Welcome

Solis Technical Workshop

October 2019

Who am I..?

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Time	Agenda
09:00 – 09:30	Registration and welcome
09:30 – 12:00	Sales Training
	Solis Company Overview
	Residential Range of Inverters
	Commercial Range of Inverters
	New Developments EPM3-5G and Commercial- New DC Box and AC Offering
12:00 - 13:00	Lunch Break
13:00 – 15:30	Technical Session – Installer Training
	Regulatory requirements (DC and AC protection discussion
	In-depth Product Installation Training
15:30 – 15:45	Short Break
15:45 – 16:30	SegenSolar Portal training and Feedback

EPM3-5G-PLUS

EXPORT POWER MANAGER

FEATURES:

- SUITABLE FOR USE WITH ALL 3PHASE SOLIS INVERTERS
- MAX CT SIZE: 3000A/5
- REQUIRED CT ACCURACY: 0,5%
- MAX CT CABLE LENGTH-10M
- MAX COMMUNICATION LENGTH RS-485-1000M
- MAX NUMBER OF INVERTERS THAT CAN BE CONNECTED: 80
- INVERTERS MAY BE OF ANY CONFIGURATION ON THE SAME EPM-IE 20-30-40-50-60 KW
- 2 MODES OF OPERATION-EXPORT LIMITATION-MODE 1/MODE2
- ALL CONNECTIONS TO THE EPM VIA PLUG SYSTEM
- IP 65 RATED
- PROGRAMMABLE VIA INTERGRATED LCD SCREEN AND FUNCTION KEYS

Smart & strong

- Simultaneous control of 80 X Solis inverters
- Realizing reactive compensation of the system, which ensure the power factor of the system is up to standard

Saving & high precision

- Simultaneously monitor the operating data of the 80 X Solis inverter, saving the cost of the monitoring system
- The control accuracy is up to 3%, which improves the system's spontaneous use rate

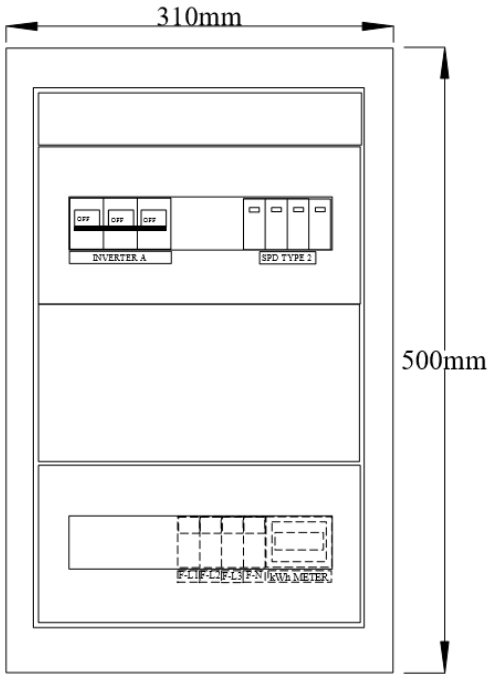
Friendly & compatible

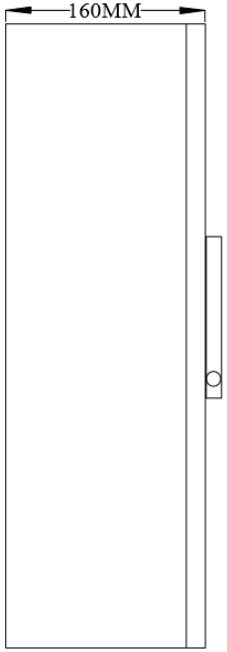
- Support "Δ" and "Y" grid systems and single-phase grids to reduce system changes
- Supports simultaneous access of Solis inverters with different powers

NEW DC Protection Box for SOLIS 60KW with DC Switch, fuse and Type 1 &2 SPD

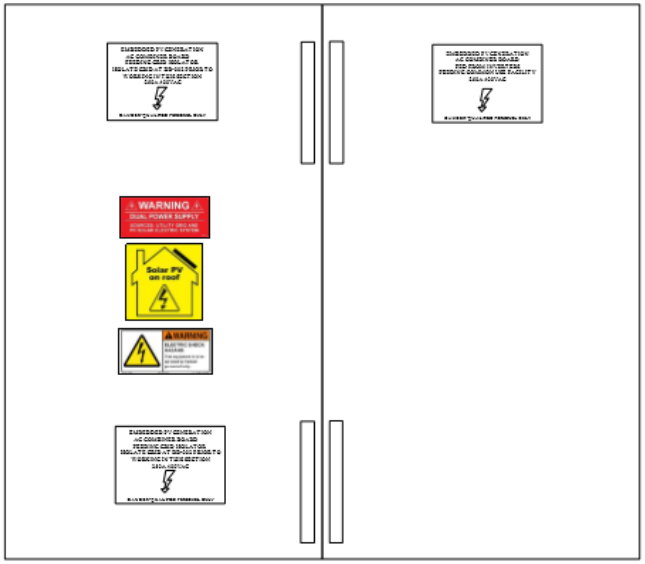
- PART NUMBER: DCB-NF-6I-1000V-I16A-6O
- 6 STRINGS IN/ 6 STRINGS OUT
- NO SPD-INVERTER HAS TYPE 1&2 BUILT IN
- SERVICES 2 X MPPT'S- 3 STRINGS PER MPPT
- ORIGINAL MC 4 CONNECTORS
- VISIBLE MARKING IN/OUT POSIITONS
- 2 X BOXES REQUIRED PER INVERTER

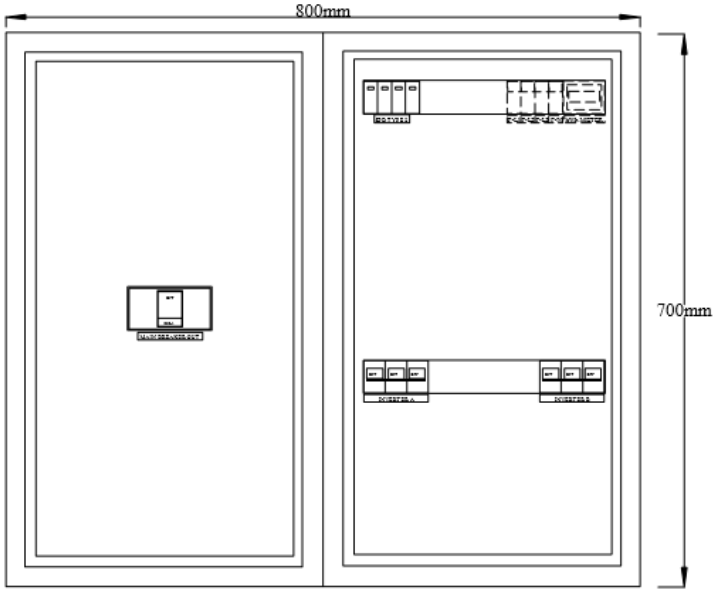
NEW AC COMBINER BOARDS FOR SOLIS 60KW INVERTER PACKAGES
1 X 60KW SOLIS INVERTER

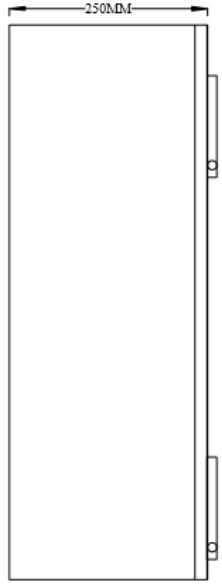




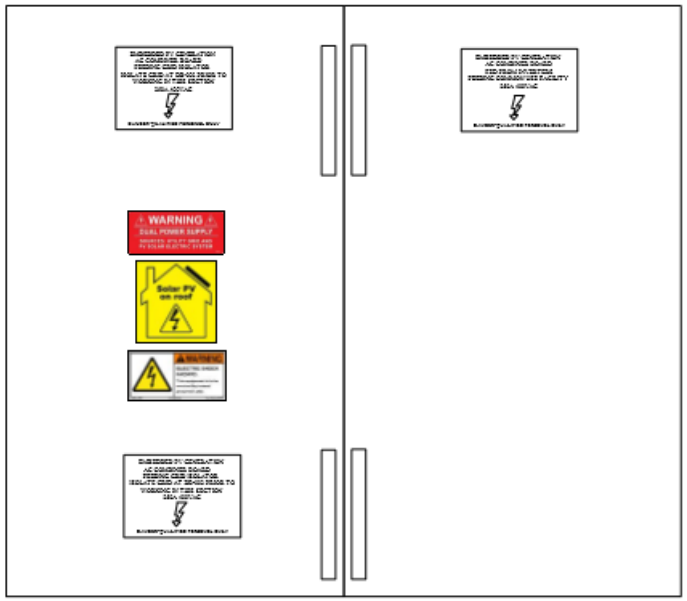
NEW AC COMBINER BOARDS FOR SOLIS 60KW INVERTER PACKAGES
2 X 60KW SOLIS INVERTER

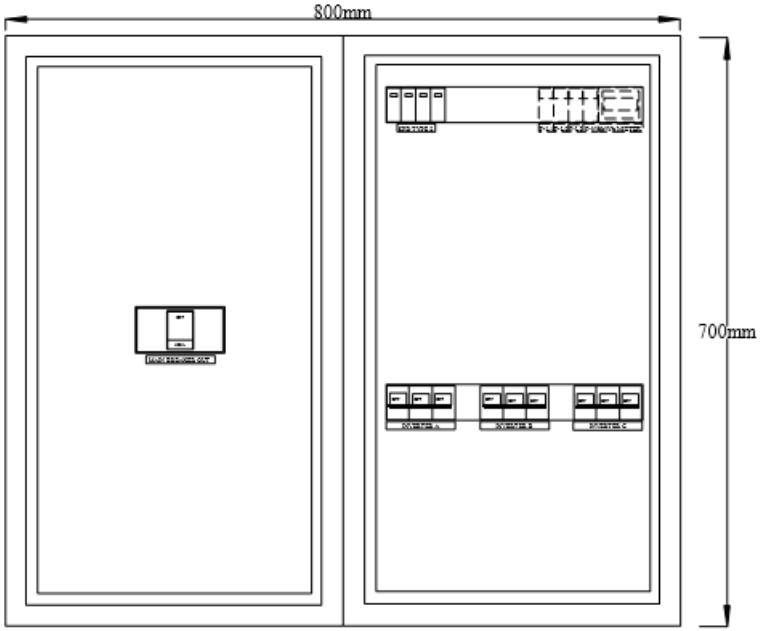


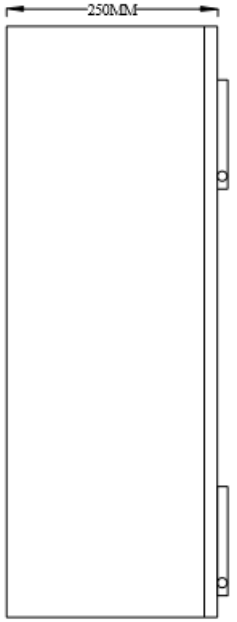




NEW AC COMBINER BOARDS FOR SOLIS 60KW INVERTER PACKAGES
3 X 60KW SOLIS INVERTER







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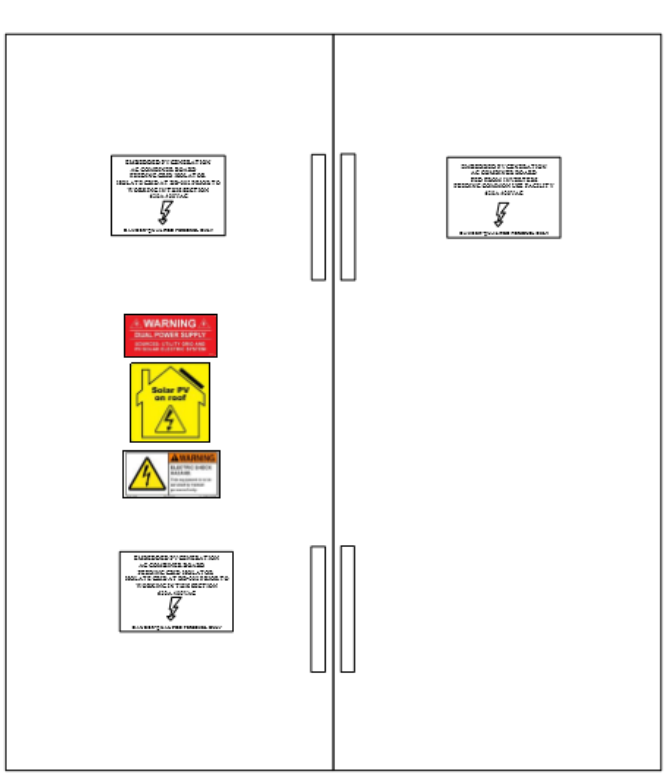
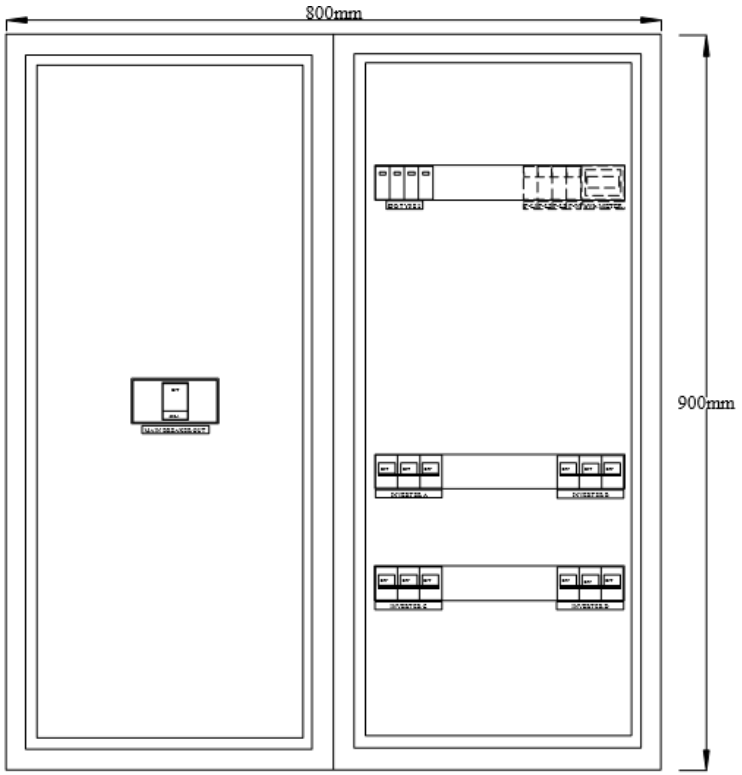
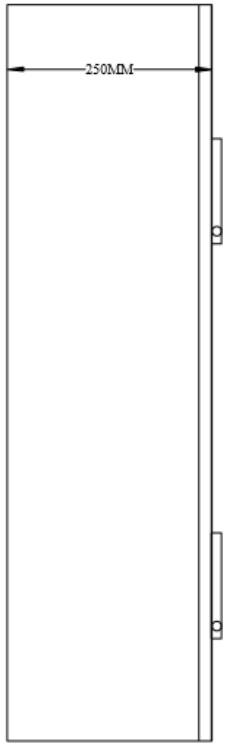
4 X 60KW SOLIS INVERTER







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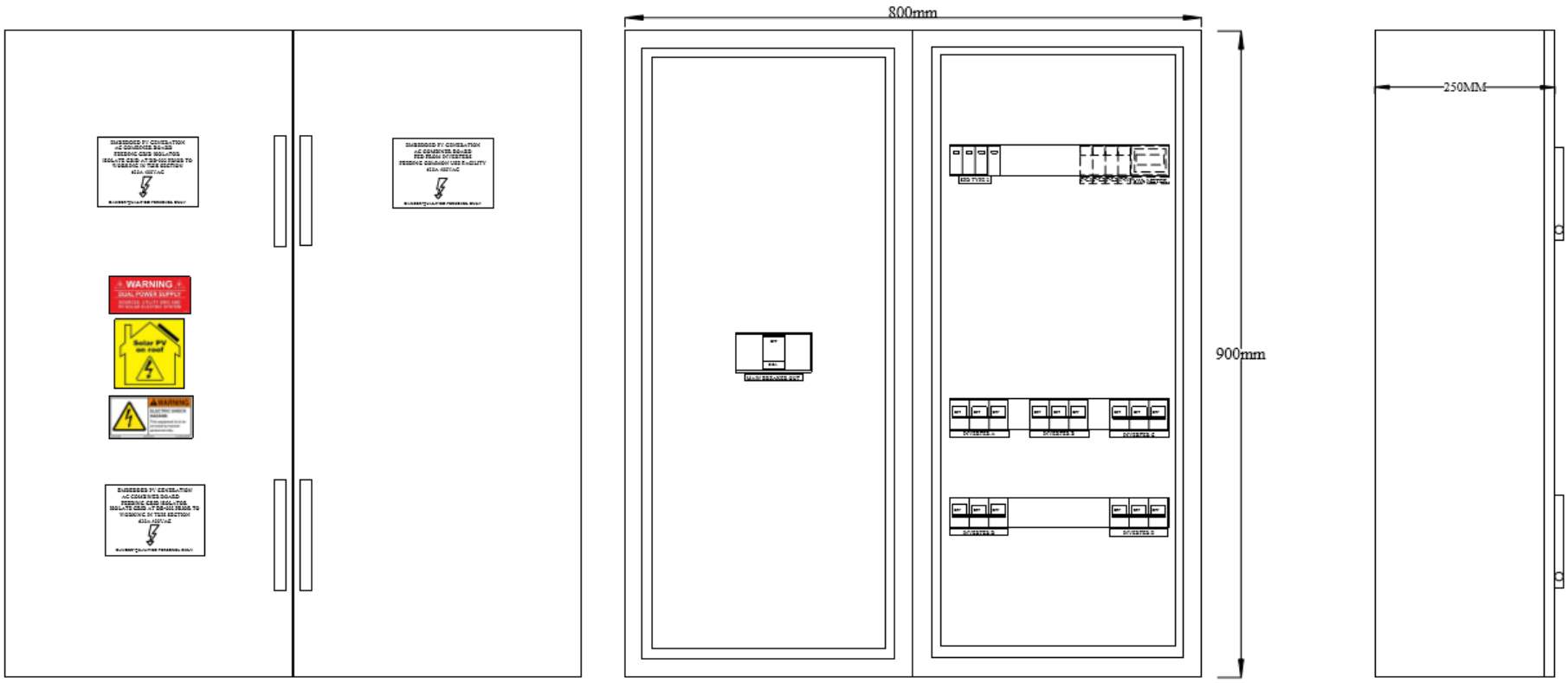
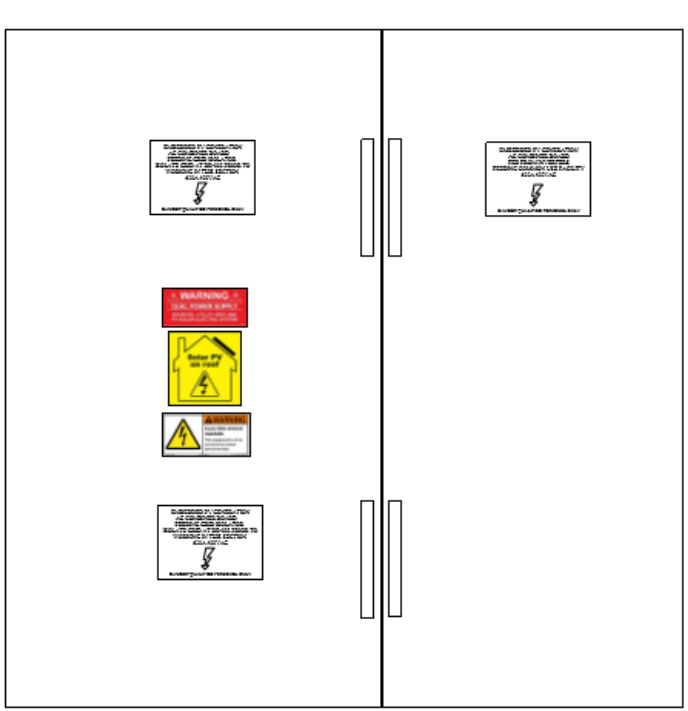
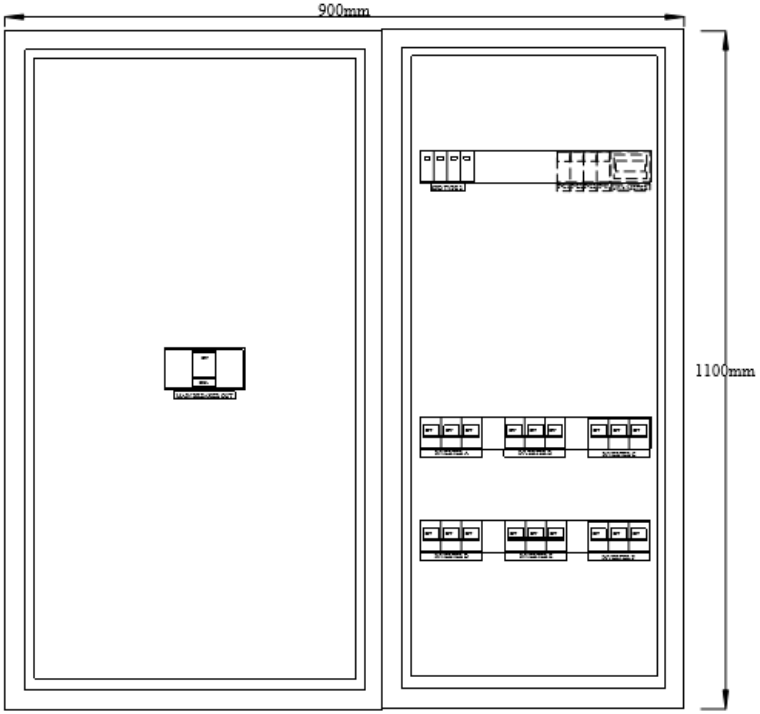
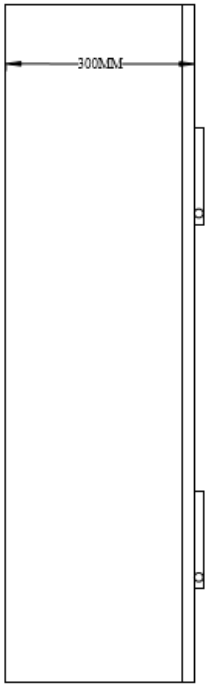
5 X 60KW SOLIS INVERTER



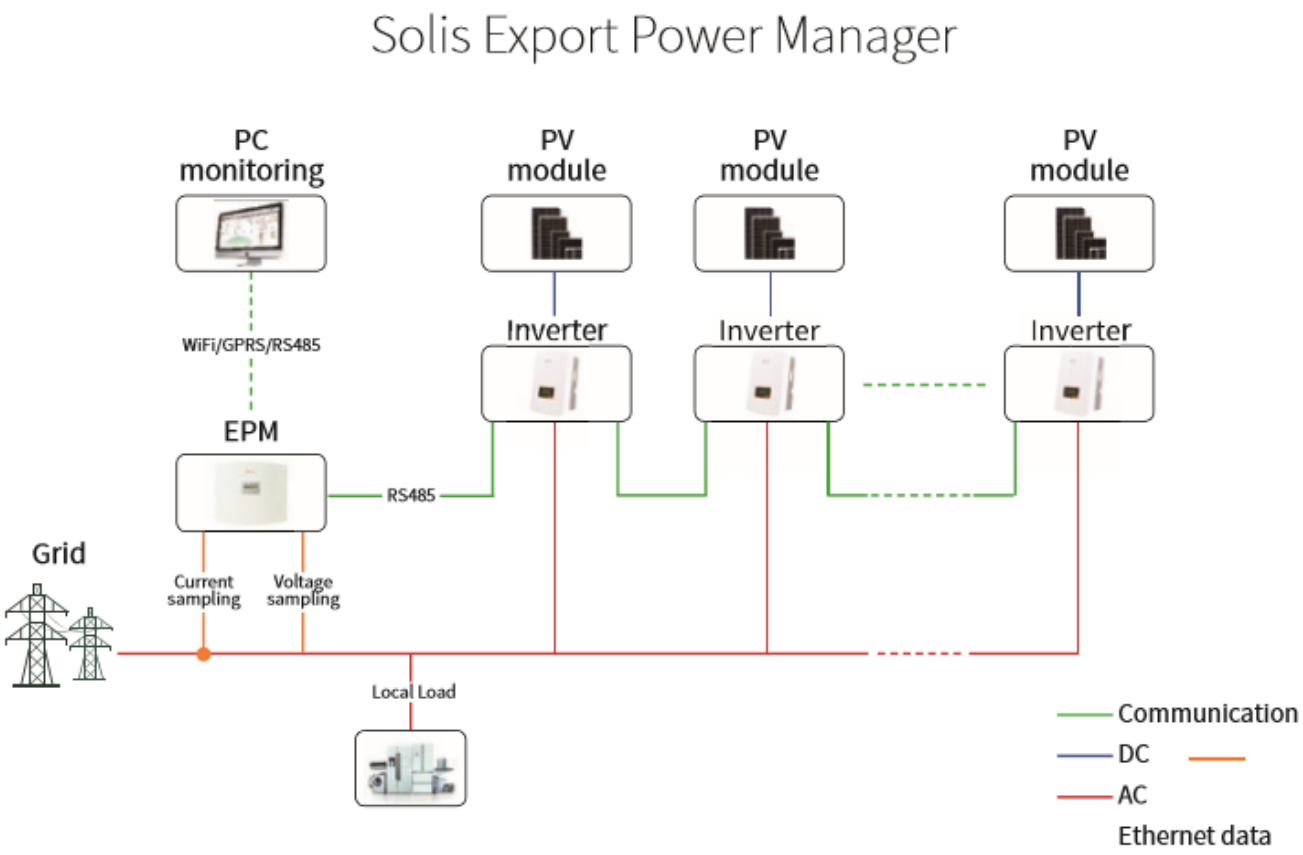
NEW AC COMBINER BOARDS FOR SOLIS 60KW INVERTER PACKAGES
6 X 60KW SOLIS INVERTER







Solis Export Power Manager



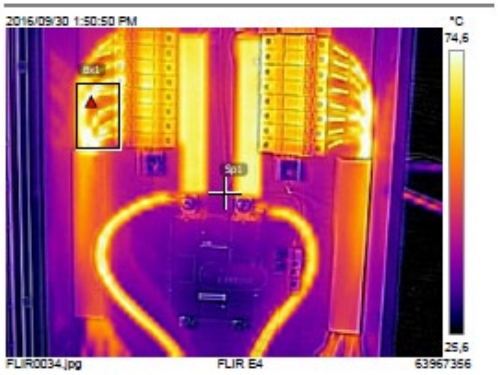
Damaged Inverter

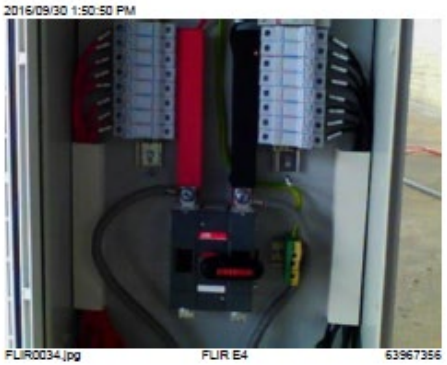
Or even worse- damaged Lives

How bad Combiner Box design Affects the Thermal Behaviour over time and load

Measurements		°C
Bx1	Max	81,4
	Average	64,3
Sp1		37,8

Parameters	
Emissivity	0.95
Refl. temp.	29 °C
Distance	1 m
Atmospheric temp.	25 °C
Ext. optics temp.	20 °C
Ext. optics trans.	1
Relative humidity	30 %

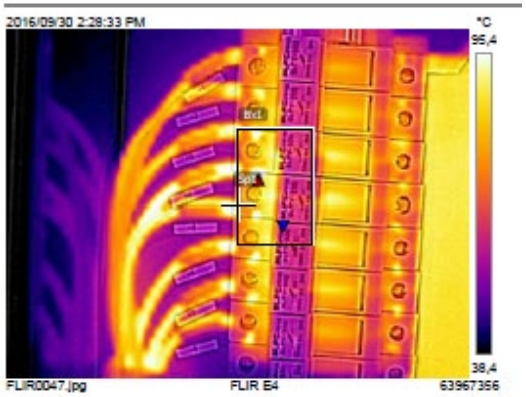


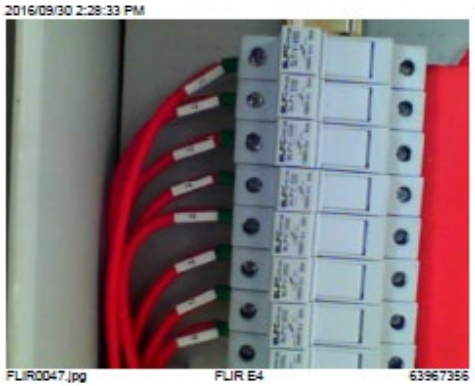


Text annotations	
Time to Test	30 Mins
Current	225A

Measurements		°C
Bx1	Max	112,4
	Min	57,8
	Average	73,3
Sp1		83,9

Parameters	
Emissivity	0.95
Refl. temp.	29 °C
Distance	1 m
Atmospheric temp.	25 °C
Ext. optics temp.	20 °C
Ext. optics trans.	1
Relative humidity	30 %





Text annotations	
Start to Test	60 Mins

Some points to consider when designing your PV system

1. The centre of your design is your inverter
2. Only once you have chosen your inverter can you plan the BOS of the plant
3. Consider the appropriate standards applicable to the installation or System

Applicable SABS Standards as contained in
DRAFT: SANS 10142-1-2:20XX Edition 1

Subsection: 6.2.7 (Requirement)

Isolation and Switching

- Isolation shall be provided for the inverter on both the DC and AC side
- The solar PV array shall be equipped with devices for isolation and switching
- PV strings and PV sub-arrays shall have accessible means of isolation
- PV arrays shall have accessible Switch Disconnectors

Applicable SABS Standards as contained in
DRAFT: SANS 10142-1-2:20XX Edition 1

Subsection: 6.2.7 (Requirement)

Isolation and Switching

- All Switch Disconnectors shall be selected and erected to comply with the following requirements

1. It shall not have exposed live metal parts in connected or disconnected states
2. It shall be DC rated at the calculated maximum voltage and current
3. The DC Switch Disconnector shall comply with SANS 60947-1 and 3, and SANS 60947-2, when circuit breakers are used

Applicable SABS Standards as contained in
DRAFT: SANS 10142-1-2:20XX Edition 1

Subsection: 6.2.7.1 (Requirement)

Location of the Switch Disconnector for Inverter

All Switch Disconnectors shall be selected and erected to comply with the following requirements

1. **The Switch Disconnector shall be located such that maintenance of the inverter (e.g., the replacing of modules and fans, or the cleaning of filters) is possible without risk of electrical hazards shall be DC rated at the calculated maximum voltage and current**
2. **For multiple DC inputs, these requirements apply to each input**

Applicable SABS Standards as contained in
DRAFT: SANS 10142-1-2:20XX Edition 1

Subsection: 6.2.9 (Requirement)

DC Combiner Boxes

DC combiner boxes shall be required when PV Sub-Arrays are combined, or where overcurrent protection and / or switch disconnection devices are used (Protection Boxes)

Applicable SABS Standards as contained in
DRAFT: SANS 10142-1-2:20XX Edition 1

Subsection: 6.2.9.1 (Requirement)

Component Requirements

- **Where protective measures used on the DC side is double or reinforced insulation, combiner boxes shall be selected according to Class II or equivalent insulation, as per SANS 61140**
- **Combiner boxes shall comply with SANS 61439-2. Alternatively, in the event of household or similar solutions only, combiner boxes may comply with SANS 60670 (relevant parts)**
- **Switchgear assemblies shall comply with SANS 61439 (relevant parts)**

Applicable SABS Standards as contained in
DRAFT: SANS 10142-1-2:20XX Edition 1

Subsection: 6.2.9.2 (Requirement)

Accessibility Requirements

- Combiner boxes that contain overcurrent and / or Switching Devices shall be accessible for inspection, maintenance and / or repairs without necessitating the dismantling of the structural parts (such as cupboards, benches or the like)
- Combiner boxes shall be accessible from ground level, i.e., no ladder or scaffolding is required to reach the boxes.)

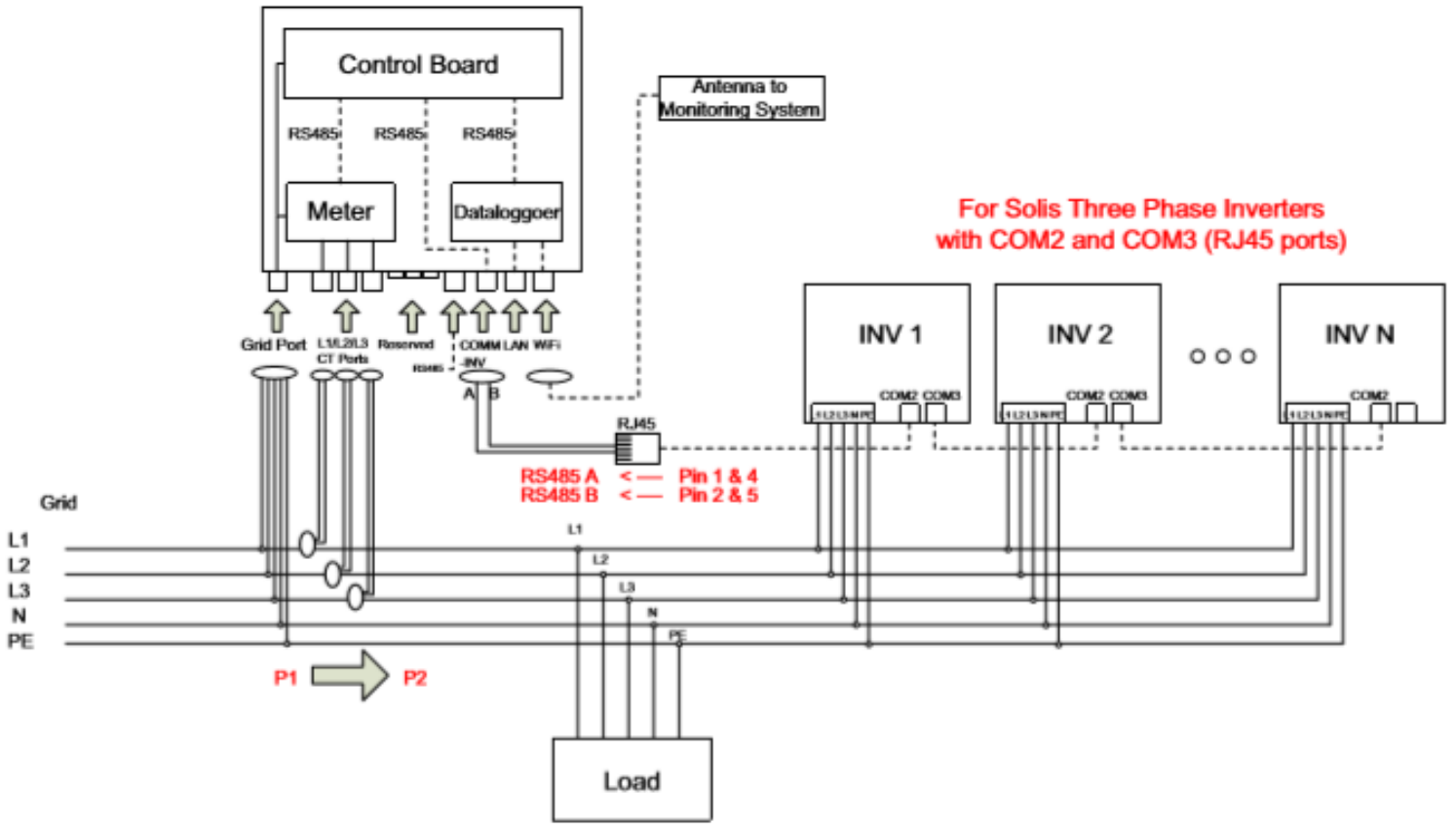
Applicable SABS Standards as contained in
DRAFT: SANS 10142-1-2:20XX Edition 1

Subsection: 6.2.9.3 (Requirement)

Wiring in Combiner Boxes

- All cable entries shall maintain the IP rating of the enclosure
- Where conductors enter a combiner box without a conduit, a tension relief arrangement shall be used to avoid cable disconnection inside the box.
- Note 1: Using a gland-connector could serve as a tension relief arrangement
- Note 2: Water condensation inside combiner boxes can be a problem in some locations – in these cases, provision should be made to drain water build-up.

WIRING SCHEMATIC



TYPICAL SYSTEM OVERVIEW

PV MODULES

DC PROTECTION BOXES

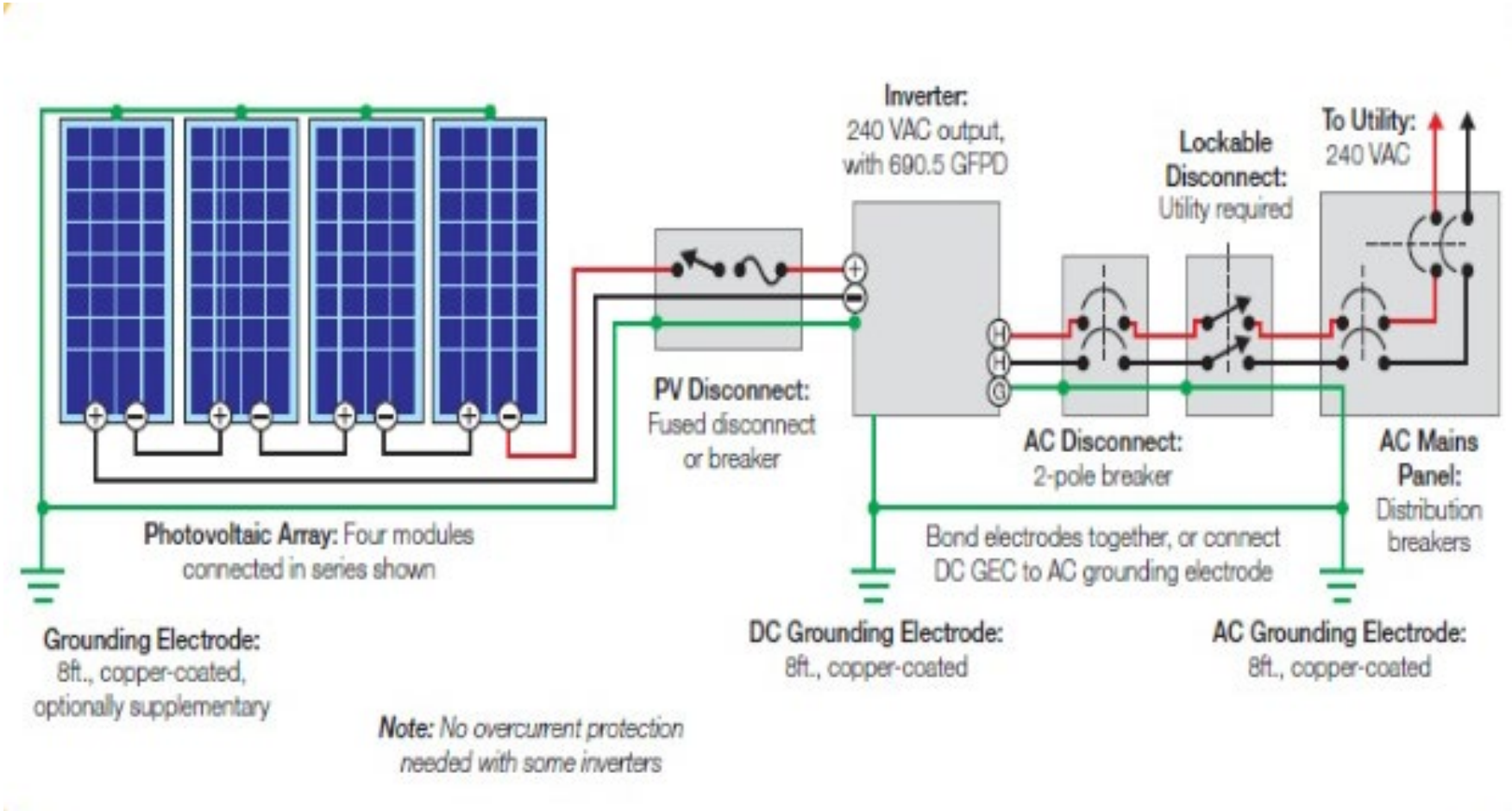
INVERTER

PV AC DB

EXPORT POWER MANAGER

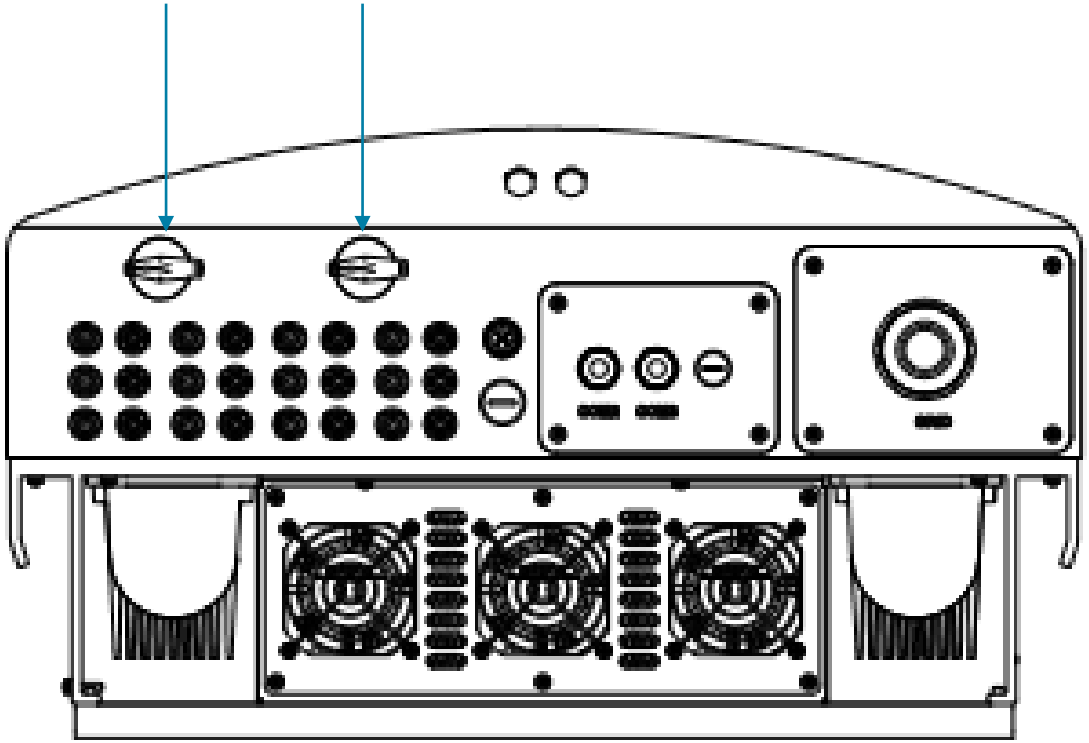
EXISTING MAINS DB

PV SYSTEM EARTHING NB!!



INVERTER DC SWITCH NB!!

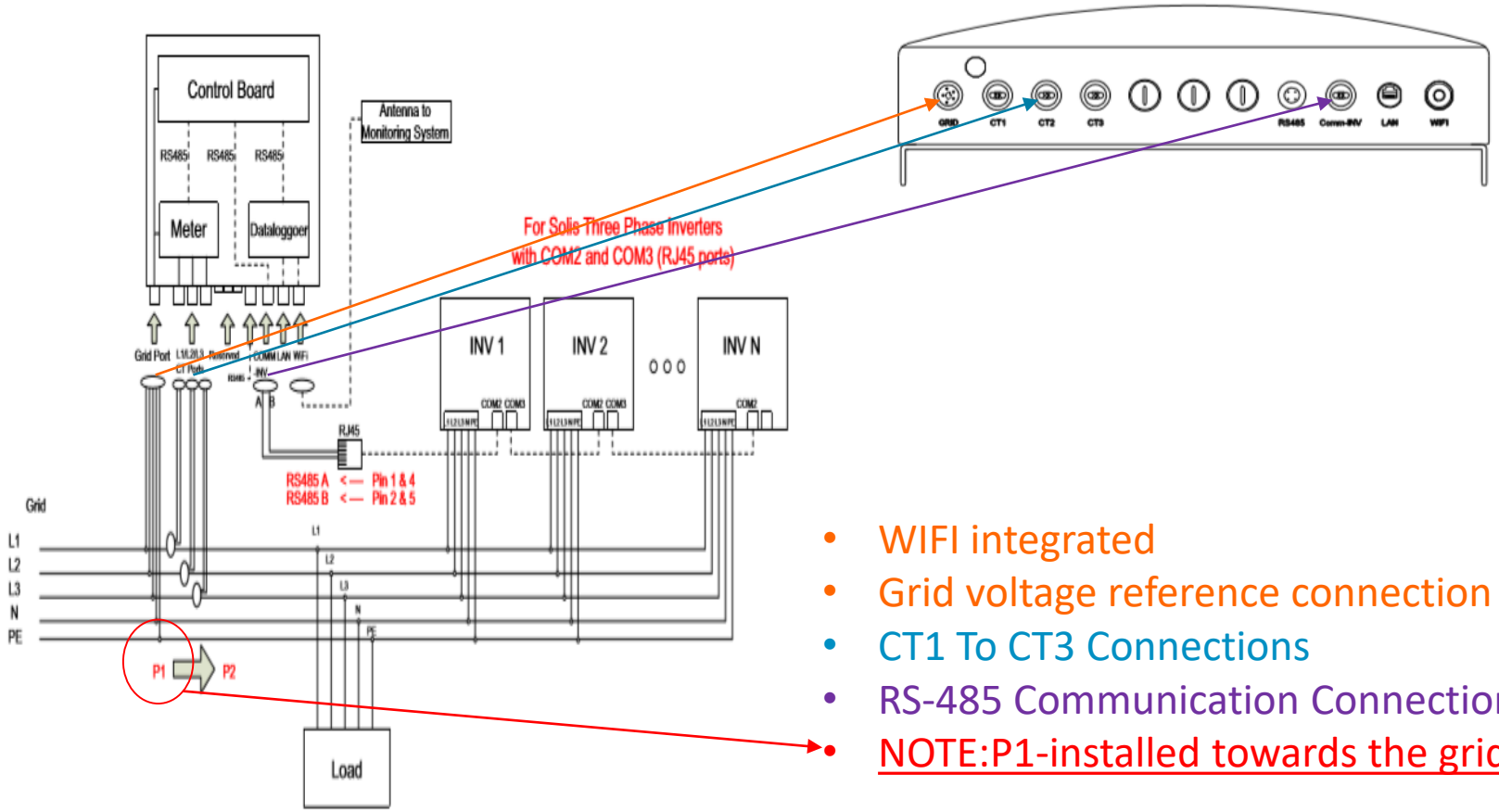
DO NOT SWITCH UNDER LOAD



INVERTER DC SWITCH NB!!

DO NOT SWITCH UNDER LOAD

WIRING SCHEMATIC-EXPLAINED



- WIFI integrated
- Grid voltage reference connection
- CT1 To CT3 Connections
- RS-485 Communication Connection
- NOTE:P1-installed towards the grid supply

BOTTOM CONNECTION VIEW-EPM3-5G-PLUS

EPM3-5G-PLUS SETUP

6. Operation

6.3 Settings

The following submenus are displayed when the Settings menu is selected:

1.Set Time

2.Set Address

6.3.1 Set Time

This function allows time and date setting. When this function is selected, the LCD will display a screen as shown in Figure 6.3.

Figure 6.3 Set Time

Press the UP/DOWN keys to set time and data. Press the ENTER key to move from one digit to the next (from left to right). Press the ESC key to save the settings and return to the previous menu.

6.3.2 Set Address

This function is used to set the address when muti inverters are connected to three monitor. The address number can be assigned from "01"to "99"(see Figure 6.4).
The default address number is "01".

Figure 6.4 Set Address

Press the UP/DOWN keys to set the address. Press the ENTER key to save the settings. Press the ESC key to cancel the change and return to the previous menu.

- Time/Date settings to be the same for the entire system

- 1 inverter: address on inverter and EPM to be set the same -01
- More than 1 inverter ie- 3 inverter 2 address setting will 02 and inverter 3 will be 03

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Any Questions

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Thank you