SERVICE MANUAL

For SUPER HOME SERIES UPS

1.2K ~ 13KVA UPS

Warning:

1. For unqualified personnel, do not open the cover of the UPS. Otherwise, it may cause accident injuries.
2. Disconnect the connection wires from the utility power and the battery bank before performing the maintenance.
3. Do not wear metallic rings such as watches when performing the maintenance.
4. Wear anti-static bracelets when removing, maintaining the PCBA. Otherwise the CPU, IC and MOSFET will be damaged by the static.
5. The maintenance tools must be reliable and insulated.
6. When performing the finished unit and PCBA tests after the maintenance, you’d better start up the UPS with DC voltage stabilizing power supply in current limit mode, which may help the PCBA avoid heavy damages.
7. Make sure that the PE wire of all the probes are on the same electric phase when using a multi-channel oscilloscope.

1. Specifications

MODEL			SH-1200	SH-2400	SH-3600
Input	Capacity		1.2KVA / 800W	2.4KVA / 1600W	3.6KVA / 2400W
	Nominal Voltage	Nominal Voltage	120Vac or 220 Vac Systems		
		Acceptable Voltage	60Vac ~ 135 Vac or 120Vac ~275Vac		
		Frequency	45Hz ~ 70Hz		
	Voltage Range	Line Low Transfer	60Vac ± 2% or 120Vac ± 2%		
		Line Low Return	65Vac ± 2% or 130Vac ± 2%		
		Line High Transfer	135Vac ± 2% or 275Vac ± 2%		
		Line High Return	130Vac ± 2% or 260Vac ± 2%		
Output	Voltage		120Vac (110Vac or 115Vac re-settable via LCD panel) 220Vac (230Vac or 240Vac re-settable via LCD panel)		
	Voltage Regulation (Batt. Mode)		< 3% RMS for entire battery voltage range		
	Frequency		50Hz or 60Hz		
	Frequency Regulation (Batt. Mode)		± 0.1Hz		
	Wave Form		Pure Sinewave		
	Power Factor		0.67		
	Transfer Time		< 8 milliseconds (typical)		
Battery	Battery DC Voltage		12Vdc	24Vdc	
	Backup Time		Long time backup available		
	Max. Charging Current (3 Steps Selectable)		> 40A	>50A	
Display	LCD		UPS Status, I/P & O/P Voltage and Frequency, Load %, Battery Voltage and %, Temperature, Model Specifications, etc		
Audible Alarm	Battery Mode		Beep every 4 seconds		
	Battery Low		Beep every 1 second		
	Fault		Beep continuously		
	Overload		Beeping twice per second. UPS will shutdown automatically in 30 seconds if Overload is over 105%~150% and up to 150% will Shutdown immediately .		
Solar Server (Optional)	Solar Power Server		Optional Charger 50A		
Interface	SNMP Intelligent Card (Optional)		Power Management for SNMP Manager and Web Browser		
Environment	Operation Temperature		0^{o} C - 40^{o} C ; 32^{o} F - 104^{o} F ;		
	Humidity		0-95% Non-condensing		
	Acoustic Noise		Less than 55dB at 1mt		
Net Weight	Wall Mounted		14.00 Kgs	21.00 Kgs	23.00 Kgs
Dimensions	Tower(W x H x D) mm		298*400*150	298*450*190	298*450*190

** Specification Subject to Chance Without Prior Notice*

MODEL			SH-6600	SH-10000	SH-13000
Input	Capacity		6.6KVA / 4000W	10KVA / 6000W	13KVA / 8000W
	Nominal Voltage	Nominal Voltage	120Vac or 220 Vac Systems		220Vac Systems
		Acceptable Voltage	60Vac ~ 135 Vac or 120Vac ~275Vac		120Vac ~275Vac
		Frequency	45Hz ~ 70Hz		
	Voltage Range	Line Low Transfer	60Vac ± 2% or 120Vac ± 2%		120Vac ± 2%
		Line Low Return	65Vac ± 2% or 130Vac ± 2%		130Vac ± 2%
		Line High Transfer	135Vac ± 2% or 275Vac ± 2%		275Vac ± 2%
		Line High Return	130Vac ± 2% or 260Vac ± 2%		260Vac ± 2%
Output	Voltage		120Vac (110/115Vac re-settable via LCD panel) 220Vac (230/240Vac re-settable via LCD panel)		220Vac (230Vac or 240Vac re-settable via LCD panel)
	Voltage Regulation (Batt. Mode)		< 3% RMS for entire battery voltage range		
	Frequency		50Hz or 60Hz		
	Frequency Regulation (Batt. Mode)		± 0.1Hz		
	Wave Form		Pure Sinewave		
	Power Factor		0.6		0.62
	Transfer Time		< 8 milliseconds (typical)		
Battery	Battery DC Voltage		24Vdc	48Vdc	
	Backup Time		Long time backup available		
	Max. Charging Current (3 Steps Selectable)		>60A		
Display	LCD		UPS Status, I/P & O/P Voltage and Frequency, Load %, Battery Voltage and %, Temperature, Model Specifications, etc		
Audible Alarm	Battery Mode		Beep every 4 seconds		
	Battery Low		Beep every 1 second		
	Fault		Beep continuously		
	Overload		Beeping twice per second. UPS will shutdown automatically in 30 seconds if Overload is over 105%~150% and up to 150% will Shutdown immediately .		
Solar Server (Optional)	Solar Power Server		Optional Charger 50A		
Interface	SNMP Intelligent Card (Optional)		Power Management for SNMP Manager and Web Browser		
Environment	Operation Temperature		0^{o} C - 40^{o} C ; 32^{o} F - 104 ^{o} F ;		
	Humidity		0-95% Non-condensing		
	Acoustic Noise		Less than 55dB at 1mt		
Net Weight	Wall Mounted		49.20 Kgs	51.40 Kgs	53.60 Kgs
Dimensions	Tower(W x H x D) mm		415*600*260	415*600*260	415*600*260

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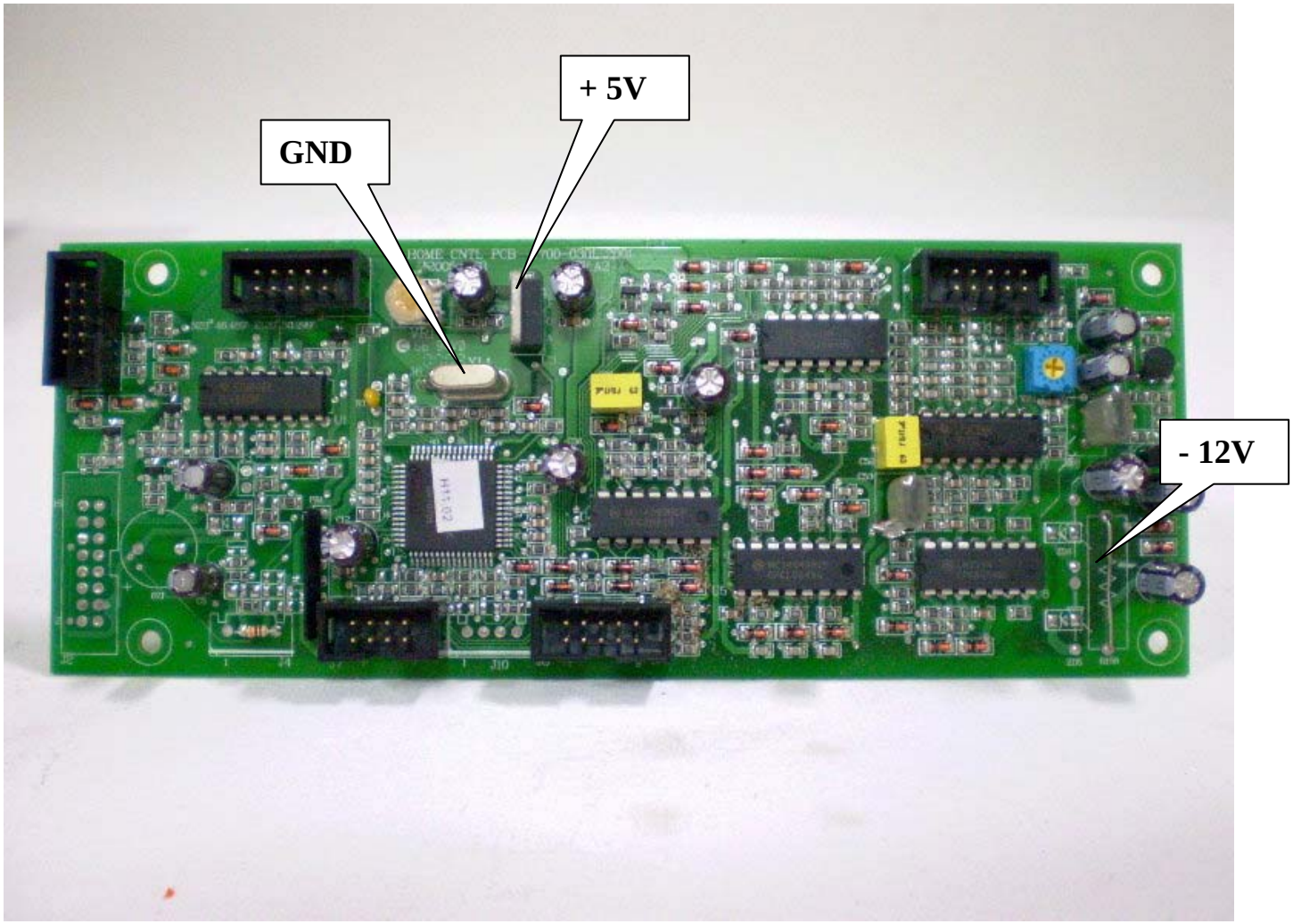
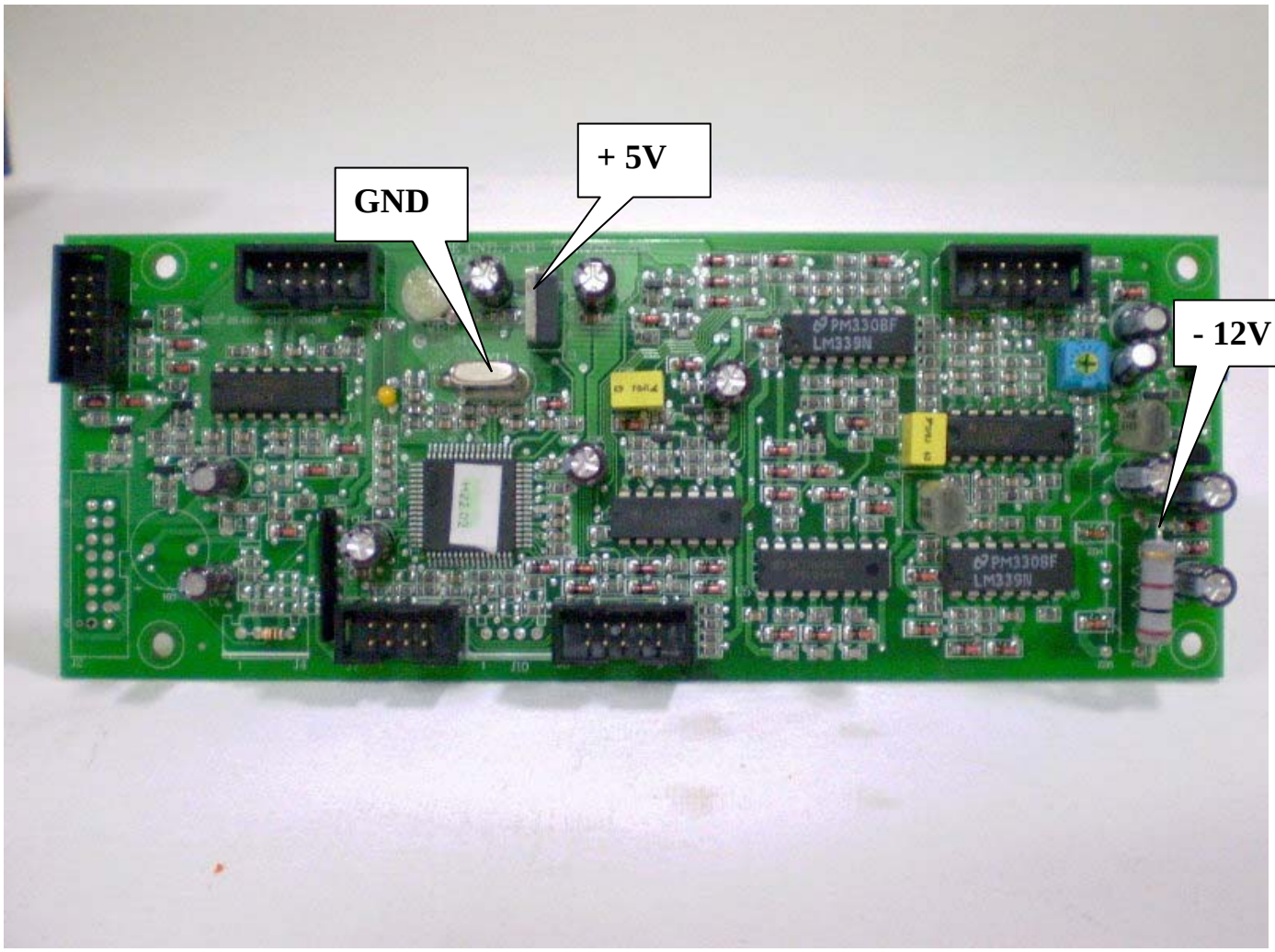
2. Reference Data

Item	Data
Battery Voltage(Zero Load)	1.2KVA : 10.5V ~ 13.5V 2.4K / 3.6K / 5KVA : 20V ~ 27V 6K / 8KVA : 40V ~ 54V
+ 5V	4.95V ~ 5.05V
+12V	+11.8V ~ +13.8V
-12V	-11.8V ~ -13.8V
Balance voltage(zero load）	< 5mV
Inverter Voltage(Zero Load)	+ / - 3 %

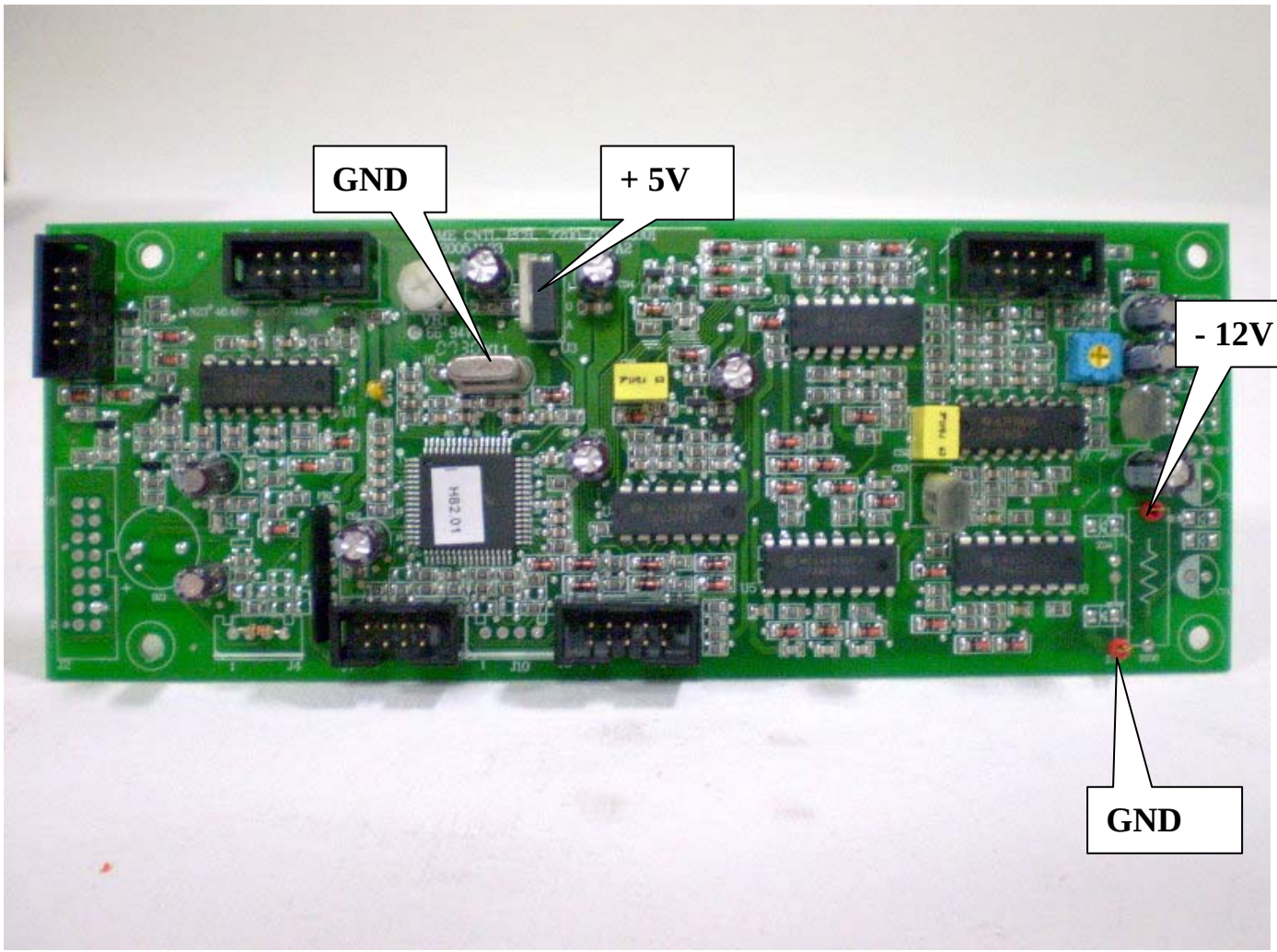
3. SH-1200 TEST POINT



4. SH-2400 SH-3600 TEST POINT



5. SH-6600 SH-10000 SH-130000 TEST POINT :



6. Maintenance Tools

1、A suitcase or a toolbox

2、Wire cutters and clamps

3、Balance equipments, current limiting resistors, a electric soldering iron, tubes and clamp terminals with different specifications

4、A multimeter and a oscilloscope（or current meter）

5、Other tools in common use：Diagonal pliers、Snipe nose pliers、Cross screwdrivers (150mm/75mm length), Straight screwdrivers (75mm length) and PVC insulating tapes etc.

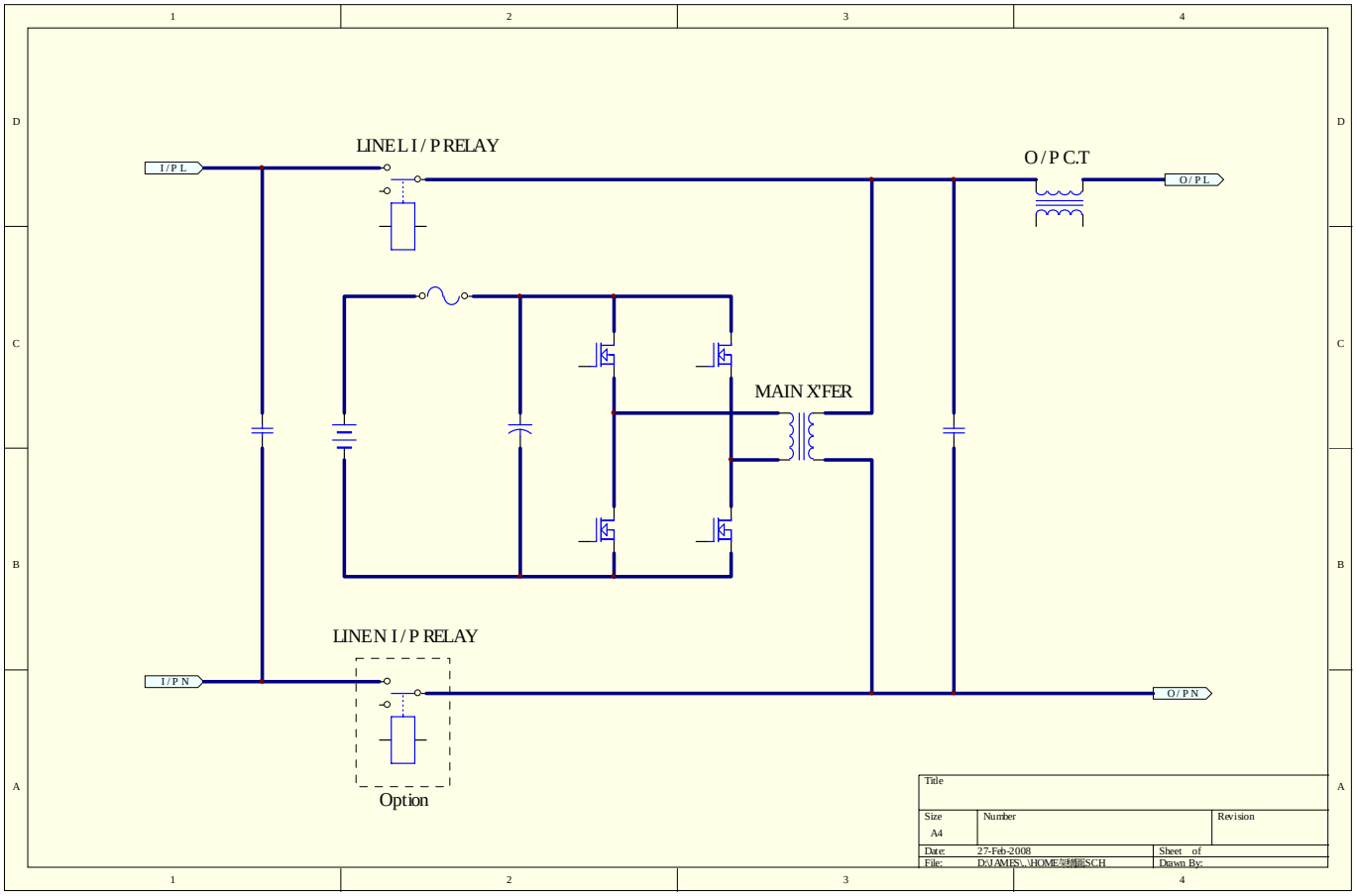
6、PCB and some other materials.

7. Trouble shooting

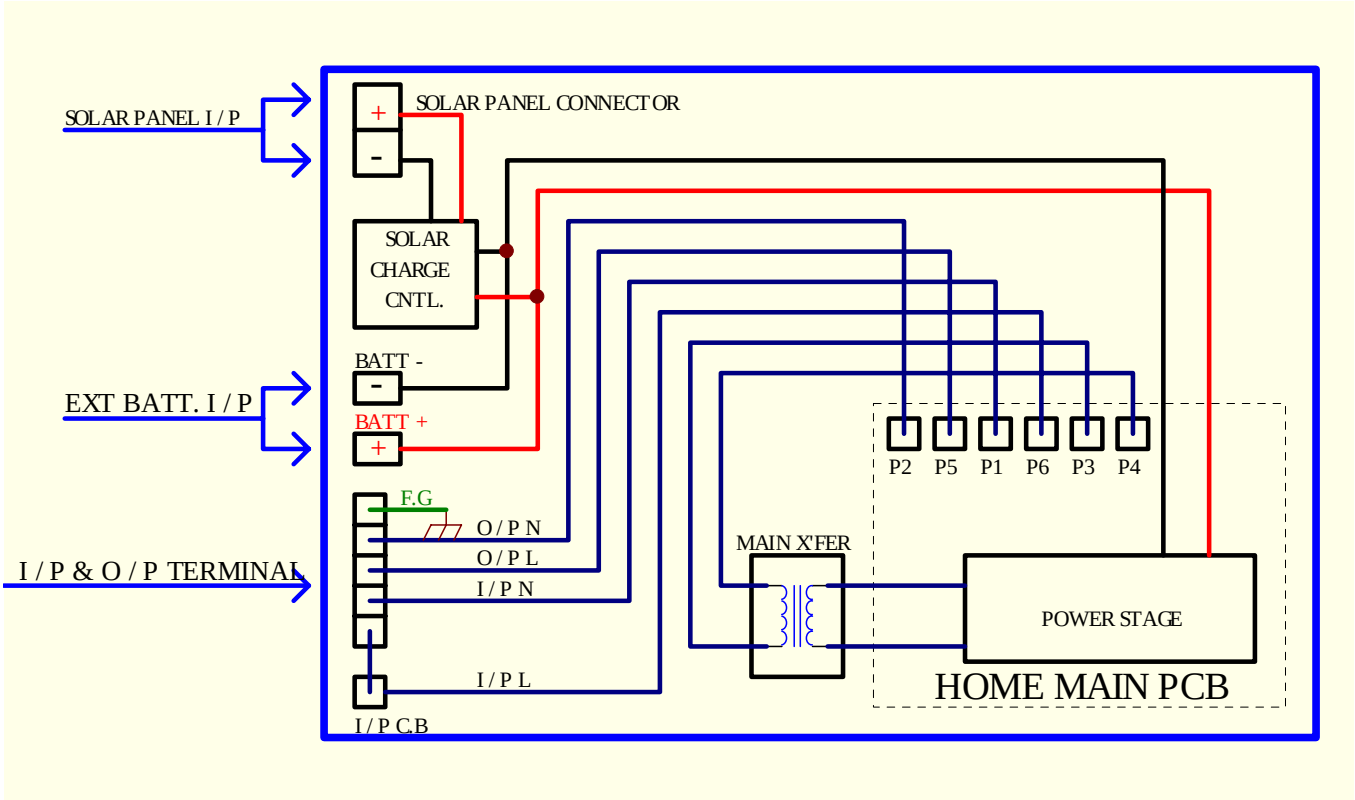
Problems	LCD Display	Solutions
AC Abnormal	I/P Polarity ERR	**Check(Only 120V Series) :** AC INPUT N – GND VOL > 1V **Solutions : Improve the grounding of AC main.**
	AC Fail (Under inverter mode, but can not transfer to line mode.)	**Check :** **a. AC Voltage :** *** 60V > AC Voltage > 135V (120V Series) *** 120V > AC Voltage > 270V (220V Series) **b. AC Frequency :** *** 45Hz > AC Frequency > 70Hz If no, replace control & Main PCB.
DC Abnormal	DC_BUS Fail	**Check : (Battery Voltage)** *** 1.2K : Battery Voltage > 15.0V *** 2.4K / 3.6K / 6.6K : Battery Voltage > 30.0V *** 10K / 13K : Battery Voltage > 60.0V If no, replace battery.
	Charger Fail	**Check : (Chargeer Voltage)** *** 1.2K : 11.2V > CHG. VOL > 15V *** 2.4K / 3.6K / 6.6K : 22.5V > CHG. VOL > 30V *** 10K / 13K : 45V > CHG. VOL > 60V **Solutions : (OFF AC)** *** Under cold start, if Inverter Mode OK, replace the Control PCB *** Under cold start, if Inverter Mode N.G., replace control & Main PCB
Over Temperature	Temp Fail	**Check :** *** If The Temperature Of the AHS UPS is really high *** Remove Some Unnecessary Loads *** That The Fan is Normal *** The Temperature Sensor Circuit.. **Solutions :** *** Restart the UPS. If N.G., replace the control PCB
Fan Abnormal	Fan Fail	**Check :** *** That The Fan is Normal *** The Fan's Sensor Circuit. **Solutions :** *** Restart the UPS. If N.G., replace the control & main PCB

Over Load	Over Load	**Check :** *** If LCD Display Output Power > 110 % *** Remove Some Unnecessary Loads to be Less Than 90% *** Restart The UPS to Enter Into the Inverter mode
Inverter Abnormal	Inverter Fail	***** Remove the load** **Check :** *** 1.2K ~ 3.6K Check PSDR Board DC Fuse Damaged; *** 6.6K ~ 13K :Check Fuse Board DC Fuse Damaged; *** Check if power PCB is damaged.. **Solutions :** *** If DC Fuse or Power Components Damaged, Please replace the main PCB *** If no damaged, the UPS may be output shorted or output inrush current cause the inverter protection. Please restart the UPS.
Can't Cold Start		**Check :** **a. LCD Display Panel :** *** Check it LCD Display Panel is connected or inserted properly. **b. Battery Voltage :** 1.2K : 10.5V > Batt. VOL 2.4K / 3.6K / 6.6K : 21.5V > Batt. VOL 10K / 13K : 40V > Batt. VOL **Solutions :** *** Replace the battery

8. SUPER HOME SERIES UPS DIAGRAM



9. UPS 1.2K / 2.4K / 3.6KVA Power driven diagram



10. UPS 6.6K / 10K / 13KVA Power driven diagram