



## Single Phase Industrial UPS Systems

Range: 5 to 225 kVA UL Series



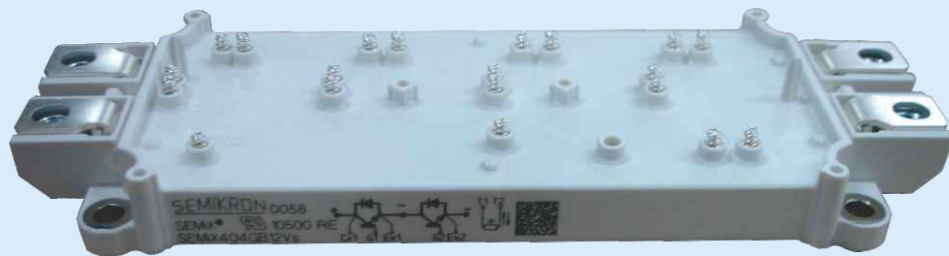
# Single Phase Industrial UPS Systems

**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.

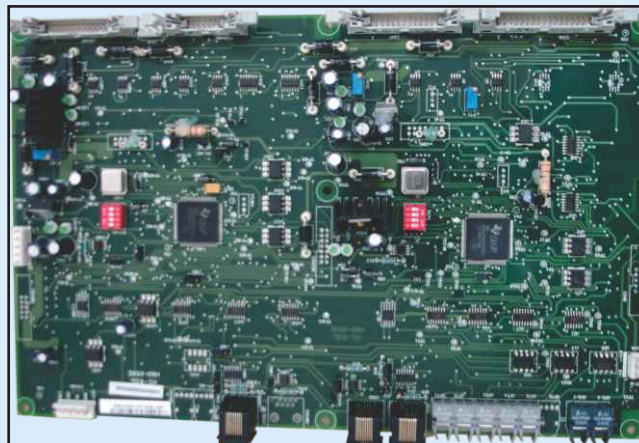
Hitachi Hi-Rel Power Electronics offers high quality power back-up technology and complete customized system solutions for demanding applications..

## Design Philosophy

I4<sup>+</sup> 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 LCD display
- LED mimic system diagram
- Thyristor Based Rectifier
- Charger compatible to all types of battery for industrial use
- Fully rated make before break 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
- Battery reverse polarity protection
- Insensitive to phase rotation
- Industrial compatible power terminals

## Options

- Input : 230 VAC, 1 Ph, 2 wire
- Input isolation transformer
- Input breaker 50 kA.
- 12 pulse rectifier / charger
- IGBT based PWM rectifier
- Input harmonics filter
- Parallel / hot standby configuration
- PC based monitoring and recording
- Common battery bank
- SNMP, Profibus, Modbus communication protocols
- Lower DC bus voltage
- 50°C ambient temperature
- Bypass line equipment
  - SCVS - Servo Controlled Voltage Stabilizer
  - SSVS - Solid State Voltage Stabilizer
  - CVCF - Constant Voltage Constant Frequency Stabilizer
- Front access
- Top cable entry
- Various input / output voltage level
- Battery earth leakage protection
- Panel protection class
- Panel color (Paint shade)
- UL listing



Open Door View > 80 kVA System

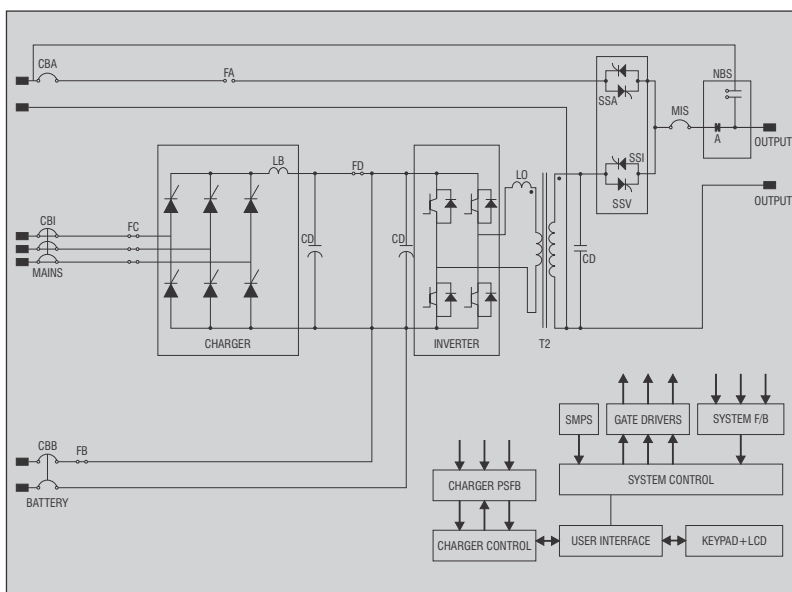


Open Door View < 80 kVA System

# Battery Management System

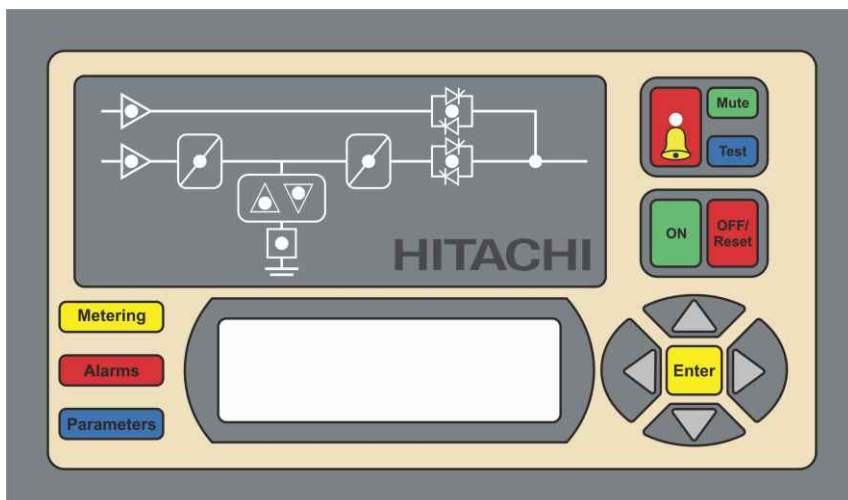
Battery Monitoring System is an on-line built-in feature to check the battery open / weak status automatically at a pre-defined period. It also indicates the residual time, AH, balance life in terms of years /cycles.

## Single Line Diagram



Thyristor Based Rectifier

## Digital Control Panel



# Alarms, Indications and Metering

LED. No.	Parameter	Status	LED Indication
1	Bypass Input	Absent Within Range Out of Range	Red Green Red
2	Mains Input	Absent Within Range Out of Range	OFF Green Blinking Green
3	Charger Operation	ON OFF Trip	Green Red Blinking Red
4	Battery Discharge		Red
5	Battery Operation	Equalise 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 Inverter Load
<b>POWER METERS</b>	Load kVA Load kW Load Power Factor UPS kVA UPS kW UPS 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

MAINS INPUT			
Rectifier Input Voltage	480 V 3 Phase 3 Wire / 208 V 3 Phase 3 Wire		
Voltage Tolerance	+10%, -15%		
Input Power Factor	0.8 at Full Load & Nominal Voltage		
Frequency	60 Hz / 50 Hz $\pm$ 6%		
Input Current Harmonics	~30% ( $\pm$ 10% Input Voltage) (Optional 10% with 12 Pulse Rectifier)* Consult Factory		
Inrush Current	Built-in Soft Start (<10 x Input Current, When Input Transformer is Used)		
DC BUS (Options Based on Rating )			
Nominal DC Bus	120 VDC	240 VDC	360 VDC
Voltage Range	105 VDC - 140 VDC	210 VDC - 280 VDC	305 VDC - 434 VDC
Recommended No of Cells	60	120	180
Battery Charger kW	Maximum 25% of UPS Rating		
Maximum DC Bus Voltage Ripple with Battery	1%		
Maximum DC Bus Voltage Ripple without Battery	2%		
DC Voltage Regulation	$\pm$ 1 %		
UPS OUTPUT			
Normal UPS Rating	at 0.8 Lagging Power Factor		
Voltage	110V / 120 V / 220 V / 230 V / 240 V		
Voltage Tolerance:-			
Steady State	$\pm$ 1%		
100% Step Load	$\pm$ 5%		
Recovery Time	< 20 mSec		
Power Supply Interruption and Restoration	$\pm$ 1%		
Overload:-			
Inverter 1 min	150%		
Inverter 10 min	125%		
Inverter 60 min	110%		
Frequency	60 Hz / 50 Hz		
Frequency Stability, Free Running	$\pm$ 0.1%		
Synchronization Range	$\pm$ 6% ( $\pm$ 1 to $\pm$ 6% Field Programmable)		
Slew Rate Single Unit	1 Hz / 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% ( Rating of UPS Considered at Nominal Voltage )		
Static Switch Transfer Time in Sync Mode	< 4 mSec		
Static Switch Transfer Time in Async Mode	< 20 mSec		
Maintenance Bypass	Make Before Break		
Ambient Temperature Range for Storage	32-160° F (0-60° C)		
Ambient Temperature Range for Operation	32-113° F (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	60 dBA to 74 dBA (Depending on System Rating and System Configuration)		
ENCLOSURES			
Construction	CRCA Steel Sheet		
Enclosure	NEMA 1		
Finish (Powder Coated)	Industrial Gray (ANSI - 61)		
Ventilation	Forced Air (Internal Fans)		
Cable Entry	Bottom (Top Optional W/Side Car)		
STANDARDS			
Standard Compliance	UL 1778, NEMA PE1 (2012), ANSI		
PROTECTION			
Input Protections	AC Input and Battery Circuit Breaker, Battery Charger Current Limit, DC Over Voltage Protection and Rectifier Over Temperature Protection		
Output Protections	Overload, Short Circuit, Over Temperature, Over and Under DC Input Voltage Protection, Over and Under AC Voltage Protection		

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

## Hitachi Hi-Rel Worldwide



### **COSTA POWER INDUSTRIES PVT. LTD.**

209, 2nd Floor, Infinity Business Park, Behind Pendharkar College,  
MIDC Phase – 1, Dombivli(E), Thane – 421023.  
Phone No. - 9820710392 / 9372217661.  
Email - [sales@upsbatteriesindia.com](mailto:sales@upsbatteriesindia.com) / [sunil@upsbatteriesindia.com](mailto:sunil@upsbatteriesindia.com).