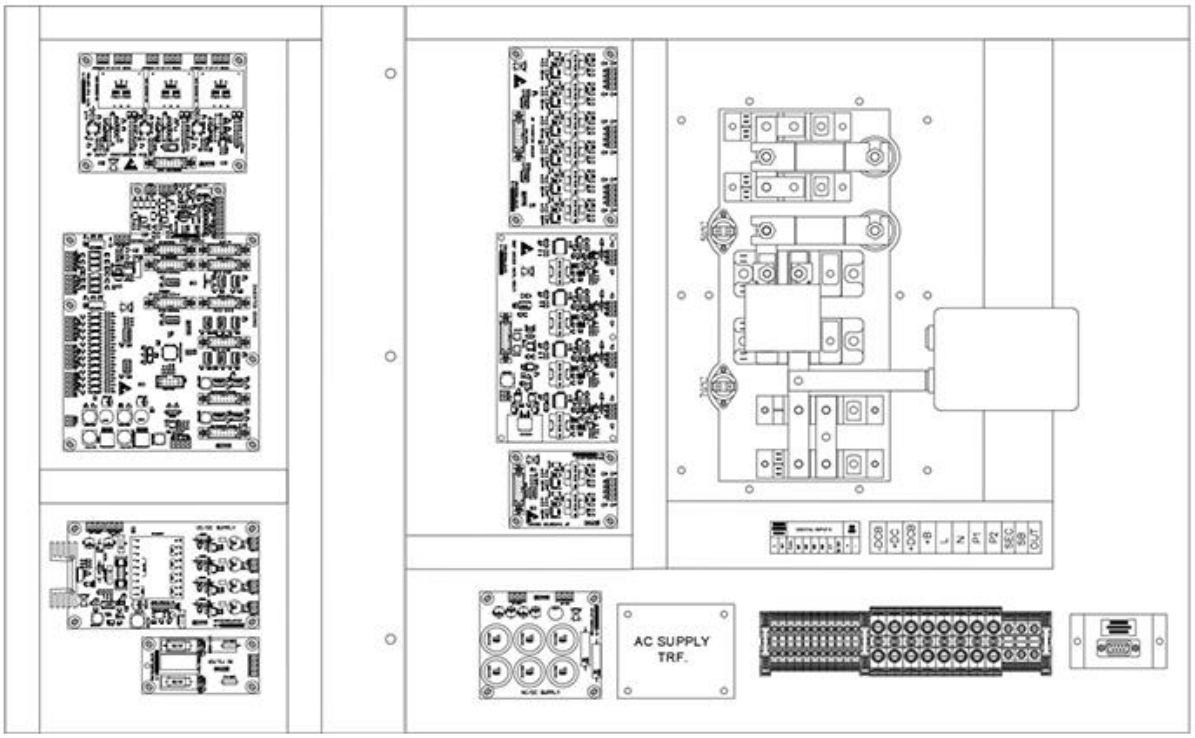
Quick Installation Guide for PESS Open Frame Devices



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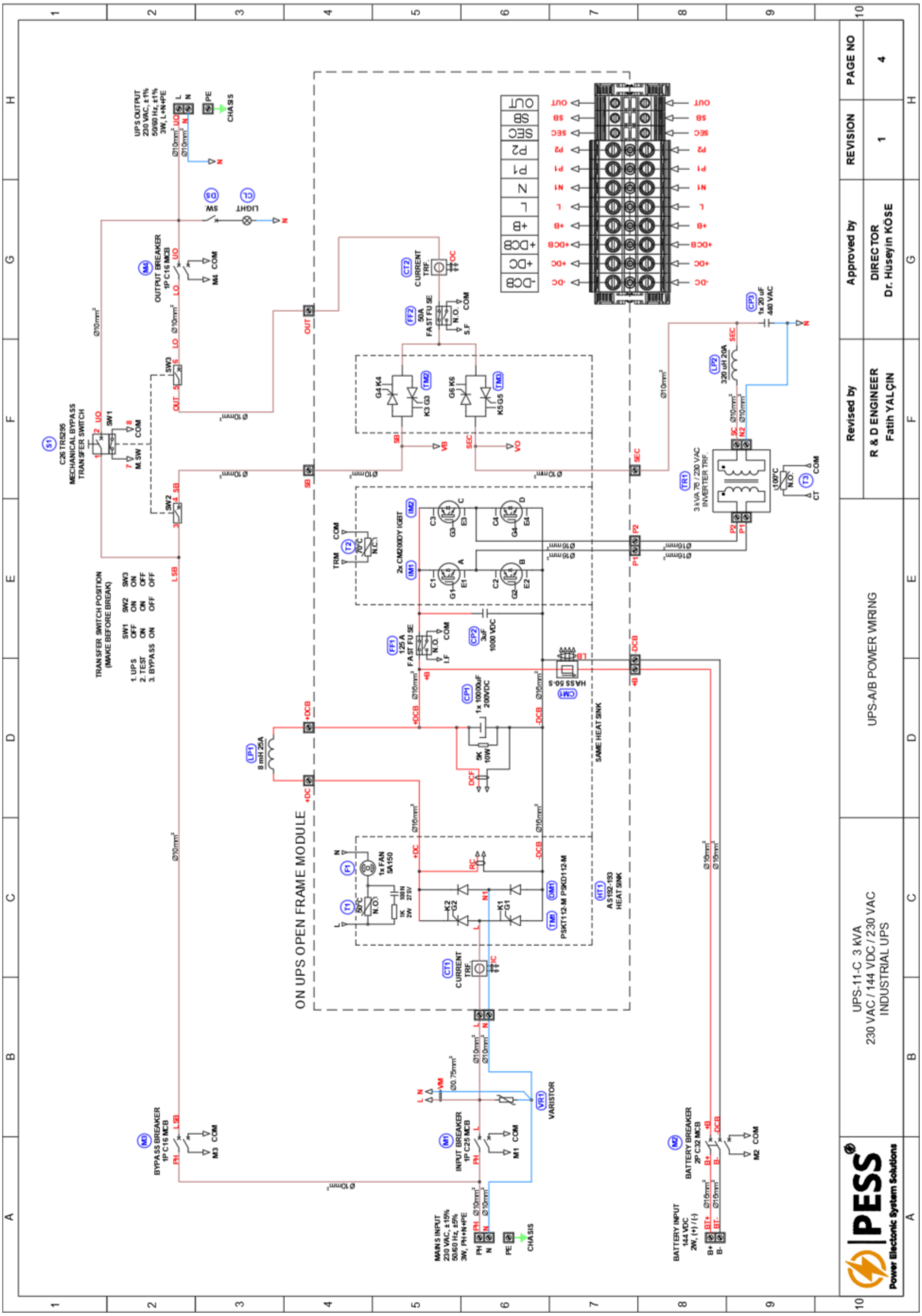
1. Table for Required Components

The list of the components provided by PESS				
No	**Description**	**QTY**	**Manufacturer**	**Part code**
1	3 kVA 1PH 230 VAC 50 Hz / 144 VDC / 230 VAC UPS-11 Module	1	PESS	UPS-11
2	7" Touch screen HMI display module	1	PESS	TS-UPS-HMI
3	Battery current measurement module	1	LEM	HASS 50-S
4	8 Channel programmable free alarm relay board	1	PESS	REC-RLY-BD
5	32A UPS-11 Maintenance bypass transfer switch	1	KRAUS NAIMER	C26-TR5295
6	320 uH 20A HF Inverter output filter inductor	1	PESS	320-20-F
7	⌀63/⌀38 mm Ferrite Troid Ring 12600nH	1	COSMO	CF195T6325C
8	DB9 Parallel operation cable	1	PESS	PCC

The list of the components should provided by customer				
No	**Description**	**QTY**	**Manufacturer**	**Part code**
1	1P C25 Input circuit breaker MCB (10 kA)	1	Schneider	A9F74125
2	1P C16 Bypass circuit breaker MCB(10 kA)	1	Schneider	A9F74116
3	2P C32 Battery circuit breaker MCB(10 kA)	1	Schneider	A9F74232
4	1P C16 Output circuit breaker MCB(10 kA)	1	Schneider	A9F74116
5	NO/NC Auxiliary contact for MCB	4	Schneider	A9A26924
6	3 kVA 76 VAC / 230 VAC Inverter transformer	1		
7	8 mH 25A Inductor	1		
8	220 VAC Cabinet light + light siwtch	1		


ON UPS OPEN FRAME MODULE
UPS OUTPUT
MAINS INPUT
BATTERY INPUT
BYPASS BREAKER
INPUT BREAKER
OUTPUT BREAKER
BATTERY BREAKER
MECHANICAL BYPASS TRANSFER SWITCH
TRANSFER SWITCH POSITION (MAKE BEFORE BREAK)
VARISTOR
CURRENT TRF.
SAME HEAT SINK
Revised by
R & D ENGINEER
Fatih YALÇIN
Approved by
DIRECTOR
Dr. Hüseyin KÖSE
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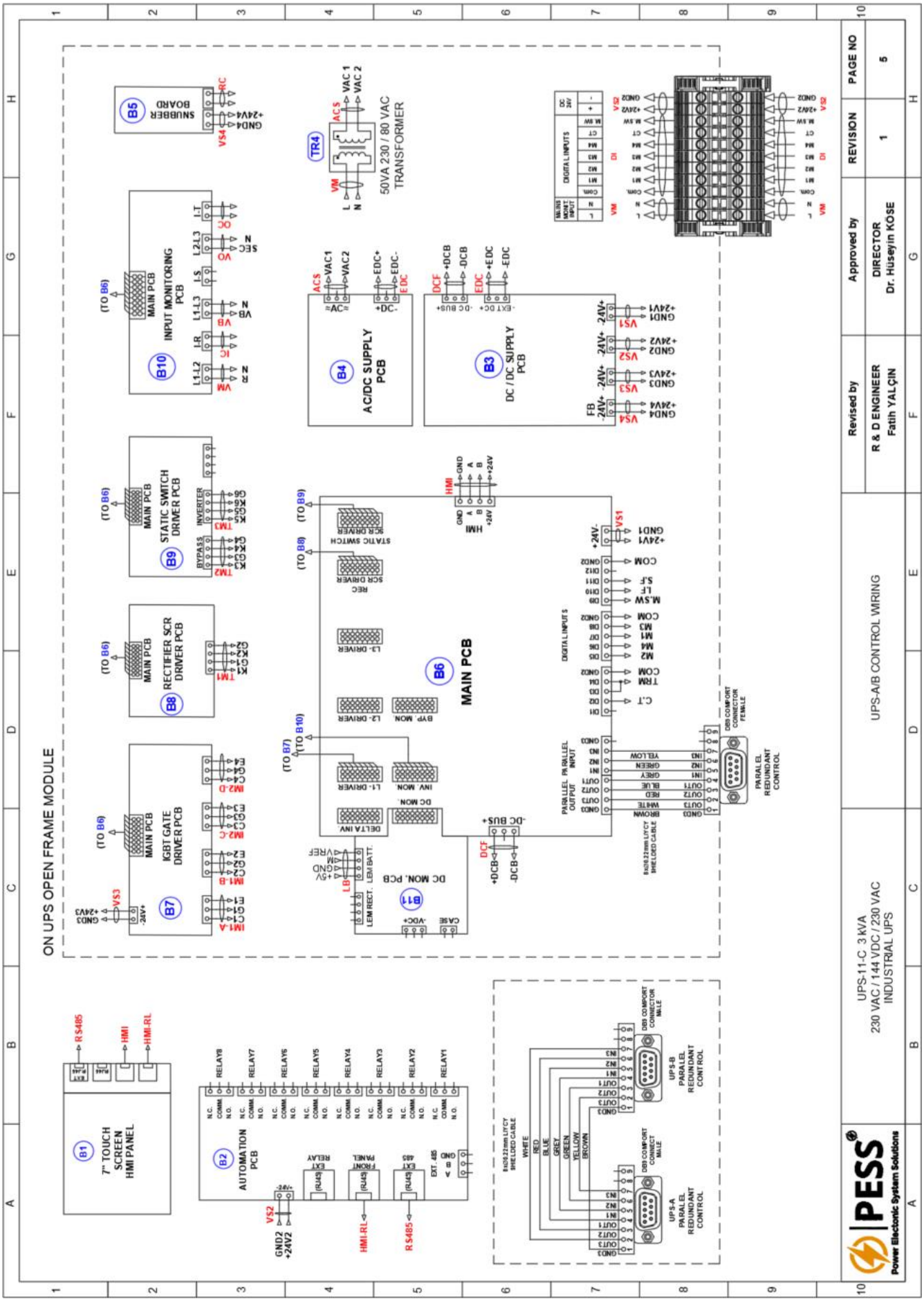
UPS-A/B POWER WIRING
UPS-11-C 3 kVA
230 VAC / 144 VDC / 230 VAC
INDUSTRIAL UPS
PESS
Power Electronic System Solutions


ON UPS OPEN FRAME MODULE
B1 7" TOUCH SCREEN HMI PANEL
B2 AUTOMATION PCB
B3 DC / DC SUPPLY PCB
B4 AC/DC SUPPLY PCB
B5 SNUBBER BOARD
B6 MAIN PCB
B7 IGBT GATE DRIVER PCB
B8 RECTIFIER SCR DRIVER PCB
B9 STATIC SWITCH DRIVER PCB
B10 INPUT MONITORING PCB
B11 DC MON. PCB
TR4 50VA 230 / 80 VAC TRANSFORMER
HMI
DIGITAL INPUTS
PARALLEL OUTPUT
PARALLEL INPUT
PARALLEL REDUNDANT CONTROL
UPS-11-C 3 kVA
230 VAC / 144 VDC / 230 VAC
INDUSTRIAL UPS
UPS-A/B CONTROL WIRING
Revised by
R & D ENGINEER
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2. Connection Points

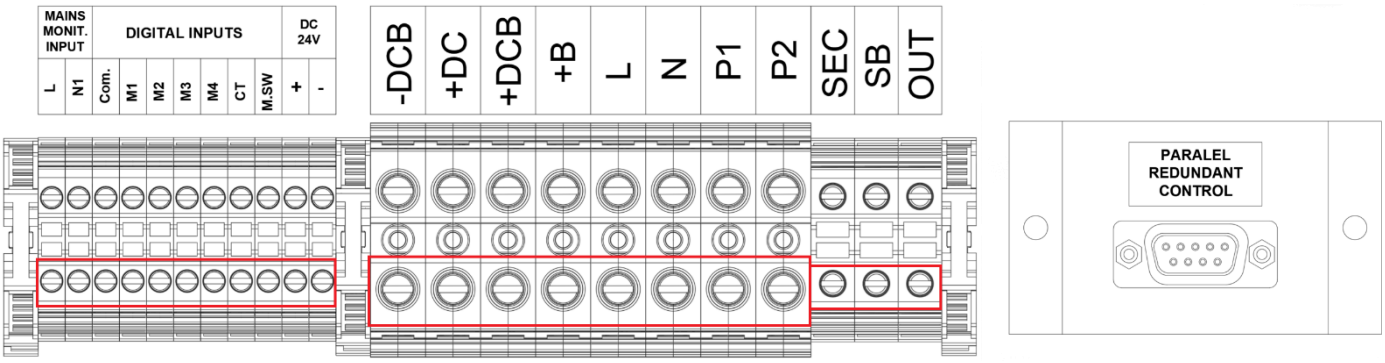

Figure 1 Connection terminal of the UPS-11 Module

Figure 1 shows the connection terminals of the UPS-11 module.

⚠ The areas marked with the red rectangles in Figure 1 should be used for wiring. Except from these areas, no cables should be disconnected.

⚠ Energy should not be applied without ensuring the tightness of the connection terminals.

Mains Monit. Input

Monitoring input is used to monitor the mains input voltage. 2x0.75 mm^2 NYAF cable can be used.

Since the monitoring cable is also used for AC supply, the monitoring cable should not be connected without all checks.

Digital Inputs

- M1-COM terminals must be connected to the auxiliary contacts of the input circuit breaker.
- M2-COM terminals must be connected to the auxiliary contacts of the battery circuit breaker.
- M3-COM terminals must be connected to the auxiliary contacts of the bypass circuit breaker.
- M4-COM terminals must be connected to the auxiliary contacts of the output circuit breaker.
- CT-COM terminals must be connected to the 100 C NO thermostat located at the core of the inverter transformer.
- MSW-COM terminals must be connected to the auxiliary contacts of the mechanical bypass transfer switch aux contacts.

DC 24V

24 V supply is reserved for the relay card. Connection can be made with 2x0.75 mm NYAF cable.

⚠ No load other than the relay card should be connected to the 24 V supply line.

⚠ When connecting the relay card's supply cable, attention should be paid to +/- polarity. We recommend using a red color for the (+) cable and a black color for the (-) cable.

-DCB

High power -DC BUS cable should be connected to -Vbat.

+DC

High power rectifier filter input cable. It should be connected to the filter inductor first terminal.

+DCB

High power rectifier filter return cable. It should be connected to the filter inductor second terminal.

+B

High power +DC BUS cable should be connected to +Vbat.

L and N

High power rectifier AC input cable.

P1 and P2

High power inverter output cable pair. It should be connected to the low voltage side of the inverter transformer.

SEC

High power inverter transformer output cable. It should be connected to the inverter output LC filter joint. (for detail, please look the circuit schematic)

SB

High power static bypass input cable. It should be connected to the relevant mechanical bypass transfer switch contact. (for detail, please look the circuit schematic)

OUT

UPS output cable. It should be connected to the relevant mechanical bypass transfer switch contact. (for detail, please look the circuit schematic)

Common warnings for high power cables

⚠ Do not connect or disconnect any cables under energy.

⚠ We recommend using rings on all high-power cables.

⚠ We recommend that you make connections with bolts at the points where two high-power cables should be connected together. And also we recommend that you isolate the joints after the connection is made.

⚠ After the connections are completed, check the tightness of the high power cables.

⚠ When connecting the battery cables, make sure that the (+) and (-) poles do not touch each other.

⚠ Keep the P1 and P2 inverter cables as short as possible and twist these two cables into twisted pairs.

⚠ After P1 and P2 cables are turned into twisted pair, do not forget to attach two thyroid rings to this cable pair at equal distance.

⚠ After the LC output filter is connected to the output of the inverter transformer, the cable labeled as "SEC" will be connected to the point where the inductor and capacitor joint together. Make sure that the LC filter cables are as short as possible.

⚠ The terminal numbers of the mechanical bypass transfer switch are written on the circuit schematic. Additionally, how the mechanical transfer switch works is also included in the circuit schematic diagram.

⚠ After the connections of the mechanical bypass transfer switch are completed, the probe check should be applied before the turn-on the power.

3. Front panel connection

Figure 2 shows the front panel connections. The cables shown with dashed lines are standard Rj45 cables. The functions of the 4 RJ45 connection ports are listed below, from top to bottom.

1. External RS485 Communication port
2. Not used
3. Internal Communication
4. Relay Board Communication

For Modbus RS485 communication with the device, use the connection terminal circled in red on the relay card. There are three pins in this terminal: RS485-A, RS485-B and ground.

⚠ For high quality communication, 3x0.22 mm or 3x0.5 mm shielded cable must be used.

⚠ The communication cable should be kept as short as possible.

⚠ Short-circuiting any two of the 3 pins on the RS485 communication line will damage the communication circuit. For this reason, we recommend performing a probe check after the connections are completed.

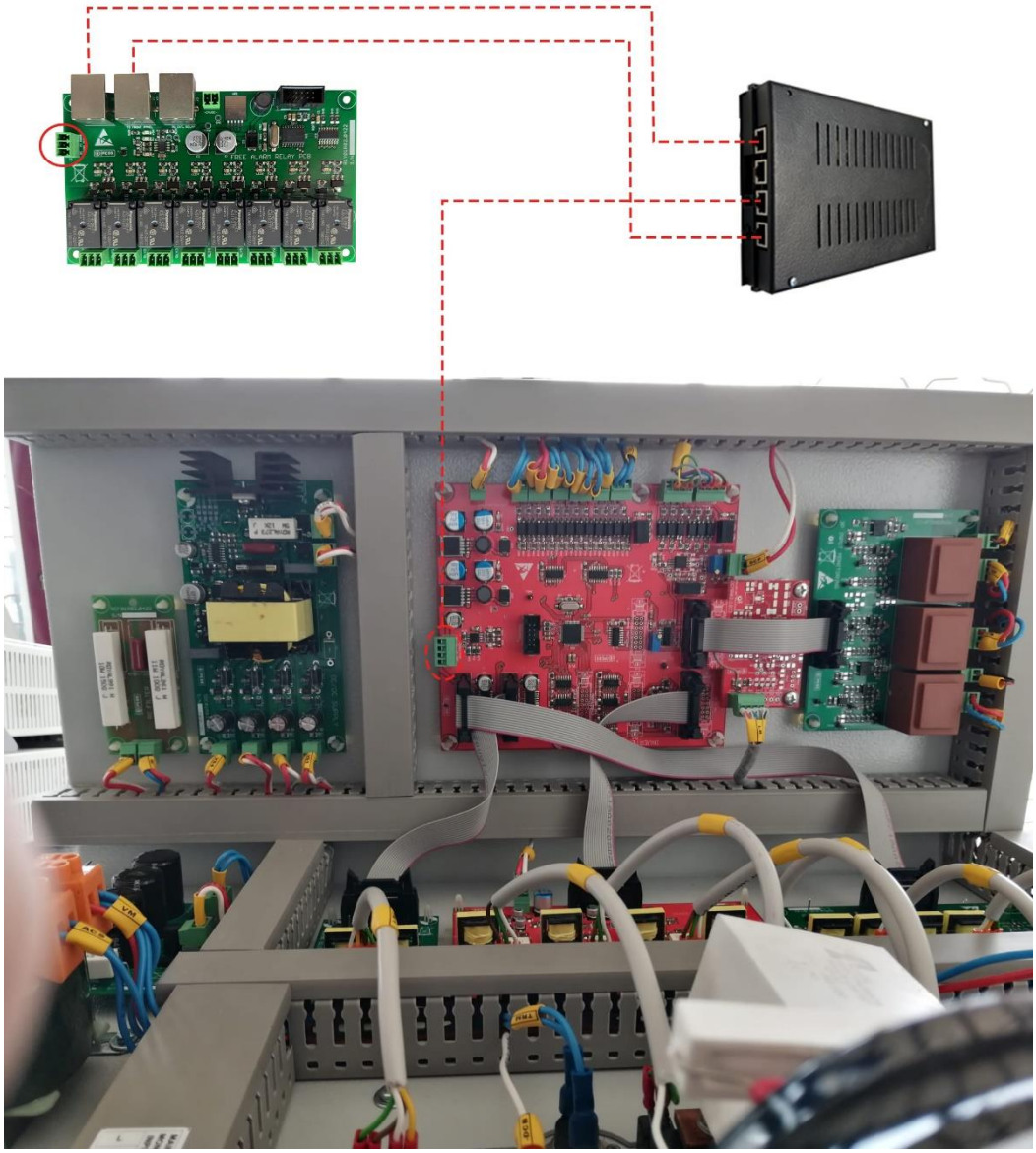

Figure 2 Front panel connection of the UPS-11 Module

4. Parallel Operation

In this section, information about parallel or redundant operation of the UPS module will be given.

In order for the UPS modules to operate in parallel or redundant mode, they must be connected to each other with the paralleling cable which is sent with the device. The detailed view of the paralleling cable is shown in figure 3.

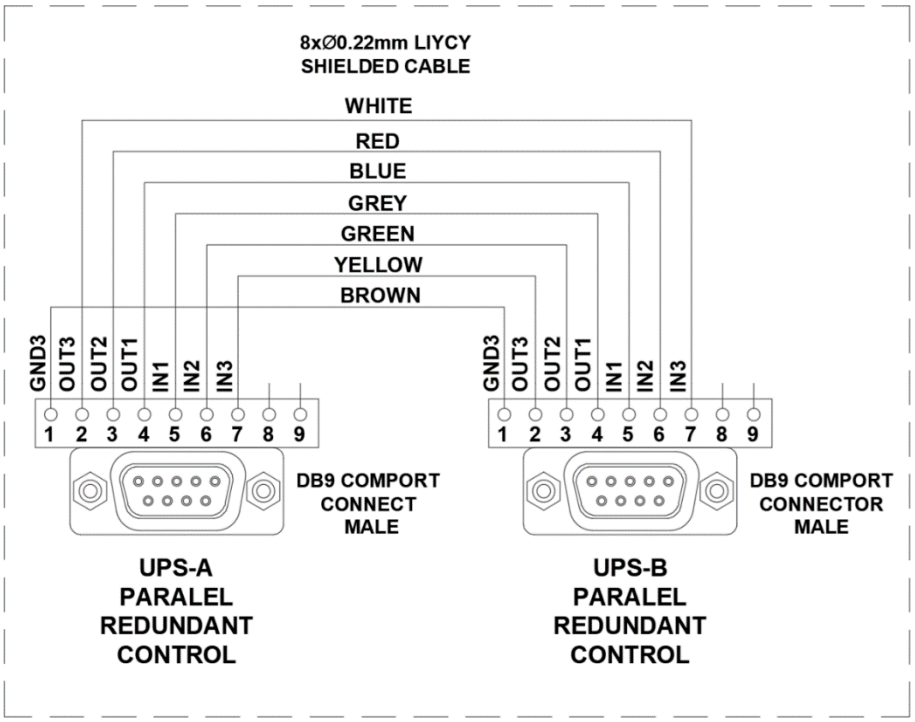

Figure 3 Detailed view of the paralleling cable

Since the paralleling cable cable carries the critical information listed below, operating the UPS module in parallel or redundant mode without connecting the parallel cable may cause a fatal damage to the device. Therefore, if UPS modules will be used in parallel or redundant, it is a must to first connect the parallel cable.

The information carried on the paralleling cable

- Master-Slave information
- Regulation control
- Synchronization level
- Maintenance information
- On inverter or on bypass information
- Emergency fail information

Warnings for paralleling cable

⚠ The paralleling cable is not standard DB9 cable. It is specially produced for UPS-11 Module. Please do not use the standard DB9 cable. Just cable connecter has DB9 connector that's all.

⚠ Paralleling cable should be 8x0.22 mm shielded cable.

⚠ The length of the paralleling cable should not exceed 5 meters.

Operating the UPS-11 module in parallel mode

After the paralleling cable is connected, parallel operation can be started by pressing the button in the area marked with a red rectangle in the touch panel menu shown in Figure 4. In this mode, UPS modules will constantly share the load equally.

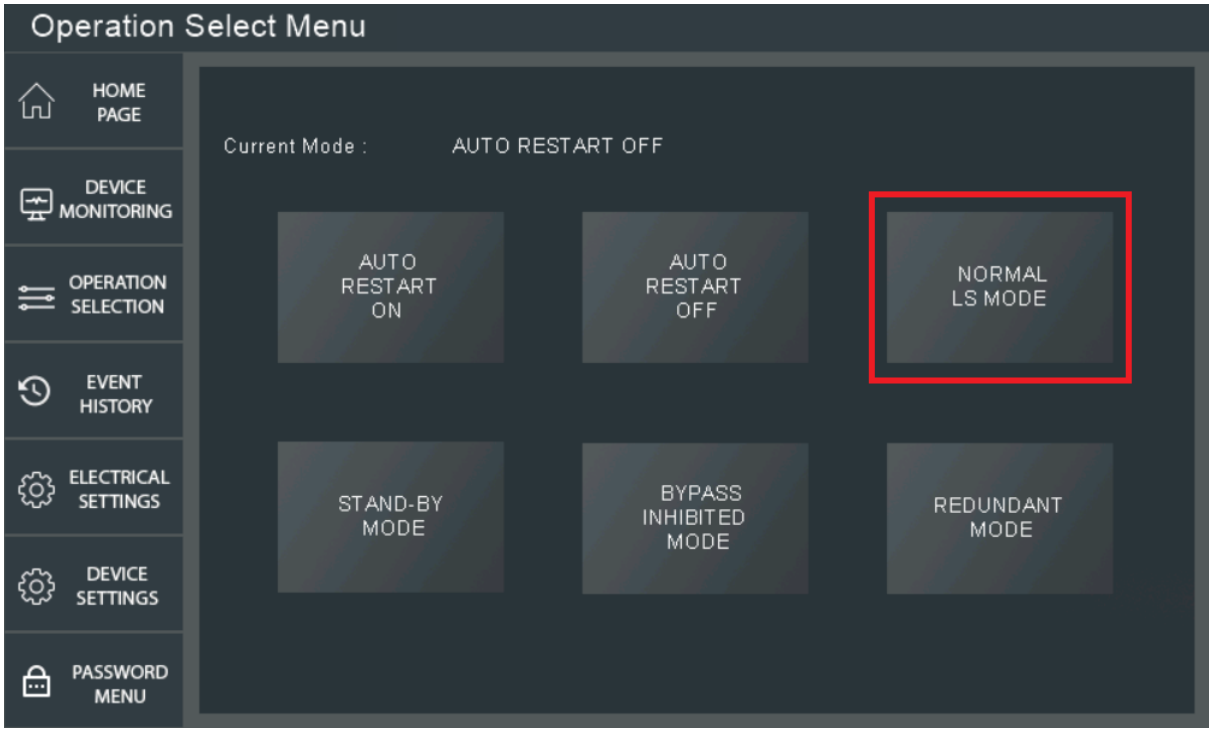

Figure 4 UPS-11 Operation select menu

⚠ **<u>If the outputs of UPS-11 modules are connected in parallel without connecting the parallel cable and if the UPS modules are tried to be used in parallel ls mode, a fatal damage may occur in the device.</u>**

Operating the UPS-11 module in redundant mode

To operate the UPS-11 modules in redundant mode, the button in the area marked with the red rectangle in Figure 5 must be pressed. The paralleling cable must be connected in redundant operation mode as well as in parallel operation mode. In this mode, one of the two UPS modules supplies the entire load while the other UPS module is in standby mode. In case of any fault or error, the UPS in standby mode takes over the the all loads without any interruption.

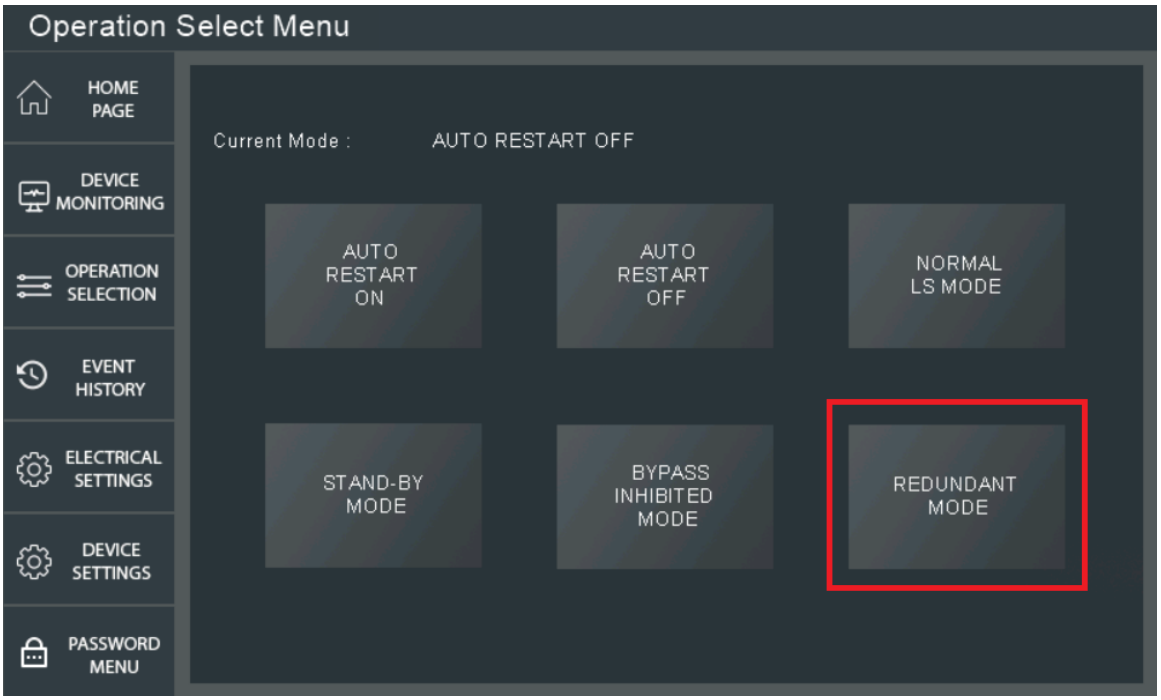

Figure 5 UPS-11 Operation select menu

⚠ **If the outputs of UPS-11 modules are connected in parallel without connecting the parallel cable and if the UPS modules are tried to be used in redundant mode, a fatal damage may occur in the device.**