HITACHI
Inspire the Next

Single Phase Industrial UPS Systems

Range: 5 to 225kVA

Single Phase Industrial UPS Systems

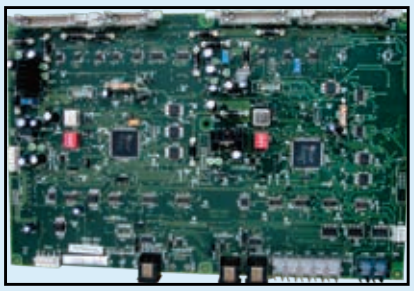
Hitachi Hi-Rel Power Electronics Pvt. Ltd. is in the business of Industrial UPS Systems since 1987 and has rich experience in supplying power back-up and power quality solutions for mission critical applications in refineries, petrochemicals, power generation, steel & metals, process industries as well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

Open Door View > 80 kVA System

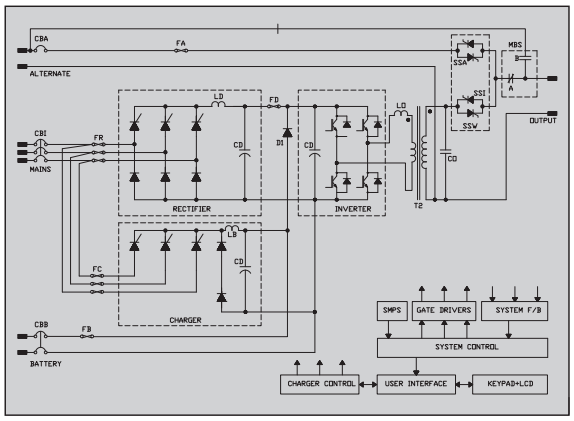
Open Door View < 80 kVA System

Optical Link to enhance Reliability

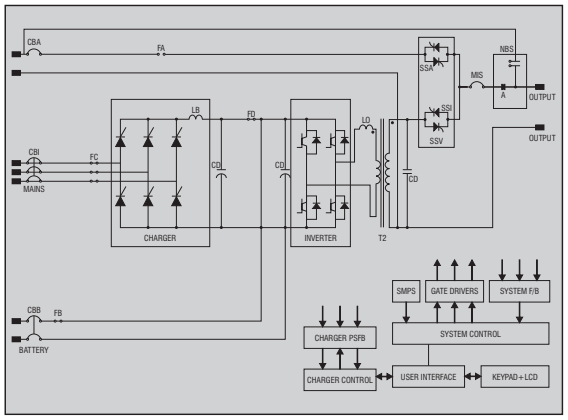
Standard Features

- 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
- Rectifier options (refer SLD)
- Charger compatible to all types' battery for industrial use
- 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
- Battery reverse polarity protection
- Insensitive to phase rotation
- Industrial compatible power terminals

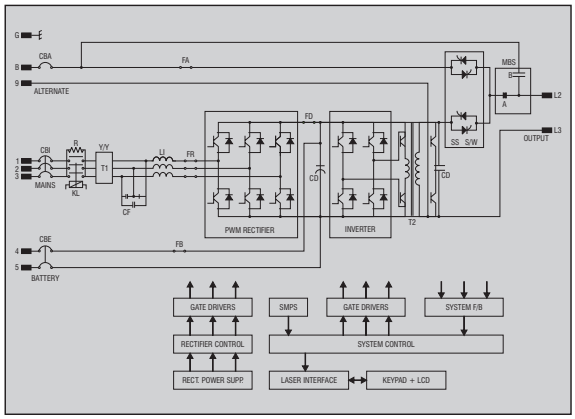
Single Line Diagram



Diode Based Rectifier



Thyristor Based Rectifier



IGBT Based Rectifier

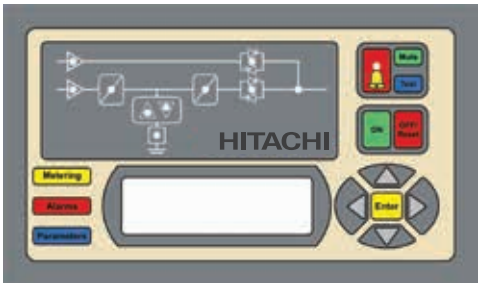
Battery Management System

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.

Options

- 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
- 50^0C ambient temperature
- Bypass line equipment
  - SCVS - Servo Controlled Voltage Stabilizer
  - SSVS - Solid State Voltage Stabilizers
  - CVCF - Constant Voltage Constant Frequency
- Front access
- Top cable entry
- Various Input /Output voltage level
- Battery earth leakage protection
- Panel protection class
- Panel color

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	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	Loadon Inverter	Inverter SSW ON Inverter SSW OFF	Green OFF
9	Loadon 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	
VOLTAGE METERS	Mains Alternate Battery Inverter Load
FREQUENCY METERS	Mains Alternate Output
Metering with true RMS measurement	
CURRENT METERS	Mains Battery Inverter Load
POWER METERS	Load kVA Load kW Load Power Factor UPS kVA UPS kW UPS Power Factor

MAJOR ALARMS - TEXT READOUT - LCD DISPLAY		
INPUT	Under Voltage Over Voltage	Mains Low Mains High
DC	Over Voltage	High DC Shutdown
BATTERY	Discharging Under Voltage End of Battery	Bat Discharge Low Battery Low Battery Trip
INVERTER	Under Voltage Over Voltage IGBT Limb Fault Overload Overload Trip (Inverse Time)	Inv Low Inv High Inv Sat Trip Overload Inv Over LD Trip Inv Over Temp
ALTE-NATE	Over Temperature Under Voltage Over Voltage Frequency out of Range	Alt. Low Alt. High Alt. FO
STATIC SW	Transfer to Bypass	Load on Bypass

Technical Specifications

Exceptional Safeguard against Power Disruption

MAINS INPUT			
	Thyristor Rectifier	**Diode Rectifier**	**IGBT Rectifier**
Rectifier Input Voltage	415V 3 Phase 3 Wire	415V 3 Phase 3 Wire	415V 3 Phase 3 Wire
Voltage Tolerance	+10%, -15%	+10% , - 25%	+10% , - 20%
Input Power Factor	0.80	0.92	0.95
Frequency	50Hz / 60Hz ±6%	50Hz / 60Hz ±6%	50Hz / 60Hz ±6%
Input Current Harmonics	< 35%	< 30%	< 5%
Inrush Current	Built-in Soft Start (< 10 x input current, when input transformer is used)		
DC BUS			
DC Bus Charger Voltage	305 to 434Vdc	305 to 445Vdc	305 to 445Vdc
Battery Charger Ampere Capacity	(kVA x 0.65) A	kVA=Amp.	(kVA x 0.65) A
Minimum End Cell Voltage	305Vdc		
Maximum DC Bus Ripple With Battery	1%		
Maximum DC Bus Ripple Without Battery	2%		
Recommended No. of Cells :-			
SMFB	175-180		
LATB	175-180		
NICD	273-277		
DC Voltage Regulation	±1%		
UPS OUTPUT			
Normal UPS Rating	At 0.8 PF		
Voltage	220 / 230 / 240 / 110 / 115 / 120V		
Voltage Tolerance:-			
Steady State	±1%		
100% Step Load	±5%		
Recovery Time	< 20mSec		
Power Supply Interruption and Restoration	±1%		
Overload:-			
Inverter 1 min	150%		
Inverter 10 min	125%		
Inverter 60 min	110%		
Frequency	50Hz / 60Hz		
Frequency Stability, Free Running	±0.1%		
Synchronization Range	±6% (±1 to ±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	±10%		
Static Switch Transfer Time in Sync Mode	< 4mSec		
Static Switch Transfer Time in Async Mode	< 20mSec		
Maintenance Bypass	Make Before Break		
OPERATING CONDITIONS			
Ambient Temperature Range for Storage	0-60^{0}C		
Ambient Temperature Range for Operation	0-45^{0}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 41
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 41 According to IEC 60529
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.

Dimensions

Rating kVA	Thyristor / Diode Rectifier				IGBT Rectifier			
	Height (mm)	Depth (mm)	Length (mm)	Weight (kg)	Height (mm)	Depth (mm)	Length (mm)	Weight (kg)
5	1700	800	800	250	1700	800	800	300
7.5	1700	800	800	250	1700	800	800	300
10	1700	800	800	300	1700	800	600+800	500
15	1700	800	800	300	1700	800	600+800	500
20	1700	800	800	350	1700	800	600+800	550
25	1700	800	1000	500	1900	800	600+800	650
30	1700	800	1000	500	1900	800	600+800	700
40	1700	800	1000	700	1900	800	600+800	900
50	1800	900	1000+1000	850	1800	900	1000+1000	1250
60	1800	900	1000+1000	950	1800	900	1000+1000	1300
75	1800	900	1000+1000	1150	Consult Factory			
100	2200	1000	1200+1200	1550				
120	2200	1000	1200+1200	1650				
130	2200	1000	1200+1200	1650				
160	2200	1000	1200+1200	2000				
180	2200	1000	1200+1400	2500				
200	2200	1000	1200+1400	2500				
225	2200	1000	1200+1400	2750				

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

Consult factory for customized dimension & weight.

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