INTELLIGENT ONLINE UPS

BRIC30S/BRIC30N User Manual

Contents

Introduction

Thank you for purchasing our product. Please read through this manual carefully to ensure the correct operation of the product you purchased. We will also help you with installing and operating this product. Please note the following warranty service terms & conditions:

- The product casing should only be opened by technicians from us or an authorized distributor as it represents an electrocution hazard. Unauthorized access will void your warranty.
- All product components have been inspected to ensure their high quality. Parts should only be replaced by qualified personnel from us or an authorized distributor.
- Please note the warranty period on the UPS you purchased.
- Please read the information on UPS safety precautions and maintenance contained in this manual thoroughly before installation.

1. Safety Precautions

1.1. Important Rules

1.1.1. Please follow these UPS operating instructions to ensure safe and proper operation.

1.1.2. When the UPS is being moved or operated, please ensure that the machine is standing vertically. Do not shake or tip over the machine. Avoid heavy impact.

1.1.3. Poor grounding will lead to unexpected current leakage. Please ensure that the AC power input is properly grounded (PE Ground) before making any connections.

1.1.4. Please make sure that the UPS is placed in an insulated environment before use and that there are no electrocution hazards to the operating personnel.

1.1.5. Do not connect the neutral wire with the ground and make sure that the input voltage is correct.

1.1.6. Once the UPS has been switched on, if the UPS needs to be moved then it must be fully switched off and fully discharged. If the UPS is not discharged, the UPS will switch to battery power after grid power is disconnected and pose an electrocution hazard.

1.1.7. Do not place any objects, liquid containers, or coverings over the UPS. The liquid spilt into the UPS or heat prevented from dissipating could lead to internal damage or cause electrocution.

1.1.8. Make sure that the battery specifications match the UPS requirements before connecting any external batteries.

1.1.9. Please follow the rules below before engaging in any activity that involves the battery.

a. Remove all metallic items such as rings, watches and jewelry before working on the battery.
b. Please use insulated tools.
c. Do not open or damage the battery. The toxic liquid inside will harm the skin and eyes.
d. Keep batteries away from fire to prevent explosion.

1.2. **Symbols**

Please follow the instructions and warnings on the UPS module.

WARNING！Refer to the operating instructions.

WARNING！High voltage inside.

Ground.

2. Product Introduction

2.1. General Characteristics

2.1.1. Pure online UPS architecture to provide connected equipment with pure sine wave AC power that is stable, continuous and has a fixed voltage.

2.1.2. High-efficiency PWM sinusoidal modulation technology is used to improve the UPS efficiency and stability.

2.1.3. Overload Protection: Automatic overload protection that will run for 60 minutes when load exceeds 110%. Overload protection lasts 10 minutes when load exceeds 125% and 1 minute when load exceeds 150%. When overload protection ends, UPS will automatically switch to the alternative power supply circuit. When the situation ends the UPS automatically restores the inverter. If overloading forces the UPS to switch to the alternative circuit more than 3 times, the switching mechanism is locked on the 3rd time to keep the UPS on the alternative circuit.

2.1.4. Short Circuit Protection: When there is short circuit in the output, the UPS will automatically cut off, sound an alarm and retain the error so the user can troubleshoot the problem. The automatic cut-off prevents electrocution and fire hazards during the troubleshooting process.

2.2. Special Features

2.2.1. Digital Signal Processor (DSP) is used to monitor the UPS operation to improve its function and protection. Monitoring is enabled through the signal port.

2.2.2. There are three user-selectable operating modes: VFI mode, ECO mode, and CONVERTER mode.

2.2.3. The cold-start module allows the UPS to be started from the battery side when emergency power is needed.

2.2.4. PFC Control is used to maintain the input power factor correction at PF>=0.99 and reduce the load on the grid.

2.2.5. Programmable output voltage devices allow the user to select the voltage appropriate to the current environment.

2.2.6. Touch control interface allows data to be displayed in real-time. The

monitoring program can also display any errors for fast troubleshooting.

2.2.7. The modular design of this UPS means it can not only operate independently but also in parallel mode for even higher power output.

2.2.8. It has passed CE safety and electromagnetic interference protection certification.

3. Unpacking and Installation

The UPS may experience unexpected circumstances during transportation. We recommend inspecting the packaging for any signs of damage or improper handling before unpacking so you can contact the distributor immediately.

At least 3 people are required during unpacking and installation for safety reasons.

3.1. Environmental Requirements

A proper installation environment not only ensures the effective operation of the UPS but also reduces the chance of failure and extends service life. Please take the following recommendations into account to select the most suitable environment and reduce the likelihood of accidents.

3.1.1. This product must not be used in an environment with sparks, smoke or gas to prevent arcing, injury, and fire hazards.

3.1.2. Avoid using dusty materials, volatile gases, or corrosive substances with a high salt-content in the environment where the UPS is installed.

3.1.3. The installation location of the UPS should be well-ventilated. During charging, the chemical reaction of the battery generates small amounts of gases. If there is a crack in the battery then this may pose an environmental hazard.

3.1.4. Please check the installation location. Do not install the UPS in an environment outside the range specified in the manual (Temperature: 0-40, relative humidity: 0-95%) that is too hot or too humid.

3.1.5. Do not place in a location near a heat source as this will shorten the battery life.

3.1.6. Do not place outdoors and avoid direct exposure to sunlight.

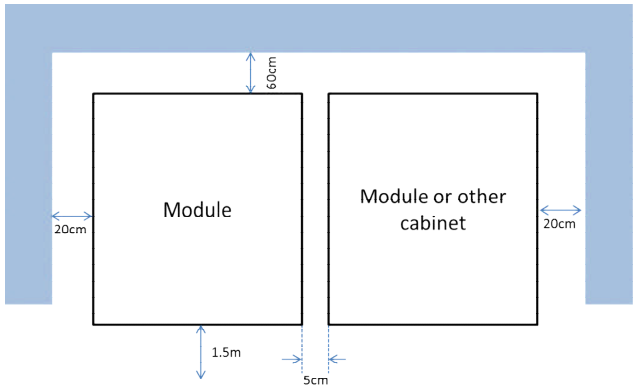
3.1.7. Please ensure that the environment where the UPS is placed is free from animals that may damage the wiring, such as: rats and other small animals.

3.1.8. Please ensure that the floor is strong enough to hold the UPS and battery. It must keep the equipment stable to ensure that it won't suffer damage in a fall.

3.1.9. We recommend placing a fire extinguisher near the UPS in case of an

emergency.

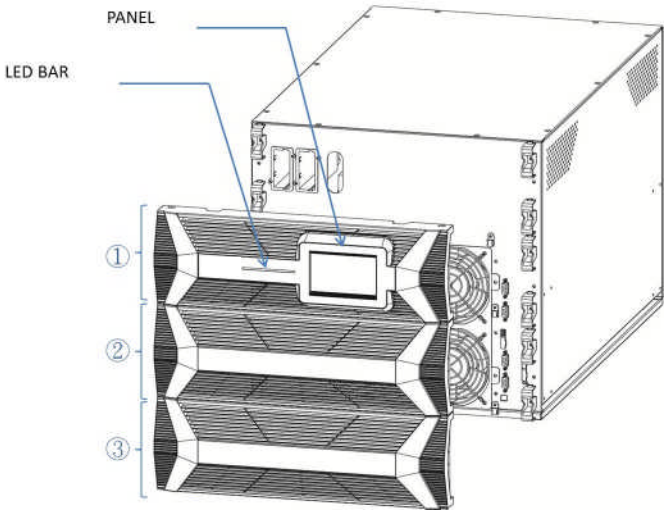
3.1.10. Please obey the following distance restrictions when installing the UPS to ensure its normal operation.



3.2. **Easy Installation and Removal**

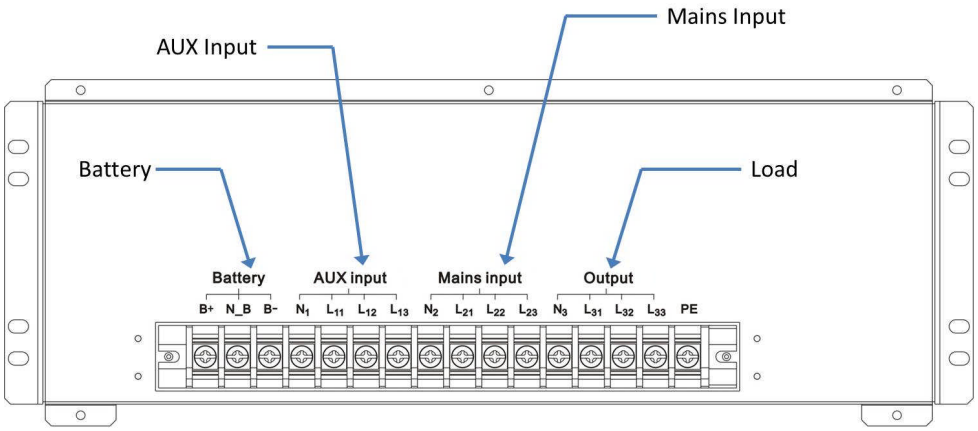
The UPS module should be placed inside a cabinet for safety when running. An optional rack mounting is available for BRIC30S/BRIC30N installation. Please refer to the mechanical installation guide for safety purposes.

The outer casing may need to be removed in certain situations to operate the machine. The front panel of the UPS features three molded covers. Cover ① contains the touch screen, signal LED and external communications port. Once covers ①②③ have been removed, the power knob and internal communications port are revealed on the front of the inner casing.



3.3. Electrical Installation

3.3.1. BRIC30S/BRIC30N uses a plug and play design for the power input. Grid power can be connected to the connector kit to power female socket. When the UPS module is connected to the connector kit, power becomes available. The power supply installation of the connector kit is as shown below:

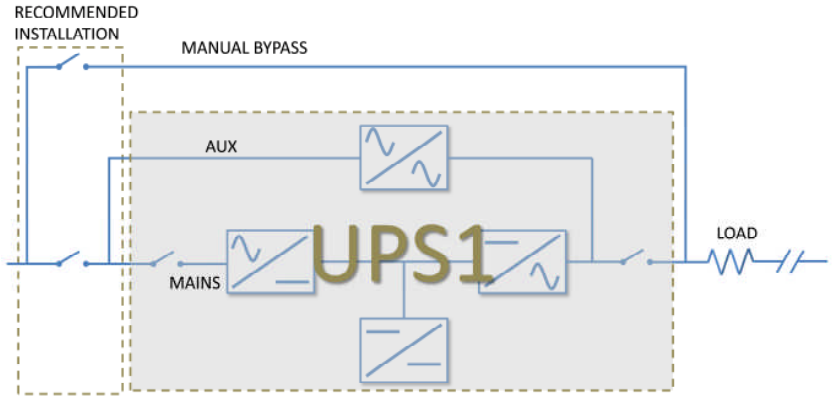


Attention: For safety reason, please plugging machine is carried out by technicians.

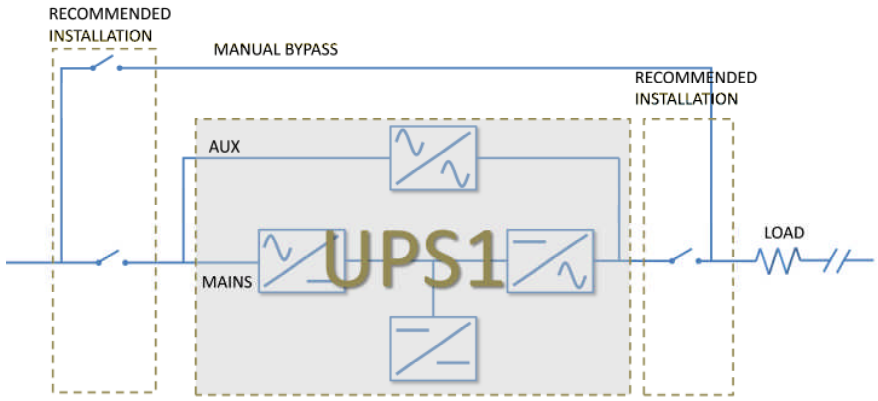
Attention: Phase direction→L11/L21/L31 is indicated phase R; L12/L22/L32 is indicated phase S and L13/L23/L33 is indicated phase T.

3.3.2. BRIC30S/BRIC30N offers two installation methods for connecting external UPS power sources: single-loop or dual-loop:

- Single-Loop



BRIC30S schematic diagram

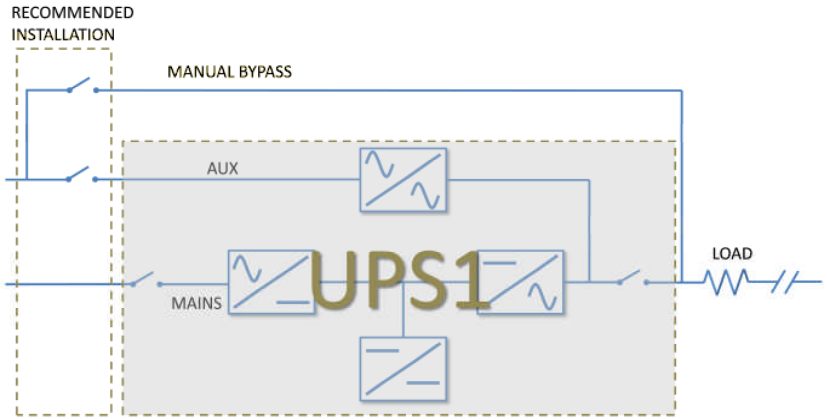


BRIC30N schematic diagram

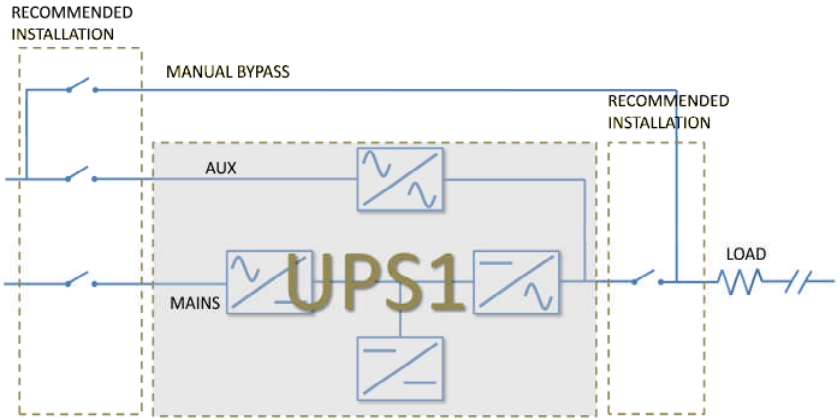
In a single-loop setup, the MANUAL BYPASS, AUX and MAINS use the same input source. The input must have a common connection between the AUX and MAINS ports. In single-loop mode, we strongly

recommend that including circuit breakers for the power input and Manual Bypass should be indispensable (as shown by RECOMMENDED INSTALLATION in the figure).

- Double-Loop



BRIC30S schematic diagram



BRIC30N schematic diagram

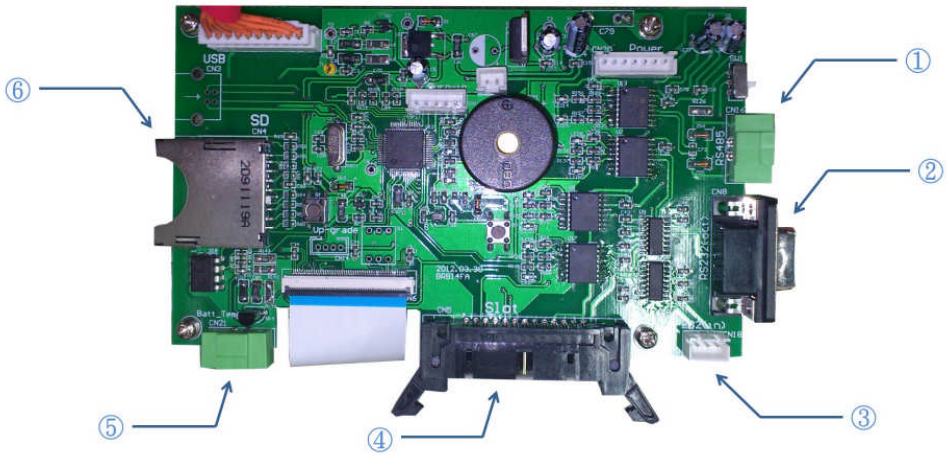
In double-loop mode, the AUX and MAINS each use a different power input. Grid power can go through MAINS while AUX can be connected to the backup power supply. We strongly recommend that including circuit breakers for the AUX input and Manual Bypass should be indispensable (as shown by RECOMMENDED INSTALATION in the figure).

Attention: In a single-module setup, the RECOMMENDED INSTALATION component is rated for 63A.

Attention: Recommend using the rated of cable 8AWG for phase L of AUX input / Mains input / Load and more then 6 AWG for phase N; 6 AWG for B+/N_B/B-; 6AWG rated for PE with color yellow/green wire.

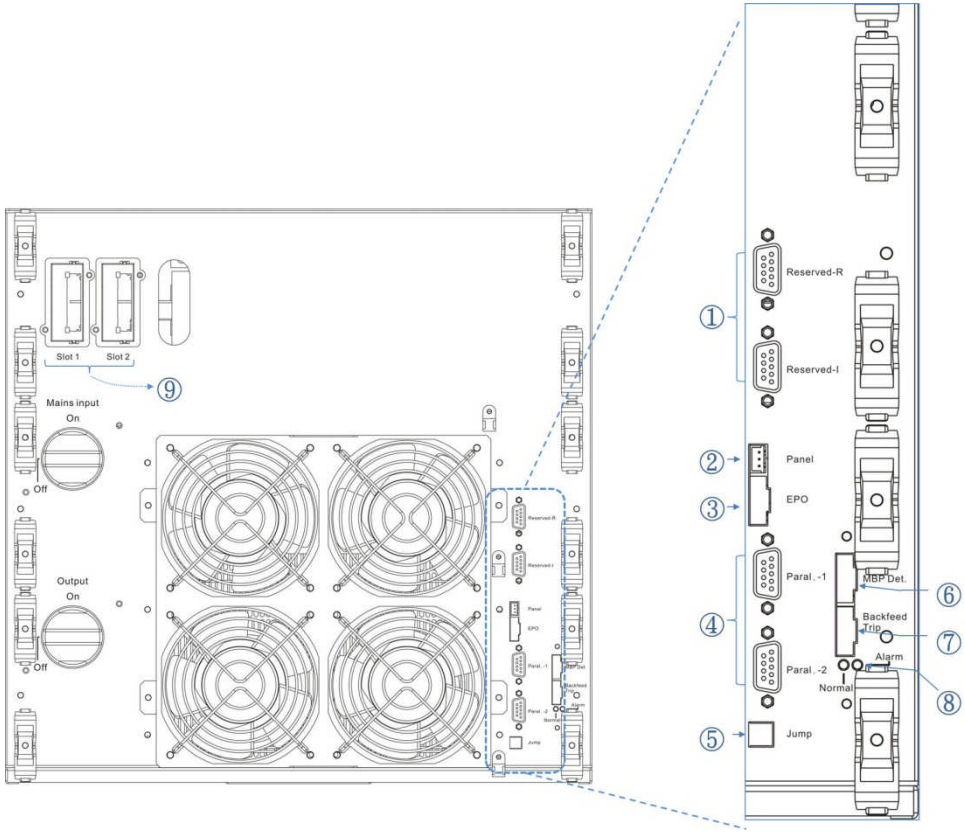
3.4. **Comm. Port Description**

◆ External communications of BRIC30S/BRIC30N interface is placed within the front external plastic casing. The location and function are described below:



① RS485 port
② RS232 port
③ Touch screen connector (Connects with comm. port ② on the inner casing's front panel)
④ Expansion slot comm. port connector
⑤ Battery temperature signal port
⑥ SD Card slot

◆ Internal communications BRIC30S/BRIC30N interface, alarm, and expansion slot are fitted to the front panel of the inner metal casing. The locations and functions are described below:



① Reserved Port
② Touch Screen Comm Connector (Panel Comm. Port)
③ Emergency Power Off (EPO)
④ Parallel Comm Port
⑤ Parallel Jumper (Jump)
⑥ Manual Bypass Signal Port (MBP Det.)
⑦ Backfeed Protection Signal Port (Backfeed Trip)
⑧ LED Light / Alarm sign
⑨ Interface card expansion slot

Attention: In order to avoid technician shocking, the provided Back-feed

protection signal port will output the signal to drive the contactor or breaker equipment and disconnect UPS and bypass when AUX device is failure.

4. Operating Mode and Instructions

An online UPS provides stable power that is not affected by an unstable main power supply (ex. grid power). Through the online UPS, grid power can provide a clean, noise-free power supply environment.

The online architecture offers three types of power supply methods depending on the power environment.

- Normal Mode: When grid power is normal, once RECT has been turned on at the main power supply then the battery is charged in DC/DC mode while the required power is supplied via INV at the same time.
- Bypass Mode: In the event of UPS overload, INV failure or module overheating, the power supply circuit switches from INV to the auxiliary (AUX) output.
- Battery Mode: When the UPS detects a failure in the main power supply then power is provided from the battery instead. The touch screen at the front of the module will also display current battery level to remind the user.

BRIC30S/BRIC30N offers not only the three above power supply modes but also an Economy mode and Converter mode for special environments.

4.1. Operating Mode

4.1.1. Normal Mode:

In Normal mode, grid power is passed through RECT then used to charge the battery and provide power through the INV simultaneously. Different output voltages settings can be set in VFI mode. The three options are 380/220V, 400/230V and 415/240V. These can be fine-tuned by ±8V.

4.1.2. Economy Mode:

Economy Mode (ECO Mode) effectively improves overall efficiency. In ECO Mode grid power is routed through the AUX SCR to the load. At the same time, grid power continues to charge the battery in DC/DC mode through RECT following the same setup as VFI Mode. INV is also kept ready to switch power supply modes at any time. If VFI mode is set then power can be quickly routed from AUX to INV.

Attention: In ECO Mode the power supply frequency and voltage will be less stable. Please check the load requirements and use ECO Mode with care.

4.1.3. Converter Mode:

Converter Mode allows the user to provide a power supply with constant voltage and constant frequency based on their power requirements. The frequency can be set to 50HZ or 60HZ. The voltage options are 380/220V, 400/230V and 415/240V. These can be fine-tuned by ±8V. When Converter mode is used, in the event of grid power failure then power is provided from the battery in Back-up mode. In the event of the battery running low, UPS overload, INV failure or module overheating, the entire system will shut down.

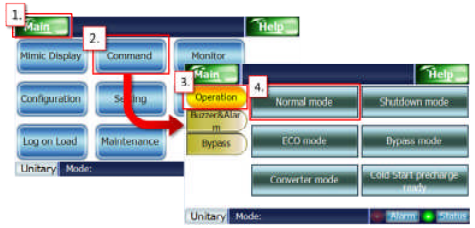
4.2. Single Unit Operation

- Check that the power supply voltage matches the UPS specifications. Make sure the unit is properly grounded.
- Before turning on grid power, make sure that the UPS module is properly closed and in an insulated environment to avoid accidental electrocution.

- Section5 describes how to use the monitoring platform. Please read carefully before use.
- If grid power is turned on but MAINS INPUT is not active, grid power will already be passed through AUX to the SCR. This means the machine is powered and the casing should be kept closed to prevent electrocution.

4.2.1. Mains power normal boot mode

Monitoring Software



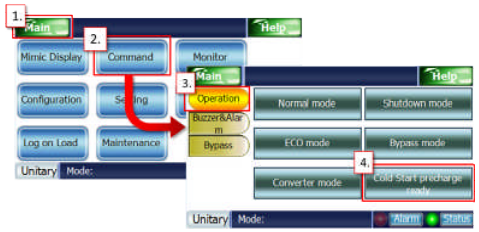
Touch Panel

- Turn on the MAINS INPUT switch on the front panel. The relays and magnetic contacts in the UPS module will activate in series under normal boot conditions. The touch panel or monitoring software will display the tri-phase input voltage, current and frequency return values. The INV in the system is not yet activated at this point but the DC Bus within the UPS module is already at high voltage and represents an electrocution hazard.

- Next, on the touch panel select Main→Command→Operation→Normal Mode, or from the monitoring software select Home→Command→Normal Mode as pictured above to activate INV. The touch panel or monitoring software will now display the UPS output readings and status on the main screen or view page. At this point, the Normal booting process with grid power is complete.

4.2.2. Battery boot mode

Monitoring Software

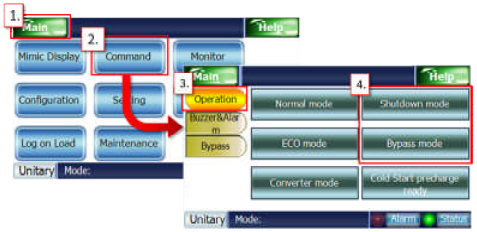


Touch Panel

- BRIC30S/BRIC30N offers a Cold Start kit that allows the UPS to boot directly from the battery when grid power fails.
- Check that the battery capacity and quantity matches the UPS requirements.
- On the touch panel select Main→Command→Operation→Cold Start precharge ready, or from the monitoring software select Home→Command→Cold Start precharge ready as pictured above. The electromagnetic relays in the Cold Start kit will make a sound when the conditions are met. Once the system has been successfully booted, the touch panel or monitoring software will display the system status. The Battery mode boot process is then complete.

4.2.3. Shutdown

Monitoring Software



Touch Panel

- On the touch panel select Main→Command→Operation→Shutdown Mode or→Bypass Mode. Alternatively, from the monitoring software select Home→Command→Shutdown Mode or →Bypass Mode as pictured above. The UPS will then behave as follows:
  a. "Shutdown mode": The UPS shuts down completely and provides no power output.
  b. "Bypass mode": RECT, INV and DC/DC charging are all turned off. Power is only provided to the load via Bypass.

4.3. Parallel Mode Operation

- Please refer to the section 4.2, and highly recommend operating with the mentioned precautions.
- The procedure is described as follow.

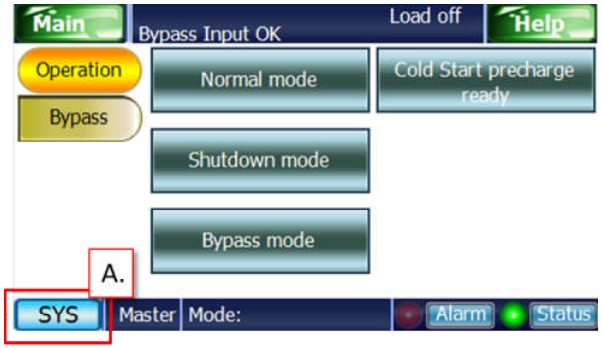
4.3.1. Limits of authority of Command

Click Main → Command to enter this item. The limit of authority of each function is described as following list.

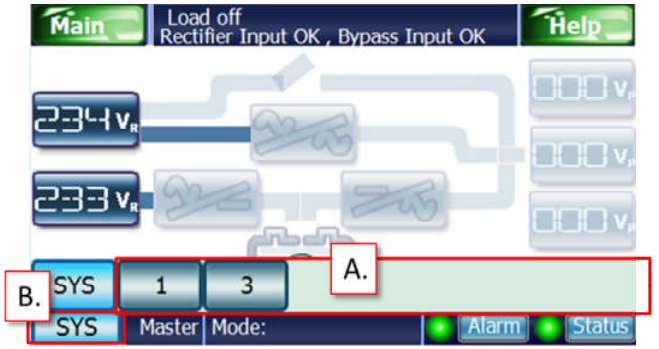
Manu	Item	SYS	Non-SYS
Operation	Normal mode	√	√
	ECO mode		
	Converter mode		
	Shutdown mode	√	√
	Bypass mode	√	
	Cold Start precharge ready	√	
Buzzer & Alarm	Disable		√
	Enable		√
	Latch Alarms Reset		√
Bypass	Recover backfeed protection signal	√	

4.3.2. Procedure

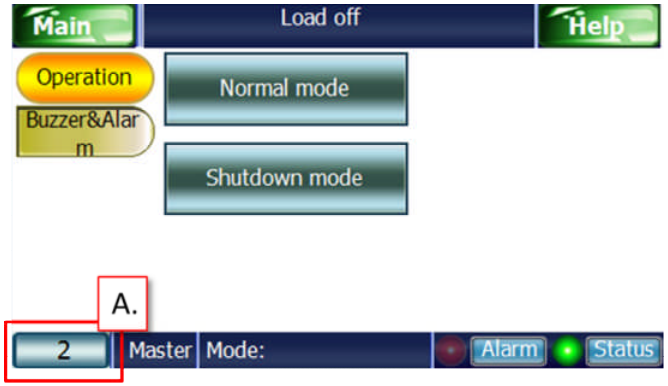
- Before all on-line units need to be functioned with item “command” synchronously, please check that the selected unit is master one and set level “SYS” or select “SYS” level on the panel as the block A of the following figure.



- The selected level SYS showing in the block B means that all machines whose IDs are displaying in the block A are selected to function characteristic setting synchronously.



- Non-SYS level showing in the block A means that the only selected machine whose ID is displaying in block A could be functioned not only characteristic setting but also command item.



4.4. LED Display

- When the system is running the LED indicators on the casing will display the system conditions using a system of different lights.

LED Light	Blinking green light	Searching for connection
	Constant green light	System operating normally
	Blinking red light	System error
	Red light moving from left to right	Emergency system shutdown
	Blinking green and red lights	System in Maintenance mode

5. Monitoring Platform

Each UPS is equipped with a touch screen and embedded system monitoring software. Monitoring software running on a computer can also be used.

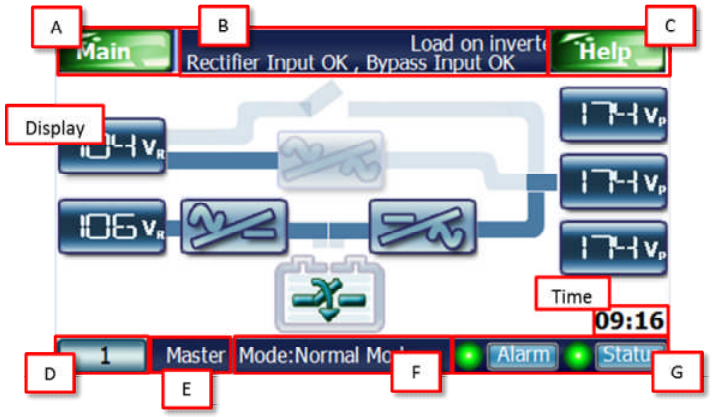
BRIC30S/BRIC30N provides the user with a simple and intuitive user interface that is easy to learn. The touch panel and computer-side monitoring software offers a combination of graphics and numbers that make it easy to determine the input/output voltage, frequency, load and battery level at a glance. The current status of the UPS is displayed at the main screen. The software includes a log viewer for viewing the UPS logs. There is a data logger that integrates the input/output voltage, frequency, load and battery level then displays them in a visualized format. A complete scheduling function allows the scheduling of one-time and regular events. In the event of UPS overload or overheating, the BRIC30S/BRIC30N monitoring software can use Internet to notify the user by e-mail or SMS of the current situation. Computer shutdown and file saving can also be performed automatically. This helps to prevent the loss of data from UPS outage.

Note: Instructions for the monitoring software are provided in the "BRIC-Link" user manual.

5.1. Panel

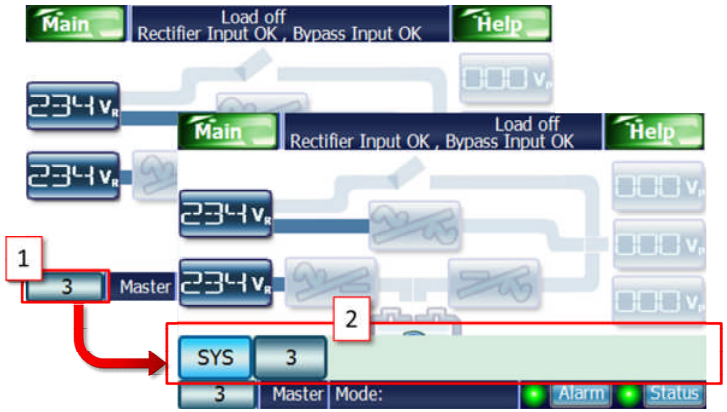
Each UPS module has a touch screen with embedded monitoring software that displays the UPS status in real-time.

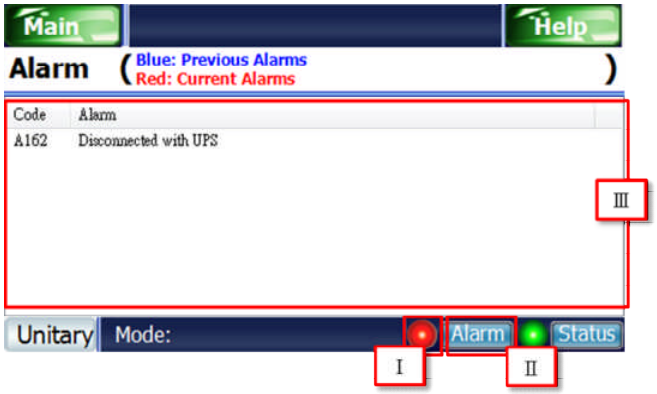
5.1.1. Default screen



Default screen is as shown above. The individual blocks are described below:

- Click Block A to enter the Main. The menu items are as shown in section5.1.2.
- Block B is the status display area. The display is divided into the upper and lower row.
  1. Upper Status: No UPS output, INV Output... … etc.
  2. Lower Status: Rectifier input normal and Bypass input normal.
- Click on Block C Help shows information about each block on the main screen and a tree diagram of the menu options.
- Block D shows the UPS ID needed to observe and the IDs list via clicking the block D. Procedure of modifying the UPS ID shows as following figure. **Attention: "Master" has to exist in the ID list as following and then selecting SYS will work on.**
- Block E shows "Master" or "Slave" with the selected ID of UPS. **Attention: Block E will not appear with unitary mode.**
- Block F shows the current mode and command progress.
- Block G shows the Alarm and Status alerts.



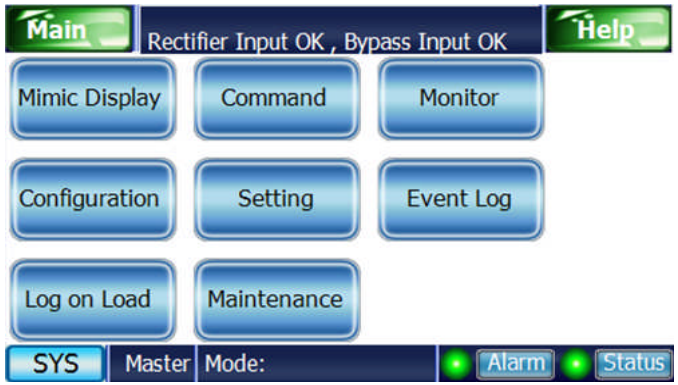


The Alarm and Status alerts are shown above and described as below:

- Block I shows the warning lights. Green light means there are no alarms. Blinking red light means that alarm is currently active.
- Block Ⅱ has the function buttons. Click to display the current status in Block Ⅲ.
- In Block Ⅲ, when Alarm is chosen for display then blue text shows past alarms; red means the alarm is currently active. When the selected display area is Status, this display area will list the current system status.

5.1.2. Main Menu

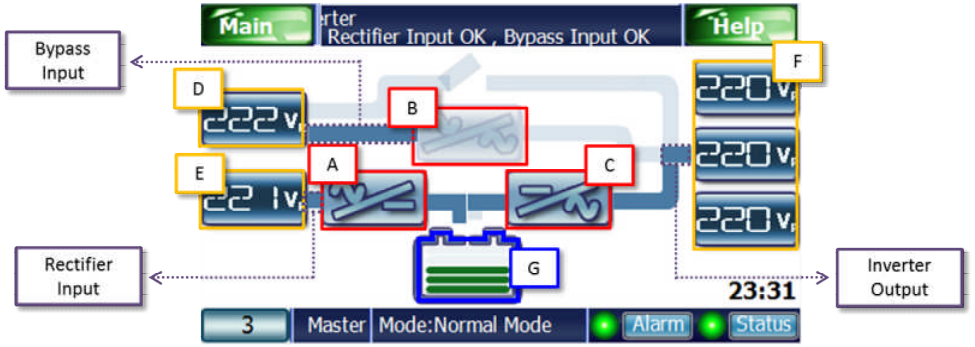
Selecting the Main brings up the UPS settings as pictured below.



➢ All of the functions are listed in the following table:

Menu	Functionality	Description
Mimic Display		This function is mainly used to display important information such as the monitor readings, UPS mode and alarms.
Command		The user can use this function to issue boot, shutdown, and change mode commands to the UPS.
Monitor	Identification	Display the default system information.
	Measurements	Real-time display of all monitor-readings including input and output voltage/current, bypass, load and battery.
	Maintenance Code	Displays the error code of the UPS to help the technician quickly diagnose the system problem.
	Version	Display the current software and firmware version.
Configuration		1. Set alarm functions. 2. Set input, output and bypass display options.
Setting	Date and Time	Set the current date and time of the UPS.
	General	Backlight Delay Time.
	Language	Default language is English. Other languages can be set as default through this function.
	Update Prog.	Update the program.
Event Log		Display a detailed list of UPS events including status, alarms and commands.
Log on Load		A graphical display of load data.
Maintenance		Key in the password “3001” to execute Screen Calibration.

5.1.3. Mimic Display



➢ Block A (Rectifier), Block B (Bypass) and Block C (Inverter) use  to show that a particular system block is not active or not connected;  shows that a system block is active; When  is shown then that system block has experienced an error.

➢ Block D, E, and F use to show that real-time monitor readings are not available because a particular system block is not active or not connected.  shows that the system block is active and real-time monitor readings are available; When  is shown then that system block has experienced an error.

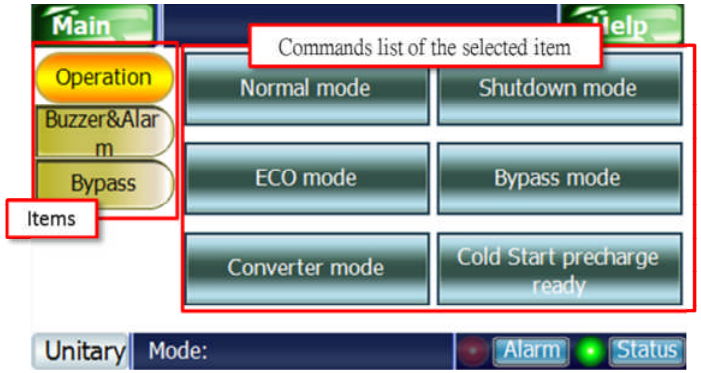
➢ Block G shows the current battery status. When battery is not online then it is shown as  ; When batter is charging, the progress display is green as pictured below:

When batter is discharging, the progress display is yellow as pictured below:

The relationship between battery capacity and progress display is as pictured below:

5.1.4. Command

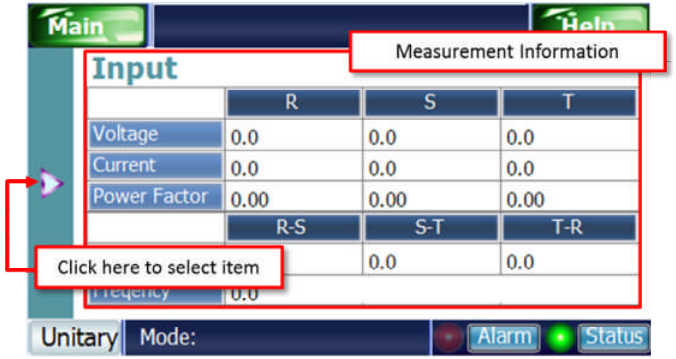
Clicking on Main→Command brings up three options. Clicking on the options brings up the command bar as pictured below.



Attention: We strongly recommend the use of qualified technicians for this function.

5.1.5. UPS Monitor

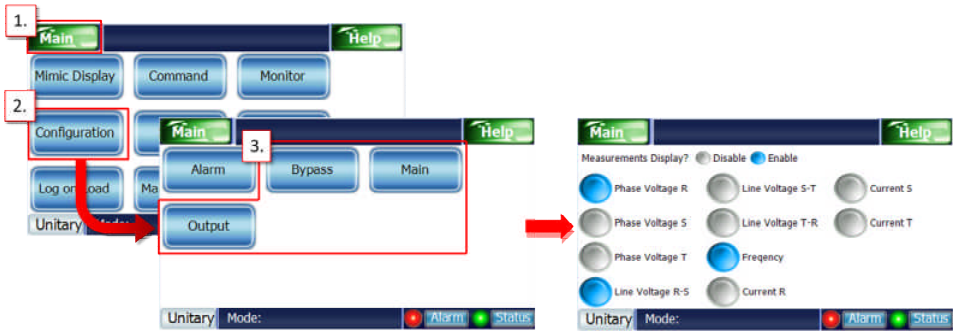
Clicking on Main→Monitor→Measurements will bring up the real-time monitor readings. The pop-up menu on the right can be used to select other observation options as pictured below.



5.1.6. Configuration

- "After clicking on Main→Configuration→Alarm the user can edit the volatile and non-volatile alarm setting as pictured below. After editing the alarm settings, click on "Enter" to save the changes. .

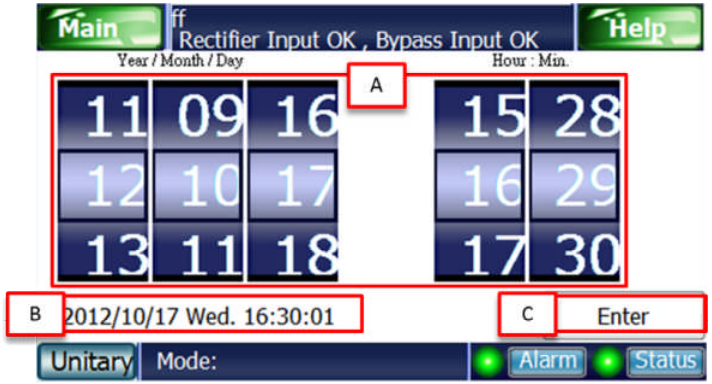
- Clicking on Bypass, Main or Output will display the available monitor reading options. Click on the required readings to change the settings.



5.1.7. Time and Date Setting

Click on Main→Setting→Time and Date to change the time and date display.

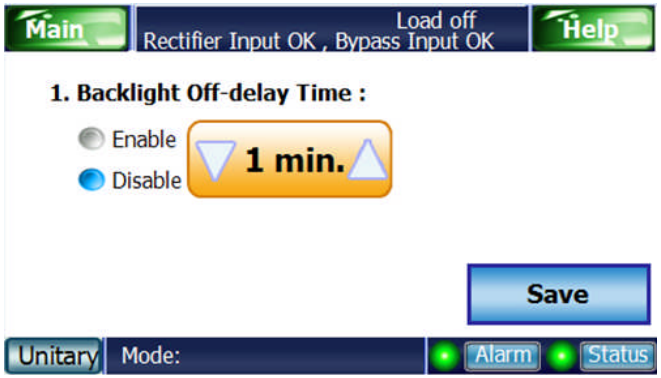
- In Block A, pull-up/down to change the time and date. (24 hour time)
- Block B shows the current UPS date and time.
- In Block C click on "Enter" to finish setting the time.



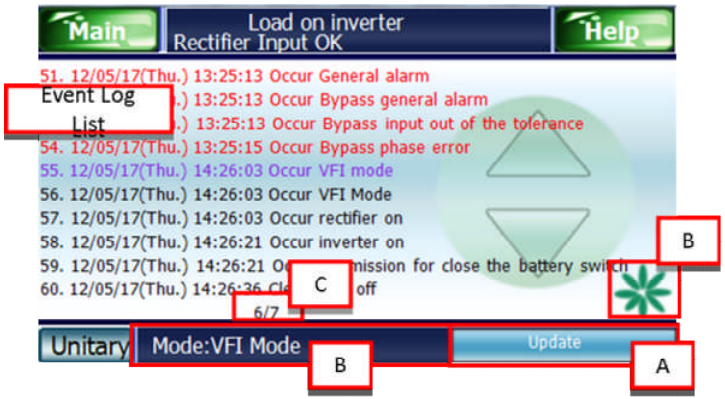
5.1.8. Backlight Delay Time

Click on Main→Setting→General to set the Backlight Delay Time. Select Enable or Disable to decide whether the backlight module of the touch screen should enter power-saving mode. When "Enable" is selected, the up and down

buttons can be used to set how long before the backlight module enters power-saving mode. If "Disable" is selected then the backlight module power-saving mode is switched off. Click on "Save" to keep the changed settings.



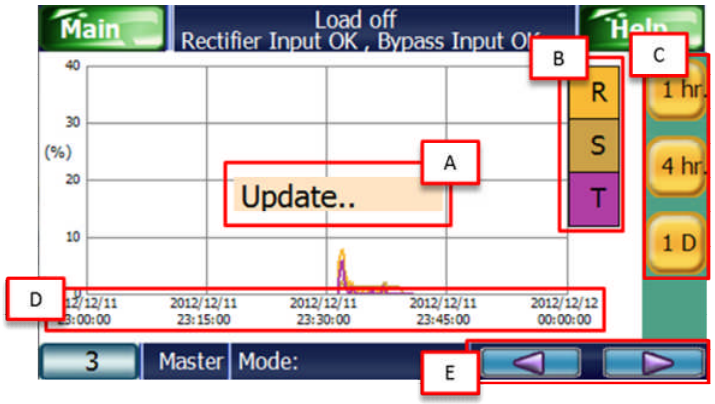
5.1.9. Event Log



Click on Main→Event Log to display all the status, alarm and command events logged by the UPS over time as pictured above. In the Event Log List area, red text indicates an alarm; black text indicates a status; purple text indicates a command. A description of each block in the above picture is provided below:

- Block A is the data update button.
- Block B is the update progress indicator.
- Block C shows the event log page. can be used to change page.

5.1.10. Log on Load

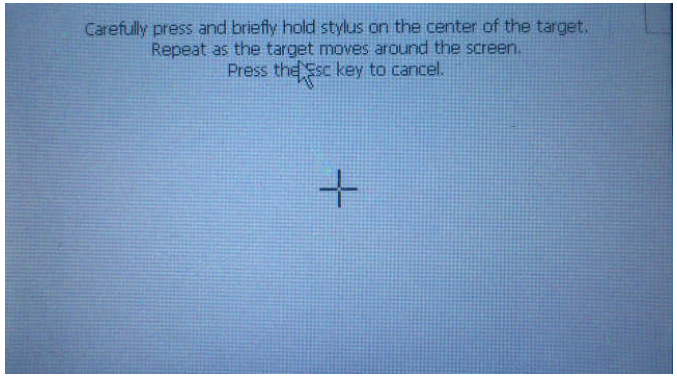


Clicking on Main→Log on Load displays the tri-phase load record of the UPS as pictured above. A description of each block is provided below:

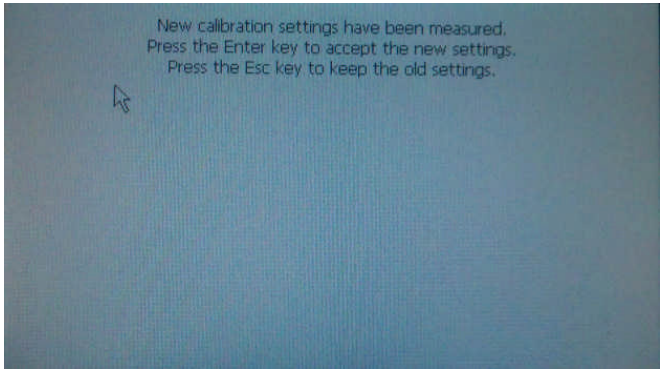
- When Block A is shown then data is being updated.
- Block B is the filter and when grayed out it means that log is not shown on the graph.
- Block C is the time interval option. Available intervals are 1 hour, 4 hours and 1 day. Block D will display the information using the selected time interval.
- Block D is the time axis.
- Click on the left and right buttons in Block E to select the logs from different time periods.

  Attention: Logs are kept for up to 3 days. Data older than 3 days will be automatically erased.

5.1.11. Screen Calibration



Please aim and press the center of the target accurately. Repeat the motion described above as the target moves around the screen until the display shows as pictured below.

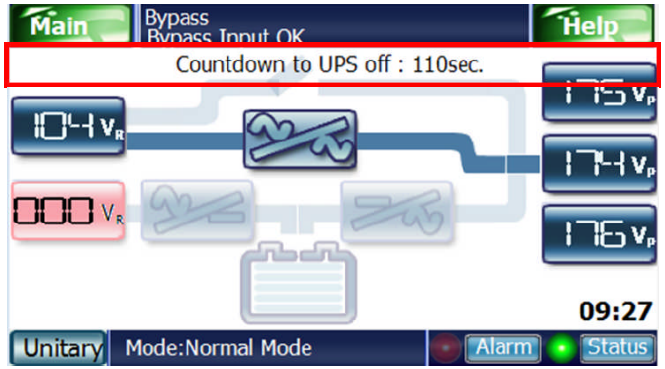


Then press any point of the screen to back to the menu.

5.1.12. Pop-up Window

When a pop-up window appears on screen, clicking on the "Yes" or "OK" button allows the software to continue. Clicking on "No", "Cancel" or will cancel the action as pictured below.

5.1.13. UPS Shutdown Timer



In the event of mains input failure, UPS overload or low battery, the UPS shutdown timer is activated. The shutdown timer is also shown on the main display of the monitoring software or touch panel as pictured above. The UPS shutdown timer can only configured through the monitoring software **[Authorization required]**.

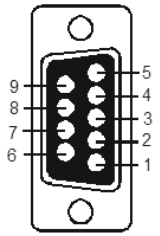
6. Communications interface:

6.1. RS-232 interface

6.1.1. Communications interface setting

baud rate	9600bps
data length	8 bits
stop bit	1 bit
parity	none

6.1.2.Pin definition



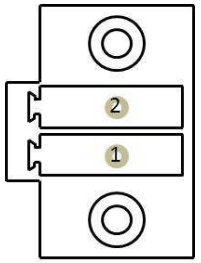
PIN 2 = RS-232C RX
PIN 3 = RS-232C TX
PIN 5 = Ground

6.2. RS-485 interface

6.2.1. Communications interface setting

baud rate	9600bps
data length	8 bits
stop bit	1 bit
parity	none

6.2.2. Pin definition



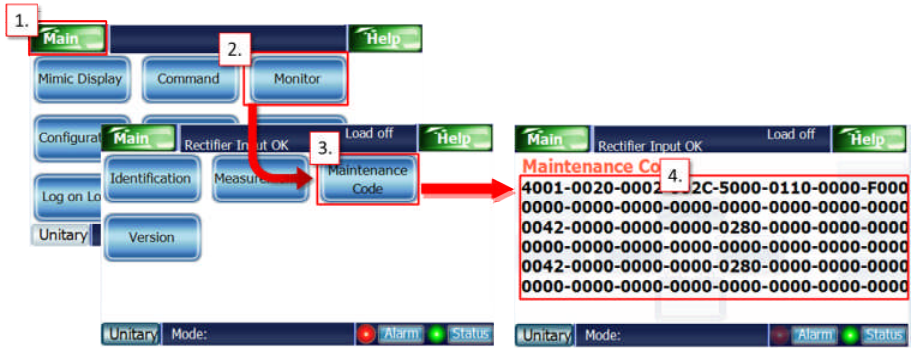
PIN 1 = RS-485 H
PIN 2 = RS-485 L

7. Troubleshooting

In the event of failure, the display area on the front panel will highlight the problem area in red. The "Alarm" light in the lower right corner will also blink to warn that there is a problem with the UPS. For more information about the current error status, please refer to sections 5.1.1. and 5.1.9.

We recommend checking the error code using the following method when troubleshooting：

- At the panel, click on Main→Monitor→Maintenance Code to bring up the screen shown below. If you can provide the maintenance code to the technician from us or the authorized distributor, this will speed up troubleshooting.



8. Maintenance

8.1. Regular Maintenance

To prevent unexpected machine outages, we recommend arranging for an authorized Ablerex distributor to conduct annual maintenance to the electrical and mechanical components. Our technicians may advise you to replace certain parts as necessary.

8.2. Battery

The condition of the battery is one of the most important factors in UPS operation. Battery life depends on the external operating environment and usage. Apart from placing the UPS in a suitable environment, if the battery is not used for extended periods of time then we recommend executing the battery test mode every 2 ~ 3 months to check the battery health.

8.3. Fan

The fan is used to keep the system cool and its service life depends on the ambient temperature and amount of dust in the air. We recommend replacing the fan regularly as recommended by the technician.

8.4. Capacitor

Capacitor life depends on usage and environment. The technician may recommend replacements based on the condition of each component during routine maintenance.

8.5. Fuse

The BRIC30S/BRIC30N contains three sets of fuses, one for Input, one for Output and one for Battery Output. If you need to replace a fuse do not use a higher fuse rating. Apart from ensuring that all fuses are from the same manufacturer and have the same specifications, you should also make sure the replacement fuses match the following specifications:

Installation Location	Specification
Input (3 pcs/set)	80A/690V
Output (3 pcs/set)	80A/690V
Battery (2 pcs/set)	160A/660V

9. Accessories and Options

9.1. Accessories

9.1.1. Comm. Port Connector

The provided comm. port connectors with locking communication cable are used for plugging into the comm. ports on two positions. One is on the inner metal casing like emergency power off (EPO), manual bypass detect (MBP Det.) and Backfeed trip. The other is on external communication device like RS485 and battery temperature port.

9.1.2. Communication Cable of Parallel

To operate in parallel mode, link two units UPS by connecting the parallel port on the inner metal casing via the communication cable of parallel with DB9 female connectors.

9.1.3. Temperature Cable

Connecting the temperature cable with the battery temperature port on external communication device is used for monitoring the temperature of battery cabinet.

9.1.4. Rack Handle

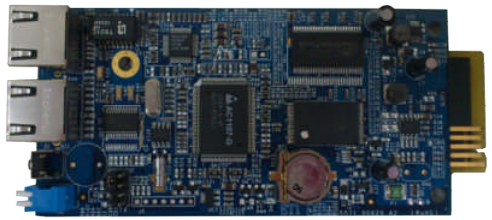
Rack handle is used for securing the unit machine in the cabinet. Please follow the installation procedure in mechanical installation guide。

9.2. Options

9.2.1. Cabinet and related mounting accessories

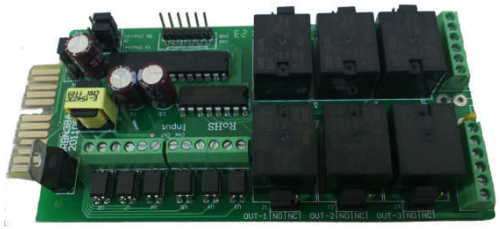
The UPS should be placed inside a cabinet to prevent unexpected hazards. We have designed rack and mounting accessories for the BRIC30S/BRIC30N as an option for our customers to choose from. Detailed installation instructions are provided separately.

9.2.2. SNMP Network Card



If the user wishes to monitor the UPS in real-time over the network, the TCP/IP network card is available as an option. The network card requires a dedicated monitoring platform. Instructions are provided separately.

9.2.3. Dry Contact Card



The dry contact card is a programmable circuit that can be programmed and configured to suit the user's needs before shipping. Instructions are provided separately.

10. Specification

Item	Specifications
General	
Nominal power	30kVA/27kW
Power scalable (parallel operation)	Up to 4 units for 120kVA or 90kVA + 30kVA redundancy
Operational modes	VFI, ECO, Converter
Display and MMI	4.3" touch screen
Built-in communication port	RS232 & RS485
External communication slot	2 cards work simultaneously
Audible noise	< 60dBA at 1 meter
Working temperature	0~40 degree C
Working humidity	0~95%
Tested to standards	Safety: IEC/EN 62040-1, EMC: EN 62040-2
Mark	CE
Overall Dimensions (WxDxH)mm	440 x 430 x 800
Net Weight (kg)	78
Input electrical characteristics	
Technology	Bridge with IGBT
Nominal mains supply voltage	3x400V+N
Voltage tolerance	+20% ~ -20% with 100% of the nominal power
	-20% ~ -40% with 50% of the nominal power
	< -40% changing to backup mode
Nominal frequency	50/60Hz (auto sensing)
Frequency tolerance	±5Hz
Power factor	≥ 0.99 at full load and nominal voltage
Current harmonic distortion (THDi)	< 3% at full load and nominal voltage
Max inrush current at start-up	< 45A (no over-current)

Output electrical characteristics	
Technology	Bridge with IGBT
Nominal output voltage (selectable)	3x380/400/415V+N
Power factor at nominal power	0.9
Tolerance on the output voltage	Static: ±1%
	Dynamic: ±5% (0~100% or 100~0% stepping load)
Nominal output frequency	50/60Hz (auto sensing)
Tolerance on the output frequency	±0.1% when free running
Slew rate	< 1Hz/s
Load crest factor	3:1 acceptable
Voltage harmonic distortion (THDv)	< 3% with linear load
	< 5% with distorting load
Overload capability by the inverter	110% load for 60 minutes
	125% load for 10 minutes
	150% load for 1 minute
Voltage unbalance	2% maximum with 100% unbalanced load
Dynamic output voltage regulation	±5% with 100% stepping load
	return to ±1% within 50ms
Phase displacement	120°±1° with 0~100% balanced load
	120°±3° with 100% unbalanced load
By-pass electrical characteristics	
Technology	Thyristors
By-pass nominal voltage	380/400/415V
By-pass rated voltage range	Inverter voltage ±10% (Lo-sensitive)；±5% (Hi-sensitive) (Selectable)
By-pass rated frequency	50/60Hz (auto sensing)
Tolerance on by-pass frequency	±3Hz (Lo-sensitive)；±1Hz (Hi-sensitive) (Selectable)
Battery	
Battery type	Lead-acid battery
Workable numbers in a string	32/34/36/38/40pcs depending upon configuration

Common battery feature	Yes
Floating charge voltage	2.30V/cell
Cut-off voltage	1.60V/cell
Max charging current	10Adc
Efficiency	
Efficiency in dual conversion mode	> 93%
Efficiency in "ECO Mode"	> 97%
Efficiency in backup mode	> 93%