



Leading Conversion Technology for Power Resilience

# SIERRA 25 - 110/230

## User Manual V1.0

### THE NEW GENERATION OF POWER CONVERTERS

- **DUAL AC AND DC OUTPUT CONVERTER**  
Commercial Power as default source
- **AC AND DC BACKUP IN A DC ENVIRONMENT**  
Leverage your existing DC infrastructure
- **ONE STOP SHOP**  
Wide output power range
- **HARSHEST AC INPUT CONDITIONS**  
Without compromising the quality of the AC output



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1.0	08/02/2022	-	First release of the Manual.

# 1. CE+T Power at a glance

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CE+T Power designs, manufactures and markets a range of products for industrial operators with mission critical applications, who are not satisfied with existing AC backup systems performance and related maintenance costs.

Our product is an innovative AC backup solution that unlike most used UPS's

- Maximizes the operator's applications uptime;
- Operates with lowest OPEX;
- Provides best protection to power disturbances;
- Optimizes footprint.

Our systems are:

- Modular
- Truly redundant
- Highly efficient
- Maintenance free
- Battery friendly

CE+T puts 60+ years expertise in power conversion together with worldwide presence to provide customized solutions and extended services 24/7 – 365 days a year.

## 2. Abbreviations

---

ECI	Enhanced Conversion Innovation
EPC	Enhanced Power Conversion
REG	Regular
DSP	Digital Signal Processor
AC	Alternating current
DC	Direct current
PE	Protective Earth (also called Main Protective Conductor)
N	Neutral
PCB	Printed Circuit Board
TRS	True Redundant Structure
PWR	Power
ESD	Electro Static Discharge
MET	Main Earth Terminal
MBP	Manual By-pass
UMB	Universal Measure Box
TCP/IP	Transmission Control Protocol/Internet Protocol
USB	Universal Serial Bus
LAN	Local Access Network
ETH	Ethernet
SNMP	Simple Network Management Protocol
HTTP	HyperText Transfer Protocol
HTTPS	Secure HyperText Transfer Protocol
NTP	Network Time Protocol
MIB	Management Information Base
DHCP	Dynamic Host Configuration Protocol

## 3. Warranty and Safety Conditions\*

### WARNING:

The electronics in the power supply system are designed for an indoor, clean environment.

When installed in a dusty and/or corrosive environment, indoor, it is important to:

- Install an appropriate filter on the enclosure door, or on the room's air conditioning system.
- Keep the enclosure door closed during operation.
- Replace the filters on a regular basis.

**Important Safety Instructions, Save These Instructions.**

### 3.1 Disclaimer

- The manufacturer declines all responsibilities if equipment is not installed, used or operated according to the instructions herein by skilled technicians according to local regulations.
- Warranty does not apply if the product is not installed, used or handled according to the instructions in the manual.
- This equipment is shipped with a SHOCKWATCH monitor. If the SHOCKWATCH shows that the equipment was exposed to excessive force the warranty will be void.

### 3.2 Technical care

- This electric equipment can only be repaired or maintained by a "qualified employee" with adequate training. Even personnel who are in charge of simple repairs or maintenance are required to have knowledge or experience related to electrical maintenance.
- Please follow the procedures contained in this Manual, and note all the "DANGER", "WARNING" AND "NOTICE" marks contained in this Manual. Warning labels must not be removed.
- Qualified employees are trained to recognize and avoid any dangers that might be present when working on or near exposed electrical parts.
- Qualified employees know how to lock out and tag out machines so the machines will not accidentally be turned on and injure employees working on them.
- Qualified employees also know safety related work practices, including those by OSHA and NFPA, as well as knowing what personal protective equipment should be worn.
- All operators are to be trained to perform the emergency shut-down procedure.
- Never wear metallic objects such as rings, watches, or bracelets during installation, service and maintenance of the product.
- Maximum operating ambient temperature is 40°C (104°F).
- Insulated tools must be used at all times when working with live systems.
- When handling the system/units pay attention to sharp edges.
- This product is suitable for use in a computer room.

\* These instructions are valid for most CE+T Products/Systems. Some points might however not be valid for the product described in this manual.



### 3.3 Installation

- This product is intended to be installed only in restricted access areas as defined by local regulations and in accordance with the National Electric Code, ANSI/NFPA 70, or equivalent agencies.
- The Converter System may contain output over current protection in the form of circuit breakers. In addition to these circuit breakers, the user must observe the recommended upstream and downstream circuit breaker requirements as defined in this manual.
- Please use extreme caution when accessing circuits that may be at hazardous voltages or energy levels.
- The modular converter rack is a dual input power supply. The complete system shall be wired in a way that both input and output leads can be de-energized when necessary.
- REG systems and EPC systems that have no AC input wired and connected can be seen as independent power sources. To comply with local and international safety standards N (input) and PE shall be bonded. The bonded connection between N (input) and PE must be removed once the AC input is connected.
- AC and DC circuits shall be terminated with no voltage / power applied (de-energized).
- The safety standard IEC/EN62040-1-1 requires that, in the event of an output short circuit, the converter must disconnect in 5 seconds maximum. The parameter can be adjusted on Inview; however, if the parameter is set at a value > 5 seconds, an external protection must be provided so that the short circuit protection operates within 5 seconds. Default setting is 60 seconds.
- The system is designed for installation within an IP20 environment. When installed in a dusty or humid environment, appropriate measures (air filtering) must be taken.
- Environment Conditions:
  - Storage Conditions: -40 to 70°C
  - Relative Humidity: 95%, non-condensing
  - Altitude above sea without de-rating: Less than 1500 m  
Greater than 1500 m – de-rating at 0.8% per 100 m
- All illustrations in the manual are for general reference, refer to the technical drawing which is received along with the system for exact information.

#### 3.3.1 Handling

- The cabinet shall not be lifted using lifting eyes.
- Remove weight from the cabinet by unplugging the converters. Mark converters clearly with shelf and position for correct rebuild. This is especially important in dual or three phase configurations.
- Empty converter positions must not be left open. Replace with module or blank cover.

### 3.3.2 Surge and transients

The mains (AC) supply of the modular converter system shall be fitted with Lightning surge suppression and Transient voltage surge suppression suitable for the application at hand. Manufacturer's recommendations of installation shall be adhered to. Selecting a device with an alarm relay for function failure is advised.

Indoor sites are considered to have a working lightning surge suppression device in service.

- Indoor sites Min Class II.
- Outdoor sites Min Class I + Class II or combined Class I+II. The modular converter system/rack can reach hazardous leakage currents. Grounding must be carried out prior to energizing the system. Grounding shall be made according to local regulations.

#### Note:

Choosing and installing surge arrestors must obey to precise technical rules. Distance to equipment to protect, cable gage and cable routing have significant influence on proper device service.

Some areas are more susceptible to be hit by electrical strikes, especially when altitude increases.

Good earthing is also crucial for surge arrestors to work properly.

CE+T declines any liability in regard to damaged caused to equipment not correctly or not sufficiently protected.

### 3.3.3 Other

- Insulation test (Hi-Pot) must not be performed without instructions from the manufacturer.

## 3.4 Maintenance

- The converter system/rack can reach hazardous leakage currents. Earthing must be carried out prior to energizing the system. Earthing shall be made according to local regulations.
- Prior to any work conducted to a system/unit, make sure that AC input voltage and DC input voltage are disconnected.
- Prior to accessing the system or modules, make sure all source of supply is disconnected.  
**CAUTION** – Risk of electric shock. Capacitors store hazardous energy. Do not remove cover until 5 minutes after disconnecting all sources of supply..
- Some components and terminals carry high voltage during operation. Contact may result in fatal injury.

## 3.5 Replacement and Dismantling

- ESD Strap must be worn when handling PCB's and open units.
- The converter system/rack is not supplied with internal disconnect devices on input nor output.
- CE+T cannot be held responsible for disposal of the converter system and therefore the customer must segregate and dispose of the materials which are potentially harmful to the environment, in accordance with the local regulations in force in the country of installation.
- If the equipment is dismantled, to dispose of its component products, you must comply with the local regulations in force in the country of destination and in any case avoid causing any kind of pollution.

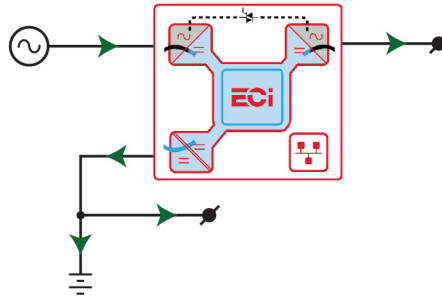
To download the latest documentation and software, please visit our website at [www.cet-power.com](http://www.cet-power.com)



## 4.1 EPC mode

In EPC mode, the **AC Mains** is the primary source and DC source works as a backup. When AC mains is present, the sierra module takes energy from the AC source and feed to:

- AC Load via a double conversation to provide a pure sine wave.
- DC load and also charges the battery with a regulated DC.



The total output power of a module can be shared between the AC load, DC load and charging power based upon the requirement.

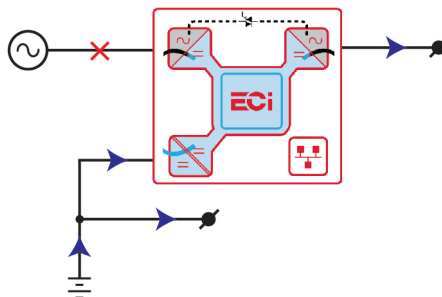
If the AC source is not present, the module seamlessly switches to DC source without impacting the critical loads and resumes to EPC mode once AC source returns. The transfer time between AC to DC and DC to AC is 0 ms.

The EPC mode provides a higher efficiency of  $\geq 96\%$  without compromising the purity of the output sine wave.

## 4.2 Back up mode

In back up mode, module operates in DC source and feed to:

- AC Load via a double conversation to provide a pure sine wave.
- DC load directly.



## 5. Building Blocks

### 5.1 Sierra 25 - 110/230

Industrial / Datacom:	Input	110 Vdc 230 Vac, 50/60 Hz
	Output	230 Vac and 110 Vdc
	Power	3000 VA / 2500 W



- The Sierra converter is a triple port converter.
- Each converter can supply 2500 W on any DC, AC or combination of both AC and DC output ports. AC output load is the highest priority. Even if AC output is fully loaded (2500 W), still 200 W is available for DC output.
- Hot swappable and hot pluggable.
- The front LED's indicate the converter status and output power.
- Module is equipped with soft start.
- Fan is equipped with alarm and run time meter. The fan is field replaceable.
- 435 mm (D) x 102 mm (W) x 88 mm (H).
- 5 Kg.

#### 5.1.1 Specifications

Model	Sierra 25 - 110/230
Part Number: Module / Shelf without Isolation Port / Shelf with Isolation Port	T721D50201 / T724D50000 / T724D50010
Cooling / Audible noise	Fan forced cooling / <60 dBA @1meter (100% load at 25°C)
MTBF	240 000 hrs (MIL-217IF)
Dielectric strength DC/AC	2100 Vdc
RoHS	Compliant
Operating T° / Relative Humidity (RH) non-condensing	Tested according ETS300-019-2-3 Class 3.1 -20°C to 65°C, power de-rating from 40°C to 65°C / Max RH 95% for 96 hours per year
Storage T° / Relative Humidity (RH) non-condensing	Tested according ETS300-019-2-1 Class 1.2 -40°C to 70°C / Max RH 95% for 96 hours per year
Public transport T°/Relative Humidity (RH) non-condensing	Tested according ETS300-019-2-2 Class 3.1 -40°C to 70°C / Max RH 95% for 96 hours per year
Material (casing)	Nickel-Zinc coated steel
AC Input Data	
Nominal voltage / Current	230 Vac / 11.7 A
Voltage range	195 - 290 Vac (De-rating from 195 to 150 Vac)
Brownout	2500 W @ 195 Vac linear decreasing
Power factor / THD	> 0.99 / < 3%
Frequency (Synchronization range)	50 Hz (47 - 53 Hz) or 60 Hz (57 - 63 Hz)

DC Input Data	
Nominal voltage (range)	110 Vdc (90 - 150 Vdc)
Nominal current (at 110 Vdc and 2500 W output)	24.3 A
Maximum input current (for 15 seconds) / voltage ripple	30.3 A / < 10 mV RMS
AC Output Data	
Efficiency AC to AC (EPC) / DC to AC / AC to DC	> 96% / > 93.7% / > 93.7%
Nominal voltage (Adjustable)	230 Vac (200 - 240 Vac)
Frequency / frequency accuracy	50 or 60 Hz / 0.03%
Nominal Output power (VA) / (W)	3 kVA / 2.5 kW (at 2.5 kW AC load, still 200 W available for DC load)
Short time overload capacity	125% (15 seconds)
Admissible load power factor	Full power rating from 0 inductive to 0 capacitive
Total harmonic distortion (resistive load)	< 3%
Load impact recovery time (10% - 90%)	≤ 0.4 ms
Nominal current	13 A @ 230 Vac
Crest factor at nominal power	3 : 1 for load P.F. ≤ 0.7
Short circuit clear up capacity at AC input / On battery	109 A / 34 Arms for 20 ms
Short circuit current after > 20 ms	22.5 A for 15 seconds
AC output voltage stability	±1% from 10% to 100% load
Static / Dynamic voltage regulation	±1% between 10% and 100% load / <5% from 0 to 100% to 0 load impact (100 ms)
DC Output Data	
Nominal voltage (range)	110 Vdc (90 - 150 Vdc)
Maximum power	2.5 kW (at 2.5 kW DC load, still 200 W available for AC output)
Maximum current at 110 Vdc	24.3 A
Reverse polarity protection	YES
Efficiency AC to DC	> 93.7%
Max. Voltage interruption / total transient voltage duration (max)	0 sec / 0 sec
Signaling & Supervision	
Display	Synoptic LED
Supervision / Part number	Inview ranges: Inview S - T302004100 & Inview GW - T602004000
Remote ON / OFF	On rear terminal of the shelf through Inview
Battery Measure / Part number	UMB (Universal Measure Box) - 3 dry contacts and 4 digital Inputs / T602006110
Safety & EMC	
Electrical Safety	IEC/EN 60950, IEC/EN 62040-1, IEC/EN 62477-1
EMC	EN 61000-4-2 / EN 61000-4-3 / EN 61000-4-4 / EN 61000-4-5 / EN 61000-4-6 / EN 61000-4-8 ETSI EN 300386 v1.9.1

## 5.2 Sub-rack

- The Sierra shelf shall be integrated in min 600 mm deep cabinets, Inch/ETSI mounting.
- The Sierra shelf can accommodate maximum of four inverter modules.
- The Sierra shelf is designed with individual Input/Output for DC power and common Input/Output for AC power.
- Rear cover for IP 20 in open rack (optional).
- Max 12 kVA per shelf.
- Dimension (W x D x H) in mm - 480 x 483 x 2U.
- 6 Kg empty.



## 5.3 Controller - Inview S

Inview S is an advanced monitoring and controller unit for Multi-directional converter power systems. It allows the user to easily access the system information through inbuilt powerful touch screen graphic display. In addition to the touch screen display, the user can also access the system information through the web interface and SNMP/MODBUS protocol.

The Inview S interface provides the user to access the configuration and setup files of the modules in the system. Also, it is a controller for DC regulation. The Aux power supply is 12VDC from external converter.

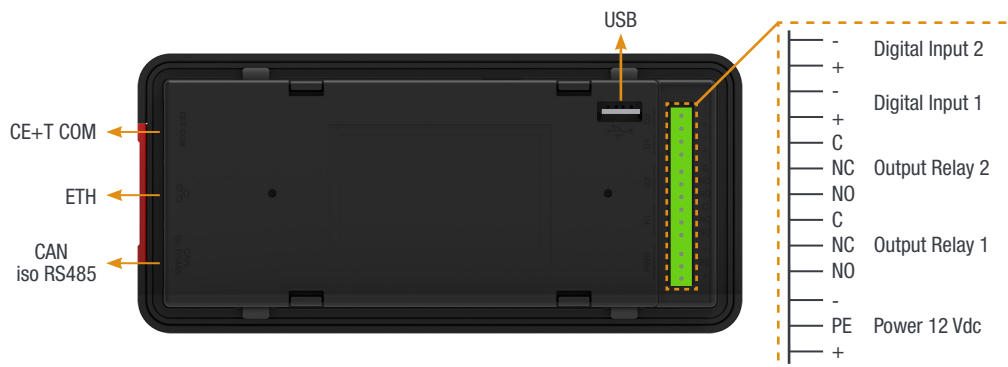
Inview S can monitor up to 32 inverters/converters and featured with:

- LCD touch screen GUI
- 2 Digital Inputs
- 2 Output Relay contacts
- External 12VDC Aux power supply
- Records 5000 events on FIFO order



### 5.3.1 Inview S - Connections

Inview S is composed of multiple network ports and inbuilt free potential contacts.



- CE+T COM port is dedicated to establish connection between Inview S and Sierra - shelf.
- ETH port is used for network connectivity and user can access the system information in the web interface.

- **CAN / iso RS485** is used share the system (DC) information to UMB (Universal Measure Box).
- **USB port** is used to access the Inview S configuration and setup files.
- **Digital Inputs (D1 and D2):** Two potential free Digital Inputs are available for customer connections.
  - Digital Input 1 is assigned for MBP operation if used.
  - Digital Input 2 is assigned for Surge Arrester if used.
- **Output Relays (K1 and K2):** Two output relays are available and can be used for Major and Minor Alarms
- **Power:** Separate and regulated +12 V power supply is required for powering Inview S and this power should not be shared with other devices. (CET can provide Auxiliary Power Supply converter and the part number is T602004120).

## 5.4 Universal Measure Box (UMB)

Universal Measure Box is a device which monitors the Battery. It is composed of multiple digital inputs and analog outputs as follows.

- 2 DC Voltage measurement inputs
- 1 DC Current measurement input (shunts)
- Isolated 1 Temperature measurement input - PT1000
- 3 Relays outputs
- 4 Digital inputs - Customer will use potential free contact
- Communication Port with monitoring - RS485 communication port, Modbus
- Protocol
- Power Supply - 10Vdc to 60Vdc Power supply
- Status Display - In display and communication





## 6. Accessories

### 6.1 Cabinet

Powder coated (RAL 7024), 19 inch Flat Pack cabinet with 600 x 600 mm foot print. Cabinet designed for top cabling or bottom cabling.

- 1100 mm (600 x 600 mm) 21U
- 1800 mm (600 x 600 mm) 37U
- 2100 mm (600 x 600 mm) 44U

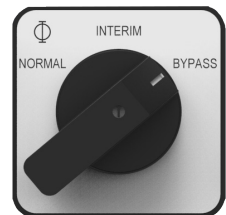
The cabinet comes with a separable top cover to facilitate cabling. Tie strap support at cable entrance/exit.

Door accessory optional.

### 6.2 Manual By-Pass Switch

The Manual bypass switch is used to transfer the load from Normal mode to Bypass mode and back-forth without interruption of load by operating manually. The MBP switch concept is “Make before Break” with logic controls. Standard manual by-pass is “Make before Break”. When engaged or disengaged, no disturbance is transmitted to the load.

When MBP is engaged, inverter modules are switched off and can be removed without impacting the load. The battery supply is not physically disconnected. After disconnecting the battery supply (by opening the battery breakers), the shelf section is safe for maintenance.



**Warning:** When the system is in by-pass, the load is subjected to AC main disturbances. Before engaging manual bypass, make sure the voltage difference between AC IN and AC OUT should be less than 5 Vac to limit the inrush current.

### 6.3 AC Distribution Unit

#### 6.3.1 Miniature Circuit Breakers

The standard AC output distribution unit is designed with a 35 mm DIN rail, Multi Clip termination board and N/PE copper terminal bars, and built as a part of the cabinet.

The Multi Clip offers unique flexibility during installation and expansion. The terminals are spring loaded and adapt contact pressure to the size of conductor. Only one cable can be inserted per spring loaded terminal.

The AC distribution unit is available with 1 pole, 2 pole or 3 poles.

The maximum number of breakers per string is as given below:

- 1P- 20 No's ( 2-63 Amp)
- 2P- 10 No's ( 2- 63 Amp)
- 3P- 5 no's ( 2- 63 Amp )



If an alarm is required for AC output breakers, a help contact attached to each individual breaker is used. The alarm function is common and uses one of the digital inputs on the control unit. The help contact limits the breakers quantity.

	Single pole		Double pole		Three pole	
	w/o help contact	With help contact OF/SD	w/o help contact	With help contact OF/SD	w/o help contact	With help contact OF/SD
Up to 40A	20	13	10	6	5	3

### 6.3.2 AC Out on MCCB



AC output distribution via MCCB in the range up to 400 A (1p, 2p or 3p).

Max two MCCB per inverter cabinet.

## 7. System Design (from CET)

### 7.1 A la Carte

The A la Carte is pre-assembled and configured as a single phase or three phase system. The system comprises cabinet, converter sub rack, converter modules, manual by-pass, monitor device and output distributions.

Single phase system accommodates **1 to 32** modules and provides maximum **96 kVA**.

Three phase system accommodates **3 to 30** modules and provides maximum **90 kVA**.

Sierra system featured with:

- Dual output for AC and DC loads.
- Efficiency: AC/AC mode - 96%, AC/DC mode and DC/AC mode - 94%
- Pure sinusoidal AC output and ripple free DC output.
- Seamless transfer (0 ms) between primary and secondary source of supply.
- No single point of failure.
- Flexible output distribution.
- True modularity, redundancy and hot-swappable.

#### Optional

- Manual by-pass switch
- AC output distribution
- DC distribution
- Battery fuses and shunt
- Battery LVD
- Surge arresters
- Door

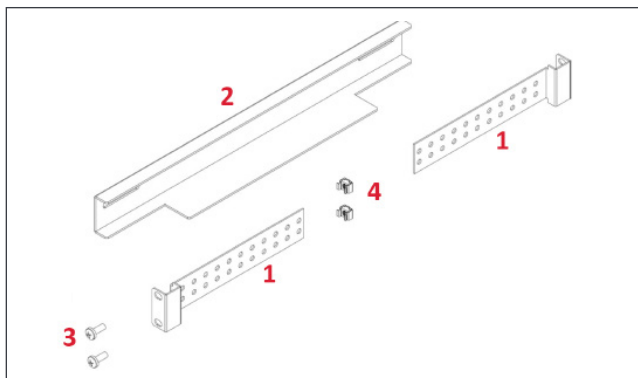


## 8. Installation of Sierra Modules / Shelf

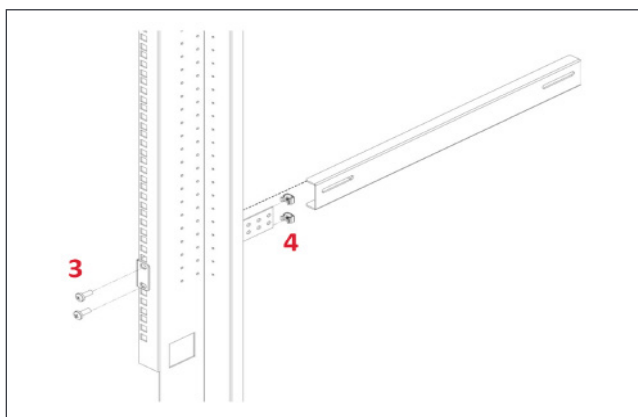
- Read safety instructions prior starting any work.
- Do not attempt to use lifting eyes to erect the cabinet.
- System is preferable handled without modules.
- Pay attention to the module position, make sure that modules are repositioned in the same slot.
- In three phase systems, the modules are configured or Phases 1 or R or A, Phase 2 or Y or B, Phase 3 or B or C. As long as the system is not in operation, make sure that modules from one phase are not mixed with modules from another phase.  
(When the system is running, modules can be moved from one phase to another without issue.)

### 8.1 Mounting kit for Sierra shelf

The fixing brackets, together with the sliders, allow for different cabinet depths.



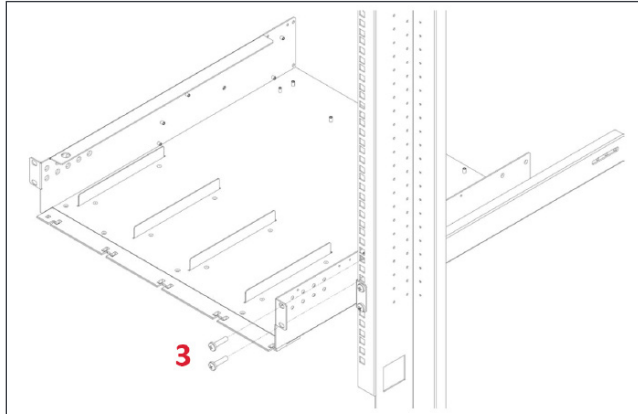
- 1** → Fixing brackets - 4 Nos
- 2** → Slider - 2 Nos
- 3** → Mounting screws - 12 Nos
- 4** → Cage nuts - 12 Nos



Assemble the sliders and adjust the length to suit the mounting depth.

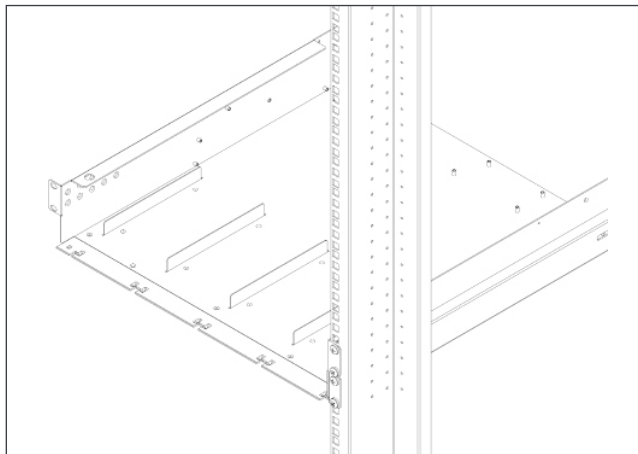
Fix cage nuts (**4**) in the cabinet front and rear frame of the left and the right side.

Fix the left and right slider of the cabinet with the supplied screws (**3**).



Fix cage nuts (4) in the mounting frame.

Slide the shelf in position and fix the shelf with the supplied screws (3).



Finished.

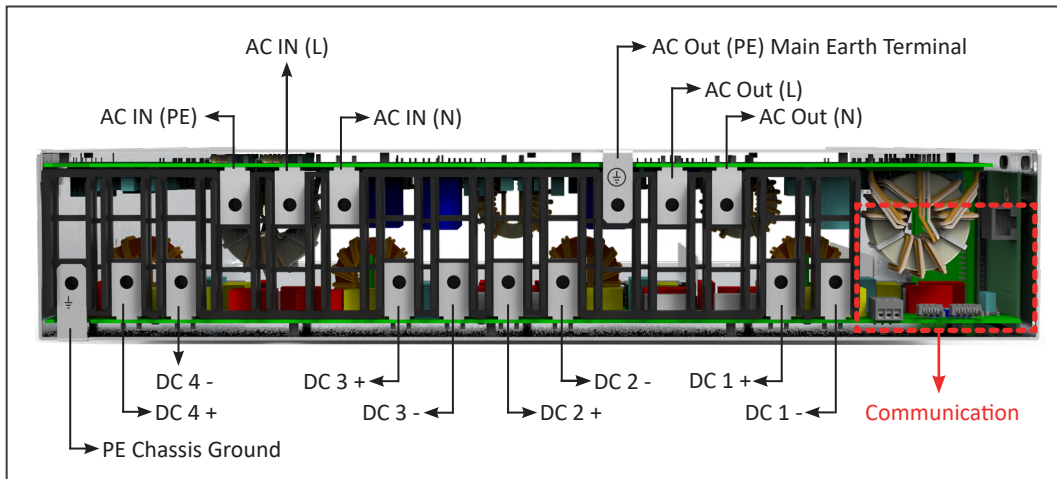
## 8.2 Electrical installation for Sierra shelf

### 8.2.1 Pre requisites

- The sub-rack have markings for all terminations.
- All cables shall be rated at Min 90 deg C.
- Electrical terminations shall be tightened with 5Nm.
- All connection screws are M5 x 12 mm.
- DC Input-Individual (per module), observe polarity.
- AC Input / AC output-Common (per shelf), respect phases.
- Wire all positions in the sub-rack for future expansion.
- Input AC / Output AC / Input DC / Signal cables shall be separated.
- Cable crossings shall be done in 90 deg angles.

### 8.2.2 Terminations

The below image is termination details of Sierra 25 - 110/230 shelf.



*Sierra 25 - 110/230 - Shelf Rear Details*

### 8.2.3 Grounding

“PE CHASSIS GROUND” 

PE Chassis ground shall be wired to MET or distributed earth bar connected to MET, according to local regulations.

### 8.2.4 DC connection

Model	MCB per converter module	Cable, min	Connector	Torque
Sierra 25 - 110/230	32 A	2 x 6 mm <sup>2</sup>	M5	5 Nm

### 8.2.5 AC Input connection

**WARNING !!!**

Recommendation of IEC 60364 4. 43

#### 431.3 Disconnection and reconnection of the neutral conductor in multi-phase systems

Where disconnection of the neutral conductor is required, disconnection and reconnection shall be such that the neutral conductor shall not be disconnected before the line conductors and shall be reconnected at the same time as or before the line conductors.

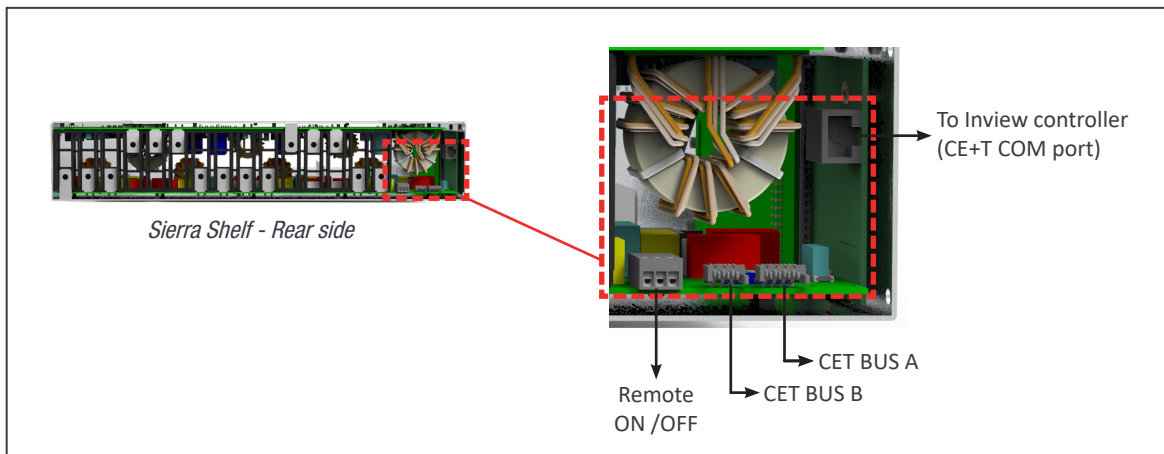
Model	Current	Cable, min	Connector	Torque
Sierra 25 - 110/230	63 A	3 x 16 mm <sup>2</sup>	M5	5 Nm

*Note: Icc value measured as 76.2 A<sub>rms</sub> per shelf with four modules.*

### 8.2.6 AC Output connection

Model	MCB per shelf	Cable, min	Connector	Torque
Sierra 25 - 110/230	3 x 63 A	3 x 16 mm <sup>2</sup>	M5	5 Nm

### 8.2.7 Communication



### 8.2.8 Remote ON/OFF

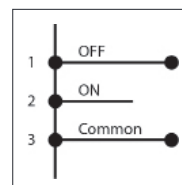
The function of remote ON/OFF is used to turn off the module/system output.

By default a jumper is placed between pin 3 and 2. If remote on/off is used, jumper should be removed from the shelf and connect changeover contactor.

- AC and DC inputs are not affected by the remote ON/OFF function.
- The remote ON/OFF can be connected to any shelf (if all the shelves are connected through CAN BUS cable).
- The remote ON/OFF requires changeover contactor, one input opens as the other close.  
If both transitions are not picked up the status is not changed.

#### Relay characteristics (Remote ON/OFF)

- Signal voltage +5 VDC (galvanic insulated)
- Max wire size 1 mm<sup>2</sup>



**Functional table for remote ON/OFF function**

#	Pin 1-3	Pin 2-3	Status	Indication
1	Open	Open	Normal operation	All (Green)
2	Closed	Open	OFF	AC output (OFF) AC Input (Green) DC Input (Green)
3	Open	Closed	Normal operation	All (Green)
4	Closed	Closed	Normal operation	All (Green)

**Warning: If remote ON/OFF is not used, pin 2 and 3 MUST be bridged together!**

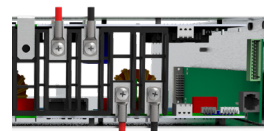
### 8.2.9 Internal CAN BUS A and B

- In A la Carte systems the internal Bus is pre installed.
- The internal bus comprise of a 6 and 8 pin ribbon cables.
- The internal bus connectors are sensitive and special caution should be taken during installation.
- The internal bus is connected from the first shelf to the last shelf (The CAN BUS cable depends on the number of shelves).

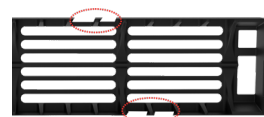
### 8.2.10 Shelf rear cover

The rear cover provides IP20 protection for the rear terminations when required.

- The rear cover is snapped into position in the rear of the sub-rack.
- Remove material using a pair of side-cutters to allow cable entry and exit.
- The rear cover is ordered separately.



Connect the cables.



Cut appropriate size on the protection cover for cable access.



Fix the protection cover at rear side of the shelf.



## 9. Installation of Cabinet (A la Carte)

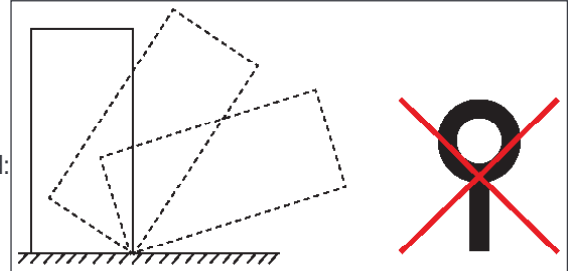
### 9.1 Unpacking the system

CE+T cabinets are always fixed on a pallet, and then packed in a wooden crate.

These crates are usually delivered laying flat, horizontally.

To unpack your cabinet, we recommend the following method:

1. Make sure that the crate is laying flat, with the correct side up. This side is identified by a double red arrow.
2. Remove the top cover in order to be able to identify the top and bottom sides of the cabinet.
3. Raise the crate vertically with the top side of the cabinet up. Make sure that the cabinet does not fall forward out of the crate while you do so.
4. Remove the cabinet and its attached pallet from the crate.



If you prefer to take the wooden crate apart before raising the cabinet, make sure you do not damage or dent the cabinet while doing so.

**Warning: The top cover fixing bolts may NEVER be replaced with lifting eye bolts.**

### 9.2 Module packing

When converters are ordered **together with a system**, they are either delivered in the cabinet or on a separate pallet.

- If you find the converters in the cabinet: you need to remove them in order to raise the cabinet more easily, **but before you do so make sure to have identified in which slot was each module. Indeed, it is important to replace each module in the same slot** it was delivered in!
- If the modules have been delivered separately, in carton on pallet, they will be clearly identified in order to be placed in the right slot.
- It is important to place the modules in the right slot, as this will ensure that the addressing of each module in the config file corresponds to the physical slot. Without this, the system will of course function properly but you might find it difficult to identify on which modules your applying changes you would be bringing to the config file.
- Also, in 3 phase systems, replacing modules configured to function in a specific phase in a slot assigned to another phase will result in the module to be un-synchronized. Your system may not start and you will have to reconfigure manually each module that was misplaced.

If you ordered modules only:

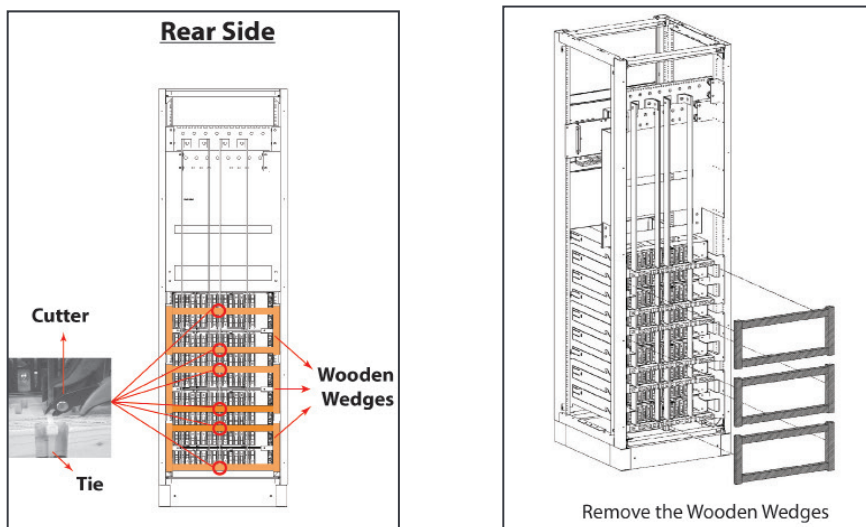
- If they are meant to be used in running systems or in a not operational single phase system, you may insert them in any slot.
- If they are meant to be placed in a not yet started 3 Phase system, follow these steps:
  - Insert one module per phase.
  - Start the system according to the start-up and commissioning procedure.
  - Insert the remaining modules progressively.

Module packing material shall be taken apart.

### 9.3 Removing the cabinet rear protection

Wooden wedges are fixed at the back of the cabinet to prevent parts from moving and sustaining damage during transportation. These wooden wedges must be removed before going further with the cabinet's installation and commissioning.

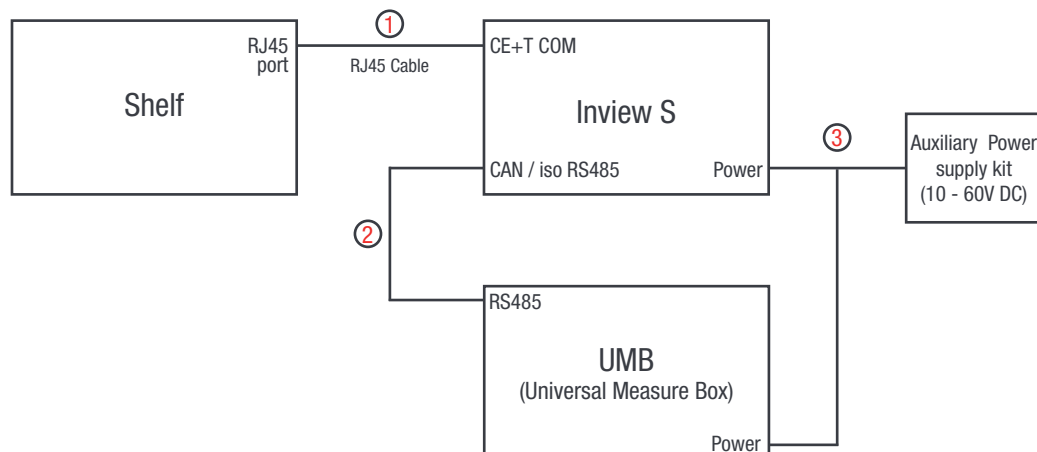
1. Remove the rear panel.
2. Identify the protection (see the following figure).
3. Cut the tie wraps holding the back wedges and remove them.



### 9.4 Hardware Connections

In Sierra 25 - 110/230 system, the Inview S and Measure Box Battery should be connected as per the following:

1. Connect "RJ45" port in shelf and "CE+T COM" port in Inview S using RJ45 straight cable.
2. Connect "CAN / iso RS485" port in Inview S and "RS485" port in UMB using RJ45 straight cable.
3. Connect 12 V supply to Inview S and UMB from auxiliary power supply kit.

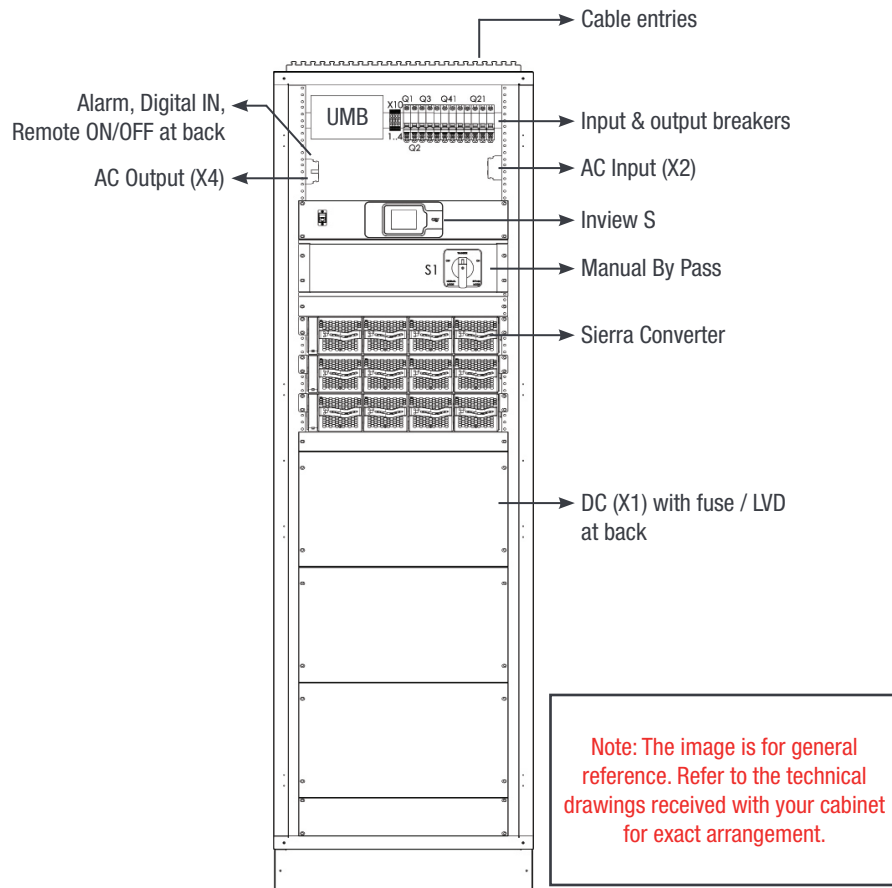


For more information about wiring refer section 19.3, page 53

### 9.5 Electrical installation

- All cables shall be halogen free and rated min 90 deg C.
- Wire all positions for future expansion.
- Input AC / Output AC / Input DC / Signal cables shall be separated.
- Cable crossings shall be made at 90 deg angles.
- Empty module positions shall be covered with **blank or dummy modules**.

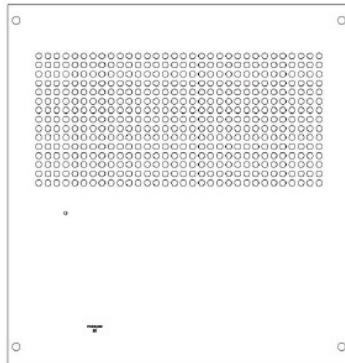
#### 9.5.1 Positioning



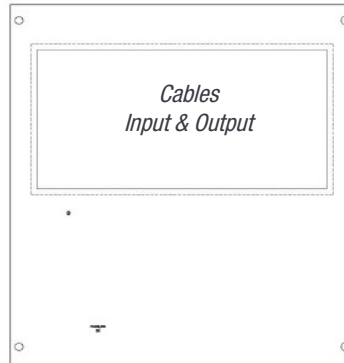
### 9.5.2 Cabling

All the cable routings are made through top or bottom of the system. The top cover can be split into two parts to facilitate cabling. The top cover accommodates nylon tie straps used to strap the cables.

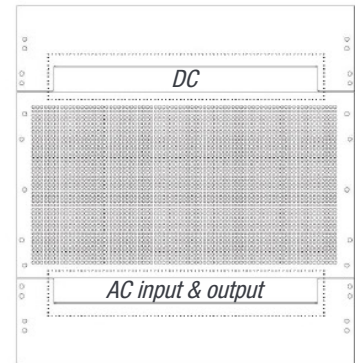
*Note: Do not block the airflow at top of the cabinet.*



*Top plate - Type I*




*Top plate - Type II*



*Top plate - Type III*

### 9.5.3 Grounding

Ground terminals are located in the top rear left corner, labelled "PE CHASSIS GROUND" 

PE Chassis ground shall be wired to MET or distributed earth bar (MET). Ground must be terminated even if commercial mains is not available.

According to local regulations, Min 16 mm<sup>2</sup>.

### 9.5.4 Surge Suppression

The mains (AC) supply of the modular converter system shall be fitted with suitable Lightning surge suppression and Transient voltage surge suppression for the application at hand. Manufacturer's recommendations of installation shall be adhered. It is advisory to select device with alarm relay for function failure.

Indoor sites are considered to have a working lightning surge suppression device in service.

- Indoor sites                      Min Class II.
- Outdoor sites :                  Min Class I + Class II or combined Class I+II.

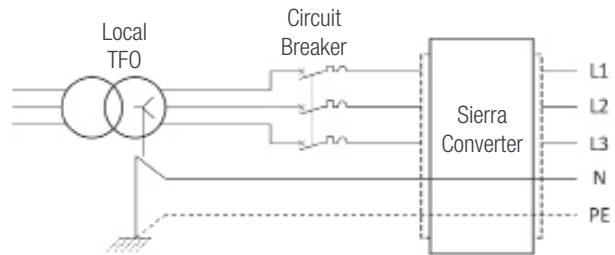
### 9.5.5 AC Input (X2) and Output (X4)

Insert the AC input cable on the screw terminal and tighten it. Max cable area is 180 mm<sup>2</sup>.

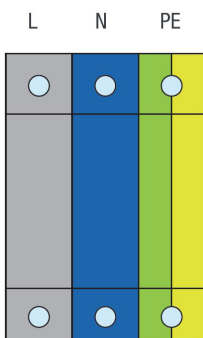
#### WARNING !!!

#### Input Neutral is required to operate the Converter, UPS

In TN-S System no 4 pole input switch or circuit breaker shall be used. If you have to use 4 pole protective device, be aware that the neutral against the ground is floating. The converter, UPS will operate without problem but you may infringe the local regulation.

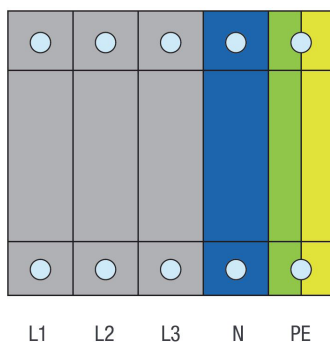


#### 9.5.5.1 Single phase



#### 9.5.5.2 Three phase

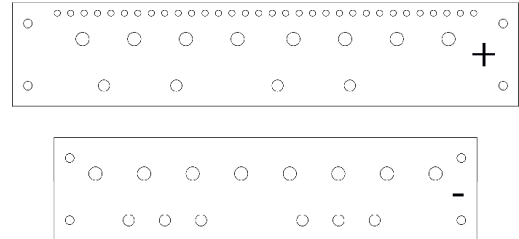
The three phase input is 123, ABC, RST phase sensitive; clockwise rotation is recommended. Phase one starts at 0° phase shift, while the other phases will be at 120° phase shift and 240° phase shift resulting in three phase output.



### 9.5.6 DC (X1)

- Common DC input per system.
- M12 holes in bar.
- Max 8 x 240 mm<sup>2</sup> per pole (group).

**Note:** Screws and nuts are not included in the delivery.



### 9.5.7 DC Connection table

Capacity		Fuse/CB	Min Cable mm <sup>2</sup>
12000		109.23	35
24000		218.45	95
36000	36000	327.68	150
48000		436.91	2 x 70
60000		546.14	2 x 120
72000	72000	655.36	2 x 150
84000		764.59	2 x 180
90000		819.21	2 x 180
96000	96000	873.82	2 x 240

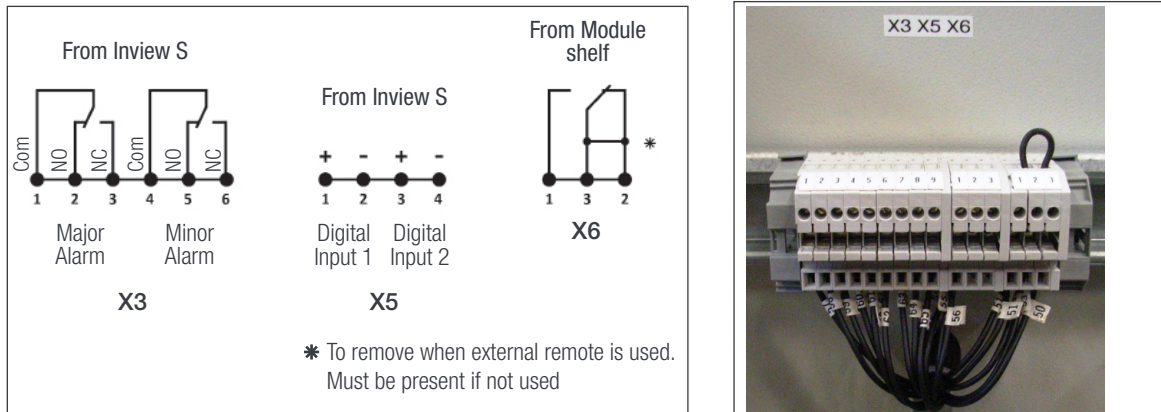
### 9.5.8 Connection table – AC Input (X2) & Output (X4)

The AC input supply breaker shall be 2p for single phase, and minimum 3p for three phase.

Power (kVA)		AC Input & Output (Screw terminal)		
1ph	3ph	Calculated	Fuse/CB	Min.Cable mm <sup>2</sup>
12		52.5 A	63 A	16
24		105 A	125 A	35
36		157 A	160 A	70
	36	3 x 52.5 A	3 x 63 A	3 x 16
48		210 A	250 A	95
60		262.5 A	300 A	150
72		315 A	350 A	180
	72	3 x 105 A	3 x 125 A	3 x 35
84		370 A	400 A	180
	90	3 x 131 A	3 x 160 A	3 x 70
96		420 A	630 A	2 x 180

### 9.5.9 Communication

The illustration below shows the X3 relays contacts in a non-alarm state when the system is operational. In this case, the relays are energized and as below.



When an alarm occurs, the X3 relay contacts are de-energized and switch.

**Note:** For auxiliary connections from MBP, refer section 12.2, page 40.

#### 9.5.9.1 Alarm (X3)

Relay characteristics X3 (Major and Minor Alarm)

- Switching power 60 W
- Rating 2 A at 30 Vdc / 1 A at 60 Vdc
- Max wire size 1 mm<sup>2</sup>

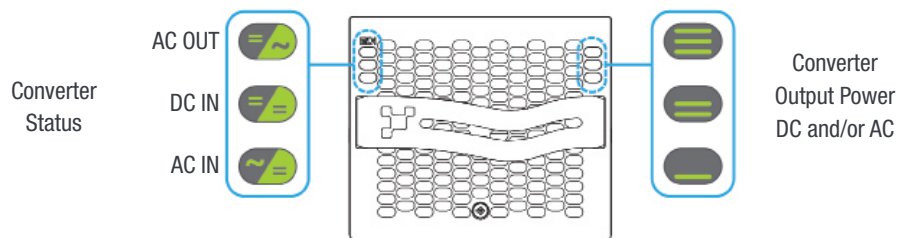
#### 9.5.9.2 Digital In (X5)

Input characteristics X5 (Digital Input 1 and 2)

- Signal voltage +5 Vdc (galvanically insulated)
- Max wire size 1 mm<sup>2</sup>

## 10. Operation

### 10.1 Converter module



Converter Status LED	Description	Remedial action
OFF	No input power or forced stop	Check environment
Permanent green	Operation	
Blinking green	Converter OK but working conditions are not fulfilled to operate properly	
Blinking green/orange alternatively	Recovery mode after boost (10 In short circuit condition)	
Permanent orange	Starting mode	
Blinking orange	Modules cannot start	Check Inview
Blinking red	Recoverable fault	
Permanent red	Non recoverable fault	Send module back for repair

Output Power (redundancy not counted)						
<5%	5% to 40%	40 to 70%	80 to 95%	100%	100% = overload	Output Power (redundancy not counted)
×	×	×	≡	≡	≡	Status output power LED
×	×	≡	≡	≡	≡	
—	—	—	×	—	—	
1B	1P	2P	2P	3P	3B	Behaviour (B = Blinking, P = Permanent )



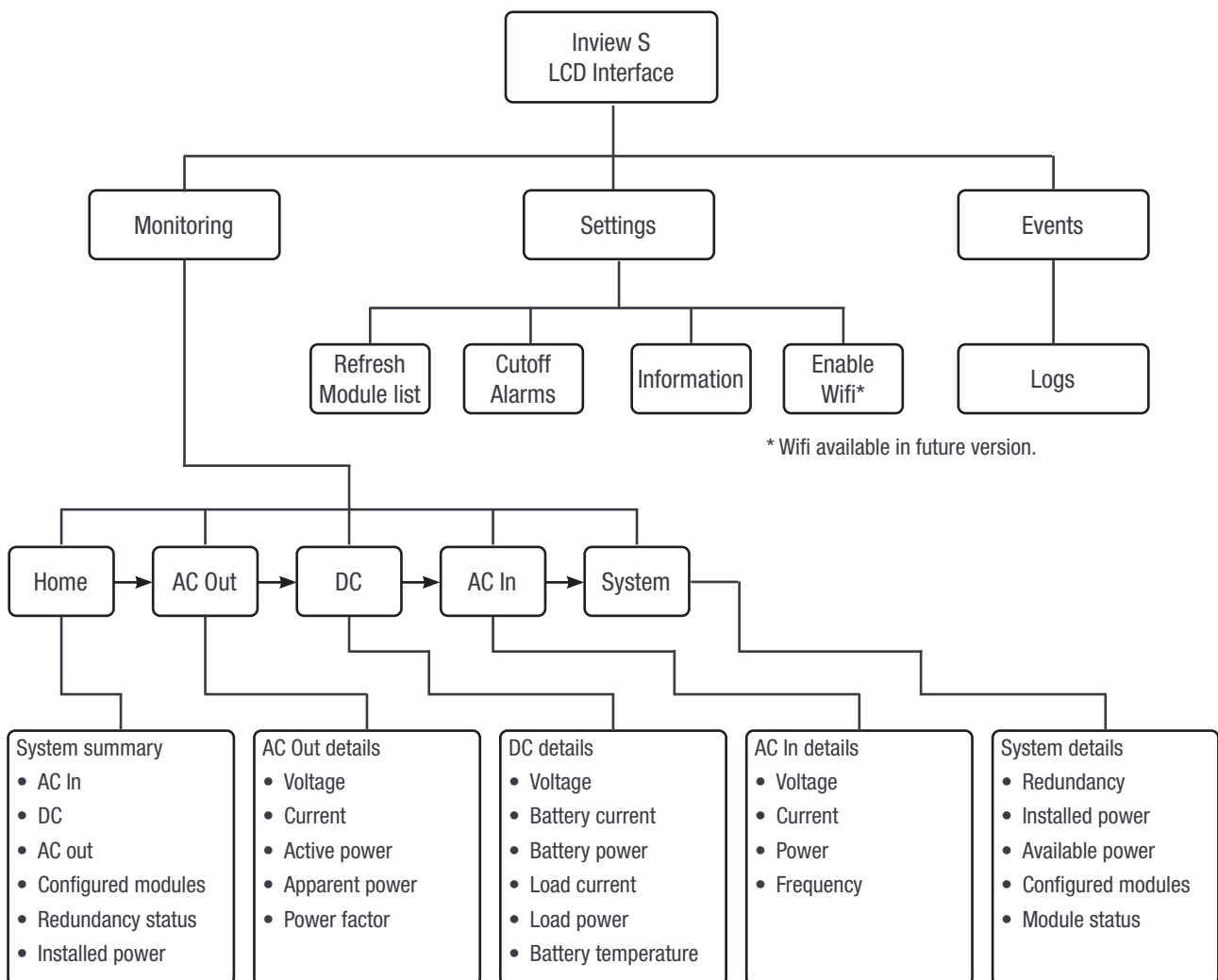
## 10.2 Inview S - LCD Display

Once system is powered upon, the Inview S is up and ready for operation.




User can access and view the system parameters through the LCD interface. The LCD is a 2.8-inch touch screen, and using stylus provides the best way for navigating pages.

### 10.2.1 Menu structure

The home page is the default page in the LCD, and other pages display as below sequence in a circular list.



## 10.2.2 Interface Areas

<div> <span>&lt;</span> <span>&gt;</span> Home <span>[1]</span> </div>		
AC In	DC	AC Out
L1	Float	L1
[2] 220.0 V	49.0 V	230.0 V
7.7 A	36.2 A	4.8 A
1.7 kW		1.1 kW
MOD 6	RED FAIL	INST 15.6 kW
[3] 		 2

- [1] Header

Displays the title of the current page and navigation buttons for next and previous page. In some pages, Up and Down navigation buttons appear at the right side, indicating more contents are present.

- [2] Information Area

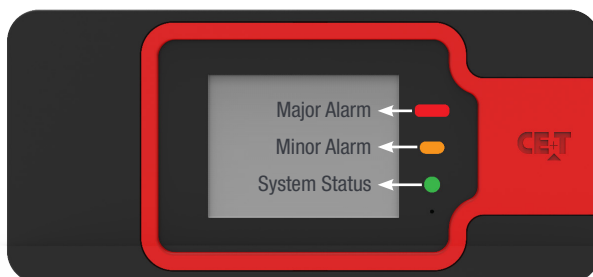
Provides information about the corresponding page.

- [3] Toolbar

The toolbar is present at the bottom throughout the interface, to provide quick access to following pages:

- Measures
- Controls / Settings
- Alarms and Logs

## 10.2.3 Inview S - LED indications



## 10.3 Inview S Web Interface

The user can access the controller on the laptop through ETH port.

This section provides an overview of the web interface, refer Inview S user manual for detailed information.

## 10.3.1 Login

Open the web browser and type the IP address **10.250.250.1** in the address field and press enter.

**Note:** Use any one of the following latest version of web browser: Google Chrome, Mozilla Firefox, Safari or Internet Explorer.

Inview S can be logged in with three user names as listed below (Case sensitive):

- Basic
- Expert
- Admin

The default password for all three user names is “1234”.

Basic login can only browse the pages and download the files, but Expert and Admin login can access and also modify the system parameter values.

An auto-logout feature is available to avoid a user being connected all the time and blocking the system. When no action is performed for more than **10 minutes**, the session will expire and goes to login screen.

User name

Admin

Password

....

[Password lost?](#)

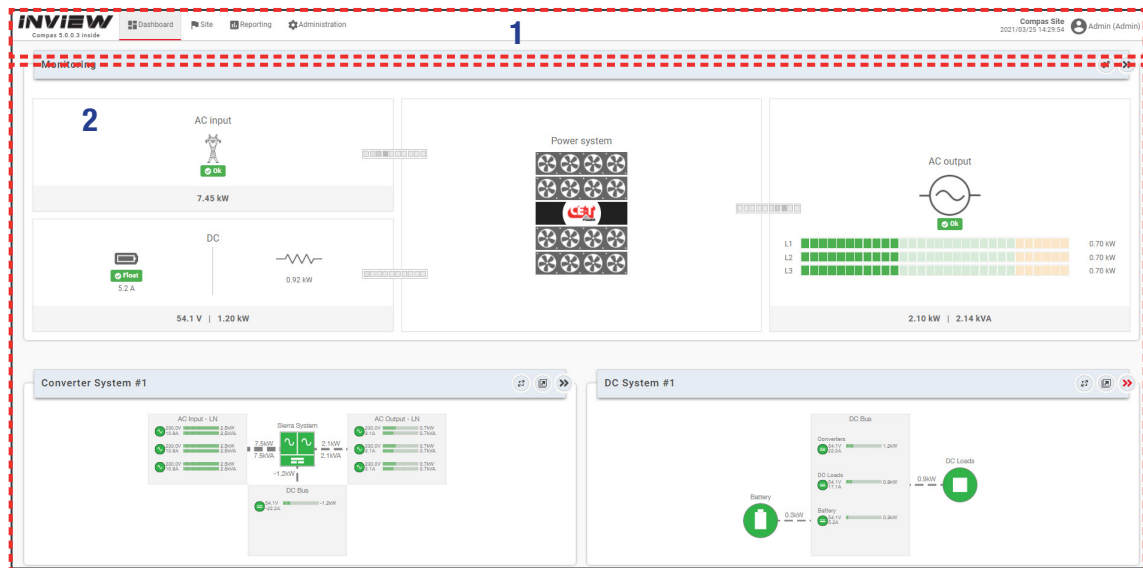
LOGIN

[English](#)
[Français](#)

## 10.3.2 Interface Areas

1 → Header

2 → Main Page



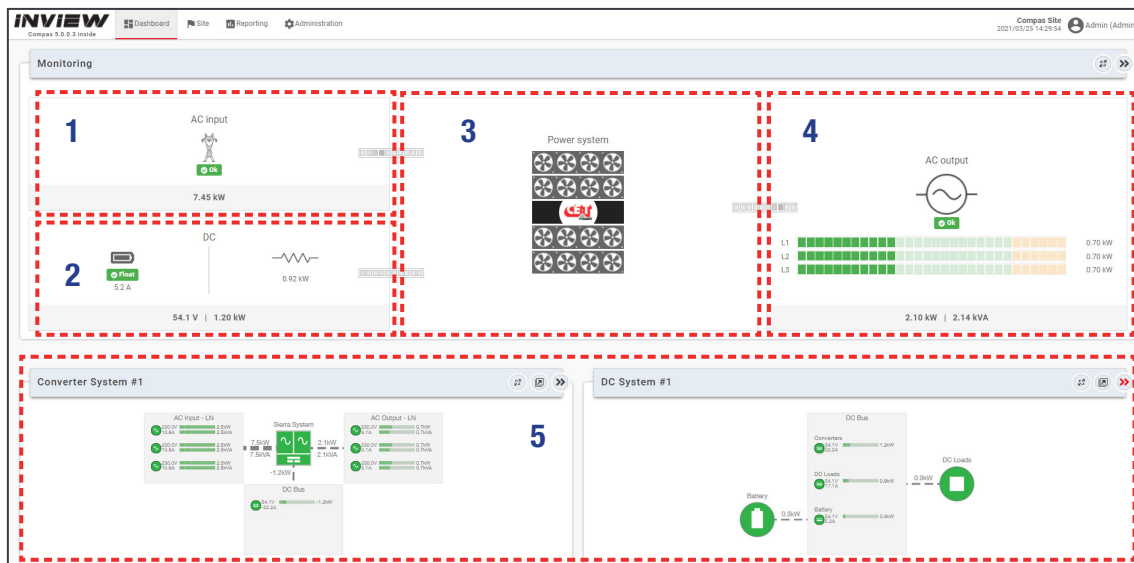
### 10.3.2.1 Header



The tabs in header provide quick access to the corresponding pages.

- 1 → **Home:** Clicking on **INVIEW** logo goes to the home page from any page you are accessing in the interface.
- 2 → **Menu:** Provides access to other pages.
- 3 → Display the date, time and the site name of the system.
- 4 → **Account:** Provides the information of which account is logged in (Basic, Expert or Admin). Clicking on drop-down arrow user can perform the following actions: Save Configuration and Inventory, Reboot Controller, Change Password and Logout.

### 10.3.2.2 Home Page



- 1 → **AC Input:** Clicking on the AC Input region displays the page contain all measurements regarding AC Input.
- 2 → **DC:** Clicking on the DC region displays the page contains all measurements regarding DC input and output.
- 3 → **Power System:** Clicking on the Power System region display the page contains regarding system information such as overall system power and also in each phase, configured converters, active converters, and list of detected converters and accessories.
- 4 → **AC Output:** Clicking on the AC Output region displays the page contains all measurements regarding AC Output. Regardless of the system configuration (1P, 3P), display the power fed to the load on each phase.
- 5 → **System Information:** Displays system information such as Converter System, DC System, Site, Energy system, Sensors and Actuators details.

*Note: System information screen varies depending upon the topology selection. To know more about Inview S operation, refer to the Inview manual which is available on request.*

# 11. Inserting/removing/replacing - modules

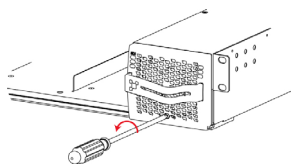
## 11.1 Sierra Converter

- The Sierra converter is hot swappable.
- When a new module is inserted in a live system it automatically takes the working set of parameters.
- When a new module is inserted in a live system it is automatically assigned to the next available address.

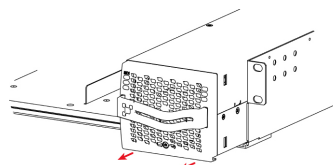
### 11.1.1 Removal

**Notice:** When one or several converter modules is/are removed access to live parts becomes possible. Replace module(s) with blanks without delay.

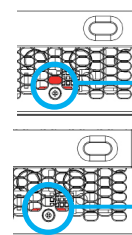
1. Rotate the screw in anti clockwise by using cross head screw driver to unlock the latch.
2. Hold the front handle and pull the module out.
3. Replace with a new module or a blind unit



1. Unlock the Latch



2. Pull the module out

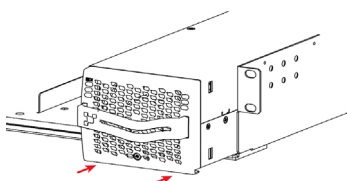


Latch in  
Locked  
Position

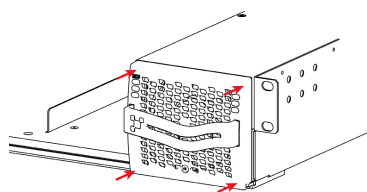
Latch in  
Unlocked  
Position

### 11.1.2 Inserting

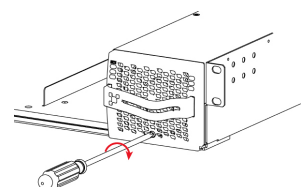
1. Check module compatibility (DC Voltage!).
2. Place the module in the shelf and slide in.
3. Using the module handle, push firmly until the unit is properly connected.
4. Rotate the screw in clockwise by using cross head screw driver to lock the latch.
5. The module will start up and take the first address available on the bus.



2. Slide the module in



3. Push firmly till the connection is properly engaged.



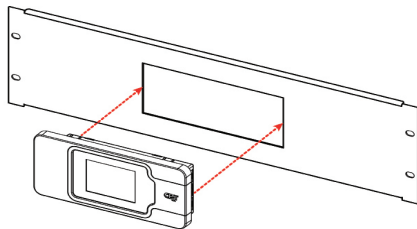
4. Lock the latch.

## 11.2 Inview S

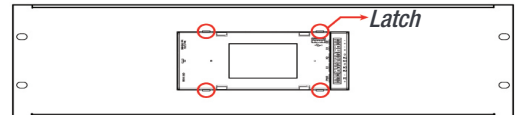
### 11.2.1 Panel Mounting

Before mounting the Inview S in the system, route all the required connection cables from the system and place near to the Inview S mounting location.

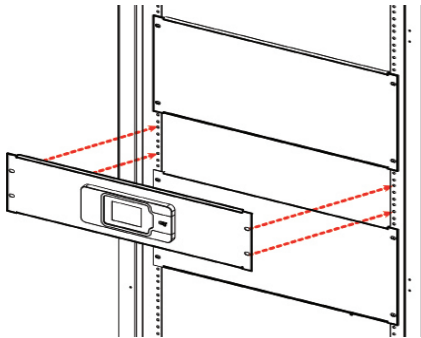
1. Place the Inview S in the panel sheet.
2. Lock all the four latches at the rear side of the Inview S in the panel sheet.
3. Connect required connection cables to the Inview S.
4. Place the panel sheet in the system and fix it with screws.



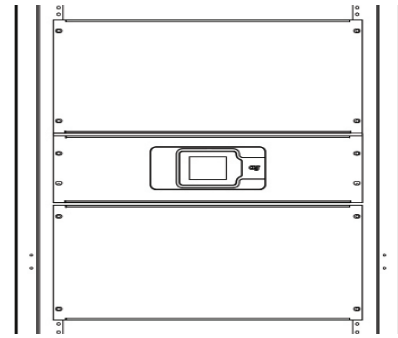
*Place the Inview S in the panel sheet*



*Fix it with four latches*



*Connect wires and place the panel sheet in the cabinet*



*Fix the panel sheet with screws*

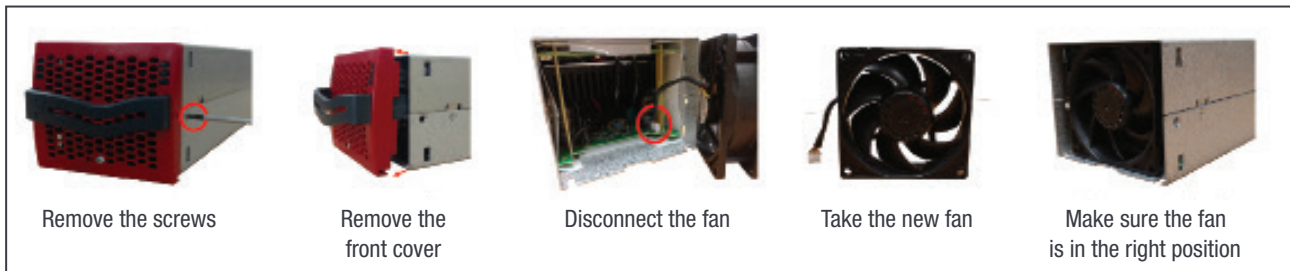
## 11.3 Fan replacement

The FAN life is approximately 60,000 (Sixty Thousand) hours. The converter modules have fan runtime meters and fan failure alarms. Fan failure can result from a failing fan or driver circuit.

1. Let the module rest at least 5 minutes before initiating work.
2. The converter front cover must be removed. Use a screw driver and remove the screws on both side of the module.
3. Free up the fan. (Note the fan connector and wires position).
4. Disconnect the supply cord, and remove the fan..



5. Replace with new fan and connect supply cord.
6. Place the front cover and tighten the screws on both sides of the module.
7. Check fan for operation.
8. Access Inview and reset the fan run time alarm from within the action menu



## 12. Manual By-Pass (MBP)

Manual By-Pass has to be operated by trained people only.

When system is in manual by-pass the load is subjected to mains voltage without active filtering. Output alarm is activated when system is in manual by-pass.

The Manual By-Pass cannot be operated remotely.

The Manual By-Pass can be integrated into the CE+T cabinet if requested at time of order. A Manual By-Pass purchased separately must comply with the instructions within section 12.2, page 40

### 12.1 Pre-requisites

Commercial AC power must be present, and the converter must be synchronized with it, before operating MBP. The upstream commercial breaker must be correctly sized to accept the overload, and if the AC is supplied by a Gen-set, the minimal required power will be twice the nominal power of the converter.

The converter may be overloaded during the MBP procedure, depending on voltage network and output. Converter voltage setting: To reduce the impact of an overload, the converter power and current will be reduced from 150% to nominal value.

The by-pass switch disconnects all AC voltage on the shelves but has no effect on the DC feeding the converter and the remote alarm terminal.

**It is requested in order to reduce the inrush current during manual by pass operation to adjust the converter AC output voltage to the same value as AC input voltage. If the difference between AC input and AC output voltage exceed 5 Vac, there is a risk of shutdown of converter due to high inrush current during the return to normal operation from Manual By Pass engaged.**

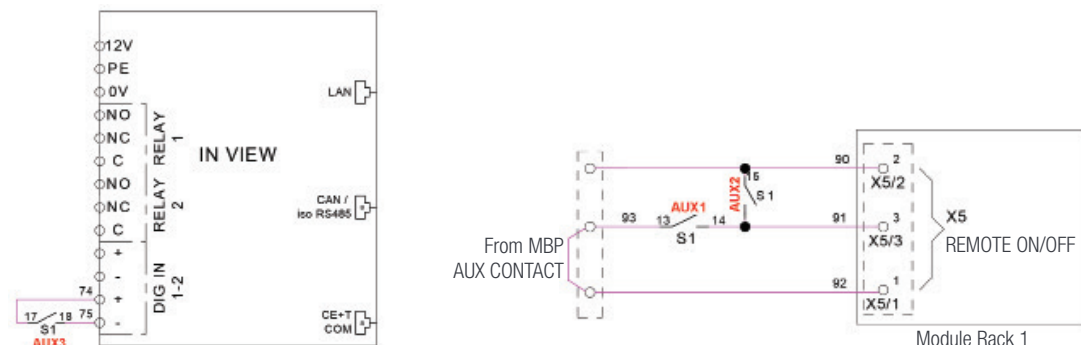
### 12.2 MBP Auxiliary connection

If manual by pass is installed in the system and its auxiliary should be wired as per the following:

- MBP - Single rotary switch

*Note: The below connection is for a sub-rack system, and auxiliary (Aux) number varies depending upon the MBP switch. So it is recommended to refer the technical sheet received along with the system.*

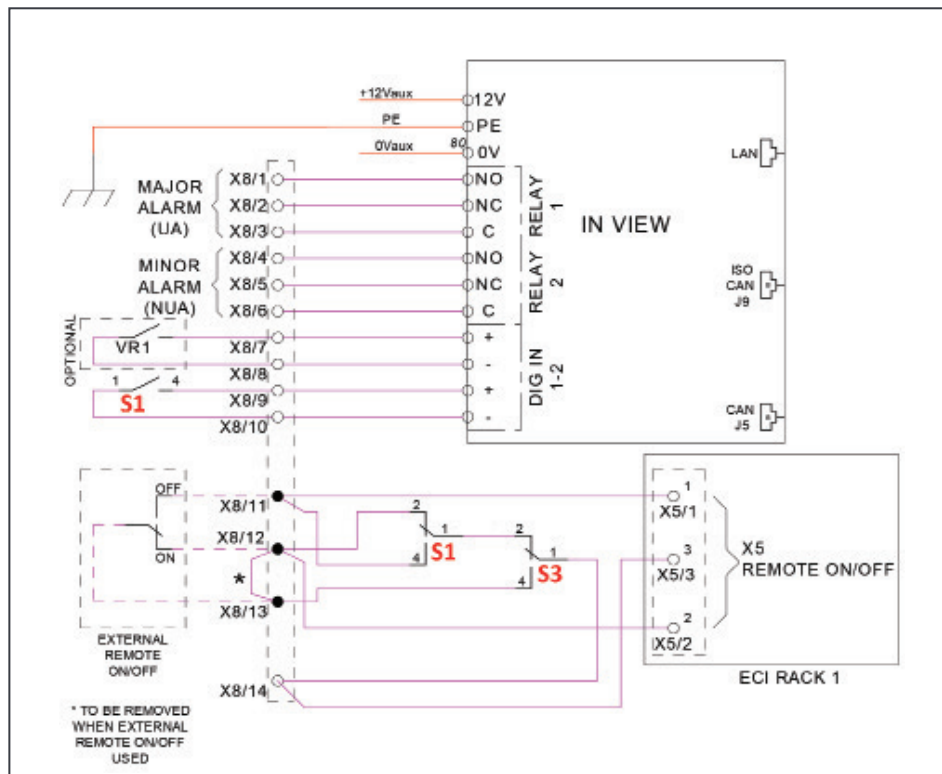
- Connect Aux3 of MBP to Digital Input 01 of controller. So that the controller gets information when MBP is engaged.
- Connect Aux1 and Aux2 of MBP to Remote ON/OFF terminal in the shelf where controller is installed.





- MBP - Three independent switch

- Connect auxiliary wire from MBP switch (S1) to Digital Input 01 of controller. So that the controller gets information when MBP is engaged.
- Connect auxiliary wire from MBP switch (S1) and AC input switch (S3) to Remote ON/OFF terminal in the shelf where controller is installed.



## 12.3 Manual Bypass operation

Manual Bypass operation creates a bypass from mains input via output AC distribution. Converter modules are bypassed and possible to disconnect without impacting the load.

Manual By-Pass operation is “Make before Break” logic

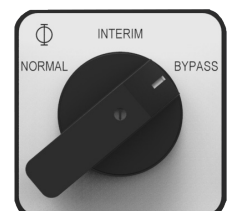
The sierra system has a single rotary switch or three individual switches depending upon the system configuration, and the operation also varies for each model.

### 12.3.1 MBP - Single rotary switch

In this model, manual bypass operates in single switch and it has three positions - Normal, Interim and Bypass.

#### 12.3.1.1 Normal to Bypass

1. Rotate the MBP Switch (S1) from **NORMAL** to **BYPASS**. (Note: Do not stop at **INTERIM** position)
2. Switch **OFF** the DC power and/or disconnect batteries.

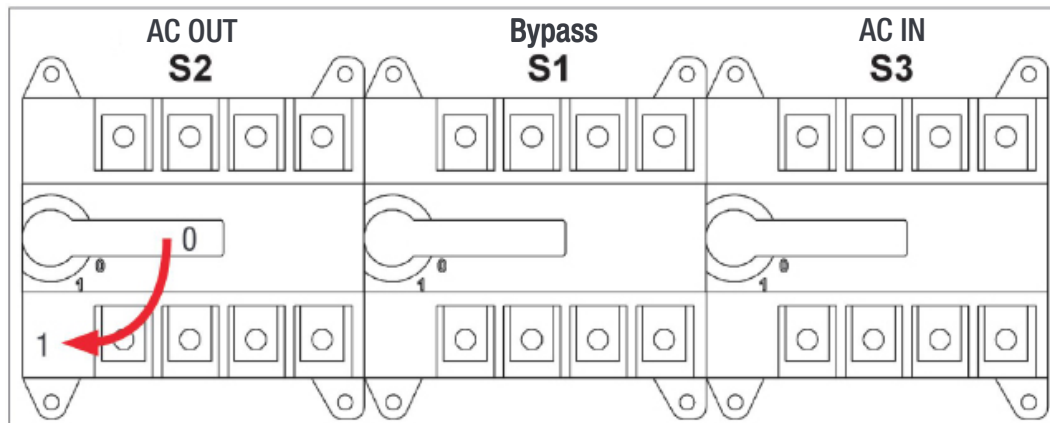


### 12.3.1.2 By-Pass to Normal

1. Switch **ON** the DC power and/or connect batteries.
2. Rotate the MBP Switch (S1) from **BYPASS** to **INTERIM**.  
(Wait until the modules turn on and synchronized, approximately 30-60 seconds).
3. Rotate the MBP Switch (S1) from **INTERIM** to **NORMAL**.

### 12.3.2 MBP - Three individual switches

In this model, manual bypass operates through three individual switches - S1 (Manual Bypass), S2 (AC out) and S3 (AC IN).



#### 12.3.2.1 Normal to By-Pass

1. Close the By-Pass switch **S1**, 0 to 1
2. Open the AC Out switch **S2**, 1 to 0
3. Open the AC IN switch **S3**, 1 to 0
4. Switch **OFF** the DC power and/or disconnect batteries

#### 12.3.2.2 By-Pass to Normal

1. Switch **ON** the DC power and/or connect batteries.
2. Close the AC IN switch **S3**, 0 to 1.  
(Wait until the modules turn on and synchronized, approximately 30-60 seconds).
3. Close the AC Out switch **S2**, 0 to 1.
4. Open the By-Pass switch **S1**, 1 to 0

## 13. Finishing

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- Make sure that the sub-rack/cabinet is properly fixed to the cabinet/floor
- Make sure that the sub-rack/cabinet is connected to Ground.
- Make sure that all DC and AC input breakers are switched OFF.
- Make sure that all cables are according to recommendations and local regulations.
- Make sure that all cables are strained relieved.
- Make sure that all breakers are according to recommendation and local regulations.
- Make sure that DC polarity is according to marking.
- Re tighten all electrical terminations.
- Make sure that no converter/controller positions are left open.
- Cover empty converter positions with blanks.
- Make sure that the Remote ON/OFF is appropriately wired according to local regulations.
- Make sure that the point of AC supply meets local regulations.

## 14. Commissioning

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The DC breaker is a protection device. Modules are plugged in a system and DC breaker is then engaged. Please make sure the corresponding DC breaker is engaged in the ON position. Failure to observe this rules will result not to have all module operating when running on DC and have module failure when AC input recover from fault condition.

Installation and commissioning must be done and conducted by trained people fully authorized to act on installation.

It is prohibited to perform any isolation test without instruction from manufacturer.

Equipments are not covered by warranty if procedures are not respected.

### 14.1 Check list

DATA	
Date	
Performed by	
Site	
System serial number	
Module serial numbers	
Inview Serial number	
ACTION	OK/ N.OK
Unplug all converters except one converter per phase (Just pull off the inverter from the shelf, to interrupt electrical contacts)	
Check the commercial AC before closing the AC input breaker.	
Switch ON the commercial AC	
Check if converters are working (Green led)	
Check the DC power supply and switch ON the DC breakers	
Plug in all converters one by one	
Check output voltage (on bulk output or on breaker)	
Check if converters are working properly	
Check if system has no alarm (Disable the alarm if any)	
Read configuration file and review all parameters. Some parameters must be adapted according to the site (LVD, load on AC, AC threshold level)	
Switch OFF ACin and check if system is working on DC	
Switch ON ACin and check if system correctly transferred load on AC	
Switch OFF system and start on AC only	
Switch OFF system and start on DC only	
Check if display working properly (Inview)	
Check if TCP/IP working properly (if this option is present)	
Test on load (if available)	
ALARM	
Switch ON AC input and DC input and check that no alarm are present	
Pull out one converter and check alarm according to redundancy	
Pull out two converters and check alarm according to redundancy	
Switch OFF AC input (commercial power failure) and check the alarm according to the configuration	
Switch OFF DC input (DC power failure) and check that the alarm according to the configuration	
Check the different digital input according to the configuration (when used)	

## 15. Trouble Shooting and Defective Situations Fixing

### 15.1 Trouble Shooting

Converter module does not power up:

- Check AC input present and in range (AC breakers)
- Check DC input present and in range (DC breakers)
- Check that the converter is properly inserted
- Remove converter to verify that slot is not damaged, check connectors
- Check that module(s) is (are) in OFF state
- Check for loose terminations

Converter system does not start:

- Check that Inview is present and properly connected
- Check remote ON/OFF terminal
- Check the configuration and setting
- Check threshold level

Converter only run on AC or DC:

- Check AC input present and in range (AC breakers)
- Check DC input present and in range (DC breakers)
- Check the configuration and setting
- Check threshold level(s)

No output power:

- Check output breaker

All OK but I have alarm:

- Check the type of event and log file in the controller

No alarm:

- Check relay delay time of alarms in the controller
- Check configuration file

## 16. Maintenance

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Maintenance should be performed by properly trained people.

### 16.1 Access Inview S with Laptop

- Download system LOG FILE and save
  - Analyze log file and correct errors
- Download system CONFIGURATION FILE and save
  - Check/correct configuration file according to operation conditions
  - Check/correct alarm configuration
- Download the SUPPORT FILE named “debug file”
- Check module internal temperature for deviation between modules
  - Temperature deviation may indicate build up of dust. Clean the module by air suction blower or vacuum cleaner.
- Check module/system load
- Check/Correct inverter mapping (DC group/AC group/ Address)

### 16.2 Manual check

- Check voltages of AC input, DC input, AC output and DC output using the multi-meter
- Replace door filter if more dust is accumulated.
- Take a snap shot of the cabinet and site condition

### 16.3 Optional

- With an infrared camera check termination hot spots
  - Tighten terminations

### 16.4 Manual By-Pass

- Make sure AC input source is available during MBP operation. Otherwise the LOAD will be affected.

## 17. Defective modules

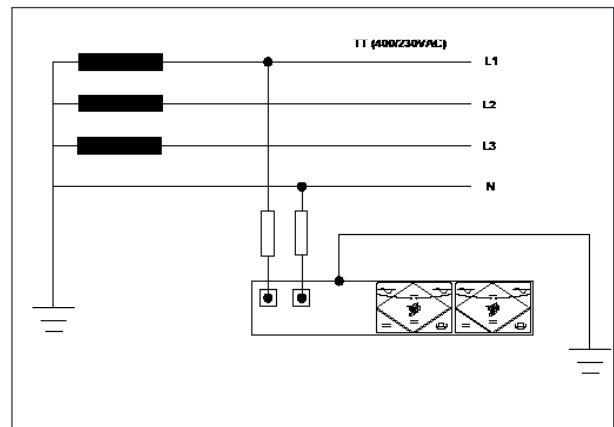
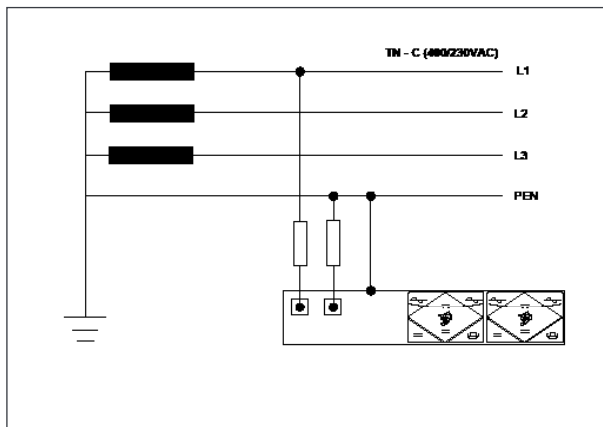
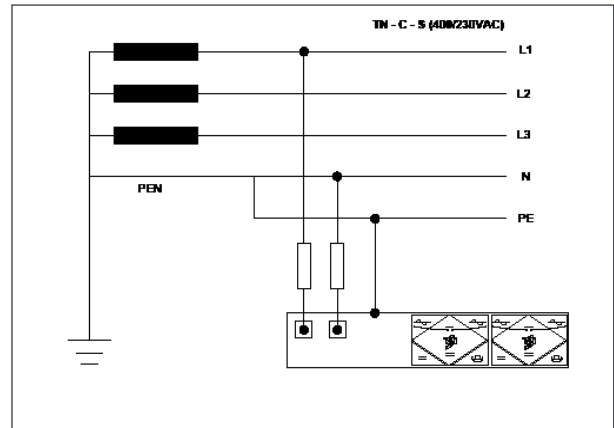
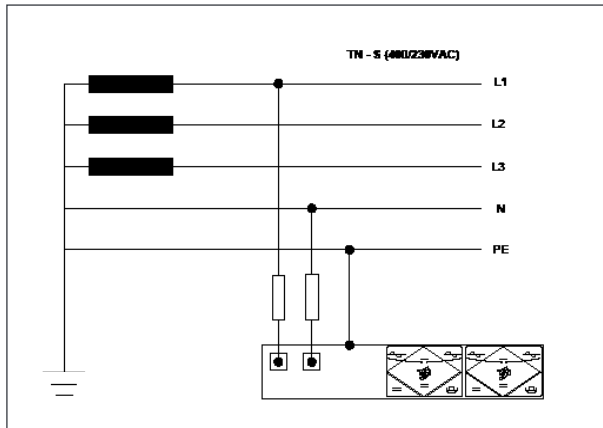
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- A repair request should follow the regular logistics chain:  
End-user => Distributor => CE+T Power.
- Before returning a defective product, a RMA number must be requested through the <http://my.cet-power.com> extranet. Repair registering guidelines may be requested by email at [repair@cet-power.com](mailto:repair@cet-power.com).
- The RMA number should be mentioned on all shipping documents related to the repair.
- Be aware that products shipped back to CE+T Power without being registered first will not be treated with high priority! (Label shown here is only for representation)

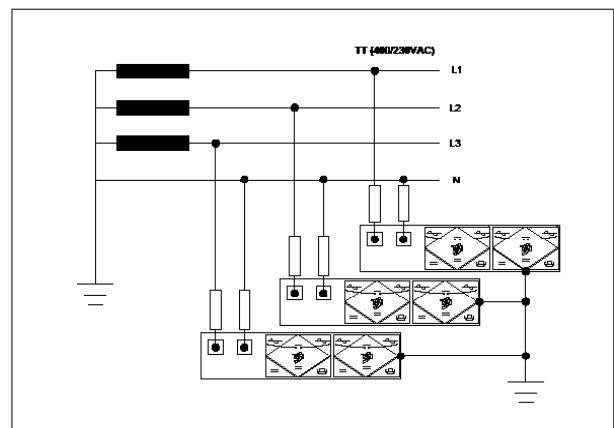
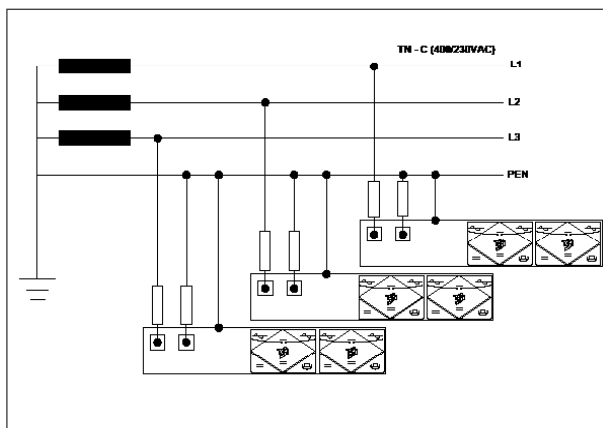
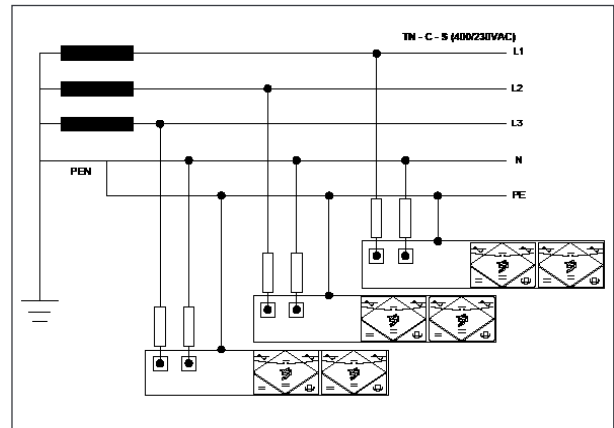
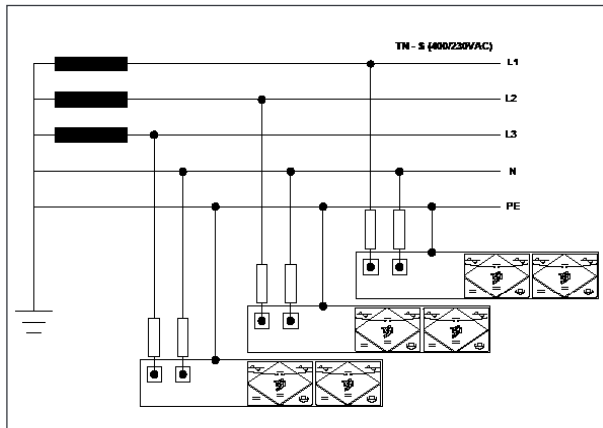


## 18. Appendix

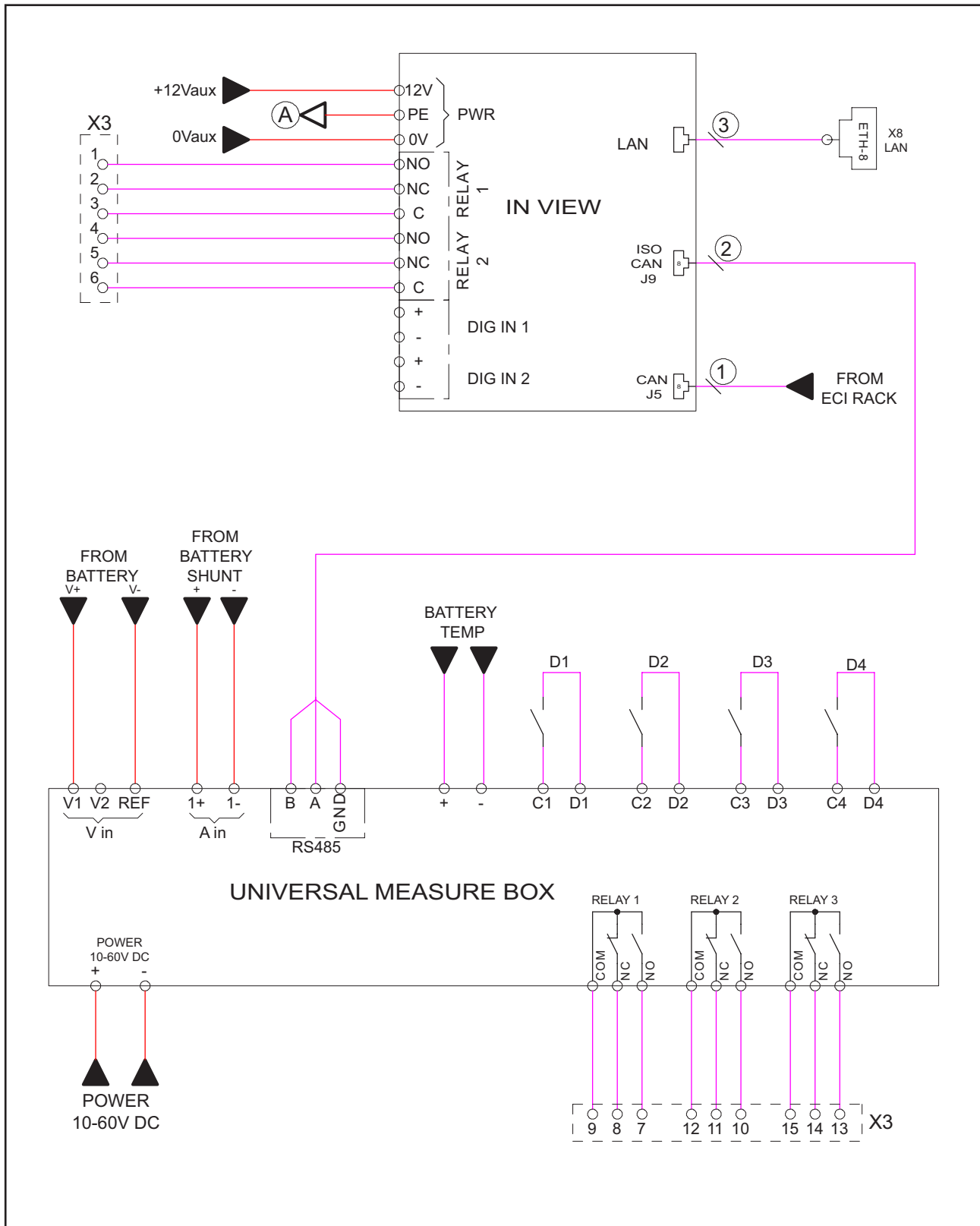
### 18.1 Mains connection, Single phase



## 18.2 Mains connection, Three phases



### 18.3 Inview S with UMB - Wiring diagram



## 18.4 Converter - Parameter List

ID	Name	Description	Min	Default	Max	Unit
<b>System</b>						
CF1	Topology	Select the topology based upon the system design.	-	-	-	-
CF6	Number Of Phases	Enter the number of phases based upon the system input/output power.	1	1	3	-
<b>Converters</b>						
CF41	Allow Full Remote Control	It allows to shut down all the converters in the system.	-	False	-	
<b>AC Outputs</b>						
CF111	Saturation Level Alarm Set	The saturation is an event defined in the percentage of the Installed Power with Parameter CF121 when the output power crosses the threshold.	0	80	100	%
CF112	Saturation Level Alarm Clear	The saturation is an event defined in the percentage of the Power to clear the saturation level.	0	70	100	%
CF121	Configured Converters	The number of converters configured in the output of phase 1.	1	1	32	-
CF122	Redundant Converters	The number of redundant converters configured in the output of phase 1.	1	1	3	-
CF123	Nominal Phase Shift	The angle of phase shift at phase 1.	0	0	240	Deg
CF124	Nominal Voltage	The nominal voltage at AC output of phase 1.	200	230	245	V
CF141	Configured Converters	The number of converters configured in the output of phase 2.	1	1	32	-
CF142	Redundant Converters	The number of redundant converters configured in the output of phase 2.	1	1	3	-
CF143	Nominal Phase Shift	The angle of phase shift at phase 2.	0	120	240	Deg
CF144	Nominal Voltage	The nominal voltage at AC output of phase 2.	200	230	245	V
CF161	Configured Converters	The number of converters configured in the output of phase 3.	1	1	32	-
CF162	Redundant Converters	The number of redundant converters configured in the output of phase 3.	1	1	1	-
CF163	Nominal Phase Shift	The angle of phase shift at phase 3.	0	240	240	Deg
CF164	Nominal Voltage	The nominal voltage at AC output of phase 3.	200	230	245	V
CF1016	Nominal	Set the converters system frequency. This frequency is used when the system is not synchronized on AC input.	50	50	60	Hz

ID	Name	Description	Min	Default	Max	Unit
<b>AC Inputs</b>						
CF301	Override Power Limitation Timeout	The timeout after the defined voltage, which the system returns in normal condition.	0	20	60	s
CF1068	Default Power Limitation	global peak-shaving (-1 if no peak-shaving)	0	-1	2500	W
CF1006	Low Start	AC IN Voltage where a higher value leads the AC IN to start	195	195	195	V
CF1007	Low Transfer	AC IN Voltage where a lower value leads to the transfer of the load from the AC IN to DC IN	185	185	185	V
CF1008	Low Stop	AC IN Voltage where a lower value leads the AC IN converter to stops. It is possible to step down to 150 Vac. In this case, the AC/DC converter will run at a lower power. The converter DC/DC supply the rest (Only if DC is available, if not, there is a de-rating)	182	182	182	V
CF1009	High Start	AC IN Voltage where a lower value leads the AC IN converter re-start	255	255	255	V
CF1010	High Transfer	AC IN Voltage where a higher value leads to the transfer the load of the charge from the AC IN converter to the DC IN converter	260	260	260	V
CF1011	High Stop	AC IN Voltage where a higher value leads to stop the AC IN converter.	265	265	265	V
CF1012	Low Start	Frequency where a higher value leads the outlet of the inverters trying to synchronize with AC IN.	47	47	63	Hz
CF1013	Low Stop	Frequency where a lower value leads the outlet of inverters stop to synchronize with AC IN.	47	47	63	Hz
CF1014	High Start	Frequency where a lower value leads the inverters outlet to synchronize with AC IN.	47	52.7	63	Hz
CF1015	High Stop	Frequency where a higher value leads the inverters outlet to stop to synchronize with AC IN.	47	53	63	Hz
<b>DC</b>						
CF501	Override Voltage SetPoint Timeout	The timeout after the defined voltage, which the system returns in normal condition.	0	20	60	s
CF503	Override Power SetPoint Timeout	The timeout after the defined power, which the system returns in normal condition.	0	20	60	s
CF1000	Low Start	Low DC Voltage where a higher value leads the DC/AC converter to re-start.	90	100	160	V
CF1001	Low Transfer	Low DC Voltage where a lower value leads to transfer the load from DC IN to AC IN. Under this voltage peak-shaving is relaxed and battery discharge test is stopped.	90	92	160	V
CF1002	Low Stop	Low DC voltage where a lower value stops the DC/AC converter.	90	90	160	V

ID	Name	Description	Min	Default	Max	Unit
CF1003	High Start	High DC voltage where a higher value re-starts the DC/AC converter.	90	150	160	V
CF1004	High Transfer	High DC Voltage where a higher value leads to transfer the load from DC IN to AC IN.	90	158	160	V
CF1005	High Stop	High DC voltage where a higher value stops the DC IN converter. Value increased from sw 173 to 62 VDC.	90	160	160	V
CF1066	Charging Voltage	DC voltage set point in SIERRA mode.	121	124	130	V
CF1067	Discharging Power	DC power setpoint in sierra mode (> 0 if battery discharge, <0 if battery charging).	0	-	2500	W
<b>Converters Configuration</b>						
CF1034	Short circuit threshold voltage	Minimum Voltage Threshold where converter considers that outlet is in short circuit.	80	80	200	V
CF1035	Short circuit hold time	Time Duration when a converter tries to eliminate the short-circuit existing on outlet. If the system is still in short-circuit after this time, the output will be stopped.	1	60	600	s
CF1036	Input source in Percent	Defines the priority source 0 - Feeding from AC IN has priority (converter AC/AC - EPC mode) default value. 100 - Feeding from DC has priority (converter DC/AC - On Line mode)	0	0	100	%
CF1037	Synchronization tracking speed	The speed at which the converter tries to synchronize the AC Out with AC IN. The lowest value will have the fastest synchronization.	-2	0	2	-
CF1038	Max current Percent	Maximum Power that converter can supply.	30	150	150	%
CF1039	Max power Percent	Maximum Current that converter can supply.	30	150	150	%
CF1040	Max Overload Duration	Maximum Time Duration when converter can run with overload.	0	15	15	s
CF1041	AC in mode	Allows to open the AC IN inlet relay 0 - normal running in EPC mode 1 - AC IN inlet relay is open and so the system is insulated from the Mains. This parameter can be set to 1 only if repartition is on DC (parameter 036 should be 100)	0	0	1	-
CF1042	Booster 10x I in	Allow to inhibit the Booster option which generates a current of 10 In for 20ms in case of short-circuit (9 In for Nova inverter).	0	1	1	-
CF1043	Remote Off Disable AC InPower	This parameter change the attribution of the remote ON/OFF input. If parameter is 1, then, when system is in remote OFF position, output is not stopped and AC input is stopped instead.	0	0	1	-

ID	Name	Description	Min	Default	Max	Unit
CF1044	Reinjection allowed	If this parameter is 1, the converter is allowed to inject power in the grid with its AC input.	0	0	1	-
CF1045	External clock	Records the “External Clock” mode configuration 0 - no protection in: phase drift is allowed. 1 - protection in: no phase drift allowed, stops the system after 1 minute. 2 - System stops immediately.	0	0	2	-
CF1046	Walk in mode	The Walk-in mode allows the inverter to come back progressively on the AC priority source after an outage. Friendly use on Genset.	0	0	60	-
CF1047	Triangle mode	Defines the protection type for working on Delta load. 0 - Default setting, and no delta load protection 1 - The mode is active. If one output phase stops, the other phases will also stop.	0	0	1	-
CF1048	Airco Mode	When this mode is activated, the overload capabilities are moved from default value to 330% overload in current and power for maximum 900 ms.	0	0	1	-
CF1049	Start without supervision	When this mode is activated, the converter is able to start without Inview.	0	1	1	-
CF1050	P DC Max	This feature allow to limit or reduce the INRUSH DC current when the system work on battery. To limit the current this configuration line should limit the inrush DC current.  To allow for the high capability this inverter is build with extra capacitor running on 400VDC to provide the requested energy.	0	0	1	-
CF1051	AC 1 stop power	Stops the power of the corresponding AC group. The AC input of the converters of this AC group will then be used for synchronisation only, no power will be taken.	0	0	1	-
CF1052	AC 2 stop power		0	0	1	-
CF1053	AC 3 stop power		0	0	1	-
CF1054	AC 4 stop power		0	0	1	-
CF1055	St module Number	NA	0	0	0	-
CF1056	St module Redundancy	NA	0	0	0	-
CF1057	Tus	Mode TUS activation.	0	0	1	-
CF1058	Tus modules number	Number of TUS modules in the system (typically 2) -> number of tus seen by local supervision.	0	0	24	-
CF1059	Tus sub sub system address	address of the system on TUS bus -> address of local supervision which need to be different from other local supervisions.	0	1	4	-
CF1060	Tus sub sub system output phase	Output phase in TUS mode.	0	1	11	-

ID	Name	Description	Min	Default	Max	Unit
CF1061	Tus sub system index	System index in TUS mode (for example, if we have a A+B redundancy, this parameter is 1 for A systems, 2 for B systems)	0	1	2	-
CF1062	Number of tus sub sub system	Number of systems connected on TUS bus.	0	0	8	-
CF1063	X Tus supply Source	X TUS supply source.	0	3	3	-
CF1064	Y Tus supply Source	Y TUS supply source.	0	3	3	-
CF1065	Tus sub sub system dc group	DC group of the system in TUS mode.	0	0	3	-
CF1069	P AC max per phase safe mode	Peak-shaving for each individual phase (-1 if no peak-shaving).	0	-1	1	-
CF1070	Phase compensation	Phase balancing	0	1	1	-
CF1071	Sierra mode	Converter allowed to run in charger mode.	0	1	1	-
CF1072	V DC low stop charger	Dc voltage under which charger is stopped.	0	124	130	V
CF1073	Lvd mode	If this mode is ON, converter goes in low consumption mode 1 minute after it stops by Vdc LowStop.	0	0	1	-
CF1074	Max V DC increment safe mode	Vdc set point rising speed, if controller is missing.	0	2	2	-
CF1075	Out Sync 1	Reserved for future implementation. <b>Note: Do not change the default values.</b>				
CF1076	Out Sync 2					
CF1077	Out Sync 3					
CF1078	Out Sync 4					
CF1079	Out Sync 5					
CF1080	Out Sync 6					
CF1081	Out Sync 7					
CF1082	Out Sync 8					
CF1083	Scaling Factor					
CF1084	Temperature Derating Mode					
CF1097	BackFeed DetectionMode					
CF1098	SleepMode					



