HITACHI
Inspire the Next

Three Phase Industrial UPS Systems

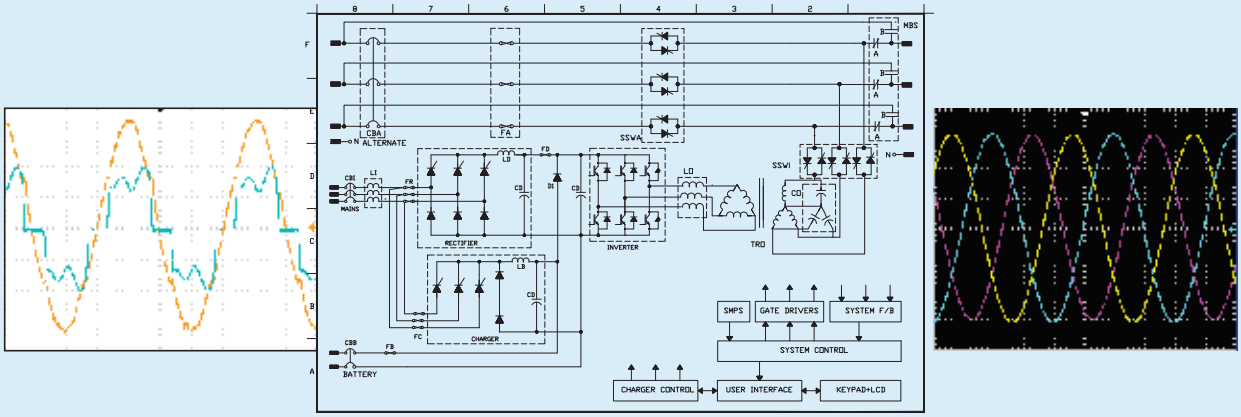
Range: 10 to 500 kVA

Three 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..

Single Line Diagram



Design Philosophy

i6 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

Digital Signal Processors based Control

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
- High input power factor
- Capable to handle 100% unbalance load
- 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

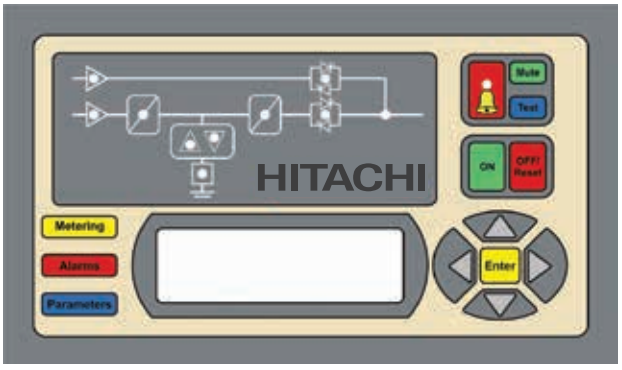
Options

- Low DC bus 220 Vdc, 110 Vdc
- Input Breaker 50 kVA
- Input Isolation Transformer
- 12 Pulse Rectifier
- Harmonic TRAP LC / Active Filter
- AC Distribution Panel
- PC Based Monitoring and Recording Unit
- Various Input / Output Voltage Level
- Fan Redundancy
- High capacity charger
- System available in Parallel redundant, Cascade Redundant, N+1 redundant and split redundant configuration
- Common Battery Bank
- Remote Annunciator
- Automatic Shutdown Kit
- Individual Battery Health Monitoring System (BHMS)
- 50^{0}C Ambient
- Front Access
- Top Cable Entry
- Bypass Line Equipment:
  - SCVS - Servo Controlled Voltage Stabilizer
  - SSVS - Solid State Voltage Stabilizers
  - CVCF - Constant Voltage Constant Frequency
- Bypass Isolation Transformer
- SNMP/MODBUS/Profibus Communication

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	
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
DC	Over Voltage
BATTERY	Discharging Under Voltage End of Battery Discharge
INVERTER	Under Voltage Over Voltage IGBT Limb Fault Over load Over load Trip (Inverse Time) Over Temperature
ALTERNATE	Under Voltage Over Voltage Frequency out of Range
STATIC SWITCH	Transfer to Bypass

Technical Specifications

Exceptional Safeguard against Power Disruption

MAINS INPUT	
Input Voltage	415V 3 Phase 3 Wire
Voltage Tolerance	+15%, -25%
Input Power Factor	0.92 @ Full Load
Frequency	50Hz / 60Hz ±6%
Inrush Current	Built-in Soft Start (< 10 x input current, when input transformer is used)
Alt Supply	415 V, 3 Phase 4 wire
DC BUS	
DC Bus Charger Voltage	305Vdc to 445Vdc
Battery Charger Ampere Capacity	kVA= Amp.
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	380 - 400 - 415Vac, Three Phase + Neutral
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 20 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

Consult factory for customized specifications.

Dimensions

Rating (kVA)	Height (mm)	Width (mm)	Depth (mm)	Weight (Kg)
10	1600	800	860	450
20	1600	1000	860	500
30	1900	1000	1000	800
40	1900	1000	1000	900
50	1900	1000	1000	1100
60	1900	1000	1000	1200
80	2200	1200	1000	1300
100	2200	2400	1000	1400
120/125	2200	2400	1000	1600
150	2200	2400	1000	2000
200	2200	2400	1000	2400
250	2200	2400	1000	2700
300	1800	4300	1000	3000
400	Please consult factory for Dimensions			
500				

Note:

- Dimensions of 10 kVA to 80 kVA UPS systems are without I/P x'mer
- Dimensions of 100 kVA to 300 kVA UPS systems are with I/P x'mer.

In the spirit of continual improvements, specification and features are subject to change without any notice.

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