

SU-KAM OFFICES ADDRESSES

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USER'S MANUAL (IFU)

IntelliQ Series DSP ONLINE UPS

Salient Features

- DSP Based PWM Technology with IGBT
- Voltage & Frequency Independent (VFI) Technology.
- True Galvanic Isolation.
- Transient Free Pure Sine Wave Output Power.
- Future Up Gradable Through Flash Memory.
- Wide Input Mains Range.
- Constant Charging Current for the Entire Mains Input Range.
- High Efficiency in Mains & Battery Modes.
- High Inrush Current Handling Capability.

GLOBAL CERTIFICATIONS:

ISO 9001 : 2000
 ISO 14001:2004



Before connecting, operating, or adjusting this unit, please read this instruction booklet carefully.
 Customer care: +91 - 11 - 44231111

CONTENTS:

1. Introduction.....	1
1.1 Main Application of Online UPS.....	1
1.2 Mechanical Construction.....	2
2. DSP Based Online UPS	
2.1 Technical Specifications.....	3
2.2 Description of Front Panel.....	4
2.3 LCD Display Messages.....	5-7
3. Description of Rear Panel.....	8
4. IntelliQ ONLINE UPS Monitoring Software.....	9-14
5. Installation	
5.1 Unpacking & Inspection.....	15
5.2 Pre-Check & Commissioning.....	15
5.3 Battery Bank Connections.....	15
5.4 Installation Procedure.....	16
5.5 Storage Instructions.....	16
6. Site Preparation.....	17
6.1 Battery Room.....	18
6.2 Cable Requirement.....	18
6.3 Earthing Requirement.....	19
6.4 Battery Stand.....	19
7. Working of Online UPS System.....	19
7.1 Normal Mode.....	20
7.2 Battery Mode.....	21
7.3 Bypass Mode.....	21
7.4 UPS Operating Procedure.....	22
8. Preventive Maintenance	
8.1 UPS Maintenance.....	23
8.2 Battery Maintenance.....	23
9. Trouble Shooting.....	24
10. Safety Notes	
10.1 Instructions.....	25
10.2 Warning.....	25
10.3 Caution.....	25
10.4 Attention.....	26
10.5 Conditions of Use.....	26
11. Warranty.....	27-28

1. INTRODUCTION

Thank you for selecting Uninterruptible Power Supply (UPS) of Su-Kam as your power protection system. **ISO 9001** certification represents Su-Kam's commitment to building world-class products. We take pride in every unit that leaves our manufacturing facility.

Su-Kam's Uninterruptible Power Supply Systems supply No-break, clean & constant Power to loads. UPS is connected between the Mains or Utility Power and the load (e.g. : PC). It protects the load against Mains disturbances like Blackout, Brownouts, Sags & Surges. Voltage variations and Fluctuations, Frequency variations, Spikes, Distortion and Noise. This UPS model is a Double Conversion True Online Uninterruptible Power Supply, best suited for your critical load.

This UPS has been designed & developed by our dedicated R&D team and is ideally suitable for Indian power conditions. These have been duly certified by various independent institutions and test agencies of national standing and repute.

Note: Due to continuous product development, information given in this manual is subjected to change without any prior notice.

1.1 MAIN APPLICATIONS OF ONLINE UPS:**Computers**

Workstations, Servers, Data Centers, Plotters, Monitors, Modems,

Telecommunication / Communications

Key Systems, EPABX systems, Fax Machines, Networking Products, Bridges, Voice Messaging systems.

Medical Equipment

Operation Theatres, CT scan machine, X-Ray machine, Stone Crushing Machine, ECG etc.

Printing & Media Equipment

Digital Color Labs, Scan Printing Systems, Xerox Machines etc.

Point Of Sale

Cash Registers, Inventory Control systems.

Miscellaneous

Video Equipment, sound equipment, Sensitive Electronics and computerized systems.

1.2: MECHANICAL CONSTRUCTION

UPS System is housed in a compact and sturdy MS sheet metal enclosure consisting of framework and folded sheet metal panels. Framework and all panels are powder coated. The arrangement of components has been done in such a way to provide adequate mechanical strength, easy accessibility for servicing, efficient heat dissipation and follows the general engineering practices. The dimensions are shown in the table for 1KVA-10KVA.

S.No.	CAPACITY	DIMENSIONS DxWxH(mm)	WEIGHT (Without Batteries)
1.	1KVA / 48V D.C.	490x255x350	32 Kg
2.	2KVA / 180V D.C.	550x350x325	40 Kg
3.	3 KVA / 180V D.C.	475x350x325	57.5 Kg
4.	5 KVA / 180V D.C.	475x350x610	71.5 Kg
5.	7.5 KVA / 192V D.C.	550x350x660	93 Kg
6.	10 KVA / 192V D.C.	550x350x660	108 Kg

Note : These weights are approximated only. Company reserves the right to change it without notice.

The base of the cubical has castor wheels so the system can be moved. The UPS system is packed with a poly packing, corrugated packing and wooden packing for rail / road transport.

2. DSP ON-LINE UPS

2.1 TECHNICAL SPECIFICATIONS

Electrical Performance / Protections / Environment Specifications
Range of Capacity : 1KVA-10KVA

INPUT PARAMETERS

AC Input Voltage Range : 170V-280V
Input Frequency Range : 50Hz ± 10%(10 Hz window)
Phase : Single

OUTPUT PARAMETERS

AC Output Voltage : 230V + 1%(with alternate settings from 220-240V± 1%)
Frequency : 50 Hz ± 0.1 Hz
Phase : Single
Output Waveform : Sine Wave
Total Harmonic Distortion : < 3%
Transfer Time : Zero
Overload Capacity : 110% for 5 minutes and 150% for 15 Sec (other range available on request)

PROTECTIONS

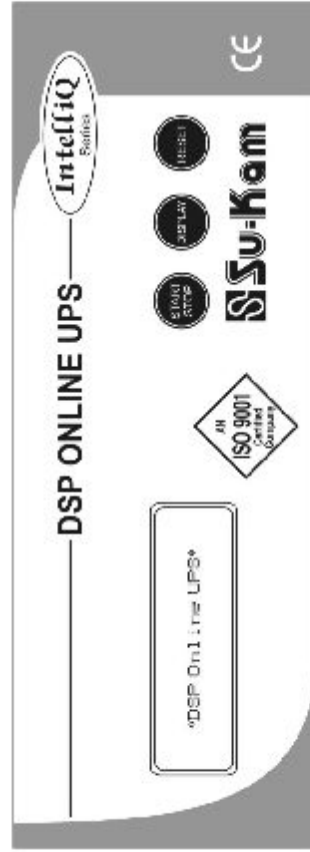
Inverter : Overload, Short Circuit
Battery : Overcharge, Deep Discharge, Low battery
Output : Over Voltage, Under Voltage
Technology : Digital Signal Processing
Power Device : IGBT
Battery Voltage Range : 48V-192V (as per system specifications)
Recommended Battery Ah : 7.2 Ah - 200 Ah

Environment Specifications

Cooling : In-built Instrument Fan
Storage Temp. : 0°C to 45°C
Operation Temp. : 0°C to 40°C
Relative Humidity : 0 to 95%, non-condensing

Note :- Please Set Battery charging current as per battery Ah at the time of installation.


2.2 DESCRIPTION OF FRONT PANEL



SWITCHES :

- ◆ **START/STOP** : Press Start/Stop switch for one beep for UPS system ON/OFF.
- ◆ **DISPLAY** : To change LCD Display Parameters, press display for one beep & release. To see previous displayed parameters, press display switch for two beeps & release. To switch off Buzzer (on protection), press display for one beep & release.
- ◆ **RESET** : To reset UPS system, press reset switch till LCD panel blanks.

2.3 LCD MESSAGES OF ONLINE UPS

1. ***SU-KAM WELCOMES YOU***
This message appears whenever UPS is Powered Up.
2. **DSP ONLINE UPS
INTELLIQ SERIES**
This UPS is Digital signal Processor based Online UPS.
3. **SELF TEST IN
PROGRESS....**
Whenever the UPS is powered UP the self test is performed.
4. **SYSTEM CAPACITY
10 KVA**
Capacity of the UPS is displayed in this screen.
5. **H/WVER-4.01
S/WVER-26.09**
This screen displays the hardware & software version of the UPS.
6. **LCD SELF TEST**
During UPS self test the LCD test is performed.
7. 
All the pixels of LCD glows in this screen to visually see if the LCD is OK or not.
8. **AUTO CALIBRATION PASS**
If the calibration of DSP is OK then pass appears else fail appears.
9. **REFERENCE SIGNAL PASS**
If the internal reference signal is OK then pass appears otherwise fail appears.
10. **SELF TEST PASS**
If during the UPS self test any test fail then self test fail appears.

11. MAINS : PRESENT / FAIL
OUTPUT : ON / OFF

Grid power is available then MAINS PRESENT and grid power is not available then MAINS FAIL. If UPS is ON condition then OUTPUT ON other wise OUTPUT OFF.

O/P POWER : 08000 VA
O/P FREQ. : 50.0 HZ

Output Power delivered by the UPS & frequency of output Voltage are displayed in this screen.

DC VOLT : ___V
INVERTER ON/OFF

Actual Battery Voltage available & whether UPS is switched ON or OFF.

I/P VOLT : 230.5V
I/P FREQ : 49.5 HZ

Mains Voltage & Frequency are displayed in this screen.

OVERLOAD > 110%
O/P CRNT. : 047.2A

Incase of overload > 110% this screen appears along with O/P Current.

O/P VOLT : 230.6V
O/P CRNT : 004.1 A

UPS output Voltage & O/P Current are displayed in this screen.

OVERLOAD > 150%
REDUCE SOME LOAD

Incase of overload > 150% this screen appears.

18. PROTECTION
BATTERY VOLT HIGH

If battery voltage exceed its high limit then the UPS is switch off & this message appears.

22. ATTENTION
O/P VOLTAGE HIGH

This is an alarm that the UPS battery is almost at the low limit set & will shutdown in short time.

19. PROTECTION
OVERLOAD SHUTDOWN

If the UPS shuts down after running in overload condition then this screen appears.

23. PROTECTION
O/P VOLTAGE HIGH

If the UPS output goes above a set limit then the UPS is switched off & this message appears.

20. PROTECTION
SHORT CIRCUIT

If short ckt occurs at the UPS O/P UPS is switch OFF and this Protection message is displayed.

24. E-MAIL : support@su-kam.net

E-mail address for assistance is displayed in this screen.

21. PROTECTION
O/P UNDER VOLTAGE

If the O/P Voltage from UPS is below set limit then this message appears on the screen .

3. DESCRIPTION OF REAR PANEL

Rear Panel Connections :

Refer to figure for the terminal details for connecting

Input Utility Power

Output UPS Power

Battery Terminal for DC Voltage

1. Comm. Port
2. Rotary Switch
3. Mains ON MCB
4. Battery MCB

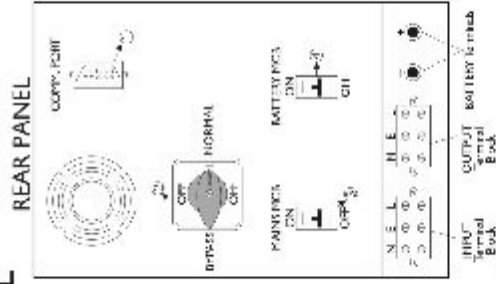
➤ Rotary Switch Operation

A three position Rotary Switch is provided On the Rear Panel.

The Positions Are: 1. UPS 2. Bypass 3. OFF

➤ RS-232 PC Interface (with Comm. Port):

The UPS provides an isolated computer interface via which the UPS status can be signed to a computer. To use this feature, an interface kit consisting of a customized cable and monitor software installation CD (developed for Win 98/2000 specifically) is required which is available as an accessory. The customer will have to order it.



4. IntelliQ ONLINE UPS MONITORING SOFTWARE

Monitoring software is a complete solution designed to prevent network and hard-disk crashes and to take care of sophisticated computer components. It is the latest innovation for reducing the laborious and time consuming daily checkups. At the same time, it maintains the good health and reliability of your **IntelliQ ONLINE UPS**. It also completely eradicates any chances of abrupt client and server shutdowns. Thus, it provides you total care, security, and convenience.

Two unique software.

Su-Kam **IntelliQ ONLINE UPS MONITORING SOFTWARE** comes in two parts.
 i) Online UPS server software ii) Online UPS client software

HOW TO CONNECT

Server software is installed on the computer system connected through the **IntelliQ ONLINE UPS** with the help of a DB9 connector. Client software requires an Ethernet connection to the server computer system via a router or hub with TCP/IP as the protocol. The software is available on an auto run CD with client software in the client folder and server softwares in the server folder.

HOW IT WORKS

A multi platform support based IntelliQ SOFTWARE interface a computer with the **IntelliQ ONLINE UPS** through serial communication, and real time parameters on the computer (Monitoring softwares on other platform available on request).

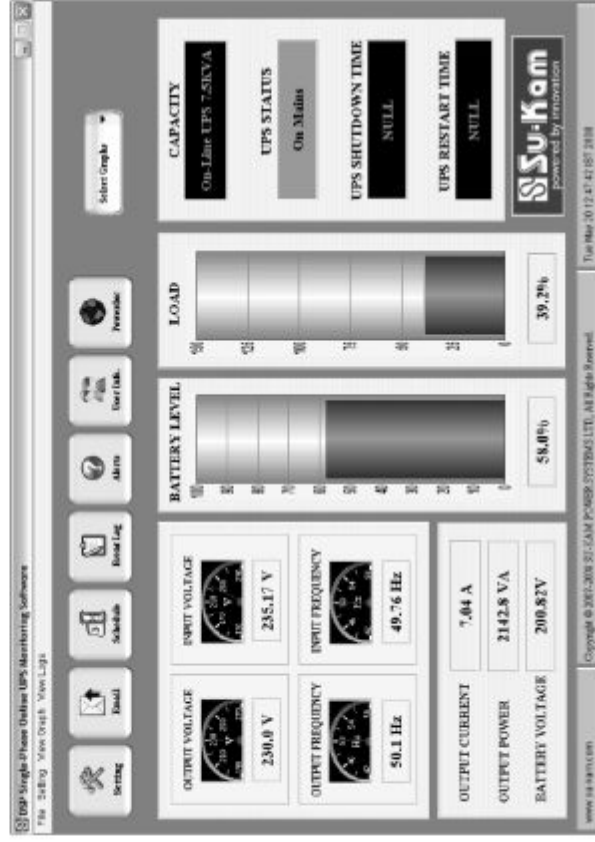
- Its display screen shows real time values such as output voltage, input voltage, output frequency, battery level, load, output current and output VA.
- It has analog meter for display of output voltage, input voltage, output frequency, input frequency and histograms for battery charge & load.
- It has some more screens such as data logging, Event logging alerts, E-mail setting.
- It has dynamic graph displaying live values in graphical form.
- The software also informs those clients which are connected to the server about various situations. These include low battery and the client system shutdown after auto saving running applications in MS-Word, MS-Excel, Notepad, Paintbrush and Wordpad.

THE AUTO-SHUTDOWN PROCEDURE

In sequence, first it shuts down all clients, then server, and lastly, the **IntelliQ ONLINE UPS**.

The client software also displays various real time UPS parameters that it gets from the server. This communication works on TCP/IP protocol so that it can be used on almost all networks.

The client software also shows all the parameters output voltage, input voltage, output frequency, input frequency, battery charge, load, output current and output VA on system in addition to the status of client and server communication.



HI-TECH FEATURES

- 1. Auto data saving to prevent data loss**
Since the software saves various applications before shutting down the system, it prevents important data loss. This is especially useful if the computer is unattended at time of shutdown.
- 2. Auto shutdown of system to reduce breakdowns**
It eradicates the chances of abrupt sudden shutdown in case of battery low thus reduces operating system and hardware problems due to sudden power failure.
- 3. Data logging for easy reference**
It logs UPS parameters such as output voltage, input voltage, output frequency, input frequency, battery level, load, output current and output VA and generates log files to get track of UPS operational history.
- 4. Popup screens for quick remedial action**
It flashes various popup screens within the specified time interval to alert the system user in case of critical errors when UPS is not placed within hearing distance, to alert by its beep.
- 5. Low Battery Warning**
It transmits a signal to all clients and server to shutdown them after saving running applications, in case of low battery.
- 6. Sends auto E-mail in case of problems**
In case of critical conditions, it automatically informs the respective company department about the problem with desired details. This is done without any user intervention.
- 7. Sends auto SMS in case of problems**
In case of critical conditions, it automatically informs the company service engineers about the problem by sending SMS to their mobiles. It doesn't require any user intervention (SMS alerts are available on request).
- 8. Network clients monitoring for complete user info**
It allows client users to see the display screen showing various parameters such as output voltage, input voltage, output frequency, input frequency, battery level, load, output current and output VA via server which is connected to UPS.

HOW TO INSTALL

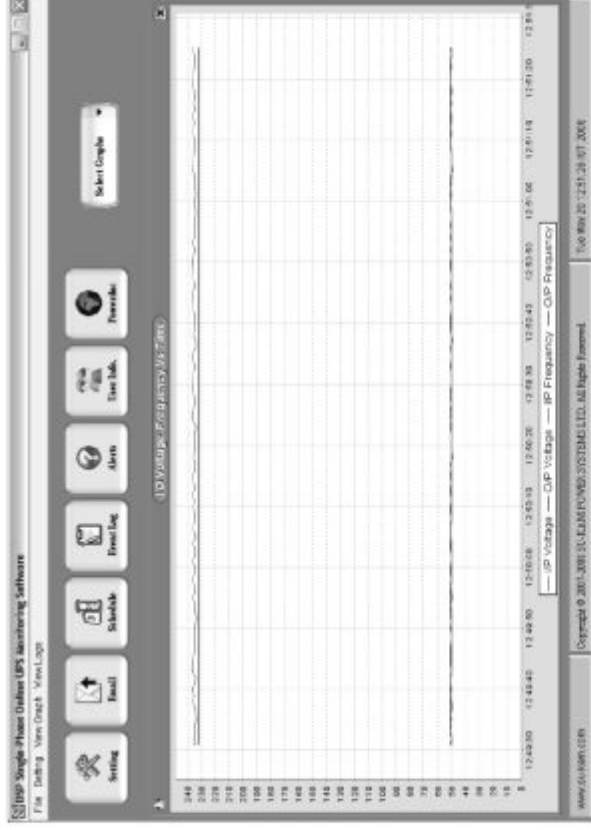
1. Connect the DB-9 male and female connector ends of the RS-232 connecting cable to the UPS and computer respectively.
2. Double click on the icon **S** named Setup.Exe in server or client folders to install their respective software in client and server systems respectively.
3. Now the wizard will prompt the user to click on the "next" button to continue installation. If at any time you press "cancel" button, the setup will terminate and remove previously installed files.
4. Sometimes it may prompt the system restart to upgrade some files.
5. In case during installation, it asks the user how to operate older files, it is always recommended to keep the backup of previous files for safety purpose, by pressing the button marked "YES"

The Startup Configuration

At first start-up, the software displays the list of available PC ports and ask the user to select the communication port for communication with the UPS.

Main Console

The main form console of the software has four meters that shows the output voltage, input voltage, output frequency, input frequency. There are two histograms, which shows the battery battery level and load respectively. Further, there are some digital displays for output current, output VA and system capacity. The status bar of the forms shows the status of UPS (ON/OFF), Date, Time and status of communication (Communicating / Not Communicating). In addition an icon blinks in green and white interchangeably in case of communication, and red in case of no communication between the UPS and PC. The drop down menu shows various other screens as data logging, settings, help etc to the user to traverse between various forms.



VARIOUS OPTIONS

After installation, the software starts with the factory settings. The user can change the settings but once changed they will remain saved. It has the following:-

1. **E-Mail setting**
Check the box if mail required to be sent to Su-Kam in case of critical errors. The settings button opens a form that has adjustments for the recipient's address, sender's address, etc. but the user can modify these settings only if username and password are verified.
2. **Log files settings**
Check this box if logging of UPS parameters as output voltage, input voltage, output frequency, input frequency, battery level, load, output current and output VA are required to be logged for future reference and for rigorous testing of performance. The scroll down list box has option to set the interval to log data.

3. SMS setting (optional)

Enabling this setting sends SMS to field engineers in case of critical conditions and problems. This ensures quick service and fewer hassles.

4. Shutdown Settings

Check the box if auto shutdown in case of low battery is required. The scroll down list box has the option for the setting of the interval.

5. Event Log

This will display any events or changes happened to the UPS.

6. Alerts

This will display all critical conditions log.

LOGGING CONSOLE

This shows the tabular scrollable form of the logged data of UPS parameters as output voltage, input voltage, input frequency, output frequency, battery level, load, output current and output VA etc. The button "refresh" updates the current data from the table.

TROUBLE SHOOTING

- 1. ERROR :** Communication Error
- CAUSES :** a. Improper port selection
b. Incomplete wire connection between UPS and Computer
c. Faulty RS-232 interfacing wire
- REMEDY :** Select right port from Comport form in software and check wire connections
- 2. ERROR :** Setup Terminated / Installation Setup Error
- CAUSES :** a. Corrupted System Registry
b. Already installed software
c. Incomplete installation of previous version of software
d. Corrupted window installer
- REMEDY :** Re-install corrupted software

5. INSTALLATION

Do not install the UPS system yourself. A qualified engineer from Su-Kam will be deputed for installation and commissioning of the UPS systems. Any tempering or shifting or unauthorized addition of load after the installation annuls warranty. Strictly follow the operating instructions given on the front panel button.

5.1 Unpacking & Inspection

While unpacking a brand new UPS system, check for the following:

- The condition of the packing box
 - The UPS box contains Warranty card & Product Manual
 - Check for the physical damages occurred during transit, if any
- Keep safe all the packing material until the inspection & installation is complete. In case of any shortage or damage, intimate carriers and company immediately.

5.2 Pre-Check & Commissioning

The installation work should be carried out only under the supervision of a qualified engineer from Su-Kam. The customer should provide all necessary material handling equipments, hand tools and labour including an electrician.

Remove the side panel & top panel. Check there are no wire broken. Also check for terminals, loose screws, dislodged control cards or control connectors. Rectify if necessary. Check and tighten all power connections.

5.3 Battery Bank Connections

Install batteries in the battery cabinet/stand. Measure the individual battery voltages. These voltages should be between 12V to 13V. Connect all batteries in series. The total battery bank should be 180V (can differ as per UPS DC bus design). Check and tighten all the battery connections. Apply white petroleum jelly on the terminals to avoid corrosion.

Attention:

User must exercise due caution in using the batteries. Please ensure that instructions laid down by battery manufacturers are positively followed. Improper use and carelessness in handling batteries can be hazardous and Su-Kam does not take any responsibility for any accidents/damages arising out of the same.

5.4 Installation Procedure

After unpacking & inspection, follow the simple installation procedure :

- Check the Input earth to neutral voltage. It should be less than 5V.
- Connect the UPS to utility mains (Ensure P & N are connected to appropriate terminals).
- Switch ON the mains MCB & measure the DC voltage. If OK, press the Start button & measure the UPS output voltage. If OK, switch OFF the UPS by pressing Stop button.
- Check the battery type & note the battery Ah.
- Connect the battery in series and make the DC bank (confirm battery MCB is OFF).
- Connect the battery bank to the UPS (confirm polarity at terminal).
- Switch ON the battery MCB.
- Set the battery charging current as per battery Ah. Recommended battery charging current = (Battery Ah/10).
- Allow battery to charge for 12 hours before its first use.
- Once battery charging is over, switch ON the UPS.
- Load the UPS gradually.
- Switch OFF the mains MCB & allow the UPS to be loaded with batteries for some time.
- Switch on the mains MCB.
- Put the back cover plate over the connecting terminals.

😊 Congratulations, You have successfully installed the UPS. 😊

5.5 Storage Instructions

To prolong the battery life and proper functioning of UPS system, maintain the temperature of site at 25 C to 35 C.

Charge the battery for at least 12 Hrs every three months (2 months is necessary if in high temperature area).

6. SITE PREPARATION

The UPS system should be installed in a clean, well-ventilated room of minimum 50 square feet approximately, if battery bank is installed in the same room as the UPS. Minimum carpet area for UPS is 10 square Feet with adequate space for movement of personnel for servicing whenever required. There should be a clear space of minimum 2 feet around the UPS.

The customer should provide the following facilities:

- (1) 230V, 1 Phase 3 wire, 50 Hz power source of adequate capacity with an Independent switch fuse unit or MCB'S for powering the UPS System in the room at a convenient point and this should be easily accessible.
- (2) 3 core PVC insulated copper cables of adequate length & cross section for connecting the Utility Power from the Switch Fuse unit/Isolator to the charger system.
- (3) A load distribution panel for connecting the various computer/Loads. This Board should have one SPN (Isolator) of adequate rating feeding individual loads with separate MCB of adequate rating to enable any load to be isolated in case of branch faults. The output of UPS is fed to the main Isolator and distributed to individual loads through the branch circuit MCB.
- (4) 3 core PVC insulated copper cables are required for connecting the UPS output to the Load Distribution Panel.
- (5) A 2 core PVC insulated cables of proper gauge are required for connecting the Battery bank to the UPS system. All cable required for making the above connection has to be arranged by the customer unless Su-Kam has specifically agreed to supply the same.

6.1 Battery Room

If SMF battery bank is used for backup power, it should be placed in the same room as the UPS on suitable Battery cabinet.

If tubular Lead Acid Battery bank is used, it should be kept in a separate room nearby, and should be well-ventilated. The batteries should be mounted on the Iron stand of adequate size. The frame should be treated with acid resistant paint and the stand should be preferably mounted on the porcelain insulators.

The battery room should be equipped with following accessories.

- ◆ A hydrometer to enable measurement of the specific gravity of the electrolyte periodically at required intervals.
- ◆ A measuring jar of 1-liter capacity.
- ◆ A pipette for withdrawing electrolyte for Specific gravity Measurement.
- ◆ Acid resistant hand gloves.
- ◆ A washbasin with water tap.
- ◆ A thermometer to monitor room temperature.
- ◆ Acid resistant gum boots.

6.2 Cable Requirement

Model No.	2KVA/180V	3KVA/180V	5KVA/180V	7.5KVA/192V	10KVA/192V
Input Cable	3 Core 4mm ²	3 Core 6mm ²	3 Core 10mm ²	3 Core 16mm ²	3 Core 16mm ²
Battery Cable	2 Core 2.5mm ²	2 Core 4mm ²	2 Core 6mm ²	3 Core 16mm ²	3 Core 16mm ²
Output Cable to Distribution Box	3 Core 2.5mm ²	3 Core 4mm ²	3 Core 4mm ²	3 Core 10mm ²	3 Core 10mm ²

- ◆ Customer should provide mains outlet with isolator pole & REYROLE plug/isolator for powering UPS systems and distribution box for load near UPS.

6.3 Earthing requirement

- ◆ The UPS cabinet should be earthed to prevent any shock hazards due to leakage current.
- ◆ All connected loads are to be earthed to output earth terminal.

6.4 Battery stand

A suitable MS angle Open Battery stand in single, two & three tier Stand or Closed Metal battery rack in single, two & three tier can be supplied along with UPS system if ordered separately.

7. WORKING OF ON-LINE UPS SYSTEM

Su-Kam online UPS contains following sections.

1. RECTIFIER/CHARGER SECTION
2. INVERTER SECTION
3. BATTERY
4. BYPASS

RECTIFIER/CHARGER SECTION: This section converts the raw utility power into clean DC & charges the battery (storage). This DC is fed into inverter section. All the problems of utility power vanishes due to the Conversion of AC to DC.

INVERTER SECTION: This section converts the DC power into AC power. Since the generation is electronic, the reliability & accuracy is very high as compared to thermal & hydro generation.

Battery: Battery is a combination of cells and is the ultimate source of DC storage. The cells store charge in the form of chemical energy.

Generally there are two types of cells available in the market :

Primary Cell: Can't be recharged (not used with UPS systems).

Secondary Cell: Can be recharged once discharged.

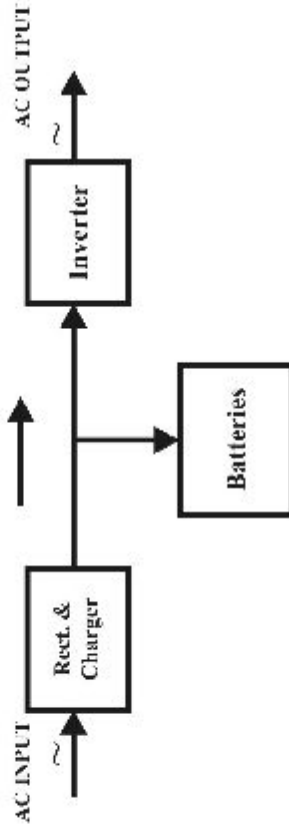
In UPS systems, the secondary cell are used. The commonly battery for UPS is lead acid battery. Three types of batteries are used :

- SMF/VRLA Battery ➤ Automotive Battery ➤ Tubular Battery
- The term SMF battery stands for sealed maintenance free lead acid battery. These batteries do not require water topping. Automotive & Tubular batteries need frequent maintenance & water topping up.

7.1 NORMAL MODE :

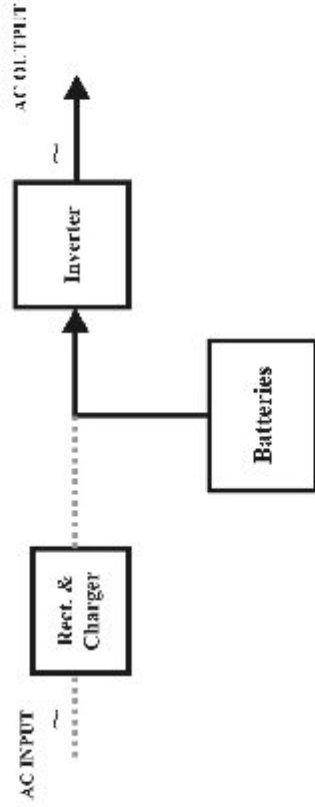
In an online UPS, the normal power flow is from the Input through the Rectifier /Charger & Inverter to the output. The Inverter Continuously supplies the load with power and at the same time conditions power delivered to the load.

Normally in this condition, the charger will charge the batteries and the output of the UPS should be 230V±1%, and Frequency should be 50±0.1Hz.irrespective of mains Input. (Input voltage range is 170V-280V AC)



7.2 BATTERY MODE:

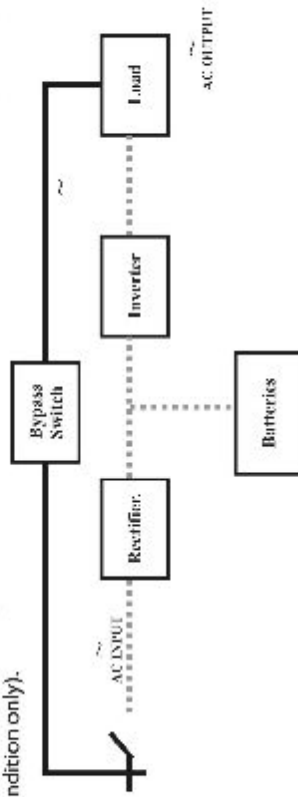
When the utility power fails, the inverter draws the DC power from battery & converts this DC into clean AC of 230V±1%, frequency 50Hz±0.1Hz. Irrespective of DC voltage.



7.3 Bypass Mode:

In manual bypass mode, the switch is activated and the utility power is fed directly to output load. Filtering & surge protections can be made present in this mode.

This mode is used only for maintenance & at the time of UPS breakdown (in emergency condition only).



7.4 UPS Operating Procedure:

Three Feather touch Buttons are On the Front Panel.

- Start/ Stop
 - Display
 - Reset
- To charge the Batteries alone, with all connected Loads Off**
- ⊙ Mains MCB of UPS should be in ON position.
 - ⊙ Rotary Switch should be in OFF position.
 - ⊙ Battery MCB should be in ON position.
- To power connected loads through UPS Power**
- ⊙ Mains MCB of UPS should be ON.
 - ⊙ Battery MCB Should be ON.
 - ⊙ Rotary switch should be in UPS position.
 - ⊙ Switch on the start button (from front panel) by pressing it. one Beep.
- To switch off the entire UPS System.**
- ⊙ Press the stop button for one Beep from the front panel.
 - ⊙ Keep the Rotary switch in OFF position.
 - ⊙ Input mains MCB should be in OFF position
- To power connected loads through Bypass source on UPS failure (Manually).**
- ⊙ Mains MCB of charger should be OFF.
 - ⊙ Rotary switch should be in Bypass position.

8. PREVENTIVE MAINTENANCE

To get long trouble free service from UPS system, the frequent maintenance of UPS as well as battery is required.

*Read **Caution** before attempting any maintenance of UPS System.*

8.1 **UPS Maintenance**

Switch Off UPS from Stop Button & then switch off mains input isolator & place the rotary switch in OFF position.

Ensure the following:

- Proper Ventilation of site
- Premises is dry & clean
- No Loose Contacts anywhere in the utility output powering the UPS
- UPS is not Overloaded
- Clean the panel at least once in 30 days with the help of dry cotton cloth.

8.2 **Battery Maintenance**

Switch off the Battery MCB and then :

- Check all the connections are tight.
- If Loose tight the same with **Insulated** Spanner.
- Remove the dirt/dust from terminals
- Clean the terminals with a dry cloth.
- Apply petroleum jelly/Vaseline.
- Check the Individual Battery Voltage with multimeter. All batteries should have identical voltages of Approx 12.6 to 12.85 V.

For Tubular Battery use the following additional steps :

- Use only PVC mug for topping UP.
- Avoid Naked Light in Battery room.
- Check the battery level at least in 60 days.
- Always use distilled water for topping up.
- Topping should be done before charging or early part of charger cycle.
- Check & record individual Cell voltage. All cells should have voltage of 2.15V to 2.20V.

9. TROUBLESHOOTING

S.NO.	Problem	Possible Cause (S)	Action Recommended
01	UPS system works on battery when mains is Present	Mains MCB trip Input connecting Wires may be loose UPS defective Mains may be low	Check the MCB Check the wiring Check the wiring Call Engineer
02	No Battery Backup Or Less Battery Backup	Battery MCB may be OFF. Few batteries of battery bank may be defective. Charger section of UPS may be defective	Check the MCB. Call engineer Call engineer Call engineer
03	Mains MCB Tripping	UPS may be defective	Call engineer
04	UPS does not start	Mains not present Problem with UPS	Call engineer
05	Indications : No Mains ON	Input mains not present Isolator defective LED may defective	No problem with UPS Call engineer
06	Sudden shutdown of unit	Short circuit/Overload at the output System may be faulty	Check short circuit/Overload Call engineer
07	Excessive gassing of	Could be over charging	Call engineer

10. SAFETY NOTES

10.1 INSTRUCTIONS

This manual contains important safety notes that should be followed during the installation and Maintenance of the Power Protection Systems Series UPS.

Follow these instructions during the unpacking, installation & maintenance of the UPS & the Batteries. If you have any problem with the UPS, please refer the troubleshooting chart before calling the Su-Kam technical services.

Please read this manual thoroughly before attempting to operate this UPS.

10.2 ⚠ WARNING

- To prevent the risk of Fire or Electric Shock, install the UPS in a temperature and humidity controlled room, free of conductive contaminants.
- Operate the UPS only from a properly grounded/earthed AC supply only.
- To reduce the risk of electric shock, do not remove the UPS covers, as it has no user-serviceable parts inside. Some components are live, even when AC power is disconnected. For service, contact a qualified trained Engineer from Su-Kam.

10.3 CAUTION

Although this UPS has been designed and manufactured to assure personal safety, improper use / mishandling can result in electrical shock or fire. To ensure safety, please observe the following rules:

- Turn off your UPS Systems before cleaning. Do not use liquid or aerosol cleaners. A dry cloth is recommended to remove dust from the surface of your UPS.
- Do not install your UPS in or near water.
- Do not place UPS on an uneven surface.
- Do not place UPS under direct sunlight or close to heat emitting sources.
- Allow proper ventilation of UPS, do not block or cover sides of unit.
- Do not place UPS power cord in any area where it may get damaged by heavy objects.
- Do not touch the Batteries as they can present the high risk of electric shock.
- Do not dispose off batteries in fire, the battery may explode.
- The normal Operating Temperature is 0 to 35 C.
- Follow all warnings and instructions. Do not attempt to service the UPS, as it has no user-serviceable parts inside. Refer all repairs to qualified Su-Kam service engineer

10.4 ATTENTION

Turn off your UPS system from the front panel, turn off the mains MCB and select the rotary switch into by pass mode and contact the service engineer if:

- The cables are damaged.
- Liquid has been spilled from Battery.
- The MCB of UPS trips frequently.
- The UPS does not operate even when user follows the operating instructions.

10.5 CONDITIONS OF USE

The input /output receptacle & battery must be within 2.5 meters to 3.5 meters from the UPS.

Your UPS provides conditioned power to connected equipment. Maximum load must not exceed that shown on UPS rating label. If uncertain, consult Su-Kam HELPLINENOS.

Keep the unit clean & vacuum the ventilation intake periodically.

Switch Off the UPS systems using **Stop switch** of UPS when not in use over long periods. Placing magnetic storage media on top of the UPS may result in data corruption or malfunctioning.

Terms and conditions of warranty

- ★ SU-KAM POWER SYSTEMS LIMITED warrant to the original purchaser provided the product is still in possession of and used by the original purchaser from the date of purchase.
- ★ The warranty stands on all parts (except LCD's, switches and external body) for UPS will be for a period of 12 months from the date of purchase.
- ★ The warranty will be automatically terminate on the expiry of the warranty period, even in case of the UPS not being in use in the specified period.
- ★ This warranty is valid only if it is duly signed by the authorized dealer.
- ★ The warranty will be invalidated if defects arising in company's opinion by reasons of accident, abuse, misuse, neglect, improper installation (if not undertaken by the company or its representative), fire, flood, or other act of GOD and any other natural calamities and any other unauthorized repairs done or carried out will have to be borne by the purchaser. The problem of fuse blown will not be included in the warranty of the product. The services given for the same will be paid service.
- ★ The company will not be held liable in any condition for any loss or injury or damage caused to life or property or death and disability caused to any form of life for any reason whatsoever.
- ★ The warranty will not apply if the original seals are found broken or tampered with.
- ★ Free service under the terms of warranty will be provided only by authorized representatives/dealers of the company anywhere in India.
- ★ The company expressly denies the right of any person to incur or assure for it any other liability or obligation in connection with the sale of UPS.
- ★ Claims if any, to this warranty shall be made only before courts having jurisdiction in New Delhi.
- ★ Now register your product or launch online complaints at www.su-kam.com for prompt after sales services.

WARRANTY CARD

Model No. : IP - IP DSP IntelliQ ONLINE UPS
Serial Number :
Name of Purchaser :
Address :
Telephone Nos. :
Date of Purchase :
Dealer's Name :

This Operating manual is supplied to the Proud Owner of Su-Kam PFC Online UPS System in good faith, for the specific purpose of understanding, maintaining & operation of UPS System. The information Contained herein is confidential and is exclusive property of Su-kam Power Systems Ltd.

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