

AGIL - MODULAR UPS

Installation Manual V7.2

RE-INVENTING THE MODULAR UPS

THE NEW GENERATION OF POWER CONVERTERS

- » **SELECTIVITY**
Adapted response to short circuit and overload
- » **VERSATILE CHARGING**
Short or long backup recovery time at no extra cost
- » **BATTERY SUSTAINABILITY**
Qualitative charging for longer battery life expectancy
- » **HARSHEST AC INPUT CONDITIONS**
Without compromising the quality of the AC output



Table of content

1. CE+T Power at a glance.....	4
2. Abbreviations.....	5
3. Warranty and Safety Conditions	6
3.1 Disclaimer.....	6
3.2 Technical care.....	6
3.3 Installation	7
3.3.1 Handling.....	7
3.3.2 Surge and transients.....	7
3.3.3 Other	7
3.4 Maintenance	8
3.5 Replacement and Dismantling.....	8
4. TSI TECHNOLOGY	9
4.1 EPC-mode.....	10
4.2 Mix Mode & Walk-in-mode	10
5. System Description	11
5.1 System Layout	11
5.2 AGIL UPS Module 20 kVA.....	13
5.3 T4S Monitoring Controller.....	13
5.4 CATENA Interface (Optional).....	13
6. AGIL Design and Description	14
6.1 System Configuration	14
6.1.1 System Description Agil 60	15
6.1.2 System Description Agil 160	16
6.1.3 System Description AGIL 200 to 640kVA	17
6.2 Manual by-pass.....	21
6.2.1 Internal MBP for AGIL 60 and AGIL 160 with internal MBP	21
6.2.2 External MBP	22
6.3 MBP Procedure	23
6.3.1 From Normal to By-Pass	23
6.3.2 By-Pass to Normal	23
7. Site Location planning.....	24
7.1 Dimensions	24
7.2 STORING & UNPACKING.....	24
7.2.1 Storing.....	24
7.2.2 Initial Checking and Positioning.....	24
7.2.3 System Packaging:.....	24
7.2.4 Module Packaging:.....	25
7.2.5 Module Unpacking	25
7.3 Location of the UPS.....	26
7.4 Location of the battery backup	26
7.5 Clearance.....	27

7.5.1	Cable entrance.....	27
7.5.2	Tools Pre-requisite.....	27
7.6	Lifting the cabinet	28
7.7	Cabinet door.....	28
7.8	Fixing the cabinet to the floor	28
7.9	Cabling.....	29
7.9.1	Cabling Termination AGIL 60 KVA System	30
7.9.2	Cabling Termination AGIL 160 KVA System	31
7.9.3	Cabling termination AGIL 200 to 640 KVA System.....	32
7.10	Cable Selection	33
7.10.1	AC Input.....	33
7.10.2	DC Input.....	33
7.10.3	Ground.....	33
7.10.4	Signalling.....	34
7.11	Grounding	35
7.11.1	Cabinet ground	35
7.11.2	Protective device.....	35
7.12	Battery Connection.....	36
8.	Commissioning	37
8.1	Commissioning procedure.....	37
8.2	Check list.....	38
9.	Trouble shooting and fixing defective situations.....	39
9.1	Trouble shooting.....	39



Leading AC Backup Technology

1. CE+T Power at a glance

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 performances, 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 disturbances;
- Optimizes footprint.

Our systems are:

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

CE+T power puts 60+ years expertise in power conversion together with worldwide presence to provide customized solutions and extended service 24/7 - 365.

2. Abbreviations

TSI	Twin Sine Innovation
EPC	Enhanced Power Conversion
REG	Regular
DSP	Digital Signal Processor
AC	Alternating current
DC	Direct current
ESD	Electro Static Discharge
MET	Main Earth Terminal
MBP	Manual By-pass
TCP/IP	Transmission Control Protocol/Internet Protocol
USB	Universal Serial Bus
PE	Protective Earth (also called Main Protective Conductor)
N	Neutral
PCB	Printed Circuit Board
TRS	True Redundant Structure
SNMP	Simple Network Management Protocol
NEC	National Electric Code
CB	Circuit Breaker

3. Warranty and Safety Conditions¹

WARNING:

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

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

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

Important Safety Instructions and Save these Instructions.

3.1 Disclaimer

- The manufacturer declines all responsibilities if equipment is not installed, used or operated according to instructions herein by skilled technician according to local regulations.
- Warranty does not apply if the product is not installed, used and handled according to the instructions in the manuals.

3.2 Technical care

- This electric equipment can only be repaired or maintained by “qualified employee” with adequate training. Even the personnel who are in charge of simple repair or maintenance are required to have the knowledge or experience in relation 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 have the training to know how 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 hurt the employees that are 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, bracelets during installation, service and maintenance of the product.
- Insulated tools must be used at all times when working with live systems.
- When handling the system/units pay attention to sharp edges.

¹ 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 EN60364-4-42 and in accordance with the National Electric Code, ANSI/NFPA 70, or equivalent agencies. The UPS is approved according to safety standard EN62040-1.
- UPS System contains output over current protection in the form of circuit breakers. In addition to these circuit breakers, the user must observe the recommended NEC listed 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 UPS rack is a dual input power supply. The complete system shall be wired in a way that both input and output leads can be made powerless.
- 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 (output) and PE shall be bonded. The bonded connection between N (output) and PE must be removed once the AC input is being connected.
- AC and DC circuits shall be terminated with no voltage / power applied.
- The safety standard IEC/EN62040-1-1 requires that, in case of output short circuit, the UPS must disconnect in maximum 5 seconds. Parameter can be adjusted on T2S; however, if the parameter is set at a value >5 seconds, an external protection must be provided in order that the short circuit protection operates within 5 seconds. Default setting is 60 seconds.

3.3.1 Handling

- The cabinet shall not be lifted using lifting eyes.
- Remove weight from the cabinet by unplugging the UPS Module.
- Empty UPS module positions must not be left open. Replace with module or cover.

3.3.2 Surge and transients

The mains (AC) supply of the modular UPS 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. The modular UPS system/rack can reach hazardous leakage currents. Earthing must be carried out prior energizing the system. Earthing shall be made according to local regulations.

3.3.3 Other

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

3.4 Maintenance

- The modular UPS system/rack can reach hazardous leakage currents. Earthing must be carried out prior energizing the system. Earthing shall be made according to local regulations.
- Prior any work conducted to a system/unit make sure that AC input voltage and DC input voltage is disconnected.
- UPS modules and shelves comprise capacitors for filtering and energy storage. Prior to accessing to the system/modules after power down, wait min 5 minutes to allow capacitors to discharge.
- Some components and terminals carry high voltage during operation. Contact may result in fatal injury.

3.5 Replacement and Dismantling

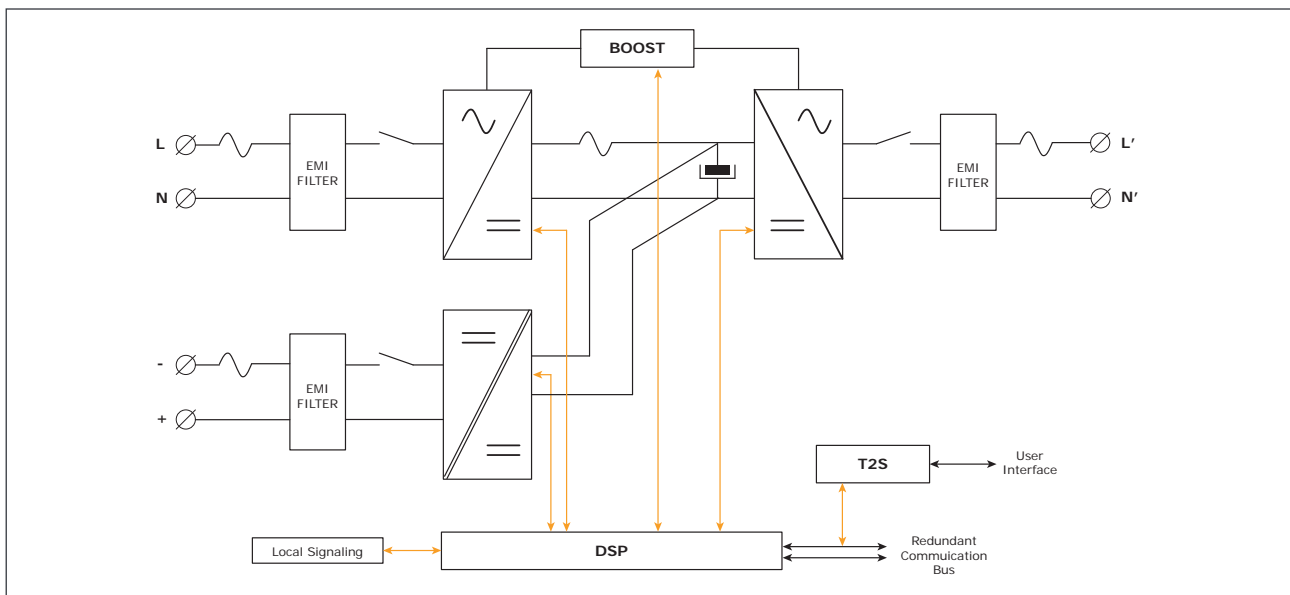
- ESD Strap must be worn when handling PCB's and open units.
- CE+T cannot be held responsible for disposal of the UPS system and therefore the customer must segregate and dispose the materials which are potentially harmful to the environment, in accordance with the local regulations in force in the country of installation.
- If the equipment is dismantled, to dispose of the products it consists of, you must stick to the local regulations in force in the country of destination and in any case avoid causing any kind of pollution.
- There is a risk of explosion if battery is replaced by an incorrect battery type dispose of used batteries according to the instructions.

To download the latest documentation and software, please visit our website at www.cet-power.com

4. TSI TECHNOLOGY ¹

UPS modules carrying the TSI logo and the EPC mark are triple port converters (AC in, DC in, AC out). Sinusoidal output is converted from Mains or/and DC.

The block diagram here below gives an explicit description of the topology and operation.



The module is built around the following sub-converters

- AC to DC at input
- DC to DC at input
- DC to AC at output

The energy can flow either from the AC source or the DC source under the control of the local DSP controller. Thanks to internal energy buffering, the output sine wave is constant and disturbance free regardless of the active source.

The BOOST functionality multiplies the nominal current for a period of 20ms(max) in the event of down stream failures. The upstream breakers does not have to be oversized to prevent tripping. The overload capacity is 150% for 15 seconds.

The TSI works according to True Redundant Structure (TRS) that features decentralized and independent logic, redundant communication bus and three internal levels of disconnection to isolate a module after internal failure.

The functionality is included in every UPS module. Running them in parallel provides a modular system with, no single point of failure, always conditioned output, high system efficiency and 0ms source transfer time.

¹ | Information and data given in this chapter intend to for an overview on the technology. Detailed features and parameters for each individual module type of the range may differ and should be referred in the dedicated data sheet.

4.1 EPC-mode

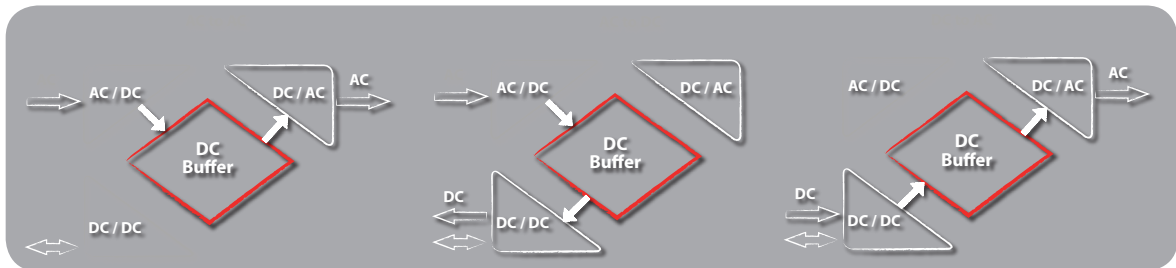
Mains input (AC) is the primary source whilst DC works as backup.

The TSI is designed to operate on Mains on permanent basis and to deliver output voltage conditioned with low THD.

There is no physical difference on the output sine wave whether the source is AC (or) DC. If the Mains is out of tolerance or goes down, the converter seamlessly switches to DC and the converter operates in “Back-up mode” (Switching time back and forth is 0ms).

As soon as the Mains returns in to valid range, the EPC mode is automatically resumed.

The EPC mode offers higher efficiency (up to 96% depending on the model) without compromising the purity of the output sine wave.



4.2 Mix Mode & Walk-in-mode

Under some circumstances DC and AC source can be combined. The sequence is defined by a user selectable set of parameters, start, control and exit are fully automatic .

A specific example of Mix-mode is the Walk-in mode where the transfer from DC source to AC source is ramped up within a fix and adjustable period of time.

5. System Description

5.1 System Layout

The AGIL modular UPS is built as a

- Single stand alone cabinet with or without integrated battery backup and internal manual by-pass(up to 60 kVA)
- System of up to four cabinets with external by-pass

AGIL 60



AGIL 160



AGIL 640



5.2 AGIL UPS Module 20 kVA

The AGIL module is a modular UPS of 20kVA/20kW.

The design of the module allows dynamic load transfer, high efficiency, unsurpassed flexibility and scalability. The module is hot pluggable and hot swappable



5.3 T4S Monitoring Controller

The T4S supervisor act as a link between the system and the user, the control of the system and the modules are distributed on each module.

The T4S allow to :

- configure and set the system parameters
- consult information, alarm, measure through USB port
- control of output Alarm relay (8) and digital input (8).

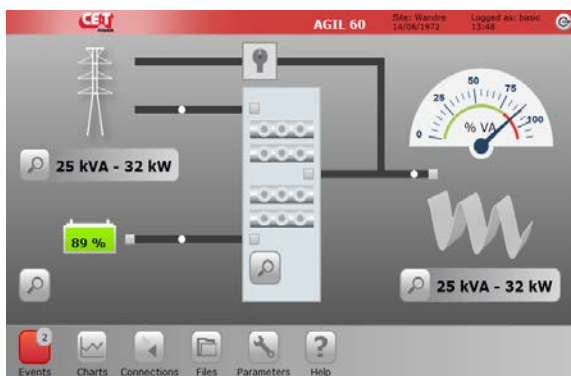
The standard battery management system of the T4S allows float charge, boost charge, temperature compensated charging, discharge measurements etc.



5.4 CATENA Interface (Optional)

The CATENA (GUI) is a rack or panel mounted device with :

- 7 " touchscreen
- Ethernet communication capabilities
- Up to 3 languages.

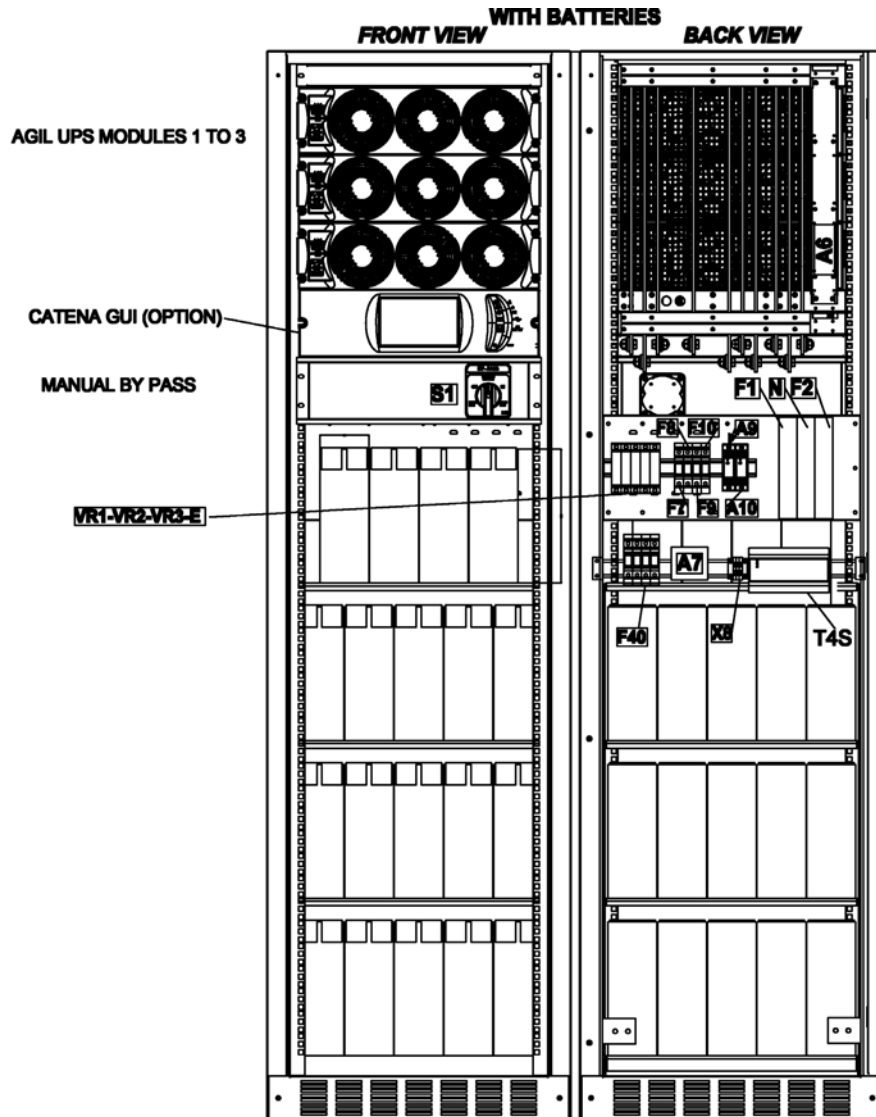


6. AGIL Design and Description

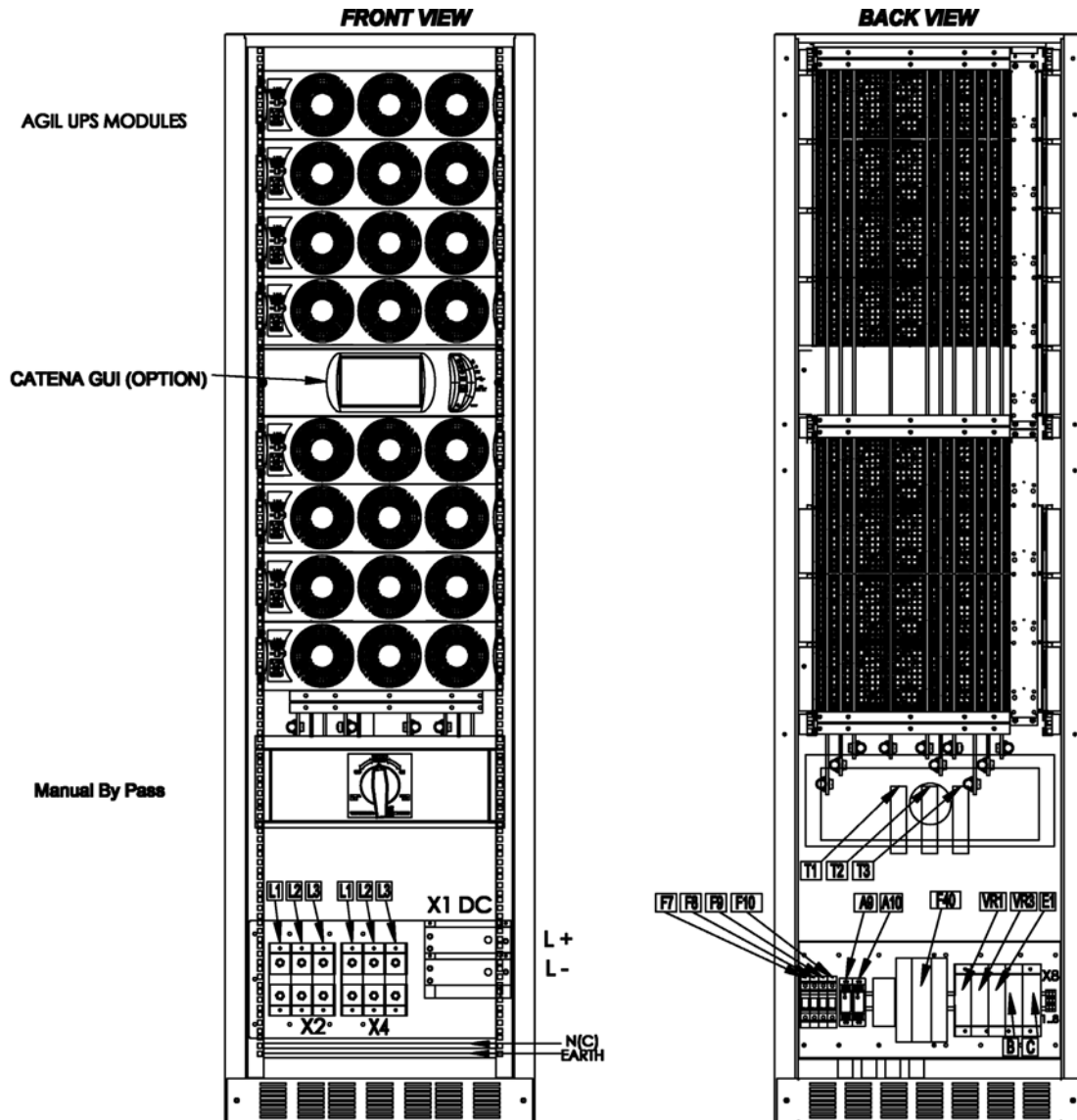
6.1 System Configuration

Agil 60	Cabinet can handle maximum 3 Agil module (20 kVA each). Manual Bypass included Maximum output power 60 kVA or 40 kVA N+1
Agil 160	Cabinet prepared to receive maximum 8 Agil module (20 kVA each) Maximum output power 160 kVA or 140 kVA N+1
Agil 200	Primary cabinet 200 kVA
Agil 220	Expansion cabinet 220 kVA (max 2 cabinet) Maximum output power 200 kVA or 180 kVA N+1 (1 Primary cabinet) Maximum output power 420 kVA or 400 kVA N+1 (1 Primary cabinet + 1 expansion cabinet) Maximum output power 640 kVA or 620 kVA N+1 (1 primary cabinet + 2 expansion cabinet)

6.1.1 System Description Agil 60

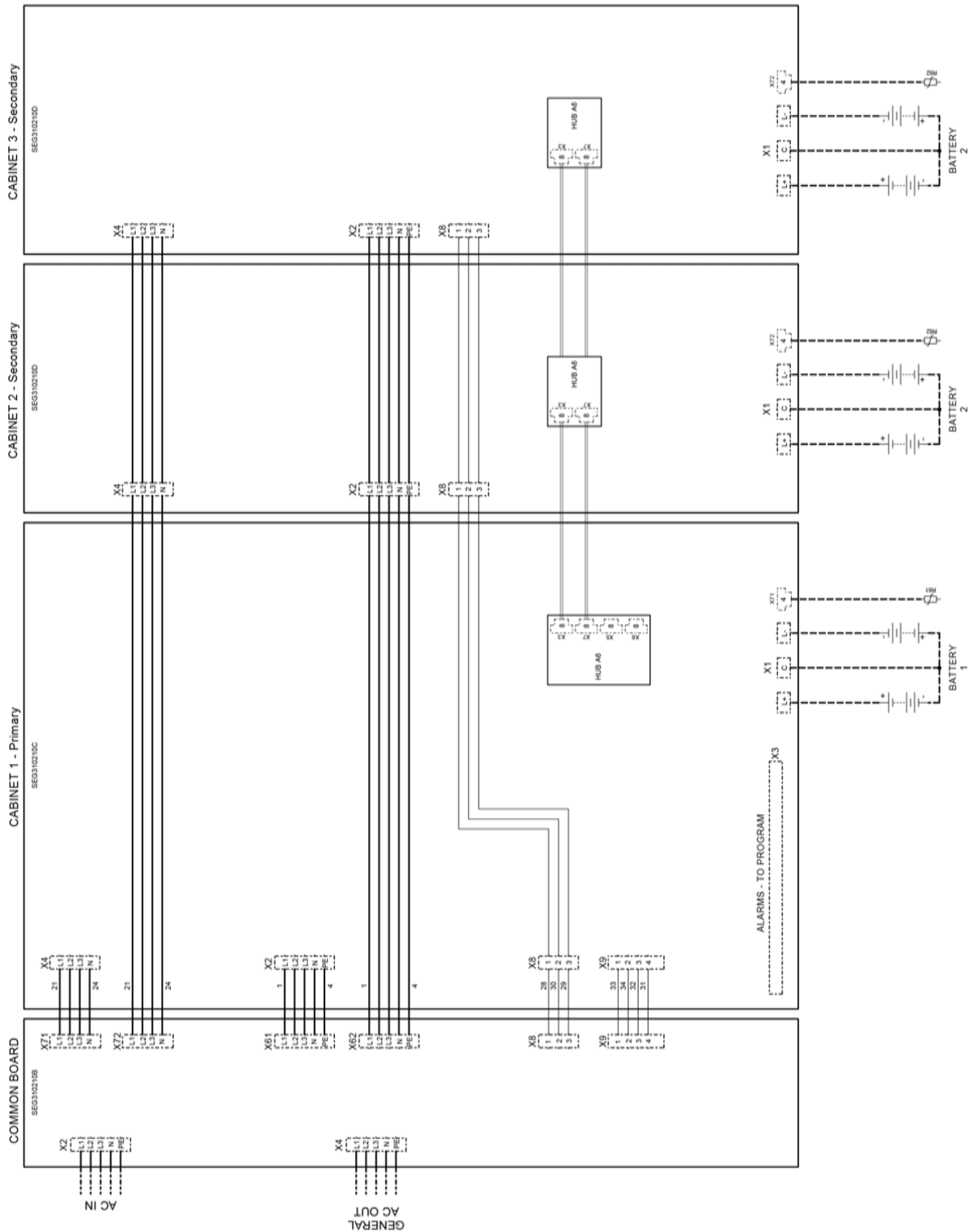


6.1.2 System Description Agil 160

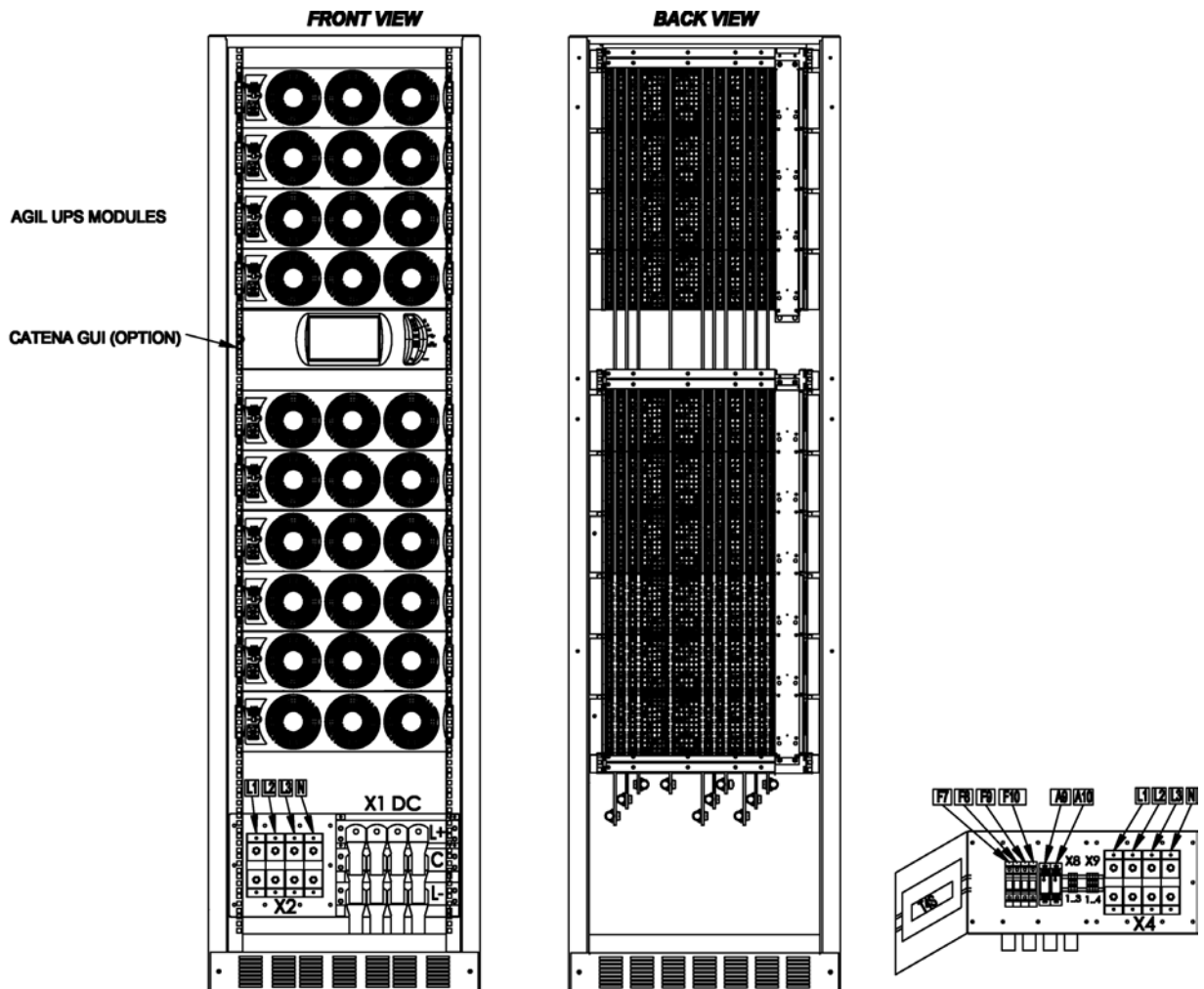


6.1.3 System Description AGIL 200 to 640kVA

AGIL 640 System

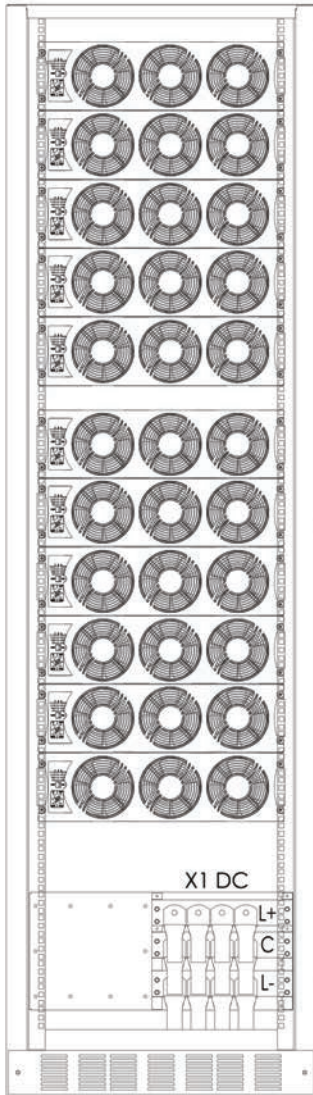


AGIL 200 Primary Cabinet

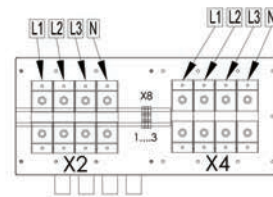
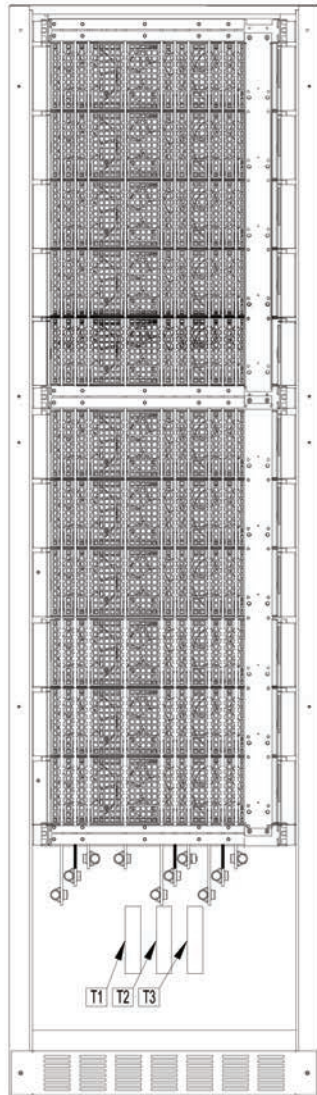


AGIL 220 Extension Cabinet

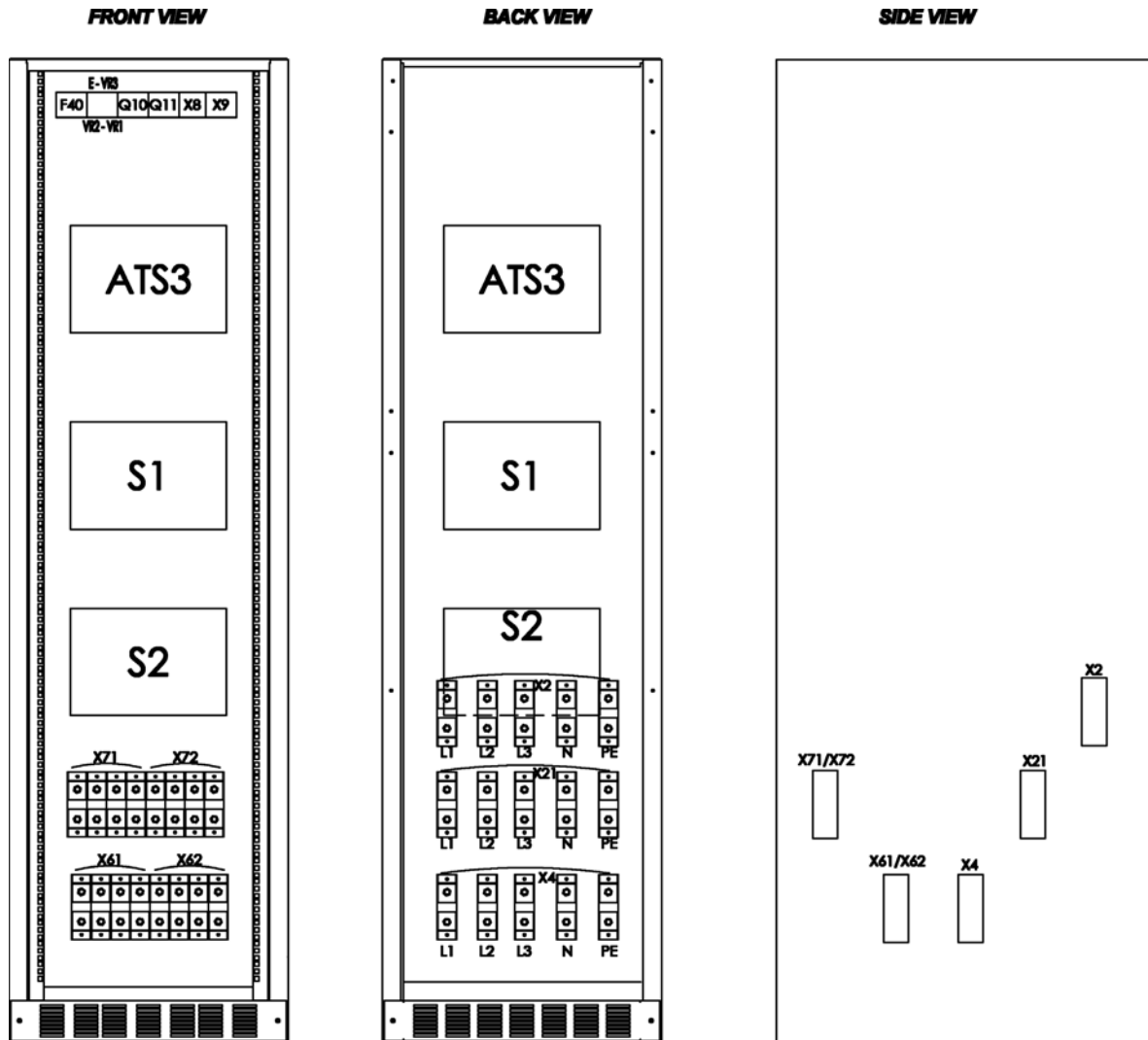
Front View



Rear View



AGIL Common Board



6.2 Manual by-pass

6.2.1 Internal MBP for AGIL 60 and AGIL 160 with internal MBP

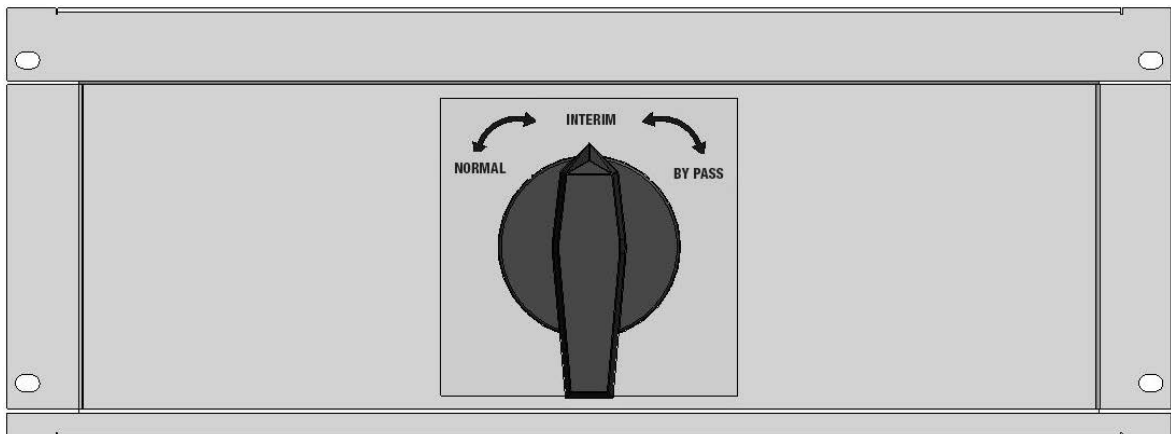
The manual by-pass switch is only integrated in single cabinets without the ability of expansion. Systems building more than one cabinet or that are going to have future expansion possibilities are equipped with an external manual by-pass, located in the “common board” cabinet.

The manual by-pass works in Make before Break.

NORMAL the AGIL modular UPS is operational providing secure backup of the load.

BY PASS the AGIL modular UPS is bypassed. UPS modules are powered off and AC input/output is isolated. However battery input is not isolated.

INTERIM start up the UPS modules prior throwing the switch to Normal. When in transfer the output of the Modular UPS modules are still isolated on the output.



WARNING

In 3 phase configuration the phase order between AC input / AC output must be respected prior to engage the MBP for the first time. Improper phase order might damage the equipment during manual by-pass procedure.

To verify the phase order L1 to L3 please measure the AC voltage between AC input and AC output of each corresponding phase

L1 AC In to L1 AC out voltage should be lower than 40Vac

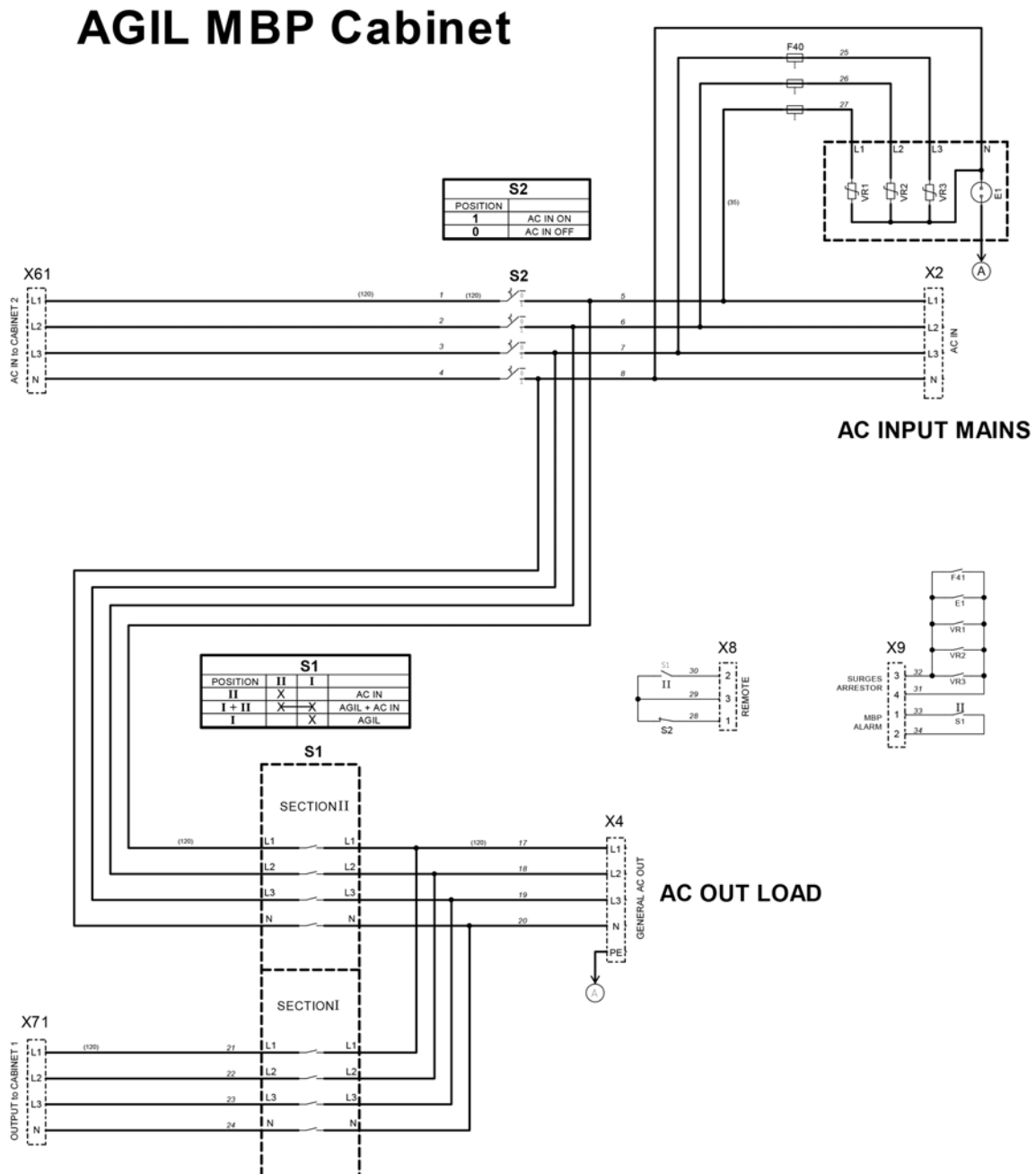
L2 AC in to L2 AC out voltage should be lower than 40Vac

L3 AC in to L3 AC out voltage should be lower than 40Vac

If one of those voltages reaches 380 VAC please check phase order of the measured phase

6.2.2 External MBP

External MBP for AGIL 200 kVA to 640 kVA is installed in separate cabinet with AC input/AC output terminal as well as all interconnection cable to AGIL cabinet.



6.3 MBP Procedure

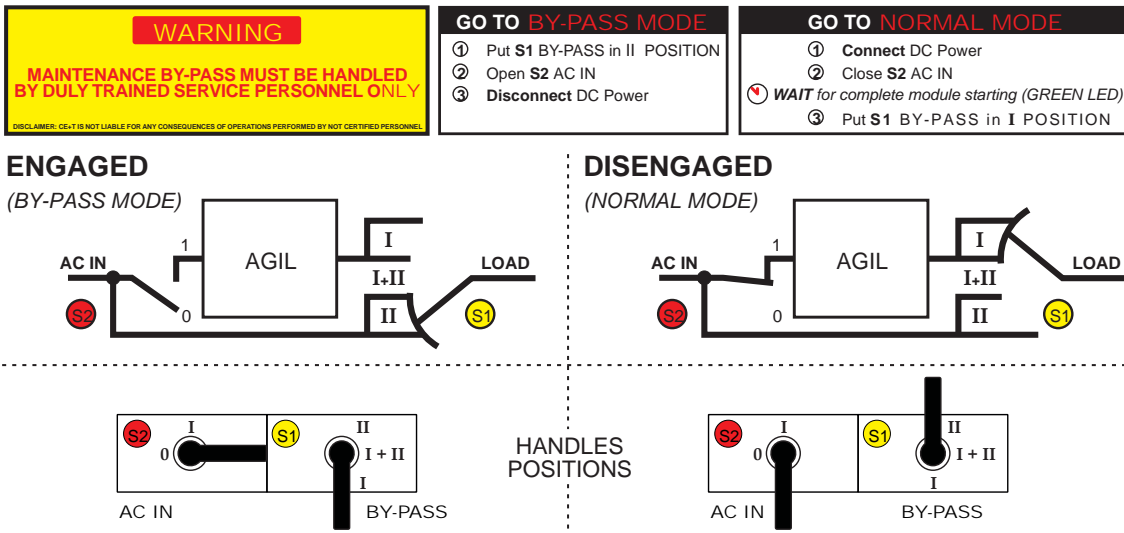
6.3.1 From Normal to By-Pass

Internal MBP

1. Turn MBP switch from position **NORMAL** to **INTERIM**
2. Turn the MBP switch from **INTERIM** to position **BYPASS**
3. Switch off DC input from the battery to the AGIL Cabinet

External MBP

1. Turn switch **S1** to position 2
2. Turn Switch **S2** to OFF (Position 0)
3. Switch Off DC input from the battery to the AGIL cabinet



6.3.2 By-Pass to Normal

Internal MBP

Switch on the DC feed to the Agil Cabinet (DC battery fuse ON)

1. Turn Rotary Switch from **BYPASS** to "**INTERIM**" position
2. Wait for all LED on AGIL module to be permanent green
3. Turn Rotary Switch to **NORMAL**.

External MBP

1. Switch on the DC feed to the Agil Cabinet (DC battery fuse ON)
2. Turn switch **S2** to ON(Position 1)
3. Wait for all LED on AGIL module to be permanent green
4. Turn Switch **S1** to Position 1



7. Site Location planning

7.1 Dimensions

Cabinet dimensions unpacked/packed

600 x 800 x 2100mm / 750 x 950 x 2250mm

7.2 STORING & UNPACKING

7.2.1 Storing

If the equipment is not installed immediately, it must be stored in a room so as to protect it against excessive humidity and heat sources. The battery needs to be stored in dry and cool place with good ventilation. The most suitable storage temperature is 20 °C to 25°C. Battery should not be stored more than 6 months without charge

7.2.2 Initial Checking and Positioning

Check the packaging first upon the arrival of product to see if there is any damage; open the packaging to check the equipment report any such damage to the shipping company immediately.

7.2.3 System Packaging:

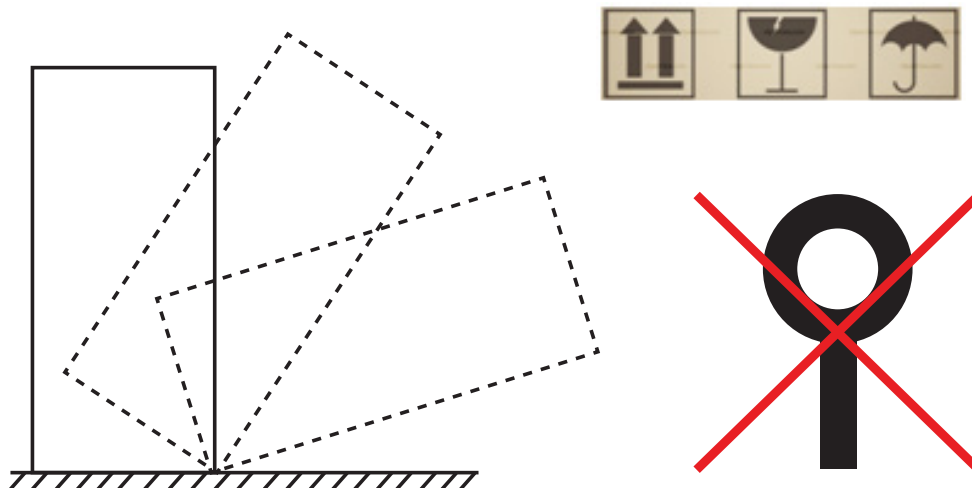
Cabinet dimensions unpacked/packed 600 x 800 x 2100mm / 750 x 950 x 2350mm

Make sure the wooden crate is in right position with TOP and BOTTOM stickers in the right direction.



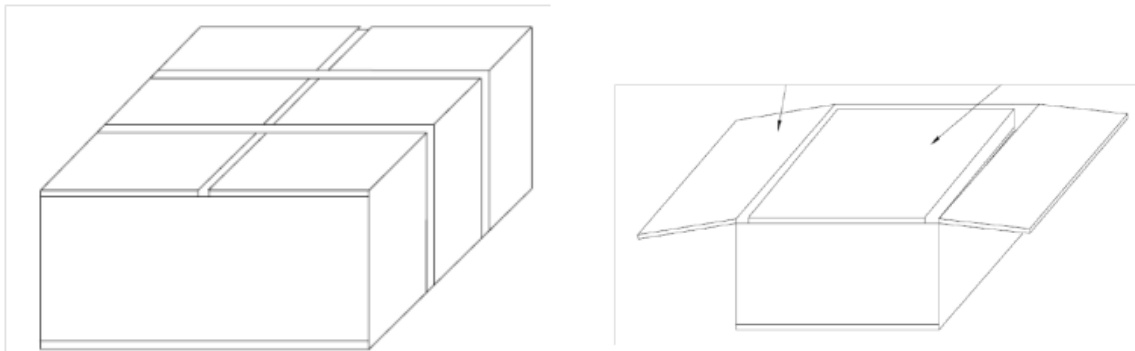
The top cover fixing bolts must NOT be replaced with lifting eye bolts.

Raise the cabinet on location.



7.2.4 Module Packaging:

AGIL modules are not included in the cabinet. They are packed individually in cartons and on pallet. One AGIL module is 24Kg, maximum 3 modules carton boxes may be stacked on each other at all times. Always transport modules in their carton box with suitable protection.



The packing case should be placed horizontal and stable;

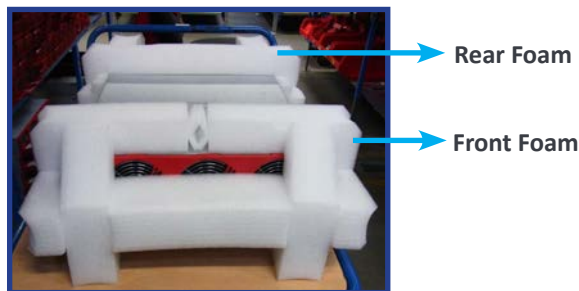
Cut the plastic packing belt and scotch tape to open the carton

Please dispose wasted material according environmental protection and regulation

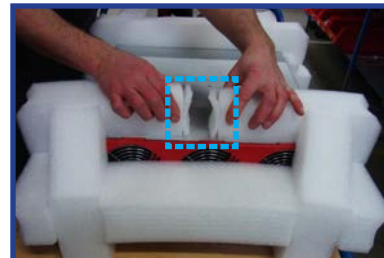
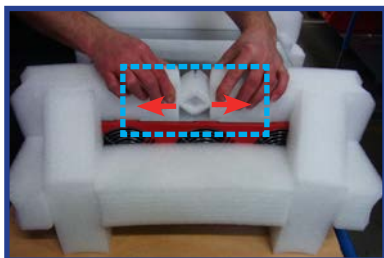
7.2.5 Module Unpacking

Perform the following steps to unpack the AGIL module from the carton:

Step 1. Remove the AGIL module from its carton and place it horizontally on a support

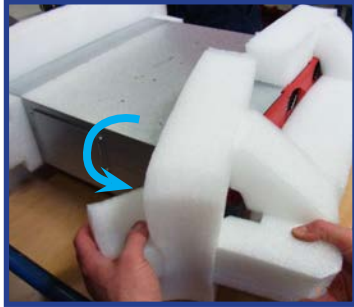


Step 2. In the front foam, tear at middle of top side and middle of bottom side.

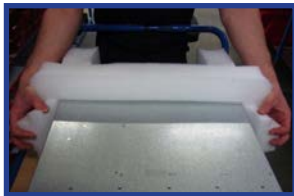


Step 3. Pull on one side of the foam to free the one side of the AGIL hand grip from the foam.

Step 4. Pull on the other side of the foam to free the other side of AGIL hand grip from the foam.



Step 5. Remove the rear foam in one way or each side consecutively.



(Rear foam can be removed without any special method)

Caution:

- Please use original packaging for any transport.
- Keep the foams and original box as spare parts for any future transport.

7.3 Location of the UPS

The AGIL Modular UPS shall be located in a dry, cool, clean and ventilated area suitable to maintain the environment within the range of the specification. Ingress Protection (IP) degree by default is IP20.

The floor shall be non combustible and able to withstand a floor load of min 2000kg/m².

When the cabinet is mounted on a raised floor, the floor shall be equipped with struts supporting the weight of the cabinet.

When batteries are installed adjacent to the AGIL Modular UPS, the battery requirements and weight should be properly dimensioned for the location. Please consult the battery manufacturer's instructions.

The AGIL modular UPS modules are fan cooled. The cool air enters in the front of the modules and exhausts through the rear and the top of the cabinet. No additional system evacuation fans are required.

The heat dissipation will be equivalent to 5% of the total installed power (so for a 100kW installation, it will be roughly 5kW). Please assure enough heat evacuation in the room to prevent a potential UPS' overheating.

7.4 Location of the battery backup

The battery shall be located according to manufacturer specification.

Shorter battery backup is often located adjacent to the UPS cabinet in purpose built battery cabinets.

Longer battery backup is often located in a separate battery room.

7.5 Clearance

The cabinet shall be positioned at least 200mm from the rear wall allowing for adequate ventilation

Overhead distance to cable ladder or ceiling shall be at least 200mm to allow for adequate ventilation.

Front clearance according to local regulations with open door to allow free passage of personnel.

If the cabinet is equipped with rear door, rear clearance will be large enough to allow door opening to facilitate access to the rear of the cabinet.

7.5.1 Cable entrance

The cables enter the system from bottom by default. Top cable access shall be required at the order.

7.5.2 Tools Pre-requisite

The tools used to perform the installation shall be insulated

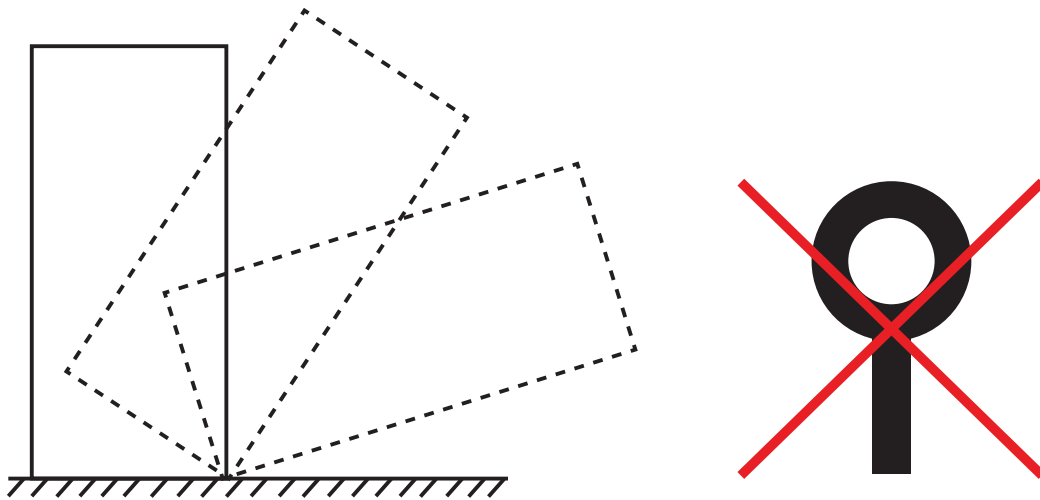
All screws, bolts and nuts of the system are metric.

- Screw driver (Straight)
- Screw driver (Phillips head) Ph 2, Ph 3, Ph 4
- Screw driver (Torx) T10, T15, T20, T25
- Fixed socket wrenches 10, 12, 13, 15
- Adjustable torque wrench
- Sockets 10, 12, 13, 14, 15
- Power drill/Drill hammer
- Drill
- Vacuum cleaner
- Cable cutter
- Heat blower
- Cable lug press tool and dies
- Multi meter
- Ampere meter
- Knife
- Lifting eyes (M12)
- Marking pen
- Measuring tape
- Water level

7.6 Lifting the cabinet

Never try to lift the cabinet on your own. The cabinet can have an individual weight of close to 500kg with modules inserted.

The top cover fixing bolts must NOT be replaced with lifting eye bolts. If modules are present then it must be removed before raising the cabinet.



7.7 Cabinet door

The door of the cabinet is possible to swing open in excess of 180 degrees. The door is right hand hung. It is not possible to change to swing of the door.

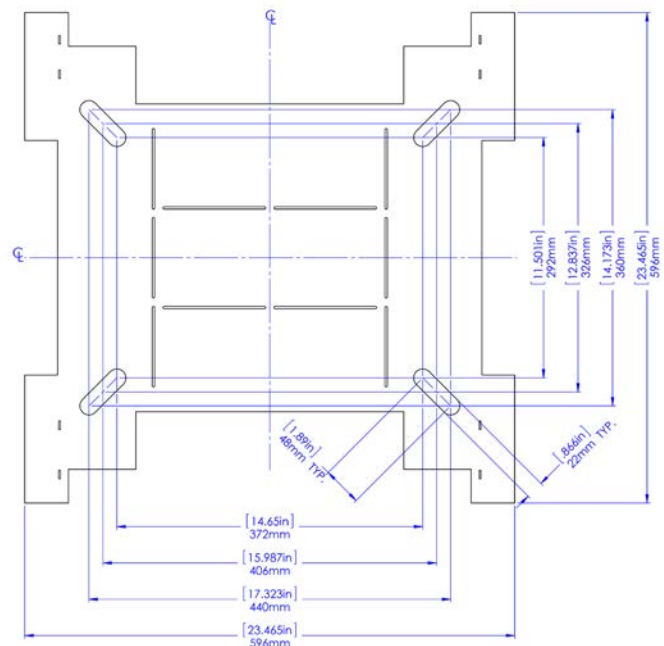
The door is strapped on three hinges. Each hinge is fastened by two screws. Work in pair if the door shall be removed. The cabinet must never be left with the door removed.

7.8 Fixing the cabinet to the floor

The cabinet is fixed through the base of the cabinet.

Remove lowest front cover to gain access to the fixing holes.

Max screw diameter is 0.8" (22mm). See Hole pattern, foot print for measurements



7.9 Cabling

Each cabinet have bulk AC supply on the input and bulk AC output. The mains cable shall be dimensioned according to the maximum input current.

The battery cable shall be dimensioned according to the battery discharge current at final voltage. The voltage drop has to be considered at every installation.

Input AC must always be separated from Output AC to limit induction of interference and noise passing from primary to secondary side.

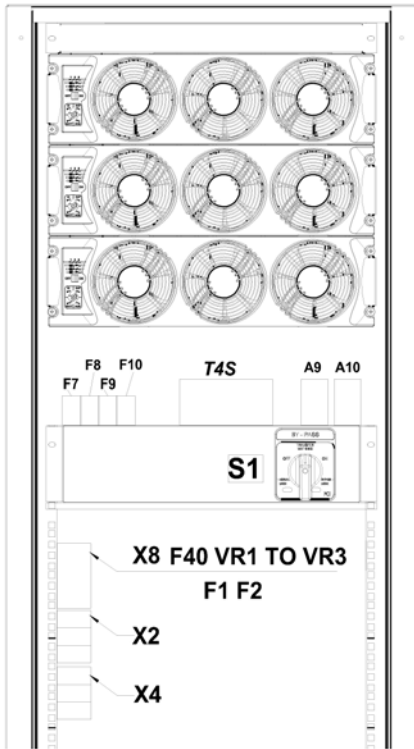
Signal cables shall be separated from all other cables.

Cables shall be strain relieved by suitable means. The bottom plate and the top cover have strain relieve fixing points for battery and signalling cables using cable straps. Mains cables are strain relieved and fixed by compression brackets.

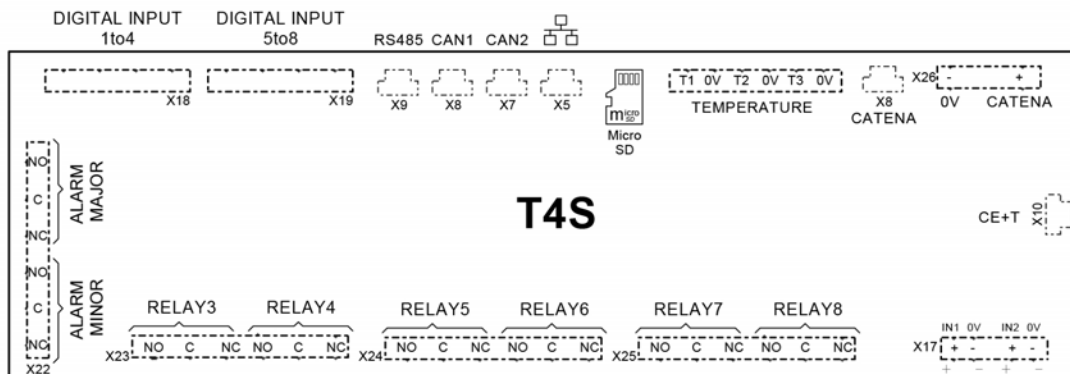
Cables need to be terminated in the following order to facilitate the installation

1. Signal cables
2. AC output
3. AC input
4. Battery Negative
5. Battery Common
6. Battery Positive

7.9.1 Cabling Termination AGIL 60 KVA System

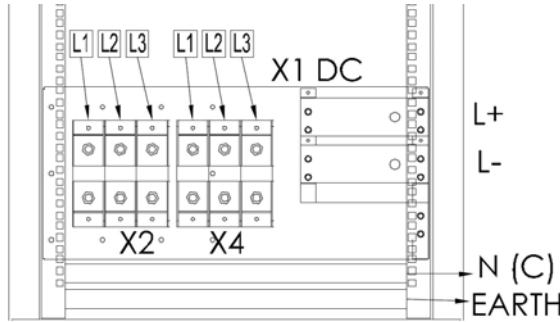


- F7 to F10** Auxiliary power supply
- T4S** T4S Monitoring Unit
- A9 and A10** Protections
- S1** Manual By Pass
- X8** Remote ON/OFF Terminal
- F40** Fuse
- VR1 to VR3** Surge Arrester
- F1 and F2** DC+ and DC-
- X2** AC Input Terminal 5 Wires (L1, L2, L3, N, PE)
- X4** AC Output Terminal 5 Wires (L1, L2, L3, N, PE)

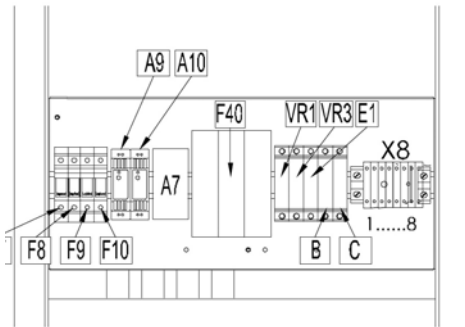


X18 DIG1 : AUX3(MBP)
 X18 DIG2 : VR1 à VR3 + E1

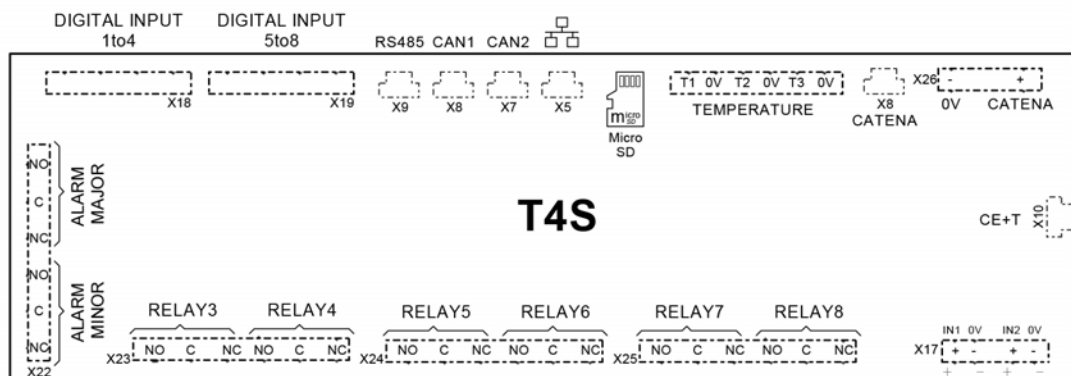
7.9.2 Cabling Termination AGIL 160 KVA System



- X2** AC Input Terminal (L1, L2, L3)
- X4** AC Output Terminal (L1, L2, L3)
- X1** DC Input Terminal (L1, L-)
- N(C)** Neutral and BAT 0V Terminal
- EARTH** PE Grounding



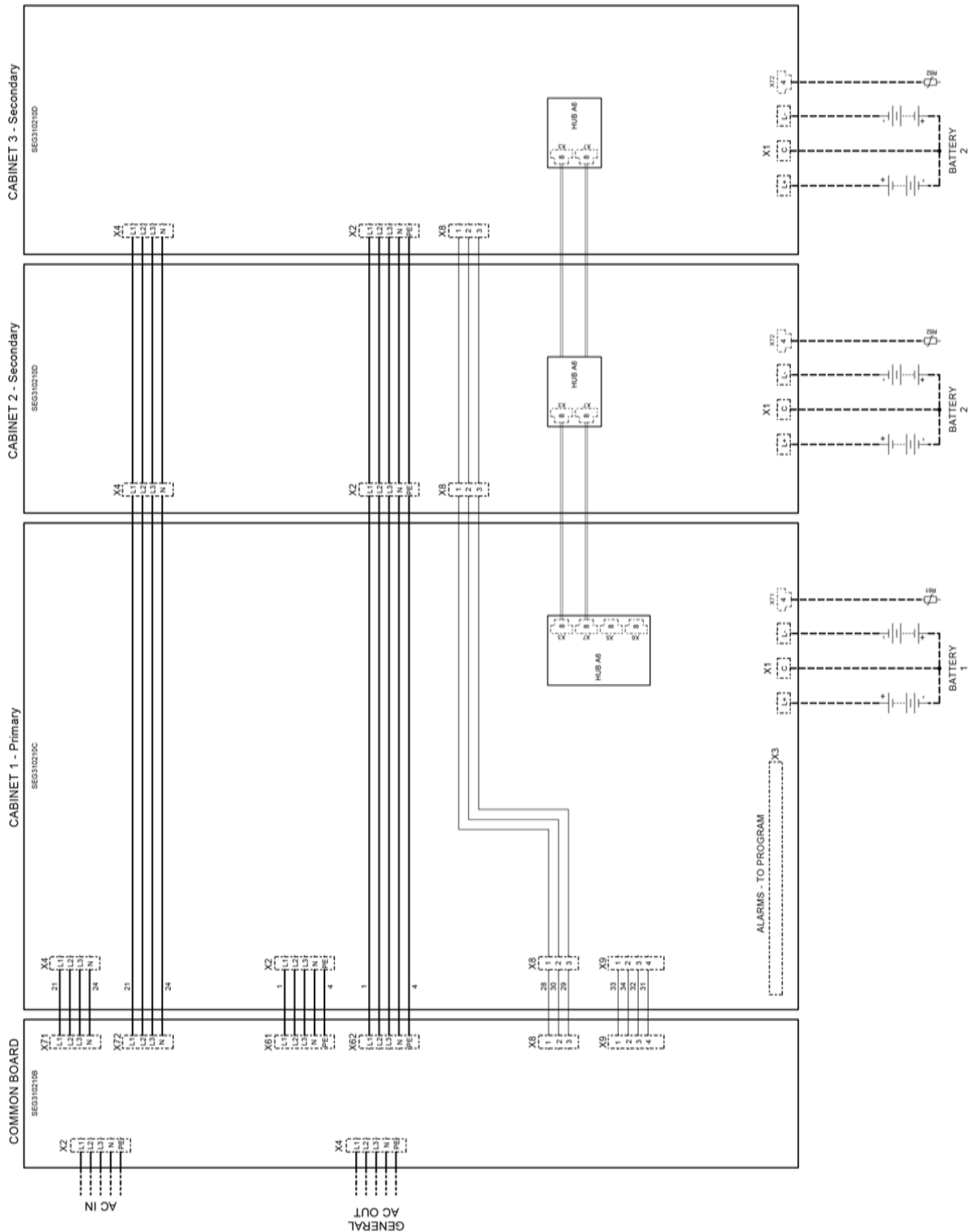
- F7 to F10** Auxiliary power supply
- A9 and A10** Protections
- VR1 to VR3** Surge Arrester
- X8** Remote ON/OFF Terminal
- A7** T4S Monitoring Unit



X18 DIG1 : AUX3(MBP)
 X18 DIG2 : VR1 à VR3 + E1

7.9.3 Cabling termination AGIL 200 to 640 KVA System

AGIL 200 to 640 consist of several interconnected cabinets as below



7.10 Cable Selection

7.10.1 AC Input

WARNING !!!

Recommendation of IEC 60364 4. 43

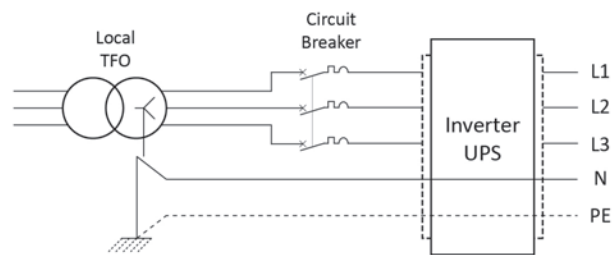
431.3 Disconnection and reconnection of the neutral conductor in multi-phase systems

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.

WARNING !!!

Input Neutral is required to operate the Inverter, 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 inverter, UPS will operate without problem but you may infringe the local regulation.



AC cables connected to the system shall be rated min 0,6/1kV +90°C

The following instructions are guide lines only superseded by local regulations or code of practice where applicable.

Mains supply shall be switched OFF, post necessary warning signs for alert.

Unplug all modules from the system. The modules shall be switched OFF.

Make sure that the manual by-pass (if a part of the system) is in position OFF

Battery isolators/fuses shall be removed and one midsection of the battery must be left uninstalled in each half of the battery string.

7.10.2 DC Input

DC Cables connected to the system shall be rated min 0,6/1kV +90°C

DC Cables are terminated using single hole cable lugs.

7.10.3 Ground

Ground cable connected to cabinet ground terminal.

The ground cable is terminated using single hole cable lug.

The ground cable shall be at least ¾ that of the AC input cable dimension.

Model		AGIL 60	AGIL 160	AGIL 200	AGIL 420	AGIL 640
Capacity	Max Power(kVA)	60 kVA	160 kVA	200 kVA	420 kVA	640 kVA
	Each Module capacity	20 kVA				
AC input/ AC output	Rated current A	90	231	289	607	924
	cable mm ²	35	95	150	300	640
Battery	Rated current at nominal 408VDC	155	413	491	1084	1652
	Cable mm ²	70	240	240	2x240	3x240
PE	Cable mm ²	35	95	150	300	640

7.10.4 Signalling

Located on the controller T4S



Terminal Digital Input:

Dx – 0V : signal from digital input. Potential free contact !!!

D1 : Aux contact from the manual By Pass

D2 : Aux contact from surge arrestor (optional). Minor alarm generated when active

D3 : Digital input available for user

D4 : Digital input available for user

D5 : Digital input available for user

D6: Digital input available for user

D7: Digital input available for user

D8: Digital input available for user

Output Relays Alarm Form C changeover contact rating 60 VDC /0.5 A

NO – C - NC	Major alarm
NO – C - NC	Minor alarm
R3 to R8	User configurable alarm relay.

Battery T° probe T1, T2, T3

7.11 Grounding

7.11.1 Cabinet ground

The cabinet ground shall be terminated to the ground stud and bonded to each and every other cabinet of the UPS system.

The PE grounding is located at the bottom of the bay and identified with symbol:

All grounding connection are reported in PE protection copper plate.

All grounding cables section should not be lower than the maximum power cable section.

7.11.2 Protective device

External supply circuit breakers/fuses are required in the mains input supply of the system.

AGIL 60kVA recommended protection 3 pole 125 A MCB.

AGIL 160kVA recommended protection 3 pole 300 A MCB.

AGIL 200kVA recommended protection 3 pole 400 A MCB

AGIL 420kVA recommended protection 3 pole 700 A MCB

AGIL 640kVA recommended protection 3 pole 1000 A MCB

Those MCB protection serve also as AC Input disconnection switch.

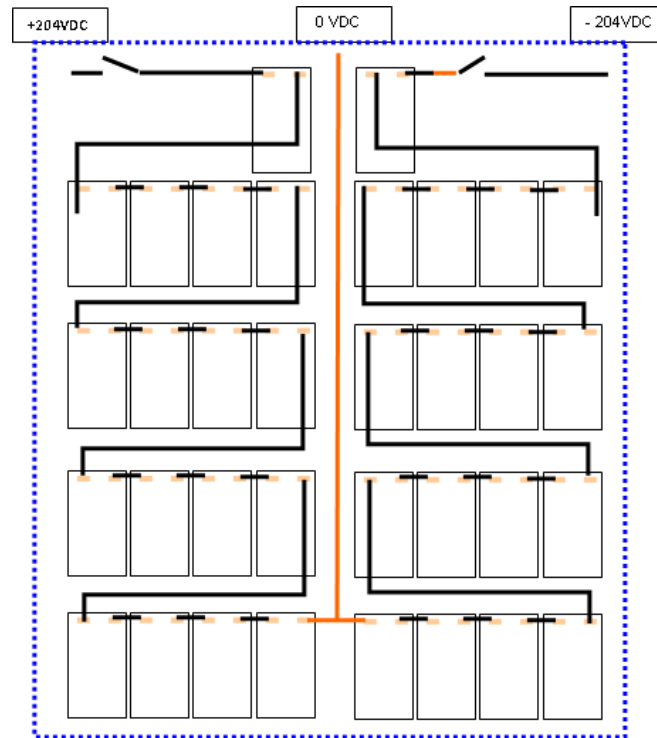
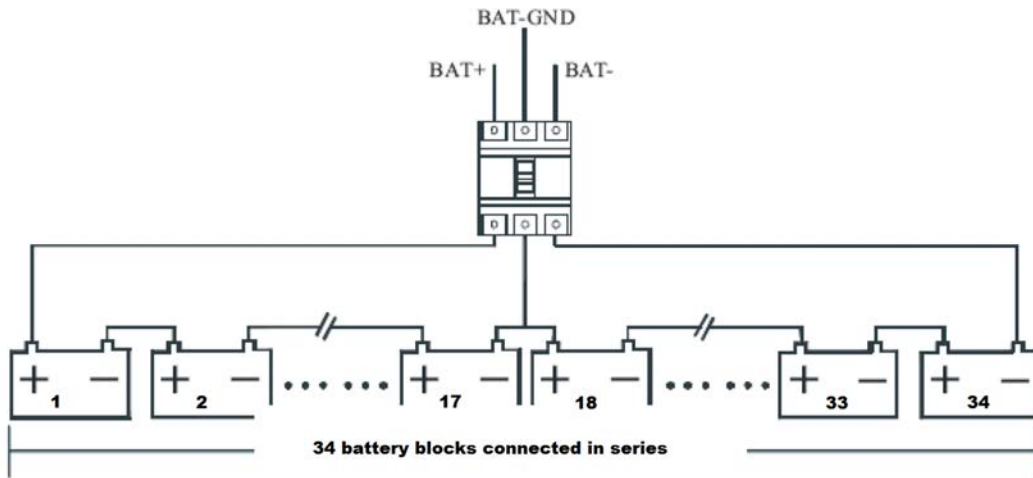
External supply circuit breakers/fuses are required in the battery backup.

7.12 Battery Connection

AGIL battery consist of 204 cells with nominal voltage of 2 V or 34 block of 12 VDC.

The AGIL battery has a middle connection which means we have +204 VDC / 0 VDC / -204 VDC.

There is a risk of explosion if battery is replaced by an incorrect battery type dispose of used batteries according to the instructions



8. Commissioning

Installation and commissioning must be conducted by trained and “AGIL installation duly authorized” personnel only.

CE+T Power cannot be held responsible for any liabilities that would occur due to a non respect of the instructions stated in this manual or due to unproper installation.

It is forbidden to conduct any isolation test without instructions from CE+T.

8.1 Commissioning procedure

1. Make sure that the cabinets are properly positioned and connected.
2. For AC input and AC output, make sure that the phase sequence is properly respected.
3. Insert One AGIL UPS modules into the cabinet with the ON/OFF switch in OFF position.
4. Check that the MBP is in “NORMAL” position.
5. Close the AC input breaker(s).
 - Start the module only with AC input.
 - Check and adjust all parameter according with your configuration (ie: module quantity; redundancy; battery AH; battery charging mode)
 - Insert all other module UPS and turn them ON.
 - Check the DC bus polarity and your battery polarity before close the DC fuse or breaker.
6. Close the DC input breaker(s) or fuse(s).
7. Start the modules one by one and verify that each starts properly (all LED are green on the module’s front panel).
8. Once all modules are started properly, close the AC output breaker(s).
9. If needed adjust the configuration (see “AGIL Modular UPS – User Manual”).

Note : At the commissioning process, if your battery is discharged, the alarm “Unknown capacity” can be triggered until the current battery decrease.

8.2 Check list

DATA	
Date	
Performed by	
Site	
System serial number	
Module serial numbers	
T1S/T2S/T4S serial number-Specify T1S/T2S/T4S	
ACTION	OK/ N.OK
Unplug all UPS modules except one UPS module (Just pull off the UPS module from the rack, to interrupt electrical contacts)	
Check the commercial AC before closing the AC input breaker and check phase order	
Switch ON the commercial AC	
Check if UPS modules are working (Green led)	
Check the DC power supply	
Plug in all UPS modules one by one	
Check output voltage (on bulk output or on breaker)	
Check if UPS modules are working properly (All LED Green-see table)	
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 (if this CANDIS option is present)	
Check if TCPIP 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 UPS module and check alarm according to redundancy	
Pull out two UPS modules 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)	

9. Trouble shooting and fixing defective situations

9.1 Trouble shooting

UPS module does not power up:	Check that the UPS module is properly inserted and switched ON Reposition UPS module to verify that slot is not damaged Check AC input present and in range (AC breakers) Check DC input present and in range (DC breakers) Check for loose terminations
UPS module does not start:	Check that T4S is present and properly installed Check remote ON/OFF terminal on T4S. Check the configuration and setting Check threshold level
UPS module only run on AC or DC:	Check the configuration and setting Check threshold level
No output power:	Check output breaker
All OK but I have alarm:	Check configuration file and correct No of modules Download/clear log file
No output alarm:	Mind the default time delay (UA: 60s, NUA: 30s) Check configuration file

