

# HITACHI

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## **ic** **S** **Three Phase UPS Systems**

Range: 10 to 500kVA



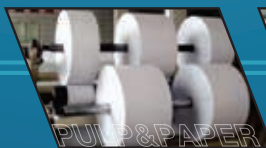
MEDICAL



PLASTIC



AUTOMOBILE



PULP & PAPER



PACKAGING

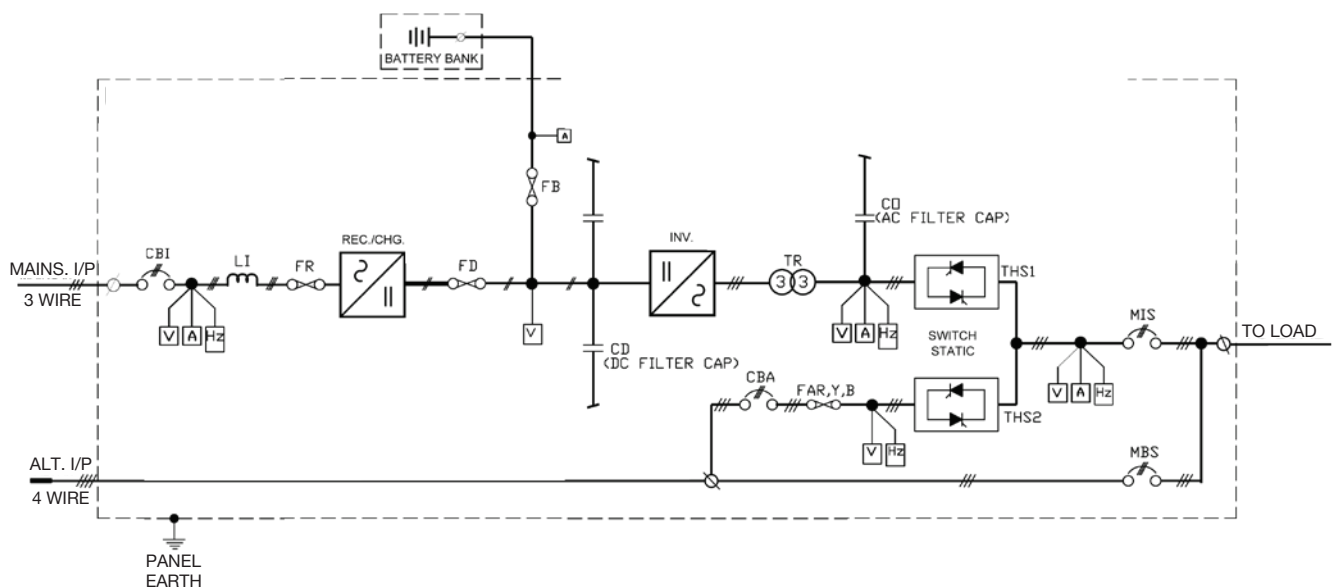
# Three Phase UPS Systems

Hitachi Hi-Rel Power Electronics Pvt. Ltd. is in the business of Industrial UPS Systems since 1987 and has rich experience in supplying power back-up and power quality solutions for mission critical applications in refineries, petrochemicals, power generation, steel & metals, process industries as well as for critical data processing applications.

Hitachi Hi-Rel Power Electronics Pvt. offers high quality power back-up technology and complete customized system solutions for demanding applications.

i6s Three Phase UPS Systems are specifically designed to provide power quality and back-up for applications in Chemicals, Textiles, Pharmaceutical, Pulp & Paper, Printing & Packaging, Glass, Food & Beverages, Automotive, and Data Processing.

## Single Line Diagram

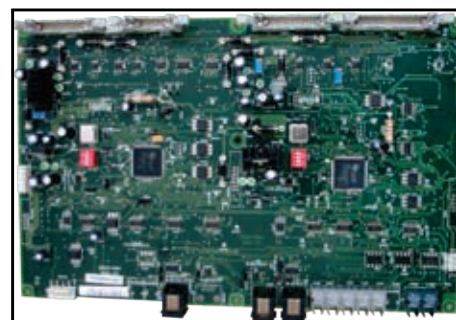


## Design Philosophy

i6s series of UPS systems have been designed to perform under extreme operating conditions that normally exist in industrial environments. The use of Digital Signal Processors (DSP) has made the control loop of the UPS system very stable, drift free and with better HMI for monitoring, control and precise settings of parameters. High speed CAN bus interfaced sections make the system response very fast to handle the extreme transient load conditions. Intelligent power device with sandwich bus architecture makes the systems highly efficient and reliable.



Latest Generation IGBT modules



Digital Signal Processing (DSP) based control board

# Standard Features

- IGBT – based PWM Inverter
- Internal Interface on high speed CANbus
- DSP – based system control
- Fiber optic data communication
- Redundant control power supply
- Latest generation power devices
- True power measurement
- High resolution LC display
- LED mimic system diagram
- Six pulse Thyristors based rectifier/charger
- Capable to handle 100% unbalance load
- Eco mode configurable
- Charger compatible to SFMB & VRLA types' battery
- Fully rated Make before brake type maintenance bypass switch
- High branch fuse clearing capacity
- Industrial grade enclosures
- RS 485 link for external communication
- Event log (with date & time) last 999
- Programmable 8 nos. potential free (NO/NC) contacts
- Isolated 8 nos. inputs for remote alarm
- Built in Battery management system
- Insensitive to phase rotation
- Industrial compatible power terminals

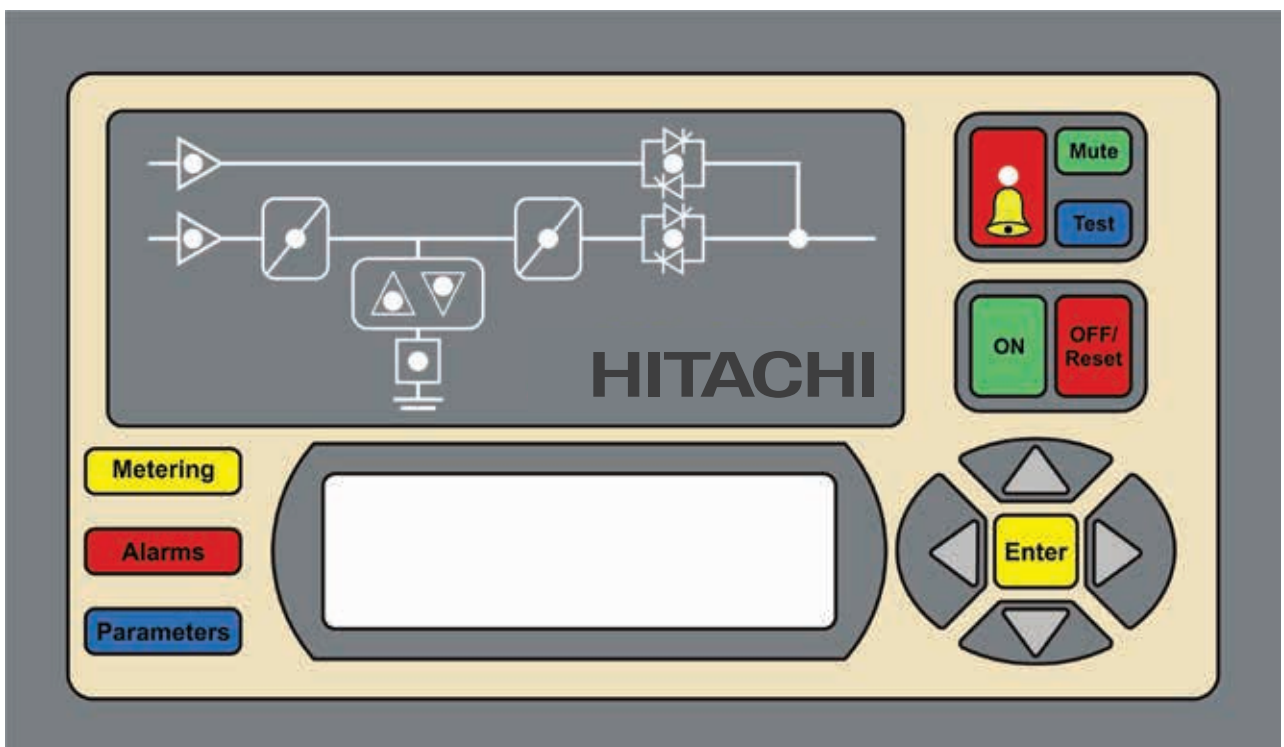
## Options

- 12 Pulse Rectifier
- Input isolation transformer
- Input harmonics filter
- PC based monitoring and recording
- Common battery bank
- SNMP, Profibus, Modbus communication protocols
- Parallel Redundant / Hot Standby Configuration
- Bypass Line Regulator

## Battery Management System

Battery Monitoring System is an on-line built-in feature to check the battery open / weak status automatically at a pre-defined period. It also indicates the residual time, AH, balance life in terms of years /cycles.

## Digital Control Panel



# Alarms, Indications and Metering

LCD No.	Parameter	Status	LCD Indication
1	Mains Input	Absent Within Range Out of Range	OFF Green Blinking Green
2	Bypass Input	Absent Within Range Out of Range	Red Green Red
3	Charger Operation	ON OFF Trip	Green Red Blinking Red
4	Battery Discharge	On Battery Operation	Red
5	Battery Operation	Boost Charge Float Charge Discharge	Red Green OFF
6	Battery MCCB	ON OFF	Green Blinking Red
7	Inverter Operation	ON OFF Trip	Green Red Blinking Red
8	Load on Inverter	Inverter SSW ON Inverter SSW OFF	Green OFF
9	Load on Bypass	Bypass SSW ON Bypass SSW OFF	Red OFF
10	Synchronization	Synch. No Synch.	Steady Yellow Blinking Yellow
11	Common Alarm Indication	Any Alarm Present	Blinking Red

## LCD Display

METERS-DIGITAL-LCD DISPLAY	
<b>VOLTAGE METERS</b>	Mains Alternate Battery Inverter Load
<b>FREQUENCY METERS</b>	Mains Alternate Output
Metering with true RMS measurement	
<b>CURRENT METERS</b>	Mains Battery Load
<b>POWER METERS</b>	Load kVA Load kW Load Power Factor

MAJOR ALARMS-TEXT READOUT-LCD DISPLAY	
<b>INPUT</b>	Under Voltage Over Voltage
<b>DC</b>	Over Voltage
<b>BATTERY</b>	Discharging Under Voltage End of Battery Discharge
<b>INVERTER</b>	Under Voltage Over Voltage IGBT Limb Fault Over load Over load Trip (Inverse Time) Over Temperature
<b>ALTERNATE</b>	Under Voltage Over Voltage Frequency out of Range
<b>STATIC SWITCH</b>	Transfer to Bypass

# Technical Specifications

Exceptional Safeguard against Power Disruption

<b>MAINS INPUT</b>	
Rectifier Input Voltage	415V 3 Phase 3 Wire
Voltage Tolerance	+15%, -15%
Input Power Factor	0.8 @ Full Load
Frequency	50Hz / 60Hz $\pm$ 6%
Input Current Harmonics	< 30%
Bypass Supply	415 V, 3 Phase, 4 Wire
<b>DC BUS</b>	
DC Bus Charger Voltage	357Vdc to 476Vdc
Battery Charger Current Capacity	(kVA x 0.65)A
Minimum End Cell Voltage	357Vdc
Maximum DC Bus Ripple With Battery	< 1%
Maximum DC Bus Ripple Without Battery	< 2%
Recommended No. of Cells :-	
SMFB	204
LATB	204
DC Voltage Regulation	$\pm$ 1%
<b>UPS OUTPUT</b>	
Normal UPS Rating	At 0.8 PF
Voltage	380 - 400 - 415Vac, Three Phase + Neutral
Voltage Tolerance:-	
Steady State	$\pm$ 1%
100% Step Load	$\pm$ 5%
Recovery Time	< 20mSec
Power Supply Interruption and Restoration	$\pm$ 1%
Overload:-	
Inverter 1 min	150%
Inverter 10 min	125%
Inverter 60 min	110%
Frequency	50Hz / 60Hz
Frequency Stability, Free Running	$\pm$ 0.1%
Synchronization Range	$\pm$ 6% ( $\pm$ 1 to $\pm$ 6% Field Programmable)
Slew Rate Single Unit	1Hz / Second
Wave Form	Sinusoidal
Distortion Factor:-	
Linear Load	< 2.5%
Non-linear Load	< 5%
Admissible Output Crest Factor	3:1
Branch Fuse Clearing Ability	30% Rated (Semiconductor Type Fuse)
Output Voltage Adjustment Range Step Less	$\pm$ 10%
Static Switch Transfer time in Sync Mode	< 4mSec
Static Switch Transfer Time in Async Mode	< 20mSec
Maintenance Bypass	Make Before Break
<b>OPERATING CONDITIONS</b>	
Ambient Temperature Range for Storage	0-60°C
Ambient Temperature Range for Operation	0-45°C
Altitude Above Sea Level	1000 Meters From MSL
Allowable Air Humidity	95% Non Condensing
Atmosphere	Non Corrosive, Dust Free, Freely Ventilated
Audible Noise @ 1meter From Panel Front	55 dBA to 74 dBA (Depending on System Rating and System Configuration)

ENCLOSURES	
Construction	CRCA Steel Sheet
Protection Class	IP 20
Finish (Power Coated)	RAL 7035/7032
Ventilation	Forced Air (Internal Fans)
Cable Entry	Bottom
STANDARDS	
Safety	IEC 62040-1
Performance	IEC 62040-3
EMC Standard	IEC 62040-2
Product Certification	IEC 62040-3
IP Rating	IP 20 According to IEC 60529

## Dimensions

Rating kVA	Height (mm)	Width (mm)	Depth (mm)	Weight (Kg)
10	1600	800	900	450
20	1600	800	900	465
30	1600	800	900	480
40	1600	800	900	520
60	1600	800	900	540
80	1900	1200	800	1000
100	1900	1200	800	1000
120	1900	1200	800	1100
150	1900	1200	800	1200
200	1900	1610	800	1350
250	1900	1610	800	1650
300	1900	1610	1000	1850
400	2100	2800	1000	2200
500	2100	2800	1000	2500

**Note:**

Overall dimensions, weight, audible noise, heat generation, module height etc. depend upon the system configuration and options required.

In the spirit of continual improvements, specifications are subjects to change without any notice.

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