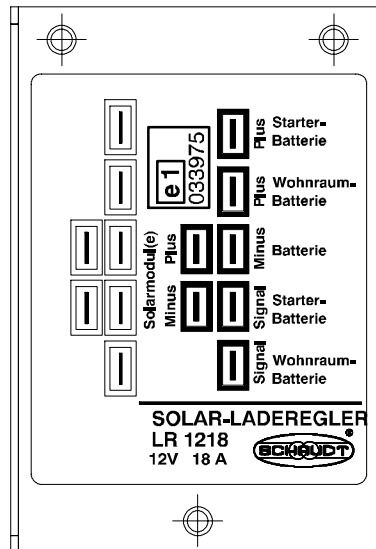


## Installation instructions



## LR 1218 Solar Charge Regulator

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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



**▲ WARNING!**

Hot components!

Burns:

- Blown fuses should only be replaced once the system has been completely disconnected from the power supply.
- Only replace blown fuses once the cause of the fault has been identified and rectified.
- The rear of the device may become hot during operation. Do not touch.



**▲ ATTENTION!**

Voltage carrying parts

Damage to devices:

- The electrical system of the motorhome or caravan must comply with current DIN, VDE and ISO regulations.
- Never modify the device.
- Never try to start the device using a defective mains cable or with a faulty connection.
- Never carry out maintenance work on live devices.
- Ensure proper electrical connections are made.
- Ensure correct electrical fuses are used.

### 2 Introduction

**These installation instructions are aimed at trained personnel.**

They contain important information on the connection and safe operation of the device. The safety information provided must be observed.

Always follow the relevant instruction manual in addition to the installation instructions.

### 3 Scope of delivery

Delivered as part of the LR 1218 solar charge regulator:

- 1 x LR 1218 solar charge regulator
- Connection set for the different applications
- Instruction Manual
- Installation instructions

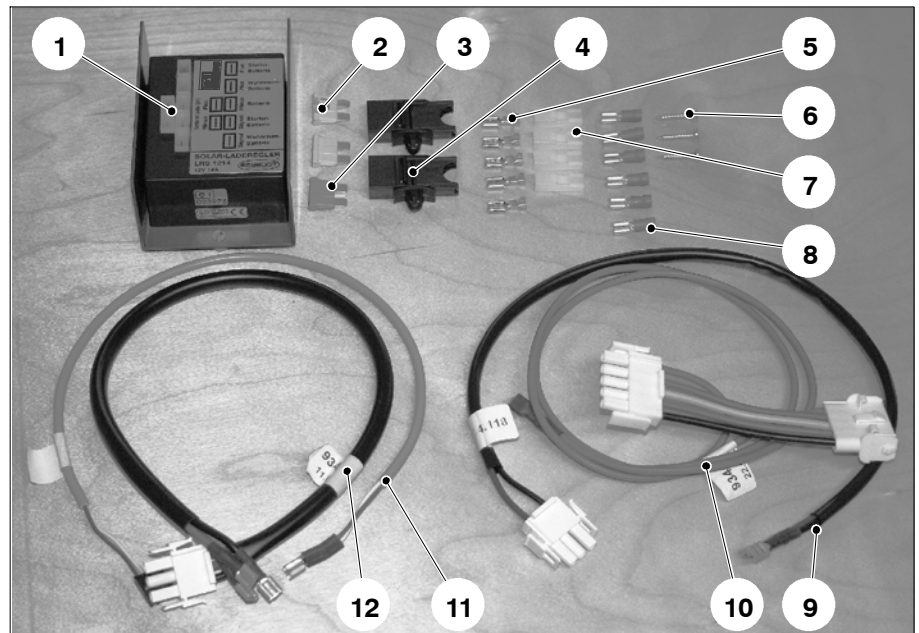


Fig. 1 LR 1218 Solar Charge Regulator Deliverables

Pos.	Qty	Name
1	1	LR 1218 solar charge regulator
2	2	Flat vehicle fuse, 20A
3	1	Flat vehicle fuse, 15 A
4	2	Fuse holder for flat vehicle fuse
5	5	Flat push-on contacts, 6.3 x 0.8 without sleeve
6	3	Screws, 3.5 x 20
7	4	Insulating sleeves for pos. 5
8	6	Flat push-on contacts, 6.3 x 0.8 (blue)
9	1	EBL ... connector cable (caravan battery charge current)
10	1	EBL ... adapter cable (starter battery charge current)
11	1	EBL ... connector cable (signals for display charge currents on DT ... / LT ...)
12	1	EBL ... connector cable (batteries for charge currents)



▲ Not all parts/cables are required for every different application.

## 4 Mechanical installation



▲ This device is intended for installation into a vehicle.

The device is designed for wall or floor installation. For applications in sections 5.2 and 5.3, it must be installed in the direction vicinity of the EBL ... electrobloc (at a maximum distance of 30cm to the front plate).

### Environment

- ▶ For applications in which the cables supplied are used to connect to an Schaudt EBL ... electrobloc, the solar charge regulator must be installed in the direct vicinity of the electrobloc.
- ▶ For other applications, a dry and sufficiently ventilated place in the insulated interior is to be selected for installation. No condensation may be able to form on the device. In order to prevent a build-up of heat, ventilation holes towards the living area must be provided in the upper and lower areas of the place of installation. Its cross-section is based on the size and average temperature of the place of installation.

### Minimum clearance

- ▶ Ensure a minimum clearance to the surrounding fixtures and fittings:
  - Maintain a gap of at least 5 cm on all sides (except mounted side).
  - Whilst in operation, the ambient temperature must not exceed +45 °C, measured 2.5 cm away from the sides of the device.

### Fitting

- ▶ On a stable and even surface, attach the solar charge regulator to the drillholes with three screws (Fig. 1, Pos. 6).

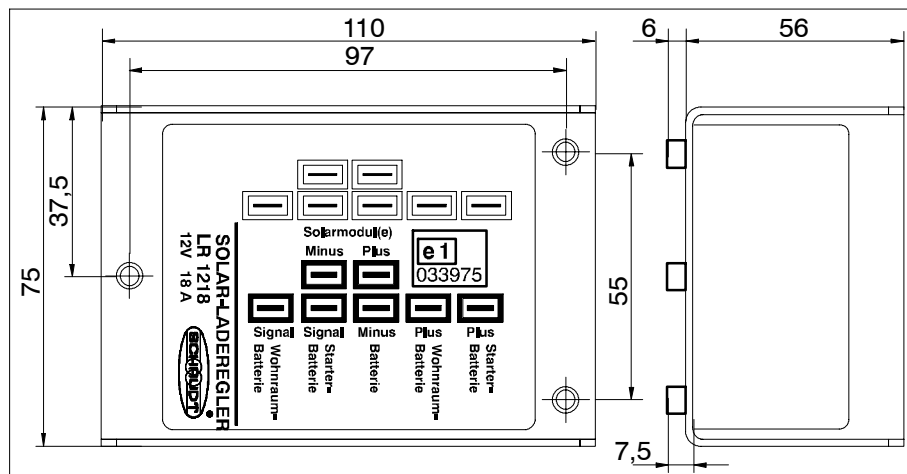


Fig. 1 Dimension Diagram of LR 1218 Solar Charge Regulator (dimensions in mm)

## 5 Electrical connection



### ▲ ATTENTION!

The output voltage of the charge regulator is not suitable for direct supply without battery.

Malfunction of or damage to connected consumers:

- Do not operate the solar charge regulator without a battery.
- Disconnect connector "Plus Solar module(s)" on the solar charge regulator before changing or removing the battery.
- The solar charge regulator may only be used in buffer mode with lead acid or lead gel batteries with a minimum rating of 55 Ah.

The electrical connection of the solar charge regulator is ready for the following applications:

- Connections to living area battery and starter battery
- Connection to an EBL ... electrobloc with connected DT ... / LT ... control and display panel .
- Connection to an EBL ... electrobloc with 3-pin MNL connection and adapter for starter battery

### 5.1 Connections to living area battery and starter battery



### ▲ ATTENTION!

Short circuits!

Damage to the solar charge regulator or fire damage to cable:

- To protect the supply lines in the event of a short circuit, connect the fuses directly to the positive pole of battery.

Select the cable cross-sections in line with EN 1648-1 or -2. The maximum current load must not exceed 90% of the individual fuse rating.

Recommended cable cross-sections:

Line length (sum of supply and return lines)	Cable cross-section
up to 4m	2,5 mm <sup>2</sup>
up to 8m	4,0 mm <sup>2</sup>
up to 12m	6,0 mm <sup>2</sup>

For this application, the follow parts are required from those delivered:

Pos.	Qty	Name
1	1	LR 1218 solar charge regulator
2	2	Flat vehicle fuse, 20A
4	2	Fuse holder for flat vehicle fuse
5	4	Flat push-on contacts, 6.3 x 0.8 without sleeve
7	4	Insulating sleeves for pos. 5
8	5	Flat push-on contacts, 6.3 x 0.8 (blue)

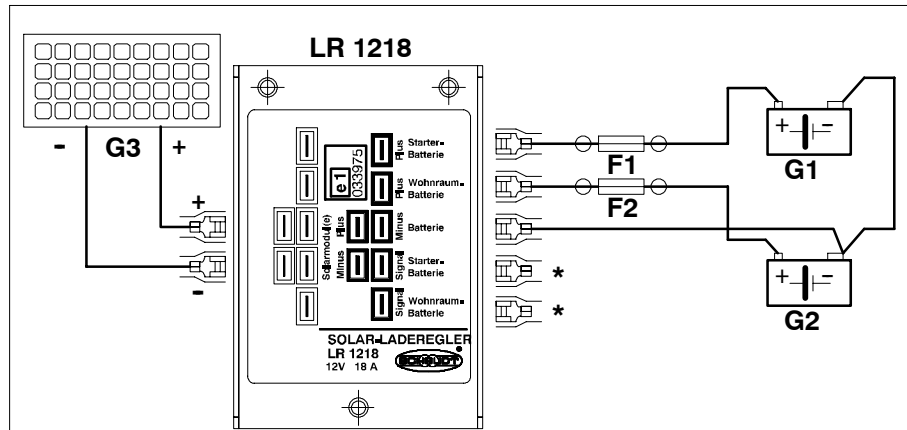


Fig. 2 Circuit diagram of connection LR 1218 to starter battery and living area battery

Pos.	Name
F1	Fuse for starter battery charge current (20A)
F2	Fuse for living area battery charge current (20A)
G1	Starter battery
G2	Living area battery
G3	Solar module(s)
LR 1218	Solar charge regulator
*	for display panel (optional)

## Connection sequence

The connection at the front of the solar charge regulator is established in the following sequence:

- ▶ 1. Connect the two fuse holders with fuses to the connection cable in accordance with the circuit diagram in Fig. 2. Use the flat push-on contacts (6.3 x 0.8) without sleeve for this (Fig. 1, Pos. 5). After crimping, attach the insulating sleeves (Fig. 1, Pos. 7). Insert the two fuses.
- ▶ 2. First connect the connection cables for living area battery and starter battery to the solar charge regulator, observing the polarity of the connections. Use the flat push-on contacts (6.3 x 0.8) for this (blue, Fig. 1, Pos. 8).
- ▶ 3. Connect the connection cables for living area battery and starter battery to the batteries.
- ▶ 4. **Finally**, connect solar modules to the solar charge regulator. Use the flat push-on contacts (6.3 x 0.8) for this (blue, Fig. 1, Pos. 8). The connection cables for the solar modules should be positioned as closely as possible to each other to avoid interference of radio reception.

## Disconnection

Disconnect in reverse order.

### 5.2 Connection to an EBL ... electrobloc with connected DT ... / LT ... control and display panel

For this application, the follow parts are required from those delivered:

Pos.	Qty	Name
1	1	LR 1218 solar charge regulator
2/3	1	20A or 15A flat vehicle fuse (depending on EBL ...)
8	2	Flat push-on contacts, 6.3 x 0.8 (blue)
11	1	EBL ... connector cable (batteries for charge currents)
12	1	EBL ... connector cable (signals for display charge currents on DT ... / LT ...)

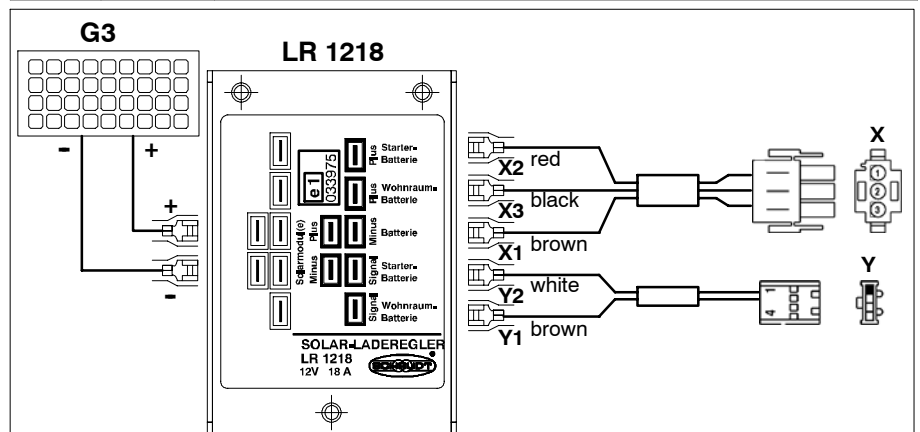


Fig. 3 Circuit diagram of connection LR 1218 to EBL ... with DT ... / LT ...

Pos.	Name
X	Cable with electrobloc connector: - X1 brown negative battery - X2 red + starter battery - X3 black + living area battery
Y	Cable with DT .../LT ... control and display panel connector - Y1 brown living area battery signal - Y2 white starter battery signal
G3	Solar module(s)
LR 1218	Solar charge regulator

#### Connection sequence

The connection at the front of the solar charge regulator is established in the following sequence:

- ▶ 1. Connect the electrobloc with cable X (connection cable EBL ... (charge currents for batteries), Fig. 1, Pos. 11).
- ▶ 2. Connect the electrobloc with cable Y (signals for display of charge currents on DT ... / LT ..., Fig. 1, Pos. 12).
- ▶ 3. Fit the right flat vehicle fuse (15A or 20 A; Fig. 1, Pos. 2 or 3) into the "Solar" fuse on the EBL ...
- ▶ 4. **Finally**, connect solar modules to the solar charge regulator. Use the flat push-on contacts (6.3 x 0.8) for this (blue, Fig. 1, Pos. 8). The connection cables for the solar modules should be positioned as closely as possible to each other to avoid interference of radio reception.



- ▲ The correct fuse rating is imprinted on the front plate of the EBL ... front plate. See also the block diagram in the instruction manual of the electrobloc.

**Disconnection** Disconnect in reverse order.

## 5.3 Connection to an EBL ... electrobloc with 3-pin MNL connection and adapter for starter battery

When using an electrobloc which only has a 3-pin connection for a solar charge regulator, an adapter for charging the starter battery can be retrofitted. It is then possible to charge the living area battery and the starter battery simultaneously.

The following electroblocs (as of April 2008) can be used with the adapter:

- EBL 99
- EBL 100
- EBL 264-9
- EBL 240
- EBL 269

An IT 300 Solar display panel, for the display of the solar charge current, can be used as an optional extra.

For this application, the follow parts are required from those delivered:

Pos.	Qty	Name
1	1	LR 1218 solar charge regulator
2/3	1	20A or 15A flat vehicle fuse (depending on EBL ...)
3	1	Flat vehicle fuses
8	2	Flat push-on contacts, 6.3 x 0.8 (blue)
9	1	EBL ... connector cable (caravan battery charge current)
10	1	EBL ... adapter cable (starter battery charge current)

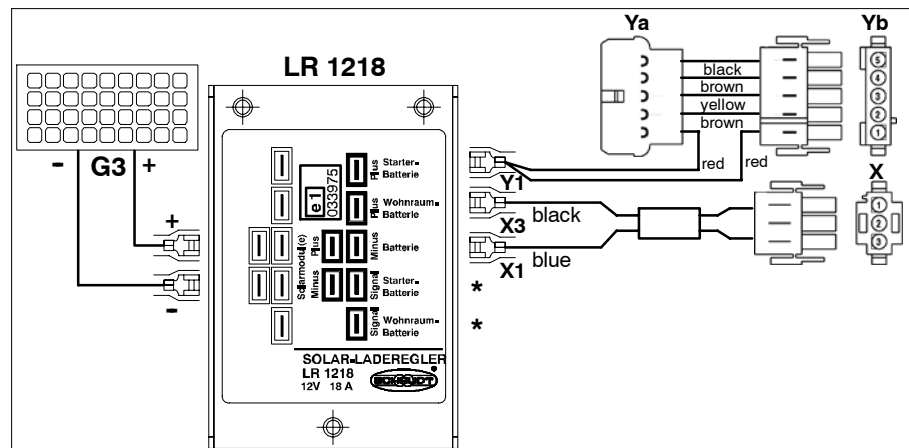


Fig. 4 Circuit diagram of connection LR 1218 to EBL ...



Pos.	Name
X	Cable with electrobloc connector: - X1 blue negative battery - X2 - not assigned - X3 black + living area battery
Y	Electrobloc adapter cable - Ya to available electrobloc cable - Yb to electrobloc - Y1 red + starter battery - Y2 brown negative sensor, living area battery - Y3 yellow D+ input - Y4 brown negative starter battery for refrigerator - Y5 black + living area battery sensor
G3	Solar module(s)
LR 1218	Solar charge regulator
*	for display panel (optional)

### Connection sequence

The connection at the front of the solar charge regulator is established in the following sequence:

- ▶ 1. On the electrobloc, disconnect the vehicle-side 5-pin cable carrying the starter battery supply.
- ▶ 2. Connect the electrobloc with cable Y(adapter cable EBL ... (charge current for starter batteries), Fig. 1, Pos. 10).
  - Ya to the vehicle-side cable
  - Connect Yb on the electrobloc
- ▶ 3. Connect the electrobloc with cable X (connection cable EBL ... (charge current for caravan battery), Fig. 1, Pos. 9).
- ▶ 4. Fit the right flat vehicle fuse (15A or 20 A; Fig. 1, Pos. 2 or 3) into the "Solar" fuse on the EBL ...
  - ▲ The correct fuse rating is imprinted on the front plate of the EBL ... front plate. See also the block diagram in the instruction manual of the electrobloc.
- ▶ 5. **Finally**, connect solar modules to the solar charge regulator. Use the flat push-on contacts (6.3 x 0.8) for this (blue, Fig. 1, Pos. 8). The connection cables for the solar modules should be positioned as closely as possible to each other to avoid interference of radio reception.



**Disconnection** Disconnect in reverse order.

### 5.4 Block diagram/connection diagram



- ▲ The block diagram and connection diagram are appended to the instruction manual of the solar charge regulator.

## **6 Initial use**

### **6.1 Checks prior to initial use**

- Before starting up**
- ▶ Ensure that all the connections are correct (only for initial use).
  - ▶ Ensure that the batteries or the electrobloc are connected (depending on operating mode).
  - ▶ If the solar charge regulator is connected to an electrobloc, ensure the battery cut-off switch is enabled.

- Starting up the system**
- ▶ Connect the solar module to the solar charge regulator with the correct polarity. The solar charge regulator is ready to use.

## **7 Technical data**

### **7.1 Mechanical data**

**Dimensions** 56 x 75 x 110 (H x W x D in mm), including attachment feet

**Weight** 160 g

**Housing** Plastic, black

**Base plate** Aluminium, powder coated, gentian blue RAL 5010

### 7.2 Electrical data

<b>Nominal voltage</b>	12 V						
<b>Regulating principle</b>	pulse-width modulated series regulator charge curve (with solar module) IU						
<b>Final charge voltage</b>	14.2 V living area battery (has priority) 14.2 V starter battery						
<b>Solar charge regulator consumption</b>	approx. 4.5 mA (with solar module in the dark)						
<b>Suitable batteries</b>	6-cell lead acid or lead gel batteries, rated 55 Ah or higher						
<b>Suitable solar modules</b>	Typ. 36-cell modules with the following properties: <ul style="list-style-type: none"><li>● Off-load voltage max. 25 V</li><li>● Overall nominal current max. 18 A</li><li>● Overall short circuit current max. 19 A</li></ul>						
<b>Calculation example</b>	For example, five solar modules each rated at 55W can be connected in parallel: <table><tr><td>Per solar module</td><td><math>U_0 = 22 \text{ V}</math></td></tr><tr><td></td><td><math>I_{\text{nominal}} = 3.2 \text{ A}</math></td></tr><tr><td>Overall nominal current</td><td><math>I_{\text{nominal}} = 16 \text{ A}</math></td></tr></table>	Per solar module	$U_0 = 22 \text{ V}$		$I_{\text{nominal}} = 3.2 \text{ A}$	Overall nominal current	$I_{\text{nominal}} = 16 \text{ A}$
Per solar module	$U_0 = 22 \text{ V}$						
	$I_{\text{nominal}} = 3.2 \text{ A}$						
Overall nominal current	$I_{\text{nominal}} = 16 \text{ A}$						

### 7.3 Environmental parameters

<b>Operational temperature</b>	-20 °C to +40 °C
<b>Storage temperature</b>	-20 °C to +70 °C
<b>Humidity</b>	Operation in dry environment only

## 8 Storage - Packaging - Transportation

Only transport and store the solar charge regulator if the packing is suitable and ambient conditions are dry.

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