USER MANUAL | ENG

SHIELD

Online Double Conversion UPS

1:1

6 – 10 kVA

Singlephase / Singlephase

Accedi al link ed utilizza la password per scaricare il manuale in Italiano

Access the link and use the password to download the manual in English

Accédez au lien et utilisez le mot de passe pour télécharger le manuel en Français

Rufen Sie den Link auf und verwenden Sie das Passwort, um das Handbuch auf Deutsch herunterzuladen

https://gtec-power.eu/en/shield-user-manual/

PASSWORD: GTCSHD61024

IMPORTANT SAFETY INSTRUCTIONS

SAVE THESE INSTRUCTIONS

This manual contains important safety instructions. Read all safety and operating instructions before operating the uninterruptible power systems (UPS). Follow all operating and user instructions. This equipment can be operated by individuals without previous training.

This product designed for commercial/industrial use only. It is intended for use with lift support and other designated “critical” devices. Maximum load must not exceed that shown on the UPS rating label. The UPS is designed for data processing equipment. If uncertain, consult your dealer or local representative.

This UPS is a class 1equipment,it is designed for use on a properly grounded (earthed), 220/230/240VAC, 50 or 60Hz supply. The factory default setting is 230VAC/50Hz. Installation instructions and warning notices are in this manual.

The UPS 06-10kVA @ 220/230/240VAC is designed for use with a three-wire input (L,N,G).

Warning

ELECTRIC SHOCK HAZARD AND HAZARDOUS ENERGY IN CASE OF SHORT CIRCUIT OF THE BATTERY; THE EVENT MAY GENERATE ELECTRIC SHOCKS, LIGHT SHOCKS, AND FIRE.TO MINIMISE THESE RISKS, FOLLOW THE INFORMATION BELOW FOR REPLACING THE BATTERIES

- Wear insulating safety gloves and footwear.
- Remove rings, bracelets, necklaces, watches and any metal objects
- Use only tools with suitable insulation
- Do not place tools or other metal objects on the batteries.
- If the battery is damaged in any way or shows signs of leakage, contact the distributor or installer immediately.
- Do not put batteries in a fire or near excessive heat sources as they could explode
- Handle, transport, move and recycle batteries according to legal provisions

WARNING

ALTHOUGH THE UPS HAS BEEN DESIGNED AND MANUFACTURED TO ENSURE PERSONAL SAFETY, IMPROPER USE CAN RESULT IN ELECTRICAL SHOCK OR FIRE. TO ENSURE SAFETY, OBSERVE THE FOLLOWING PRECAUTIONS:

- Turn off and unplug the UPS before cleaning it.
- Clean the UPS with a dry cloth. Do not use liquid or aerosol cleaners.
- Never block or insert any objects into the ventilation holes or other openings of the UPS.
- Do not place the UPS power cord where it might be damaged.
- Do not insert objects into the cooling fans and ventilation grilles
- UPS cables must be adequately protected
- After commissioning, do not change the UPS settings without the consent of the technical manager

Battery room ventilation

In order to avoid hazardous concentrations of Hydrogen (released from the batteries themselves) it is necessary to ensure appropriate air ventilation between the internal and external environment. The change of air in the rooms should be through natural ventilation, if natural ventilation is not possible, adopt a forced ventilation system (fan)
To do this, use the formula indicated in the EN50272-2 and EN IEC 62485-2 standard shown below to calculate the minimum surface for the exchange of air

$A = 28 \times Q = 28 \times 0{,}05 \times n \times Igas \times Crt \times 10^{-3}$ [cm^2]
Where:
A = Minimum free exchange area between internal and external spaces
Q = Ventilation air flow [m^3/h]
n = Number of cells;
Crt = Battery capacity, for VRLA at 10 hours [Ah]
Igas = Current producing gas [mA/Ah]
According to the standard for lead acid batteries type VRLA the parameter Igas = 1 in Float, or 8 in boost 2,40 V/cell.
Below is an example of calculation of the exchange surface for 96 VRLA cells (16 batteries), with capacity 80A/h

$A = 28 \times 0{,}05 \times 96 \times 1 \times 80 \times 10^{-3} = 10{,}8$ [cm^2] in float
$A = 28 \times 0{,}05 \times 96 \times 8 \times 80 \times 10^{-3} = 86$ [cm^2] in boost

Warnings:

Environmental instructions according European Directive rules

Pb	**Dispose of batteries according to legal provisions 2006/66/EC and subsequent amendments**

Dispose of packaging material according to legal provisions

Packaging Material List	Material	
Pallets	Plywood	
External packaging	Corrugated cardboard	
External protective film	Low density polyethylene (Polyethylene PE-LD)	04 PE-LD
Internal protections		
Inner bag		

2012/19/EU and subsequent amendments	This product must not be disposed of as municipal waste: Disposal must take place through separate WEEE collection; Any violation is punishable in accordance with current rules and regulations. Incorrect disposal of the product or improper use of the product or its parts are harmful to the environment and human health. It is possible to request the collection in case of purchase of a new equivalent device, or to return the product to the manufacturer.

Description of Symbols

Labels	Descriptions
 Danger	Hazardous voltage inside
	Read the manual before operating
	Ground connection is mandatory
	Connect the grounding as a first step
	Disconnect the equipment before performing maintenance
	Maintenance can only be carried out by technical support.

TABLE OF CONTENTS

1. Product description

We thank you for choosing this UPS.

This chapter contains a brief description of the product, dimensions, electrical data and operating methods

1.1 Conformity

Markings: CE	
*** Safety**	
European directive: 2014/35/EU	
EN 62040-1	
Other standards: battery standard IEC 62485-2	
*** European EMC directive: 2014/30/EU**	
Conducted Emissions ..... EN 62040-2	Category C3*
Radiated Emissions ..... EN 62040-2	Category C3
*** EMS - IMMUNITY**	
ESD.....EN 61000-4-2	Level 4
RS.....EN 61000-4-3	Level 3
EFT.....EN 61000-4-4	Level 4
SURGE.....EN 61000-4-5	Level 4
Low frequency disturbances EN 61000-2-2	
Warning: This product is for commercial and industrial use; if used in different environments, check if you need to take other precautions and measures.	
Environment: The product complies with the Rohs-Reach-RAEE environmental directives	

NOTICE：

This is a product for restricted sales distribution to informed partners. Installation restrictions or additional measures may be needed to prevent radio interference.

Usage environment

This device has been designed for indoor use in a temperature range of 0-40°C, where there are no animals and insects; it is not suitable for explosive, conductive, flammable atmospheres or those with corrosive substances. Contact the distributor for any other use.

Maintenance

This UPS does not contain user-serviceable parts.

The UPS on/off buttons and switches do not electrically isolate the internal parts from the batteries. Do not remove the covers, otherwise there is a risk of electric shock and burns.

In the event of a serious fault, put the UPS on manual bypass, turn off the UPS, open the batteries, the rectifier and bypass disconnector (on the back of the UPS). In this case, it is recommended to send the damaged UPS to the manufacturer for repair and overhaul.

Carefully follow the instructions and indications displayed on the UPS display, consult the section dedicated to troubleshooting where the description of the alarms is given.

Battery maintenance must be performed by expert personnel.

Properly dispose of batteries. Refer to local laws and regulations for disposal requirements.

DO NOT CONNECT equipment that could overload the UPS or that may generate backfeed or that could overload the equipment such as electric drills, vacuum cleaners, hair dryers, motors; before connecting this type of loads, carry out a technical check.

DO NOT CONNECT life-saving equipment, for example: medical equipment, lifts.

Storing magnetic media near the UPS can cause data loss or corruption.

Turn off and isolate the UPS before cleaning it. Use only a soft cloth, never liquid or spray cleaners.

1.2 Features

- Digital control
- Smart battery management, overcharge and deep discharge protections, etc. that optimise its life
- Protection, without failures, from reversing the polarity of the batteries.
- Sound indication and through clean contact of the overload condition.
- Short battery test from synoptic and/or long-lasting programmable.
- Turning on the rectifier switch (RECT) on the back of the UPS allows you to check the autonomy continuously. At the end of EOD autonomy, the UPS will automatically transfer the load from the inverter output to the emergency network if present
- The Standby off function allows you to power the load, only in the event of a power failure and/or opening of the ordinary lighting line (Using the dry contacts card).
- Casing completely in fireproof steel
- Battery, mains and output measurements shown on the display.
- Possibility to set the UPS by synoptic; the settings are password protected and will be communicated upon request.

WARNING:

- **INCORRECT SETTING MAY COMPROMISE THE SAFETY OF THE APPLICATION**

1.3 Models

The standard models available are shown in table 1

Tab.1 Models

Model code with 16 internal battery			
MODEL	**Rated P**	**Use**	**Notes**
SHIELD-6K	6kVA/6kW	EN62040-1 and -2	
SHIELD-6K-KS	6kVA/6kW	EN62040-1 and -2	Battery charger 5A - No internal batt.
SHIELD-10K-11	10kVA/10kW	EN62040-1 and -2	
SHIELD-10K-11-KS	10kVA/10kW	EN62040-1 and -2	Battery charger 5A - No internal batt.

1.4 Appearance

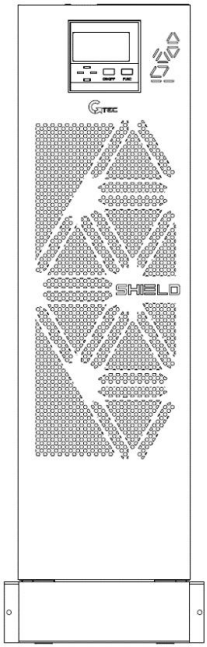
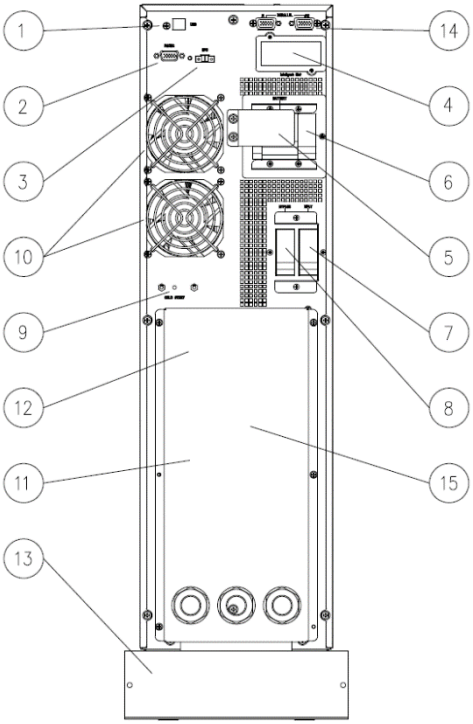


Fig.1- 1:Front view



Nameplate data and warnings are in the cover

1) USB: B (MTR SW),
2) RS232 (external SW or SNMP)
3) EPO:(NC)
4) Slot with relay card
5) Manual bypass
6) Output disconnector, usable as EPO (OUTPUT)
7) Rectifier input disconnector (INPUT)
8) Bypass input line disconnector (BYPASS)
9) Cold start: Battery start
10) Fans
11) Connector seat (optional)
12) Terminal block protection
13) Stabilising brackets
14) Parallel port (optional)
15) Terminal block present under panel, see details in Fig.2.1

Fig.1-2: Rear view

1.5 Description of the system

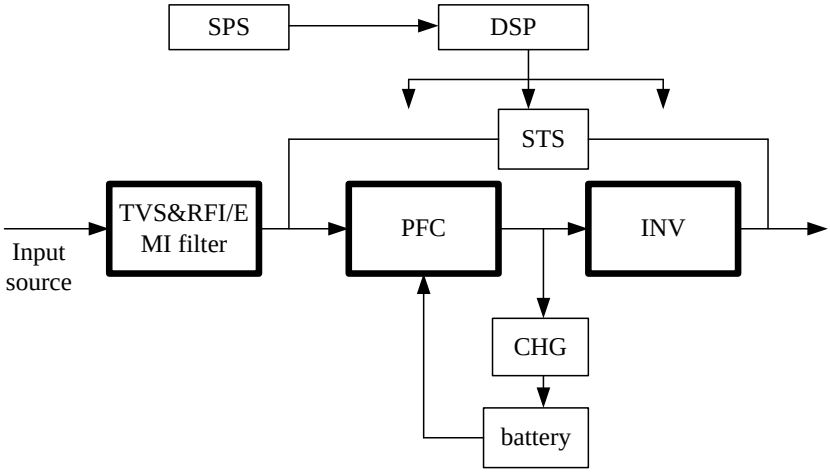


Fig.1- 2:UPS

SPS (synoptic) / DSP (digital adjustment) / STS (static bypass) / RFI (filter) / PFC (AC/DC converter) / INV (DC/AC converter) / CHG (battery charger)

1.5.1 Protection against mains overvoltages and EMC filters

Set of components designed to filter out any disturbances or overvoltages present on the network (Surge) and attenuates the disturbances to radio frequency (EMI) coming from the power converters.

1.5.2 Rectifier with PFC (Power Factor Control)

It stabilises the input voltage to the inverter and performs the function of PFC ensuring a draw from the mains with a sinusoidal current, with a low harmonic content and a Power Factor close to 1.

Sinusoidal draw allows you to reduce the disturbances introduced on the power supply.

1.5.3 Inverter

It is a DC/AC converter, which is powered by the DC bus, generated by the mains (via the PFC/Rectifier) or by the battery (via the DC/DC converter). The inverter supplies the load with a filtered sinusoidal voltage, stable in amplitude and frequency, with very low harmonic content.

1.5.4 Battery charger

It is a converter powered by the rectifier (DC BUS) which recharges the batteries in the presence of the mains.

1.5.5 DC-to-DC Converter (RECT/PFC)

It is a converter that generates and stabilises the DC supply voltage of the inverter during UPS operation in battery mode.

1.5.6 Batteries

They provide energy to the inverter in battery mode.

1.5.7 Static bypass STS (static transfer switch)

It has the function of powering the load in case of unavailability of the inverter (Overload, failure, etc.)

BY-PASS operation is the load signalled by the synoptic, by an audible signal. By switching off the UPS, using the ON/OFF key, the load is automatically transferred by bypass to the input network (unless otherwise set upon activation).

Information: The load powered by bypass is not protected against disturbances on the power supply.

1.6 UPS Work mode

This device has operating modes to improve UPS performance depending on the applications.
The operating modes available are always powered, bypass mode, Eco mode, standby-off, battery mode, frequency converter

Normal mode:

See fig 1-4 The load is powered continuously by the inverter, with the mains present the rectifier and the battery charger are operating, the bypass is off.

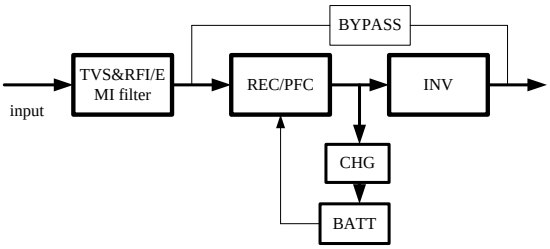


Fig.1- 3: Normal Mode

Load powered by the static bypass (bypass mode)

The logic can decide to inhibit the inverter and transfer the load on the static bypass line. It is also possible to manually transfer the load on bypass by pressing the ON/OFF button. When the load is powered by static bypass in this mode, it is not protected from voltage and frequency anomalies that may be present on the line.

See fig 1-5

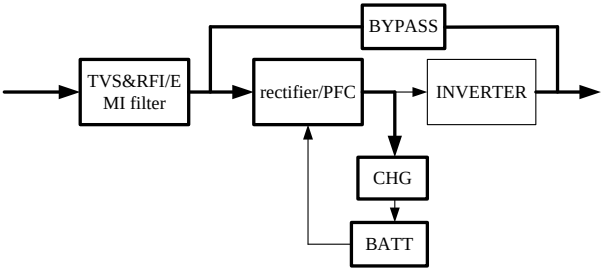


Fig.1- 4:Bypass Mode

Battery Mode

If there is a mains outage or it does not have the suitable characteristics to power the UPS, the inverter supplies the load by drawing energy from the battery. See fig. 1-6

Warning: In this mode, turning off the UPS by pressing the ON/OFF button shuts down the load

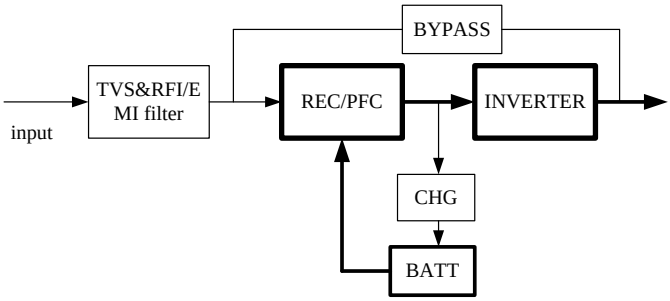


Fig.1- 5: Battery Mode

ECO Mode (Not Available for Parallel)

The load is normally powered by the static bypass line. The inverter is on standby and the batteries are kept charged. If the mains are no longer available or exceeds the set tolerances, it is powered by the battery inverter. In this mode the efficiency reaches up to 98%.

See Fig. 1-7

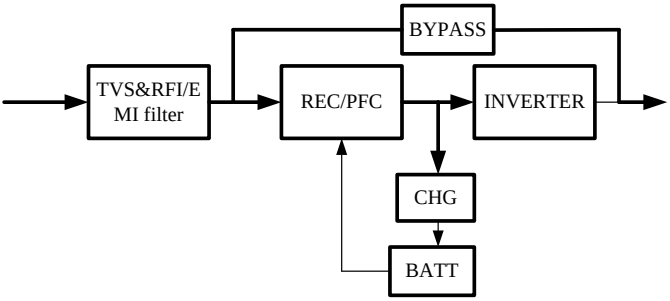


Fig.1- 6:ECO Mode

Frequency converter

With this mode it is possible to power the load at a frequency different from that of the input. The bypass is disabled

Warning: The load applicable in this mode is 50% of the rated power

Open the static bypass line switch located on the back of the UPS

The load will no longer be transferred on static bypass

1.7 Technical specifications

Model			6K	6K-KS	10K	10K-KS
Rated power			6kVA/6kW		10kVA/10kW	
Earthing system			TT-TN-IT, No. of wires 1 Phase + N + Earth			
Rated frequency		Hz	50/60		50/60	
Input	**V**	VAC	(176-288)		(176-288)	
	Imax	A	36		60	
	THDI	%	<5%		< 5%	
VRLA Battery N° 16 x 12V	**Rated V**(note 1)	VDC	192		192	
	Imax (note 1)	A	40		66	
VRLA Battery N°20 x 12V	**Rated V**	VDC	240		240	
	Imax	A	32		53	
	Capacity	A/h	7 as a standard		9 as a standard	
Battery Charger	**I max @ 230V and Pnom.**	A	1	5 (note 2)	1	5 (note 2)
	I Default	A	1	5 (note 4)	1	5 (note 4)
	Float Default	V/el.	2,25 V/el.			
	Boost Default	V/el.	2,25 V/el.			
Output	**V**	VAC	230 (Note.3)		230 (Note.3)	
	I nom.	A	26		43,5	
	Rat. Freq.	Hz	50Hz settable 60 Hz			
	Crest factor		3:1			
	Load pf range		- 0.3 capacitive at + 0.3 inductive			
	Voltage regulatio		Vnom. ± 1 %			
Efficiency			Up to 94.5%		Up to 95%	
Dimensions (WxDxH)		**mm**	190*540*705			
Weight		**(kg)**	56	21	66	27

Note 1: See in the UPS data label the battery number present. During activation, if it is necessary set the battery parameters correctly according to the installed capacity and battery number.

Note 2: The battery charger current can be set from 0.5-1-2-3-4-5A via SW MTR in the KS version

Note 3: 230Vac 50Hz is the standard setting, on request it is possible to set 220 or 240V, and/or 60Hz

Note 4: If the optional 10A battery charger is required, the rated load is 80% of the rated power

1.7.2. Electrical Specifications

INPUT	
Model	6kVA / 10kVA
Power supply	1 Phase + Neutral + Earth
Frequency range	40-70Hz
Power factor	≥ 0.99 (at 100% of the load)

OUTPUT	
Voltage Frequency	±1%
Power factor	1
Frequency accuracy	± 0.1
Distortion	THD < 1% 100% of the linear load
Overload capability	110% load on bypass after 60 minutes 125% 1 minute 150% after 30 sec. load on bypass, after 1 minute the bypass turns off and removes the output
Crest factor	3:1

1.7.3. Environmental conditions

Temperature	0°C-40°C
Humidity	<95%
Altitude	<1000m
Storage temperature	0°C-70°C

Decreased output power to be applied if used above an altitude of 1000m

Altitude (m)	**1000**	**1500**	**2000**	**2500**	**3000**	**3500**	**4000**	**4500**	**5000**
Usable power	100%	95%	91%	86%	82%	78%	74%	70%	67%

1.7.4 Communications

Port	Available functions
RS232	Communication program and for SW MTR settings / external SNMP network board
USB	SW MTR for calibration and settings / SW Upsilon for monitoring and shutdown
SNMP	Board for integrating the UPS into the corporate network, it allows monitoring of the UPS, to remotely report any fault and to manage the shutdown of PCs and servers

2. Installation

Only a qualified electrician can install the equipment following the applicable safety regulations.

Important:

Using the UPS with temperatures higher than 25°C reduces the life of the batteries.

2.1 Unpacking and checks

1) Remove the packaging and check the contents. The pack contains:
    - 1 UPS
    - 1 Operating manual

2) Check that there are no signs of damage or damage caused by device transportation. If the UPS is damaged, it must not be switched on, inform the courier as soon as possible of the damage suffered and contact the supplier's support centre

2.2 Connect Input and Output

1. Notes for commissioning

1) Install the UPS in a room with good ventilation, away from water, gas and flammable corrosive agents and dust.
2) Check that the ventilation grilles of the UPS are free. Leave enough free space for maintenance (50cm per side in case the UPS cannot be removed).
3) If the external environment is colder than the internal, there is a danger of condensation during installation; before turning on the UPS, make sure that there is no condensation inside: wait at least 3 hours, so that the temperature of the UPS has reached the room temperature so as to avoid electric arcs inside the equipment

2.Commissioning

Installation and electrical connections must be made by qualified personnel in compliance with the laws and standards in force.

Before installing, make sure that there is no voltage, open all the mains and battery protections

1) Remove the terminal protection located on the back of the UPS, see fig. 2-1
2) For models 6kVA, use cables with a minimum cross section (6mm$^{2,)}$

for models 10kVA use cables with a minimum cross section (10mm^2).

Use cables suitable for the installation environment and with double insulation 450/750V and make sure that the cables are mechanically protected, if necessary fix the UPS to the floor.

For KS model make sure that the capacity of batteries is larger than 24AH to avoid over charging

Information： Make sure that the rated current of any industrial socket, and/or the cables used is greater than the maximum current drawn by the equipment, see the nameplate.

2- Input protections,

To choose See the Maximum UPS input current is in the UPS data label.

For the UPS selectivity see chapter 1.7 and considerate that UPS has in the input line an automatic breaker 1Pole 63 A C Curve. Normally a 40A C curve could be used for a 6 kVA.

3-UPS Earth leakage current is less than 3,5 mA.

Transient and steady-state earth leakage currents, which may occur when starting the equipment, should be taken into account when selecting instantaneous RCCB or RCD devices.

Residual Current Circuit Breakers (RCCBs) must be selected insensitive to DC unidirectional pulses (class A) and transient current pulses.

These models have a rated current greater than 16A.

Correctly set the recharge current and the recharge voltages of the batteries according to the information's present in the data UPS ad battery box data labels, and in the technical data of the batteries installed, , to avoid damaging them, and to guarantee the recharge times required in the application. It is possible set the parameters during activation with special SW supplied to the installer.

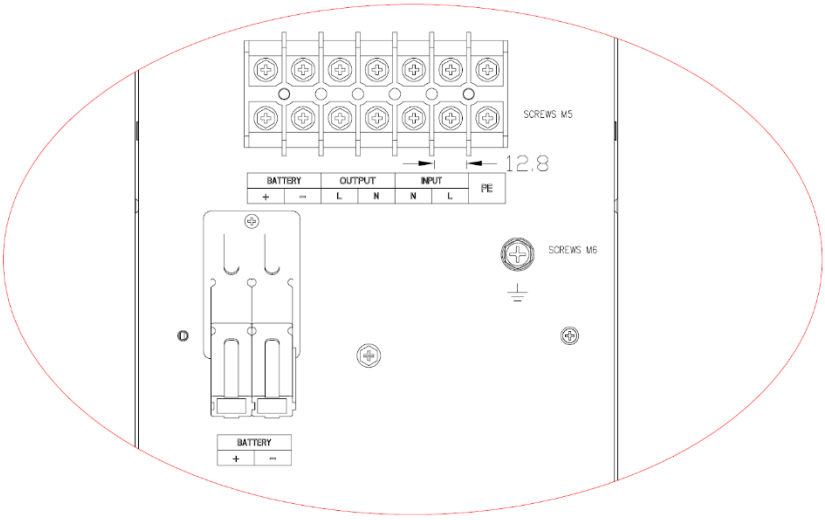


Fig 2- 1:Terminal block

BATTERY + Battery positive pole	INPUT N Neutral Input
BATTERY - Negative battery pole	INPUT L Input phase
OUTPUT L Output phase	PE Earth
OUTPUT N Neutral Output	

Leave the earth wires longer than the Phase and Neutral and Battery cables. In the event of impact, it must be the last cable to be pulled. It is advisable to fix the equipment to the floor.

NOTE： Make sure all cables are properly connected

6) Connect the utilities and the battery cabinet to the ⏚ earth terminal. The cross section of the earth conductor will be the same as the cross section of the Phase conductor and yellow/green
7) After installation, check the connections
8) Install a double-pole switch in the distribution panel in the input and output lines.
9) Turn on the UPS without load, then connect one load at a time.
10) Warning: even if the UPS is not connected to the mains it can power the output. To have no output voltage, turn off the UPS and open the double-pole output disconnector.
11) It is recommended to recharge the batteries for 8 hours before use. After completing the connections, close the input switches. The UPS will charge the batteries automatically. If the batteries are not recharged, the required autonomy may not be guaranteed.
12) If the load is inductive or with high inrushes (e.g. motors, fans, pumps or laser printers), the power required at start-up may be greater than the power of the UPS. In these cases, calculate the rated power of the UPS by dividing the inrush power by 1.5, this should be sufficient in most applications.

Warning This type of UPS is not suitable for absorbing energy returns from the load (loads with backfeed).

Warning: In the system panels, place the warning below

Before operating this circuit
Isolate the UPS and check there is no voltage between all terminals including the earth terminal

2.3 Procedure for connecting the battery cabinet to the UPS

1. The rated voltage of the battery cabinet is 192Vdc.A battery cabinet is made up of one or more strings of 16 Pb batteries, maintenance-free, at 12V/each connected in series. It is possible to connect several battery cabinets, of the same type, having the same number of batteries and the same voltage.
2. To connect the battery cabinet to the UPS, use 6mm2 cables for 6kVA UPS and 10mm2 cables for UPS up to 10kVA.Keep the voltage drop in the cable within 1%. Use double insulated cables with suitable voltages and insulation. During installation, carefully follow the safety instructions to minimise the risk of electric shock. Protect cables from mechanical risks.
3. A suitable double-pole protection must be installed between the UPS and the battery cabinet, with automatic switch for DC, or with fuses. The protection value must not be less than the current indicated in the technical specifications.
4. Open all battery protections. If the batteries are not installed, insert them and connect them. Check first (the number of batteries to be installed (UPS nameplate) and verify that this coincides with the number of batteries of the single string (16 or 20 batteries in series) present in the cabinets.

   Check (via MTR SW) that the number of cells set in the logic corresponds to the number of batteries installed and that the battery charging current is correct.

   WARNING: Incorrect setting of these parameters can cause the batteries to fail or not guarantee the restoration of autonomy in the desired times.
5. With the UPS disconnected from the mains and with all the battery disconnectors open, connect the battery cable first to the battery cabinet and then to the UPS; this allows you to reduce the risk of electric shock.
6. **Cable colours:** Use the red cable for the positive pole; the black cable for the negative one; the yellow/green for the earth. If different coloured cables are used for the positive and the negative battery pole, mark the cables on both sides with the polarity + or - before connecting them.
7. Before connecting the load, check that the UPS power cable has been connected correctly; check that the battery voltage and polarity are correct. Close the battery disconnector first and then that of the external mains. Closing the mains switch means the battery charger will start charging the batteries

   Warning: use double insulated cables compliant with the application and installation.

2.4 How to install UPSs in parallel

1.Introduction

By installing the **PARALLEL** option, it is possible to connect up to a maximum of 4 units in parallel. (To achieve the required power or to have redundancy). Parallel is only available for normal mode.

2.Parallel installation

1) Using two standard 15 pin cables less than 3m in length, connect the parallel boards
2) Power up the UPS following the instructions of the individual UPS
3) Connect each UPS output to a double-pole output switch located on the parallel panel.
4) Each UPS must be connected to a dedicated battery cabinet
5) The wiring diagram is shown below; size the general output disconnector, if present, so that its current is greater than the sum of the rated currents of the UPS x 1.2.

To guarantee correct distribution of the currents and system response, the UPS output cables must be less than 20 m in length and the length of each cable must not differ by more than 10% from the others.

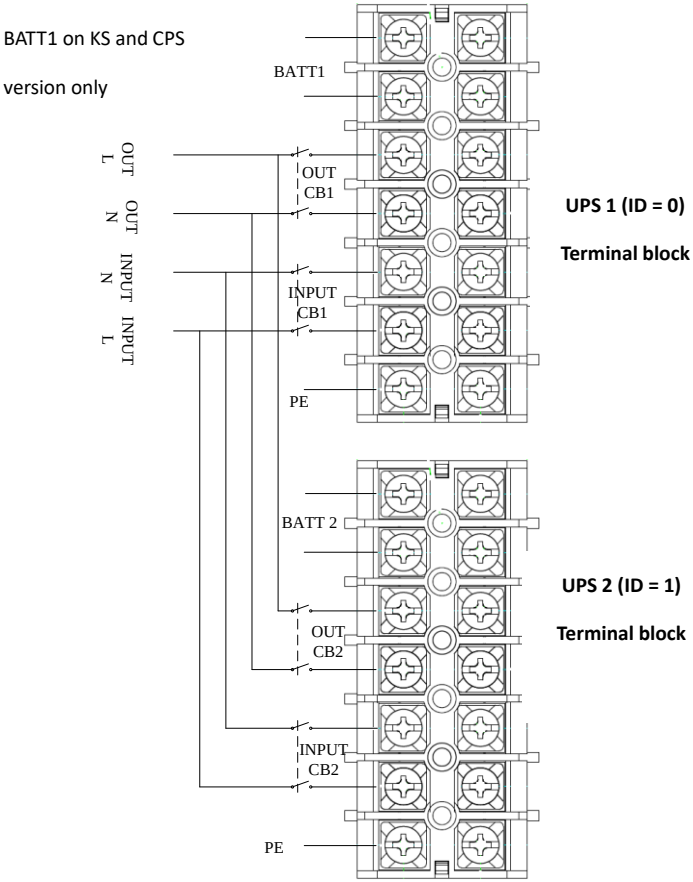


Fig.2- 2: Diagram for connecting 2 UPSs in parallel

2.5 How to connect communication cables

The communication cable includes USB cable and parallel communication cables.

Connect the USB cable:

1) Connect the USB cable to the USB port on the rear panel of the UPS shown as Fig.1-2

2) Connect the USB cable to the PCB

Connect the communication cables:

If there are two UPSs in parallel, connect the communication cables as in Fig. 2-3 Communication

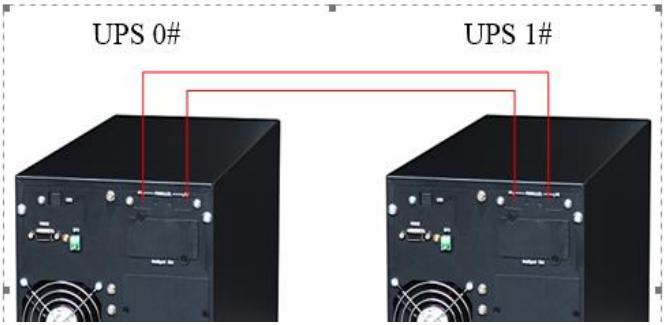


Fig.2-3 :System with 2 UPSs in Parallel

If there are three UPSs in parallel, connect the communication cables as in Fig. 2-4

Fig.2-4 : System with 3 UPSs in Parallel

NOTICE: it is necessary to set the UPS as a parallel system in "parallel mode" via software according to "Appendix A" before starting the parallel system

3. Control Panel and Display

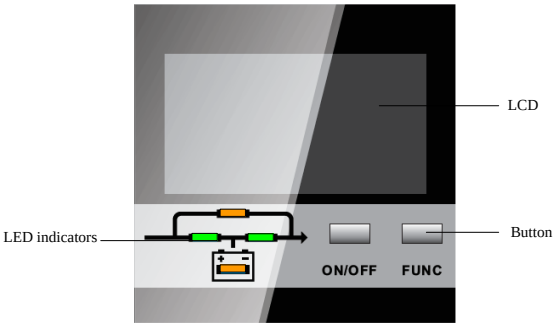


Fig 3-1: Control panel and Display

Descriptions of the Control panel

Controls	Description
ON/OFF	Power on/off button 1.Press the ON/OFF button; to activate the UPS NOTE: The control is not available when the UPS is set in automatic start mode when the mains returns. 2.By pressing ON/OFF in Normal mode the inverter switches off and the load is transferred to the bypass network 3.By pressing ON/OFF in battery mode the UPS shuts down completely. 4.In settings mode, pressing ON/OFF confirms the new setting
FUNC	Button to select the new function: 1.By Pressing FUNC the menu scrolls down and displays the menu on the LCD. 2. Pressing the FUNC button for 2.5 seconds on page 1 deactivates the audible alarm; press again to reactivate 3. Press FUNC and ON/OFF together for 2.5 seconds to enter the settings mode

LED lights	Description
REC	**LED Rectifier** **green**: normal rectifier, **flashing green**: rectifier in start-up phase, **red**: faulty rectifier, **flashing red**: rectifier in alarm, **LED off**: rectifier not active
INV	**LED Inverter** **green**: normal inverter **flashing green**: inverter starting or ready if (ECO) mode is set, **red LED**: inverter faulty and load not on inverter **Flashing red LED**: fault, but loaded on inverter **Inverter LED off:** the inverter is not working.
BYP	**LED Bypass** **green**: load on the bypass network **Off**: UPS is in normal mode and the bypass is within tolerances **red:** faulty bypass **flashing red**: there is a bypass alarm.
BAT	**LED Battery** **Green**: battery charged **Flashing green**: battery discharging **Off** Battery connected **Red:** faulty battery, **Flashing red**: battery alarm

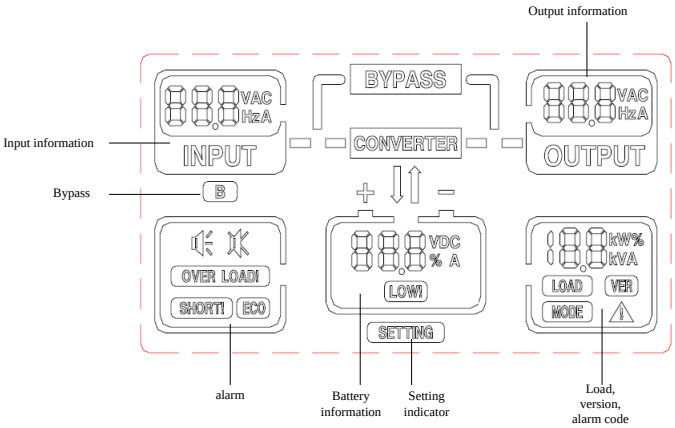
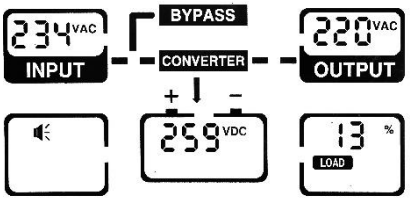
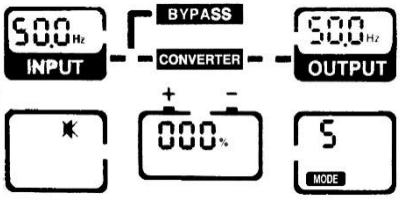
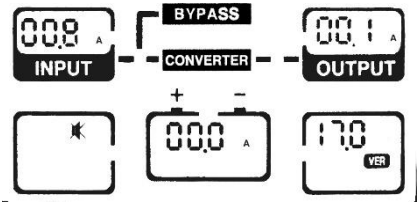
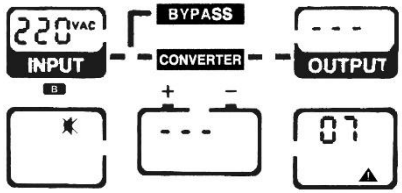


Fig 3-2:LCD Menu

Menu description

Menu	Information
Input	Main input: VAC voltage, current (A), frequency (Hz) Bypass input (bypass "B"): Voltage: VAC
Battery	VDC voltage, discharge or charge current A, remaining capacity %, Low = low battery alarm!
Output	Voltage (V), current (A), Frequency (Hz)
Alarm	: Alarm silencing on/off OVER LOAD: Overload SHORT: Short circuit in output ECO: Eco-Mode is set
Load / Version / Alarm code	Load: Active power KW, Apparent power KVA, % of load Ver: Firmware version Mode: S-single mode P-parallel mode E-ECO mode A-self aging mode ⚠ Error code: See the specific section.
Other	B: Bypass line menu SETTING: LCD is in the settings menu BYPASS: Load on bypass CONVERTER: Load on inverter (double conversion)

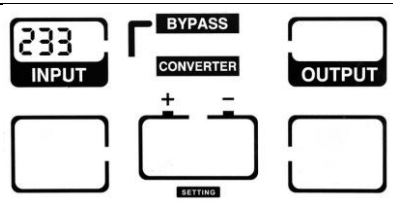
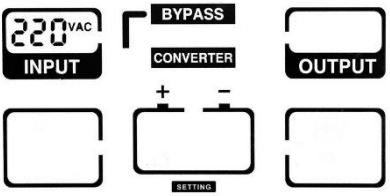
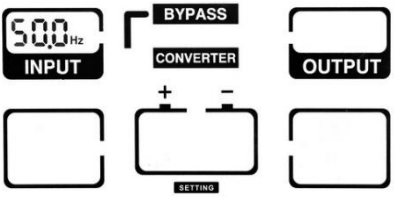
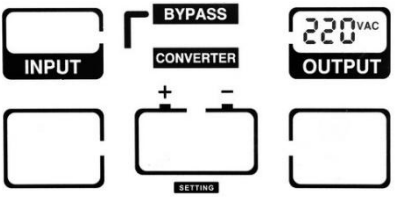
Press **FUNC** to check menu:

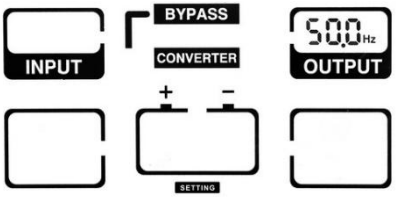
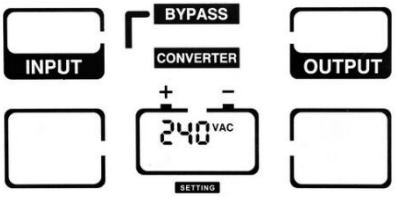
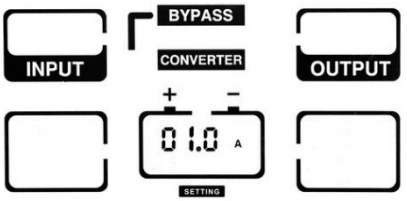
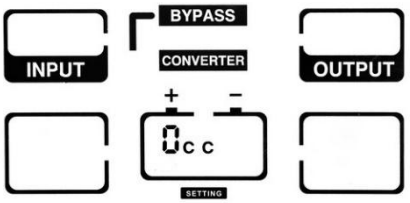
Page	Description
	Page 1 Input voltage : 234VAC Output voltage : 220VAC Battery voltage: 259VDC In turn, the following is displayed: Load 13% Active Power (KW) Apparent Power (KVA) Pressing the FUNC button on this page for 2,5s silences the alarm
	Page 2: INPUT frequency:50Hz OUTPUT frequency:50Hz Battery capacity:0% (Battery not connected) Mode: S / P / E / A operating mode
	Page 3: INPUT current:0.8 A OUTPUT current:0.1 A Battery current:0.0 A (down arrow for charging current, up arrow for discharge current, no arrow for batteries not connected) Firmware Version: V0-17 (17.0)
	Page 4: "B": Indicates that the bypass line menus are displayed Bypass voltage:220VAC ⚠ alarm code:07 By pressing the FUNC button in this menu for 2,5s, it is possible to reset the alarms

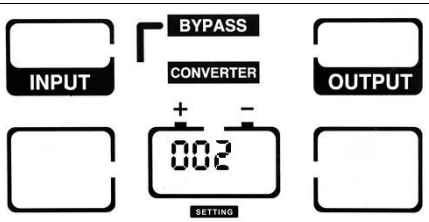
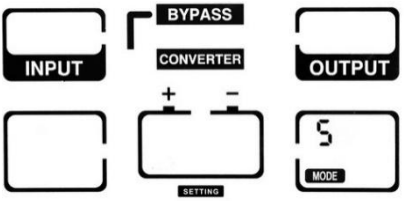
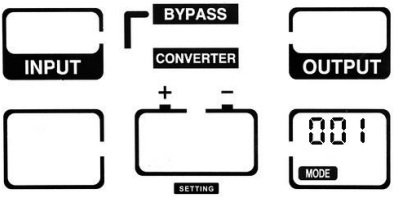
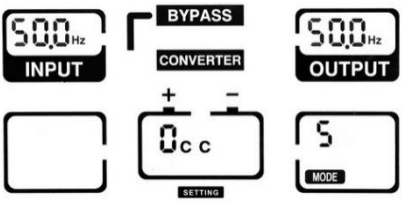
How to change the parameters

By pressing the ON/OFF and FUNC buttons simultaneously for 2.5s, the UPS will enter the "SETTING" menu, in this mode all the LEDs will flash.

By entering the Password, you can make the following settings.

Setting menu	Press FUNC and the OFF button at the same time until the display blink. Press "function" button to insert the password 233. For security reasons, this function must be used only by skilled person	
Rated input voltage	It can be set 200VAC / 208VAC / 220VAC / 230VAC / 240VAC, press FUNC to select and then ON/OFF to confirm and enter the next page. Factory setting 230VAC. 110-115-120-127 V are special factory setting only	
Rated frequency	It is possible to set the input frequency to 50 or 60Hz, press the FUNC button to select the frequency, press ON / OFF to save and go to the next page. Factory setting 50Hz.	
Rated output voltage	It is possible to select the following output voltages 200VAC / 208VAC / 220VAC / 230VAC / 240VAC, press FUNC to select, press ON/OFF to save the new output voltage and enter the next page. By turning the UPS off and on again, it will restart with the new voltage set. Factory setting 230VAC.	

Rated output frequency	It can be 50 or 60Hz, press FUNC to select, press ON/OFF to save and go to the next page. Factory setting 50Hz. By turning the UPS off and on again, it will restart with the new frequency set.	
Number of batteries in series	You can select 16 (192Vdc), 18 (216Vdc**),** 20 (240Vdc).22 (264 Vdc), 24 (288 Vdc). Press the FUNCT button to select the number of batteries present, press ON/OFF to save and enter the next page. Factory setting 16 batteries	
Battery charger	The charging current of the batteries can be set to: 0,5-1-2-3-4-5A Optional super charger: 1-12A Press FUNC to select the desired charging current, press ON/OFF to save and go to the next page.	
Select the settings of the communication protocol	0CC-MODBUS 1CC-SNT Press FUNC to select, press ON/OFF to confirm and go to the next page. 2cc is reserved by manufacturer When MODBUS is selected, it is possible to choose the number from 001 to 020.	

Communication ID setting	002- Communication ID2 Communication ID could be set as 001 to 020 (When MODBUS is selected). Press FUNC to select, press ON/OFF to confirm and enter in next page	
System mode	S-single mode P-parallel mode E-ECO mode A-self aging mode Press FUNC to select, press ON/OFF to confirm and enter in next page.	
Parallel ID	001- parallel ID1 In parallel mode, the parallel ID could be set as 000 to 008 (max parallel unit is 3) Press FUNC to select, press ON/OFF to confirm and enter in next page.	
Present setting	The settings are displayed together, press ON/OFF to confirm and exit, press FUNC to modify the settings. Turn the UPS OFF and ON again for the new settings to take effect	

Warning

When selecting the output voltage at 200/208VAC the PF is 0.9.

To change other settings, it is necessary to have the support SW

4.Procedures

4.1 Operating modes

4.1.1 Switching on in "Normal mode"

1) After checking the connections, close the battery disconnectors, then close the Input and Bypass switches on the rear of the UPS. The fans start, the load will be powered from the mains via the bypass

2) When the Rectifier LED (REC) is steady green and the yellow bypass LED is on, the load will be powered by the bypass line

The system is normally set to restart manually. Press the ON/OFF button to turn the UPS on.

The inverter LED flashes for about 1 minute, then turns green and the load will be powered by the inverter, unless an operating mode other than Normal mode has been set.

NOTE: *In some application, UPS is set to start manually, you should press ON/OFF to start inverter.*

3) The inverter LED start to flick, and after 1 minute, the UPS turn into normal working mode. If the utility power is abnormal, the UPS will operate in Battery mode without output interruption of the UPS

4.1.2 Switching the UPS on from battery, with no mains

1) With the battery disconnector closed

2) Press the battery start button located on the back of the UPS (see figure 1-2).

Press the ON/OFF button for 2.5 seconds, until the buzzer is activated.

3) After about one minute the UPS turns on in battery mode. If the mains power supply becomes available again, the UPS will return to normal operation.

4.1.3 Turning off the UPS in normal mode

1) To power off the UPS by pressing the ON/OFF button for more than 1 second, then choose it.

2) By pressing the ON/OFF button, the UPS power circuits are turned off

3) Open the mains and bypass switches, finally open the battery protections

4.1.4 Turning off the UPS from battery mode

1) To turn off the UPS, press the ON/OFF button for more than 1 second

2) The output voltage to the load will first be removed and finally the logic and the display will turn off.

NOTICE: Please turn off the connected loads before turning on the UPS and turn on the loads one by one after the UPS is operating in INVERTER mode. Turn off all connected loads before turning off the UPS.

 Warning: the internal DC bus is still powered, wait at least 5 minutes until opening the UPS. Before carrying out maintenance operations, check the DC bus voltage.

4.1.5 Maintenance mode

The UPS is equipped with a bypass switch: ***Warning****, even in manual bypass the neutral is present inside the UPS, dangerous voltage is present in the breaker terminal and in the terminal blocks.*

For this reason, it is highly recommended to equip the system with three double-pole switches or disconnectors (Input, Output, Maintenance Bypass), the external maintenance bypass allows you to isolate the UPS while keeping the load powered, and allows you to perform all maintenance operations on the UPS.

If the UPS cannot be repaired on site, disconnect the UPS, contact your distributor or the manufacturer

4.2 Parallel

4.2.1 Turning on the UPS in parallel

Check that the parallel connections have been made correctly. As described in *Fig 2-2, Fig 2-3, Fig 2-4:*

1) Close the Out CB1 and Out output disconnectors.CB2

2) Close the mains input switches and the bypass input switches of UPS1 and UPS2, after about 2 minutes, the UPSs work in parallel mode

3) Close the external battery switches

4) Connect the load. The load is now powered by the parallel system.

4.2.2 Turning off the parallel system

1) Turn off the connected load.

Press the ON/OFF button to transfer the load from the inverter to the bypass mains.

Open the output switches.

Open the mains inputs and bypass input switches of all the UPSs.

2) Open the external battery switches. After a few seconds, the UPSs will completely shut down.

4.2.3 How to install a new UPS in a parallel system:

1) Before installing a new UPS in a parallel UPS system, prepare the input and output cables, the output switch and the parallel cables.

2) Open the input and output switches of each UPS.

3) Connect the input, output and battery cables to the new UPS.

4) Connect the parallel cables to all UPSs.

5) Close the battery switches and the input switches of all the UPSs in the parallel system in sequence.

6) Turn on one UPS at a time checking the status of its display. Make sure that each UPS is displayed correctly and that all UPSs go into inverter mode.

4.2.4 How to remove a UPS from parallel:

1) If it is necessary to remove a UPS from the parallel system in normal mode, press the ON/OFF button of the UPS you want to remove and the UPS will immediately stop its output.
2) Open the mains input switch, the bypass input switch, the external mains input switch, the output switch and the battery switch/disconnector.
3) Press the ON/OFF button of the other UPSs. All of them move into Bypass mode.
4) Remove the parallel cables of the UPS to be removed.
5) Press the ON/OFF button of the remaining UPSs to transfer the UPSs to the inverter output.

5.Communication and monitoring ports

The RS232, RS485 and USB communication ports are available on the UPS: the UPS has a contact card: the external SNMP network card can be connected to the RS232 connector.
Information: Alternatively, you can use the SLOT (contact card) or RS485, and you can use either USB or RS232.

5.1 SNMP Card

The SNMP card is used to monitor the UPS via TCP/IP, the user can check the status, voltage and current of the UPS in the LAN network or even via the Internet. Consult the SNMP card manual for more detailed information.
Note: when the relay card is present on the slot, it is necessary use the external SNMP model connected to the RS232 serial port

5.2 Dry contact relay card (Optional)

The dry contacts are available in a “Phoenix” terminal are indicated in the table below.

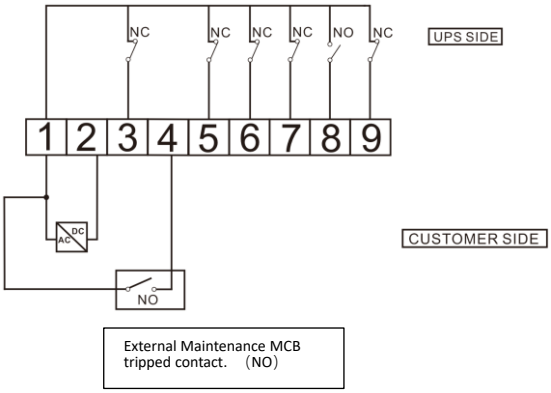


Fig 5- 1: General diagram of contact board

The connector pins have different functions and in particular we can divide them into:

1-2 => Voltage of an external power supply (AC/DC max 24VDC) to power the “Input” contact on pin 4. It must have double insulation with respect to the 230VAC voltage.

1-4 => Input Contact to signal the “tripped” of an external MCB (or MCCB).

1 (common) – 3, 5, 6, 7, 8 and 9 Output Contacts i.e. they are clean contacts for signals.

All Input and Output contacts can be programmed for different functions.

The default functions of these ports are shown in the table below.

Tab.5- 1: Functions of the dry contact relay card

Function	Pin	Description
Common	1	It has a double function. It is the positive (+12-24V_{DC}) of the voltage of an external power supply, and it is also the “Common” for the Output contact relays.
GND	2	It is the “GND” point of the voltage of an external power supply.
Input Mains	3	Normally “Closed” (NC). It switches to “Open” (NA) when the Input Mains is absent or out of tolerance.
Configurable Input MCB (or MCCB) tripped	4	Is an external tripped contact from MCCB (or MCB). Normally Open (NO) goes to “Close” when the MCCB (or MCB) has tripped.
Normal Mode	5	Normally “Closed” (NC) with UPS working in Normal Mode. It goes to “Open” when the UPS is not operating in Normal Mode.
Low battery	6	Normally “Closed” (NC). It goes to “Open” with “Battery almost low” alarm.
General Alarm	7	Normally “Closed” (NC) with UPS working without any alarm Open with UPS working with an alarm
Bypass Mode	8	Normally “Open” (NO) with UPS working in Inverter (Normal Mode) It goes to “Closed” when the UPS is on By-Pass Mode.
UPS Fail	9	Normally “Closed” (NC) with UPS working without any fail It goes to “Open” in the event of a UPS fault.

Note: The Output contacts can also be used without External Power Supply.

Note: Each contact has a maximum current of 1A and maximum voltage of 30V; it is recommended to use special double insulation cables.

N.B: The board can be configured via SW MTR (service personnel only).

5.3 EPO

The remote EPO control is located on the rear panel of the UPS, see Fig 1-2. It is active with contact open, Warning: If activated, the UPS removes power from the load.

NOTE: This function can be enable/disabled with the service MTR SW, if necessary, verify it.
In case of parallel connect the external EPO command to the EPO input in all UPS

5.4 RS485

RS485 is a port present on an optional card.
Note: it is a slot card, so it can only be used by removing the dry contact relay card from the slot

6.Maintenance

6.1 Battery maintenance

The batteries used for the standard models are VRLA sealed lead and maintenance-free.
By powering the UPS even without output, the batteries are kept charged, by closing the Mains switch, in this mode the overload and deep discharge protections also remain active.
If not used, the UPS batteries must be recharged for at least 12 hours, every 4-6 months, but if the temperature is high > 30°C the batteries must be recharged every 2-3 months.

The installation and replacement of batteries must be carried out by qualified personnel.
Replace the batteries with the same number of cells and of the same type.
Do not replace only one battery in the series. All batteries must be replaced at the same time following the manufacturer's instructions.

6.2 Battery disposal

1) Before starting to operate with batteries, remove any rings, jewellery, watches and other metal objects.
2) Wear rubber insulating gloves and shoes, and use tools with suitable insulation voltage.
3) If it is necessary to replace the connection cables, use only materials suitable for the voltage and capacity: ask the dealer or technical support for information. Unsuitable cables can create risk of overheating and electric shock.
4) Do not throw batteries into fire. The batteries may explode.
5) Do not open or damage the batteries, the released electrolyte is highly poisonous and harmful to the skin and eyes.
6) Shorting the positive and negative of the battery can cause electric shock, arcs or fire.
7) Make sure there is no voltage present before touching the batteries. The battery circuit is not isolated from the input circuit. There may be dangerous voltage between the battery terminals and the earth.
8) Even if the mains switch is disconnected, the components inside the UPS are still connected to the batteries, so there may be hazardous voltage and energy. Therefore, before performing any maintenance and repair work, open all the battery switches or disconnect the connection cable between the internal and/or external batteries if present.
9) Batteries have hazardous voltage and energy. Battery maintenance, such as battery replacement, should only be performed by qualified personnel who are familiar with the batteries and health & safety rules. No other person should handle batteries.

6.3 Battery replacement procedure

	Hazardous voltage and energy are present in the battery terminals and terminal block

Replacing the internal batteries

1) Press the ON/OFF button to transfer the load to the bypass network
2) Close the manual bypass switch on the back of the UPS
3) Close the external maintenance BYPASS switch (if present): otherwise it will be necessary to turn off the utilities because the neutral remains connected to the UPS
4) Open the mains switches that power the UPS
5) Open all the battery switches/protections of the external cabinets (double-pole)
6) Remove the side covers from the UPS.
7) Disconnect the battery wires one by one.
8) Remove the metal brackets securing the batteries.
9) Remove the batteries one at a time.
10) Refit the batteries one at a time
11) Secure the batteries using the appropriate brackets.
12) Connect the battery wires one by one. Be careful of potential electric arcs and shocks when connecting the last wire.

Replacing batteries in an external cabinet

1) Open the double-pole switch/disconnector of the battery cabinet being worked on.
2) Remove the panels from the battery cabinet that has been disconnected.
3) Disconnect the battery wires one by one.
4) Remove the metal bars used to secure the batteries.
5) Remove the batteries one at a time.
6) Refit the batteries one at a time
7) Screw the metal bars onto the UPS.
8) Connect the battery wires one by one. Be careful of potential electric shock when connecting the last wire.
9) Check that the battery voltage and polarity are correct
10) Close the battery cabinet
11) Close the battery switch

Warning:

Hazardous voltage is present inside throughout the entire procedure.

If there is no other battery pack, and if there are no mains during the replacement, the power supply to the load will fail.

6.4 Precautions

Although the UPS has been designed and manufactured to ensure personnel safety, misuse can result in electric shock or fire. To ensure safety, observe the following precautions

- Do not remove the brackets: it is recommended to fix the UPS to the floor to avoid accidental pulling of the cables.
- Turn off the UPS before cleaning it
- Clean the UPS with a dry cloth. Do not use liquid cleaners or sprays
- Do not block or insert any object into the ventilation grilles or other openings of the UPS
- Do not put liquids, bottles on top of the UPS

6.5 Periodic checks

Introduction

It is recommended to check the UPS once every six months using the synoptic.

Check if the UPS is capable of operating in bypass mode too, given that normally, the UPS operates in normal mode.

Check the charging voltage and charge status of the battery

Perform the battery test with fully charged batteries.

Check if the load applied has not changed compared to the previous check, above all that it is not greater than the design load and autonomy calculation.

7. Troubleshooting

This chapter provides indications that allow you to analyse the UPS status. The code shown on the synoptic provides a guide for analysing and solving any problems.
The presence of fault is signalled by the audible alarm and a red LED on the synoptic.
To display the alarm code (⚠) on the specific alarm menu, press "FUNC in the synoptic.
By entering page 4 of the menu, and keeping the "FUNC" key pressed for 2.5s, it is possible to reset the alarm. If the alarm continues, refer to Table 7-1 below.
.

Code	Description	Solution
7	Battery not present	• Check if the battery cables are connected • Check if the fuses or the battery protection are closed • Check that the batteries are not damaged
8	Manual bypass closed	Manual bypass is closed, UPS is on bypass and inverter operation is blocked.
10	EPO	Check if: • the EPO circuit is closed • EPO has been activated manually • EPO has been set normally open by SW.
16	Mains out of tolerance	Check that you have powered the UPS • Measure the voltage and frequency of the mains and check whether they are within tolerance • Check all mains switches • Check that you have correctly connected phase and neutral Quickly restore the mains power supply, otherwise the battery will be discharged: if it reaches end of discharge, the output will be de-energised
20	Bypass line out of tolerance	• Check if the bypass input power is out of tolerance • Check if the bypass input switch is closed Quickly restore correct input power to the bypass, otherwise there will be no load backup circuit if the UPS experiences a fault
22	Bypass fault	Bypass SCR open or short circuit, contact technical support
24	Bypass overload	Check the load, remove non-critical loads until the load is less than 95% of the rated power
26	Overload> allowed	When the allowed overload time is exceeded, the UPS disconnects the load

28	Out of sync	The bypass voltage or frequency is out of tolerance. This condition prevents automatic bypass operation. If the load was manually transferred on bypass, there could be an interruption in the output voltage.
30	Over transfer times	There have been 5 transfers between mains, battery, inverter, bypass in one hour
32	Short circuit in output	The load is too large or there is an output short circuit • Check and remove excess load, if necessary • Check if an output switch has opened (due to its thermal magnetic circuit breaker). In this case, remove the faulty or excess load, reset the alarm and turn on the UPS again
47	Rectifier fault	An over or under voltage of the output voltage to the AC/DC converter has occurred, If resetting the alarm, the UPS restarts, check the load and the mains. If the alarm continues, contact technical support
49	Inverter fault	The inverter voltage is out of tolerance. Reset the alarm manually; if the error and fault are still active, contact technical support.
51	Rectifier overheating alarm	The rectifier radiator has overheated or the temperature sensor is not connected correctly. • Check if the fans work normally • Check that the sensor is connected correctly (support) • Check that the room temperature is not above 40°C
53	Fan fault	One or more fans are faulty or blocked Check if the all fans work normally Check if something is blocking the fans
55	Overload	Inverter overloaded, the applied load is greater than the rated power of the UPS. Remove the non-critical loads, otherwise the UPS could transfer the output to bypass (mains).
57	Overload time greater than allowed	The UPS passes the load on the bypass line due to overload: in case of overload of the bypass, the output could be removed due to time out of the bypass overload. By removing excess or faulty loads, the UPS will transfer the load back to the inverter.

59	Inverter overheating	The inverter heat sink temperature is too high or the temperature sensor is not connected correctly. Check that the fans work normally Check that the ventilation is not obstructed Check that the sensor is connected correctly (support) Check that the room temperature is not above 40°C
61	The load is on manual bypass	If the bypass leaves the allowed synchronisation range, the output may be interrupted if the load is manually transferred to the bypass
65	Battery Low	Remaining battery capacity is low (in battery mode)
67	The polarity of the batteries has been reversed	Check if the battery cables are connected correctly Check if the battery pack cables are connected correctly
69	Inverter protection	The inverter voltage is abnormal or the DC bus is in overvoltage. The UPS resets automatically. If not, please contact your local dealer
74	Manual shutdown	The shutdown command was given to the UPS. The UPS activates the audible alarm and the general alarm. Disable the alarm or if possible turn the unit back on
78	Parallel cable error	Check that all parallel communication cables are connected correctly (only for parallel UPS)
81	Battery charger failure	The charger is defective or not connected. Contact your local dealer
85	UPS shutdown due to end of discharge (EOD)	The UPS turns off the end of discharge (EOD) output; when the mains returns, the UPS starts charging the battery, but does not power the output. Reset the alarm and restart the UPS. (no SW setting)
91	External insulation check alarm	There is an external insulation problem, check the status of the system insulation controller (optional in the system) Reset the alarm, contact an electrician if the problem persists.
93	External transformer temperature alarm	Check that the external transformer is not covered or that it is working at a room temperature too high. Reset the alarm Contact an electrician
95	Emergency line status	External signal, no ordinary line Check the condition of the line switches, remove any faults or reset the switch. If the Standby OFF S0 operating mode is set, the UPS will power the output.

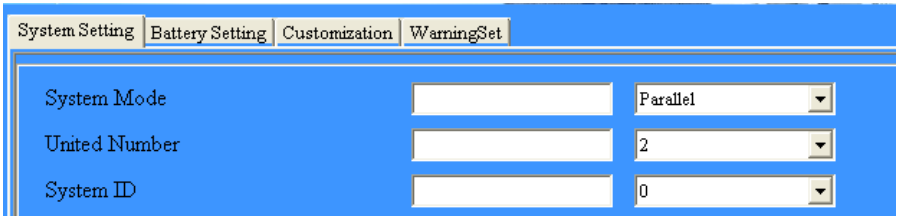
119	Relay open	The inverter relay is open. Please contact your dealer.
121	Relay closed	The inverter relay is closed. Please contact your dealer
152	Battery end of life	Maintenance notice; the batteries are nearing their end of life. Default about 4 years. When replacing the batteries with the SW MTR, rewrite the Battery Maintenance Reminding variable.

Annex A. Setting for parallel

1.Connect UPS1 with RS232 cable to the PC. Connect to the UPS with the monitoring software.

2.Enter the "ServSetting" menu, set System Mode as "Parallel" in the "System Setting" menu.

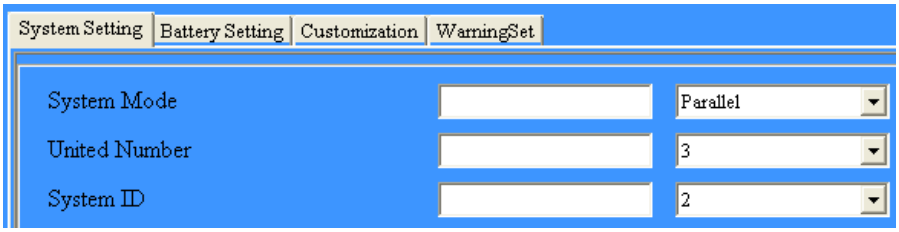
3.Set Unit Number as "2", set System ID as "0". Press "set" to confirm the setting.



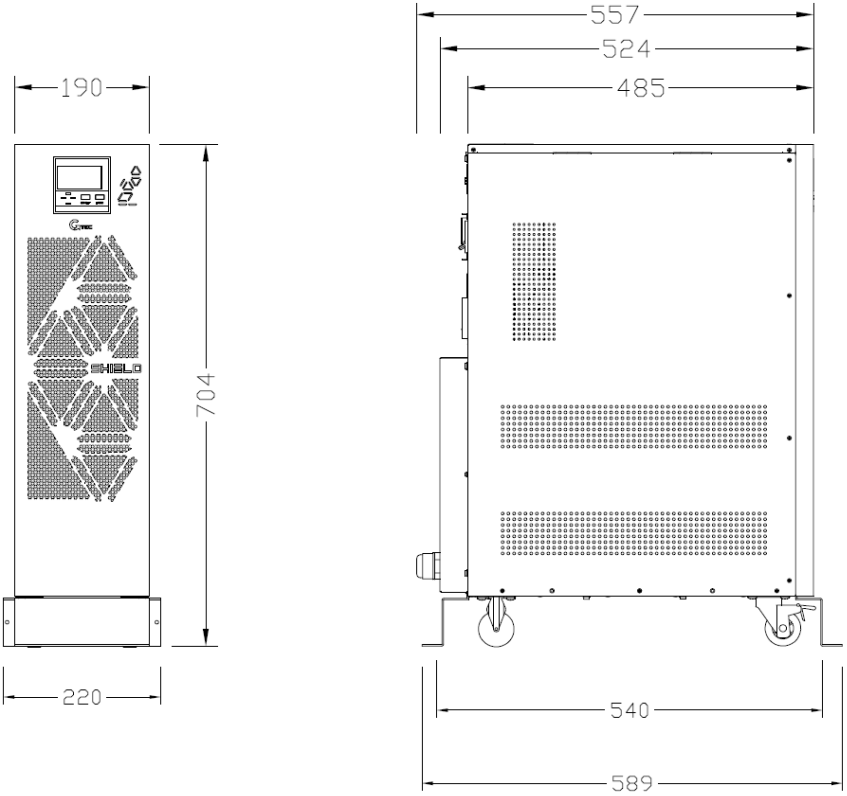
4.Connect UPS2 and set the system mode as "Parallel", set the United number as "2", set the system ID as 1. Press "set" to confirm the setting

If there are 3 or 4 UPSs in parallel, set the United number as "3 or 4".

5.Connect UPS3 and set the system mode as "Parallel", set the United Number as "3 or 4", set System ID to 2, in the fourth UPS 3.

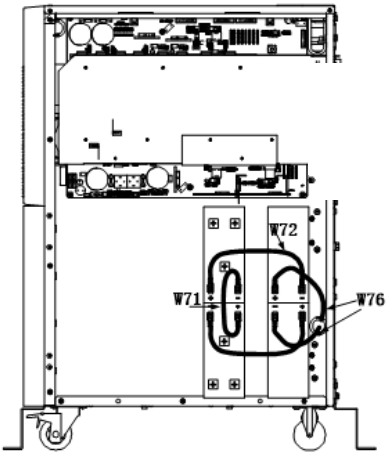


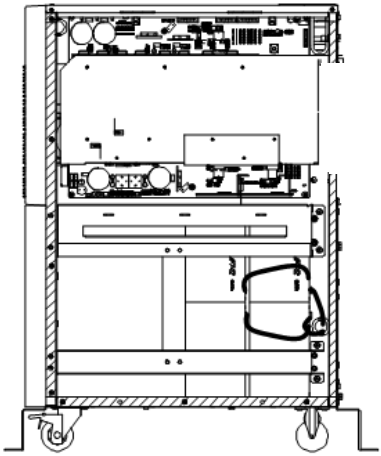
Annex B. Mechanical dimensions

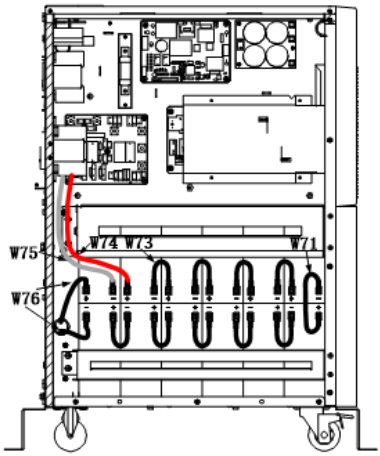


Annex C. How to install the batteries

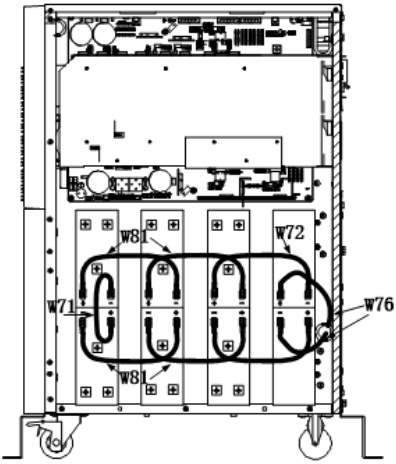
Installation schematic diagram standard backup with 16 batteries

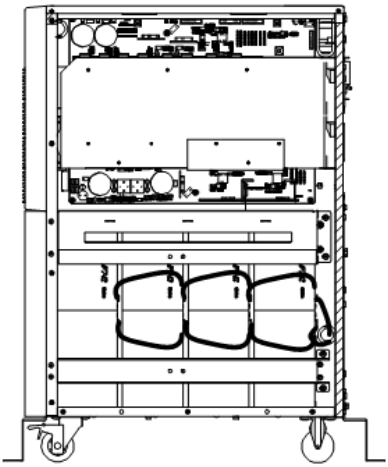


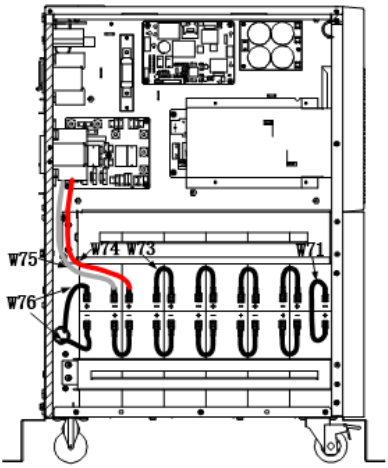




Installation schematic diagram with 20 batteries (version on request)





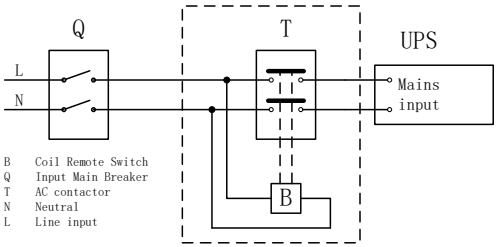


Annex D. Backfeed protection

Its purpose is to prevent a return of energy to the electrical system if the UPS has an internal fault during operation in battery mode.

This protection can be achieved either by means of a contactor external to the UPS, or by means of a current launch coil controlled by a contact on the UPS clean contact board. This coil must open the UPS input protection circuit breaker.

Below is an example of a system using an external contactor:



Note: In the case of separate networks, apply the schematic to both the Input network and the Auxiliary network (By-Pass).

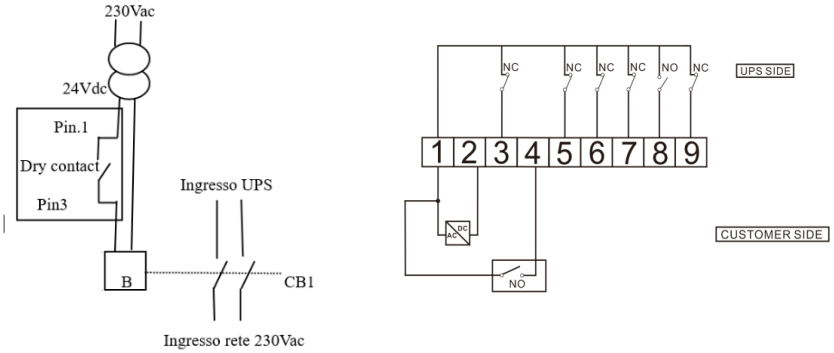
Whenever the Input and/or By-Pass network is absent, the contactor will open, blocking any return of voltage to the Input circuit breaker.

The size of the contactor to be used must take into account the maximum currents flowing through the Input section and the By-Pass, summarized below:

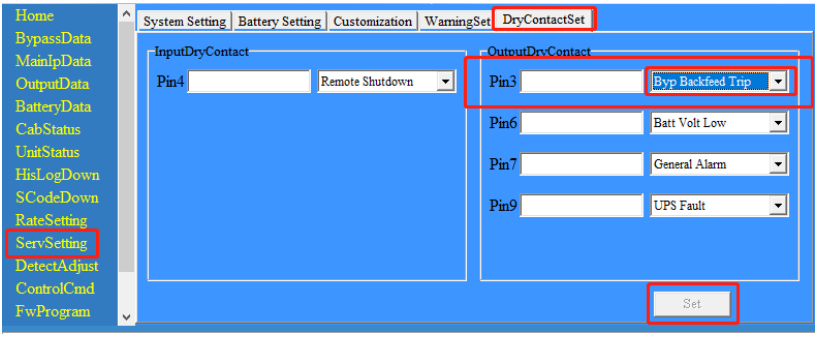
Current	UPS 6kVA	UPS 10kVA
Mains Current (A)	36	60
Auxiliary Mains (A)	26	44

The protection against voltage return must be placed on the static bypass line, with a magnetothermal switch with a current launch coil controlled by a contact on the UPS clean contact board.

Below is an example of a diagram of what has been described:



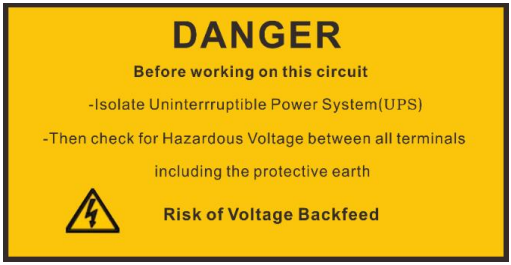
In this case is necessary, by Expert software MTR, setting the output dry-contact J3 as “BYP Backfeed Trip” (see below):



J3	Backfeed Coil	When the UPS detects a Backfeed fault, a control signal "24VDC/20mA" will be sent via J3. This signal is sent to the current launch coil of the input protection MCB (or MCCB), which will disconnect the Backfeed circuit.

WARNING LABEL

UPS is designed for permanent connection by fixed wiring to the AC supply.
A warning label (see below) shall be place by the Installer (must be a skilled person), on all primary power isolators installed remote from the UPS area and on external access points, if any, between such isolators and the UPS.



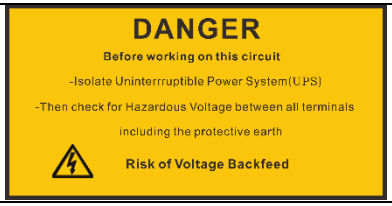
Annex E. Periodic checks

System: S/N:
Design autonomy:Maximum design load:
Check interval:

Date				
Technician				
No. of battery cabinets installed				
No. and type of batteries				
Battery date				
Set mode				
Battery voltage measure.				
Alarms-Status				
Load (KVA / KW)				
Transfer to bypass				
Battery test				
Autonomy				
Date:	**Settings other than factory / Notes**			

**** Open only the rectifier disconnector (Input); if necessary, in case of battery not OK may be the load will be transferred to the bypass line***

ANNEX F Warning Label / Arabic / Russia

SHIELD SINGLE PHASE UPS *Warning Label / Arabic / Russian*	**نظام الطاقة غير المنقطعة أحادي المرحلة من طراز شيلد** **ملصق تحذير/ اللغة العربية/ الروسية**
	**تحذير** ▪ يستقبل نظام الطاقة غير المنقطعة الطاقة من أكثر من مصدر. ويلزم فصل مصدر التيار المتردد ومصدر التيار المستمر لإزالة طاقة هذه الوحدة قبل الصيانة. ▪ خطر التعرض لصدمة كهربائية، لا تُزل الغطاء ولا تترك أجزاء يمكن للمستخدم صيانتها بالداخل، كما يرجى الرجوع إلى موظفي الصيانة المؤهلين. ▪ خطر التعرض لصدمة كهربائية، يتم تنشيط الأجزاء الحية الخطرة داخل نظام الطاقة غير المنقطعة من مزود البطارية حتى عند فصل قابس طاقة التيار المتردد.
	راجع تعليمات التركيب قبل التوصيل بمصدر الطاقة
	قبل العمل على هذه الدائرة - افصل نظام الطاقة غير المنقطعة. - ثم تحقق من الجهد الخطير بين جميع الأطراف بما في ذلك التأريض الوقائي. مخاطر الإمداد العكسي للجهد الكهربائي

العك

تحذير

- لإجراء التشغيل، اطّلع أولاً على دليل المستخدم بما في ذلك تحذيرات السلامة!
- لا يفتح هذه الوحدة إلا فنيين مُصرّح لهم!
- تُحفظ بطارية الرصاص الحمضية داخل الحيّز المُغلق!
- قد تشكل البطارية خطر التعرض لصدمة كهربائية ومخاطر الطاقة.
- خطر حدوث انفجار إذا استبدلت البطارية بنوع غير مناسب.

للحصول على معلومات حول البطارية راجع دليل المستخدم.

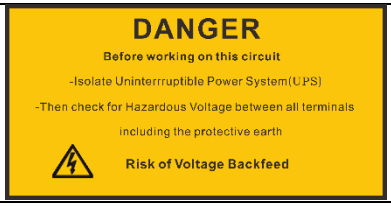
- للحصول على تعليمات التخلص من البطارية، راجع دليل المستخدم.

Warning Label / Russia

ОСТОРОЖНО

- ИБП получает питание от более чем одного источника - для обесточивания данного устройства перед обслуживанием требуется отключение от источника переменного тока и источника постоянного тока.
- Опасность поражения электрическим током, не снимайте крышку, внутри нет деталей, обслуживаемых пользователем, пожалуйста, обратитесь к квалифицированному обслуживающему персоналу.
- Опасность поражения электрическим током, опасные токоведущие части внутри данного ИБП питаются от аккумуляторной батареи, даже при отключении входного переменного тока.

ПЕРЕД ПОДКЛЮЧЕНИЕМ К ИСТОЧНИКУ ПИТАНИЯ ОЗНАКОМЬТЕСЬ С ИНСТРУКЦИЯМИ ПО УСТАНОВКЕ



Перед началом работы по этой схеме
- Изолируйте Систему бесперебойного питания (ИБП)
- Затем проверьте наличие опасного напряжения между всеми клеммами, включая защитное заземление
Риск обратного напряжения

ОСТОРОЖНО

- Перед началом работы прочитайте руководство пользователя, включая предупреждения по технике безопасности!
- Только авторизованные специалисты могут открывать данное устройство!
- Свинцово-кислотная аккумуляторная батарея внутри корпуса!
- Батарея может представлять опасность поражения электрическим током и опасность энергетических воздействий.
- Опасность взрыва при замене батареи на батарею неправильного типа. Информацию о батарее см. в руководстве пользователя.
- Инструкции по утилизации батареи см. в руководстве пользователя.