Eaton 9SX 15-20KPM(AU) Series
Online UPS

Powering Business Worldwide

Safety Instructions

- SAVE THESE INSTRUCTIONS. See installation instructions before connecting to the supply. This manual contains important instructions that should be followed during installation and maintenance of the UPS and batteries.
- In the event of a fire, please use a dry powder fire extinguisher to extinguish the fire. Do not use liquid fire extinguishers to avoid electric shock.
- The UPS models that are covered in this manual are intended for installation in an environment within 0 to 50°C, free of conductive contaminant.

Special Symbols

The following are examples of symbols used on the UPS or accessories to alert you of the below important information:

RISK OF ELECTRICAL SHOCK - Observe the warning associated with the risk of electrical shock symbol.

Important instructions that must always be followed.

Do not discard the UPS or the UPS batteries in the trash.
This product contains sealed lead acid batteries and must be disposed as outlined in this manual. For more information, contact your local recycling/reuse or hazardous waste center.

The crossed-out wheeled bin symbol indicates that electrical and electronic waste should not be discarded together with general household waste, but must be collected separately. The product should be handed in for recycling in accordance to the local environmental regulations for waste disposal.
By separating electrical and electronic waste, you will help reduce the volume of waste sent for incineration or land-fills and minimize any potential negative impact on human health and environment.

Information, advice, help.

Refer to the user manual.

Personnel Safety

- RISK OF VOLTAGE BACKFEED. This system has its own power source (the battery). Isolate the UPS and check for hazardous voltage upstream and downstream during lockout-tagout operation. Terminal blocks may be energized even if the system is disconnected from the AC power source.
- Dangerous voltage levels are present within the system. It should be opened exclusively by qualified service personnel.
- High leakage current, earth connection is essential before connecting to the supply.
- The battery supplied with the system contains small amounts of toxic materials. To avoid accidents, the directives listed below must be adhered to:
  - Servicing of batteries should be performed or supervised by personnels knowledgeable about batteries and the required precautions taken.
  - When replacing batteries, replace with the same type and number of batteries or battery packs.
  - Do not dispose of batteries in a fire. The batteries may explode.
  - Batteries constitute a hazard (electrical shock, burns). The short-circuit current may be very high.
- Precautions must be taken for all handling:
  - Wear rubber gloves and boots.
  - Do not lay tools or metal parts on top of batteries.
  - Disconnect charging source prior to connecting or disconnecting battery terminals.
  - Determine if battery is inadvertently grounded. If inadvertently grounded, remove source from ground. Contact with any part of a grounded battery can result in electrical shock. The likelihood of such shock can be reduced if such grounds are removed during installation and maintenance (applicable to equipment and remote battery supplies not having a grounded supply circuit).

Product Safety

- The UPS connection instructions and operation described in the manual must be followed in the indicated order.
- The upstream circuit breaker for Normal AC / Bypass AC must be easily accessible. The unit can be disconnected from AC power source by opening this circuit breaker.
- An additional AC contactor is used for backfeed protection and must comply with IEC/EN 62040-1 (the creep age and clearance distances shall meet the

basic insulation requirements for pollution degree 2).

- Disconnection and overcurrent protection devices shall be provided by others for permanently connected AC input (Normal AC / Bypass AC) and AC output circuits.
- Check that the indications on the rating plate correspond to your AC powered system and to the actual electrical consumption of all the equipment to be connected to the system.
- For PLUGGABLE EQUIPMENT, the socket-outlet shall be installed near the equipment and shall be easily accessible
- Never install the system near liquids or in an excessively damp environment.
- Never let a foreign body penetrate inside the system.
- Never block the ventilation grates of the system.
- Never expose the system to direct sunlight or source of heat.
- If the system must be stored prior to installation, storage must be in a dry place.
- The admissible storage temperature range is -25°C to +60°C without battery (-15°C to +40°C with battery).

Special precautions

- The unit is heavy: wear safety shoes and use vacuum lifter preferentially for handling operations.
- All handling operations will require at least two people (unpacking, lifting, installation in rack system).
- Straps are provided only for unpacking the unit manually from the carton; don't use the straps to carry the unit around. The unit may slip from the straps during handling (risk of injury and product damage):
  - keep 12" / 30cm minimum distance between the straps
  - lift the unit carefully and keep it at a low height
  - keep the unit horizontal during unpacking.
- Before and after the installation, if the UPS remains de-energized for a long period of time, the UPS must be energized for a period of 24 hours, at least once every 6 months (for a normal storage temperature less than 25°C). This charge the batteries, thus avoiding possible irreversible damage.
- During the replacement of the Battery Module, it is imperative to use the same type and number of elements as the original Battery Module provided with the UPS to maintain an identical level of performance and safety.

Contents

1. Introduction

Thank you for selecting the Eaton 9SX 15-20KPMAU Series Online UPS to protect your electrical equipment. These products support dual input requirements, as well as 4 kinds of input and output modes:

- three phase input - single phase output (3-1)
- three phase input - three phase output (3-3)
- single phase input - single phase output (1-1)
- single phase input - three phase output (1-3)

The 9SX 15-20KPMAU Series features unity power factor output to meet higher real-power load requirement. ANZ models are configured by default to take 40 blocks of 12V batteries, connected with a neutral point. This can be changed to take 32 blocks of batteries with a neutral point, only to be done by certified Eaton technicians, and the use of the correct battery pack. The charging current is adjustable from 1A to 13A. Units come with gravity sensing coloured LCD touch screen with user friendly interface for convenient operation. Higher environmental rating is achieved by high efficiency on the units of: up to 96% in online mode, and up to 95% during battery mode.

We recommend that you take the time to read this manual to take full advantage of the many features of your UPS (Uninterruptible Power System).

Before installing your UPS, please read the booklet presenting the safety instructions. Then follow the indications in this manual.

1.1 Environmental protection

Products are developed according to an eco-design approach.

Substances

This product does not contain CFCs, HCFCs or asbestos.

Packaging

To improve waste treatment and facilitate recycling, separate the various packaging components.

- The cardboardcomprises over 50% of recycled cardboard.

- Sacks and bags are made of polyethylene.
- Packaging materials are recyclable and bear the appropriate identification symbol

Materials	Abbreviations	Number in the symbols 
Polyethylene terephthalate	PET	01
High-density polyethylene	HDPE	02
Polyvinyl chloride	PVC	03
Low-density polyethylene	LDPE	04
Polypropylene	PP	05
Polystyrene	PS	06

Follow all local regulations for the disposal of packaging materials.

Product

The product is made up of recyclable materials.

Dismantling and destruction must take place in compliance with all local regulations concerning waste. At the end of its service life, the product must be transported to a processing center for electrical and electronic waste.

Batteries

The product contains lead-acid batteries that must be processed according to applicable local regulations concerning batteries.

The batteries may be removed to comply with regulations and in view of correct disposal.

1.2 Electronic equipment protection

The uninterruptible power system (UPS) protects your sensitive electronic equipment from the most common power problems, including power failures, power sags, power surges, brownouts, line noise, high voltage spikes, frequency variations, switching transients, and harmonic distortions.

Power outages may occur unexpectedly, with erratic power quality. These power problems have the potential to corrupt critical data, destroy unsaved work sessions, and damage hardware - causing hours of lost productivity and expensive repairs.

With the UPS, you can safely eliminate the effects of power disturbances and guard the integrity of your equipment. Providing outstanding performance and reliability, UPS's unique benefits include:

- True online double-conversion technology with high power density, utility frequency independence, and generator compatibility.
- Selectable High Efficiency mode of operation.
- Standard communication options: one RS232 communication port, one USB communication port, one dry in port and dry out port.
- Optional connectivity cards with enhanced communication capabilities.
- Easy, field upgradable firmware.

Eaton 9SX 15-20KPMAU Dimension:

UPS:

Model name	Size W*H*D(mm)	N.W.(kg)	Note
9SX 15KPM(AU)	438*129 (3U) *559	24.8	Long backup time model
9SX 20KPM(AU)	438*129 (3U) *559	24.8	

Notes:

1. Total 4 input/output modes are included, default mode: 3-1(single source).

2. Depth dimension does not include the front panel.

External battery (EBM):

Model name	Size W*H*D(mm)	N.W. (kg)	Note
9SX EBM384RT6U	438*129 (3U) *559	51.8 (103.6)	2 EBM /package, 16pcs 9Ah batt./EBM
9SX EBM480RT6U	438*129(3U)*559	60.5 (121)	2 EBM /package, 20pcs 9Ah batt./EBM

Note:

1. 'Size' is for 1 EBM size, N.W. with (***) is total weight of 2 EBM.

2. Depth dimension does not include the front panel.

Maintenance ByPass (MBP):

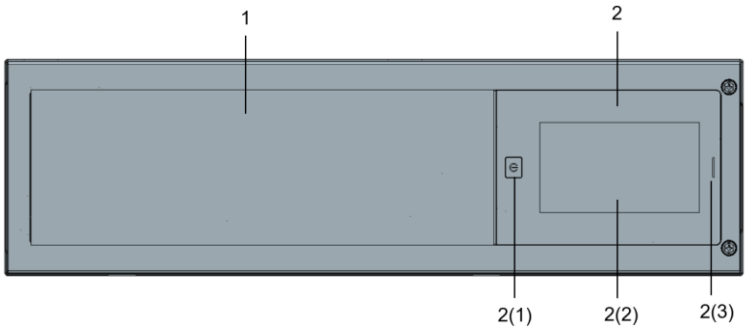
Model name	W*H*D(mm)	N.W. (kg)	Note
MBP20K	438*129 (3U) *465	12.8	single MBP (Basic version)
MBP20KPDU	438*129 (3U) *465	13.6	single MBP (Standard version)
MBP20KPARA	438*129 (3U) *465	19.9	1+1 parallel MBP (Standard version)

Note:

1. Default is setting with the mode:3-1(single source).
2. Depth dimension does not include front panel.

2. Presentation

2.1 UPS Power Module:

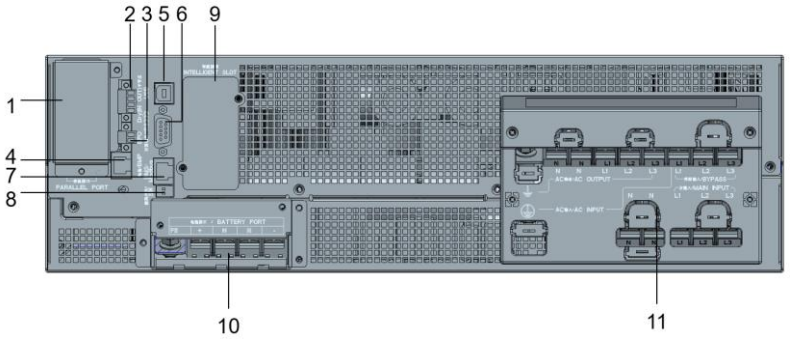


Front view

Note:

1. Ventilation area
2. LCD Module, including:

2(1): Power button，2(2):Touch screen，2(3): LED indicator



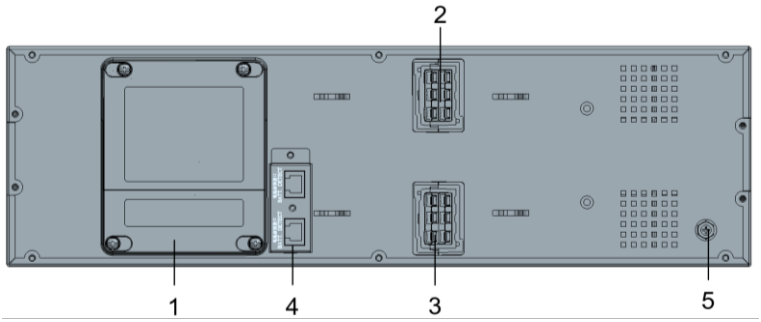
Rear view

Note:

1. Parallel port
2. Dry in/out port
3. EPO port
4. RJ45 port (Detect EBM / MBP)
5. USB port
6. RS232 port
7. RJ45 port (Modbus/BMS)
8. DIP switch
9. Comms. card slot
10. Battery terminal ports
11. Input/output/bypass terminal ports

2.2 EBM (External Battery Module):

Front view

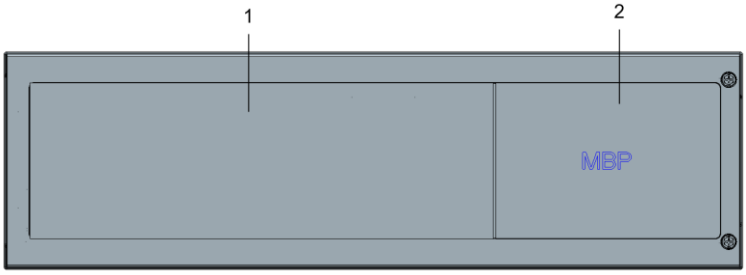


Rear view

Note:

1. Fuse box
2. Battery port 1
3. Battery port 2
4. RJ45 port (Detect EBM)
5. Ground screw

2.3 MBP (Maintenance Bypass module):

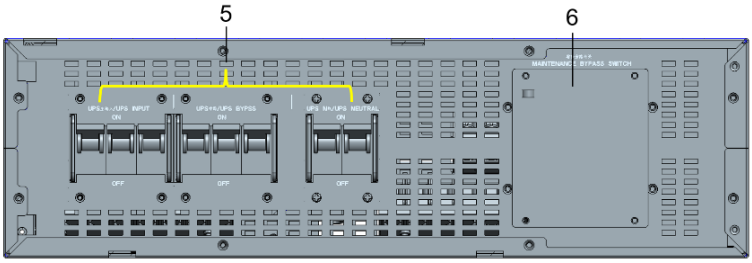


Front view

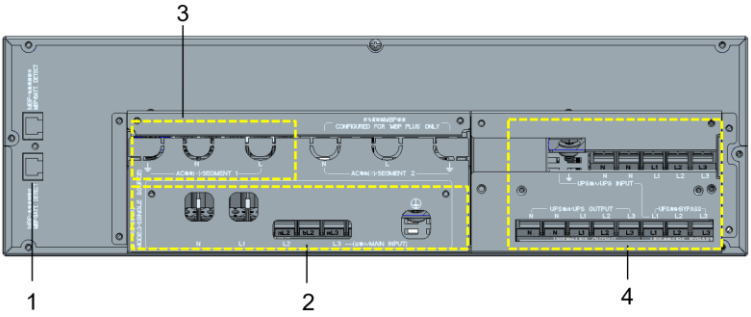
Note:

1. Ventilation area
2. Maintenance Bypass label

- Single MBP (basic version):



Front view (Remove the front panel)

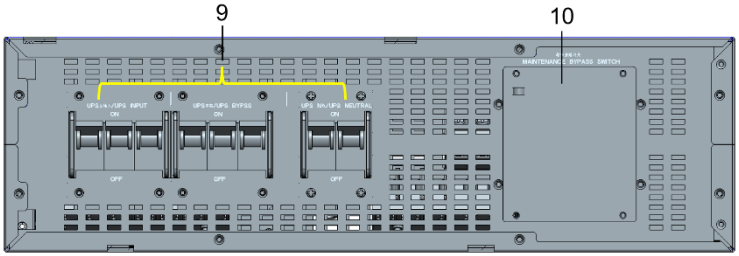


Rear view

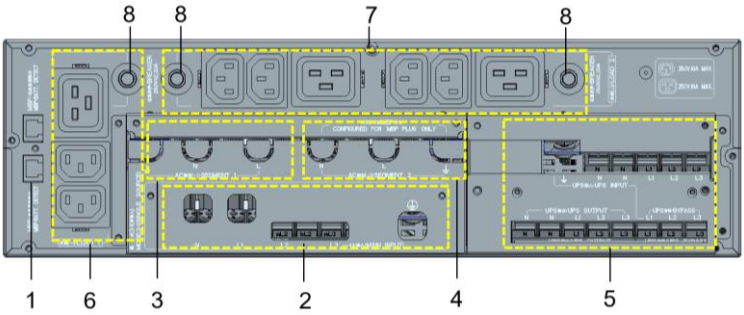
Note:

1. RJ45 ports (Detect EBM / MBP)
2. AC input terminal ports
3. AC output segment 1(Not programmable)
4. UPS ports
5. Input switch
6. Maintenance bypass switch

- Single MBP (standard version):



Front view (Remove the front panel)

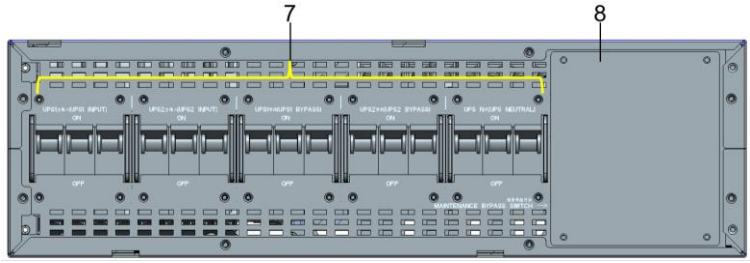


Rear view

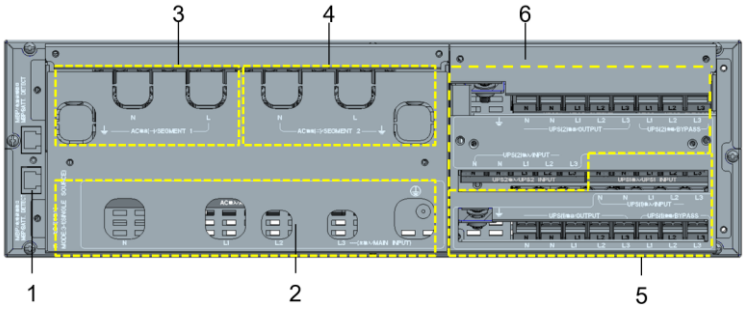
Note:

1. RJ45 ports (Detect EBM / MBP)
2. AC input terminal ports
3. AC output segment 1(Not programmable)
4. AC output segment 2 (Programmable)
5. UPS ports
6. Load 1 with IEC output sockets (Not programmable)
7. Load 2 with IEC output sockets (Programmable)
8. Breakers for IEC output sockets
9. Input switch
10. Maintenance bypass switch

- 1+1 parallel MBP (standard version) ：



Front view (Remove the front panel)



Rear view

Note:

1. RJ45 ports (Detect EBM / MBP)
2. AC input terminal ports
3. AC output segment 1 (Not programmable)
4. AC output segment 2 (Programmable)
5. UPS1 ports
6. UPS2 ports
7. Input switch
8. Maintenance bypass switch

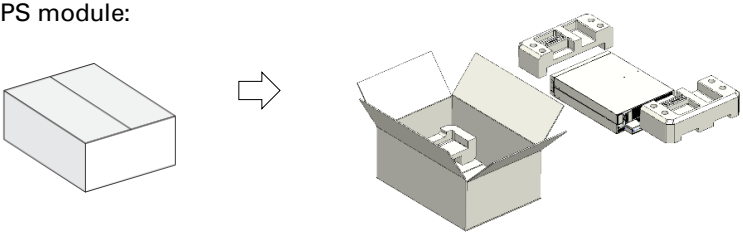
3. Mechanical installation

3.1 Unpacking and inspection

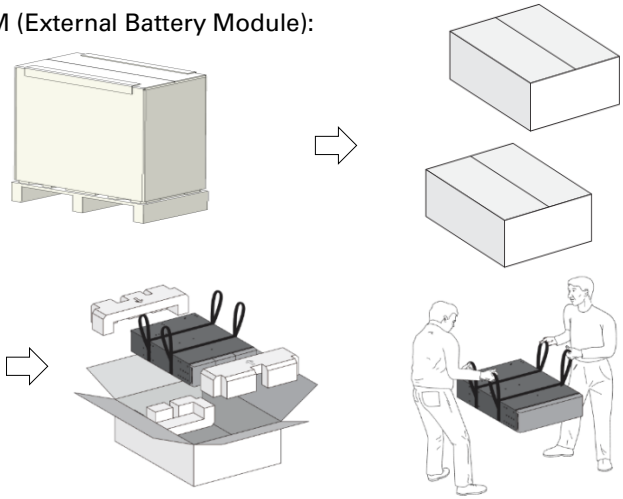
- Please carefully check the module for damages during transportation. Contact your carrier or dealer immediately to report any damages.
  Do not carry the module by the front and rear panels.

3.1.1 Unpacking the Unit

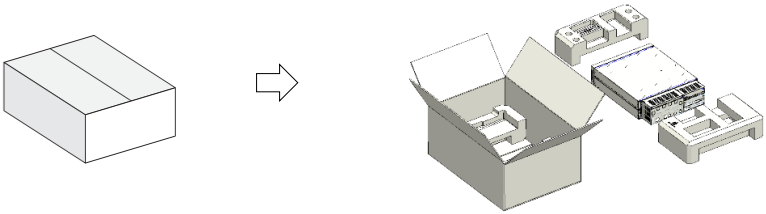
UPS module:



EBM (External Battery Module):



MBP (Maintenance Bypass module):



3.1.2 Inspecting accessories

- UPS module:

UPS accessories	9SX 15-20KPMAU
USB cable	√
RS232 cable	O
Parallel cable (including locker)	√
Copper bus-bar (including jumper cable)	√
Tower foot	√
Rack ear	√
Rack rail kit	O
End-user License Agreement	√
User manual	√

Note：√ - Included; O - Optional

- EBM:

EBM accessories	9SXEBM384RT6U/ 9SX EBM480RT6U	DXRTEBM384RT6U-IN/ DXRTEBM480RT6U-IN
EBM detection cable	√	√
EBM to UPS cable	√	√
EBM to EBM cable	√	√
Rack ear	√	√
Rack rail kit	O	O
Quick start	√	√

Note：√ - Included; O - Optional

- MBP: details see MBP user manual

Recycling: Packaging materials are reusable, please keep the packaging materials for future use.

3.3 Mechanical installation

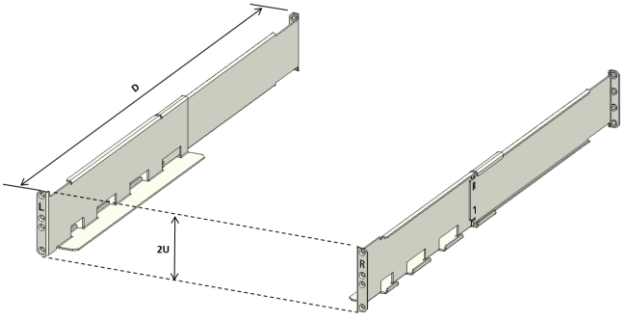
1. This series supports two installation modes: Tower installation and rack installation.
2. Leave at least 500mm of clearance for the front and rear of the module for ventilation.
3. Do not carry the module by the front/rear panel during installation.

3.3.1 UPS module installation

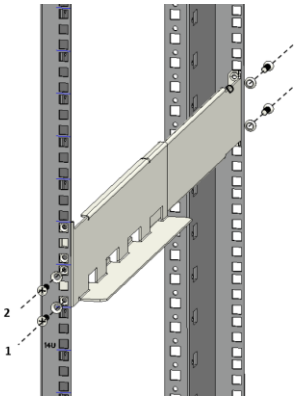
- Rack mount:

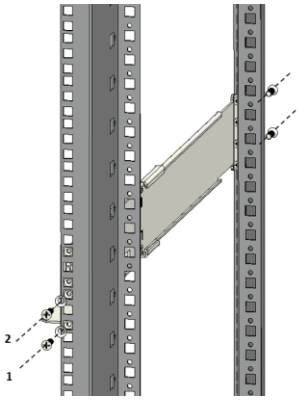
The UPS is suitable for installation in a 19-inch standard rack cabinet. The minimum recommended rack depth is 800mm.

1. Install the optional rail kit. This rail kit is '2U & with screw holes (M5)', the depth of the rail kit is: 415-763mm.

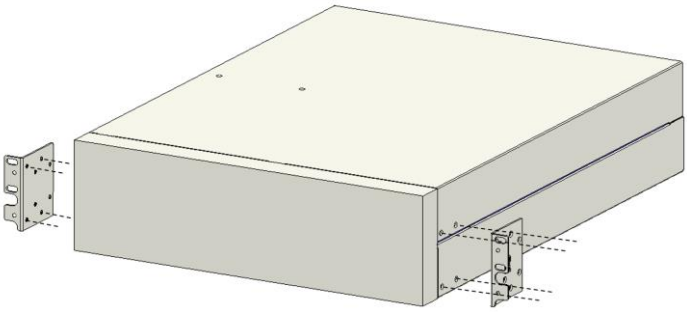


Fasten the rail kit to the cabinet with 8pcs M5 screws + washers (as below):

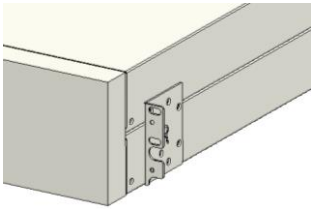


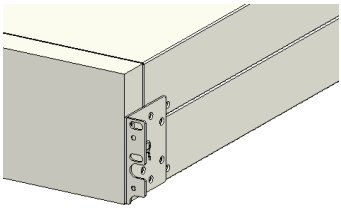


2. Install the mounting ears. Lock the left/right mounting ears into the UPS with 8pcs M4 flat screws (take note of the mounting ears sides and orientation with the diagram below).

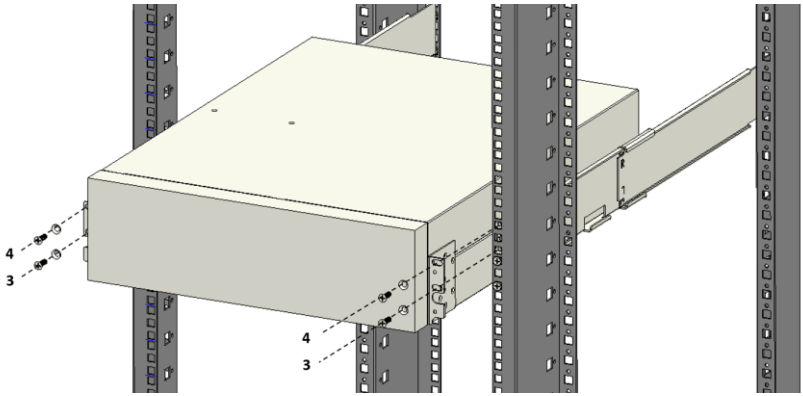


Note: There are 2 possible mounting positions for the mounting ears to suit different depth requirements.



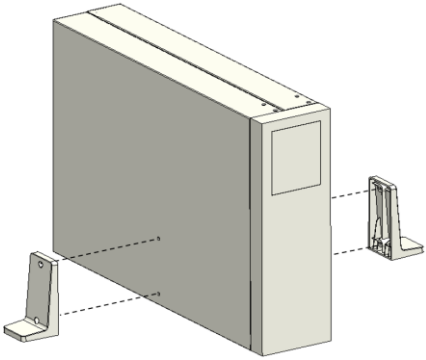


3. Rest the module on the horizontal plane of the rail kit, slide it from the front of the rack to the back till the mounting ears aligns with the vertical posts. Secure the mounting ears to the vertical posts with 4pcs M5 screws + washers (as below).



- Tower mount:

Fasten the pedestal feet to the module by its sides, paying attention to the module's orientation, the LCD of themodule should be at the top (shown below). With the gravity sensing feature, the LCD screen automatically rotates to the correct orientation based on how the module is reployed.



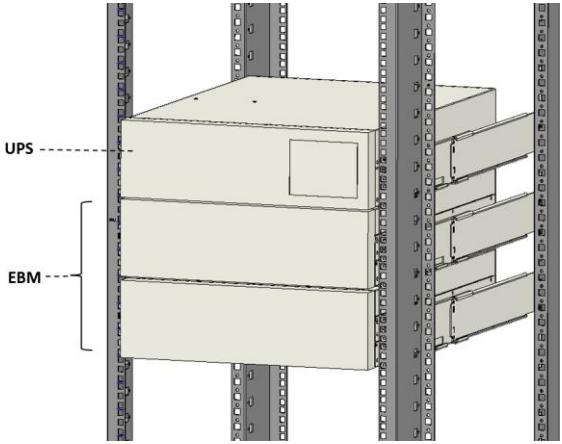
3.3.2 EBM module installation:

- Rack mount:

EBM module installation steps are the same as UPS.

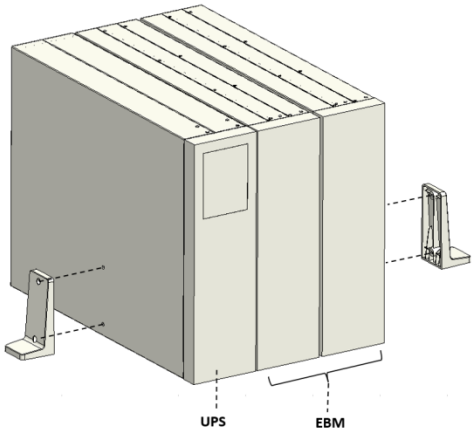
Pay attention to this installation:

1. EBM modules should be positioned beneath the UPS module (as shown below).
2. EBMs are required to be deployed in multiple of twos. Each module is 3U high, therefore a minimum of 6U is required for EBM installation.
3. EBM modules are heavy and requires at least 2 people to handle.



- Tower mount:

1. Place the EBM modules on the right side of the UPS and align with the front panel of the UPS module.
2. Fasten the pedestal feet: one to the side of the UPS, and the other to the side of the EBM (see diagram below).



Pay attention to this installation:

1. EBM modules must be installed to the right of the UPS module.
2. Reserve clearance for at least 2 x EBM modules to the right of the UPS module.

EBM modules are heavy and requires at least 2 people to handle.

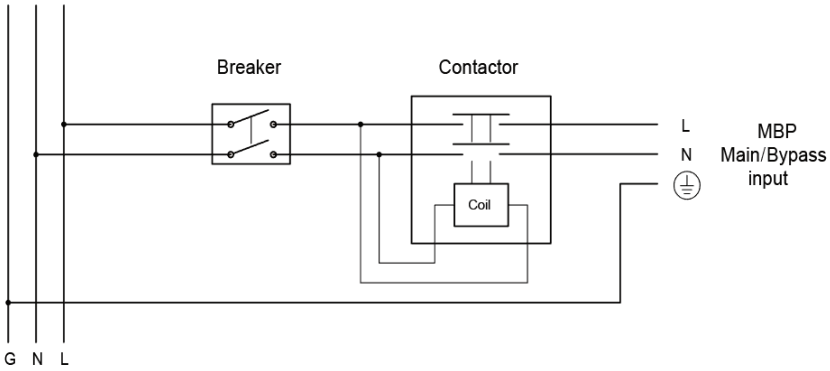
3.3.3 MBP (Maintenance Bypass Module) installation:

MBP module installation steps are the same as UPS, please refer details in the MBP user manual.

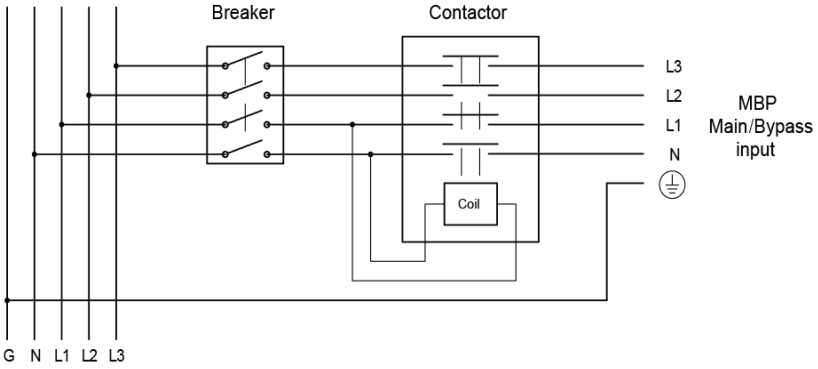
4. Cable Connections

This chapter outlines the wiring steps for AC input/output to the UPS in different modes, as well as UPS connection to the EBMs

Before any connections, ensure that upstream circuit breakers and backfeed contactors are in place to avoid power backfeed to the utility. It is recommended that a warning label with “Backfeed voltage may be present” text or similar to be added on the backfeed contactor device. Open all UPS input circuits and check all terminal voltages before operating. The current rating of the backfeed contactor should be greater than that of the UPS’. Refer to the figures below for the different wiring systems of the UPS input.



Single phase system



Three phase system

4.1 Input/Output wiring

Attention!

The current rating of the utility power switch must be greater than that of the UPS input current.

Please refer to the following table for the UPS wiring (cross-section of conductor, unit: mm²)

Model name	Input/ Output Mode	Input					Output			Battery	
		Main input		Bypass input		Ground wire					
		L wire	N wire	L wire	N wire		L wire	N wire	Ground	+/- wire	Ground wire
9SX 15KPM(AU)	3-1	6	6	16	16	16	16	16	16	10	10
	3-3	6	6	6	6	6	6	6	6	10	10
	1-1	35	35	16	16	35	16	16	16	10	10
	1-3	35	35	6	6	35	6	6	6	10	10
9SX	3-1	10	10	25	25	25	25	25	25	10	10

	3-3	10	10	10	10	10	10	10	10	10	10
	1-1	50	50	25	25	50	25	25	25	10	10
	1-3	50	50	10	10	50	10	10	10	10	10

Note:

1. For single input connection, please select the larger conductor size cross-section.
2. UPS output cable length is recommended not to exceed 10m.
3. UPS default input/output phase mode is: mode 3-1(single source).
4. If the load in a 3-phase output mode is unbalanced, the L wire of the bypass and output may exceed the rated current by 1.732 times. The corresponding protection device and wiring cable must be determined according to the standards of the region and the actual situation of the user.

   Please refer to the following table for conductor's terminal selection:

Conductor cross-section (Unit: mm^2)	Ring terminal type
6	DRNB6-6
10	DRNB6-10
16	DRNB8-16
25	DRNB8-25
35	DRNB8-35
50	DRNB8-50

Recommended circuit breaker and contactor current specifications:

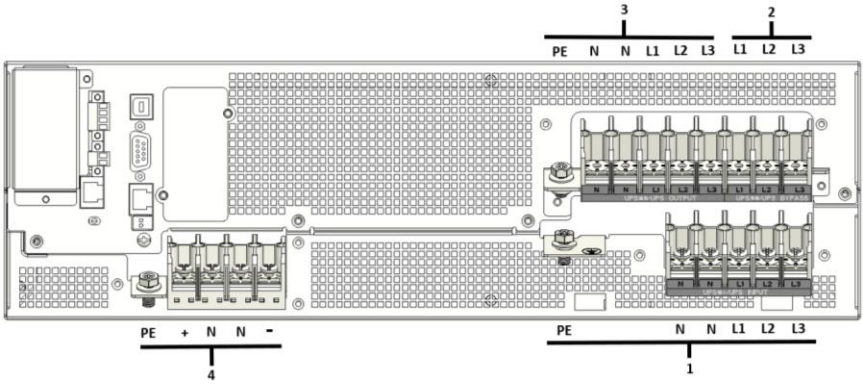
Model name	Input mode	Breaker	Contactor
9SX 15KPM(AU)	1 phase main input	D type 125A	≥125A
	3 phase main input	D type 63A	≥63A
	1 phase bypass input	D type 100A	≥100A
	3 phase bypass input	D type 40A	≥40A
9SX 20KPM(AU)	1 phase main input	D type 160A	≥160A
	3 phase main input	D type 63A	≥63A
	1 phase bypass input	D type 125A	≥125A
	3 phase bypass input	D type 63A	≥63A

Recommended output circuit breaker current specifications:

Model name	Output mode	Breaker current
9SX 15KPM(AU)	1 phase output	100A
	3 phase output	40A
9SX 20KPM(AU)	1 phase output	125A
	3 phase output	63A

Note: The diameter and cross-section of the cable conductor depend on the rated power of the UPS. The above wire diameter is for user's reference only.

Layout of the Power Module's terminal block (TB):



Note:

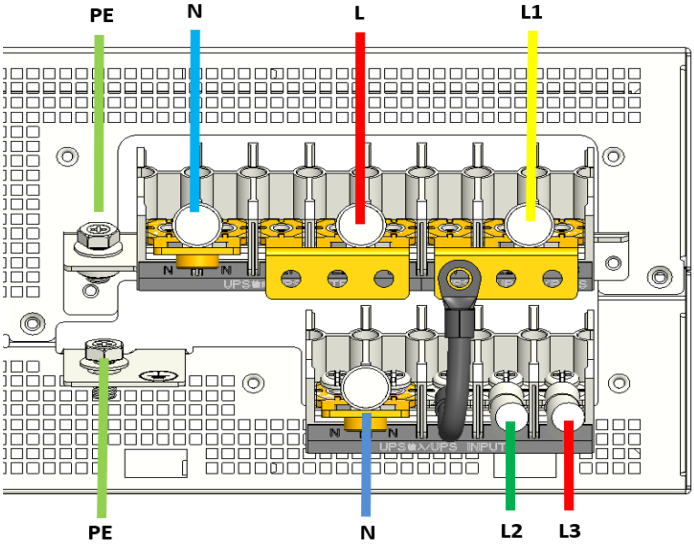
1. UPS input TB (PE/N/N/L1/L2/L3)
2. UPS bypass input TB(L1/L2/L3)
3. UPS output TB(PE/N/N/L1/L2/L3)
4. External battery TB(PE/+/N/N/-)

This section outlines the 8 different possible modes of input/output wiring application. The below copper busbars and jumper cable are included as accessories to change to input/output modes.

To gain access to the terminal blocks, it is only necessary to remove the terminal block's top cover, without removing the whole box.

	Item	Quantity (PC)	Figure
Copper busbar	1	2	
	2	2	
Jumper cable	NA	3	

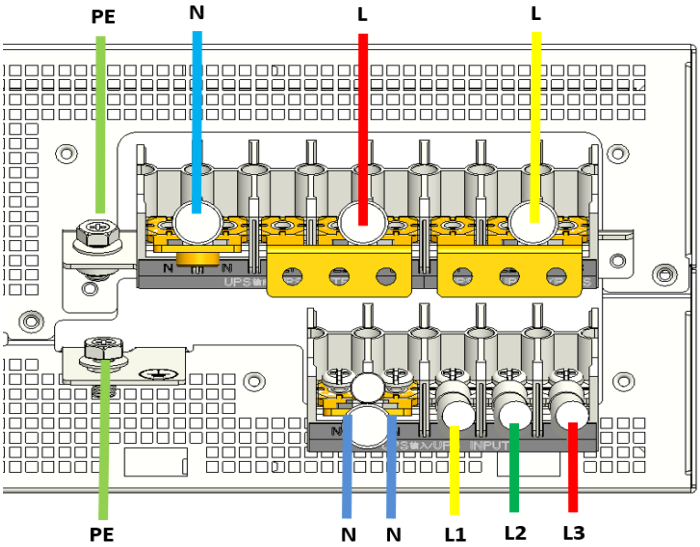
4.1.1. Mode 3-1 (single source) (Default UPS wiring mode)



1. Input: connect the ground cable (PE) to the chassis first
2. Bridge the 'UPS input terminal N/N' with 'busbar #1', then connect AC cable(N); connect 'UPS input terminal L2/L3' to AC cable (L2/L3)
3. Fix the 'jumper cable' to 'UPS input terminal L1' and 'busbar #2', then bridge the 'UPS bypass terminal L1/L2/L3' with this 'busbar #2' and connect AC cable (L1)

4. Output: connect the ground cable (PE) to the chassis first;
5. Bridge the ‘UPS output terminal N/N’ with ‘busbar #1’, then connect AC cable(N)
6. bridge the ‘UPS output terminal L1/L2/L3’ with ‘busbar #2’, then connect AC cable(L)

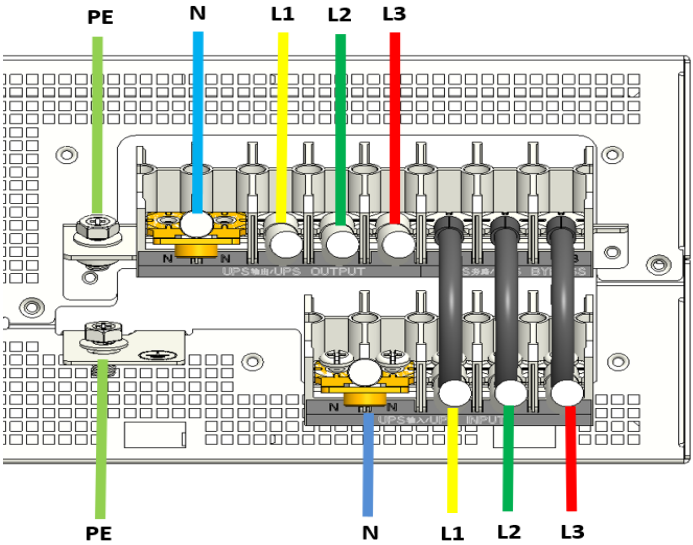
4.1.2. Mode 3-1 (dual source)



1. Input: connect the main ground cable (PE) to the chassis first
2. Bridge the ‘UPS input terminal N/N’ with ‘busbar #1’, then connect AC main source cable (N) and bypass source cable (N) with the lugs on top of each other
3. Connect the ‘UPS input terminal L1/L2/L3’ to main source cable(L1/L2/L3)
4. Bridge the ‘UPS bypass terminal L1/L2/L3’ with ‘busbar #2’, then connect bypass source cable (L)
5. Output: connect the ground cable (PE) to the chassis first;
6. Bridge the ‘UPS output terminal N/N’ with ‘busbar #1’, then connect AC cable (N)

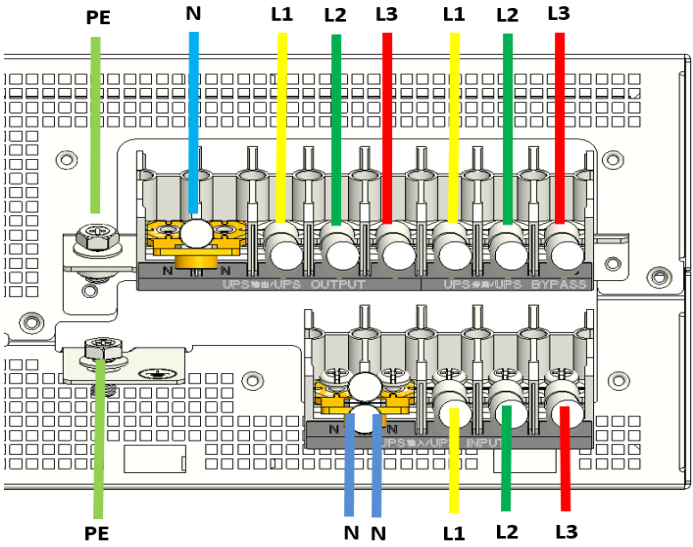
7. Bridge the ‘UPS output terminal L1/L2/L3’ with ‘busbar #2’, then connect AC cable (L)

4.1.3. Mode 3-3 (single source)



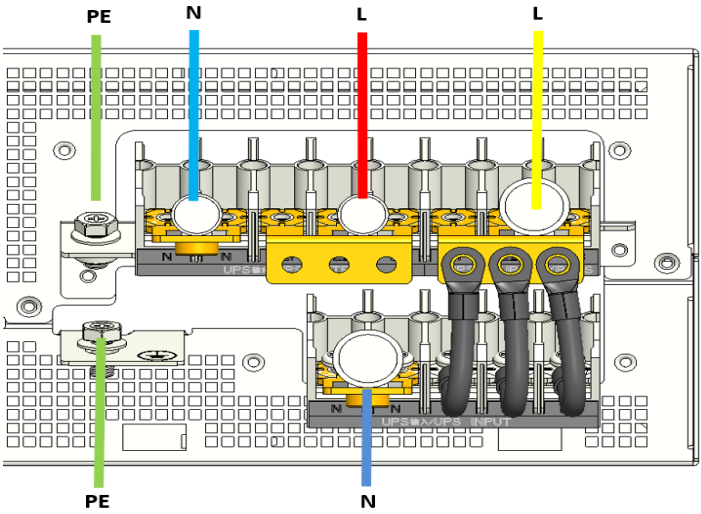
1. Input: connect the main ground cable (PE) to the chassis first
2. Bridge the ‘UPS input terminal N/N’ with ‘busbar #1’, then connect AC cable(N);connect the ‘UPS input terminal L1/L2/L3’ with AC cable (L1/L2/L3) and the ‘jumper cables’ with the lugs on top of each other
3. Fix the ‘jumper cables’ to ‘UPS bypass terminal L1/L2/L3’
4. Output: connect ground cable (PE) to chassis first;
5. Short ‘UPS output terminal N/N’ with ‘busbar #1’, then connect AC cable(N)
6. Connect ‘UPS output terminal L1/L2/L3’ to AC cable(L1/L2/L3)

4.1.4. Mode 3-3 (dual source)



1. Input: connect the main ground cable (PE) to the chassis first
2. Bridge the ‘UPS input terminal N/N’ with ‘busbar #1’, then connect the AC main source cable (N) and bypass source cable(N) with the lugs on top of each other
3. Connect the ‘UPS input terminal L1/L2/L3’ to main source cable (L1/L2/L3)
4. connect the ‘UPS bypass terminal L1/L2/L3’ to the bypass source cable (L1/L2/L3)
5. Output: connect the ground cable (PE) to chassis first
6. Bridge the ‘UPS output terminal N/N’ with ‘busbar #1’, then connect AC cable (N)
7. Connect the ‘UPS output terminal L1/L2/L3’ to the AC cable (L1/L2/L3).

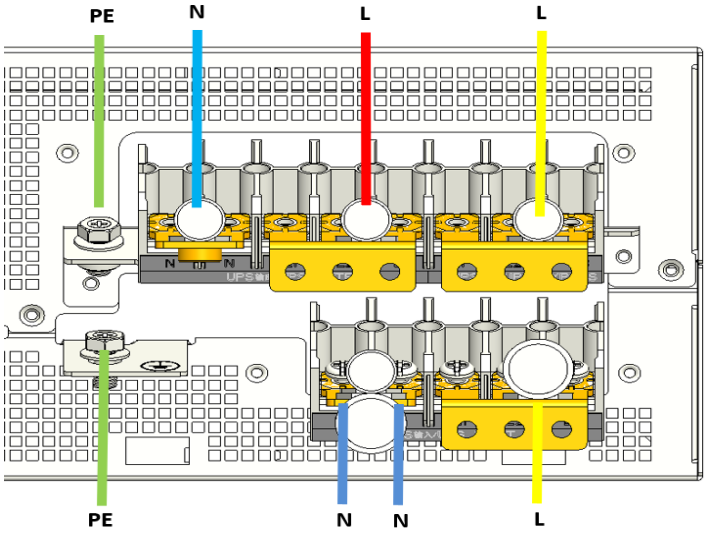
4.1.5. Mode 1-1 (single source)



1. Input: connect the main ground cable (PE) to the chassis first
2. Bridge the 'UPS input terminal N/N' with 'busbar #1', then connect the AC cable(N)
3. Fix the 'jumper cables' to the 'UPS input terminal L1/L2/L3' and 'busbar #2', then bridge the 'UPS bypass terminal L1/L2/L3' with this 'busbar #2' and connect the AC cable (L)
4. Output: connect the ground cable (PE) to the chassis first;
5. Bridge the 'UPS output terminal N/N' with 'busbar #1', then connect the AC cable (N)
6. Bridge the 'UPS output terminal L1/L2/L3' with 'busbar #2', then connect the AC cable (L)

For 1 Phase input connection, if set to CVCF (Frequency Converter) mode, the UPS needs to be derated to 60% of its rated capacity.

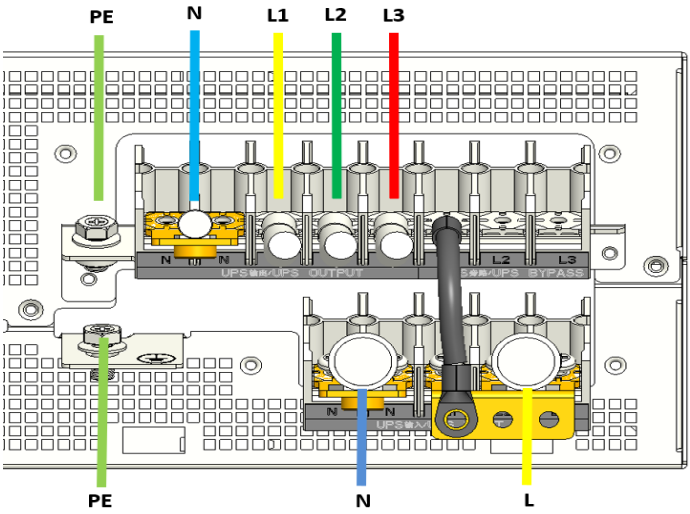
4.1.6. Mode 1-1 (dual source)



1. Input: connect the main ground cable (PE) to the chassis first
2. Bridge the 'UPS input terminal N/N' with 'busbar #1', then connect the AC main source cable (N) and bypass source cable (N) with the lugs on top of each other
3. Bridge the UPS input terminal L1/L2/L3' with 'busbar #2', then connect the main source cable (L)
4. Bridge the 'UPS bypass terminal L1/L2/L3' with 'busbar #2', then connect the bypass source cable (L)
5. Output: connect the ground cable (PE) to the chassis first
6. Bridge the 'UPS output terminal N/N' with 'busbar #1', then connect the AC cable(N)
7. Bridge the 'UPS output terminal L1/L2/L3' with 'busbar #2', then connect AC cable(L)

For 1 Phase input connection, if set to CVCF (Frequency Converter) mode, the UPS needs to be derated to 60% of its rated capacity.

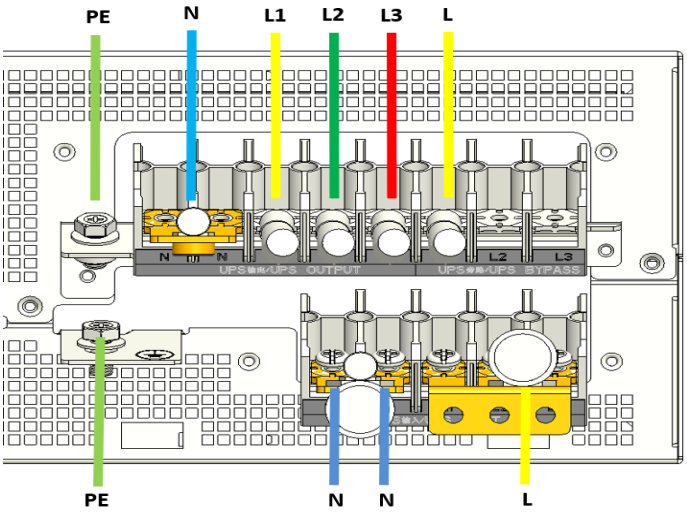
4.1.7. Mode 1-3(single source)



1. Input: connect the main ground cable (PE) to the chassis first
2. Bridge the 'UPS input terminal N/N' with 'busbar #1', then connect the AC cable(N)
3. Fix the 'jumper cable' to 'busbar #2', then bridge the 'UPS input terminal L1/L2/L3' with this 'busbar #2' and connect AC cable (L), connect this 'jumper cable' to 'UPS bypass terminal L1'
4. Output: connect the ground cable (PE) to the chassis first
5. Bridge the 'UPS output terminal N/N' with 'busbar #1', then connect the AC cable(N)
6. Connect 'UPS output terminal L1/L2/L3' to AC cable(L1/L2/L3)

In this configuration, bypass is not available. UPS needs to be derated to 60% of it's capacity. Harmonics distortion specs will be higher than the published specification data.

4.1.8. Mode 1-3(dual source)



1. Input: connect the main ground cable (PE) to the chassis first
2. Bridge the 'UPS input terminal N/N' with 'busbar #1', then connect the AC main source cable (N) and bypass source cable (N) with the lugs on top of each other
3. Bridge the 'UPS input terminal L1/L2/L3' with 'busbar #2', then connect the main source cable (L)
4. Connect 'UPS bypass terminal L1' to bypass source cable(L)
5. Output: connect ground cable (PE) to chassis first
6. Short 'UPS output terminal N/N' with 'busbar #1', then connect AC cable(N)
7. Connect 'UPS output terminal L1/L2/L3' to AC cable(L1/L2/L3)

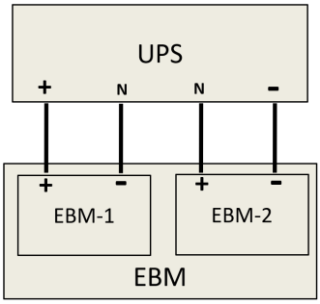
In this configuration, bypass is not available. UPS needs to be derated to 60% of it's capacity. Harmonics distortion specs will be higher than the published specification data.

4.2 External battery module (EBM) Connection

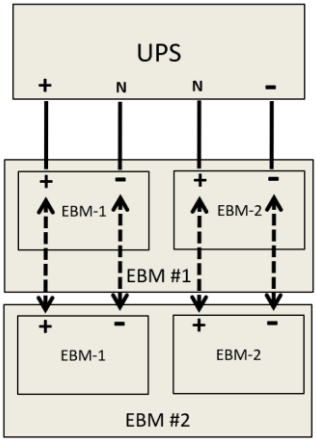
The external battery module (EBM) is optional and needs to be purchased separate to the power module. A minimum of 1 pair of EBMs is required for the system to have any stored energy to provide autonomy to your application.

1. Be sure to disconnect the battery cable from the EBMs before connecting the battery terminals of the UPS
2. Make sure the UPS is completely off before connecting or disconnecting the EBMs.
3. Ensure that the Battery setting on the LCD menu is correct and corresponds to the EBM model you are connecting to (For ANZ model it is ±240V, as well as the quantity of EBMs.
4. Do not reverse the polarity of the external battery.

EBM wiring schematic diagram is shown below:



Single string EBM

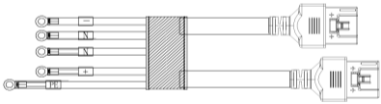


Multiple strings EBM

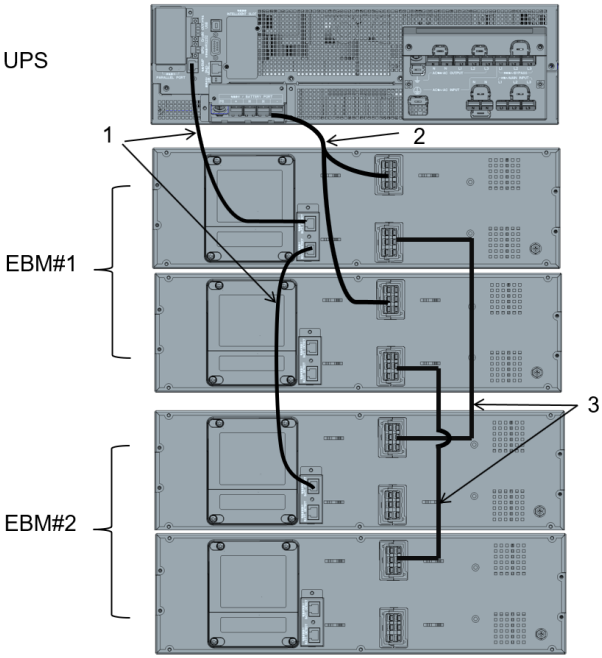
- Battery cable installation sequence: connect the UPS first, then the EBMs!
- Default battery number of the UPS is set with: 9SX15-20KPMAU: 40pcs, 20 pcs for Battery+/Battery- (EBM-1/EBM-2).

- The UPS can be connected to up to 6 strings of batteries, each string contains 2 x EBMs (batt+/batt-).
- For EBM connection, only the removal of the TB box's top cover is neccesarry. Removal of the entire TB box is not required.

EBM Included Accessories:

	Quantity (PC)	Note	Figure
EBM detect cable	1	Detecting EBM	
EBM to UPS cable	1	Connecting EBM to UPS	
EBM to EBM cable	2	Connecting EBM to EBM	

EBM to UPS connection schematic diagram：



1: EBM detect cable

2: EMB to UPS cable

3: EBM to EBM cable

Note：

If the UPS is connected to other types of battery modules (User's own battery modules), please follow wiring-diagram as above and chapter 4.1 (table of UPS wiring) to select the cable size for battery connection.

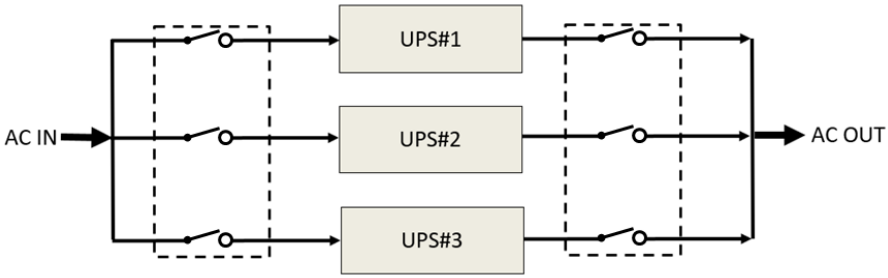
4.3 Single MBP Connection

The MBP is an optional module that when used with the UPS, allows the UPS to be isolated for maintenance without affecting the load. More details are on the Maintenance Bypass Module User Manual.

5.Parallel UPS installation

The 9SX 15/20 kVA can be paralleled up to 3 modules together for capacity, or redundancy.

Paralleled system schematic:



Note:

The '1 + 1 Parallel MBP' module is available for the convenience of paralleling 2 UPSs together and is recommended to be deployed.

Caution:

Wiring length requirement:

If the distance between the load and the paralleled system is less than 10 meters, the length difference between the UPS-to-UPS interconnecting lines

should be less than 20%.

If the distance between the load and the paralleled system is greater than 20 meters, the length difference between the UPS-to-UPS interconnecting lines should be less than 5%.

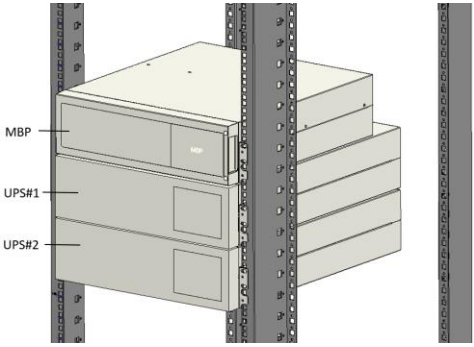
Professional installation is required, please deploy the paralleled system in the restricted area!

5.1 Paralleled UPS installation

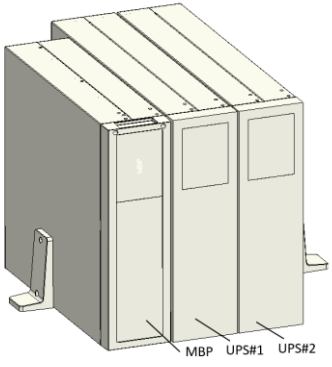
In the paralleled system, the installation of the UPS modules are the same as single UPS. Please refer to Chapter 3.

Note:

If used, the '1 + 1 parallel MBP' should be placed on top of the paralleled UPSs for rack mounting, or on the left for a tower installation (as shown below):



Rack mount for parallel system



Tower mount for parallel system

5.2 wiring

Cable-selection table for the paralleled system AC IN and AC OUT :

Paralleled system installed by 15KVA UPS (conductor cross-section, unit: mm²)											
UPS number	Mode	Main input		Bypass input		Ground wire	Output			Battery wire	Battery ground
		L wire	N wire	L wire	N wire		L wire	N wire	Ground		
2 UPS	3-1	16	16	50	50	50	50	50	50	25	25
	3-3	16	16	10	10	16	10	10	10	25	25
	1-1	95	95	50	50	95	50	50	50	25	25
	1:3	95	95	10	10	95	10	10	10	25	25
3 UPS	3-1	35	35	95	95	95	95	95	95	50	50
	3-3	35	35	16	16	35	16	16	16	50	50
	1-1	185	185	95	95	185	95	95	95	50	50
	1-3	185	185	16	16	185	16	16	16	50	50

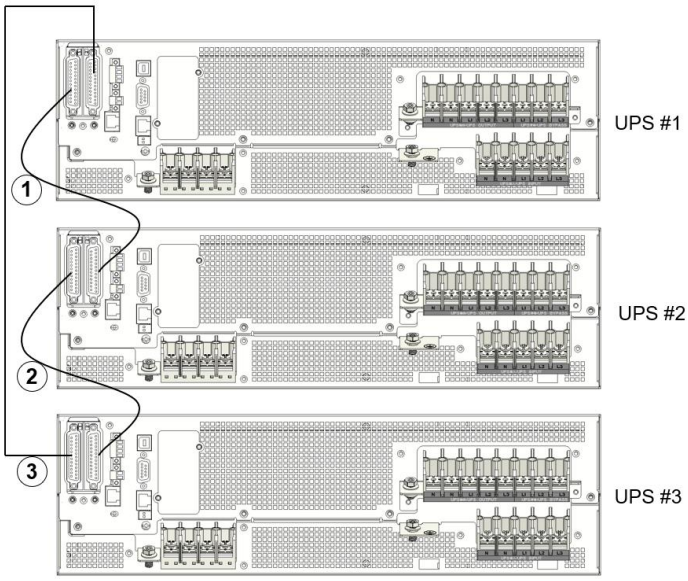
Parallel system installed by 20KVA UPS (conductor cross-section, unit: mm²)											
UPS number	Mode	Main input		Bypass input		Ground wire	Output			Battery wire	Battery Ground
		L wire	N wire	L wire	N wire		L wire	N wire	Ground		
2 UPS	3-1	25	25	70	70	70	70	70	70	35	35
	3-3	25	25	16	16	25	16	16	16	35	35
	1-1	120	120	70	70	120	70	70	70	35	35
	1-3	120	120	16	16	120	16	16	16	35	35
3 UPS	3-1	50	50	150	150	150	150	150	150	70	70
	3-3	50	50	25	25	50	25	25	25	70	70
	1-1	240	240	150	150	240	150	150	150	70	70
	1-3	240	240	25	25	240	25	25	25	70	70

Note:

1. For single input connection, please select the larger conductor size cross-section.
2. If the load in a 3-phase output mode is unbalanced, the L wire of the bypass and output may exceed the rated current by 1.732 times. . The corresponding protection device and wiring cable must be determined according to the standards of the region and the actual situation of the user.

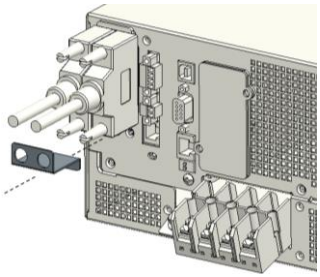
5.2.1 Basic parallel UPS wiring

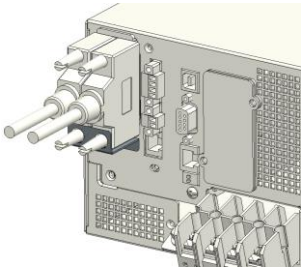
Complete the AC connection for the parallel system per the previous section. Remove the protective cover of the parallel ports, then connect the 'parallel cable' (25-pin included as an accessory) to each UPS' parallel port. The connection should be a closed loop (as shown below):



To reduce the risk of parallel system damage:

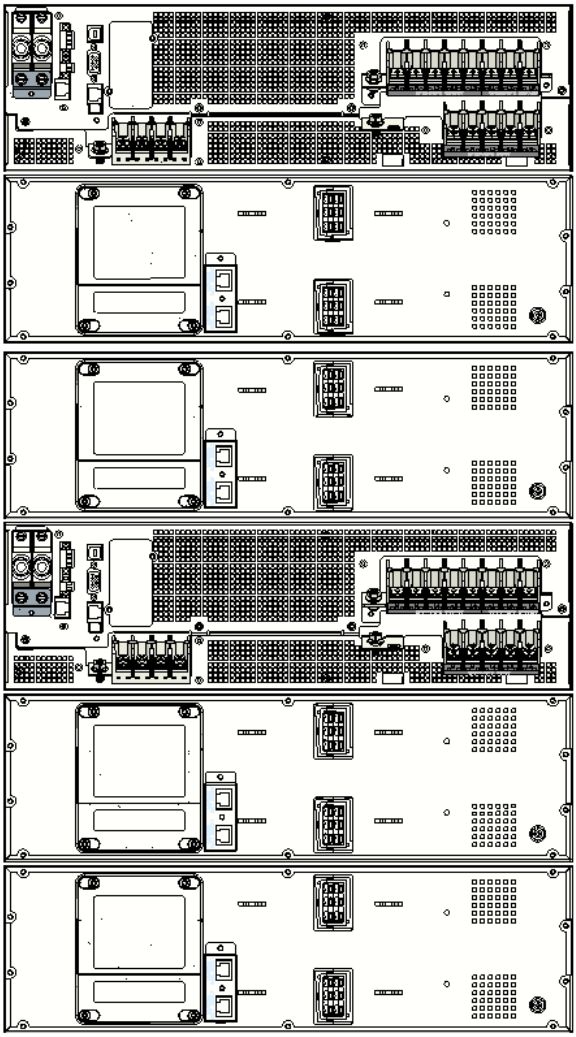
1. Please use the configured ‘parallel cable’ included as the UPS accessory!
2. After tightening the ‘parallel cables’, secure them with the ‘parallel cable locker’ (as shown below) to prevent accidental disconnection.





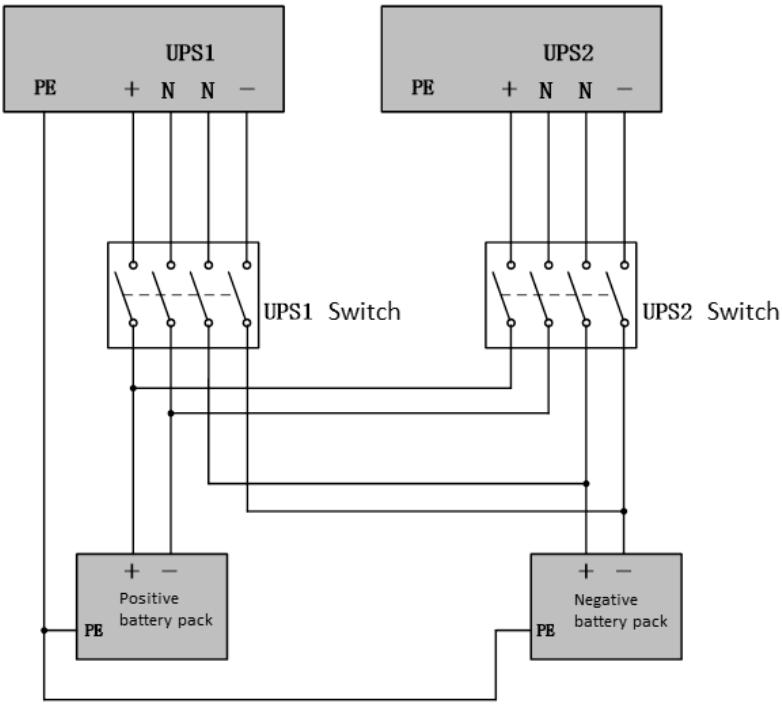
5.2.2 Paralleled UPS with independent battery banks

1. Refer to the following illustration for modules placement paralleled system with independent battery bank.
2. Please refer to chapter 4.2 for the wiring method of each UPS and its own EBM.



5.2.3 Paralleled UPS with common battery bank

It is possible to configure a paralleled system with common batteries (user's own batteries). Please refer to the following illustration for this type of connection.



5.2.4 '1+1 Parallel MBP' connection

The optional '1 + 1 Parallel MBP' is available to facilitate the connection of 2 paralleled UPS, with maintenance bypass functionality. Please refer to the MBP user manual for more details on the connection.

6. Communication ports

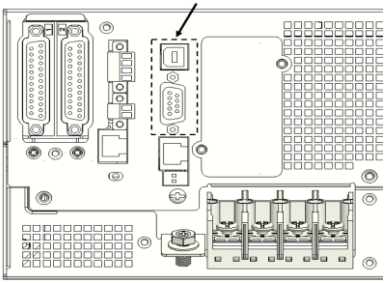
Computer ports

The UPS provides USB and RS232 communication ports. Please use the communication cables provided as accessories to connect to the corresponding communication port.

For RS232 communication, the default parameters are as follows:

- Baud rate: 2400
- Data Bits: 8
- Stop Bit: 1
- Parity: None (0)

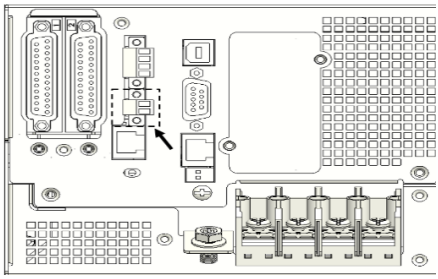
USB and RS232 cannot be used together. If both are connected at the same time, USB takes priority over RS232.



EPO (Emergency Power Off)

The EPO port is located at the rear of the UPS panel. This circuit is normally closed by a jumper connected to it supplied with the UPS. If this connector is opened, the UPS will stop the output and enter a fault mode with 'EPO active' alarm. To recover to normal operating state, below steps should be taken:

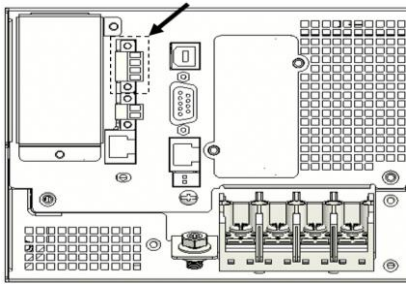
- Reconnect EPO connector
- Clear the EPO alarm by selecting 'reset fault state in the LCD screen. The UPS will go to bypass mode.
- Press and hold the on/off button until the UPS output restarts.



Dry Contacts (input/output)

The dry input contact is an optical coupling input interface, and is to be connected to an external switch. The functions are programmable from the LCD screen. This allows for remote operations such as powering on/off of the UPS.
The dry output contact is a normally open relay interface. This is used to indicate the various status of the UPS that is programmable from the LCD screen.

Reference 7.3.4 to setting Dry in & out details

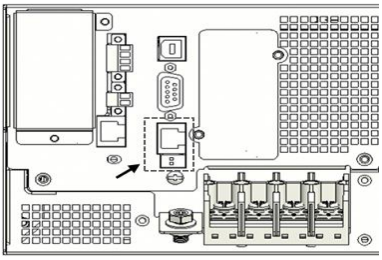


Modbus/BMS port and DIP switch

The Modbus/BMS port supports Modbus connectivity, or BMS communication for Lithium Ion battery monitoring.

The port defaults to Modbus the function, which can provide communication with a maximum of 5 UPS. For daisy chain connection, a splitter terminal block is required (please contact your service representative for this splitter). There are two switches on the DIP switch bank: SW-2 and SW-1. Both are default to the Off position. On the DIP switch bank, SW-2 is the enable terminal resistance switch. Turn this switch to the On position when this is used as a terminal device.

For Lithium Ion battery BMS monitoring, switch the SW-1 to the On position.



Intelligent Communication Card Slot

This slot enables installation of various compatible MS (mini-slot) type communication cards. These are: NETWORK-M2, INDGW-M2, and RELAY-MS cards. Cards are hot-pluggable and hot-swappable. Contact your Eaton representative for the acquisition of these optional cards.

7. Operation interface

7.1 Control panel

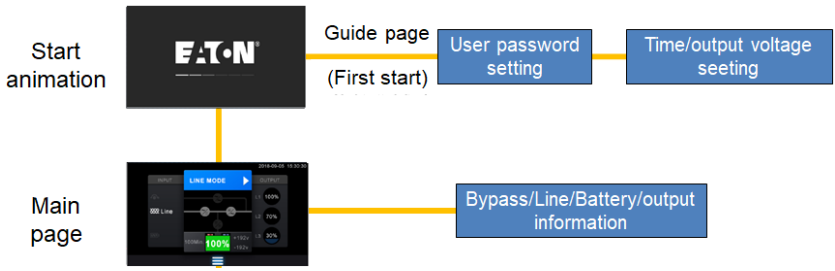
Note: The control panel has two display modes: horizontal and vertical. The following is an example of using horizontal screen.

LED indicator	Status	Description
	Steady red	UPS is in fault mode
	Flashing red	UPS has one ore more active alarms
	Steady yellow	The UPS is in Battery mode
	Flashing yellow	UPS is in bypass mode with output present
	Steady green	UPS is in Line mode or high efficiency mode
	Light off	UPS has no output at present (Power-on initialization/Shutdown/Bypass no output)
Power button	**Function**	**Description**
⏻	Power on Turn off Clear fault	- Press to turn the UPS on. - When UPS is working, press to bring up the shutdown window. - When UPS is in fault mode, press to bring up the clear fault window.
Buzzer		**Description**
No beep sound		UPS is working normally
Only one beep		Power on tone
Beep every 2 minutes		UPS is in bypass mode
Beep every 10 second s		UPS is in battery mode
Beep every second		UPS is in battery mode with low battery alarm active, or other alrms are active.
Continuous beep		UPS fault

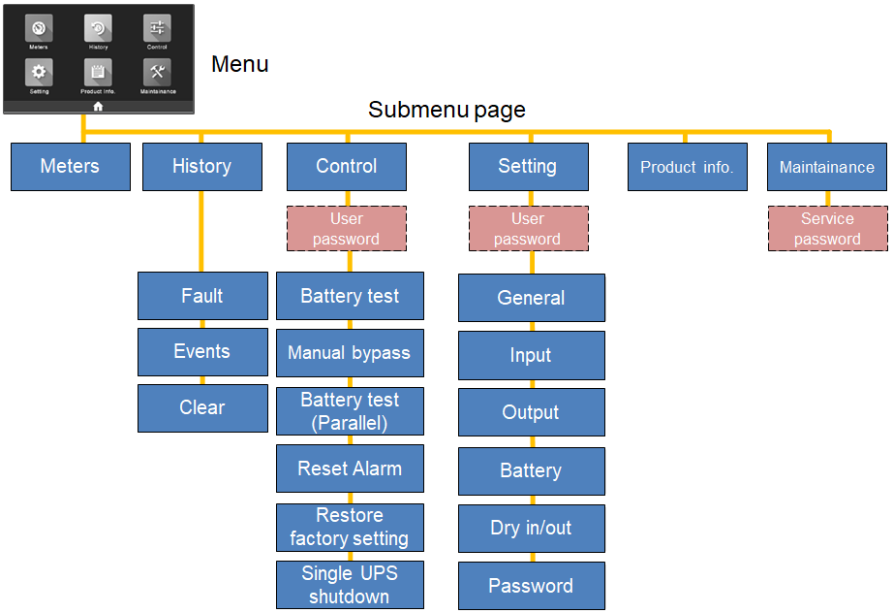
7.2 Touch screen

The Eaton 9SX 15-20KPMAU Series is equipped with a 4.3-inch 65K true color touch screen. This provides a comprehensive graphical menu with UPS information displayed for convenience.

7.2.1 User Interface overview



Start animation and Main page



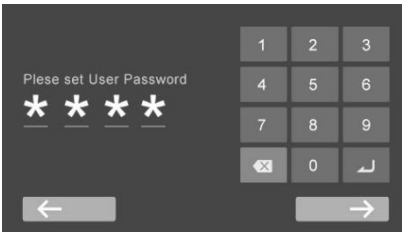
Menu and Submenu

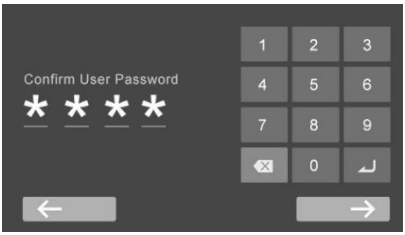
7.2.2 Guide page

During intial startup of the UPS, the LCD screen will enter a guide page after the animation ends. This allows the user to configure the initial settings, including: language selection, password setting, time setting, and output voltage setting.

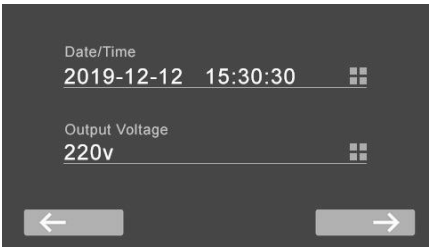
Click on the password box during this setting, then enter your four-digit password on the keypad that appeats on the right side of the screen after the cursor appears, followed by confirming the password.

This password grants you access to everything under the root menu, it is important to retain it amongst personnels that require this access. Password protection can be disabled under Settings > Password. Contact your Eaton service representative if the password is forgotten/misplaced.



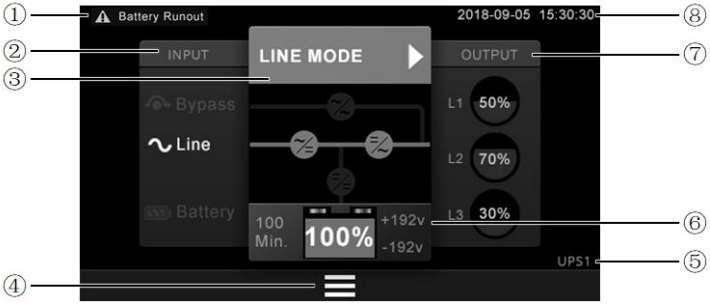


The time setting defines the time stamp on all UPS logs and information. For accurate troubleshooting in the future, the time should be set correctly.



Set the desired output voltage based on the critical load's requirement.

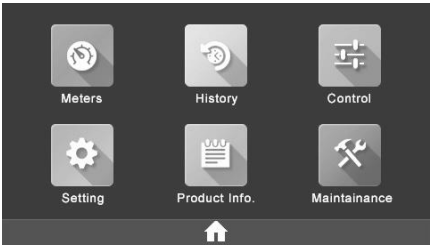
7.2.3 The main page and pop-up page



Number	Name	Description
①	Alarm or fault	Any fault or alarm messages are displayed here. The display will scroll through multiple messages if there are more than one. This section will be left blank when no active alarms are present.
②	Input information	Three input status are displayed: Bypass, Mains, and Battery. The current input state will be highlighted.
③	System status	Different system status are distinguished by the colour: Blue = Normal; Orange = Alarm; Red = Fault. The Text indicates system operating mode. Tap this section to bring up detailed system information.
④	Menu	Tap this icon to enter the main menu page.
⑤	UPS number	Indicates the UPS number in a paralleled system. For a single UPS system, this display is always 'UPS1'
Number	Name	Description
⑥	Battery Status	Displays battery information.
⑦	Output information	Displays output information.
⑧	Time	Displays the system time. To adjust it, go to: Setting → General → System Time.

7.2.4 Menu

Under the main page, click on the menu icon in the lower left corner to enter the Menu page.



Click on each icon to enter the corresponding sub-menu page.

Screen saver

- Under any page, the screensaver is activated within 5 minutes of inactivity. When screensaver is active, touch the screen to return to the

screen where it was left off.

- Under any page, the LCD will go back to the main page within 15 minutes of inactivity.
- The Screensaver function can be disabled from the Setting page.

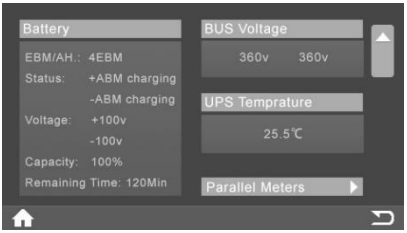
7.3 Operation

7.3.1 Query UPS real-time parameters

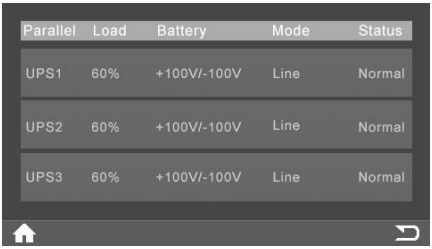
On the Menu page, click the on the Meters icon to enter the real-time parameter page. Click on the the page scrolling icon to change the query for the following items:

-Line, Output, Bypass, Load real-time parameters;

-Battery, BUS Voltage, Ambient temperature, parallel parameters.

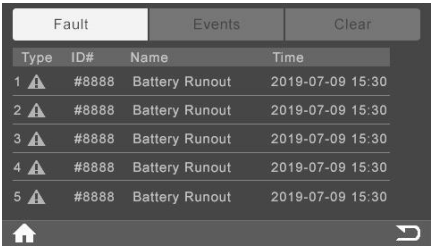


Tap on the arrow icon of the parallel parameter on the right picture to view the running status of all UPS in a paralleled system on one UPS:

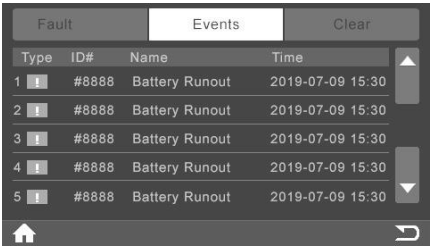


6.3.2 Query or clear UPS history

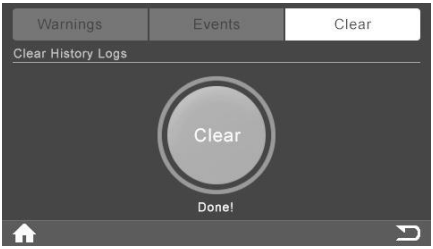
Click on the history icon on the menu page to enter the history page:



The events and alarm list are time stamped to when they occurred, up to 100 entries. Severity levels are distinguised by the different icon colour.

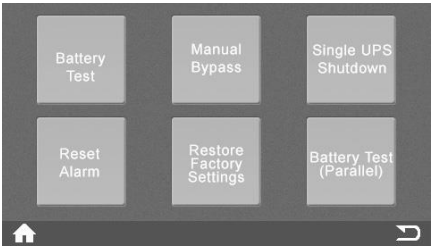


Under the Clear menu, tap on the Clear button to clear all records.



7.3.3 UPS operation control

Select Control from the Menu page to enter the Control page. This page requires the user password by default. If the password is entered incorrectly for 3 consecutive times within 5 minutes, the LCD will switch back to the main page. Following this, the Control and Setting will be locked for 5 minutes and will not be able to be operated during this timePassword protection can be disabled under: Setting → Password:



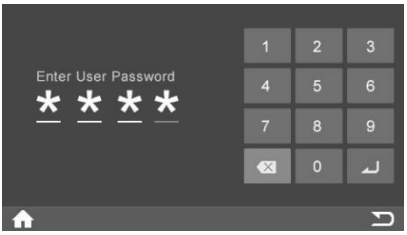
In a Paralleled system, there are 6 kinds of control operations available as shown in the figure above. In a Single UPS system, only 4 kinds of control operations are available.

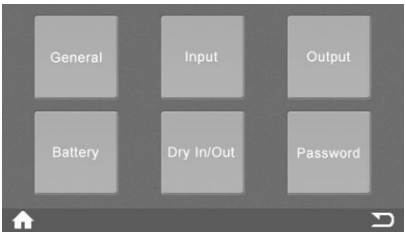
Control function	Description
BatteryTest	Start a manual battery test
Manual Bypass	Forces the UPS to enter or exit bypass mode manually, if conditions permit.
Single UPS Shutdown	Manually shuts down this UPS
Reset Alarm	Clears all alarms during fault mode.

Control function	Description
Restore Factory Settings	Restore all settings to the default factory settings. This is only permissable in bypass mode.
BatteryTest (Parallel)	Start a manual battery test for all UPS in a paralleled system.

7.3.4 UPS Setting

Under the Main Menu page, select Setting to enter the Setting page. This page requires you to enter the user password by default. If you enter the password incorrectly for 3 consecutive times within 5 minutes, the LCD will switch back to the main page. Following this, the Control and Setting will be locked for 5 minutes and will not be able to be operated during this time. The password protection can be disabled under: Setting → Password.





UPS Setting table：

Sub-setting	Setting item	Setting content
General	Alarm	[Enabled] [Disable]
	Language	[English] [简体中文]
	Date/Time	YYYY-MM-DD HH:MM:SS
	LCD Brightness	[0-100%]
	LCD Saving Mode	[Enabled] [Disable]
	Screen Rotation	[Auto Rotate] [Horizontal] [Vertical]
Input	Site Wiring Fault	[Enabled] [Disable]
	Bypass Voltage Lower Limit	xxx V (≥110V)
	Bypass Voltage High Limit	xxx V (≤276V)
	Bypass Frequency Range	[5%,10%]
	HE Voltage Low Limit	xxx V (≥110V)
	HE Voltage High Limit	xxx V (≤276V)
	HE requency range	[5%,10%]
Sub-setting	Setting item	Setting content
Output	UPS Mode	[Line mode]

		[High Efficiency] [Frequency]
	Output Voltage	[220V] [230V] [240V]
	Output Frequency	[Auto Detection] [50Hz] [60Hz]
	ESS Function	[Enabled] [Disable]
	Auto Bypass	[Enabled] [Disable]
	Auto Restart	[Enabled] [Disable]
	Clear SC Fault	[Enabled] [Disable]
	Overload Prealarm	[50%,105%]
Battery	DC Start	[Enabled] [Disable]
	Battery Auto Test	[Every ABM Cycle][Disable]
	Deep Discharge protection	[Enabled] [Disable]
	Sleep mode	[Enabled] [Disable]
	Low Battery Warning	[0%,100%]
	Low Remind Time Warning	[0,999min]
	Restart Battery Level	[0%,100%]
	Charge Current	[1A~13A]*
	Extearnal Battery Module	[Auto Detection] [External Battery Setting EBM] [External Battery Setting AH]
Dry In/Out	Dry Contact Input Signal	[No Function] [Start Up] [Shut Down] [Maintainance]
	Dry Contact Output Signal	[Load Supply] [Battery Mode] [Battery Low Voltage] [Battery Detatched] [Bypass Output] [UPS Normal]
	ModBus Address	[1-255]
Password	Setting Password	[Enabled] [Disable]
	Control Password	[Enabled] [Disable]
	Change Password	****

* When connecting to external batteries, please refer to the table below to set the charge current and AH value.

EBM charge current setting table			
EBM Str number	Battery number/AH	Total AH	Setting charge current
1 Str EBM	1*2*20 PCS/9AH	9AH	2A
2 Str EBM	2*2*20 PCS/9AH	18AH	4A
3 Str EBM	3*2*20 PCS/9AH	27AH	6A
4 Str EBM	4*2*20 PCS/9AH	36AH	8A
5 Str EBM	5*2*20 PCS/9AH	45AH	10A
6 Str EBM	6*2*20 PCS/9AH	54AH	12A
*1 Str =2 EBMs			

Self-configured battery charge current setting table			
Battery Unit AH	Battery number	Total AH	Setting charge current
18AH	2*20PCS	18AH	4A
26AH	2*20PCS	26AH	6A
38AH	2*20PCS	38AH	8A
65AH	2*20PCS	65AH	13A
100AH	2*20PCS	100AH	13A
120AH	2*20PCS	120AH	13A
150AH	2*20PCS	150AH	13A
200AH	2*20PCS	200AH	13A

7.4 UPS Operation

7.4.1 UPS Startup

Startup preparation:

Before starting up the UPS, please make sure that the wiring is securely connected to the terminal block to prevent electric shock and arcing.

- Verify that the total UPS output load does not exceed the rated capacity of the UPS;
- The wiring of the UPS input and output is correctly connected according to the required mode. Refer to section 4.1- input/output wiring;
- Confirm that the UPS output devices are off;
- Make sure the UPS is connected to the batteries properly;
- Install the communication modules if required.

Startup the UPS with utility power:

- Connect to the utility power;
- The fan will start to rotate, and the LCD displays "EATON" on the Startup animation, then enters the main page;
- If UPS 'start on Bypass' is enabled, the main page will show that the UPS is in bypass mode;
- The default input/output mode is 3 phase input and 1 phase output. If it is inconsistent with the actual connection requirement, it needs to be changed before the startup

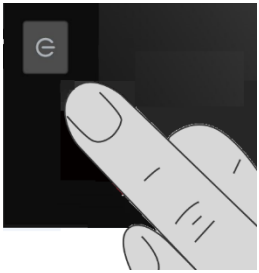
If you want to disable the 'start on Bypass' function, Setting → Output Setting

→ Auto Bypass.

The input/output mode can be modified by a service personnel under:Service → Input and output mode:

1. Pull out the EPO connector
2. Connect to the utility power, the fan will start to rotate, and the LCD will enter the main page.
3. Check the UPS mode on the LCD. If it is different from the actual wiring mode, change to the wiring mode.
4. Power off the UPS completely after powering on, confirm that the mode is set correctly.

5. After the UPS is powered off again, insert the EPO terminal and power it on again
    - Press the button for more than 1 second, the buzzer will beep and the UPS will start up. After a few seconds, the UPS will enter the mains page.



    - If the utility power is out of range, the UPS will transfer to Battery mode.
    - The UPS can be started without any batteries connected to it. If this is the case, the 'no battery' alarm will appear, and if utility power is out of rage, the load will drop.
    - When the LCD shows a charging sign during online mode, it indicates that the batteries are being charged.
    - Startup the output devices.

Starting the UPS without utility power (Cold Start).

When the UPS is connected to the batteries, wait for at least 10 seconds before pressing the power button.

'Start on Battery' can be enabled or disabled. For details, see 7.3.4 Settings → Battery Setting.

Make sure all connections are correct.

- Press the On/Off button for more than 0.1 seconds. The UPS will start up with fans rotating and LCD displaying the startup animation then enters the main page displaying it is on Standby Mode.
- After 10 seconds of inoperation, the LCD screen will switch off and UPS will power down.
- Press and hold the On/Off button for more than 1 second, the buzzer beeps and the UPS will enter battery mode with the outlets powered up.
- If the utility power is connected at this time, the UPS will switch to online

mode without interruption to the output.

- In battery mode, the buzzer will beep once every 4 seconds to indicate that batteries are being discharged. To disable this alarm, see section 7.3.4 Setting → General
- Since utility power is not present, the input out of tolerance alarm will appear on the LCD screen.

7.4.2 UPS Shutdown

Shutting down the UPS with in Online mode:

- Press and hold the On/Off button for more than 3s until the LCD shows a confirm shutdown page.
- Tap on Confirm and wait for the UPS to shut down.
- After the shut down, the UPS will still be on bypass mode.
- Disconnect the utility power to shut down the load.

Shutting down the UPS in battery mode:

- Press and hold the On/Off button for more than 3s until the LCD shows a confirm shutdown page. Tap on Confirm and wait for the UPS to shut down.
- The load will be dropped, and the UPS will go to standby mode, before automatically powering down after a few seconds.

7.4.3 UPS function

- Working modes

Mode	Break time	Output frequency	PF correction
Online mode	0ms	Synchronised with the input within range	Yes
High efficiency mode	10ms	Synchronised with the input	No
ESS mode	2ms	Synchronised with the input	No
CVCF mode*	0ms	Fixed 50Hz/60Hz	Yes

**NOTE: In CVCF mode, if UPS is connected to a single-phase input, the UPS rating needs to be derated to 60% of its rated capacity.*

- Automatic Restart

After the battery is depleted and utility power is restored, the UPS will enter the bypass mode and charge the batteries. If automatic restart is enabled, and

the battery reaches the set restart threshold, The UPS will automatically restart.

If the restart battery level threshold is set to 0%, the UPS will restart as soon as utility power is restored.

- Short circuit fault clearance function

If the Short circuit fault clearance function is disabled, after the UPS will turn to fault mode after 200ms of a short circuit occurance, and the output will be switched off until the fault is cleared.

If the Short circuit fault clearance function is enabled, after 200ms of a short circuit occurance, the UPS will keep at the rated current output for 10 seconds. If the fault is cleared within 10 seconds, the UPS will automatically return to the online mode, otherwise it will switch to fault mode. This function is particularly useful when multiple output circuits are connected, a short circuit of a single output circuit will cause the fuse of that circuit to blow, thus ensuring power supply continuity to the other circuits.

- Overload warning function

By default, the overload warning starts at 105% of the rated output. This can be adjusted to suit different applications.

- Battery deep discharge protection

This function enables the UPS to calculate the actual discharge power based on the number of EBMs or the Ah value, and dynamically adjust the battery low voltage warning points and discharge end points. If this is function is disabled, the battery low voltage warning is fixed at 10.5V/block, and discharge end point is at 9.6V/block.

- Sleep mode

With this function enabled, the UPS will go into sleep mode for 60 minutes after UPS is shut off into bypass mode while utility is not present. In this mode, the communications, display, and other functions are still operating normally. This function is recommended to be enabled for UPSs deployed in remote or unattended sites.

7.4.4 Parallel UPS

1. General single UPS operation procedure applies in a paralleled system.
2. Paralleled UPS startup:

   Startup with utility power present:

   - After connecting to the utility power, press and hold any UPS' On/Off button for more than 1 second, all the UPS in the system will be powered on and go to online mode at the same time.
   - When one of the UPS in a paralleled system is switched on to online mode, the other UPSs in the system will automatically go to online mode as soon as utility power is supplied to them.

   Startup on battery (Cold Start):

   - Press the On/Off buttons of every UPS in the system until they go on standby mode. Then Press and hold the On/Off button of one of the UPS until the UPS starts up and goes into battery mode (inverter on). All UPSs in the system will startup and go to battery mode at the same time.
   - When one of the UPS in a paralleled system is started on battery mode, pressing the On/Off button of all other UPSs will activate them to go to standby mode, and subsequently will automatically go to battery mode (inverters on).

3. Paralleled UPS Shutdown

   Shutting down a single UPS:

   • Shutdown via the LCD screen Control menu, see 7.4.2 for more details.

   Shutting down the entire paralleled system:

   • Press and hold the On/Off button of any UPS in the system for more than 3 seconds until the system goes into bypass mode. Disconnect the utility power to power down the load.

7.4.5 Using common battery bank for a paralleled system

This product can be set to share a common battery bank for multiple UPS paralleled together. Please contact your certified Eaton service provider to perform this operation.

Ensure the battery capacity meets the full load requirement for the parallele system:

- For 2 UPS paralleled system, the common battery string's rating shall be greater than 18Ah;
- For 3 UPS paralleled system, the common battery string's rating

shall be greater than 27Ah;

8. Battery maintenance

Batteries are an important component in a UPS system. The life span of the batteries is dependant on the ambient temperature and the number of discharges. A general rule of thumb is: The higher the temperature is past the rated ambient temperature, and higher the number of discharges that occurs, the lower the life span of the batteries will be.

There are no batteries in the UPS' power modules. It is recommended to use the standard EBM in this product series. Standard EBM usage precautions:

1. Batteries are of sealed lead-acid maintenance free type. When connected to the utility power via the UPS' power module, the batteries will always be cahregd regardless of the state the UPS is in. The charging of the batteries is managed by the power module and provides over-charging and deep discharge protection.
2. The ambient temperature around the batteries should be maintained between 15-25 ° C.
3. During storage, it is recommened to recharge the batteries every 3 months.
4. It is recommended to schedule a full battery discharge test once every 4-6 months in a standard ambient temperature environment, and once every 2 months in higher temperature environment.
5. Please refrain from discharging the batteries at no load.
6. When replacing batteries, please ensure all batteries within a string have a consistent rating and age. IT is advisable to replace a whole string rather than individual battery blocks.
7. The batteries have a design life of 5 years, with a typical life expactency of 3-5 years if used in a condition closed to what's described on the specifications in this document. If batteries are used in conditions that differ to the specifications, it is advisable to schedule battery replacements more frequent than a 3-5 years to ensure good power continuity.

9. Troubleshooting

The following table is a list of faults with descriptions. If presented on the screen, contact your Eaton service representative to provide the following information:

1. Product model, serial number;

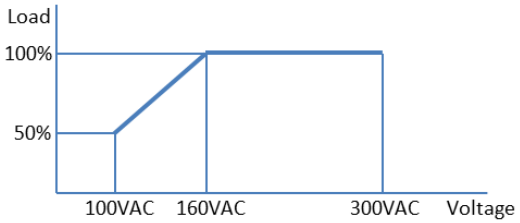
2. Fault date; 3. Description of the fault

Fault num	Fault name	Possible cause	Solution
107	Input line reversed	Input L N line reversed	Confirm the input connection
		No ground	Confirm the ground connection
120	N line loss	N line not connected	Confirm the N line connection
63F	Positive battery is not connected	Battery not connected	Check the battery and battery cable. If the battery is damaged, please replace it immediately by professional person
642	Negative battery is not connected		
641	Positive battery low voltage	Battery voltage low	Check the battery, If the battery is damaged, Replace it immediately by professional person
644	Negative battery low voltage		
646	Positive battery overcharge	Battery voltage high	Check the battery and charger, If the battery is damaged, Replace it immediately by professional person
648	Negative battery overcharge		
645	Positive charger fault	UPS charger fault	Please contact your supplier
647	Negative charger fault		
640	Positive battery number incorrect	The number of batteries is incorrect	Please contact your supplier
643	Negative battery number incorrect		
300	Positive Bus high	Positive Bus voltage high	Please contact your supplier
301	Negative Bus high	Negative Bus voltage high	Please contact your supplier
302	Positive Bus low	Positive Bus voltage low	Please contact your supplier
303	Negative Bus low	Negative Bus voltage	Please contact your supplier

		low	
304	Bus imbalance	Bus imbalance	Please contact your supplier
308	Bus short	Bus short	Please contact your supplier
100	Bus soft start failed	Bus boost fault	Please contact your supplier
805	Output short	Output short	Turn off the UPS, remove all loads, verify the load is not fault or short circuit. Press the button to clear the fault alarm and restart. If it fails, please contact your supplier
822	L1 Output short		
823	L2 Output short		
824	L3 Output short		
70D	Inverter voltage high	Inverter voltage high	
70C	Inverter voltage low	Inverter voltage low	
704	Inverter soft start fault	Inverter startup fault	Please contact your supplier
705	Inverter overload fault	Load exceeds rated value	Redistribute the load, remove the non-critical load, and check if the load is fault
808	Output overload fault		
208	Bypass overload fault		
70E	Inverter capacitor disconnect	Inverter damage	Please contact your supplier
010	Main SPS fault	UPS internal power supply is abnormal	Please contact your supplier
017	Auxiliary SPS fault		
806	Emergency shutdown	Shut down in emergency	Please check EPO terminal status
706	Internal heat sink temperature high	Internal over temperature fault	Please contact your supplier
203	Bypass temperature high		
501	Charger temperature high		
004	Ambient temperature high	Ambient temperature high	Check if the ambient temperature exceed 50°C. If the ambient temperature is normal, the UPS still alarms. Please contact your supplier
007	Internal fan fault	Fan fault	Please contact your supplier
20E	Bypass fan fault		
80D	Working mode fault	Working mode setting error	Please contact your supplier
811	Negative power		Please contact your supplier

00E	Parallel line loss	Parallel connection is abnormal	Please check if the connection is normal
00F	Parallel inconsistent	Parallel setting inconsistent	Please check parallel setting, if still alarm, Please contact your supplier

10. Appendix: General specification

<table>
<tr><td colspan="2" rowspan="2">Model name</td><td>9SX</td><td>9SX</td></tr>
<tr><td>15KPM(AU)</td><td>20KPM(AU)</td></tr>
<tr><td colspan="2">Rated power</td><td>15kVA/15kW</td><td>20kVA/20kW</td></tr>
<tr><td colspan="2">Rated frequency</td><td colspan="2">50/60Hz</td></tr>
<tr><td rowspan="4">Input</td><td>Voltage range
(Phase Voltage)</td><td colspan="2"> 

100~300VAC</td></tr>
<tr><td>Rated voltage
(Phase Voltage)</td><td colspan="2">220/230/240VAC</td></tr>
<tr><td rowspan="2">Rated current</td><td>35A(3phase)</td><td>43A(3phase)</td></tr>
<tr><td>105A(1phase)</td><td>129A(1phase)</td></tr>
<tr><td>Frequency</td><td colspan="2">40-70Hz</td></tr>
<tr><td colspan="2">Charging current</td><td colspan="2">1~13A adjustable (default 2A)</td></tr>
<tr><td rowspan="4">Output</td><td>Rated voltage
(Phase Voltage)</td><td colspan="2">220/230/240VAC</td></tr>
<tr><td rowspan="3">Overload</td><td colspan="2">105%-125% Load, 10 minutes transfer to Bypass;</td></tr>
<tr><td colspan="2">125%-150% Load, 30 seconds transfer to Bypass;</td></tr>
<tr><td colspan="2">>150% Load, 0.5 seconds transfer to Bypass</td></tr>
<tr><td colspan="2">Transfer Time
Line<->Battery</td><td colspan="2">0ms</td></tr>
<tr><td colspan="2">Transfer Time INV<->Bypass</td><td colspan="2">0ms</td></tr>
<tr><td colspan="4">Battery</td></tr>
<tr><td colspan="2">Battery Voltage</td><td colspan="2">2*192-2*240VDC adjustable (default 2*192VDC)</td></tr>
</table>

Battery Number	2*16-2*20PCS adjustable (default 2*16PCS)
Environment	
Ambient temperature	0℃ ~ 50℃(Derating 50% above 40℃)
Relative humidity	0 ~ 95%(no condensing)
Operating altitude	<4000m(Derating use above1km)
Storage temperature (With Batteries)	-15℃ ~ 40℃
Storage temperature (Without Batteries)	-25℃ ~ 60℃
Certification	
Safety	EN62040-1:2008+A1:2013
EMC	EN 62040-2