Omni 25-150kVA

User Manual

Specifications and operating guide for Omni Series UPS systems, 25-150kVA.
Includes installation, operation, and maintenance instructions.

For models:
OMNPM25
OMNCAB050
OMNCAB150

Tech Support

Need help? Our UK-based experts are available 9am–5pm, Monday to Friday.

Email: hello@neotec.co.uk **Website:** www.neotec.co.uk

Before You Begin

Thank you for choosing an Omni Series 25-150kVA UPS to protect your electrical equipment.

To get the best from your system, read this manual in full. It covers the UPS features, installation, operation, and maintenance.

Before installing your modular UPS, read the safety instructions booklet supplied with the unit. Then follow the guidance in this manual step-by-step.

Your UPS must be commissioned by a Neo Tec–approved engineer (or authorised agent) before it goes into service. Skipping this step could put people at risk, cause the system to malfunction, and void your warranty.

1 Safety Precautions

Follow the instructions in this manual when installing or maintaining the UPS and its batteries.

This UPS is designed for commercial and industrial applications only. It must never be used in life-support devices or systems.

1.1 Certification and Standards

Safety: IEC/EN 62040-1

EMC: IEC/EN 62040-2

Performance: IEC/EN 62040-3

1.2 Safety and Information Symbols

Follow the instructions in this manual and observe all warning labels. Ignoring them may result in injury or equipment damage.

Three levels of safety information are used throughout this manual:

Danger – Risk of serious injury or death if instructions are ignored.

Warning – Risk of injury or equipment damage if instructions are ignored.

Attention – Risk of equipment damage, data loss, or poor performance if instructions are ignored.

Information – Provides useful information, advice, or help.

Surfaces marked with a hot-surface label may reach high temperatures during operation. Do not touch these areas to avoid burns.

The UPS contains ESD-sensitive components. Always use appropriate anti-static precautions before handling.

Lead Acid Battery Recycling (Pb) – Do not dispose of lead acid batteries with normal household waste. Collect and recycle separately in accordance with local regulations.

WEEE Mark – Do not dispose of waste electrical or electronic equipment with normal household waste. Collect and recycle separately in accordance with local regulations.

1.3 Safety of Persons

Dangerous voltages are present inside the UPS. Only qualified service personnel should open the unit, and the system must be properly grounded at all times. Installation, commissioning, and service work must be carried out by a Neo Tec Service Representative – an engineer approved by Neo Tec and trained within the last 12 months.

1.4 Battery Safety

All battery servicing that requires internal access must only be carried out by Neo Tec Service Representatives using the correct tools.

When connected, the battery terminal voltage can exceed 400Vdc and is potentially lethal.

- Always follow the safety instructions provided by the battery manufacturer. Pay particular attention to environmental conditions, protective clothing, and the availability of first aid and fire-fighting facilities.
- The nominal operating temperature is 20°C. Higher temperatures will reduce battery life. Replace batteries in line with the manufacturer's recommendations to maintain UPS backup time.
- Replace batteries only with the same type and quantity. Using other types can cause explosion or poor performance.
- Before installation, check batteries for physical damage such as broken casings, corrosion, dirt on terminals, deformation, or leakage. Do not use damaged batteries.
- Remove metal jewellery (rings, watches, necklaces, bracelets) before working on batteries.
- Wear rubber gloves.
- Wear eye protection to prevent damage from accidental electrical arcs.
- Batteries are heavy – use correct lifting techniques and equipment to avoid injury.
- Only use tools with insulated handles.
- Do not dismantle, modify, or damage the battery. This may cause short circuit, leakage, or injury.
- Batteries contain sulphuric acid. In the event of casing damage, acid may leak. Always wear protective glasses, gloves, and clothing when handling batteries. Acid contact can cause blindness or skin burns.
- At the end of service life, batteries may suffer internal short circuits, electrolyte loss, or plate erosion. This can lead to swelling, leakage, or thermal runaway. Replace batteries before these conditions occur.
- Damaged or leaking batteries must be stored in a sulphuric-acid-resistant container and disposed of in accordance with local regulations.
- If electrolyte comes into contact with skin, wash immediately with plenty of water.

1.5 Product Safety

Moving and Installation

- Keep the UPS away from heat sources and air outlets.
- In the event of fire, use a dry powder extinguisher only. Liquid extinguishers may cause electric shock.

- Do not start the UPS if any damage or abnormal parts are found.
- Do not touch the UPS with wet hands or conductive materials – this may cause electric shock.
- Use suitable lifting and handling equipment during installation. Wear protective clothing, including safety shoes, to avoid injury.
- Take care to prevent vibration or shock during positioning and installation.
- Install the UPS in a suitable environment. See Section 4 for detailed requirements.

Operation

- Always connect the grounding cable before connecting power cables. Ground and neutral connections must comply with national regulations.
- Before moving or reconnecting cables, disconnect all input power sources. Wait at least 10 minutes for internal capacitors to discharge, then confirm with a multimeter that terminal voltage is below 36V before working.
- The earth leakage current of the connected load will be carried by the RCCB or RCD.
- If the UPS has been in storage for an extended period, carry out initial checks and inspection before operation.

Maintenance and Replacement

- All internal maintenance and servicing must only be carried out by Neo Tec Service Representatives using the correct tools. Any components requiring the removal of protective covers are not user-serviceable.
- This UPS complies with IEC/EN 62040-1 safety requirements for systems intended for operator access areas. Dangerous voltages are present inside the UPS and battery boxes.
- For non-Neo Tec Service Representatives, the risk of contact with these voltages is minimised. Access to high-voltage components requires opening covers with tools. When operated in accordance with this manual, no risk exists to users during normal operation.

Disposal

- Dispose of used batteries in accordance with local regulations.

2 Introduction

2.1 Your UPS Product

The UPS models in the Trinity series protect sensitive electronic equipment from common power problems, including:

- Power failures
- Power sags and surges
- Brownouts
- Line noise and high voltage spikes
- Frequency variations
- Switching transients
- Harmonic distortion

2.2 Environmental Considerations

Our UPS products are developed using an eco-design approach to reduce environmental impact.

Product

- Primarily made from recyclable materials.
- Dismantling and disassembly must comply with local waste regulations.
- At the end of its service life, the UPS must be sent to an authorised recycling centre or WEEE (waste electrical and electronic equipment) treatment facility.

Battery

- Contains lead-acid batteries that must be processed in accordance with local battery regulations.
- The battery can be removed for correct disposal.

Substances

- This product contains no CFCs, HCFCs, or asbestos.

Packaging

- Cardboard contains over 50% recycled material.
- Sacks and bags are made from polyethylene.
- All packing materials are recyclable.
- Follow local regulations when disposing of packing materials.

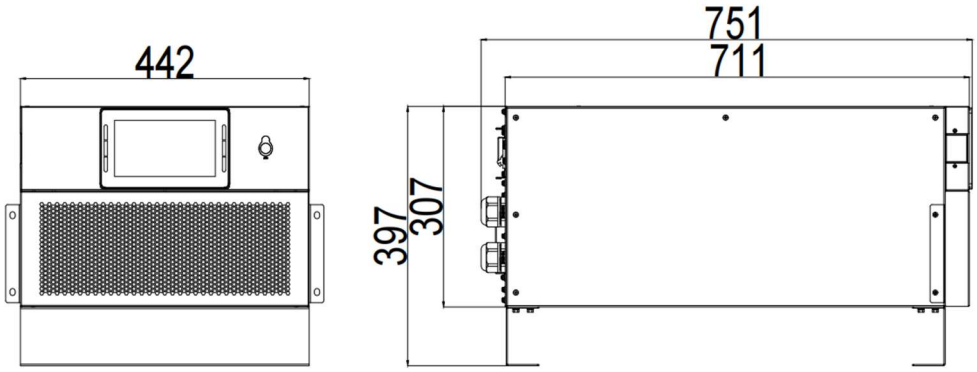
3 Product Overview

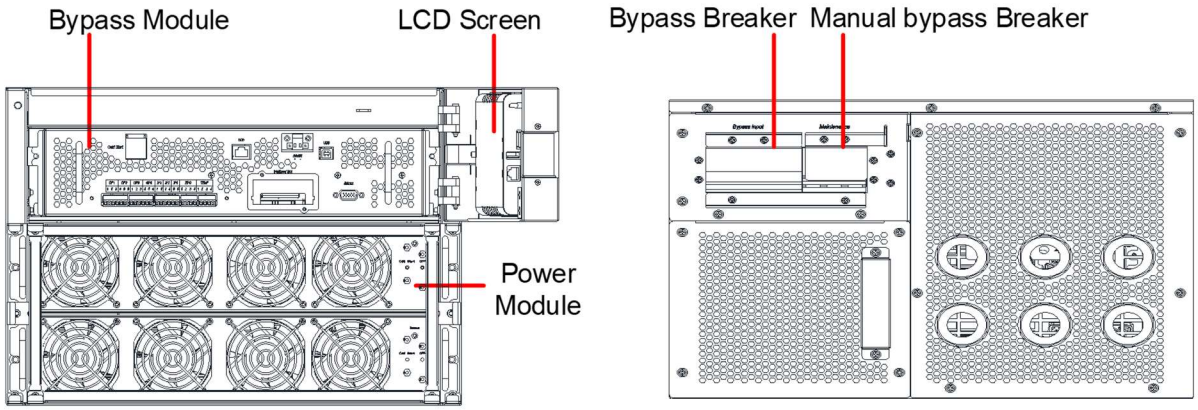
3.1 UPS Configuration

COMPONENTS	QUANTITY	NOTE
LCD	1	Standard
Bypass module	1	Standard
Bypass/maintenance bypass breakers	1	Standard
Power module	1-2 or 1-6	Standard

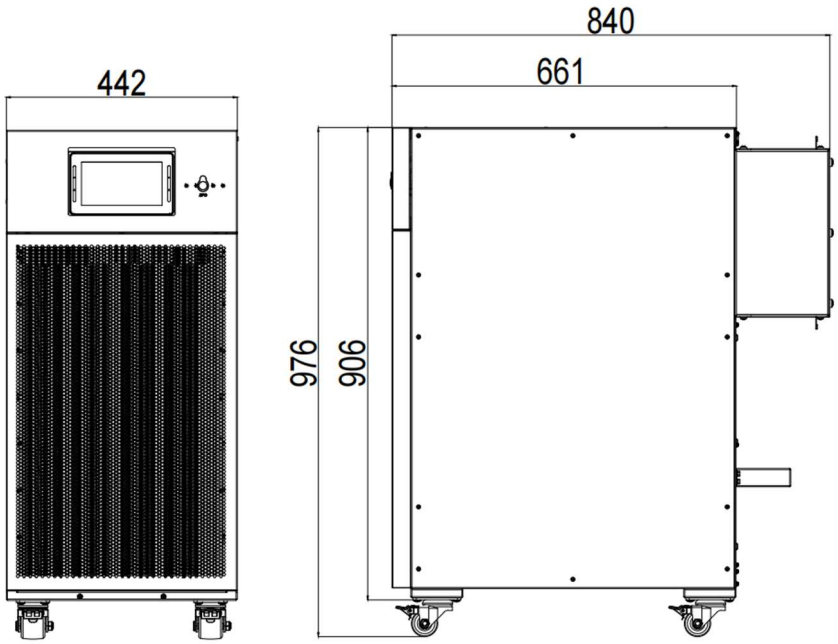
3.2 Appearance

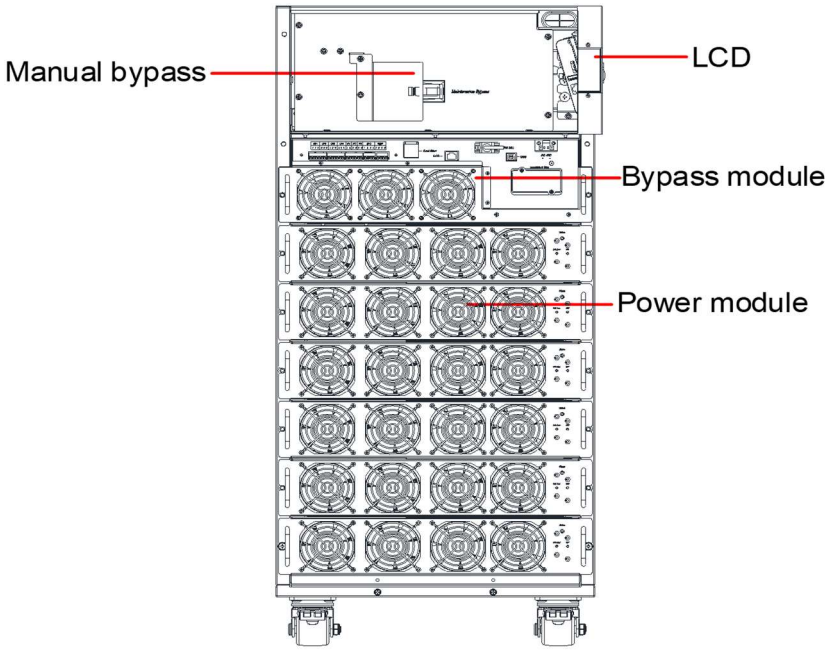
2-Module Cabinet





6-Module Cabinet





4 Installation

A 3-phase, 4-wire input power supply is required. The standard UPS system can be connected to TN or TT AC distribution systems (IEC 60364-3) using a 3-phase, 4-wire configuration. A 3-wire to 4-wire conversion transformer is available as an optional accessory. A single-phase, 3-wire option is also available.

4.1 Environmental Considerations

- The UPS is designed for indoor installation and uses forced-air cooling. Ensure adequate clearance for ventilation and keep all air inlets and outlets unobstructed.
- The UPS should be installed on a cement or other non-combustible surface.
- Install the UPS in a cool, dry, and clean environment with stable ambient conditions. Avoid locations exposed to direct sunlight, dust, moisture, heat sources, or corrosive substances.
- The UPS should be installed on a cement or other non-combustible surface.
- Do not install the UPS in environments with conductive dust or dirt.
- The recommended battery operating temperature is 20°C. Higher temperatures shorten service life, while lower temperatures reduce capacity. Operating above 40 °C can severely reduce battery life.
- During charging, batteries may release small amounts of hydrogen and oxygen gas. Ensure ventilation complies with EN 50272-2001 requirements.
- Keep batteries away from heat sources and air outlets.
- When external batteries are used, install circuit breakers or fuses as close as possible to the battery terminals, and keep cable runs short.

Storage Requirements

- If the system is not installed immediately, store it indoors in a clean, dry, and cool location.
- Batteries should be unpacked, installed, and charged as soon as possible after delivery to maintain performance and warranty validity.

Risk of battery damage due to insufficient charging.

Failure to properly charge the batteries can result in permanent damage and void the warranty. Batteries will self-discharge during storage and must be recharged as recommended by the battery manufacturer.

A Charge Before Date label is affixed to each unit containing batteries. This date is based on storage at 25 °C (77 °F). Storage at higher temperatures will accelerate self-discharge, requiring earlier recharging. Consult the battery manufacturer for guidance on determining when recharging is necessary.

4.2 Unpacking and Inspecting

1. Check the packaging for damage. If damage is found, do not attempt to install the system, report it to the carrier immediately.
2. Verify the product label and confirm the order is correct.
3. Transport the equipment to the installation site using a forklift or
4. Unpack the UPS and remove all protective foam.
5. Inspect the UPS:
    - Visually check for any damage during transport. If damage is found, contact the carrier.
    - Verify the contents against the packing list. If items are missing, contact your Neo Tec Service Representative.
6. Remove the bolts securing the cabinet to the wooden pallet.
7. Move the cabinet carefully to its final installation position.

If your equipment is damaged in transit, keep all cartons and packing materials. Report the issue to the carrier or place of purchase.

For damage found after delivery, submit a concealed damage claim.

To make a claim:

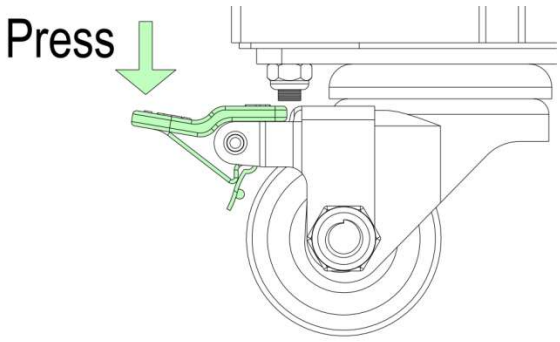
- Notify the carrier within 15 days of receiving the equipment.
- Send a copy of your claim to your Neo Tec service representative within the same 15-day period.

4.3 Positioning the Cabinet

The cabinet is fitted with four wheels. If the UPS is to be installed on a raised floor, it must be mounted on a pedestal designed to support the point loading of over 150 kg.

To position the UPS cabinet:

1. Ensure the supporting floor is smooth, level, and strong enough to bear the weight of the UPS.
2. Move the cabinet carefully into position using the wheels.
3. Lock the brake assemblies to secure the cabinet in place.



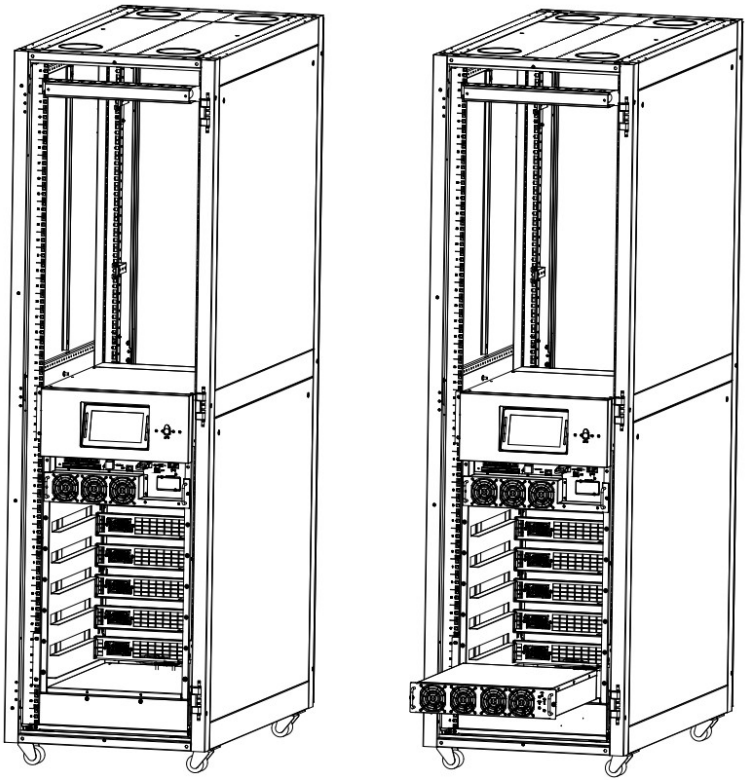
Ensure all lifting or handling equipment used has sufficient capacity for the UPS weight. Use a forklift or similar equipment where appropriate, and secure the cabinet to prevent movement when unbolting it from the shipping pallet. Wheels may be used for short-distance movement only.

Handle units fitted with batteries with care, and keep movement to a minimum.

Rack-Mount Installation

When installing the UPS in a rack configuration, it must be supported by a slide kit, fixed rails, or a suitable shelf.

1. Fasten the slide kit securely to the rack enclosure.
2. Remove the UPS cabinet wheels.
3. Lay the UPS in the rack-mount position.
4. Secure the UPS to the rack enclosure using M6 screws.
5. Insert the power modules.



Select a rack enclosure with side panels that fully cover the sides of the UPS cabinet. Failure to do so may expose the power module connectors, creating a risk of accidental contact with tools such as screwdrivers.

4.4 Power Module Installation

The number and position of power modules may vary depending on the factory configuration.
When installing power modules, always begin from the lowest available slot and work upwards to maintain a low centre of gravity. The default installation sequence is from No.1 upward to No.2 (for 2-module cabinets) or from No.1 upward to No.6 (for 6-module cabinets).

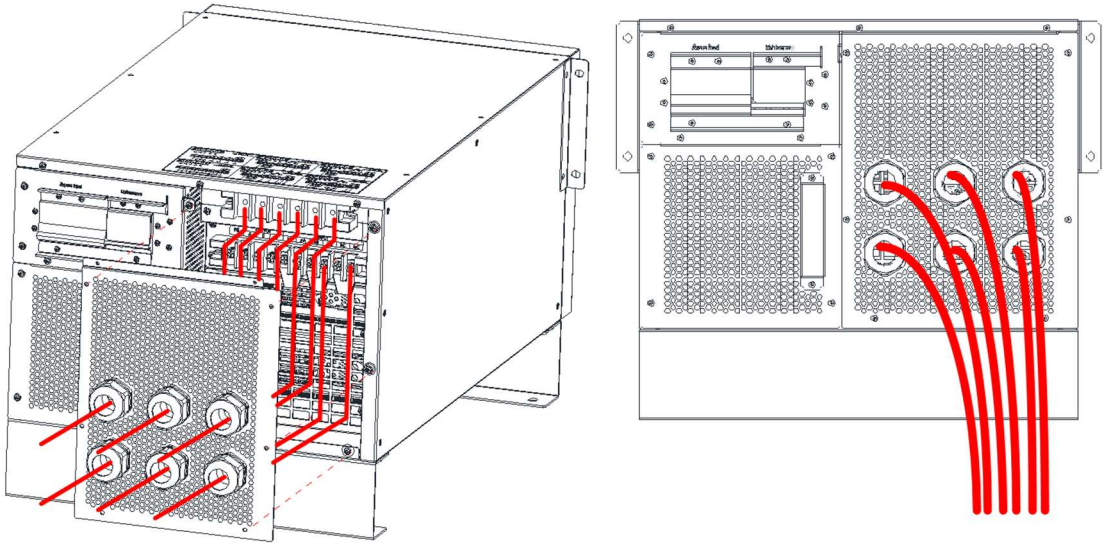
1. Remove the blank covers corresponding to the number of modules being installed.
2. Insert each module into its designated slot and push it fully into the cabinet.

4.5 Cable Entry

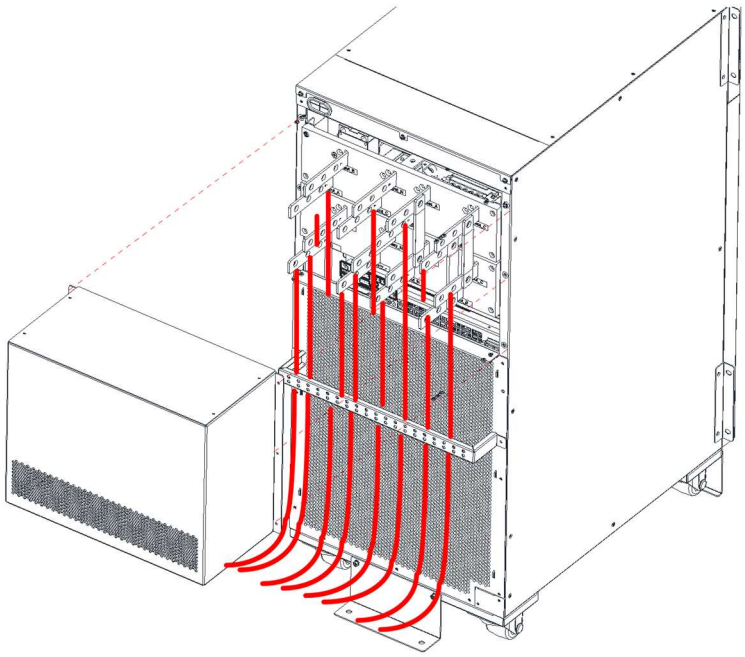
Cables can enter the modular UPS rack system from the rear. The recommended installation method is to route cables through an elliptical or circular cable gland on the removable plates to prevent foreign objects or vermin from entering the cabinet.

If using bottom cable entry, remove the cover and install a rubber cable protector in the opening before routing the cables.

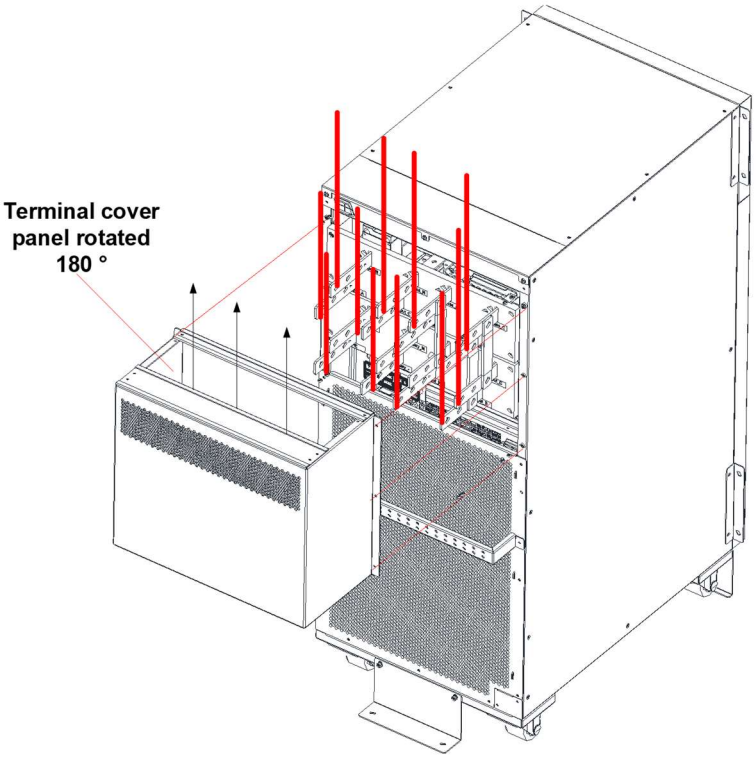
2-Module Cabinet



6-Module Cabinet



6-Module Cabinet: Top Entry



In a 6-module cabinet, arrange and secure cables as shown in the Top Entry diagram to ensure optimal ventilation.

4.6 External Protective Devices

For safety reasons, external circuit breakers or equivalent protective devices must be installed on the UPS input AC supply. The following guidance is intended for qualified installation engineers familiar with applicable wiring regulations and the equipment to be installed.

To reduce the risk of fire, connect the UPS only to a circuit with branch overcurrent protection compliant with the national safety standard.

Overcurrent Protection

Install suitable protective devices in the incoming mains distribution unit, considering the current-carrying capacity of the power cables and the overload capacity of the system.

A magnetic circuit breaker with an IEC 60947-2, curve C tripping characteristic, rated at 125% of the current listed in the UPS Spec, is recommended.

Split Bypass Systems

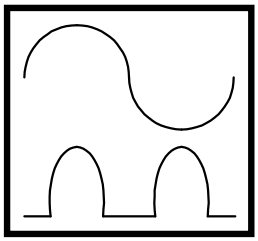
When a split bypass configuration is used, separate protective devices must be installed for both the rectifier input and bypass input in the mains distribution panel.

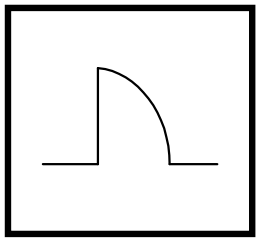
The rectifier input and bypass input must share the same neutral line.

Earth Leakage and RCD Devices

Any Residual Current Device (RCD) or Residual Current Circuit Breaker (RCCB) installed upstream of the input supply must:

- Be Class A, sensitive to DC unidirectional pulses.
- Be insensitive to transient current pulses.
- Have adjustable sensitivity between 0.3A and 1A.





To avoid false alarms, earth-leakage monitoring devices used in systems with split bypass input or parallel UPS configurations must be installed upstream of the common neutral point. Alternatively, they must monitor the combined four-wire rectifier and split bypass input currents.

4.7 Power Cables

The selection of UPS power cables must comply with the requirements of Table 3B in IEC 60950-1. Appropriate cable sizes should be chosen according to the specific engineering application. The table below lists the UPS maximum operating current and the recommended cable diameters.

Failure to follow proper earthing procedures may result in electromagnetic interference (EMI), electric shock, or fire in the event of an earth fault.

Recommended Power Cables

			2 MODULES	6 MODULES
MODULAR POWER			25kVA	25kVA
UPS POWER			50kVA	150kVA
Main Input	Main Input Current (A)		96A	287A
	Cable Section (mm^2)	A	16	95
		B		
		C		
		N		

			2 MODULES	6 MODULES
MODULAR POWER			25kVA	25kVA
UPS POWER			50kVA	150kVA
Main Output	Main Output Current (A)		76A	227A
	Cable Section (mm^2)	A	16	70
		B		
		C		
		N		
Bypass Input	Bypass Input Current (A)		76A	227A
	Cable Section (mm^2)	A	16	70
		B		
		C		
		N		
Battery Input	Battery Input Current (A)		110A	330A
	Cable Section (mm^2)	+	25	120
		-		
		N		
PE	Cable Section (mm^2)	PE	16	50

The recommended cable sections apply under the following conditions:

- Ambient temperature: 30°C.
- AC loss < 3%, DC loss < 1%. Maximum cable length: 50m (AC), 30m (DC). If these limits are exceeded, the cable cross-sectional area must be increased accordingly.
- Based on 90°C copper conductor flexible cables. For other conditions, refer to IEC 60364-5-52 and local codes.
- Current values in the table are based on 380V. For 400V, multiply the current value by 0.95; for 415V, multiply by 0.92.
- When the main loads are non-linear, increase the neutral line cross-section to 1.5–1.7 times the listed value.
- In three-input/single-input mode, the current on the AC neutral line is approximately three times higher than in standard three-input/three-output operation. Ensure the power cable configuration is rated accordingly.

Specifications for Power Cable Terminals

MODEL	TERMINAL	CONNECTION	BOLT	TORQUE
2 Modules	Input (L)	OT Terminal	M6	3Nm
	Bypass (L)			
	Output (L)			
	Battery (L)			5.5Nm
	Input (N)			
	Bypass (N)			
	Output (N)			
	Battery (N)			
	Ground line			3Nm
6 Modules	Input (L & N)		M12	28Nm
	Bypass (L & N)			
	Output (L & N)			
	Battery (L & N)			
	Ground line			

Recommended External Circuit Breakers

The UPS system must be equipped with external distribution circuit breakers, including the main input circuit breaker, bypass input circuit breaker (used when a dual-input configuration is employed), output circuit breaker, maintenance bypass circuit breaker, and battery output circuit breaker.

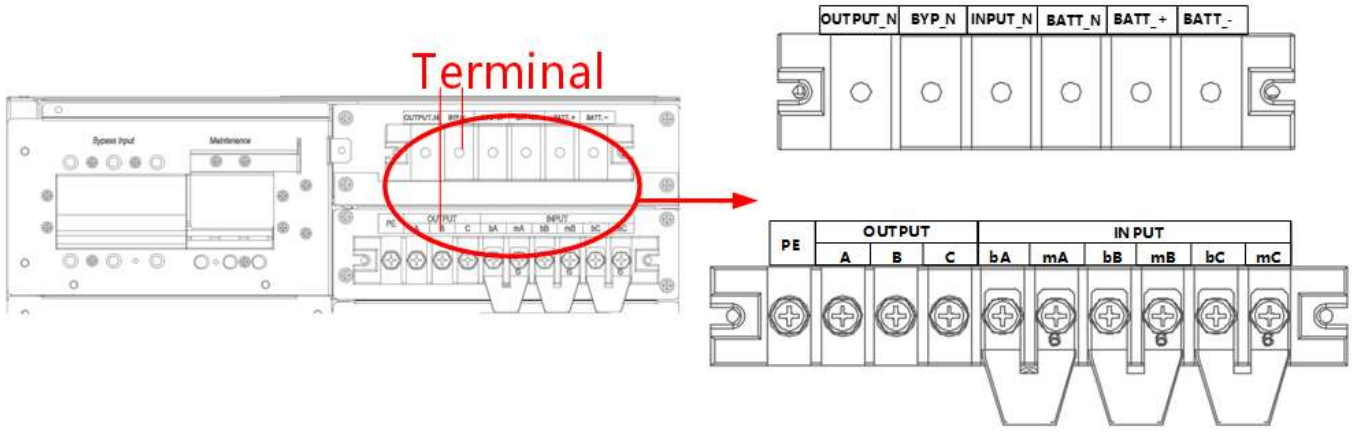
INSTALLED POSITION	2 Modules 50kVA	6 Modules 150kVA
Input CB	100A/3P	315A/3P
Bypass input CB	80A/3P	250A/3P
Output CB	80A/3P	250A/3P
Maintenance CB	80A/3P	250A/3P
Battery CB	125A	350A

Circuit breakers incorporating leakage protection are not recommended for this system.

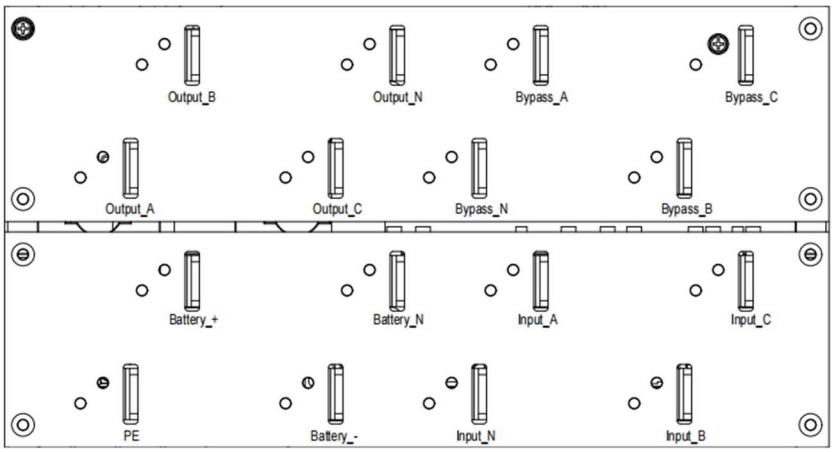
Connection Procedure

1. Ensure all input power distribution switches are turned off, and all power switches inside the cabinet are also off. Attach warning signs to these switches to prevent accidental operation.
2. Remove the rear protective cover to access the input, output, battery, and grounding terminals.

2-Module Cabinet: Terminal Block Layout



6-Module Cabinet: Terminal Block Layout



3. Connect the input ground wire to the designated grounding terminal. Ensure the grounding connection complies with all applicable national regulations.
4. Connect the AC input cable to the Main Input terminal, and connect the output load cable to the Output terminal.
5. Connect the battery cables to the Battery terminals on the UPS. External battery connections must include an isolating switch.
6. After verifying that all wiring is correct and secure, reinstall the rear protective cover to complete the wiring process.

- Before wiring the UPS, identify the position and status of the switch that connects the UPS input to the mains power supply. Ensure the switch is off and attach a warning sign to prevent accidental operation.
- When connecting power cables, ensure all terminals are securely tightened to the correct torque to prevent loose connections and potential safety hazards.

4.8 3-Phase In and 1 Phase Out, Common Input

The system supports both 3/1 and 1/1 configuration settings. When the UPS is set up in either of these configurations, the 25kVA power module must be derated to 20kVA.
Whether the cabinet system requires derating depends on the installed power module configuration. A 3/1 or 1/1 short copper busbar kit is available as an optional accessory.

The derating setting must be configured using UPSview software. For assistance, contact your Neo Tec Service Representative.

2-Module Cabinet: 3/1ph Configuration

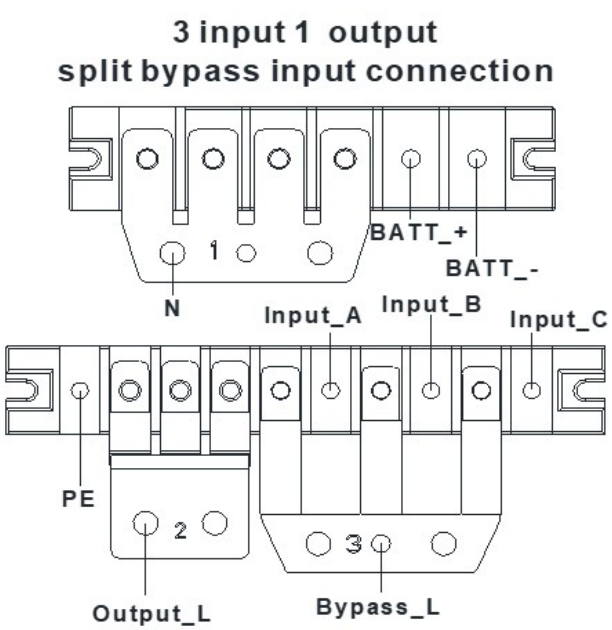
The output L-line shorting bar connects phases A, B, and C together, while the N-line shorting bar connects all neutral lines.

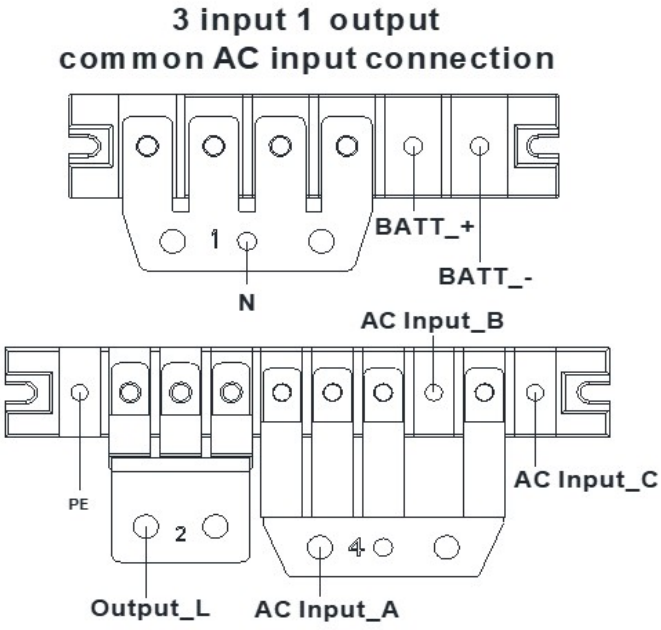
When the main and bypass use different sources:

1. Short-circuit the three bypass phases and connect them to the bypass input.
2. Connect the main input to phases A, B, and C as normal.

When the main and bypass share the same source:

1. Short-circuit the three bypass phases and connect them to phase A of the main input.
2. Connect phases B and C of the main input as normal.





2-Module Cabinet: 1/1ph Configuration

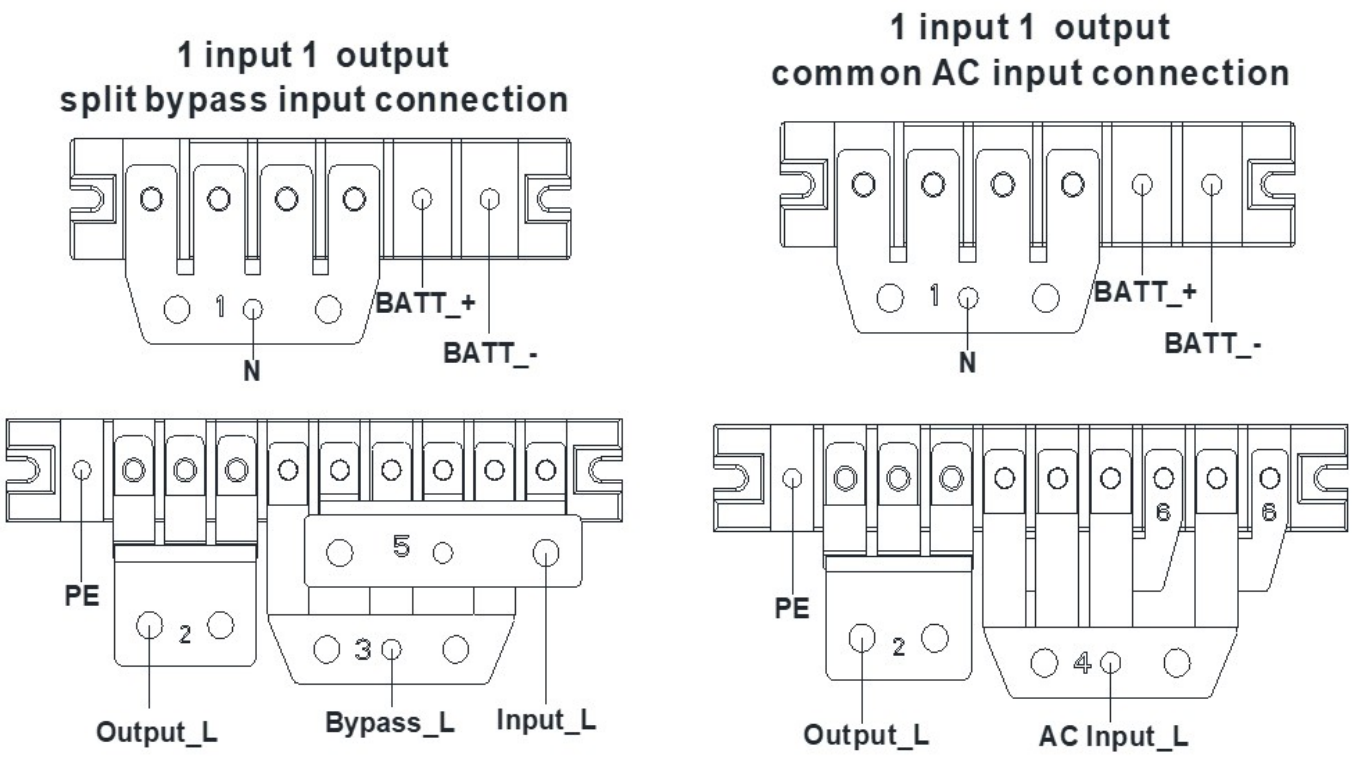
The L-line shorting bar connects output phases A, B, and C together, while the N-line shorting bar connects all neutral lines.

When the main and bypass use different sources:

1. Short-circuit the three bypass phases, then connect them to the bypass input.
2. Short-circuit the three main phases, then connect them to the main input.

When the main and bypass share the same source:

1. Short-circuit the three bypass phases, then connect them to the three main input phases.



6-Module Cabinet: 3/1ph Configuration

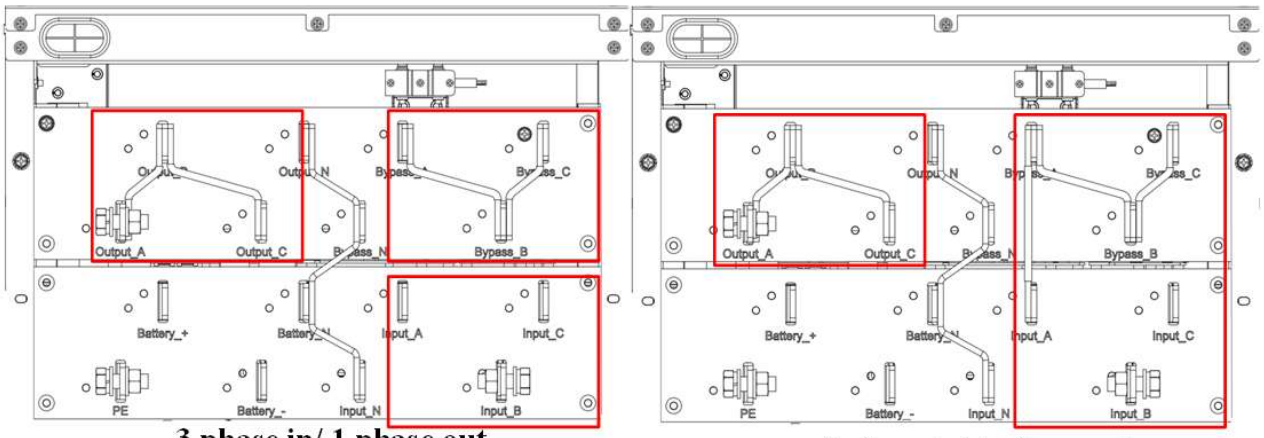
Outputs A, B, and C are short-circuited using a copper busbar, and all neutral (N) lines are also short-circuited using a copper busbar.

When the main and bypass use different sources:

1. The three bypass phases are short-circuited with a copper busbar and then connected to the bypass input.
2. The main input is connected normally to phases A, B, and C.

When the main and bypass share the same source:

1. The three bypass phases are short-circuited with a copper busbar and then connected to input phase A through a copper busbar.
2. Input phases B and C are connected normally.



6-Module Cabinet: 1/1ph Configuration

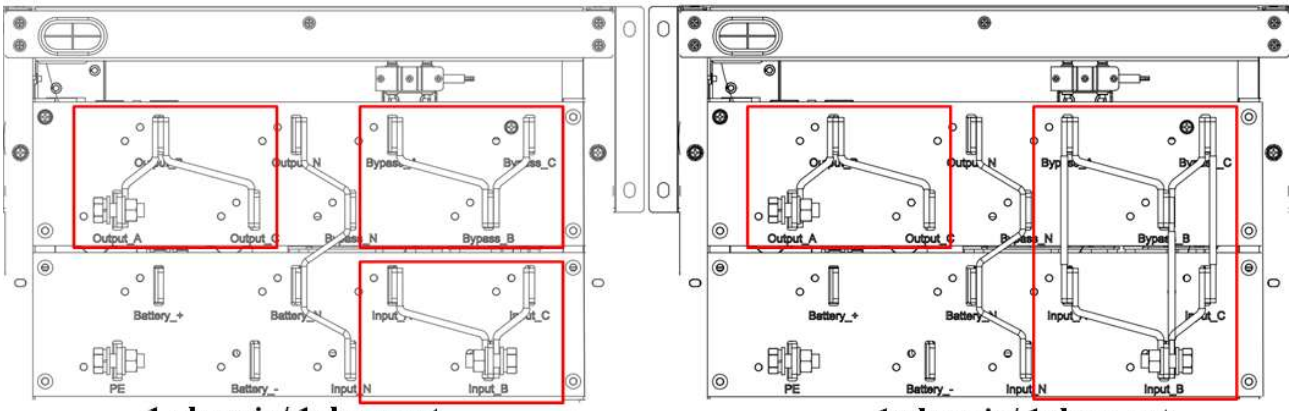
Outputs A, B, and C are short-circuited using a copper busbar, and all neutral (N) lines are also short-circuited using a copper busbar.

When the main and bypass use different sources:

1. The three bypass phases are short-circuited with copper busbars and then connected to the bypass input.
2. The three main phases are short-circuited and then connected to the main input.

When the main and bypass share the same source:

1. The three bypass phases are short-circuited with copper busbars and then connected to the three main input phases.



1 phase in/ 1phase out
Split bypass input

1 phase in/ 1phase out
Common input

4.9 Control Cabling and Communication

UPS Dry Contactor and Monitoring Board Features

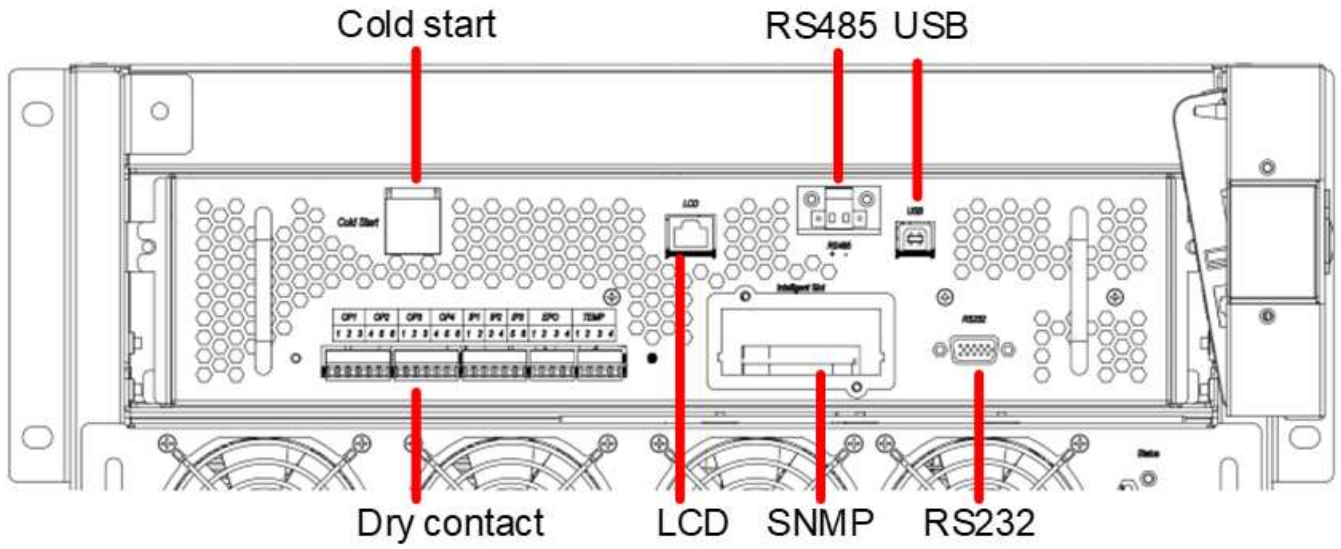
Depending on the site's specific requirements, the UPS may include auxiliary connections for managing the battery system (such as an external battery circuit breaker or battery temperature sensor), communicating with a personal computer, or providing alarm signals to external devices, including Remote Emergency Power Off (REPO) functions.

Terminals for these connections are located on the front of the static bypass assembly. Main features include:

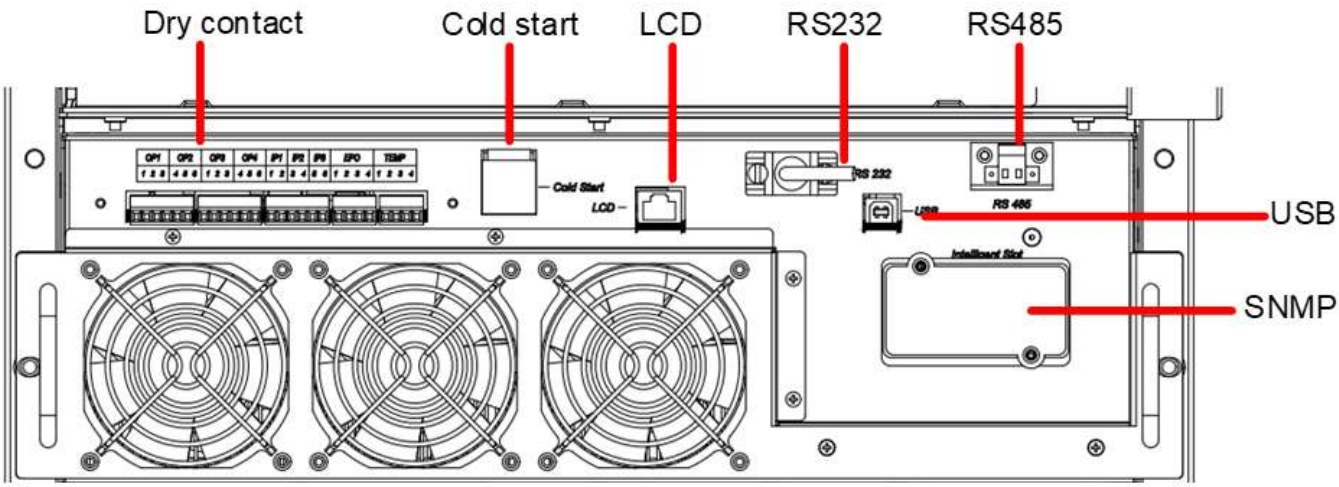
2. Emergency Power Off (EPO)
3. Environment and battery temperature input interface
4. Generator input dry contact interface
5. Battery warning output dry contact interface
6. Battery circuit breaker interface
7. Mains failure warning output dry contact interface
8. Intelligent slot for communication cards
9. User communication interfaces (RS232, RS485, USB)
10. Optional parallel ports

The UPS dry contact board provides both input and output dry contact connections.

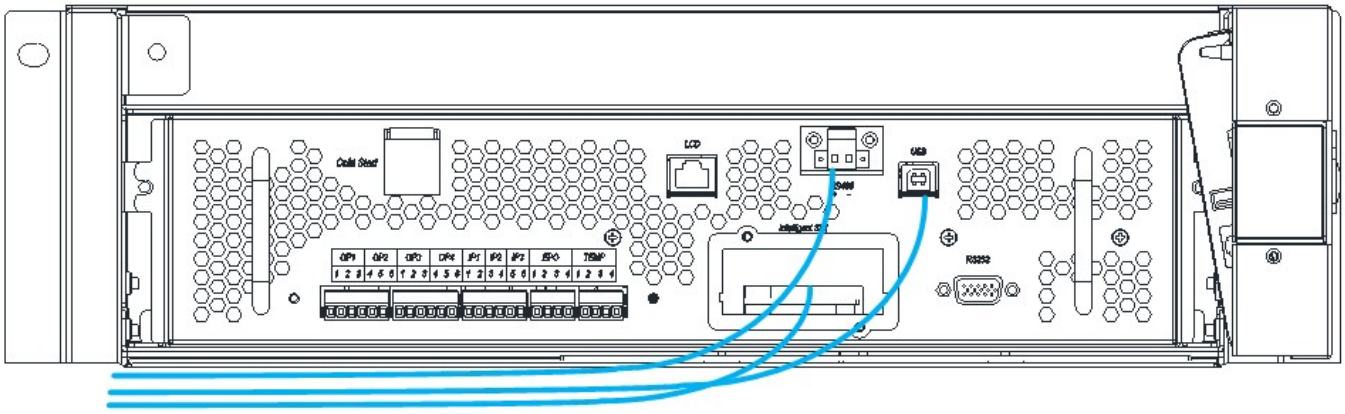
2-Module Cabinet: Static Bypass Assembly Features



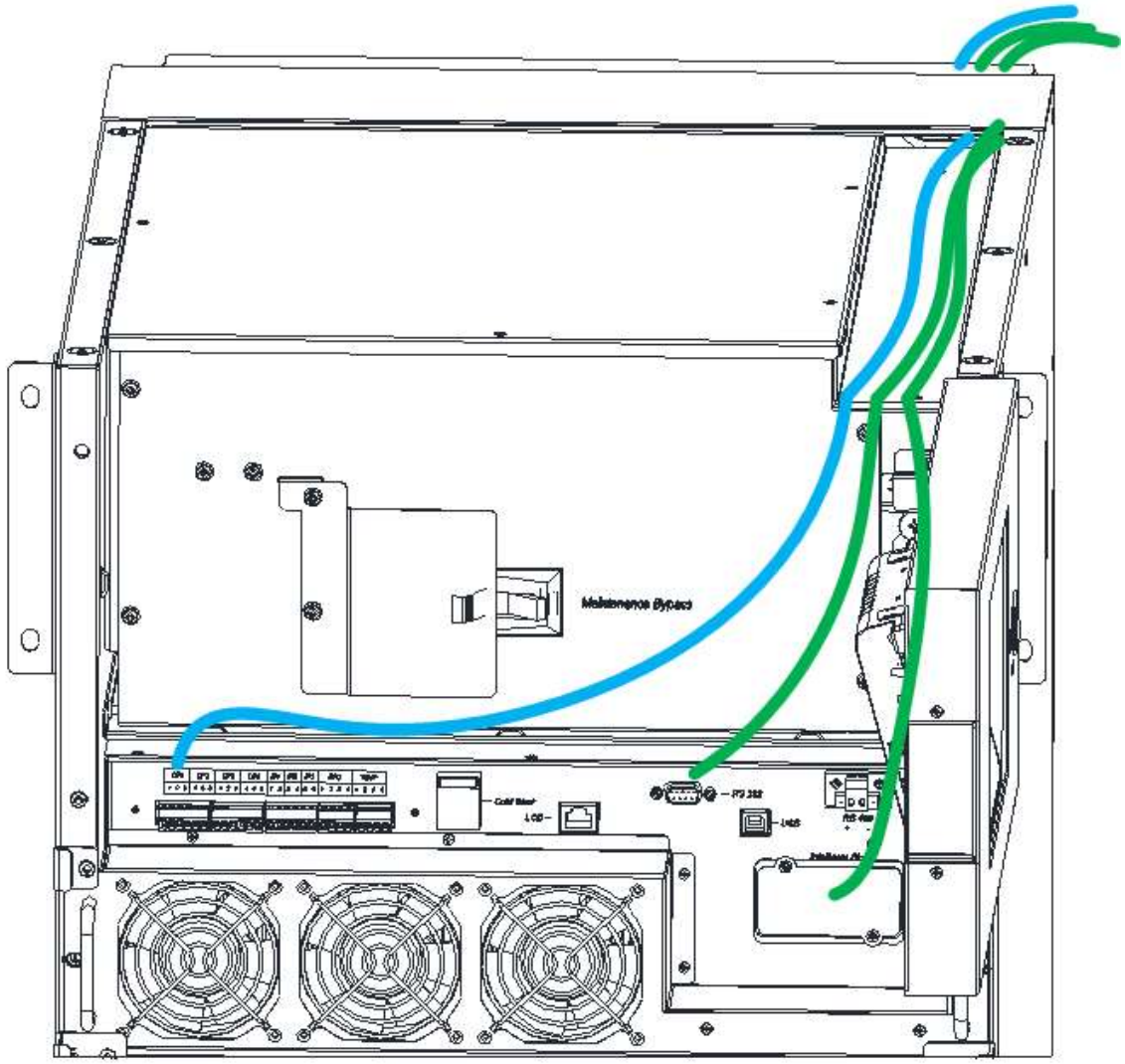
6-Module Cabinet: Static Bypass Assembly Features



2-Module Cabinet: Communication Cables Connections



6-Module Cabinet: Communication Cables Connections



Dry Contact Interface

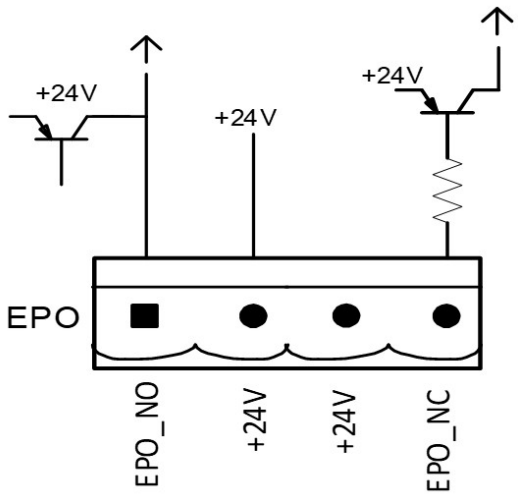
The UPS includes five dry contact interfaces. The default port definitions are shown below. These ports can be programmed using Neo Tec monitoring software.

PORT	NAME	FUNCTION
EPO-1	REMOTE_EPO_NO	Trigger EPO when connect with EPO-2
EPO-2	+24V_DRY	+24V
EPO-3	+24V_DRY	+24V
EPO-4	REMOTE_EPO_NC	Trigger EPO when disconnected with EPO-3
TEMP-1	ENV_TEMP	Detection of environmental temperature
TEMP-2	TEMP_COM	Common terminal for temperature detection
TEMP-3	TEMP_COM	Common terminal for temperature detection

PORT	NAME	FUNCTION
TEMP-4	TEMP_BAT	Detection of battery temperature
IP1-1	BCB_Status	Input dry contact, the function is settable. Default: BCB Status & BCB Online available (when BCB Status is invalid, it will report that the battery is empty)
IP1-2	GND_DRY	Ground for +24V
IP2-3	BCB_Online	Input dry contact, the function is settable. Default: BCB Status & BCB Online available (when BCB Status is invalid, it will report that the battery is empty)
IP2-4	GND_DRY	Ground for +24V
IP3-5	GEN_CONNECTED	Input dry contact, the function is settable. Default: Generator input
IP3-6	+24V_DRY	+24V
OP1-1	BAT_LOW_ALARM_NC	Output dry contact (Normally closed), the function is settable. Default: Battery voltage low.
OP1-2	BAT_LOW_ALARM_NO	Output dry contact (Normally open), the function is settable. Default: Battery voltage low.
OP1-3	BAT_LOW_ALARM_GND	OP1-1 and OP1-2 Common
OP2-4	GENERAL_ALARM_NC	Output dry contact (Normally closed), the function is settable. Default: General alarm
OP2-5	GENERAL_ALARM_NO	Output dry contact (Normally open), the function is settable. Default: General alarm
OP2-6	GENERAL_ALARM_GND	OP2-4 and OP2-5 Common
OP3-1	UTILITY_FAIL_NC	Output dry contact (Normally closed), the function is settable. Default: Mains power abnormal
OP3-2	UTILITY_FAIL_NO	Output dry contact (Normally open), the function is settable. Default: Mains power abnormal
OP3-3	UTILITY_FAIL_GND	OP3-1 and OP3-2 Common
OP4-4	BCB Drive	Output dry contact, the function is settable. Default: Battery BCB (In the EOD or EPO available)
OP4-5	GND_DRY	Ground for +24V
OP4-6	+24V_DRY	+24V

Remote EPO Input Port

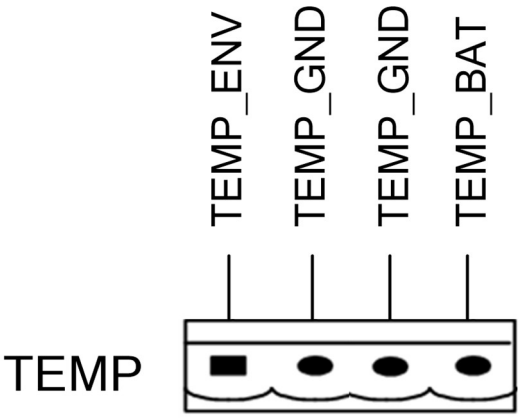
EPO is the remote EPO input interface. During normal operation, EPO_NC needs to be short-circuited to +24V. When EPO needs to be triggered, EPO_NC needs to be disconnected from +24V. During normal operation of the UPS system, pins EPO-3 and EPO-4 need to be short-circuited and pins EPO-1 and EPO-2 disconnected. If EPO-3 and pins EPO-4 are disconnected or pins EPO-1 and EPO-2 are short-circuited, an emergency shutdown will be triggered.



PORT	NAME	FUNCTION
EPO-1	REMOTE_EPO_NO	Trigger EPO when connect with EPO-2
EPO-2	+24V_DRY	+24V
EPO-3	+24V_DRY	+24V
EPO-4	REMOTE_EPO_NC	Trigger EPO when disconnected with EPO-3

Interface of Battery and Environmental Temperature Detection

The temperature dry contact detects battery temperature and ambient temperature and is used for environmental monitoring and battery temperature compensation.

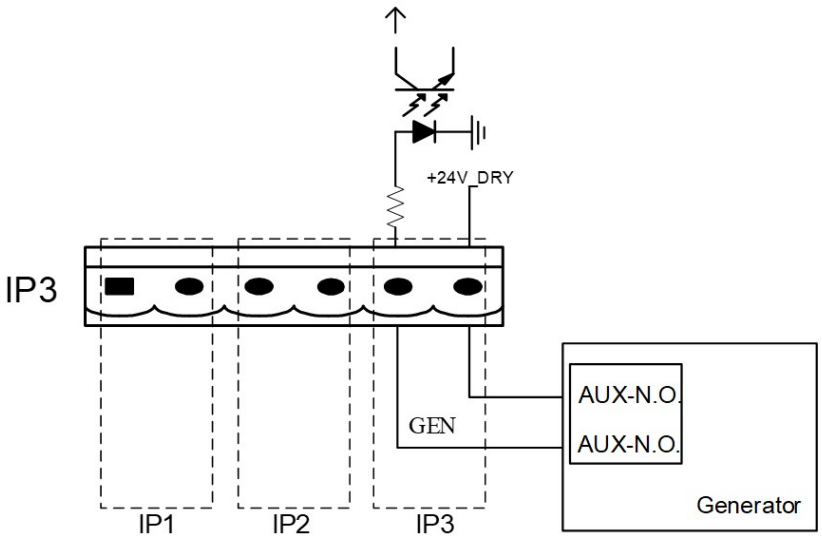


PORT	NAME	FUNCTION
TEMP-1	ENV_TEMP	Detection of environmental temperature
TEMP-2	TEMP_COM	Common terminal for temperature detection
TEMP-3	TEMP_COM	Common terminal for temperature detection
TEMP-4	TEMP_BAT	Detection of battery temperature

A specified temperature sensor is required for UPS temperature detection. This accessory is optional - confirm availability with your Neo Tec Service Representative.

Generator Input Dry Contact

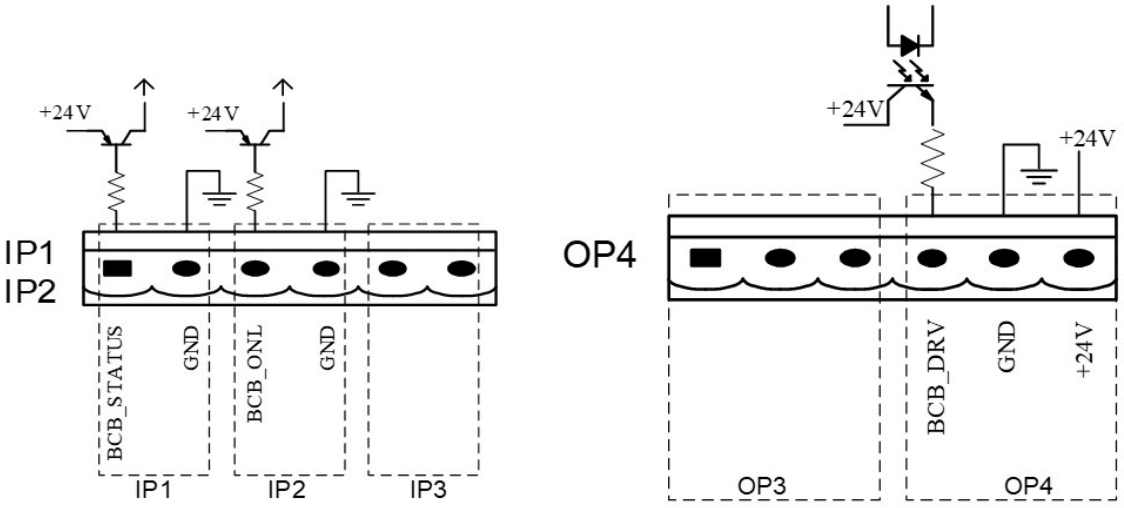
IP3 5-6 pins are the generator connection status interface. Connect pin 5 of IP3 to the +24V power supply, indicating that the generator has been connected to the system



PORT	NAME	FUNCTION
IP3-5	GEN_CONNECTED	Input dry contact, the function is settable. Default: Generator input
IP3-6	+24V_DRY	+24V

BCB Interface

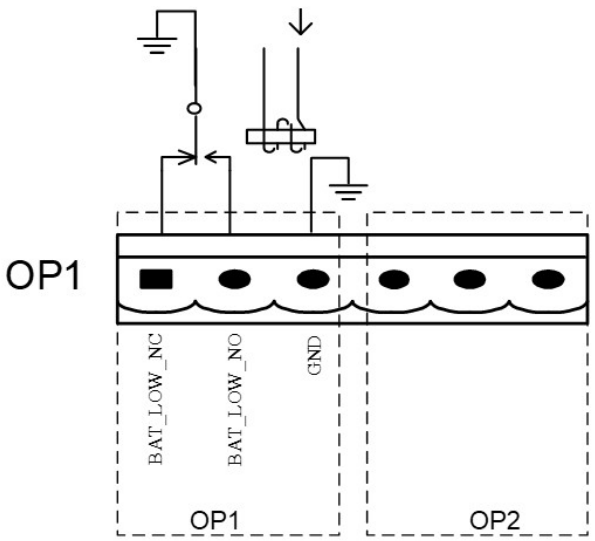
IP1 and IP2 are battery switch (BCB) interfaces, and OP4 pins 4-6 are BCB breakout signal outputs.



PORT	NAME	FUNCTION
IP1-1	BCB_Status	BCB contact status, connect with the normally open signal of BCB
IP1-2	GND_DRY	Ground for +24V
IP2-3	BCB_Online	BCB contact status, connect with the normally open signal of BCB
IP2-4	GND_DRY	Ground for +24V
OP4-4	BCB_Drive	BCB trip signal output, +24V, maximum support of 100mA
OP4-5	GND_DRY	Ground for +24V
OP4-6	+24V_DRY	+24V

Battery Voltage Low Alarm Output Dry Contact Interface

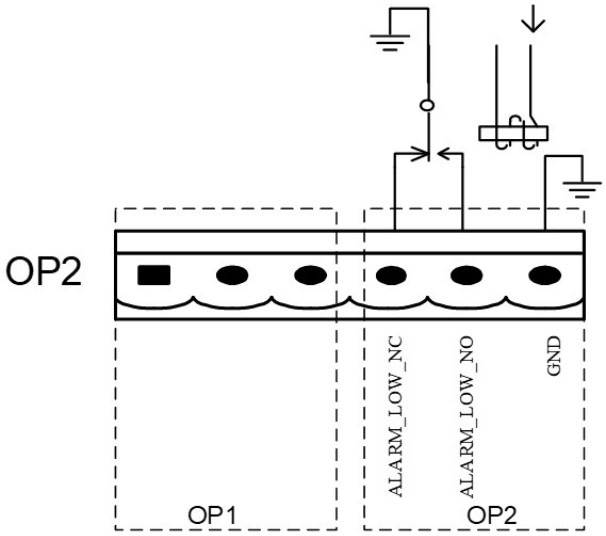
OP1 is the output dry contact interface, and OP1 1-3 pins are the output battery voltage alarm signal. When the battery voltage is lower than the set value, an auxiliary dry contact signal isolated by a relay will be provided.



PORT	NAME	FUNCTION
OP1-1	BAT_LOW_ALARM_NC	Battery warning relay (normally closed) will be open when alarm occurs
OP1-2	BAT_LOW_ALARM_NO	Battery warning relay (normally open) will be closed when alarm occurs
OP1-3	BAT_LOW_ALARM_GND	OP1-1 and OP2-2 common terminal

General Alarm Output Dry Contact Interface

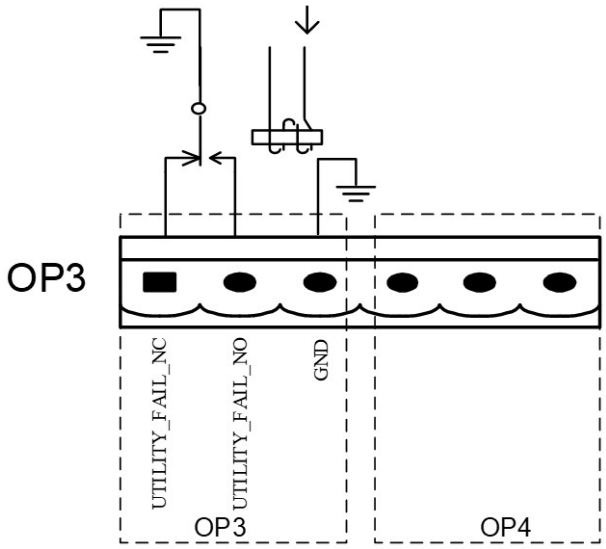
OP2 is a general alarm output dry contact interface. When one or more preset alarms are triggered, the system will send out a general alarm message and provide an auxiliary dry contact signal isolated by a relay.



PORT	NAME	FUNCTION
OP2-4	GENERAL_ALARM_NC	Integrated warning relay (normally closed) will be open when alarm occurs
OP2-5	GENERAL_ALARM_NO	Integrated warning relay (normally open) will be closed when alarm occurs
OP2-6	GENERAL_ALARM_GND	OP2-4 and OP2-5 common terminal

Utility Fail Alarm Output Dry Contact Interface

J10 is the utility fault alarm output dry contact interface. When the utility fails, the system will send out a utility fault alarm message and provide an auxiliary dry contact signal isolated by a relay.



PORT	NAME	FUNCTION
OP3-1	UTILITY_FAIL_NC	Mains failure warning relay (normally closed) will be open when alarm occurs
OP3-2	UTILITY_FAIL_NO	Mains failure warning relay (normally open) will be closed when alarm occurs
OP3-3	UTILITY_FAIL_GND	OP3-1and OP3-2 common terminal

5 Battery Installation and Maintenance

5.1 General recommendations

When connected, the battery terminal voltage can exceed 400Vdc and is potentially lethal.

- Always follow the safety instructions provided by the battery manufacturer. Pay particular attention to environmental conditions, protective clothing, and the availability of first aid and fire-fighting facilities.
- Replace batteries only with the same type and quantity. Using other types can cause explosion or poor performance.
- Do not dismantle, modify, or damage the battery. This may cause short circuit, leakage, or injury.

Inspection and Handling

- Before installation, check batteries for physical damage such as broken casings, corrosion, dirt on terminals, deformation, or leakage. Do not use damaged batteries.
- Batteries are heavy – use correct lifting techniques and equipment to avoid injury.
- Only use tools with insulated handles.
- Remove metal jewellery (rings, watches, necklaces, bracelets) before working on batteries.
- Wear rubber gloves and eye protection to prevent injury from accidental electrical arcs or acid exposure.

Installation and Environment

- Install and store batteries in a clean, cool, and dry environment. Ensure adequate ventilation in accordance with EN 50272-2001.
- Keep batteries away from heat sources, sparks, and open flames. Do not expose to fire.
- Arrange batteries so that live parts with a potential difference greater than 150V cannot be contacted simultaneously. Use insulated covers and cables where necessary.
- When connecting external batteries, install circuit breakers or fuses as close as possible to the battery terminals, keeping cables short.

Operation and Maintenance

- The nominal operating temperature is 20 °C. Higher temperatures will shorten battery life. Replace batteries according to the manufacturer's recommendations to maintain UPS backup time.
- Batteries contain sulphuric acid. If a casing is damaged, acid may leak. Always wear protective glasses, gloves, and clothing when handling batteries. Acid contact can cause blindness or skin burns.
- At the end of service life, batteries may develop internal short circuits, electrolyte loss, or plate erosion, leading to swelling, leakage, or thermal runaway. Replace batteries before these conditions occur.
- Damaged or leaking batteries must be stored in a sulphuric-acid-resistant container and disposed of in accordance with local regulations.
- If electrolyte comes into contact with skin, rinse immediately with plenty of water.

5.2 Battery Configurations

Depending on the required UPS configuration, the system may use one or more battery strings installed on shelves within a locked cabinet or in a dedicated battery room.

Traditional external battery cabinets can use an even number of batteries per string – between 30 and 50 blocks. The default factory setting is 40. The cabinet is designed exclusively for valve-regulated, maintenance-free lead-acid batteries.

Derating occurs at 34 or less batteries per string. Derating applies as follows:

- 32–34 batteries: 0.9pf
- 30 batteries: 0.8pf

Traditional Battery Installation

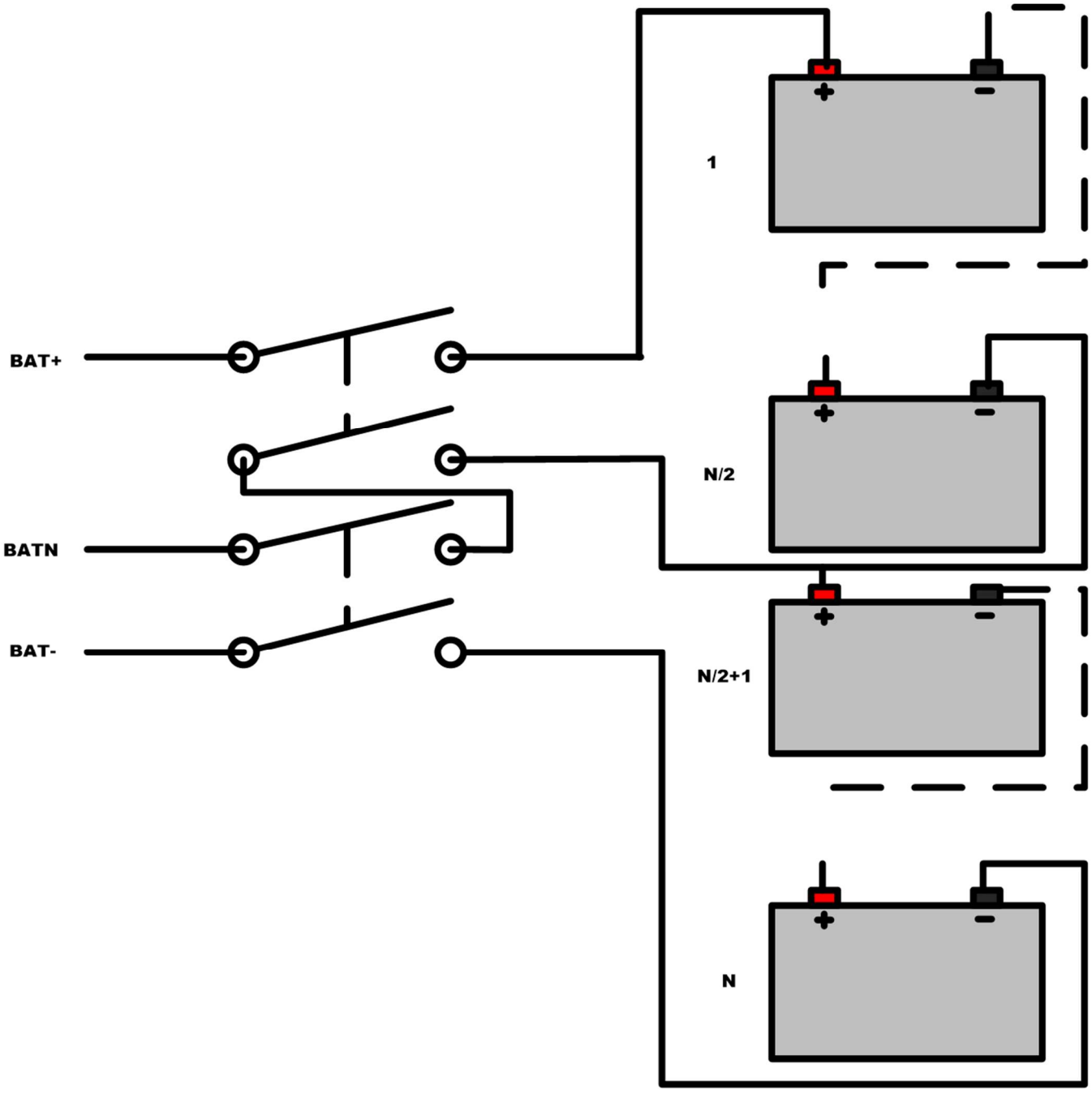
Only Neo Tec Service Representatives are permitted to install and maintain batteries mounted in a traditional battery cabinet or on open shelving. To ensure safety, external batteries must be installed in a locked cabinet or a dedicated battery room accessible only to authorised personnel.

- The number of battery cells set via the UPS software must match the actual number of installed battery cells.
- Maintain a minimum clearance of 10mm on all vertical sides of each battery block to allow adequate air circulation. Additional space must also be provided between the top of the batteries and the underside of the shelf above to permit monitoring and maintenance access.
- When installing batteries, work from the bottom shelf upwards to maintain stability and prevent raising the centre of gravity. Batteries must be installed securely, with care taken to avoid vibration or mechanical impact.
- The minimum bending radius of battery cables should be greater than 10 times the cable's outer diameter (10D). Do not cross or bundle battery cables together. All connections must be firm and reliable. After installation, verify that all terminal connections meet the torque specifications provided by the battery manufacturer.
- Each battery terminal must be insulated after connection.
- Check for accidental grounding before operation. If any part of the battery system is unintentionally grounded, disconnect the supply immediately – contact with grounded components may result in electric shock.
- After installation, measure and record the total battery voltage, and perform battery voltage calibration once the UPS has started.

When using a traditional battery system, always observe the following precautions:

- Disconnect the charging power before connecting or disconnecting any cables at the battery terminals.
- Do not connect cables between the UPS battery terminals and the batteries without prior approval from the commissioning engineer.
- When connecting cables between the battery terminals and the circuit breaker, always connect the circuit breaker end first.
- Ensure the positive and negative terminals of the batteries, circuit breakers, and UPS are connected correctly according to their polarity markings. Reversing battery polarity can cause explosion, fire, equipment damage, or serious injury.

- Battery connection terminals must not be subjected to any external mechanical stress, such as pulling or twisting forces from the cables. Such stress may damage internal connections and, in severe cases, cause fire.
- Do not apply power until the total voltage of the battery string has been verified by measurement.
- Never connect a conductor directly between the positive and negative terminals of the battery.
- Do not close the battery circuit breakers without approval from the commissioning engineer.



5.3 Battery Maintenance

For detailed guidance on battery maintenance and safety, refer to IEEE Std 1188-2005 and the manuals provided by the battery manufacturer.

- Verify that all safety devices are present and operating correctly.
- Check that battery management parameter settings are correctly configured.
- Measure and record the ambient temperature in the battery room.
- Inspect battery terminals for signs of damage or overheating, and check the casing and covers for cracks or deformation.
- Tighten all terminal bolts to the specified torque values.
- After 1–2 months of operation, recheck each connection to ensure it remains securely fastened. Loose connections may cause excessive heating or fire.
- Always replace batteries with the same type and capacity. Using an incorrect type may result in explosion or equipment failure.
- Dispose of used batteries in accordance with local regulations.

6 UPS Rack System Installation

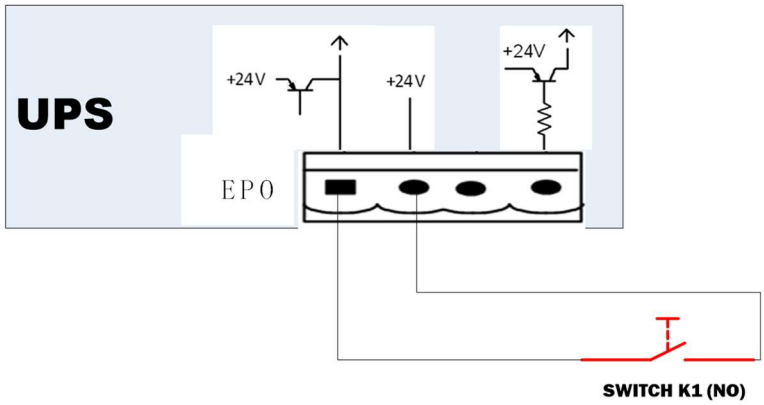
6.1 Overview

Single System Installation

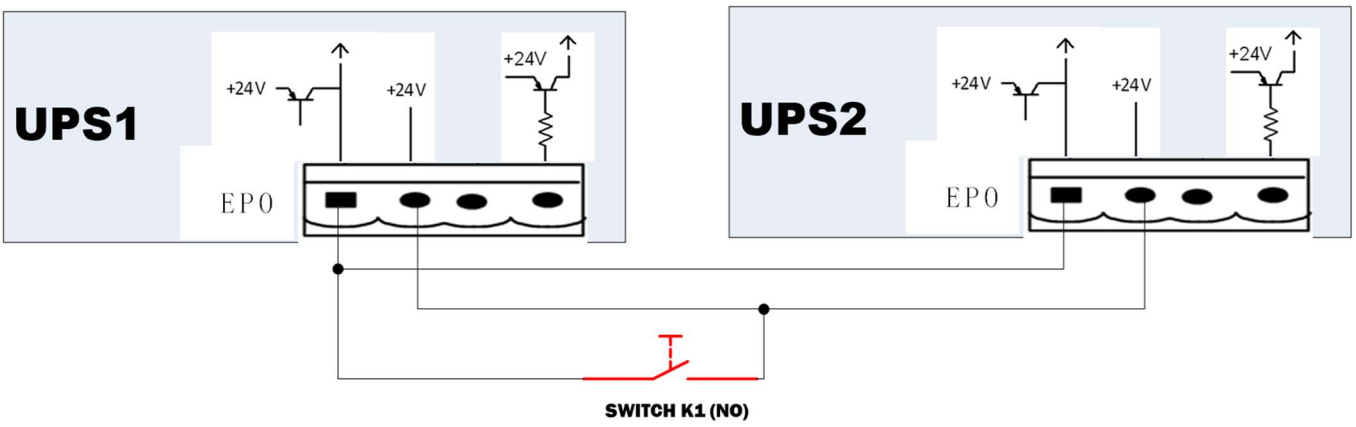
For single UPS installations, the EPO (Emergency Power Off) button on the front panel controls the emergency shutdown of both the UPS modules and the bypass static switch. It also supports a remote EPO function, allowing the UPS rack module to be shut down remotely.

- The remote EPO switch must provide normally open (NO) or normally closed (NC) dry contact signals.
- The open-circuit voltage is 24Vdc, and the current is less than 20mA.
- The normally closed EPO terminals (Pin 1 and Pin 2) are pre-wired at the factory and located on the dry contact board.
- Before using the remote EPO function, enable the EPO feature via the monitoring software on the connected PC.

Single Unit



Parallel System



6.2 Parallel System Installation

The basic installation procedures for a parallel system are the same as those for a UPS rack module system. This section describes only the installation steps specific to parallel operation.

All operations described in this section must be carried out by authorised electricians or qualified technical personnel. If any difficulties are encountered, contact your Neo Tec Service Representative.

Cabinet Installation

To facilitate maintenance and system testing, it is recommended to include an external maintenance bypass in the installation.

Power Cables

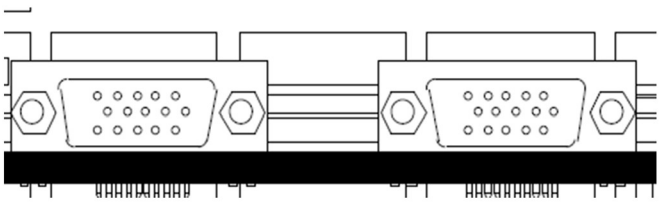
The power cable connections for a parallel system are similar to those of a single UPS system.

If the bypass input and rectifier input share the same neutral terminal and an RCD protective device is installed, the RCD must be connected upstream of the input cables, before they are joined at the neutral terminal. See section 4 Installation, for detailed connection procedures.

To ensure proper load sharing in bypass mode, the length and specification of all power cables – including bypass input and UPS output cables – must be identical for each UPS module.

Parallel Board Installation

The parallel signal board must be installed in the designated position within the UPS cabinet.

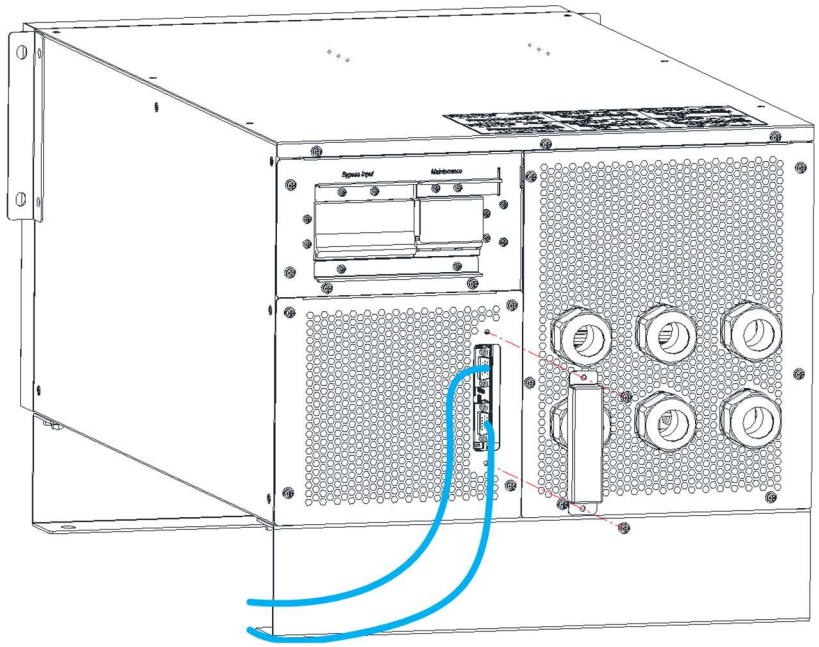


The jumper pins on the parallel board must be configured according to the number of parallel cabinets and the number of cabinet slots. Contact your Neo Tec Service Representative for guidance.

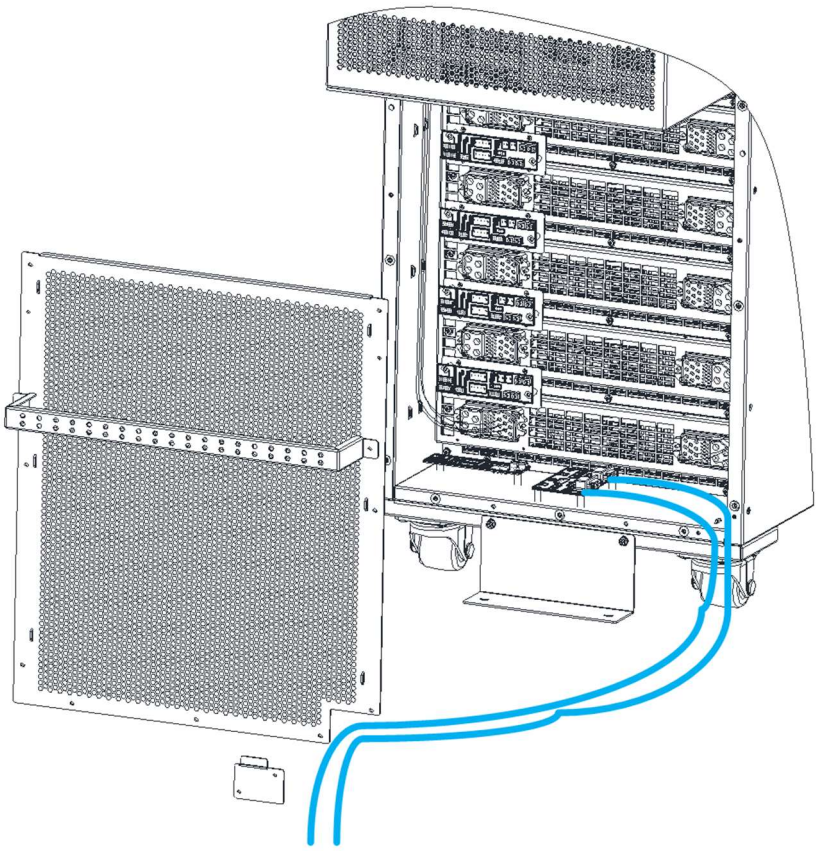
Parallel Cable Connections

The parallel control cables are designed to be shielded, double-insulated cables with DB15 connectors. These cables are connected between UPS rack modules to form a closed-loop network, ensuring reliable communication and control across the parallel system.

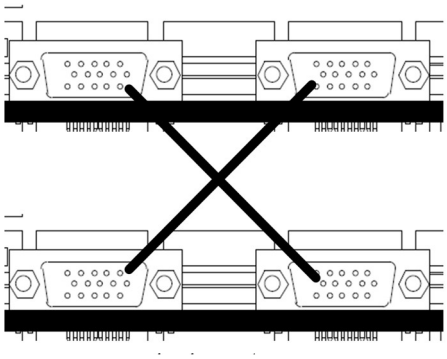
2-Module Cabinet: Parallel Control Cables Connection



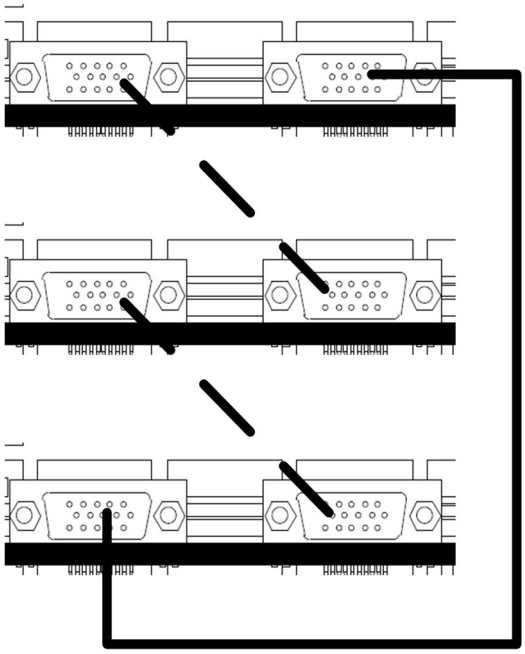
6-Module Cabinet: Parallel Control Cables Connection



1+1 System



N+1 System



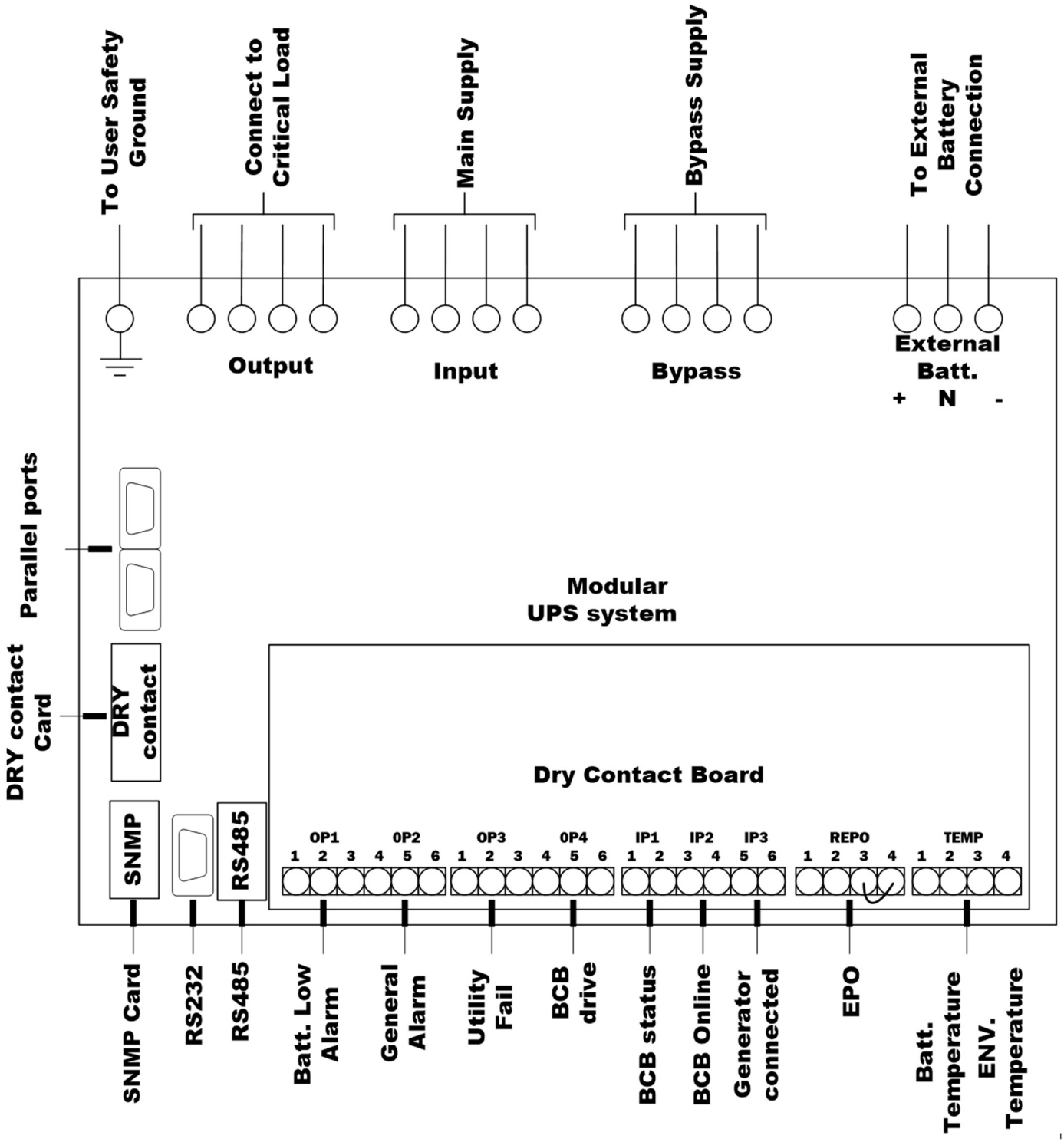
Parallel Settings

After completing all parallel cable connections, configure each UPS unit in the system using the software interface:

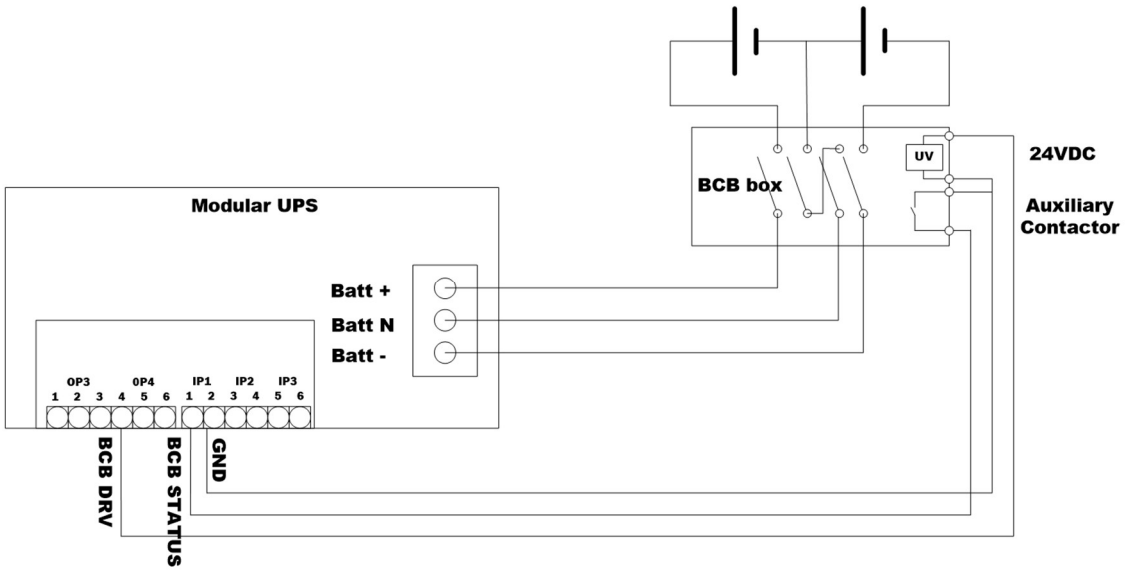
- Enter the System Settings (Sys Set) menu and set the System Mode to Parallel.
- Assign a unique Unit Number to each UPS according to the actual system configuration.
- Set the Cabinet ID for each unit (eg 0, 1, 2, 3, etc.), ensuring that no two units share the same ID.
- Example: For a four-unit parallel system, set the Cabinet IDs to 0, 1, 2, and 3.

7 Installation Drawings

7.1 Wiring diagram



7.2 External Battery Connection



External BCB interface:

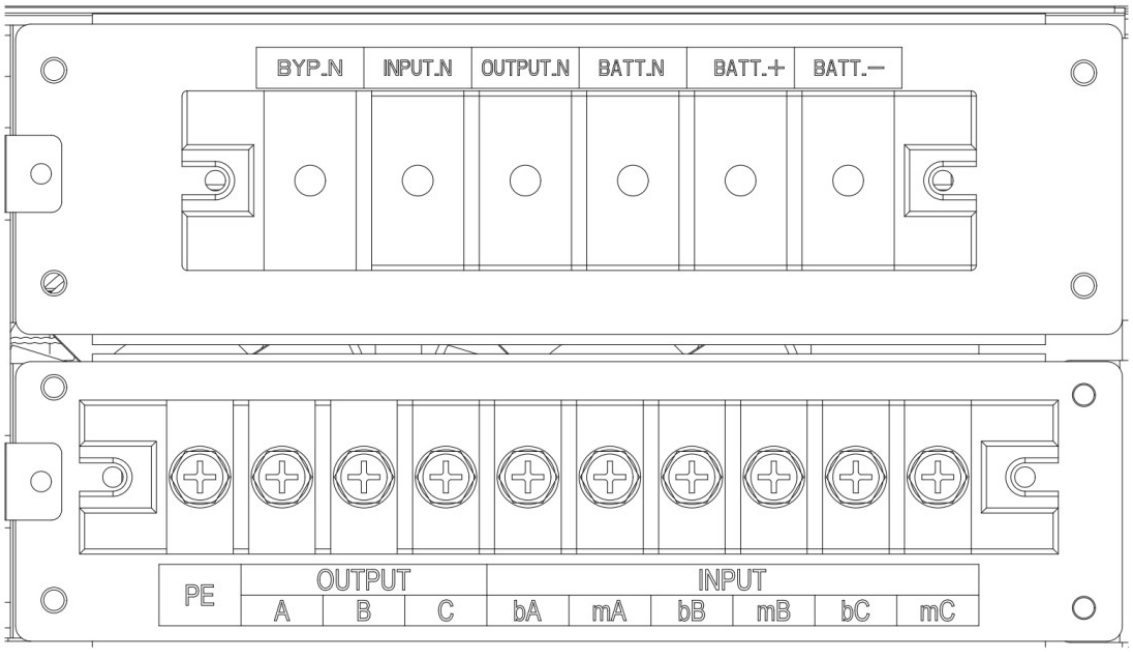
BCB DRV (OP4-4): BCB drive signal

BCB STATUS (IP1-1): BCB contactor status, normally opened. Shorted to GND when activated

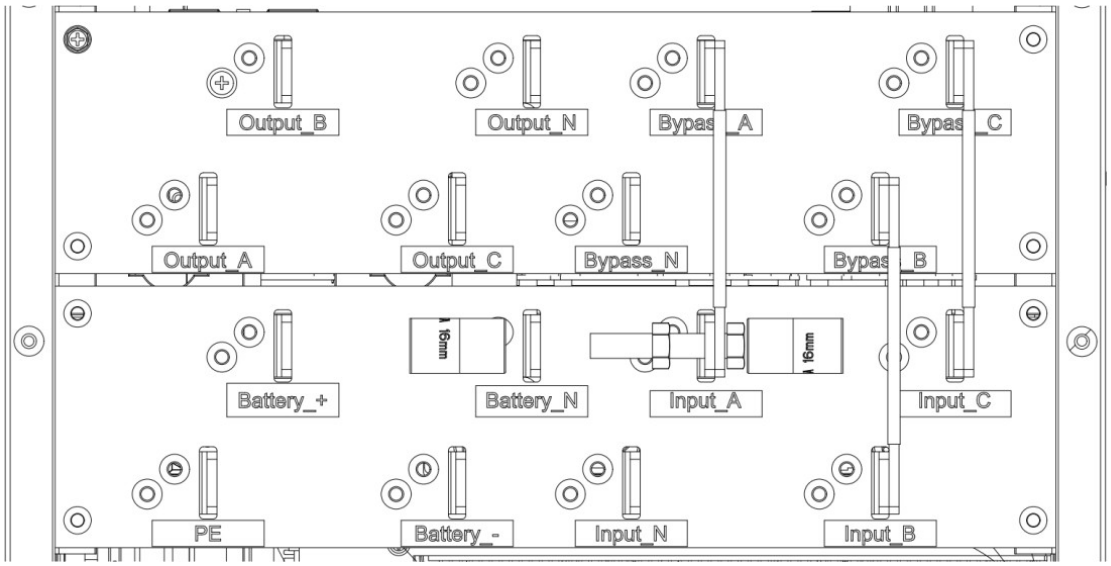
GND (IP1-2): common connection

7.3 Power Connections

2-Module Cabinet



6-Module Cabinet



8 Operations

Hazardous mains and/or battery voltages are present behind the protective cover.
Access to these components requires tools and must not be attempted by the user.
Only qualified service personnel are authorised to remove the protective cover or work on the internal components.

8.1 System Overview

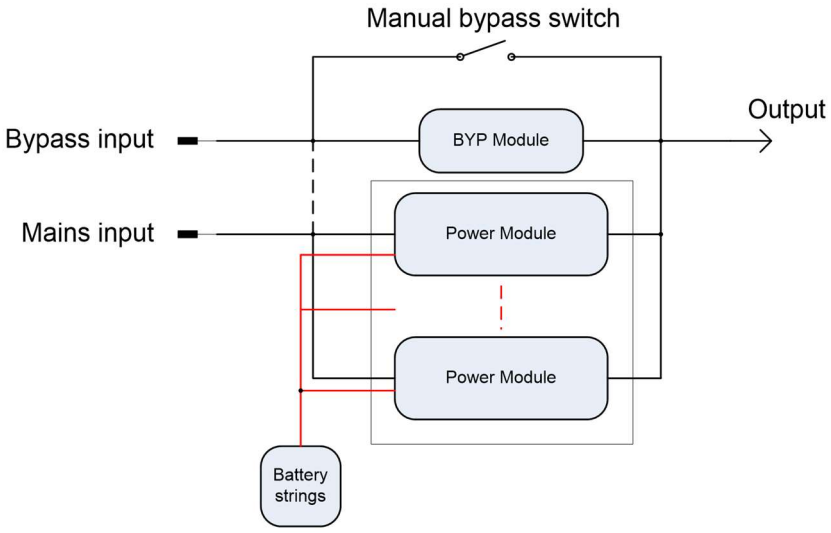
The UPS can be configured as either a fixed-capacity system or a scalable, transformer-free, online uninterruptible power supply with 400/230V input and output capability. It supports both 50Hz and 60Hz input frequencies and provides a corresponding output frequency conversion.

When configured for scalability, the UPS capacity can be increased in 25kVA increments. Depending on system requirements, individual power modules can also be configured for redundant operation to enhance system reliability.

Split Bypass Input

In a split-bypass configuration, the bypass operates using an independent AC power source. In this setup, the static bypass and manual bypass share the same isolated bypass power supply, which connects to the utility through a dedicated switch.

If a separate bypass power source is not available, the bypass and rectifier input supply connections are linked.



Static Bypass

The circuit blocks labelled 'BYP Module' contain electronically controlled transfer circuits that allow the critical load to be supplied either by the inverter output or by the bypass power source via the static bypass line.

During normal operation, the load is powered by the inverter. In the event of an overload or inverter failure, the load is automatically transferred to the static bypass line.

To ensure a no-break transfer between the inverter output and the static bypass line, the inverter and bypass supply must remain fully synchronised under normal conditions. This synchronisation is

maintained by the inverter control electronics, which makes the inverter frequency track that of the static bypass supply, provided that the bypass remains within an acceptable frequency window.

A manual maintenance bypass is also incorporated into the UPS design. This allows the critical load to be powered directly from the mains (bypass) supply while the UPS is shut down for servicing or maintenance.

When the UPS is operating in bypass mode or maintenance bypass mode, the connected load is not protected from power interruptions, surges, or voltage fluctuations.

8.2 1+1 Parallel System

Multiple single UPS modules can be configured as a 1+1 parallel system to provide increased power capacity, enhanced reliability, or both. The connected load is automatically shared equally between the paralleled UPS units.

Features of the Parallel System

The hardware and firmware of each single UPS module are fully compatible with parallel operation. A parallel configuration can be established through software settings, with all parameter settings kept consistent across modules.

The parallel control cables are connected in a closed ring, providing both performance and redundancy. Dual-bus control cables are connected between any two UPS modules of each bus. The intelligent paralleling logic allows flexible operation:

- modules can be started up or shut down in any sequence,
- transfers between Normal and Bypass modes are automatically synchronised and self-recovering following overloads or fault clearance.

The total system load of the parallel configuration can be viewed on the LCD display of each unit.

Parallel Requirements for UPS Modules

A group of paralleled UPS modules functions as a single, larger UPS system, offering greater capacity and reliability. To ensure balanced operation and compliance with electrical standards, the following requirements must be met:

- All UPS modules must be of the same rating and connected to the same bypass source.
- The bypass and main input sources must share the same neutral reference.
- If a Residual Current Device (RCD) is installed, it must be appropriately rated and positioned upstream of the common neutral bonding point. Alternatively, the RCD must monitor the system's protective earth currents.
- The outputs of all UPS modules must be connected to a common output bus.
- It is strongly recommended that each UPS in a parallel configuration includes at least one redundant power module to improve system reliability.

Optional isolation transformers are available for applications where the power sources do not share a common neutral reference or where the neutral is not available.

8.3 Operating Modes

The Modular UPS is an online, double-conversion, reverse-transfer uninterruptible power supply that can operate in the following modes:

- Normal Mode
- Battery Mode
- Auto-Restart Mode
- Bypass Mode
- Maintenance Mode (Manual Bypass)
- Parallel Redundancy Mode
- ECO Mode
- Source-Share Mode

Normal Mode

In Normal Mode, the inverter power modules continuously supply power to the critical AC load. The rectifier/charger draws power from the AC mains input and provides DC power to the inverter while simultaneously float or boost charging the backup batteries.

Battery Mode

When the AC mains input fails, the inverter modules draw power from the batteries to supply the critical load. There is no interruption in power during this transition. Once mains power is restored, the UPS automatically returns to Normal Mode operation without user intervention.

Auto-Restart Mode

If the mains power failure is prolonged and the battery becomes fully discharged, the inverter will shut down once the End of Discharge (EOD) voltage is reached. The UPS can be configured to automatically restart after a preset delay once the mains supply recovers. This feature and its delay time are programmable by the commissioning engineer.

Bypass Mode

If the inverter's overload capacity is exceeded, or if the inverter becomes unavailable, the static transfer switch automatically transfers the load to the bypass supply without interruption to the critical load. If the inverter and bypass are not synchronised, the transfer will include a brief interruption to prevent excessive current flow caused by parallel unsynchronised sources. This interruption is programmable but is typically less than ¾ of an electrical cycle ie <15ms (50 Hz) or <12.5ms (60 Hz).

Maintenance Mode (Manual Bypass)

A manual bypass switch is available to ensure continuity of supply to the critical load when the UPS becomes unavailable, for example, during routine maintenance or servicing.

Parallel Redundancy Mode (System Expansion)

For increased capacity, reliability, or both, multiple UPS modules can operate in parallel redundancy mode. A built-in parallel controller in each module ensures automatic load sharing and seamless coordination across the system.

ECO Mode

In ECO Mode, the UPS operates in bypass under normal conditions to maximise efficiency, while the inverter remains on standby. If the mains supply fails, the UPS automatically transfers to Battery Mode, and the inverter powers the load. System efficiency in ECO Mode can reach up to 99%.

Source-Share Mode

When the UPS is operating normally but the AC input power to the rectifiers is insufficient, it enters Source-Share Mode. In this condition, the power modules draw energy from both the mains and batteries, converting it through the inverter to maintain a stable AC output.

When transferring from ECO Mode to Battery Mode, a short interruption of less than 10ms may occur. Ensure this does not affect the connected load.

8.4 Battery Management: Set By Commissioning Engineer

Normal Functions

- **Constant Current Boost Charging –** The charging current can be set between 0% and 20% of the rated capacity. The default setting is 10%.
- **Constant Voltage Boost Charging –** The boost charge voltage can be adjusted according to the battery type. For Valve Regulated Lead-Acid (VRLA) batteries, the maximum boost charge voltage must not exceed 2.4V per cell.
- **Float Charging –** The float charge voltage can be adjusted as required by the battery type. For VRLA batteries, the float charge voltage should be between 2.2V and 2.3V per cell, with a default setting of 2.25V.
- **Float Charge Temperature Compensation (Optional) –** A temperature compensation coefficient can be set as required by the battery type.
- **End of Discharge (EOD) Protection –** When the battery voltage drops below the EOD threshold, the battery converter automatically shuts down, isolating the battery to prevent over-discharge. For VRLA batteries, the EOD voltage is adjustable between 1.6V and 1.75V per cell.

Advanced Functions

- **Battery Self-Test and Self-Service –** At preset intervals, the UPS performs an automatic discharge test using approximately 25% of the battery's rated capacity. The connected load must be at least 25% of the UPS's rated kVA capacity for the test to run. If the load is below this level, the self-discharge test will not be executed. The preset interval can be set between 720 and 3000 hours.
  Conditions: The battery must have been in float charge for at least 5 hours, and the load must be between 25% and 100% of rated UPS capacity.
  Trigger: The self-test can be initiated manually via the Battery Maintenance Test command on the LCD panel, or automatically based on the programmed self-test interval.
- **Battery Low Pre-Warning** – A battery undervoltage pre-warning is triggered before the end-of-discharge (EOD) threshold is reached. After this warning, the battery typically retains enough capacity to support the full load for approximately three minutes.
- **Battery Disconnect Device Alarm** – The alarm occurs when the battery disconnect device disconnects. The external battery connects to the UPS through the external battery circuit breaker. The circuit breaker is manually closed and tripped by the UPS control circuit.

9 Operating Instructions

Hazardous mains and/or battery voltages are present behind the protective cover.
Access to these components requires tools and must not be attempted by the user.
Only qualified service personnel are authorised to remove the protective cover or work on the internal components.

9.1 Introduction

The Modular UPS can operate in several different modes. This section describes the operating procedures for each mode, including mode transfers, UPS settings, and the steps for turning the inverter on and off.

MODE	DESCRIPTION
Normal Mode	The UPS supplies power to the load.
Bypass Mode	The load is powered by the static bypass. This mode serves as a temporary transition between Normal Mode and Maintenance Bypass Mode, or as an abnormal operating condition.
Battery Mode	When the mains input is abnormal, the UPS transfers to Battery Mode, and the battery supplies power to the load through the PFC and inverter.
Maintenance Mode	When the UPS is shut down, the load is connected directly to the mains through the manual bypass. In this mode, the load is not protected against abnormal mains conditions.
ECO Mode	The load is powered by the static bypass while the inverter remains on standby. If the mains input becomes abnormal, the UPS automatically transfers to inverter operation to supply the load.
Hibernate Mode	In this mode, one or more power modules are placed into sleep status sequentially, based on the load percentage and system settings.

Power Switches

The UPS rack system includes a manual bypass breaker and, for 2-slot cabinets, a bypass input breaker. All other transfer operations are handled automatically by the system.

The user must install the following external breakers:

- A mains input breaker
- A maintenance bypass breaker
- An output breaker

If a split-bypass configuration is used, an external bypass breaker must also be installed.

It is recommended to use four-pole breakers with a rated current higher than that of the breakers installed in the UPS.

9.2 UPS Start-up

Start-up procedure

During this procedure, the UPS output terminals are live. If load equipment is connected to the UPS output, confirm with the equipment user that it is safe to apply power. If the load is not ready to receive power, ensure it is isolated from the UPS output terminals before proceeding.

This procedure must be followed when turning on the UPS from a fully powered-down condition.

1. Open the external and internal power switches. Connect the power supply cables and verify the correct phase rotation.
2. Close the bypass breaker, external output circuit breaker, and external mains input circuit breaker to connect mains power. The LCD display will start up, and the rectifier will enter normal operation. After system initialisation, the static bypass switch will close.
3. The inverter will start automatically. After approximately one minute, the inverter will be ready, and the UPS will transfer from bypass to inverter, entering Normal Mode.
4. Close the external battery switch. After a few minutes, the batteries will begin to charge through the UPS.

Switching Between Operating Modes

In bypass mode, the load is supplied directly from the mains power rather than from the conditioned AC output of the inverter.

- **To switch from Normal Mode to Static Bypass Mode** - press the 'Manual Bypass' button (Control menu, Func button).
- **To switch from Static Bypass Mode to Normal Mode** - press the 'Esc Manual Bypass' button (Control menu, Func button). Once the inverter reaches normal operation, the UPS will automatically transfer back to Normal Mode.

Start-up from Battery

If the mains input is not available, the UPS can be started directly from the battery.

1. Ensure the battery string is properly connected.
2. Press and hold the 'Cold Start' button located behind the LCD panel for approximately 1 second. The LCD will power on.
3. Press the 'Cold Start' button on the front panel of the power module to start the module.
4. After approximately 2 minutes, the power module will operate in Battery Mode.
5. Start the remaining power modules one by one.

9.3 Switching between Maintenance/Manual Bypass and Normal Mode

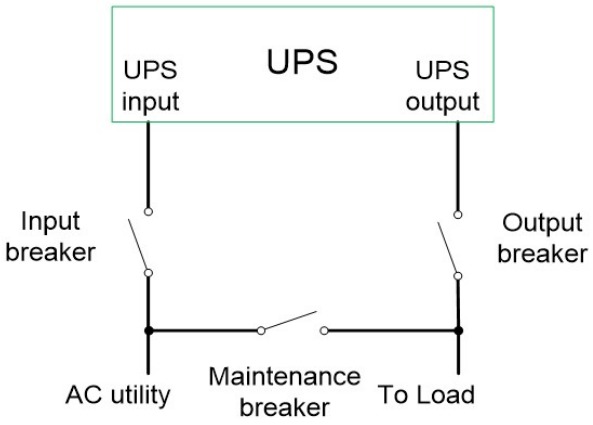
Switching from Normal Mode to Maintenance Bypass Mode

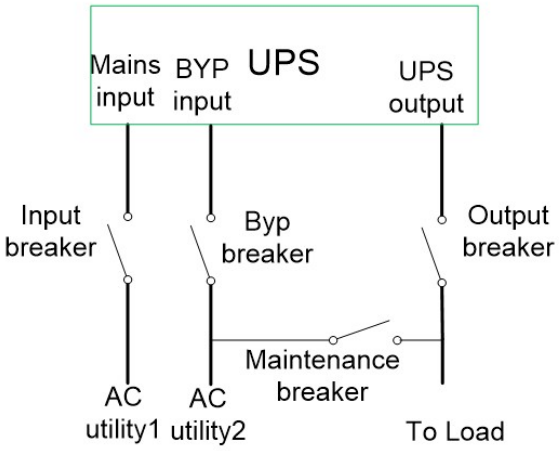
Before performing this operation, check the display messages to confirm that the bypass supply is stable and the inverter is synchronised with it. This ensures that no interruption occurs in power supply to the load.

This procedure transfers the load from the UPS inverter output to the maintenance bypass supply. The UPS must be operating in Normal Mode before performing this procedure.

1. Press the 'Manual Bypass' button to transfer the UPS to Static Bypass Mode.
2. Close the manual bypass switch. The load will now be powered by both the manual bypass and static bypass.
3. Press 'OFF' on each power module to shut down all modules.
4. Open the external battery breaker and internal battery breaker (if a battery cabinet is used). The power modules can now be serviced.
5. If cabinet maintenance is required, an external maintenance bypass breaker must be used. If installed, close the external maintenance bypass breaker. Open the external input breaker and external output breaker. The UPS cabinet can now be safely maintained.

It is recommended that the external maintenance bypass breaker be installed as shown in the system diagram.





If maintenance of a module is required, wait at least 10 minutes for the DC bus capacitors to fully discharge before removing the module.

When the manual bypass switch is in the ON position, some parts of the UPS circuit still carry hazardous voltage. Only qualified personnel are authorised to perform maintenance on the UPS.

When the UPS is operating in maintenance bypass or manual bypass mode, the load is not protected against abnormalities in the mains supply.

Switching from Maintenance Bypass Mode to Normal Mode

1. Close the bypass breaker (if available), manual bypass breaker, external output breaker, and external mains input breaker. The LCD will start up, and after approximately 20 seconds, the rectifier will enter normal operation. Once initialisation is complete, the static bypass switch will close.
2. Open the external maintenance breaker, then open the manual bypass breaker.
3. After approximately 60 seconds, the UPS will transfer to inverter operation. Close the external battery breaker and internal battery breaker (if a battery cabinet is used).

When the UPS is operating in maintenance bypass or manual bypass mode, the load is not protected against abnormalities in the mains supply.

Switching from Normal Mode to Manual Bypass Mode

1. On the LCD panel, press the 'Manual Bypass' button. The load will transfer to the static bypass, accompanied by an audible alarm, and the inverter will enter standby.
2. Close the manual bypass switch (set to ON) and open the bypass breaker.
3. Press 'OFF' on each power module to shut down all modules. Open the battery circuit breaker or disconnect the battery terminals.

Before opening the maintenance breaker, verify on the LCD display that the static bypass switch is operating correctly according to the indicated power flow.

Switching from Manual Bypass Mode to Normal Mode

1. Press 'Fault Clear' in the Function menu to clear any EPO alarms.
2. Close the bypass breaker to energise the bypass line.
3. Set the manual bypass switch to 'OFF'.
4. In bypass mode, press 'Esc Manual Bypass' on the LCD panel. After approximately 60 seconds, the UPS will transfer to inverter operation.
5. Close the external battery circuit breaker or internal battery circuit breaker.

Do not open the external input breaker, as this will interrupt power to the UPS output.

9.4 Completely Powering Down the UPS

To completely power down the UPS, follow these steps:

- Press the EPO (Emergency Power Off) button on the front panel.
- Open the external battery breaker.
- Open the bypass breaker, external input breaker, and external output breaker.

If the mains and bypass supplies are split, open both input breakers respectively.

9.5 EPO Procedure

The EPO button is designed to shut down the UPS in emergency situations such as fire, flooding, or electrical hazard. Pressing the EPO button immediately switches off the rectifier and inverter, stopping power to the load – including both the inverter and bypass outputs. The battery will also stop charging or discharging.

If the input mains power remains present, the UPS DSP control circuit will stay active; however, the output will remain off. To completely isolate the UPS, open both the mains input breaker and the battery breaker.

9.6 Auto Start

Under normal conditions, the UPS starts up in static bypass mode. When the mains power fails, the UPS draws power from the batteries to supply the load until the battery voltage reaches the End of Discharge (EOD) threshold, at which point the UPS will shut down. The UPS will automatically restart and re-enable output power:

- Once mains power is restored, or
- If the Auto Recovery after EOD feature is enabled.

9.7 UPS Reset Procedure

After using the EPO function to shut down the UPS, follow these steps to restore operation:

- Shut down the UPS completely.
- Restart the UPS following the procedure described in Section 9.2.

If the UPS shuts down due to inverter overtemperature, overload, or excessive transfer operations, it will automatically reset the fault once the condition has cleared.

The rectifier will automatically restart once the overtemperature condition clears and the temperature returns to normal levels.

After pressing the EPO button, if the mains input has been disconnected, the UPS will be completely powered down. When mains input is restored, the EPO condition will clear, and the UPS will automatically enable static bypass mode to restore output power.

If the manual bypass switch is in the ON position and the mains input is present, the UPS output remains energised.

9.8 Power Module Maintenance

Only trained and qualified personnel are authorised to perform the following procedures.

If the system is operating in Normal Mode, the bypass supply is available, and there is at least one redundant power module, follow these steps:

1. On the LCD panel, enter the Function menu and select ‘Module ON/OFF Enable’ to unlock the power module shutdown function.
2. Press the ‘OFF’ button on the front panel of the power module to manually power it down.

3. Loosen the module's securing screws, then wait at least 5 minutes before carefully removing the module.

If no redundant power modules are available:

1. On the LCD panel, enter the Function menu and select 'Manual Bypass' to transfer the system to Static Bypass Mode.
2. Loosen the module's securing screws, then wait at least 5 minutes before removing the module.

Before removing a power module, measure the DC bus capacitor voltage using a multimeter and ensure the voltage is below 60V.

3. After completing power module maintenance reinsert the power modules one by one, waiting at least 10 seconds between each insertion. Each module will automatically synchronise and join the system operation.
4. Tighten the securing screws after all modules are installed.

Bypass Power Module Maintenance

The bypass power module cannot be maintained in Battery Mode.

If the system is operating in Normal Mode and the bypass supply is available:

1. On the LCD panel, press 'Manual Bypass' to transfer the UPS to Static Bypass Mode.
2. Set the manual bypass switch to ON, transferring the UPS to Manual Bypass.
3. Open the bypass breaker (if available) to shut down the bypass line.
4. Press the EPO button to ensure that battery current is zero (0A).
5. Open the battery circuit breaker, or disconnect the battery terminals.
6. Open the LCD panel and disconnect the RJ45 cable from the back.
7. Remove the bypass power module(s) requiring maintenance or repair. Wait at least 5 minutes before performing any work on the module(s).
8. After maintenance, reinsert the module(s) securely and return the system to Normal Mode.

The bypass power module terminals are large and require firm pressure during insertion to ensure a secure and properly tightened connection.

9.9 Language Selection

The LCD menus and data displays are available in multiple languages. To select your preferred language, follow these steps:

1. From the Main Menu, press 'Set' to open the Settings menu on the LCD screen.
2. Select the Language option and choose the desired language. The LCD interface will immediately update to display all text in the selected language.

9.10 Changing the Date and Time

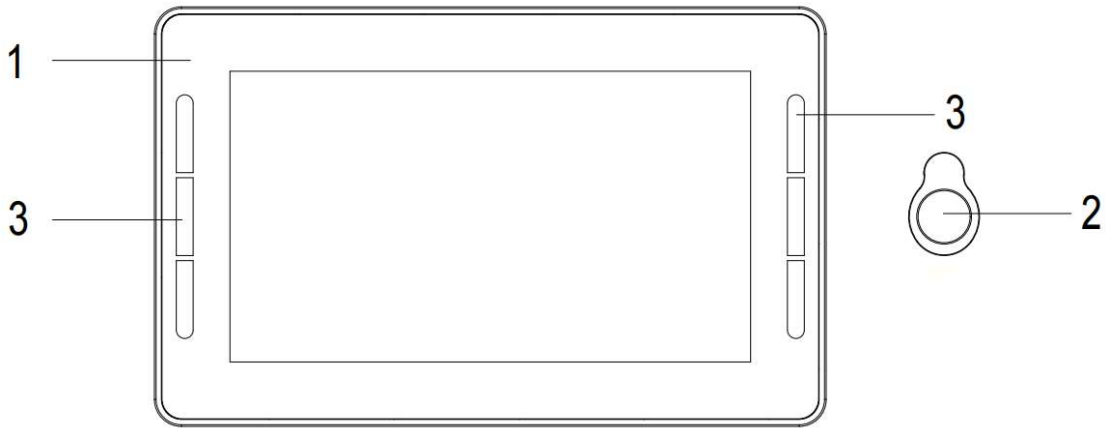
To update the system date and time:

1. From the Main Menu, press 'Func' to open the Function Settings menu on the LCD screen.
2. Select 'DATE & TIME' under SysFunc, and enter the new date and time, then press 'Enter' to confirm.

10 LCD Panel

10.1 LCD Panel Overview

The UPS LCD panel is divided into three areas: LED indicators, control keys, and a touchscreen display.



1. LCD touch screen
2. EPO switch
3. Status indicator

LED indicators on the panel show the operating status and any faults.

LED STATUS	DESCRIPTION
Green	Normal operation
Red	Fault alarm
Yellow	Warning alarm

The UPS uses two types of audible alarm to indicate operating conditions.

ALARM	DESCRIPTION
Two short beeps followed by a long beep.	When the system has general alarm (for example: main input fault)
Continuous alarm	When the system has serious faults (for example: blown fuse or hardware failure)

EPO

Press EPO to shutdown the UPS system (REC, INV, CHG, BYP) in an emergency situation.

10.2 LCD Touch Screen

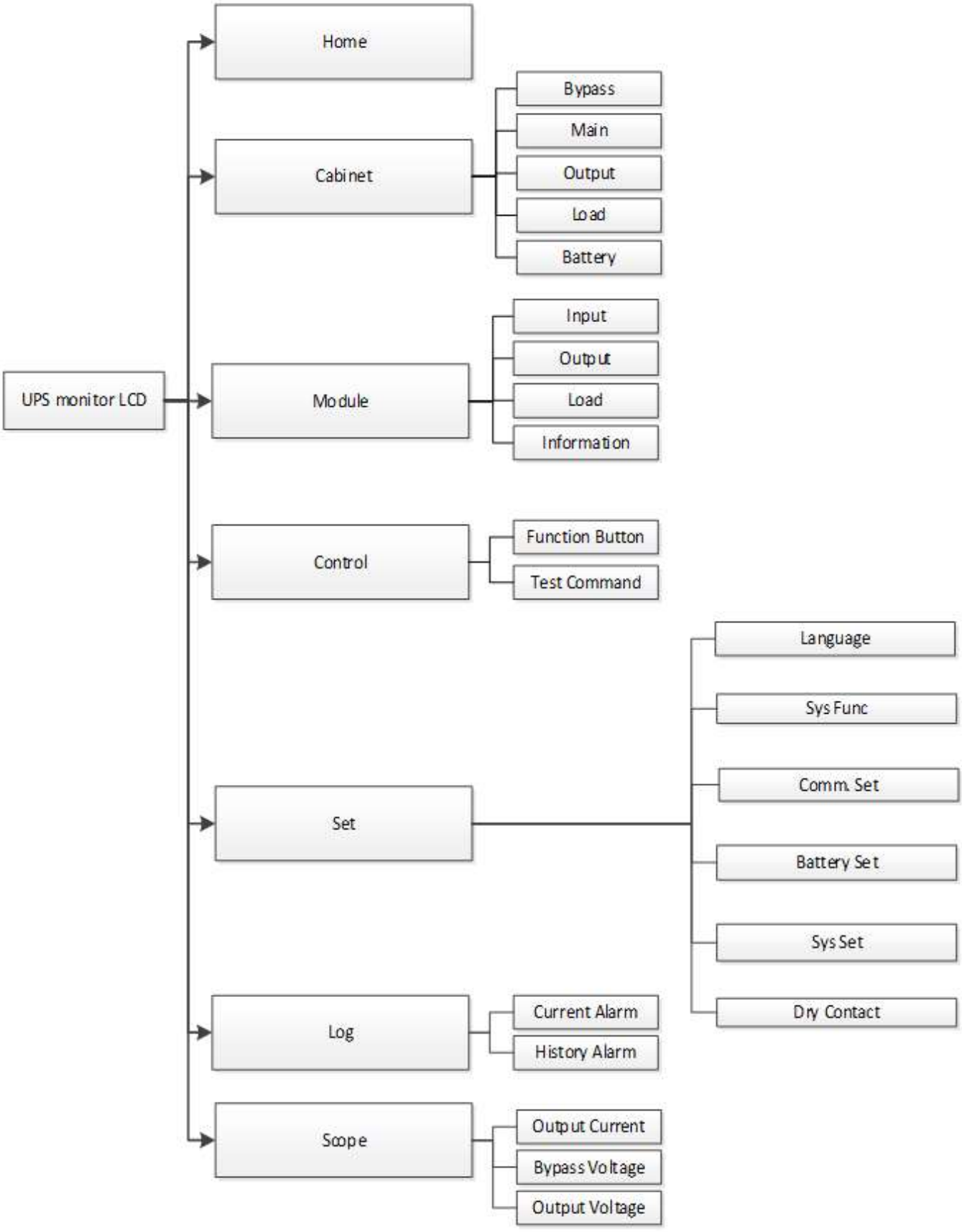
The LCD touchscreen allows users to browse system information, operate the UPS, and adjust parameters. After the monitoring system completes its self-test, the home page is displayed following the welcome screen.

- **Menu** – Main menu options: Home, Cabinet, Module, Log, Set, Control, Scope.
- **Mute On/Off** – Touch to silence active alarms; touch again to re-enable sound.
- **Login** – Opens the login window to sign in or out.
- **System Information** – Displays system date/time and configuration details (e.g. cabinet capacity, module capacity, number of power modules, and operating mode).
- **Output Information** – Shows output voltage and load percentage.
- **Current Alarms** – Lists active alarms.
- **Operation Mode** – Indicates the current power flow and system operating status.

MENU	DESCRIPTION
Cabinet	Bypass, main, output, Load, battery information
Module	Information of power module (input, output, load, information)
Set	Language, Sys Func, Change PW, Comm Set, BAT Set, Sys Set, Calibration, Dry Contact
Log	History LOG, Current Alarm
Control	Mute ON/OFF, Fault clear, Manual bypass, Manual transfer to inverter, Esc Manual bypass, Module “on/off” enable, clear battery history data, reset dust filter using time, battery test, battery maintenance, battery boost, battery float, stop test
Scope	Scope of output voltage, output current, bypass voltage

10.3 Menu Structure

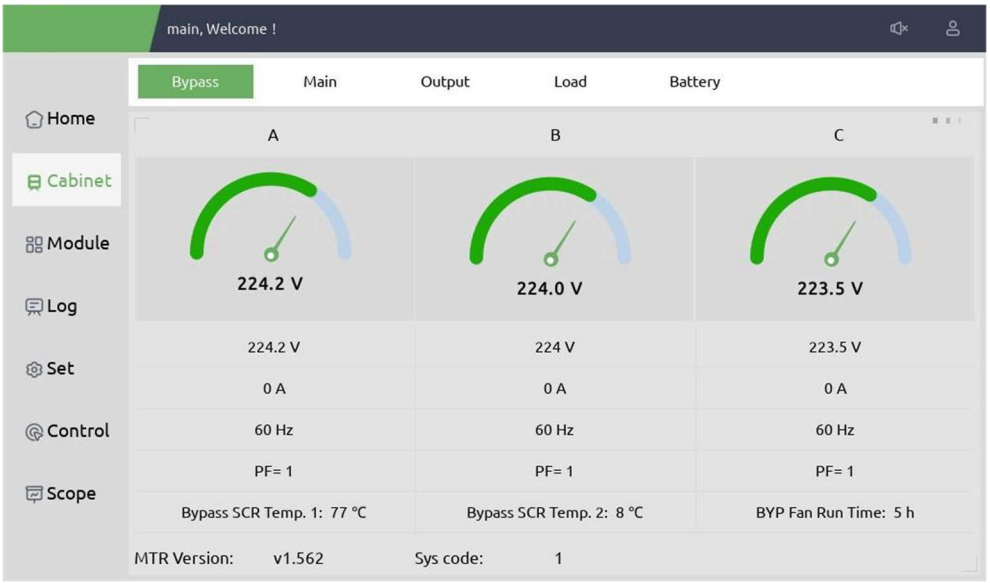
The main menu provides access to the Home page, Data, Settings, Logs, and Control functions.



10.4 Sub Menus

Cabinet

Submenu: Bypass, Main, Output, Load, Battery.



SUB-MENU	CONTENTS	MEANING
Bypass	V	Phase voltage
	A	Phase current
	Hz	Input frequency
	PF	Power factor
Main	V	Phase voltage
	A	Phase current
	Hz	Bypass frequency
	PF	Power factor
Output	V	Phase voltage
	A	Phase current
	Hz	Output frequency
	PF	Power factor
Load	kVA	Sout: Apparent Power
	kW	Pout: Active Power
	kVAr	Qout: Reactive power
	%	Load (The percentage of the UPS load)

SUB-MENU	CONTENTS	MEANING
Battery	Battery Number	Total number of battery connections per group
	Battery Status	Battery boost/float charging status
	Run time	Total battery run time
	V	Total battery voltage
	A	Total battery current
	Battery Capacity (%)	The percentage compared with new battery capacity
	Remain Time (Min)	Remaining battery backup time
	Battery Temp. (℃)	Battery temperature
	Ambient Temp. (℃)	Environmental temperature

Module

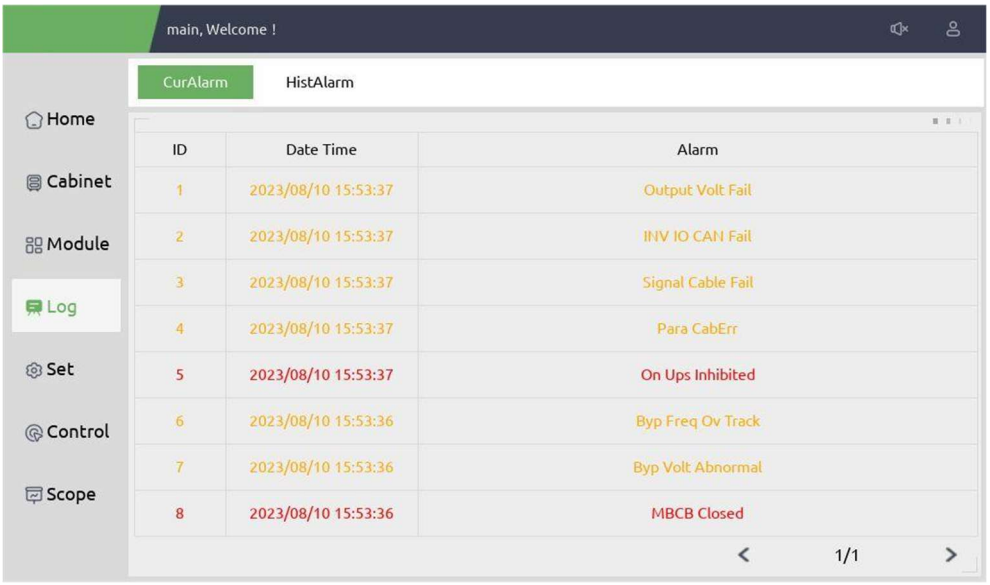
Submenu: Input, Output, Load, Information, Scode, Software version.

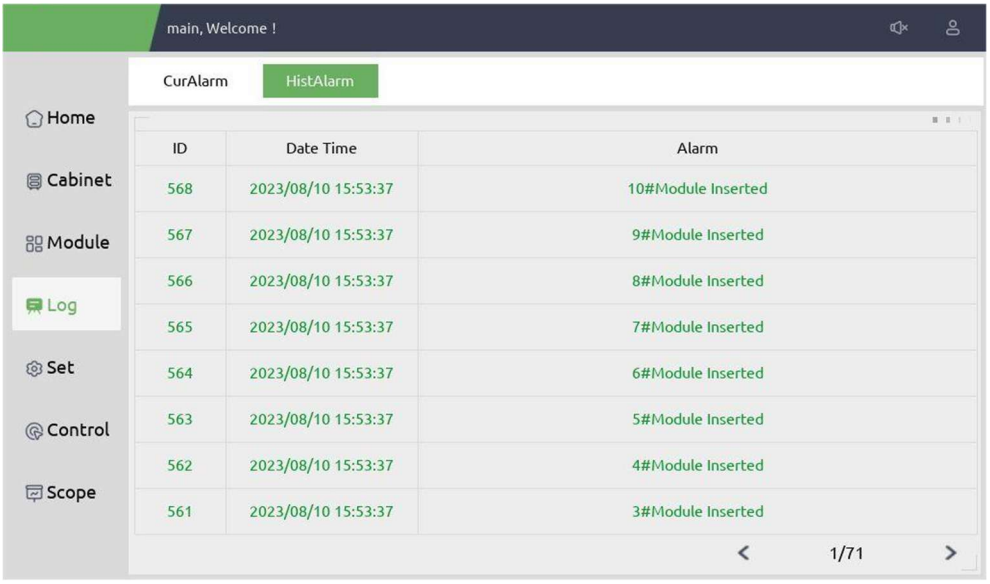
SUB-MENU	CONTENTS	MEANING
Input	V	Input phase voltage of selected module
	A	Input phase current of selected module
	Hz	Input frequency of selected module
	PF	Input power factor of selected module

SUB-MENU	CONTENTS	MEANING
Output	V	Output phase voltage of selected module
	A	Output phase current of selected module
	Hz	Output frequency of selected module
	PF	Output power factor of selected module
Load	kVA	Sout: Apparent Power
	kW	Pout: Active Power
	kVAr	Qout: Reactive power
	%	Load (The percentage of the UPS load)
Information	DC BUS +/- (V)	Bus voltage (positive & negative)
	Battery +/- (V)	Battery voltage (positive & negative)
	Charger (V)	Charger voltage
	Charger (A)	Charger current
	Discharger (A)	Discharger current (positive & negative)
	INV Voltage (V)	Inverter phase A/B/C voltage
	Fan Run Time (H)	Total fan's running time
	Capacitor Run Time (H)	Total capacitor running time
	Air Inlet Temp. (°C)	Air inlet temperature
	Air Outlet Temp. (°C)	Air outlet temperature
	REC IGBT Temp. (°C)	REC IGBT temperature of the phase A/B/C
	INV IGBT Temp. (°C)	INV IGBRT temperature of the phase A/B/C
Scode	Fault Code	For the maintenance personnel

Log Menu

The Log menu records events and alarms in time order, showing when they were set and cleared. Logs are divided into two categories: current alarms and historical alarms.





UPS EVENTS	DESCRIPTION
Fault Clear	Manually clear fault
Log Clear	Manually clear History log
Load On UPS	Inverter feeds load
Load On Bypass	Bypass feeds load
No Load	No load
Battery Boost	Charger is working in boost charging mode
Battery Float	Charger is working in float charging mode

UPS EVENTS	DESCRIPTION
Battery Discharge	Battery is discharging
Battery Connected	Battery is connected
Battery Not Connected	Battery is not connected.
Maintenance CB Closed	Manual maintenance breaker is closed
Maintenance CB Open	Manual maintenance breaker is opened
EPO	Emergency Power Off
Module On Less	Available power module capacity is less than the load capacity. Please reduce the load capacity or add extra power module to make sure that the UPS capacity is big enough.
Generator Input	Generator is connected and a signal is sent to the UPS.
Utility Abnormal	Utility (Grid) is abnormal. Mains voltage or frequency exceeds the upper or lower limit and results in rectifier shutdown. Check the input phase voltage of rectifier.
Bypass Sequence Error	Bypass voltage Sequence is reverse. Check if input power cables are connected correctly.
Bypass Volt Abnormal	This alarm is triggered by an inverter software routine when the amplitude or frequency of bypass voltage exceeds the limit. The alarm will automatically reset if the bypass voltage becomes normal. First check if relevant alarm exists, such as “bypass circuit breaker open”, “Byp Sequence Err” and “Ip Neutral Lost”. If there is any relevant alarm, first clear this alarm. 1. Then check and confirm if the bypass voltage and frequency displayed on the LCD are within the setting range. Note that the rated voltage and frequency are respectively specified by “Output Voltage” and “Output Frequency”. 2. If the displayed voltage is abnormal, measure the actual bypass voltage and frequency. If the measurement is abnormal, check the external bypass power supply. If the alarm occurs frequently, use the configuration software to increase the bypass high limit set point according to the user’s suggestions.
Bypass Module Fail	Bypass Module Fails. This fault is locked until power off. Or bypass fans fail.
Bypass Module Over Load	Bypass current is over the limitation. If bypass current is under 125% of the rated current. The UPS alarms but has no action.
Bypass Over Load Tout	The bypass overload status continues and the overload times out.

UPS EVENTS	DESCRIPTION
Byp Freq Over Track	This alarm is triggered by an inverter software routine when the frequency of bypass voltage exceeds the limit. The alarm will automatically reset if the bypass voltage becomes normal. First check if relevant alarm exists, such as “Byp Sequence Err” and “Input Neutral Lost”. If there is any relevant alarm, first clear this alarm. Then check and confirm if the bypass frequency displayed on the LCD are within the setting range. Note that the rated frequency are respectively specified by “Output Frequency”. If the displayed voltage is abnormal, measure the actual bypass frequency. If the measurement is abnormal, check the external bypass power supply. If the alarm occurs frequently, use the configuration software to increase the bypass high limit set point according to the user’s suggestions.
Exceed Tx Times Lmt	The load is on bypass because the output overload transfer and re-transfer is fixed to the set times during the current hour. The system can recover automatically and will transfer back to the inverter with 1 hour.
Output Short Circuit	Output shorted Circuit. Fist check and confirm if loads have something wrong. Then check and confirm if there is something wrong with terminals, sockets or some other power distribution unit. If the fault is solved, press “Fault Clear” to restart UPS.
Battery EOD	Inverter turned off due to low battery voltage. Check the mains power failure status and recover the mains power in time
Battery Test	System transfer to battery mode for 20 seconds to check if batteries are normal
Battery Test OK	Battery Test OK
Battery Maintenance	System transfer to battery mode until battery voltage is down to 1.1*EOD voltage to maintain battery string
Battery Maintenance OK	Battery maintenance succeed
Module inserted	Power Module is inserted in system.
Module Exit	Power Module is pulled out from system.
Rectifier Fail	The N# Power Module Rectifier Fail, The rectifier is fault and results in rectifier shutdown and battery discharging.
Inverter Fail	The N# Power Module Inverter Fail. The inverter output voltage is abnormal and the load transfers to bypass.

UPS EVENTS	DESCRIPTION
Rectifier Over Temp.	The N# Power Module Rectifier Over Temperature. The temperature of the rectifier IGBTs is too high to keep rectifier running. This alarm is triggered by the signal from the temperature monitoring device mounted in the rectifier IGBTs. The UPS recovers automatically after the over temperature signal disappears. If over temperature exists, check: 1. Whether the ambient temperature is too high. 2. Whether the ventilation channel is blocked. 3. Whether fan fault happens. 4. Whether the input voltage is too low.
Fan Fail	At least one fan fails in the N# power module.
Output Over load	The N# Power Module Output Over Load. This alarm appears when the load rises above 100% of nominal rating. The alarm automatically resets once the overload condition is removed. 1. Check which phase has overload through the load (%) displayed in LCD so as to confirm if this alarm is true. 2. If this alarm is true, measure the actual output current to confirm if the displayed value is correct. Disconnect non-critical load. In parallel system, this alarm will be triggered if the load is severely imbalanced.
Inverter Overload Tout	N# Power Module Inverter Over Load Timeout. The UPS overload status continues and the overload times out. Note: The highest loaded phase will indicate overload timing-out first. When the timer is active, then the alarm “unit over load” should also be active as the load is above nominal. When the time has expired, the inverter Switch is opened and the load transferred to bypass. If the load decreases to lower than 95%, after 2 minutes, the system will transfer back to inverter mode. Check the load (%) displayed in LCD so as to confirm if this alarm is true. If LCD displays that overload happens, then check the actual load and confirm if the UPS has over load before alarm happens.
Inverter Over Temp.	The N# Power Module Inverter Over Temperature. The temperature of the inverter heat sink is too high to keep inverter running. This alarm is triggered by the signal from the temperature monitoring device mounted in the inverter IGBTs. The UPS recovers automatically after the over temperature signal disappears. If over temperature exists, check: Whether the ambient temperature is too high. Whether the ventilation channel is blocked. Whether fan fault happens. Whether inverter overload time is out.

UPS EVENTS	DESCRIPTION
On UPS Inhibited	Inhibit system transfer from bypass to UPS (inverter). Check: Whether the power module's capacity is big enough for load. Whether the rectifier is ready. Whether the bypass voltage is normal.
Manual Transfer Byp	Transfer to bypass manually
Esc Manual Bypass	Escape from "transfer to bypass manually" command. If UPS has been transferred to bypass manually, this command enable UPS to transfer to inverter.
Battery Volt Low	Battery Voltage is Low. Before the end of discharging, battery voltage is low warning should occur. After this pre-warning, battery should have the capacity for 3 minutes discharging with full load.
Battery Reverse	Battery cables are connected not correctly.
Inverter Protect	The N# Power Module Inverter Protect. Check: Whether inverter voltage is abnormal Whether inverter voltage is much different from other modules, if yes, please adjust inverter voltage of the power module separately.
Input Neutral Lost	The mains neutral wire is lost or not detected. For 3 phases UPS, it's recommended that user use a 3-poles breaker or switch between input power and UPS.
Bypass Fan Fail	At least one of bypass module Fans Fails
Manual Shutdown	The N# Power Module is manually shutdown. The power module shuts down rectifier and inverter, and there's on inverter output.
Manual Boost Charge	Manually force the Charger work in boost charge mode.
Manual Float Charge	Manually force the charger work in float charge mode.
UPS Locked	Forbidden to shutdown UPS power module manually.
Parallel Cable Error	Parallel cables error. Check: If one or more parallel cables are disconnected or not connected correctly If parallel cable round is disconnected If parallel cable is OK
Lost N+X Redundant	Lost N+X Redundant. There is no X redundant powers module in system.
EOD Sys Inhibited	System is inhibited to supply after the battery is EOD (end of discharging)
Battery Test Fail	Battery Test Fail. Check if UPS is normal and battery voltage is over 90% of float voltage.

UPS EVENTS	DESCRIPTION
Battery Maintenance Fail	Check: If UPS is normal and not any alarms If the battery voltage is over 90% of float voltage If load is over 25%
Ambient Over Temp	Ambient temperature is over the limit of UPS. Air conditioners are required to regulate ambient temperature.
REC CAN Fail	Rectifier CAN bus communication is abnormal. Please check if communication cables are not connected correctly.
INV IO CAN Fail	IO signal communication of inverter CAN bus is abnormal. Please check if communication cables are not connected correctly.
INV DATA CAN Fail	DATA communication of inverter CAN bus is abnormal. Please check if communication cables are not connected correctly.
Power Share Fail	The difference of two or more power modules' output current in system is over limitation. Please adjust output voltage of power modules and restart UPS.
Sync Pulse Fail	Synchronization signal between modules is abnormal. Please check if communication cables are not connected correctly.
Input Volt Detect Fail	Input voltage of N# power module is abnormal. Please check if the input cables are connected correctly. Please check if input fuses are broken. Please check if utility is normal.
Battery Volt Detect Fail	Battery voltage is abnormal. Please check if batteries are normal. Please check if battery fuses are broken on input power board.
Output Volt Fail	Output voltage is abnormal.
Bypass Volt Detect Fail	Bypass voltage is abnormal. Please check if bypass breaker is closed and is good. Please check if bypass cables are connected correctly.
INV Bridge Fail	Inverter IGBTs are broken and opened.
Outlet Temp Error	Outlet temperature of power module is over the limitation. Please check if fans are abnormal. Please check if PFC or inverter inductors are abnormal. Please check if air passage is blocked. Please check if ambient temperature is too high.
Input Curr Unbalance	The difference of input current between every two phases is over 40% of rated current. Please check if rectifier's fuses, diode, IGBT or PFC diodes are broken. Please check if input voltage is abnormal.

UPS EVENTS	DESCRIPTION
DC Bus Over Volt	Voltage of DC bus capacitors is over limitation. UPS shutdown rectifier and inverter.
REC Soft Start Fail	While soft start procedures are finished, DC bus voltage is lower than the limitation of calculation according utility voltage. Please check Whether rectifier diodes are broken Whether PFC IGBTs are broken Whether PFC diodes are broken Whether drivers of SCR or IGBT are abnormal Whether soft start resistors or relay are abnormal
Relay Connect Fail	Inverter relays are opened and cannot work or fuses are broken.
Relay Short Circuit	Inverter relays are shorted and cannot be released.
PWM Sync Fail	PWM synchronizing signal is abnormal
Intelligent Sleep	UPS works in intelligent sleep mode. In this mode, the power modules will be standby in turn. It will be more reliability and higher efficiency. It must be confirmed that remained power modules' capacity is big enough to feed load. It must be conformed that working modules' capacity is big enough if user add more load to UPS. It's recommended that sleeping power modules are waken up if the capacity of new added loads is not sure.
Manual Transfer to INV	Manually transfer UPS to inverter. It's used to transfer UPS to inverter when bypass is over tracking. The interrupt time could be over 20ms.
Input Over Curr Tout	Input over current timeout and UPS transfer to battery mode. Please check if input voltage is too low and output load is big. Please regulate input voltage to be higher if it's possible or disconnect some loads.
No Inlet Temp. Sensor	Inlet temperature sensor is not connected correctly.
No Outlet Temp. Sensor	Outlet temperature sensor is not connected correctly.
Inlet Over Temp.	Inlet air is over temperature. Make sure that the operation temperature of UPS is between 0-40°C.
Capacitor Time Reset	Reset timing of DC bus capacitors.
Fan Time Reset	Reset timing of fans.
Battery History Reset	Reset battery history data.
Byp Fan Time Reset	Reset timing of bypass fans.
Battery Over Temp.	Battery is over temperature. It's optional.
Bypass Fan Expired	Working life of bypass fans is expired, and it's recommended that the fans are replaced with new fans. It must be activated via software.

UPS EVENTS	DESCRIPTION
Capacitor Expired	Working life of capacitors is expired, and it's recommended that the capacitors are replaced with new capacitors. It must be activated via software.
Fan Expired	Working life of power modules' fans is expired, and it's recommended that the fans are replaced with new fans. It must be activated via software.
INV IGBT Driver Block	Inverter IGBTs are shutdown. Please check if power modules are inserted in cabinet correctly. Please check if fuses between rectifier and inverter are broken.
Battery Expired	Working life of batteries is expired, and it's recommended that the batteries are replaced with new batteries. It must be activated via software.
Bypass CAN Fail	The CAN bus between bypass module and cabinet is abnormal.
Dust Filter Expired	Dust filter need to be clear or replaced with a new one
Stop Test	Manually stop battery test or battery maintenance, UPS transfer back to normal mode.
Wave Trigger	Waveform has been saved while UPS fail
Bypass CAN Fail	Bypass and cabinet communicate with each other via CAN bus. Check If connector or signal cable is abnormal. If monitoring board is abnormal.
Firmware Error	Manufacturer used only.
System Setting Error	Manufacturer used only.
Bypass Over Temp.	Bypass module is over temperature. Please check If bypass load is overload If ambient temperature is over 40°C If bypass SCRs are assembled correctly If bypass fans are normal
Module ID Duplicate	At least two modules are set as same ID on the power connector board, please set the ID as correct sequence

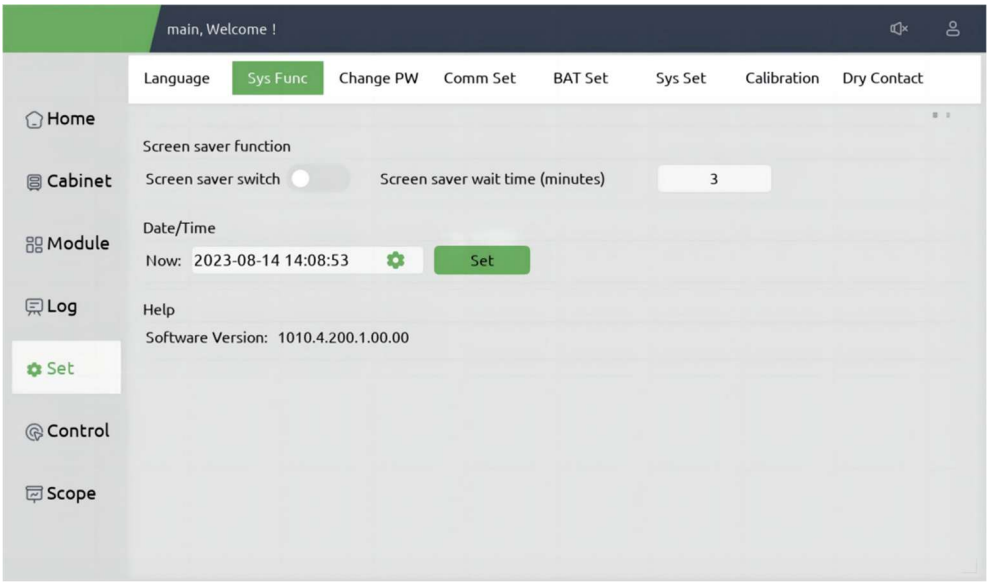
Event colours indicate the severity level:

- Green – Event occurred or cleared
- Yellow – Warning
- Red – Fault

Set Menu

Submenu: Language, Sys Func, Change PW, Comm Set, BAT Set, Sys Set, Calibration, Dry Contact

The submenu options – Comm Set, BAT Set, Calibration, and Dry Contact – are restricted to Neo Tec Service Representatives.



SUB-MENU	CONTENTS	MEANING
Language	Current language	Displays the currently selected language
	Optional language	English and other languages for choice
Sys Func	System function setting	Setting screensaver, system time, check memory and software version
Comm Set	Comm. interface	Include RS232, RS485, USB
	Protocol	Include MEGA protocol, ModBus_ASCII protocol, ModBus_RTU protocol
	Baud-rate	Setting the baud-rate
	Device Address	Setting the Device address
BAT Set	Battery Type	Setting the battery type: VRLA or Lithium
	Battery Number	VRLA 12V 30-50 pcs Lithium 3.2V 128-192 pcs
	Battery Capacity	Setting of the AH of the battery VRLA Capacity=Battery(12V) Ah* N groups Lithium Capacity=Battery(3.2V) Ah* N groups
	Float Charge Voltage/Cell*	Setting the floating Voltage for battery cell VRLA (Cell/2V)<2.5V;Lithium (Cell/3.2V)>3V

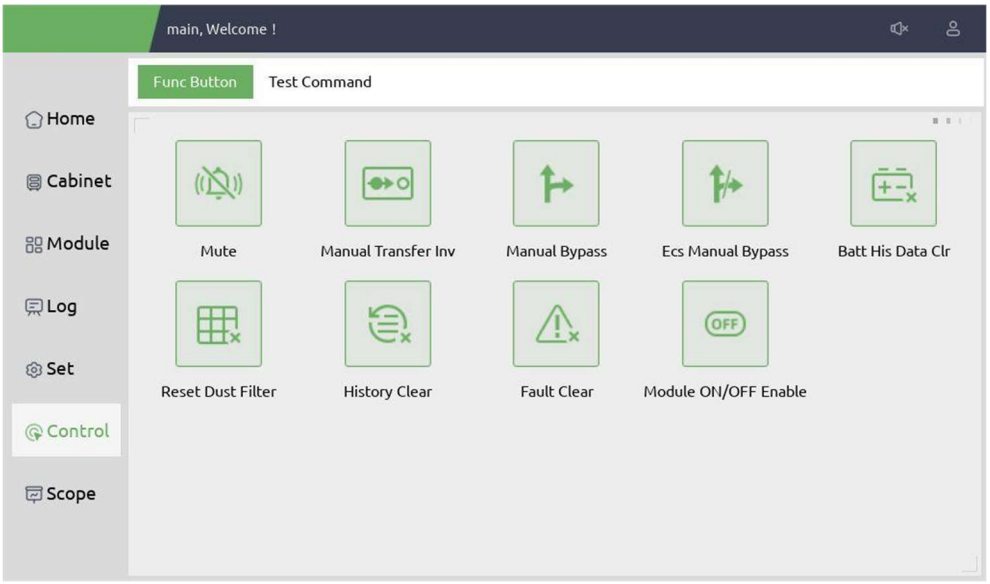
SUB-MENU	CONTENTS	MEANING
BAT Set	Boost Charge Voltage/Cell*	Setting the boost Voltage for battery cell VRLA (Cell/2V)<2.5V;Lithium (Cell/3.2V)>3V
	EOD Voltage(0.6C)*	EOD voltage for cell battery,@0.6C current VRLA (Cell/2V)<2V;Lithium (Cell/3.2V)>2V
	EOD Voltage(0.15C)*	EOD voltage for cell battery,@0.15C current VRLA (Cell/2V)<2V;Lithium (Cell/3.2V)>2V
	Charge Current Percent Limit	Charge current (percentage of the rated current)
	Battery Temperature Compensate	Coefficient for battery temperature
Sys Set	System Mode	Setting the system mode: Single, parallel, Single ECO, parallel ECO, LBS, parallel LBS
	United Number	Set the number of UPS in parallel system
	Cabinet ID	For parallel system, the ID starts from 0
	Output Voltage Adjustment	Setting the Output Voltage
Calibration	Calibration product parameters	Calibration the UPS output voltage
Dry Contact	Configuration the dry contact	Configuration the dry contact

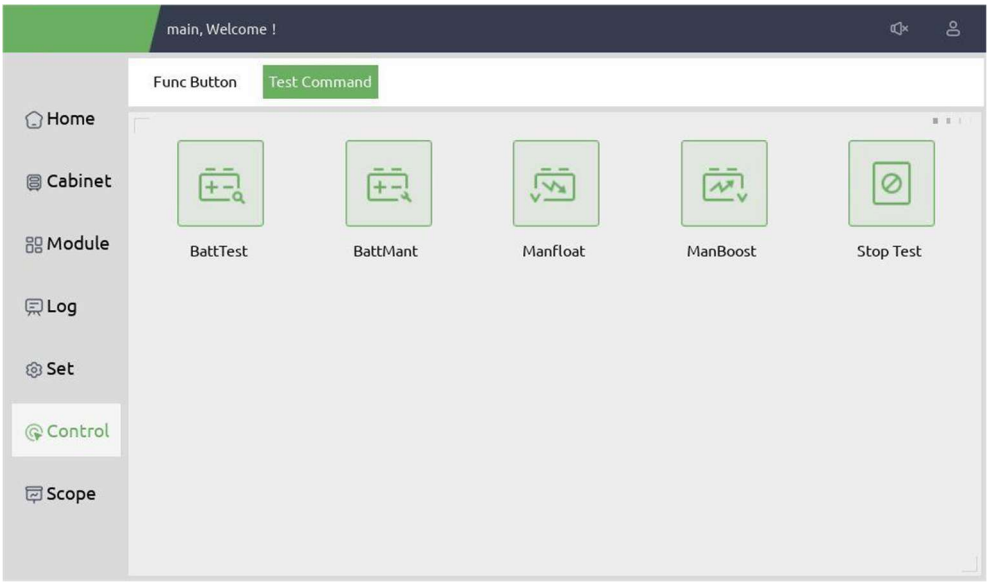
Available settings may vary depending on user permissions. For example, lithium battery parameters must be set by Neo Tec or an authorised representative.

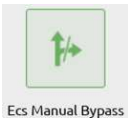
The number of batteries set in the menu or monitoring software must exactly match the number of batteries installed. Incorrect settings can cause serious damage to the batteries or the UPS.

Control Menu

Submenu: Function Button and Test Command.





SECTION	SUB-SECTION	ICON	DESCRIPTION
Function Button	Mute		Mute or unmute alarm of the system
	Fault Clear		Clears the faults
	Manual Bypass and ESC Manual Bypass	 or 	Transfers to bypass mode or cancels this command

SECTION	SUB-SECTION	ICON	DESCRIPTION
Function Button	Manual Transfer Inv		Manually transfer to inverter mode. Output power may be interrupted during the transition.
	Module on/off Enable		Enable the 'OFF' button on the front panel of the power module. Once enabled, the user can press the button to shut down the power module.
	Battery History Data Clear		Resets battery history data, including discharge dates, duration, and number of discharge cycles. This function should normally be used after installing new batteries.
	Reset Dust Filter		Resets dust filter data, including operating days and maintenance interval. This function should normally be used after replacing or cleaning the filter.
Test Command	Battery Test		The UPS transfers to battery mode to test battery condition. If the battery voltage is low or a fault is detected, the UPS will issue an alarm and return to normal mode or bypass mode. Before initiating the test, ensure there are no warnings or alarms and that the battery voltage is above 90% of the float voltage. If the battery passes the test, the UPS will automatically return to battery mode after 20 seconds. If the test fails, the UPS will generate an alarm.
	Battery Maintenance		The UPS transfers to battery mode. Before initiating this operation, ensure there are no warnings or alarms, and that the battery voltage is above 90% of the float voltage. If the battery operates normally, the UPS will remain in battery mode until the voltage drops to 105% of the end-of-discharge (EOD) voltage, at which point it will automatically return to normal mode.
	Battery Boost		The system starts boost charging.
	Battery Float		The system starts float charging.

SECTION	SUB-SECTION	ICON	DESCRIPTION
	Stop Test		The system stops battery test or battery maintenance

Scope Menu

Submenu: Output Voltage, Output Current, Bypass Voltage.

11 Product Specifications

11.1 UPS Full Specification

	OMNPM25 (2 MODULE)	OMNPM25 (6 MODULE)	OMNPM50
POWER RATING			
kVA/kWatt	50kVA/kW	150kVA/kW	300kVA/kW
EFFICIENCY			
Normal mode (dual conversion)	97%		
ECO mode	99%		
Battery mode	94.5%		96%
GENERAL			
Acoustic noise level at 1 meter	65dB @ 100% load, 62dB @ 45% load		61dB (power module)
Altitude of operation	≤3000m above sea level, derate power by 2% per 100m between 3000m and 4000m		
Relative humidity	0 to 95%, non-condensation		
Operating temperature	0-40°C, battery life is halved for every 10°C increase above 20°C		0-40°C, battery life is halved for every 5°C increase above 25°C
UPS storage temperature	-25~70°C		-20~70°C
Recommended battery storage temperature	-20~30°C (20°C for optimum battery storage)		0~25°C (20°C for optimum battery storage)
CABINET: PHYSICAL ATTRIBUTES			
Dimensions: W x D x H (mm)	442x711x307	442x840x976	600x750x2000
Weight (kg)	39	88	220
IP protection level	IP20		
Colour	Black		
MODULE: PHYSICAL ATTRIBUTES			
Dimensions: W x D x H (mm)	400×495×86(2U)		440*475*140
Weight (kg)	14		23
Colour	Black (Front)		
INPUT RECTIFIER			
Rated AC input voltage	380/400/415Vac (three-phase and sharing neutral with the bypass input) 220/230/240Vac (single-phase and sharing neutral with the bypass input)		380/400/415Vac (three-phase and sharing neutral with the bypass input)
Input voltage range	Power module 25kVA: 304~478Vac (L-L), 100% load; 304~228 (L-L) power derate from 100% to 50%		-40%~+25%
Frequency	50/60Hz (range: 40Hz~70Hz)		
Power factor	0.99		
THDI	<2% (100% linear load)		2%

	OMNPM25 (2 MODULE)	OMNPM25 (6 MODULE)	OMNPM50
BATTERY			
Battery bus voltage	Mod 25kVA: ±240V		Nominal: ±240V
Quantity of lead-acid cells	480V=40*6 cell (12V) (Selectable 30-50pcs, derates @ 34 blocks and under)		
Float charge voltage	2.25V/cell (selectable from 2.2V/cell~2.35V/cell) Constant current and constant voltage charge mode		
Temperature compensation	-3.0mV/°C/cl (selectable from: 0~-5.0, 25°C or 30°C, or inhibit)		
Ripple voltage	≤1% V float		
Ripple current	≤5% C_{10}		
Boost voltage	2.4V/cell (selectable from: 2.30V/cell~2.45V/cell) Constant current and constant voltage charge mode		
End of discharge voltage	1.65V/cell (selectable from: 1.60V/cell~1.750V/cell) at 0.6C discharge current 1.75V/cell (selectable from: 1.65V/cell~1.8V/cell) at 0.15C discharge current (EOD voltage changes linearly within the set range according to discharge current)		
Battery charge	50%* UPS capacity (selectable from: 0~50%* UPS capacity)		10%* UPS capacity (selectable from: 1~20%* UPS capacity)
INVERTER			
Rated AC voltage	380/400/415Vac (three-phase four-wire and sharing neutral with the bypass) 220/230/240Vac (single-phase and sharing neutral with the bypass input)		380/400/415Vac (three-phase four-wire and sharing neutral with the bypass)
Frequency	50/60Hz		
Overload	110%, 60min; 125%, 10min; 150%, 1min; >150%, 200ms		
Fault current	300% short current limitation for 200ms		
Non-linear load capability	100%		
Neutral current capability	170%		
Steady state voltage stability	±1% (balanced load), ±1.5% (100% unbalance load)		
Transient voltage response	±5%		
THD	<1% (linear load), <5% (non-linear load)		<1% (linear load), <3% (non-linear load)
Synchronisation window	Rated frequency ±2Hz (selectable: ±1~±5Hz)		
Max charge rate of synch frequency	1Hz/s (selectable: 0.1~5Hz/s)		
Inverter voltage range	±5%Vac		
BYPASS			
RATED CAPACITY BYPASS	50kVA	150kVA	300kVA
Rated AC voltage	380/400/415Vac (L-L); 220/230/240Vac (L-N) (three-phase four-wire, sharing neutral with the rectifier input and providing neutral reference for the output)		380/400/415Vac (three-phase four-wire, sharing neutral with the rectifier input and providing neutral reference for the output)
Rated current	76A	227A	456A
Overload	<110% long term; <125% for 10mins; <150% for 1min		

	OMNPM25 (2 MODULE)	OMNPM25 (6 MODULE)	OMNPM50
BYPASS			
RATED CAPACITY BYPASS	50kVA	150kVA	300kVA
Current rating of neutral cable	1.7A×In		
Frequency	50/60Hz		
Switch time (between bypass and inverter)	Synchronized switch: 0ms		
Bypass voltage tolerance (%Vac)	Upper limit: +10, +15, +20, +25, default: +15; Lower limit: -10, -20, -30 or -40, default: -20		
Bypass frequency tolerance	±1%, ±3%, ±5% settable		±2.5%, ±5%, ±10% or ±20%, default: ±10%