

Solar Inverter/Charger

PV1100 PLUS

(1200VA/1800VA/2400VA)



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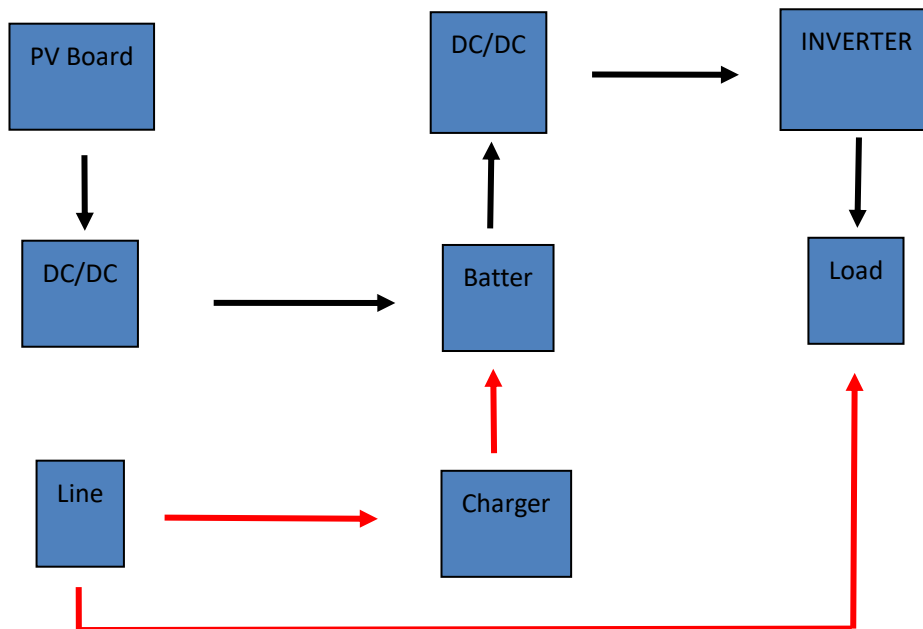
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1. General Information

1.1 Brief introduction

This manual mainly introduces the maintenance methods of PV11-1200 model, disassembly and some attention; please refer to PV11-1200 maintenance manual when repairing PV11-1800/PV11-2400.

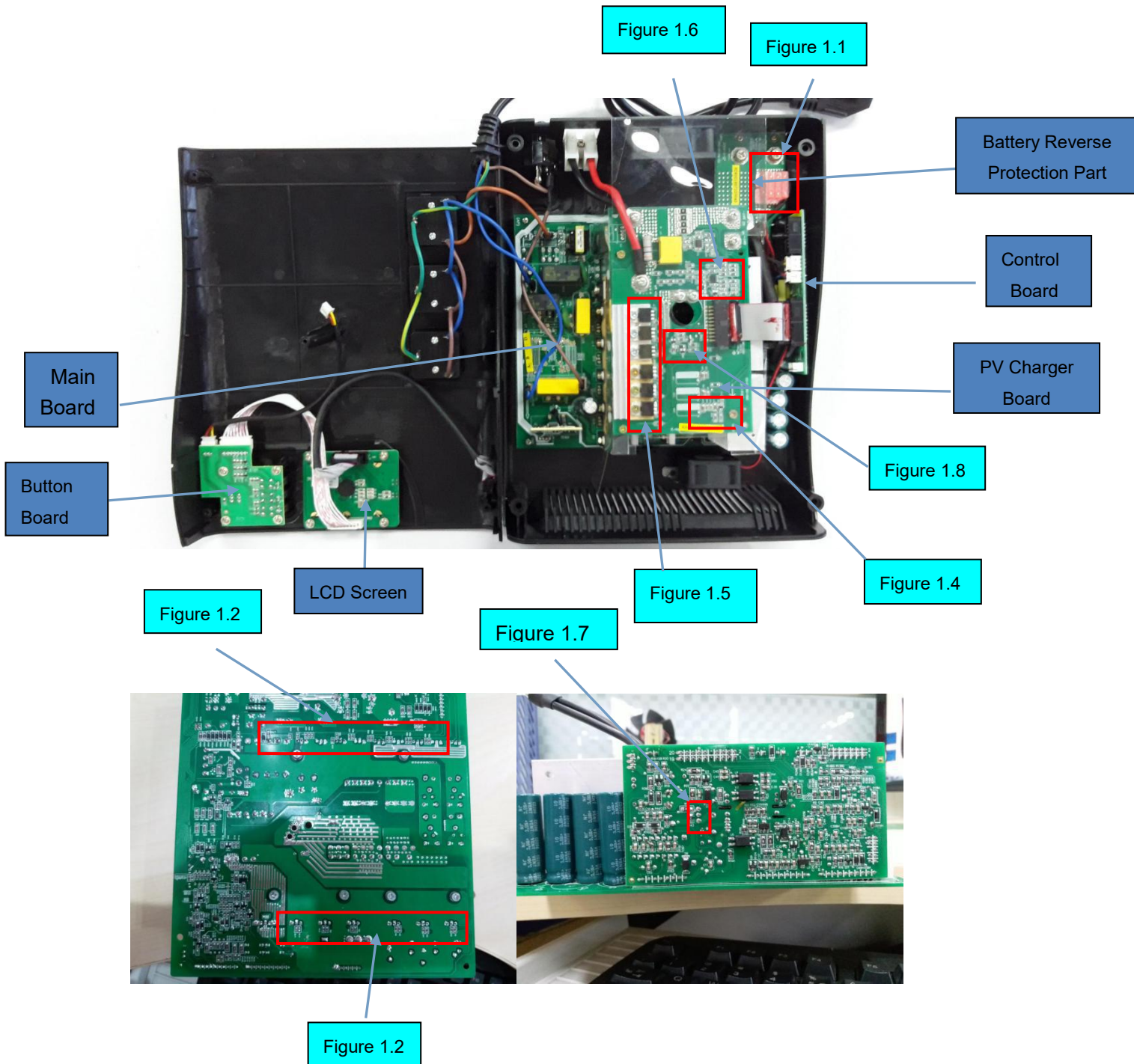
1.2 Inverter Schematic Diagram



PV Priority: Black Arrow

AC Priority: Red Arrow

1.3 Inverter Components Instructions



2. Fault Code

Note: No.00-No.07 is fault code; No.10-No.16 is warning code

Fault Code	Description
00	Output short circuit
01	Output overload
02	Battery damaged
03	Inverter output volt is over 280VAC
04	Inverter output volt is below 170VAC
05	PV charger MOS temperature is too high
06	Battery volt is too high
07	Fan fault
Warning Code	Description
10	PV charge current is too large
11	PV input volt is too low
12	PV input volt is too high
14	Frequency abnormal
15	Battery volt is too low
16	Overload warning

3. Maintenance

Note: When repairing, in order to avoid second damage caused by large current, you must use DC power supply analog battery to connect to open the inverter, and make sure the current is below 3A.

4. Fault Symptom

4.1 Inverter Failure in Starting

Possible Reasons as follows

A. Battery Reversely Connected or Battery Volt Abnormal

Check if battery input volt is normal:

Position	Type	Normal Value	Failure Status
Battery input terminal	Cable connection terminal	10-14VDC	Beyond normal value

B. Battery Reverse Protection Board Fuse Broken

Check if fuse is disconnected (Figure 1.1)

Position	Type	Normal Value	Failure Status
Battery reverse protection board F1	Fuse	Direct connected, 0 ohm	Disconnected

C. Control Board Auxiliary Power Abnormal

Check if auxiliary power MOS and IC are broken.(Figure 1.7, less possibility, normally occurs when inverter blast)

Position	Type	Normal Value	Failure Status
Control board Q7	MOS	Boost reversely between D-S 0.551	Short circuit or other value

D. Main Board MOS Broken when Boosting (Figure 1.2)

Position	Type	Normal Value	Failure Status
Main board Q1-Q7	MOS	Boost reversely between D-S 0.248	Short circuit or other value
Note: If confirmed MOS broken, need to check if relative drive resistor is burned, broken resistor value is larger than normal one.			

E. Main Board Invert MOS Broken (Figure 1.3)

Position	Type	Normal Value	Failure Status
Main board Q8-Q16	MOS	Boost reversely between D-S 0.515	Short circuit or other value
Note: If confirmed MOS broken, need to check if relative drive resistor is burned, broken resistor value is larger than normal one.			

F. Cables Not to Connect Well

Position	Type	Normal Value	Failure Status
Connection cable between control board and button board	Connection cable	Connected well	Disconnected

4.2 PV Failure in Charging

Possible Reasons as follows

A. PV Cables Connected Reversely or PV Volt Abnormal

Position	Type	Normal Value	Failure Status
PV cable connection terminal	Cable connection terminal	Connected well & PV volt between 15-30VDC	Poor connect, PV volt is beyond normal value

B. In AC Priority Mode

Position	Type	Normal Value	Failure Status
Setting option No.6	Charger priority setting	CSO/OSO	Others

C. PV Charger Board (Figure 1.8)

Position	Type	Normal Value	Failure Status
PV charger board Q7\Q8\Q9	Triode	Boost 0.660	Short circuit or big gap compared with normal value

4.3 Fault Code 00/01 When Starting Inverter

Possible Reasons as follows

A. Output Load Short Circuit or Overload

Disconnect load and restart to check if it is the load problem.

B. Main Board Output Invert MOS Broken (Figure 1.3)

Position	Type	Normal Value	Failure Status
Main board Q8-Q16	MOS	Boost reversely between D-S 0.515	Short circuit or other value
Note: If confirmed MOS broken, need to check if relative drive resistor is burned, broken resistor value is larger than normal one.			

4.4 Fault Code 02

Possible Reasons as Follows

A. Battery Damaged, battery volt is too low.

B. Battery is Connecting other load result in battery volt can't be boosted.

4.5 Fault Code 03

Possible Reasons as Follows

A. One group of output invert MOS on main board doesn't work (Figure 1.3)

Position	Type	Normal Value	Failure Status
Main board Q8-Q16	MOS	Boost reversely between D-S 0.515	Short circuit or other value

Note: If confirmed MOS broken, need to check if relative drive resistor is burned, broken resistor value is larger than normal one.

B. Voltage detected abnormal, circuit burned (less possibility, normally occurs when inverter blast)

4.6 Fault Code 04

Possible Reasons as Follows

A. Battery volt is too low and load is too large

Disconnect load and restart

4.7 Fault Code 05

Possible Reasons as Follows

A. PV charger board temperature too high, circuit abnormal (Figure 1.4)

Position	Type	Normal Value	Failure Status
PV charger board C14	Chip capacitor	Resistance valus is around 8.5K	Big gap compared with normal value

4.8 Fault Code 06

Possible Reasons as Follows

A. PV charger voltage can't be controlled, check charger MOS (Figure 1.5)

Position	Type	Normal Value	Failure Status
PV charger board Q1-Q7	MOS	Boost reversely between D-S 0.455	Short circuit or other value

4.9 Fault Code 07

Possible Reasons as Follows

- A. Fan is broken.
- B. Fan is blocked.

4.10 Fault Code 10

Possible Reasons as Follows

- A. PV charger board charge MOS is broken, current is not limited (Figure 1.5)

Position	Type	Normal Value	Failure Status
PV charger board Q1-Q7	MOS	Boost reversely between D-S 0.455	Short circuit or other value

- B. PV current detected abnormal, circuit damaged (Figure 1.6)

Position	Type	Normal Value	Failure Status
PV charger board U1-U2	IC	Normal	Pin-out to earth (4 pins) short circuit

4.11 Fault Code 12

Possible Reasons as Follows

- A. PV input volt is over rated max open circuit volt

Position	Type	Normal Value	Failure Status
PV cable connection terminal	Cable connection terminal	Connected well, the volt between 15-30VDC	Poor connect, PV inout volt is over 50VDC

4.12 Fault Code 14

Possible Reasons as Follows

- A. Utility frequency is below 40Hz or over 70Hz

Position	Type	Normal Value	Failure Status
Utility input socket	Socket	40-70 Hz	Beyond normal value

4.13 Fault Code 15

Possible Reasons as Follows

- A. Battery low volt warning.
B. Low DC cut-off voltage is set too high

Position	Type	Normal Value	Failure Status
Setting option 07	Low DC cut-off voltage	10.5-11.5VDC	Others

4.14 Fault Code 16

Possible Reasons as Follows

- A. Overload warning

Deduct some loads

5. Inverter Disassemble & Assemble

5.1 Take out the 5 screws in the inverter bottom side, then you can open the unit;

5.2 Take off the connection cable of LCD and button board;

5.3 Dis-assembly battery reverse protection board, take off all cables on main board;

5.4 Dis-assembly the screws on main board, then you can take out the main board (please note there's snap joint when taking it out)

6. Inverter Testing after Repairing

6.1 Connect DC and test OK

6.2 Connect AC and test OK

6.3 Connect PV and test OK