



Installation Manual Of Solar Charger 3500

Installation & Operation Manual



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Table of Contents

1 Brief Introduction

- 1.1 Preface
- 1.2 Target Group
- 1.3 Product Description
- 1.4 Basic System Architecture
- 1.5 Product Overview

2 Safety Instructions

3 Installation

- 3.1 Unpacking and Inspection
- 3.2 Basic installation requirements
- 3.3 Solar Charger connection

4 SC 3500 address setting

5 Operation

- 5.1 Power on/off
- 5.2 Operation and display panel

6 Specifications

7 Trouble Shooting

8 Manufacturer Warranty

9 Contact

1 Brief Introduction

1.1 Preface

This manual describes the assembly, installation, operation and troubleshooting of Growatt Solar Charger 3500 of (which designed & produced by)GROWATT NEW ENERGY TECHNOLOGY CO.LTD.SHENZHEN(Short for Growatt New Energy as below). Please read this manual carefully and put this manual on some place where is convenient to installation, operation, obtain. Any modifications of Growatt New Energy, we will not notify the user. (please read this manual carefully before installations and operations ,keep this manual for future reference).

1.2 Target Group

Only qualified and trained electrical technicians are allowed to install and operate Solar Charger 3500. Solar Charger 3500 are compatible with lead acid battery. For lead acid battery, you are easy to find it on the market. However, we strongly recommend(suggest) you to contact your installer or Growatt customer service hotline + 86-0755-27471942/400-931-3122 to confirm before the procedure.

1.3 Product Description

Solar Charger 3500 is a domestic MPPT charger. Mixing with Growatt off line Inverter SPF3000/5000 which can increase off line system charging current and satisfy high capacity battery and fast charge need. Each SPF3000/5000 can match 2 pcs Solar Charger 3500 at most.

Features:

- 1)Perfect combination with SPF3000/5000.
- 2)MPPT solar charge controller.
- 3)Stable and reliable design ,good appearance as well .
- 4)Over current/Over temperature protection.
- 5)Smart battery charger design for optimized battery performance.
- 6)Growatt SPF3000/5000 can support the monitoring system which can collect all the input、output data that can be used for analyzing.
- 7) Easy installation and maintenance.

1.4 Basic System Architecture

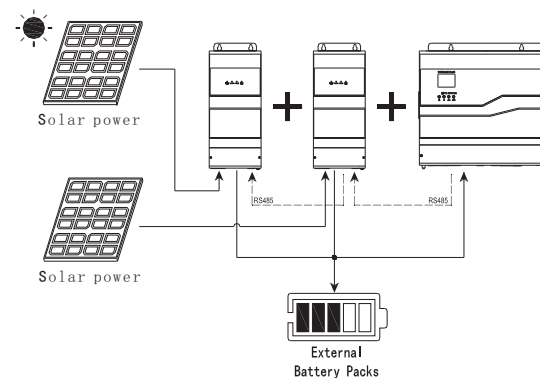


Figure 1.1

As above showing ,the photovoltaic off line system be constituted by 2pcs solar charger and 1pcs Growatt SPF3000/5000,the function of Solar Charger 3500 is increase photovoltaic energy utilization rate and charging current dramatically so that can save more energy to Battery. photovoltaic off line system can support various domestic and office devices including motor load,such as fan and refrigerator.

1.5 Product Overview

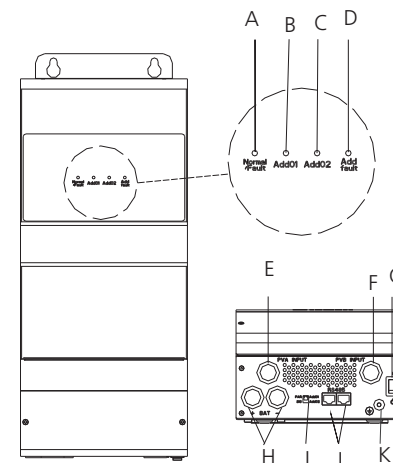


Figure 1.2

| Position | Description |
|----------|--------------------------|
| A | Status/ Fault indicator |
| B | Solar Charger 1 |
| C | Solar Charger 2 |
| D | Address Fault |
| E | PVA input |
| F | PVB input |
| G | Power on/off switch |
| H | Battery input |
| I | Mode & Address switch |
| J | RS485 communication port |
| K | Ground (yellow-green) |



WARNING: This chapter contains important safety and operating instructions. Read and keep this manual for future reference.

1. Before using the unit, read all instructions and cautionary marking on the unit, the batteries and all appropriate sections of this manual. The company has the right not to quality assurance, If not according to the instructions of this manual for installation and cause equipment damage.
2. All the operation and connection please professional electrical or mechanical engineer.
3. All the electrical installation must comply with the local electrical safety standards
4. When install PV modules in the daytime, Installer should cover the PV modules by opaque materials, Otherwise it will be dangerous as high terminal voltage of modules in the sunshine
5. **CAUTION :** To reduce risk of injury, charge only deep-cycle lead-acid type rechargeable battery. Other types of batteries may burst, causing personal injury and damage.
6. Do not disassemble the unit. Take it to a qualified service center when service or repair is required. Incorrect re-assembly may result in a risk of electric shock or fire.
7. To reduce risk of electric shock, disconnect all wirings before attempting any maintenance or cleaning. Turning off the unit will not reduce this risk.
8. NEVER charge a frozen battery.
9. For optimum operation of this inverter, please follow required spec to select appropriate cable size. It's very important to correctly operate this inverter.
10. Be very cautious when working with metal tools on or around batteries. A potential risk exists to drop a tool to spark or short circuit batteries or other electrical parts and could cause an explosion.
11. **GROUNDING INSTRUCTIONS** -This Solar Charger 3500 should be connected to a permanent grounded wiring system. Be sure to comply with local requirements and regulation to install this Solar Charger 3500.
12. Make sure the Solar Charger 3500 is completely assembled, before the operation.

3 Installation

3.1 Unpacking and Inspection

Before installation, please inspect the unit. Be sure that nothing inside the package is damaged. You should have received the following items inside of package:

- The unit x1
- User manual x1
- 1 meter long cable x1
- Setscrews x3

3.2 Basic installation requirements

- 1.The installation location must be suitable for Solar Charger 3500 weight for a long period time.
- 2.The installation location must conform with dimension of Solar Charger 3500.
- 3.Do not mount the solar charger on flammable construction material .
- 4.The Ingress Protection rate is IP20 and the pollution degree is PD2, The install area shall be generally conditioned in term of temperature, humidity and air filtration.
- 5.Battery installation option is not far below the position of energy storage machine.
- 6.The humidity of the installation location should be 5 ~ 85%.
- 7.The ambient temperature should be 0°C~55°C .
- 8.Solar Charger 3500 can be installed in vertical or lean back on plane, Please refer to the below Installation position shall not prevent access to the disconnection means.

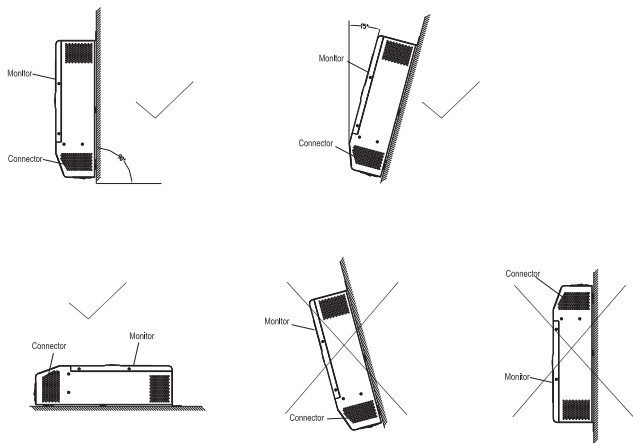


Figure 3.1

9.In order to ensure machine can run normally and easy to operate, please pay attention to provide adequate space for Solar Charger 3500. Please refer to below:

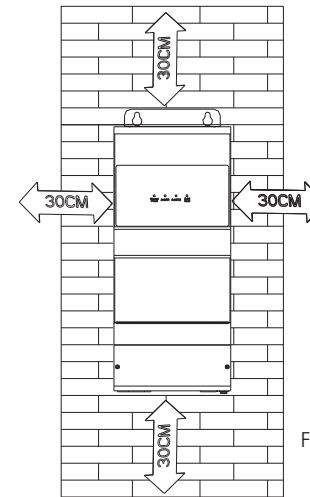


Figure 3.2

- 10.Do not install the machine near television antenna or any other antennas and antenna cables.
- 11.Don't install the machine in the living area.
- 12.Be sure that the machine is out of the children's reach.
- 13.Install the unit by screwing three crews as below. It's recommended to use M6 screws.

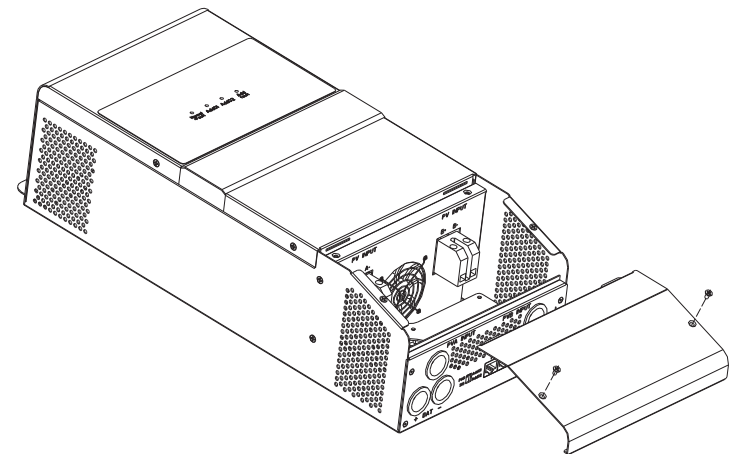


Figure 3.3

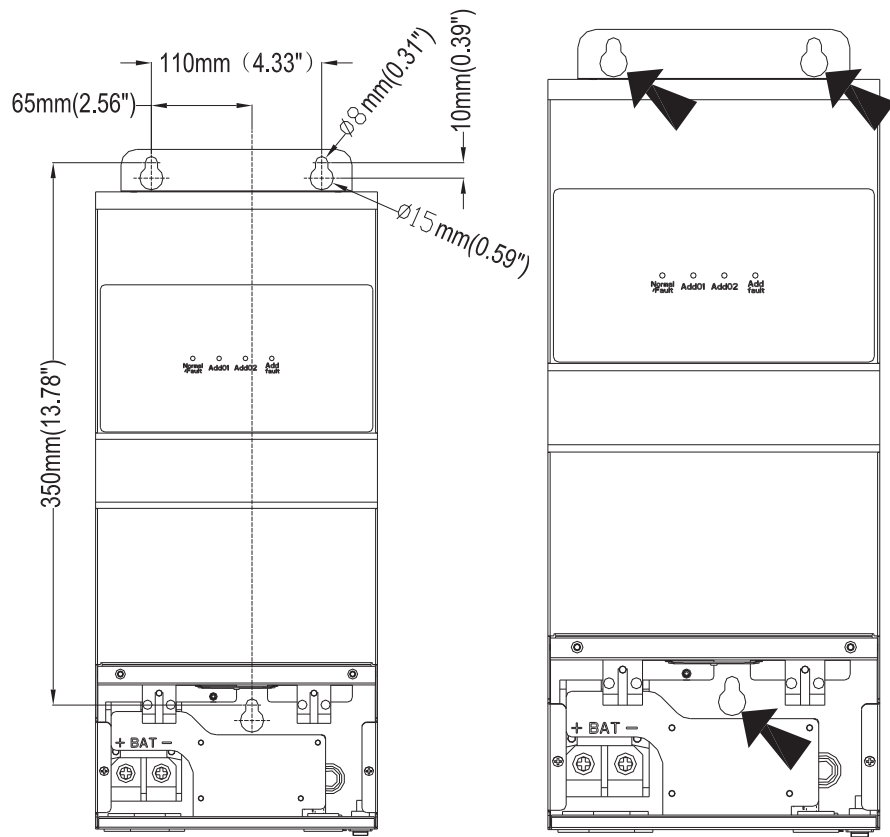


Figure 3.4

3.3 Solar Charger connection

3.3.1 Battery connection

User can choose proper capacity lead acid battery with a nominal voltage at 48V. CAUTION: For safety operation and regulation compliance, it's requested to install a separate DC over-current protector or disconnect device between battery and Solar Charger 3500. It may not be requested to have a disconnect device in some applications, however, it's still requested to have over-current protection installed. WARNING! All wiring must be performed by a qualified personnel. WARNING! It's very important for system safety and efficient operation to use appropriate cable for battery connection. To reduce risk of injury, please use the proper recommended cable and terminal size as below. Ring terminal:

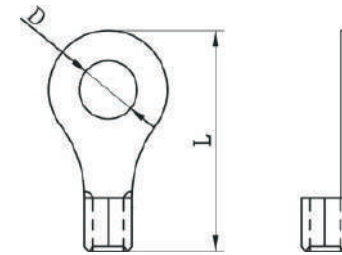


Figure 3.5

Recommended battery cable and terminal size:

| Model | Max. charging Current | Capacity | Diameter | Dimension (mm) | | | Torque |
|--------------------|-----------------------|----------|----------|----------------|----------------|--------|--------|
| | | | | Cross-section | Inner diameter | Length | |
| Solar Charger 3500 | 70A | 350AH | 1*8AWG | 8 | 6.4 | 23.8 | 2-3Nm |

Table 3. 1

Note: for lead acid battery, the recommended charge current is 0.2C(C-battery capacity) Please follow below steps to implement lead-acid battery connection:
 1.Assemble battery ring terminal based on recommended battery cable and terminal size.
 2.Connect all battery packs as units requires. It's suggested to connect at least 350Ah capacity battery for Solar Charger 3500.
 Insert the ring terminal of battery cable flatly into battery connector of inverter and make sure the bolts are tightened with torque of 2-3Nm.Make sure polarity at both the battery and the inverter/charge is correctly connected and ring terminals are tightly screwed to the battery terminals.

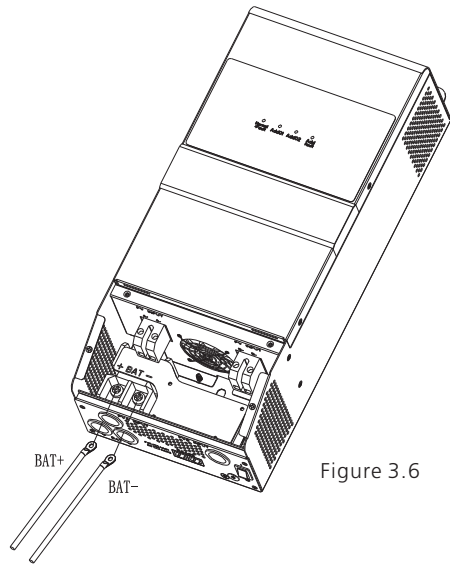


Figure 3.6

3.3.2 RS485 connection

Solar Charger 3500 has two parallel RS485 ports which can connect with Growatt SPF3000/5000 and another Solar Charger 3500 by "hand by hand" type. One of 485 ports connect with Growatt SPF3000/5000 and another one connect with Solar Charger3500.

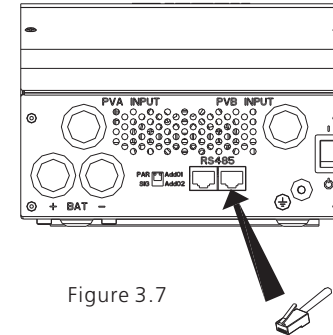


Figure 3.7

3.3.3 PE connection

- ⊕ → Ground (yellow-green)
- ⊕ With the 12 line and M5 terminals connected, and then a screwdriver to lock the ground, as shown below.

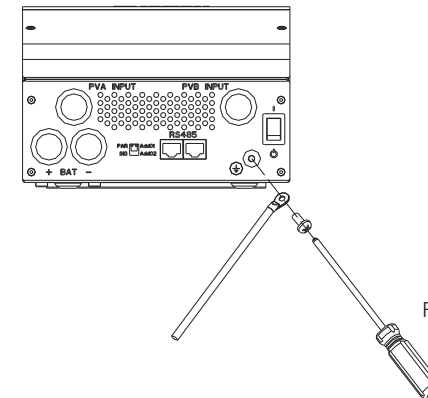


Figure 3.8

| | |
|--|--|
| | <p>WARNING: Shock Hazard PE earth must be connected to ensure personal safety</p> |
|--|--|

Table 3.3

| | |
|--|---|
| | <p>WARNING: Shock Hazard Installation must be performed with care due to high battery voltage in series.</p> |
| | <p>CAUTION!! Do not place anything between the flat part of the Solar Charger 3500 terminal and the ring terminal. Otherwise, overheating may occur. CAUTION!! Do not apply anti-oxidant substance on the terminals before terminals are connected tightly. CAUTION!! Before making the final DC connection or closing DC breaker/disconnector, be sure positive (+) must be connected to positive (+) and negative (-) must be connected to negative (-).</p> |

Table 3.2

3.3.4 PV connection

CAUTION: Before connecting to PV modules, please install separately a DC circuit breaker between inverter and PV modules.

WARNING! All wiring must be performed by a qualified personnel.

WARNING! It's very important for system safety and efficient operation to use appropriate cable for PV module connection. To reduce risk of injury, please use the proper recommended cable size as below.

| Model | Max charging current per string | Diameter | Torque |
|--------------------|---------------------------------|----------|-----------|
| Solar Charger 3500 | 35A | 1*10AWG | 1.2-1.6Nm |

Table 3.4

PV Module Selection:

When selecting proper PV modules, please be sure to consider below parameters:
1.Open circuit Voltage(Voc) of PV modules not exceeds max. PV array open circuit voltage of inverter.

2.Open circuit Voltage(Voc) of PV modules should be higher than min. battery voltage.

| Model | Solar Charger 3500 |
|------------------------------------|--------------------|
| Max. PV array open circuit voltage | 145Vdc |
| PV array MPPT voltage range | 60~115Vdc |
| Min. battery voltage for PV charge | 36Vdc |

Table 3.5

There're two pairs of string for PV SC3500.

Please follow below steps to implement PV input connection:

1.Remove insulation sleeve 10 mm for positive and negative conductors.



Figure 3.9

2.Check correct polarity of connection cable from PV modules and PV input connectors. Then, connect positive pole (+) of connection cable to positive pole (+) of PV input connector. Connect negative pole (-) of connection cable to negative pole (-) of PV input connector.

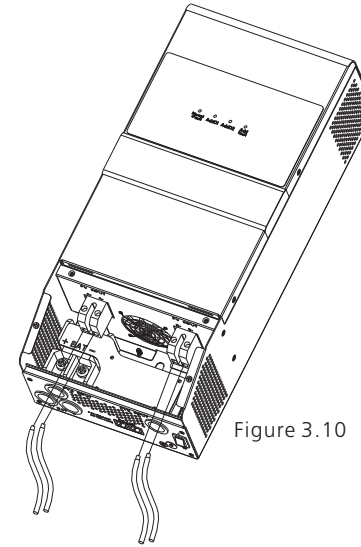


Figure 3.10

3.Make sure the wires are securely connected.

3.3.5 Finally assemble

After connecting all wirings, please put bottom cover back by screwing two screws as shown below:

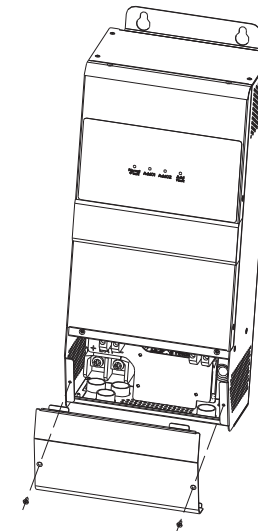


Figure 3.11

4 SC3500 address setting

As below showing ,the left DIP need to turn to 'PAR' when Solar Charger 3500 mix with Growatt SPF3000/5000.

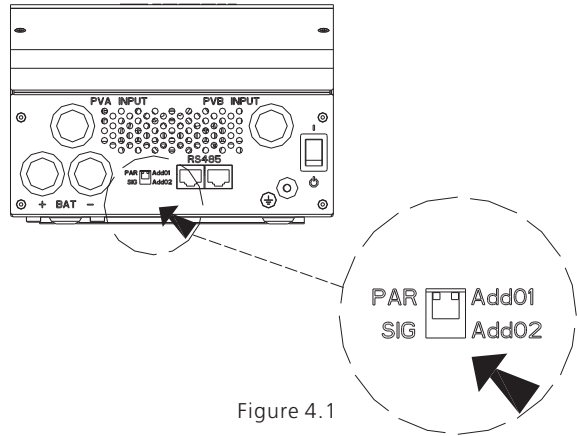


Figure 4.1

The Solar Charger 3500 is working as slave charger of Growatt SPF3000/5000.the panels energy priority from high to low is : Growatt SPF3000/5000,slave 1(charger 1), slave 2(charger 2).

The right DIP can set the charger address ,turn to "Add01" means charger 1. "Add02" means charger 2.

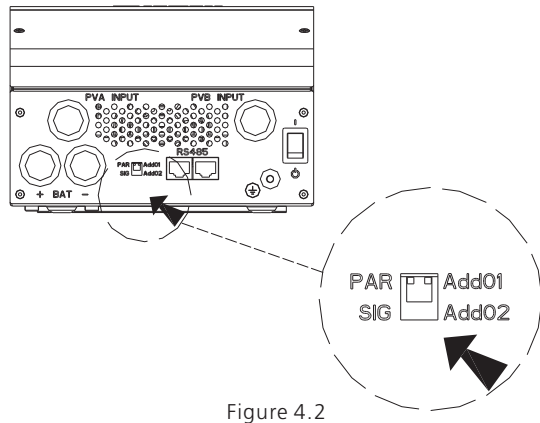


Figure 4.2

| | |
|--|--|
| | <p>WARNING: If you installed 2pcs Solar Charger 3500, The address DIP should be different ,otherwise the system would not working .</p> |
|--|--|

Table 4.1

5.1.Power on/off

Once the unit has been properly installed and the batteries are connected well,simply press On/Off switch (located on the button of the case) to turn on the unit.

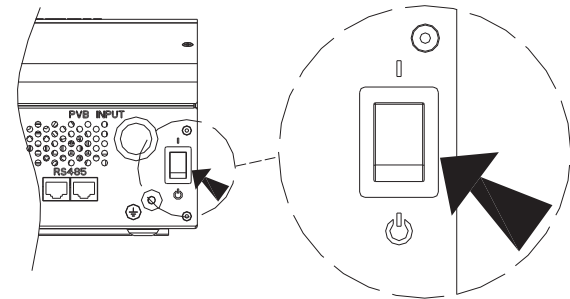


Figure 5.1

Kindly reminder :for insuring the lowest consumption in the night ,we suggest turning off the starting up switch when system working on normal mode.

5.2.Operation and display panel

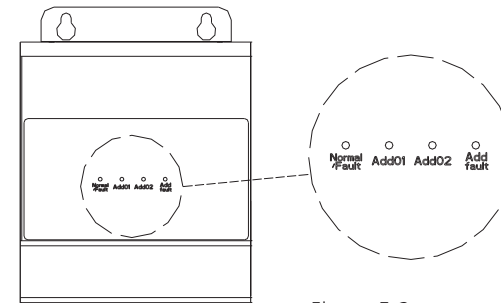


Figure 5.2

LED indicator:

| LED | LED status | Description |
|-----------|------------|----------------------------------|
| Add01 | ON | Solar Charger 3500 slave 1 |
| Add02 | ON | Solar Charger 3500 slave 2 |
| Add fault | ON | Solar Charger 3500 address fault |

| | | |
|---------------|-------------|--------------------------------------|
| Normal/ Fault | GREEN ON | Charge |
| Normal/ Fault | GREEN flash | Standby/ Flash |
| Normal/ Fault | RED flash | Warning : Warning, but still working |
| Normal/ Fault | RED ON | Error: Solar Charger stop work |

Table 5.1

Buzzer:

| Status | Description |
|-----------------------|--------------------------------------|
| Beeps every 3 seconds | Warning : Warning, but still working |
| Beeps constantly | Error: Solar Charger stop work |

Table 5.2

Setting and checking:

After pressing and holding ENTER button for 3 seconds, the unit will enter setting mode. Press "UP" or "DOWN" button to select setting programs. And then, press "ENTER" button to confirm the selection or ESC button to exit.

| main menu | submenu | description |
|--------------------|-----------------------|---|
| SolarCharge Para | ON | OPEN Solar Charger |
| | OFF (default) | Close Solar Charger |
| Buzzer ON/OFF | ON (default) | Alarm on. |
| | OFF | Alarm off. |
| Max charge Current | xxxA (default 70A) | If battery type is selected as lead acid battery, this program can be set up. Each solar charger can provide up to 70A charging current |
| Bulk charge Volt. | xx.xV (default 56.4V) | If battery type is selected as "self-defined Lead_Acid", this program can be set up. Setting range is from 50.0V to 57.4V. |
| Float charge Volt. | xx.xV (default 54V) | If battery type is selected as "self-defined Lead_Acid", this program can be set up. Setting range is from 50~56V. |

Table 5.3

| main menu | submenu | description |
|-----------------|----------------------|--|
| Solar Charger 1 | Epv_a: xx.xkwh | Solar Charger 1's Total PV generation |
| | Epv_d: xx.xkwh | Solar Charger 1's Daily PV generation |
| | Ppv: xxxx/xxxxw | Solar Charger 1's power: PVA charge power/ PVB charge power |
| | Ic_pv: xx. x/xx. x A | Solar Charger 1's charge current: PVA charge current/ PVB charge current |
| | Vpv: xxx/xxxV | Solar Charger 1's PV voltage: PVA voltage/PVB voltage |
| Solar Charger 2 | Epv_a: xx.xkwh | Solar Charger 2's Total PV generation |
| | Epv_d: xx.xkwh | Solar Charger 2's Daily PV generation |
| | Ppv: xxxx/xxxxw | Solar Charger 2's power: PVA charge power/ PVB charge power |
| | Ic_pv: xx. x/xx. x A | Solar Charger 2's charge current: PVA charge current/ PVB charge current |
| | Vpv: xxx/xxxV | Solar Charger 2's PV voltage: PVA voltage/PVB voltage |

Table 5.4

Error description:

| Error code | Description |
|------------------|-------------------------|
| Bat voltage high | Battery voltage is high |
| Over Temperature | Over temperature |
| Error: 103 | Buck over current |

Table 5.5

Warn description

| Item | Description |
|------------------|-----------------------------|
| Warn:Fan Warning | Fan failed to turn |
| Warn: Bat Low | Battery voltage low |
| Warn: Over Temp | Over temperature |
| Warn: 103 | Failed to read EEPROM |
| Warn: 104 | Firmware version mismatched |
| Warn: 105 | Failed to write EEPROM |

Table 5.6

PV Mode Specifications:

| | |
|-----------------------------------|--|
| Solar Charger MODEL | Solar Charger 3500 |
| INPUT | |
| PV Array MPPT Voltage Range | 60-115VDC |
| MAX PV Array Open Circuit Voltage | 145VDC |
| Pv1 MAX Power | 1750W |
| Pv2 MAX Power | 1750W |
| Pv1 MAX Input Current | 30A |
| PV2 MAX Input Current | 30A |
| OUTPUT | |
| Nominal Battery Voltage | 48VDC |
| Efficiency | 98.0% MAX |
| MAX Charging Current | 70A |
| PV1 MAX Charging Current | 35A |
| Pv2 MAX Charging Current | 35A |
| Connected Battery Type | lead acid |
| Charging Method | Three stages: bulk, absorption, and floating |

Table 6.1

General Specifications:

| | |
|-----------------------------|--------------------|
| INVERTER MODEL | Solar Charger 3500 |
| Safety Certification | CE |
| Operating Temperature Range | 0°C–55°C |
| Storage Temperature | –15°C–60°C |
| Quality Guarantee Period | 3 years |
| Protection | Over Temperature |
| | Over charge |
| | Over Current |
| Noise | <48dB |
| Dimension (D*W*H, mm) | 470*185*120mm |
| Net Weight, kg | 4KG |

Table 6.2

| Problem | Explanation/Possible cause | What to do |
|---|--|--|
| Unit shuts down automatically during startup process. | The battery voltage is too low | 1. Re-charge battery. 2. Replace battery. |
| No response after power on. | 1. The battery voltage is far too low. 2. Battery polarity is connected reversed. | 1. Check if batteries and the wiring are connected well. 2. Re-charge battery. 3. Replace battery. |
| Addr fault LED ON | Solar Charger 3500 address fault | Turn off the charger 1 address set to addr1, charger2 address set to addr2. Set up, re-boot |
| A boot SC3500 error | 1. RS485 cable is not inserted. 2. SPF5000 solar charger enable is not enabled. | 1. Check whether the RS485 cable is plugged in. 2. Enable the SPF5000 solar charger to turn on. |

Table 7.1

Note: Back up time depends on the quality of the battery, age of battery and type of battery.
Specifications of batteries may vary depending on different manufacturers.

8 Manufacturer Warranty

This certificate represents a 3 year warranty for the Growatt products listed below. Possession of this certificate validates a standard factory warranty of 3 years from the date of purchase.

Warranted products

This warranty is applicable solely to the following products:
Solar Charger 3500

Limited Product Warranty

(Applicable under normal application, installation, use and service conditions) Growatt provides a non-transferable warranty for a period of 3 years for the above listed products. This standard warranty validates from the date of customer purchase, and doesn't exceeding 3 years from the date of purchasing as shown in the proof of Purchase from the Original purchaser.

Growatt shall have no obligation to keep product warranty, if any of the following situations occurs:

- Misuse, abuse, neglect or accident;
- Alteration, improper installation or application;
- Unauthorized modification or attempted repairs;
- Insufficient ventilation of the product;
- Breaking of the original manufacturers seal;
- Non-observance of Growatt installation and maintenance instruction;
- Failure to observe the applicable safety regulations;
- Power failure surges, flood, fire, accident, force majeure, explosion, terrorist act, extreme weather conditions or other unreasonable circumstances.

The warranty shall also cease to apply if the product cannot be correctly identified as the product of Growatt. Warranty claims will not be honored if the type of serial number on the machines have been altered, removed or rendered illegible.

Contact 9

If you have technical problems about our products, contact the Growatt Service line or dealer. We need the following information in order to provide you with the necessary assistance:

1. Machine Serial number
2. Machine module information
3. Machine communication mode
4. Machine fault information code
5. Machine Display content
6. The manufacturer and model of the battery
7. Battery capacity and connection mode

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