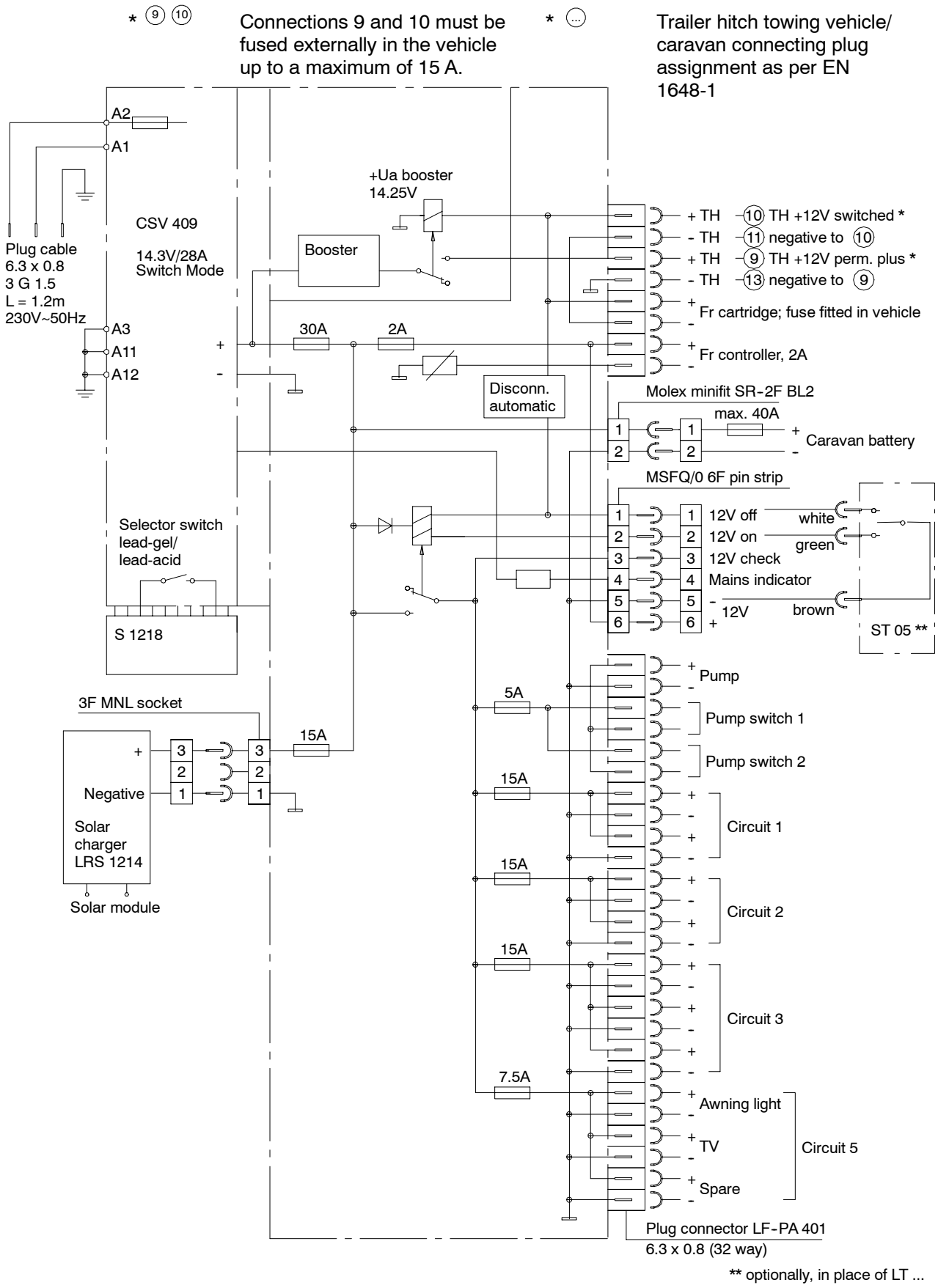
No battery charging from mains					
No battery charging whilst driving		Voltage		Current	
The following electrical consumers do not work:					
Cannot switch ON or OFF					
Permanent fault					
Temporary fault/loose contact					

Other remarks:

_____

_____

_____

_____

E Block circuit diagram/Connection diagram