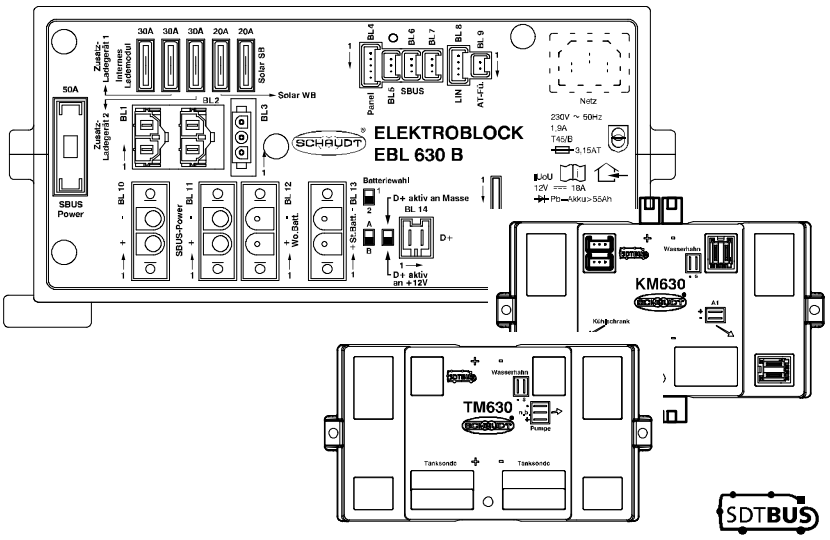
Instruction Manual



SDT**BUS 630 with**
Electroblock EBL 630 B
Bus modules XM 630 B/631 B/632 B

Table of contents

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 loads.

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!
The device contains live parts carrying 230V. These present a danger of death due to electric shock or fire so So therefore:

- 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 can cause burns. So therefore:

- 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)

ATTENTION!
The electroblock, 12V consumers and connected devices can be damaged if the thresholds for the 230V supply are exceeded. So therefore:

Generator operation and passenger vehicle ferries

- Ensure that a generator complies with the mains connected load values.
- Do not connect the generator until it is running smoothly
- Do not connect the electroblock to the mains supply on board passenger vehicle ferries (a correct mains supply is not always guaranteed on board these ferries)

2 Purpose

The EBL 630 B electroblock, together with the bus modules in the 630 family, is the central power supply unit for all 12V consumers in the vehicle's electrical system.

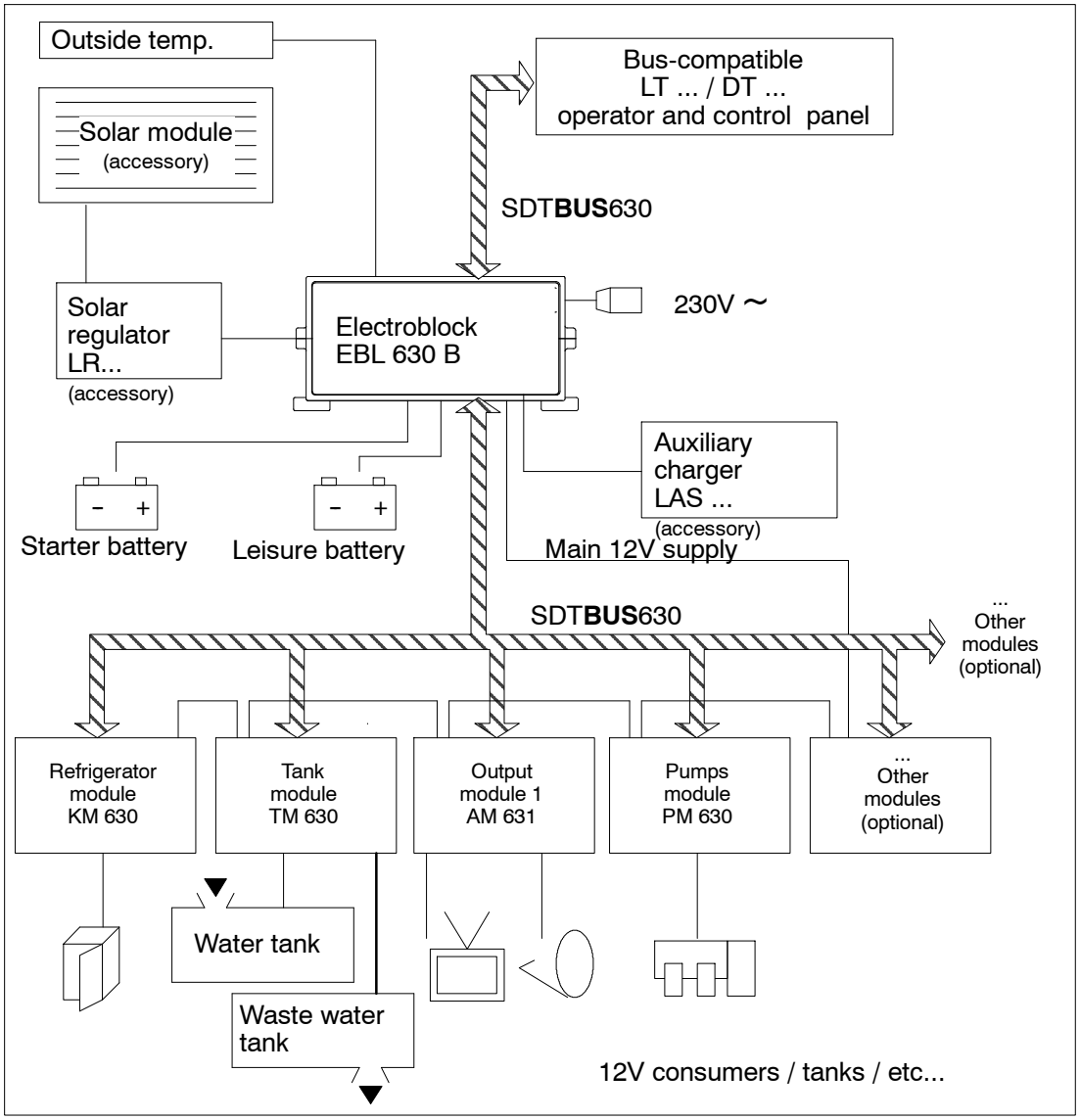


Fig. 1 On-board power supply system

Modules The EBL 630 B electroblock comprises:

- a charge module for charging all batteries connected
- output "main 12V supply" for the bus modules
- connections for the batteries
- an internal bus module for the SDT**BUS** 630 to be able to transfer readings to the bus

The individual bus modules are used for the complete 12V distribution system and for fusing the 12V circuits.

System devices

A bus-compatible IT ... or DT ... control and display panel must be connected to the EBL 630 B for operation. Bus modules are also required. Together these devices control the electrical functions in the vehicle's leisure area, including accessories.

It is also possible to connect up to 2 auxiliary chargers and a solar regulator to the EBL 630 B.

Flat vehicle fuses protect the various input circuits of the chargers. All outputs on the bus modules are fused with polyswitch fuses.

Protective circuits

The entire system is protected against:

- Excess temperature
- Overload
- Short circuit

ATTENTION!

Connecting the battery with inverse polarity poses of risk of damaging the electroblock.

3 Layout

3.1 Electroblock EBL 630 B

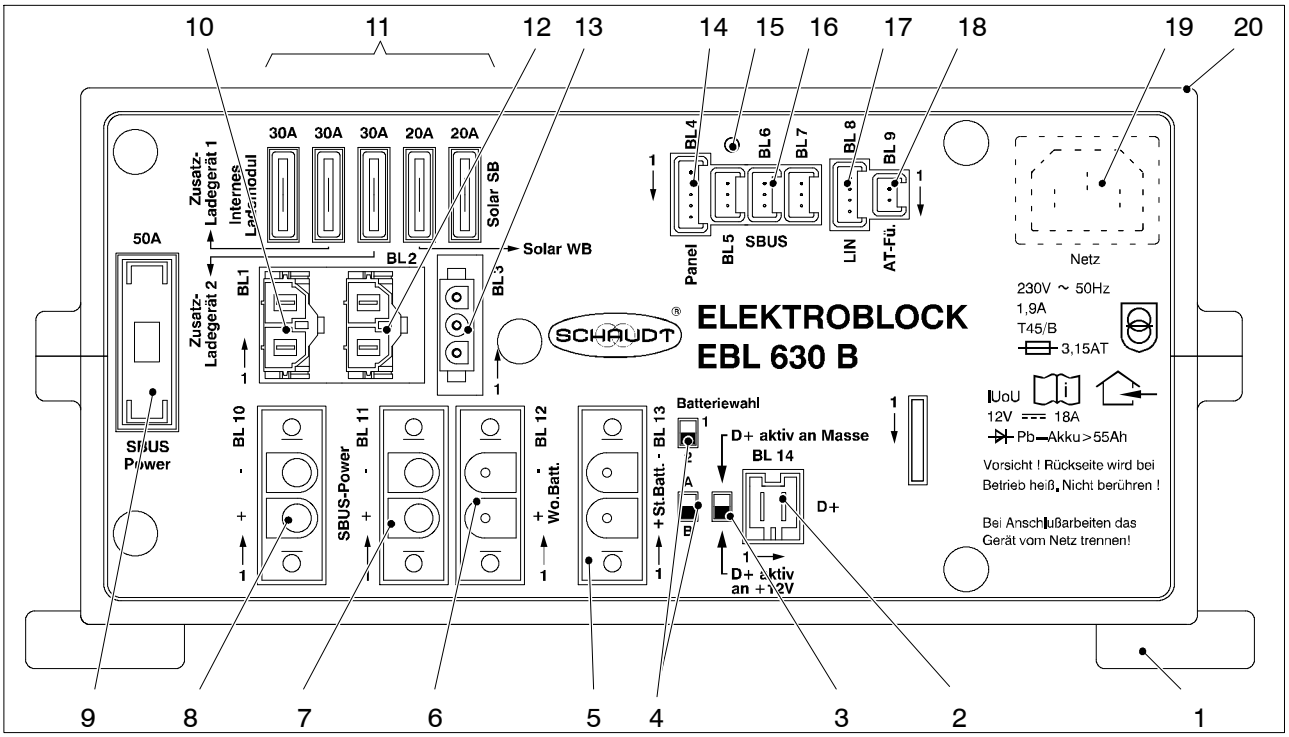


Fig. 2 Layout of the EBL 630 B electroblock (front)

1 Installation feet
2 D+ connector (input/output)
3 D+ signal changeover switch
4 Battery type switch (A/B, 1/2)
5 Block 13: Starter battery
6 Block 12: Leisure battery
7 Block 11: 12V main supply, bus modules
8 Block 10: 12V main supply, bus modules
9 Main fuse, main 12V supply
10 Block 1: Auxiliary charger 1
11 Flat vehicle fuses
12 Block 2: Auxiliary charger 2
13 Block 3: Solar regulator
14 Block 4: Operator and control panel
15 Diagnostics LED
16 Blocks 5, 6, 7: SDT**BUS** 630
17 Block 8: LIN bus
18 Block 9: Outside temperature sensor
19 Mains connector (optional low power device socket, otherwise mains cable with WAGO connector)
20 Housing

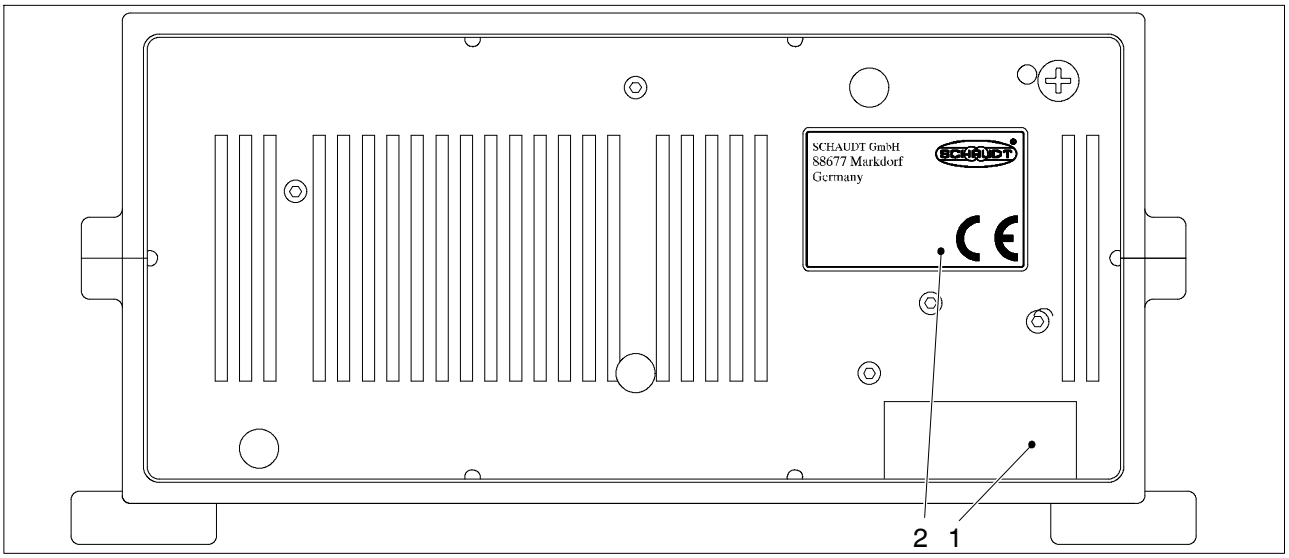


Fig. 3 Layout of the EBL 630 B electroblock (rear)

1 Cover plate
2 Nameplate

3.2 Bus modules in the 630 B family

All bus modules are designed for a 12V power supply. If nothing else is specified, the maximum output currents of the individual outputs on the modules is 90% of the value of relevant polyswitch fuse.

The following bus modules can be used in the SDT**BUS** 630 bus system (see also Fig. 1):

Name	Purpose	Comment
KM 630 B	Refrigerator	
TM 630 B	Tank sensors	
PM 630 B	Water pump	
HM 630 B	Heater	
AM 631 B	Outputs	Up to four module may be connected
AM 632 B	Outputs	Up to four module may be connected

Please refer to the manufacturer's vehicle documents for the bus modules actually available in the vehicle.

3.2.1 Fridge module KM 630 B

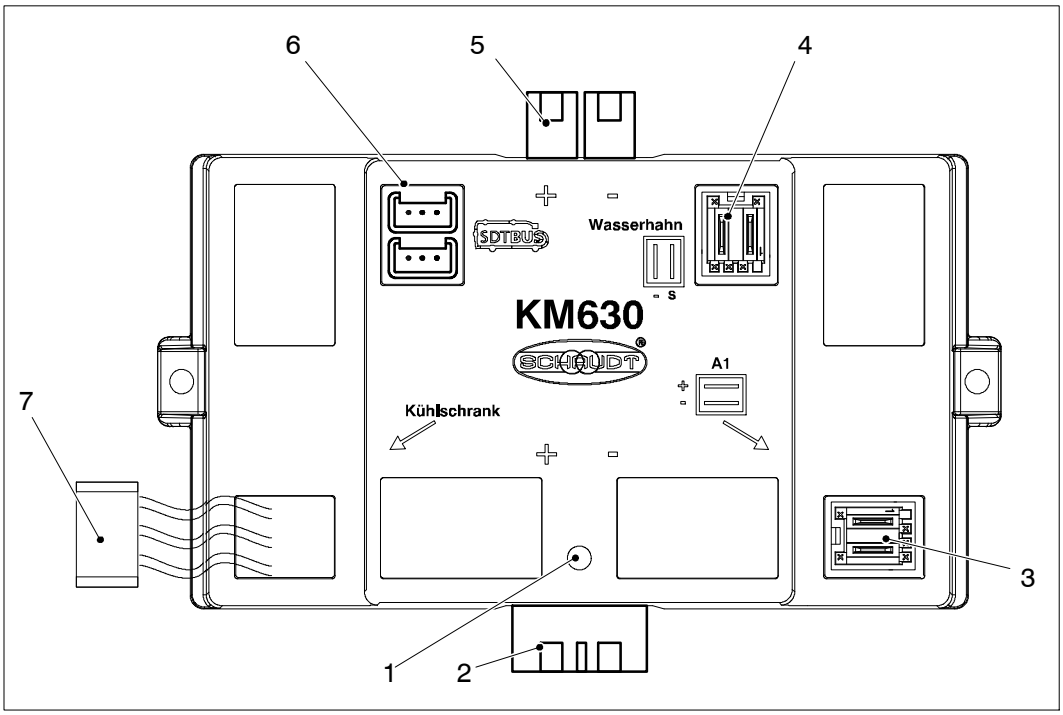


Fig. 4 Layout of the KM 630 B fridge module

1 Diagnostics LED
2 Main 12V supply (input)
3 Switched output A1
4 Water tap connection
5 Main 12V supply (output)
6 SDT**BUS** 630 connection
7 Refrigerator connector

3.2.2 Tank module TM 630 B

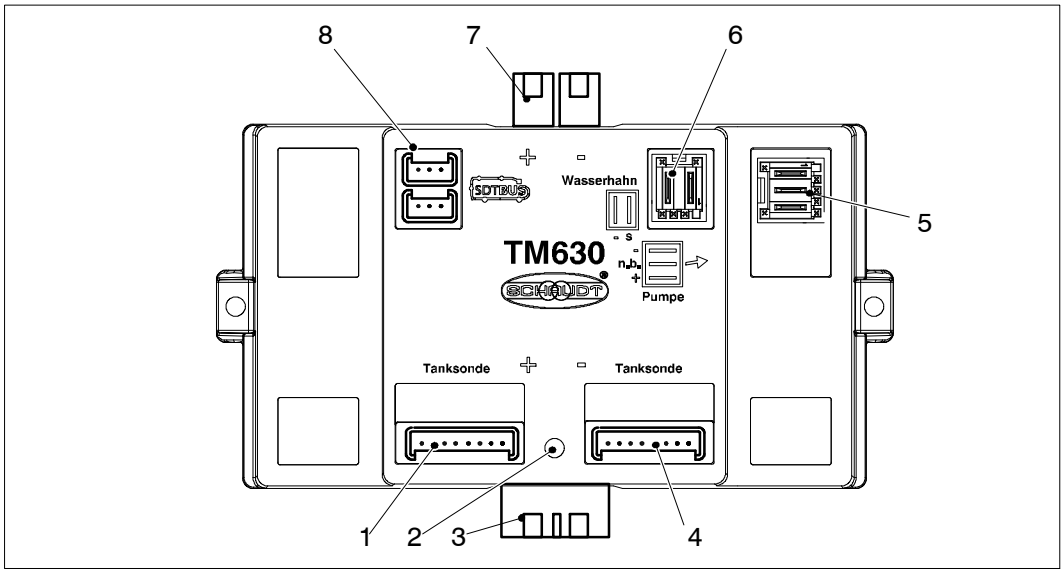


Fig. 5 Layout of TM 630 B tank module

1 Tank probe 1
2 Diagnostics LED
3 Main 12V supply (input)
4 Tank probe 2
5 Water pump output
6 Water tap connection
7 Main 12V supply (output)
8 SDT**BUS** 630 connection

3.2.3 Water pump module PM 630 B

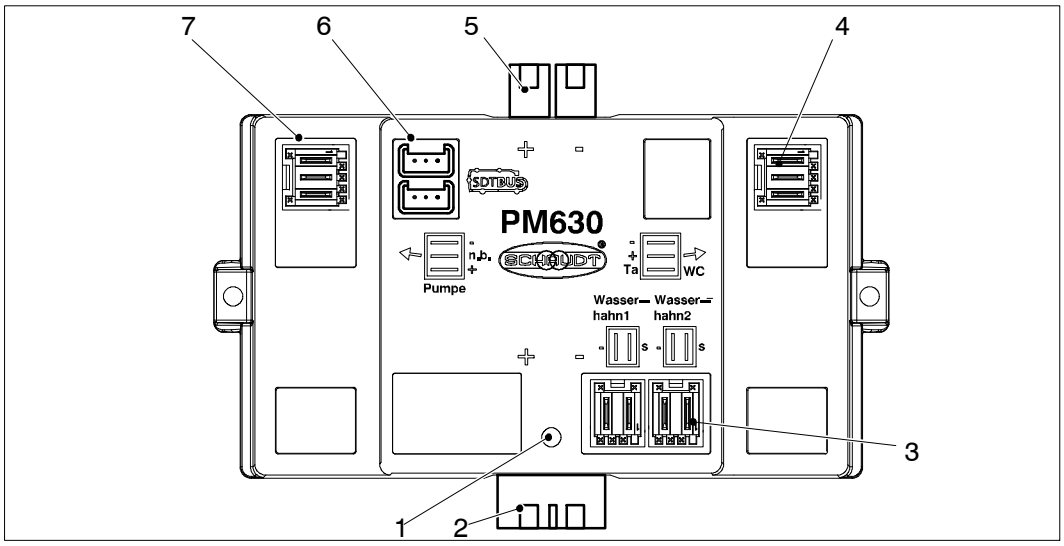


Fig. 6 Layout of the PM 630 B pump module

1 Diagnostics LED
2 Main 12V supply (input)
3 Connectors for water taps 1 and 2
4 Connector for WC pump switch and WC valve
5 Main 12V supply (output)
6 SDT**BUS** 630 connection
7 Water pump connector

3.2.4 Heater module HM 630 B

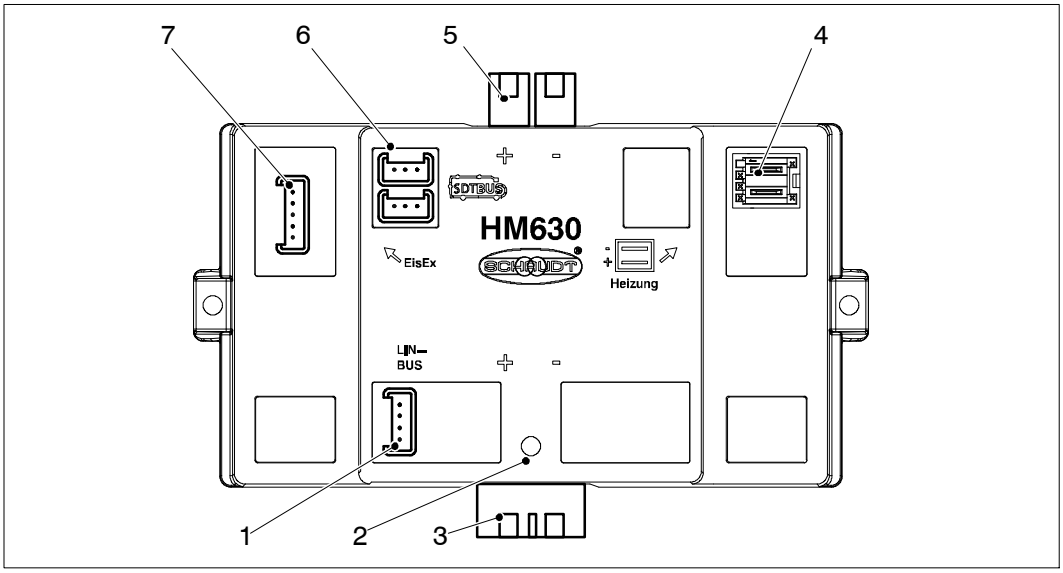


Fig. 7 Layout of the HM 630 B heater module

1 Not used (nc)
2 Diagnostics LED
3 Main 12V supply (input)
4 Heater supply
5 Main 12V supply (output)
6 SDT**BUS** 630 connection
7 EisEx connector

3.2.5 Output module AM 631 B

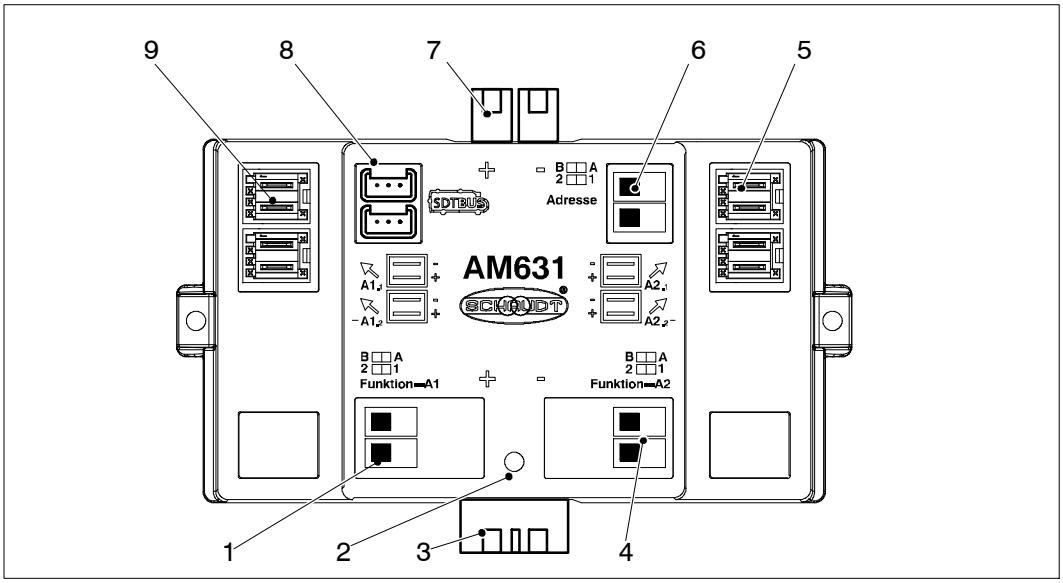


Fig. 8 Layout of AM 631 B output module

1 Selector switch, function of outputs A1
2 Diagnostics LED
3 Main 12V supply (input)
4 Selector switch, function of outputs A2
5 Outputs A2.1 and A2.2 (connected in parallel)
6 Address coding switch
7 Main 12V supply (output)
8 SDT**BUS** 630 connection
9 Outputs A1.1 and A1.2 (connected in parallel)

3.2.6 Output module AM 632 B

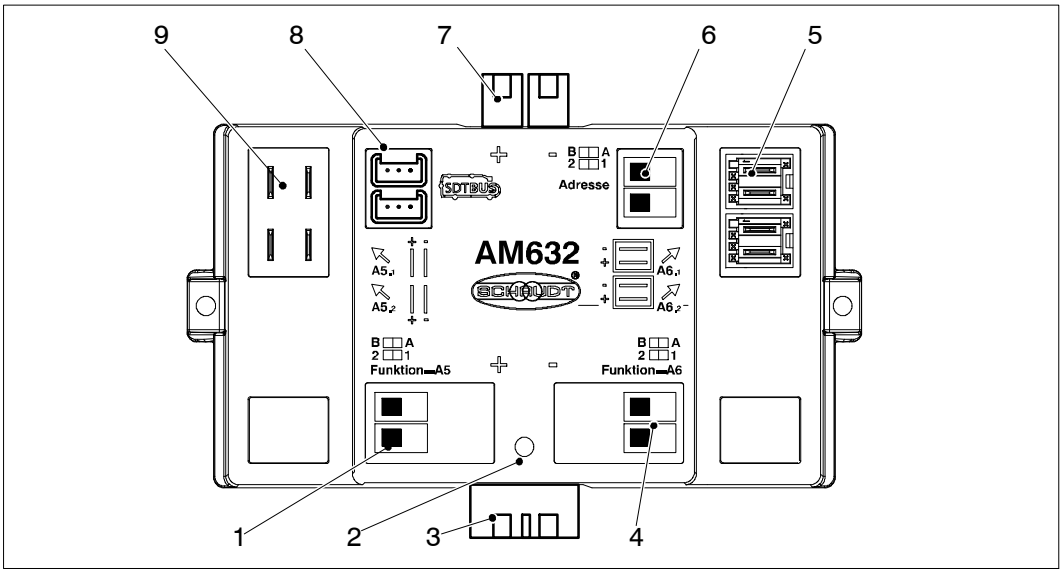


Fig. 9 Layout of AM 632 B output module

1 Selector switch, function of outputs A1
2 Diagnostics LED
3 Main 12V supply (input)
4 Selector switch, function of outputs A2
5 Outputs A6.1 and A6.2 (connected in parallel)
6 Address coding switch
7 Main 12V supply (output)
8 SDT**BUS** 630 connection
9 Outputs A5.1 and A5.2 (connected in parallel)

4 Operation

No action is required on the EBL 630 B electroblock or any of the bus modules for daily operation. The system is operated solely via the IT ... / LT ... control and switch panel connected. .

One-off configuration is only required after the type of battery (lead-acid or lead-gel) has been changed, during commissioning or when upgrading with accessories (see section 4.3 and the installation instructions for the SDT**BUS** 630 bus system for details).

4.1 Switching on and off the 12V supply for the leisure area

The 12V supply for the leisure area is switched on and off from the IT ... / LT ... connected.

Following the instructions for the operator and control panel.

The outputs of bus modules AM 631 B and AM 632 B are exceptions – they are configured such that they are not affected by ”12V ON” (see installation instructions). These could be for example:

- Steady plus
- Heater
- AES/compressor refrigerator
- Auxiliary heater
- Step
- Awning light

12V is normally applied to these outputs. They can then only be switched off with a shutdown (see Section 4.2).

4.2 Closing down

The system should be shut down if the motorhome is not being used for a lengthy period (such as during the winter).

A shutdown completely isolates the leisure battery from all consumers in the leisure area – also from those normally powered continuously. The IT ... / LT ... operator and control panel is an exception .

ATTENTION!

The leisure battery may be damaged beyond repair if totally discharged. So therefore:

- Fully charge the leisure battery before and after a shutdown (connect the vehicle to the mains for at least 12 hours and 24 hours for an 80Ah and 160Ah battery respectively)

The shutdown is performed by the IT ... / LT ... operator and control panel connected.
Following the instructions for the operator and control panel.

4.3 Changing the battery

ATTENTION!

Using incorrect battery types or incorrectly rated batteries can result in damage to the battery or devices connected to the electroblock. So therefore:

- Batteries may 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 rating should be used, i.e. the same as those originally installed by the manufacturer.
It is possible to swap lead-acid batteries with lead-gel batteries. However, swapping from lead-gel batteries to lead-acid batteries is only possible in certain circumstances. Contact the vehicle manufacturer for more information.

Battery-selection

Suitability must be checked using information from the battery supplier and the charging parameters of Schaudt equipment. The charging parameters of the EBL 630 B electroblock are specified in the operating and installation instructions.

DANGER!

Incorrectly setting the battery selector switch can cause a risk of explosion from a build-up of detonating gas (e.g. when a battery is defective, a battery charger is defective or for an excessively high battery operating temperature (above 30 °C)). So:

- Move the battery selector switch to the correct position.

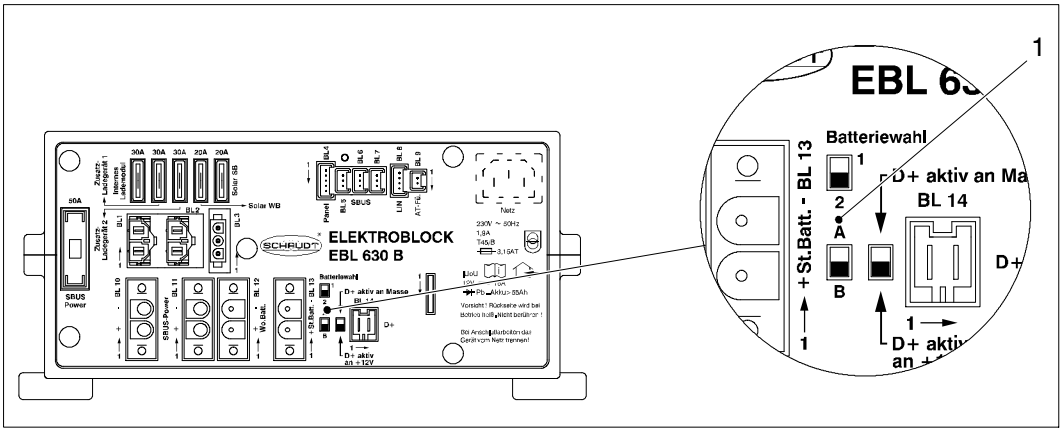


Fig. 10 Battery selector switch

➤ Isolate the electroblock from the mains

➤ Replace the battery.

Battery-Selector switch

➤ Move the battery selector switch (see Fig. 10) to the correct position using a thin object, such as a ball point pen:

Battery type set*	**Switch positions**	
	Switch 1/2	**Switch A/B**
Supply mode	1	A
AGM2	1	B
Lead-gel / AGM1	2	A
Lead-acid	2	B

* See also the table in Section 7.3 ”Technical details - Charging curve”.

In supply mode, the charge regulator supplies a constant output voltage

The two switches are recessed in the front panel to rule out incorrect operation. A small screwdriver may have to be used to switch setting.

➤ Then re-check that the battery selector switch is in the correct position for the type of battery used.

5 Battery charge functions

Charging whilst on the move

Simultaneous charging of the starter battery and the leisure battery by the alternator, parallel connection of the batteries via a cut-off relay.

Mains charging

This mechanism provides charging of the leisure battery and automatic conservation charging of the starter battery when the 230V mains voltage is connected to the electroblock.
The switching option provided by the battery selector switch ensures optimum charging of the lead-gel and lead-acid, and AGM, battery types.

Charging with solar modules

If a solar regulator is connected to input block 3 (optional), a rating of up to 18A is used for charging the two batteries.

6 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 17).

Polyswitch fuses

The following functions are protected by a polyswitch fuse:

- All outputs of the bus modules
- Control panel / internal controller in the EBL 630 B

If a fault occurs here, the electroblock must be switched off for approx. 2 minutes and be disconnected from the 230V mains. The polyswitch fuses of the EBL and bus modules reset by themselves during this time.

Fault	Possible cause	Remedy
Leisure battery is not charged during 230V operation (battery voltage permanently 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 electroblock	Contact customer service
Leisure battery is overcharged during 230V operation (battery voltage constantly above 14.5 V)	Defective electroblock	Contact customer service
Starter battery is not charged during 230V operation (battery voltage permanently 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 electroblock	Contact customer service
Leisure battery is not charged during mobile operation (battery voltage below 13.0 V)	Defective alternator	Have the alternator checked
	No voltage on D+ input	Have the fuse and cabling checked
	D+ switch on electroblock is not set correctly.	Set the switch according to the D+ signal from the vehicle (12V or active ground)
	Defective electroblock	Contact customer service
The leisure battery is overcharged during mobile operation (battery voltage permanently above 14.3 V)	Defective alternator	Have the alternator checked
The refrigerator does not work during mobile operation	No power feed to the refrigerator: – polyswitch of KM 630 B bus module has tripped	– check the cabling and switch off system for at least 2 minutes
	– cabling interrupted	– have the cabling checked
	– No D+ signal	– have the cabling checked
The refrigerator does not work during mobile operation	KM 630 B bus module defective	Contact customer service
	Defective refrigerator	Have the refrigerator checked

Fault	Possible cause	Remedy
Solar charging does not work	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 in the leisure area does not work	12V main switch for the leisure battery is switched off	12V main switch for the leisure battery must be switched on
	Not all plugs/fuses are plugged into the electroblock or bus modules	Insert all plugs and fuses (correct ratings) into the electroblock – check the connectors on the bus modules
	Defective fuse or cabling	Have the fuse and cabling checked
	Electroblock or individual bus modules defective	Read off error codes from the IT ... / LT ... operator and control panel Contact customer service if required

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.

ATTENTION!

When the automatic shut-off of the battery monitor is activated (also see the operating instructions for the DT / LT ... operator and control panel) , fully charge the leisure battery.

7 Technical details

7.1 EBL 630 B

Weight	Approx. 2 kg
Casing	PA (polyamide)
Colour	Gentian blue RAL 5010
Front	Aluminium, powder coated, light grey (RAL 7035)
Mains connection	230V ~, ± 10%, 47 to 63 Hz sinusoidal
Max. power consumption 230V ~	1.9 A
Output voltage	12V DC
Max. overall output current, 12V DC	18 A
Storage temperature	- 20° C ... 70° C
Operating temperature	- 20° C ... 45° C
Protection class	I
Protection rating	IP20
Battery types	Lead-acid Lead-gel AGM
Battery rating	55 Ah or greater
Charging for mains connection	
• Leisure battery	
Charging curve	IUoU
Final charge voltage	See Figure 11
Charging current	18 A in the entire mains voltage range, electronically limited, minus the charging current into the vehicle battery
Voltage for conservation charging	See Figure 11, with automatic switchover
• Starter battery	
Charging current	Max. 4 A
Loading of D+ connector by EBL	Approx. 1 mA
Solar regulator connector	MNL 3-pin, for starter battery and leisure battery; e.g. Schaudt LR 1218
Solar regulator charge current	Max. 18 A (with 20 A fusing)
Additional charger connector	Minifit 2-pin, e.g. Schaudt LAS 1218
Max. permissible charge current of auxiliary charger	27 A (fused with 30 A)

7.2 Bus modules

Please refer to the installation instructions for the technical details of the bus modules

7.3 Charging curve

Charging curve	IUoU
End-of-charge voltage*	Between 14.45V and 14.75V @ 22.5° C battery temperature (and without temperature sensor)
Charge current	18 A in the entire mains voltage range, electronically limited, minus the charge current into the vehicle battery
Voltage trickle charging*	Between 13.55V and 13.70V @ 22.5° C battery temperature (and without temperature sensor), with automatic switchover
New charging cycle, switchover to main charging	As soon as the charging current is limited, switchover to main charging with delay

* Dependent on the battery type set

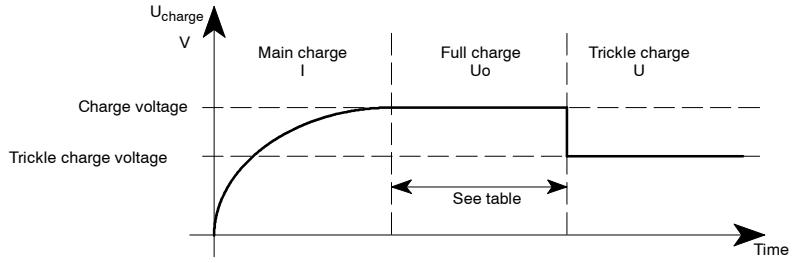


Fig. 11 Example of the charge voltage behaviour with the LAS 1218 BUS battery charger

Battery type set	Charge-voltage	Trickle charge voltage	At reference temperature	Time phase
Supply mode	Fixed voltage 12.65 V			
AGM2	14.75 V	13.70 V	22,5° C	4 hours
Lead-gel / AGM1	14.45 V	13.70 V	22,5° C	12 hours
Lead-acid	14.45 V	13.55 V	22,5° C	4 hours

The temperature correction of the end-of-charge voltages is –20 mV per degrees of temperature increase (in relation to 25° C) or +20 mV per degrees of temperature decrease (compensation range 0 to 45° C U_{max} 14.9V; the upper voltage limit at 14.9V is in consideration of the maximum input voltage of consumers connected).

I IMain charge with maximum 18 A charging current, electronically limited, up to end-of-charge voltage. Start of charge also for completely discharged batteries.

Uo Automatic switchover to full charge with constant charge voltage (see table above). The duration of the full charge phase is based on the battery type and is set on the device.

U Automatic switchover to trickle charging with constant voltage. In the trickle charge phase, a constant voltage is applied to the charger module output. The battery is now fully, or virtually fully, charged.

8 Maintenance

The devices of the SDT**BUS** 630 bus system require no maintenance.

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

Appendix

A Customer service

Customer service

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

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

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

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.

➤ Complete and enclose the fault report, see Appendix B.

➤ Send it to the addressee (free delivery).

B 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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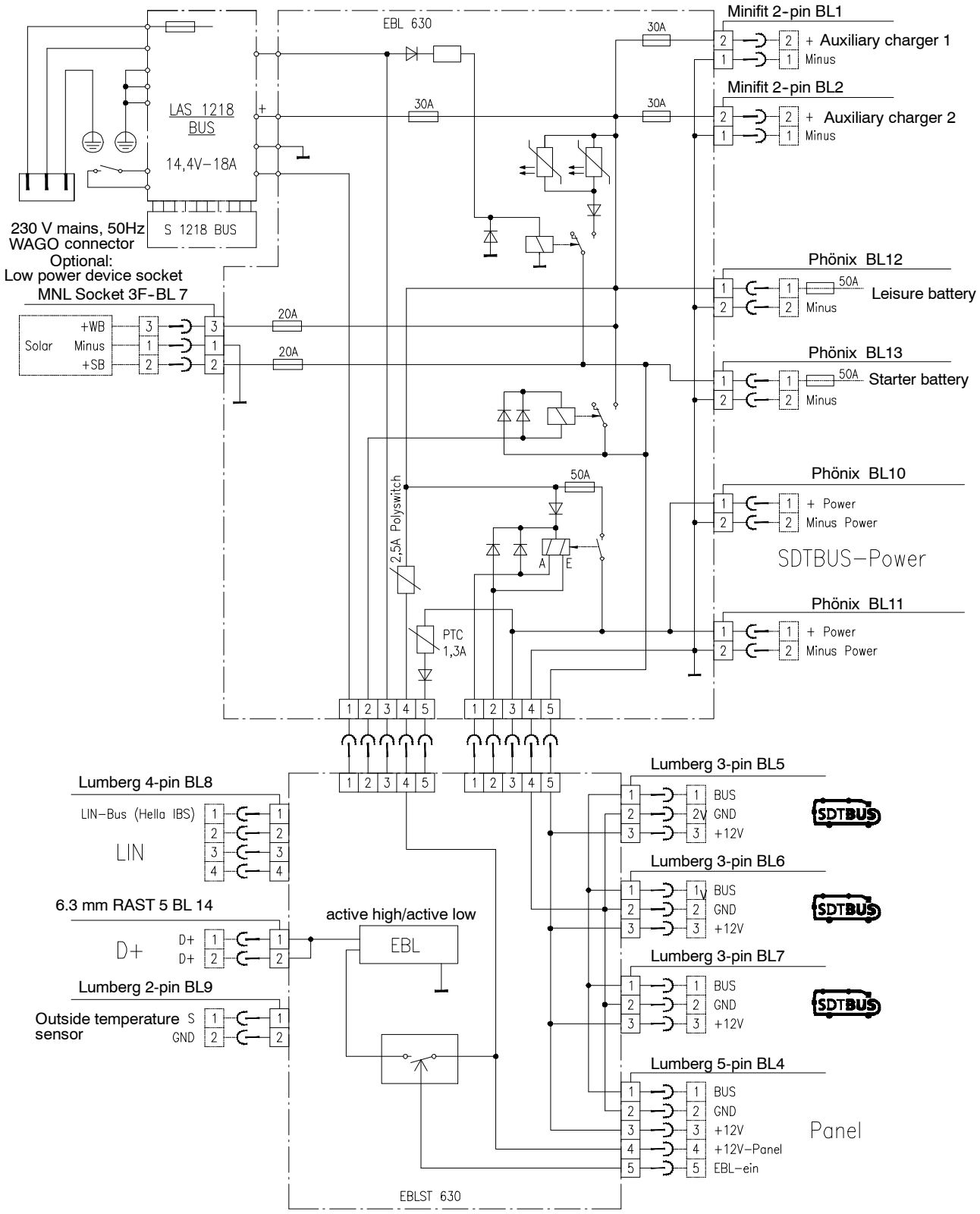
C Block diagram of EBL 630 B



D Item number compatibility list

First version to software version V1.01:

Device	LT 6..	EBL 630	AM 631	AM 632	KM 630	TM 630	PM 630	HM 630
Item no.	931.378 931.375 931.379	911.603	925.001	925.002	925.003	925.004	925.005	925.006

Variant ”A” from software version V1.02:

Device	LT 6.. A	EBL 630 A	AM 631 A	AM 632 A	KM 630 A	TM 630 A	PM 630 A	HM 630 A
Item no.	931.380 931.381 931.382	911.604	925.007	925.008	925.009	925.010	925.011	925.012

Variant ”B” from software version V3.00:

Device	LT 6.. B	EBL 630 B	AM 631 B	AM 632 B	KM 630 B	TM 630 B	PM 630 B	HM 630 B
Item no.	931.383 931.384 931.385	911.605	925.013	925.014	925.015	925.016	925.017	925.018

Different device variants (with no ”A” to devices with ”A” or ”B”, variant ”A” to variant ”B”) are **not** compatible to each other. It is therefore important to entire that, inside a vehicle, only devices of the same variant are used.

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