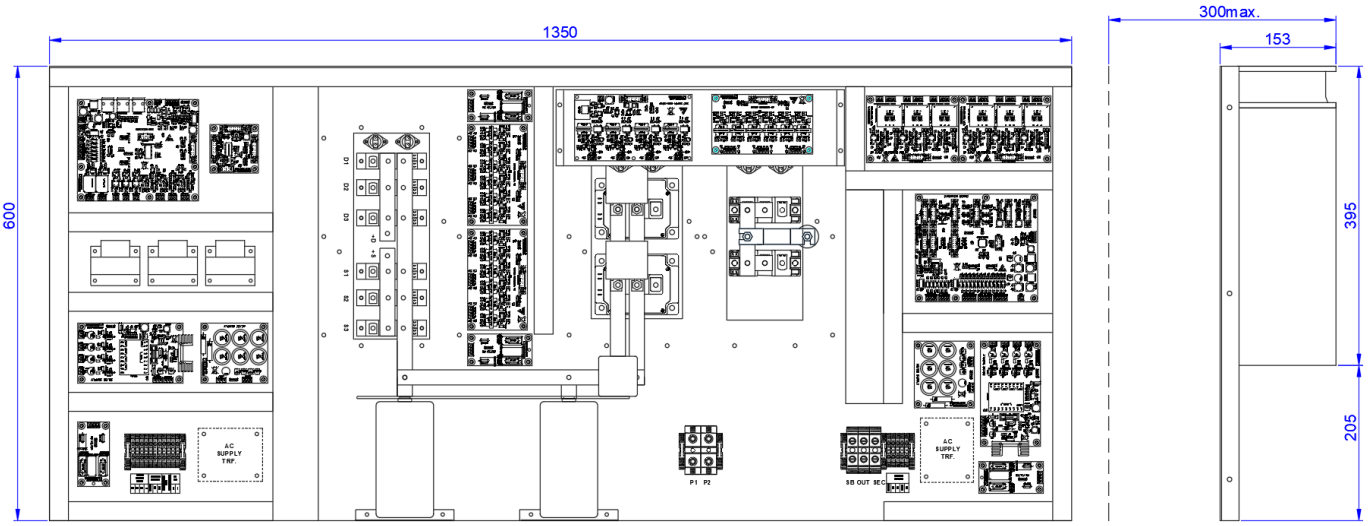
Quick Installation Guide for PESS Open Frame Devices



FRONT VIEW **SIDE VIEW**

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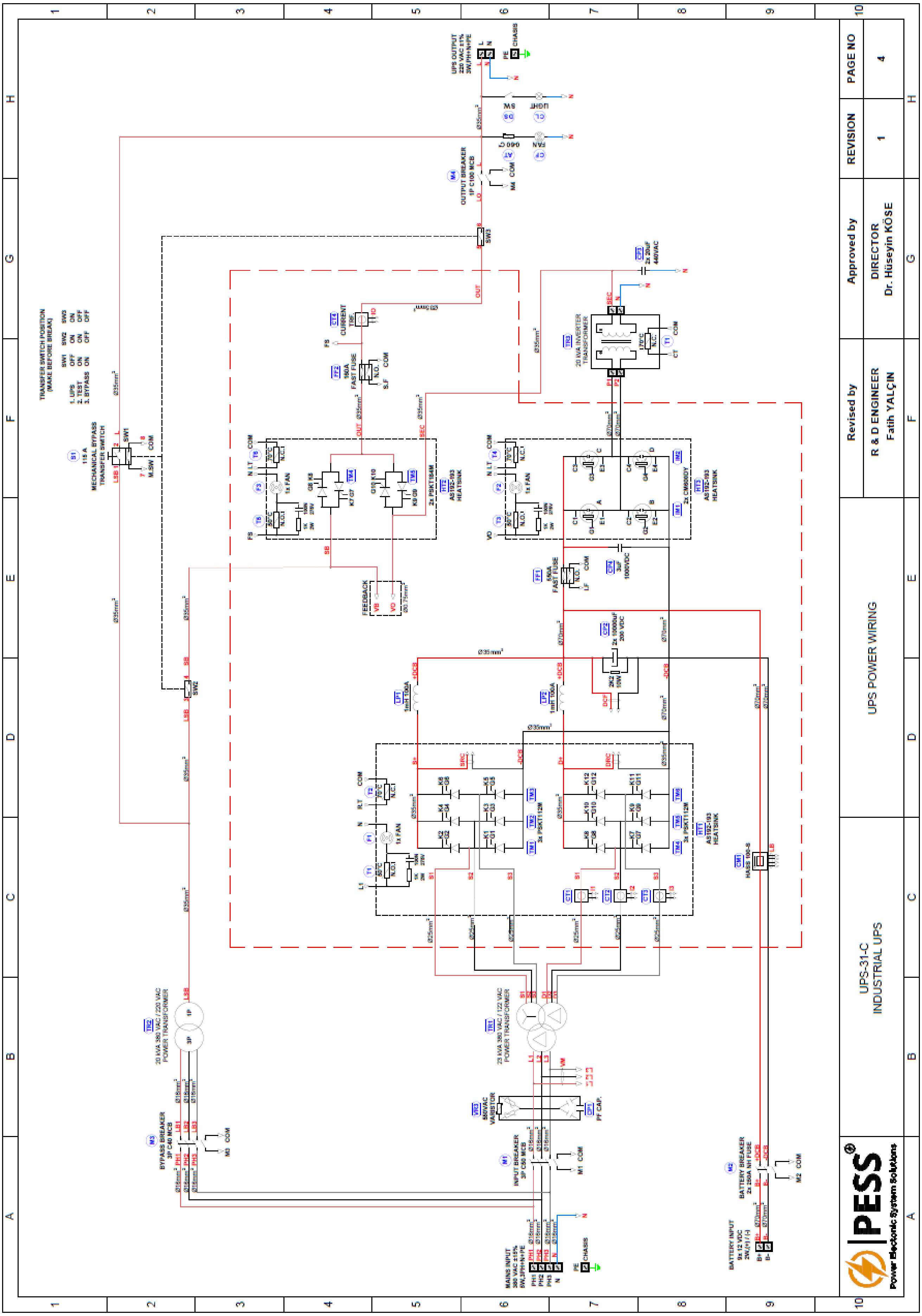
1. Table for Required Components

The list of the components provided by PESS				
No	**Description**	**QTY**	**Manufacturer**	**Part code**
1	20 kVA 3PH 380 VAC 50 Hz / 110 VDC / 220 VAC UPS-31 Module	1	PESS	UPS-31
2	7" Touch screen HMI display module	1	PESS	TS-REC-HMI
3	Rectifier output current measurement module	1	LEM	HASS 50-S
4	Battery current measurement module	1	LEM	HASS 50-S
5	8 Channel programmable free alarm relay board	1	PESS	REC-RLY-BD
6	7,5 kVAR PFC Capacitor	1	PESS	REC-RLY-BD
7	550 VAC delta connected varistor	1	PESS	VR3-550
8	UPS-31 Maintenance bypass transfer switch	1	KRAUS NAIMER	UPS-31-MSW
9	HF Inverter output filter inductor	1	PESS	UPS-31-HFI

The list of the components should provided by customer				
No	**Description**	**QTY**	**Manufacturer**	**Part code**
1	3P C50 Input circuit breaker MCB (10 kA)	1	Schneider	A9F74350
2	3P C40 Bypass circuit breaker MCB(10 kA)	1	Schneider	A9F74340
3	1P C100 Output circuit breaker MCB(10 kA)	1	Schneider	A9N18358
4	NO/NC Auxiliary contact for input and bypass MCB	2	Schneider	A9A26924
5	NO/NC Auxiliary contact for input and bypass MCB	1	Schneider	A9N26924
6	20 kVA 380 VAC / 220 VAC scott type bypass transformer	1		
7	20 kVA 60 VAC / 220 VAC Inverter transformer	1		
8	1 mH 80A Inductor	2		
9	220 VAC Cabinet cooling fan + cooling thermostat	1		
10	220 VAC Cabinet light + light siwtch	1		
11	1400x700x1950 mm Cabinet	1		
12	23 kVA 380 VAC delta primary / (122 VAC delta secondary + 122 VAC star secondary) 12 pulse rectifier transformer	1		


UPS POWER WIRING
UPS-31-C
INDUSTRIAL UPS
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REVISION
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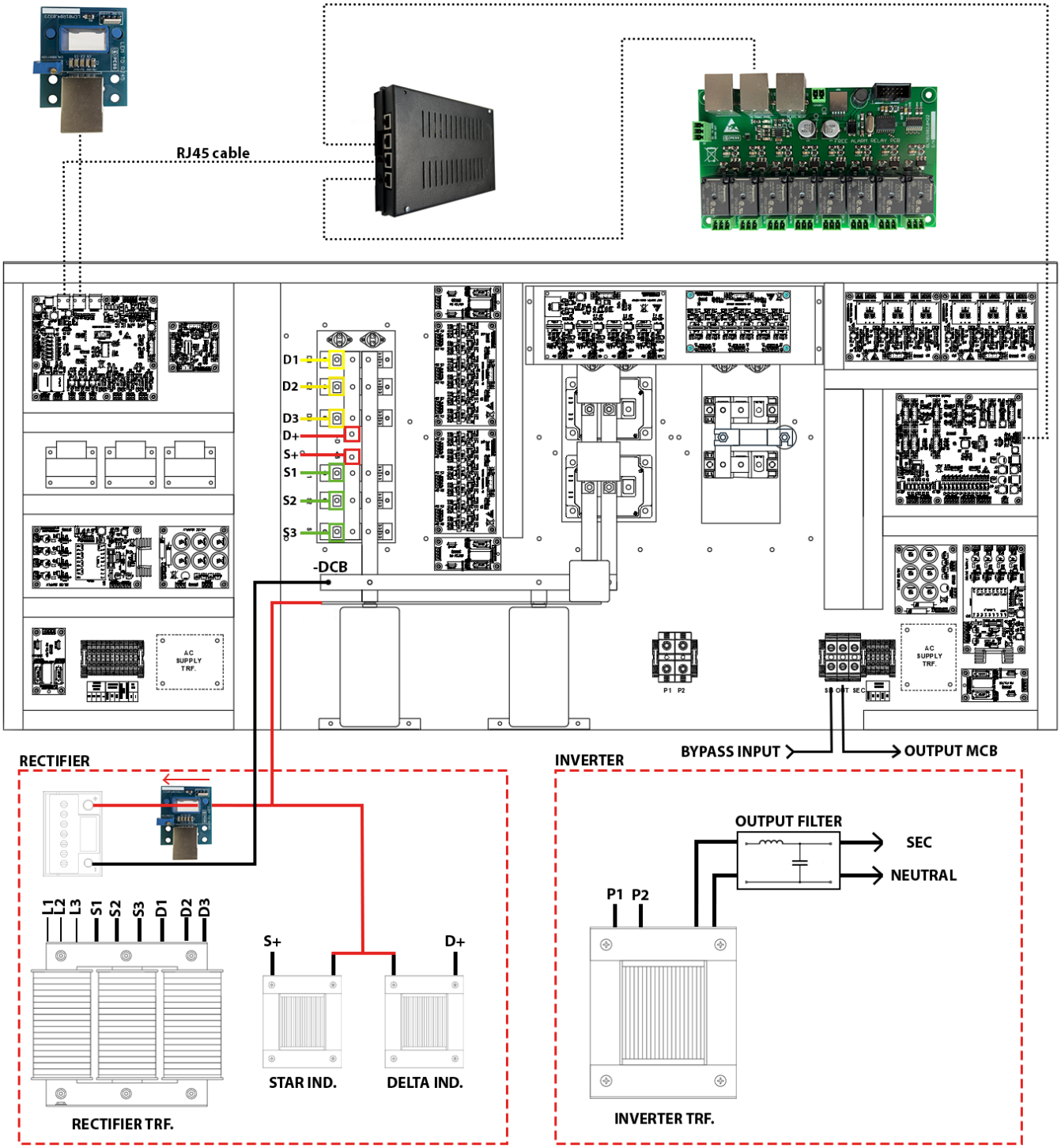
Approved by
DIRECTOR
Dr. Hüseyin KÖSE
Revised by
R & D ENGINEER
Fatih YALÇIN
PESS
Power Electronic System Solutions

2. Connection Points



3. Cabling Description

Please read this section carefully. PESS company doesn't accept any responsibility if the connection method specified in this document is not followed or the wrong connection is made.

! Please do not turn on the rectifier device without read the 4th title.

1. **Point : High power terminal connections**

D1 Rectifier transformer 122 VAC delta secondary phase 1
D2 Rectifier transformer 122 VAC delta secondary phase 2
D3 Rectifier transformer 122 VAC delta secondary phase 3

D+ Rectifier delta (+) dc output

S+ Rectifier star (+) dc output

S1 Rectifier transformer 122 VAC star secondary phase 1
S2 Rectifier transformer 122 VAC star secondary phase 2
S3 Rectifier transformer 122 VAC star secondary phase 3

Ø16 mm² NYAF cable with cable lug should be use for **(L1), (L2), (L3)** AC input cables.

Ø25 mm² NYAF cable with cable lug should be use for (**D1), (D2), (D3), (S1), (S2), (S3)** rectifier input.

Ø35 mm² NYAF cable with cable lug should be use for (**D+), (S+)** rectifier (+)dc outputs.

Ø70 mm² NYAF cable with cable lug should be use for (**-DCB)** rectifier (-)dc output.

Ø70 mm² NYAF cable with cable lug should be use for **battery cables**.

Caution ! Please do not connect connect or disconnect any cable under energy or device turn-on.
Please make sure the tightness of the terminals and connectors.
Please check the polarity of the DC cables. Reverse polarity may be caused a critical damage.

2. **Point : Low power signal cables connection**

Dry contact digital inputs

Bypass breaker aux. contacts	=>	(com – M3)
Output breaker aux. contacts	=>	(com – M4)
Maintenance switch aux. contacts	=>	(com – M.SW)
Inv. transformer core thermostat	=>	(com – CT)

Monitoring For AC input monitoring, it must be connected to the primary of the rectifier transformer with L1-L2-L3 sequence. Phase sequence is important for the correct operation of the device.

24V supply This 24V supply reserved for the relay board 24V supply. Before the turn-on the device please check the polarity of the 24V supply. Wrong polarity may cause a permanent damage.

Heat compensation This terminal is used to measure the temperature of the batteries while they are being charged. If the user does not want to use this feature, user can be left alone this terminal. If this feature will be used, a resistive temperature sensor must be connected to these terminals.

3. **Point : HMI communication cable**

This cable use for the communicate between internal device boards and touch screen front panel and RS485 communication. Connection points can be check from device circuit schematic.

4. **Point : Battery LEM cable**

One of the LEM DC current modules sent with the device should be pass to the (+) battery cable. When attaching the LEM module to the cable, the arrow mark on the module should be towards the battery.

After connecting the LEM module, the battery current can be adjust using on board trimpot.

Caution ! If the LEM module direction incorrect, the battery current will be measured incorrectly.

4. Transformer Ratings and Polarity Check

Rectifier transformer 23 kVA 380 VAC delta primary / (122 VAC delta secondary + 122 VAC star secondary).

Bypass transformer 20 kVA 380 VAC / 220 VAC scott-T type 3 phase input, single phase output transformer.

Inverter transformer 20 kVA 60 VAC / 220 VAC single phase transformer.

! **The 25% part of the core of the inverter transformer should be sheeted like an inductance and the remaining 75% part of the core should be sheeted as normal transformer core.**

! With this method, by increasing the leakage inductance of the transformer core, harmonic currents are reduced, the transformer heats up less and losses are reduced.

The quality of the transformer directly effects to the rectifier quality and efficiency.

Rectifier filter inductor ratings should be 1 mH 80A.

PESS, recommends use anti-vibration and isolation wedges when the mounting the transformer and inductor. Also, transformer core should be varnished and necessary electrical indication labels should be placed and correct.

! If the rectifier inside the UPS does not turn on after installation, the input phase sequence may be wrong. To solve this problem, simply swap the two AC input cables.