Solar Dual Battery Charger SDC 10 / 20

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Symbols used

⚠️ Symbol indicates a possible hazard.

Operating instructions

Please be sure to read the instructions for installation and use before attempting to connect and use this device!

Glossary

AGM-battery

Lead acid battery, in which the electrolyte is set in an absorbed glass mat.

Battery OPTIMA® YT S

corresponds to an AGM-battery.
Safety instructions

⚠️ To protect you from electrical shocks, injury or burns the following basic safety principles must be observed when using electrical devices. Please read and follow these instructions before using the device.

Installation
Ensure that the devices are positioned safely and cannot fall down or over. Always position the cables to ensure they do not pose a tripping hazard. Do not expose electrical devices to rain. Do not operate electrical devices in damp or wet environments. Do not operate electrical devices close to flammable liquids or gases.

Protection against electrical shocks
Only operate devices with undamaged casings and cables. Ensure the cables are installed safely. Do not pull on the cables.

The solar module generates power when light is cast on it. The full voltage is also available even if there is little light. The open circuit voltage may be twice as high. Do not touch any live parts. Cover solar modules with e.g. cardboard, before mounting and installing.

Use
This device has not been designed for use by people (including children) who have restricted physical, sensory or mental abilities or a lack of experience and/or knowledge, unless they are supervised by a person responsible for their safety or have received instructions from that person as to how the device is to be used.

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

Do not use electrical devices for purposes other than those stated by the manufacturer. The ventilation slits in the housing must be free and may not be covered by luggage, towels or clothing etc.

Caution
Batteries may generate explosive gases during charging and operation. Keep away from flames and ignition sources. Ensure there is sufficient ventilation in the battery chamber.

Repairs
Do not repair or modify the device. Please contact your dealer or the Truma Service (see www.truma.com).

Accessories
Only use accessories and additional devices that are supplied or recommended by the manufacturer.

Intended use
The solar automatic charger only serves to charge 12 V (24 V) lead accumulators comprising 6 (12) single cells (e.g. car battery) with a capacity of 50 – 100 Ah (SDC 10) or 50 – 200 Ah (SDC 20). The device was developed for connection to solar modules. Only use suitable modules e.g. Truma SM 65, SM 100 or SM 150. Observe the maximum voltage and power draw values. The preferred application fields for the automatic charger are batteries with gel, AGM or liquid electrolyte.

The device is designed for installation inside.
Improper use

⚠️ The device is not suitable for charging
– 6 V batteries or 6 V lead accumulators
– non-chargeable batteries
– nickel-cadmium batteries.

If batteries with a rated voltage of 6 V are charged with the device, gassing occurs immediately. An explosive gas can be created.

The device is only suitable for regulating solar modules. Do not connect any other voltage sources (e.g. main voltage 230 V) to the device. This may destroy the device and/or sources. If any other voltage sources are used together with the device, please ask your dealer.

Battery care
(also maintenance-free batteries)

The following points should be observed to extend the battery life:
– Batteries should be fully charged before and after being used.
– In the case of longer standstills (without sunshine), disconnect the battery and charge for 24 hours at the latest every 12 weeks.

Store fully charged batteries in a cool but frost-free place during the winter and recharge regularly (every 12 weeks).

Device elements

![Diagram of the device elements]

Fig. 1: Device elements

- H1 LED - Function display battery 1 (supply battery)
- H2 LED - Function display battery 2 (starter battery)
- H3 LED – Battery type - AGM, gel, liquid (liquid electrolyte)
- H4 LED – Charging current distribution
- H5 LED – PWM charging frequency
- H6 shows the values of H3, H4, H5 as numbers

- T Query / change operating mode

- B2 Internal temperature sensor

- X1 Connection for temperature sensor B1
- X2 Connection for battery 1 (supply battery)
- X3 Connection solar module
- X4 Connection battery 2 (starter battery)
- X5 No function
Function
The device has a modern microprocessor-controlled pulse width modulated three phase charging characteristic. This allows high performance combined with a light weight and small dimensions. By virtue of the high-quality electronics, it works highly efficiently. The automatic charging process preserves the device and does not overcharge the batteries. This in turn extends the service life of the batteries significantly. It is suitable for batteries with liquid, gel or AGM technology and has a settable charging current distribution for two separate battery connections.

The device is designed for continuous operation and parallel mode. Consumers can be continuously connected, switched on or disconnected. Consumers are supplied and the batteries are charged at the same time. The consumer current here should be smaller than the solar charging current as otherwise the battery will not charge.

If the device is operated in conjunction with an external temperature sensor for the supply battery (battery 1), the device regulates the charging voltage automatically depending on the battery temperature. This ensures particularly effective and gentle charging of the battery. If an external temperature sensor is not used, the device regulates the charging process based on the internal temperature sensor.

The supply and starter batteries can be charged by connecting one or several solar modules. Please observe the maximum voltage and power consumption values.

Charging process
The device has an electronic reverse voltage, reverse current and solar short-circuit protection. The charging current is only released (see “charging diagram”) if the battery is connected correctly and there is enough power available from sunlight. When a temperature sensor is used, charging takes place on a temperature-dependent basis.

Bulk phase
Charging with maximum available solar charging current until the charging end voltage is reached.

Absorption phase
The charging current is kept for a period of 2 hours. At the end of this period, it changes to the float phase.

Float phase
The charging voltage is set to 13.8 V. The charging current drops to the value necessary to compensate the self-consumption of the battery. Power is still supplied to the consumers. If the consumed current exceeds the available solar charging current, the charging process can no longer be maintained.

If the battery voltage drops below 13.3 V, the device automatically switches to the bulk phase, if there is adequate solar charging current.
Equalisation charging phase
(only for AGM and liquid electrolyte battery type)

The equalisation charging phase serves to compensate the cell voltages and can reduce any sulphation.

If the voltage of the battery drops below 11.1 V, it is assumed that the battery has deep-discharged. The device is switched to the equalisation charging phase for two hours. At the end of this period, it changes automatically to the float phase.

- Deep-discharged batteries can be permanently damaged. Equalisation charging cannot repair this.
- Liquid electrolyte batteries can create explosive gases, so ensure there is adequate ventilation. Check the liquid level at regular intervals. Overcharging can damage your battery; check the technical data for your battery.
- Equalisation charging increases the charging voltage; this may damage the consumer. Ensure that all consumers are designed for these voltages.

Parallel mode
If load current is consumed whilst the battery is being charged, it is served from the available solar charging current. If the consumed current exceeds the available solar charging current, the device cannot charge the battery. The device starts charging automatically once an adequate amount of solar charging current is available again.

Settings – query / change

Operation

The display H6 shows different system settings. Press the key (T) to switch between LED H3, H4 and H5 and display this in H6. If the key is pressed again, the system starts at LED H3 again.

Battery type

The battery type can only be set for battery 1, battery 2 is assumed to be the same battery type.

Query
- Press (T) until LED H3 illuminates; the saved value is shown in display H6.

<table>
<thead>
<tr>
<th>Display H6</th>
<th>Battery type</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Gel (pre-setting)</td>
</tr>
<tr>
<td>2</td>
<td>AGM</td>
</tr>
<tr>
<td>3</td>
<td>Liquid (liquid electrolyte)</td>
</tr>
</tbody>
</table>

Change
- Press key (T) for 5 seconds until the display H6 flashes.
- Press the key (T) to set the required value.
- If the key is not pressed for 5 seconds, the displayed value will be saved and flashing stops.
Charging current distribution

The charging current distribution between battery 1 and battery 2 can be set. The following distributions can be selected.

**Query**

- Press (T) until LED H4 illuminates; the saved value is shown in display H6.

<table>
<thead>
<tr>
<th>Display H6</th>
<th>Battery 1</th>
<th>Battery 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0 %</td>
<td>100 %</td>
</tr>
<tr>
<td>1</td>
<td>10 %</td>
<td>90 %</td>
</tr>
<tr>
<td>2</td>
<td>20 %</td>
<td>80 %</td>
</tr>
<tr>
<td>3</td>
<td>30 %</td>
<td>70 %</td>
</tr>
<tr>
<td>4</td>
<td>40 %</td>
<td>60 %</td>
</tr>
<tr>
<td>5</td>
<td>50 % (pre-setting)</td>
<td>50 %</td>
</tr>
<tr>
<td>6</td>
<td>60 %</td>
<td>40 %</td>
</tr>
<tr>
<td>7</td>
<td>70 %</td>
<td>30 %</td>
</tr>
<tr>
<td>8</td>
<td>80 %</td>
<td>20 %</td>
</tr>
<tr>
<td>9</td>
<td>90 %</td>
<td>10 %</td>
</tr>
</tbody>
</table>

**Change**

- Press key (T) for 5 seconds until the display H6 flashes.
- Press the key (T) to set the required value.
- If the key is not pressed for 5 seconds, the displayed value will be saved and flashing stops.

During the normal charging process, the device divides the charging current between battery 1 and battery 2 as set. Once the battery 1 is fully charged, all the charging current is fed to battery 2, regardless of the set value. If the voltage of battery 1 drops, the charging process starts again. If only battery 1 is connected, the entire charging current is supplied to this battery regardless of the set value.

**PWM charging frequency**

The pulse frequency of the device can be set here. This may be changed to reduce possible interferences.

**Query**

- Press (T) until LED H5 illuminates; the saved value is shown in display H6.

<table>
<thead>
<tr>
<th>Display H6</th>
<th>PWM charging frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>25 Hz (pre-setting)</td>
</tr>
<tr>
<td>1</td>
<td>50 Hz</td>
</tr>
<tr>
<td>2</td>
<td>100 Hz</td>
</tr>
</tbody>
</table>

- Press key (T) for 5 seconds until the display H6 flashes.
- Press the key (T) to set the required value.
- If the key is not pressed for 5 seconds, the displayed value will be saved and flashing stops.
Function display / troubleshooting

LED H1 (H2) shows the status of battery 1 (battery 2).

<table>
<thead>
<tr>
<th>Display</th>
<th>Cause / rectification</th>
</tr>
</thead>
<tbody>
<tr>
<td>LED flashes in longer intervals</td>
<td>Check connections from the device to the battery and solar module, ensure that they are connected to the right terminals. Test the fuse, solar module and the battery.</td>
</tr>
<tr>
<td>LED flashes</td>
<td>Battery is fully charged.</td>
</tr>
<tr>
<td>LED shines.</td>
<td>The battery is being charged.</td>
</tr>
<tr>
<td>LED flashes in short intervals</td>
<td>The battery is not being charged. If necessary, replace faulty battery.</td>
</tr>
<tr>
<td>LED does not shine</td>
<td>Battery not connected or over-voltage</td>
</tr>
</tbody>
</table>

If this does not solve the problem, please contact the Truma Service.

Maintenance

⚠️ The power supply must always be disconnected before performing any maintenance work. For example cover the solar module with a cardboard box.

Clean the device with a dry and lint-free cloth.

Technical data

* Double the values of the 12 V – to work out the 24 V values.

<table>
<thead>
<tr>
<th>Electrical values</th>
<th>12 V</th>
<th>24 V</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating voltage</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Automatic recognition</td>
<td></td>
<td></td>
</tr>
<tr>
<td>max. input voltage</td>
<td>30 V</td>
<td>50 V</td>
</tr>
<tr>
<td>Voltage range *</td>
<td>8 – 15 V</td>
<td></td>
</tr>
<tr>
<td>Allowed ambient temperature range</td>
<td>-35 °C – +55 °C</td>
<td></td>
</tr>
<tr>
<td>Allowed storage temperature range</td>
<td>-35 °C – +80 °C</td>
<td></td>
</tr>
<tr>
<td>Self-consumption</td>
<td>4 mA at night 10 mA during charging</td>
<td></td>
</tr>
<tr>
<td>PWM frequency, settable</td>
<td>25 Hz, 50 Hz, 100 Hz</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Currents</th>
<th>SDC 10</th>
<th>SDC 20</th>
</tr>
</thead>
<tbody>
<tr>
<td>max. module current constant at 25 °C</td>
<td>10 A (approx. 150 Wp)</td>
<td>20 A (approx. 300 Wp)</td>
</tr>
<tr>
<td>max. output current constant at 25 °C</td>
<td>10 A</td>
<td>20 A</td>
</tr>
<tr>
<td>Battery capacity</td>
<td>50 – 100 Ah</td>
<td>50 – 200 Ah</td>
</tr>
</tbody>
</table>
**Charging voltage**

<table>
<thead>
<tr>
<th>Battery type, settable</th>
<th>Gel</th>
<th>AGM sealed</th>
<th>Liquid</th>
</tr>
</thead>
<tbody>
<tr>
<td>Absorption phase *</td>
<td>14,2 V</td>
<td>14,4 V</td>
<td>14,4 V</td>
</tr>
<tr>
<td>Float phase *</td>
<td>13,8 V</td>
<td>13,8 V</td>
<td>13,8 V</td>
</tr>
<tr>
<td>Equalisation charging phase *</td>
<td>–</td>
<td>14,6 V</td>
<td>14,6 V</td>
</tr>
<tr>
<td>Bulk phase reconnection voltage *</td>
<td>13,3 V</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maximum charging voltage *</td>
<td>14,8 V</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Temperature compensation *</td>
<td>-30 mV / K</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Temperature sensor (measuring range)</td>
<td>-40 °C – +125 °C</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Mechanical values**

<table>
<thead>
<tr>
<th></th>
<th>SDC 10</th>
<th>SDC 20</th>
</tr>
</thead>
<tbody>
<tr>
<td>Protection type</td>
<td>IP 30</td>
<td></td>
</tr>
<tr>
<td>Installation</td>
<td>Wall mounted</td>
<td></td>
</tr>
<tr>
<td>Weight</td>
<td>200 g</td>
<td>230 g</td>
</tr>
<tr>
<td>Connection terminals</td>
<td>4 mm²</td>
<td></td>
</tr>
<tr>
<td>Dimensions L x W x H</td>
<td>154 x 76 x 37,5 mm</td>
<td></td>
</tr>
<tr>
<td>Humidity (not condensing)</td>
<td>95 %</td>
<td></td>
</tr>
</tbody>
</table>

**Charging chart**

HL = Bulk phase  
NL = Absorption phase (2 hours)  
EL = Float phase

![Charging chart diagram](image)

**Fig. 2:** Charging chart (basic curve)

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The right to effect technical modifications is reserved!

**Disposal**

The device must be disposed of in line with the administrative regulations of the respective country in which it is used. National regulations and laws (in Germany, for example, the End-of-life Vehicle Regulation) must be observed.
Manufacturer’s Warranty (European Union)

1. Scope of Manufacturer’s Warranty

As the Manufacturer of the unit, Truma undertakes a warranty towards the Consumer that covers any material and/or manufacturing defects of the unit.

This Warranty is applicable in EU member states as well as in Iceland, Norway, Switzerland and Turkey. A Consumer is the natural person who was the first one to purchase the unit from the Manufacturer, OEM or dealer and who neither resold the unit in a commercial or self-employed professional capacity nor did he or she install it for a third party in such a capacity.

The Manufacturer’s Warranty covers any of the aforementioned defects that occur within 24 months upon concluding the purchase agreement between the seller and the Consumer. The Manufacturer or an authorised service partner undertakes to remedy such defects through subsequent fulfilment, i.e. at its discretion either by repairing or replacing the defective item. Any defective parts shall become the property of the Manufacturer or the authorised service partner. If the unit is no longer manufactured at the time of defect notification and if replacement delivery has been opted for, then the Manufacturer may deliver a similar product.

If the Manufacturer remedies a defect under its warranty commitment, the term of the Warranty shall not recommence anew with regard to the repaired or replaced parts; rather, the original warranty period shall continue to be applicable to the unit. Only the Manufacturer itself and an authorised service partner shall be entitled to conduct a warranty job. Any costs that occur in the event of a warranty claim shall be settled directly between the authorised service partner and the Manufacturer.

The Warranty does not cover additional costs arising from complicated removal or installation jobs on the unit (e.g. dismantling of furnishings or parts of the vehicle body), and neither does it cover travel expenses incurred by the authorised service partner or the Manufacturer.

No further-reaching claims shall be permitted, especially damage claims presented by the Consumer or third parties. This provision shall not affect the validity of the German Product Liability Act (Produkthaftungsgesetz).

Neither does the voluntary Manufacturer’s Warranty affects the Consumer’s legally applicable claims for defects towards the seller in the relevant country of purchase. In individual countries there may be warranties that can be issued by the relevant dealer (official distributor, Truma Partner). In such cases the warranty can be implemented directly through the dealer from whom the Consumer bought the unit. The warranty regulations of the country in which the unit was purchased by the Consumer for the first time shall also be applicable.

2. Warranty exclusions

No warranty claim shall be applicable under the following circumstances:

- Improper use, contrary to the specified use
- Improper installation, assembly or commissioning, contrary to operating or installation instructions
- Improper operation, contrary to operating or installation instructions, particularly maintenance, care and warning notes
- Instances where repairs, installations or any other procedures have been conducted by non-authorised partners
- Consumable materials and parts which are subject to natural wear and tear
- Installation of replacement, supplementary or accessory parts that are not original Manufacturer’s parts and which have thus caused a defect
– Damage arising from foreign substances (e.g. oils, plasticisers in the gas), chemical or electrochemical influences in the water, or cases when the unit has come into contact with unsuitable substances (e.g. chemical products, unsuitable cleaning agents)
– Damage caused by abnormal environmental or unsuitable operating conditions
– Damage caused by force majeure or natural disasters or any other influences not within Truma’s responsibility
– Damage resulting from improper transport

3. Making a warranty claim

The warranty must be claimed with an authorised service partner or at the Truma Service Centre. All the relevant addresses and phone numbers can be found at www.truma.com, in the “Service” section.

To ensure a smooth procedure, we should be grateful if you could have the following details ready before contacting us:
– Detailed description of the defect
– Serial number of the unit
– Date of purchase

The authorised service partner or the Truma Service Centre will then specify the further procedure. To avoid transport damage, the affected unit must only be shipped upon prior arrangement with the authorised service partner or the Truma Service Centre.

If the warranty claim is recognised by the Manufacturer, then the transport expenses shall be borne by the same. If no warranty claim is applicable, the Consumer will be notified accordingly and any repair and transport expenses shall then be the Consumer’s liability. We must ask you not to send in a unit without prior arrangement.

### Installation instructions

### Safety instructions

⚠️ This device contains parts that could cause sparks or a light arc!

Only qualified technicians may assemble and connect electrical devices!

The solar module generates power when light is cast on it. The full voltage is also available even if there is little light. The open circuit voltage may be twice as high. Do not touch any live parts. Cover solar modules with e.g. cardboard, before mounting and installing.

The device was developed for the connection of solar modules. Only use suitable modules e.g. Truma SM 65, SM 100 or SM 150. Observe the maximum voltage and power draw values.

Only use the specified cable cross-sections and fuses of the correct strength!

Do not install or operate the device in wet rooms (e.g. bathrooms) or in rooms in which highly flammable gas mixes can develop.

The installation of the device must comply with the technical and administrative provisions of the respective country in which it is used (e.g. EN 1648). National regulations and laws must be observed. National regulations and laws must be observed.
Delivery scope

- 1 Solar automatic charger
- 1 Temperature sensor
- 1 Support for temperature sensor
- 1 Instructions for installation and use

Assembly

See page 3, fig. B, C

The device should be installed away from damp and wet. The installation site should be clean, dry and well ventilated. During operation, the casing may heat up to around 80 °C.

⚠️ Ensure that the ventilation slits remain free! Inadequate ventilation can cause the device to overheat!

The installation space for the device must have ventilation openings at the top and side that provide a total opening surface of 100 cm².

If the temperature inside the device increases due to a lack of circulating air or due to the fact that the ambient temperature is too high, the device may become damaged.

Liquid electrolyte batteries need to be placed in a separate box with an external venting system. The gel and AGM batteries do not need a separate box. Observe the installation regulations of the battery manufacturer.

Secure the device with four screws (diameter 4 mm – not countersunk head screws). The screw length and torque depend on the underlying surface.

Connection

Cable lengths and cross-sections
Model complies with EN 1648-1 und VDE 0100, Part 721.

Fuses F1, F2
SDC 10 – 15 A
SDC 20 – 30 A

⚠️ Always position the fuses close to the energy source (e.g. battery). Only use the specified cable cross-sections and fuses of the correct strength!

Energy source / consumer connection

Connect the device with the solar modules and the batteries according to the wiring diagram. Check that the terminals are connected correctly.

Always switch several solar modules in parallel. Only use modules of the same typical voltage values (approx. 18 V). Just ask your dealer for the Truma Cable Set Expansion.

⚠️ Observe the connection sequence. The automatic adjustment 12 V / 24 V only function correctly in this case and can prevent damage to the battery.

1. Connect battery 1 (2) to the charger – plus and minus
2. Connect the solar modules to the charger – plus and minus
3. Connect the temperature sensor to the charger – plus and minus

Dismantle in reverse order.
Temperature sensor
Use the enclosed Truma temperature sensor, in particular for AGM batteries, for temperature-controlled battery charging.

Place the sensor in the centre near the positive terminal on the housing of the battery (1). To do this, place the sensor in the middle of the recess of the holder. Remove the protective film from the self-adhesive holder. Press the holder firmly into the desired position on the battery.

Wiring diagram
See page 2, fig. A.

Commissioning
The device is operational as soon as a battery of a solar module is connected (observe connection sequence).

Set battery type
Set the used battery type (battery 1) (see “Query / change settings – battery type”).

Cable fixing
Secure all cables (e.g. to energy sources, consumers and accessories) with cable ties.