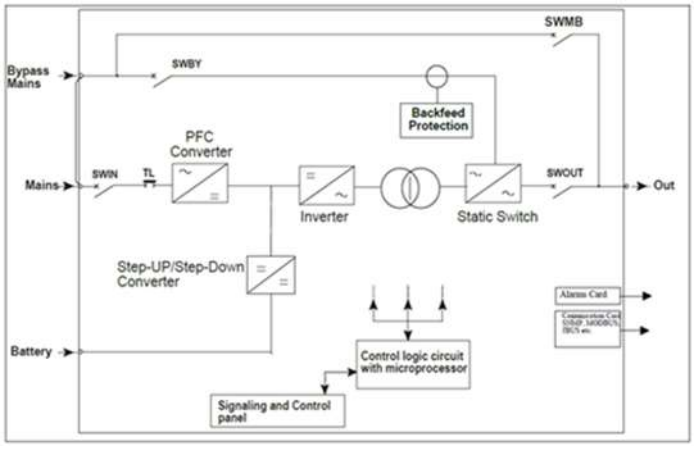
UNINTERRUPTIBLE POWER SUPPLY

TPH IGBT series represents the last transformer-less double conversion (VFI-SS-111) power protection technology designed to protect a wide area of critical applications. For technology, performances (Eco Mode selectable from the panel), LCD display for alarms, measurements and historical events, 2 serial interface, RS232 and dry contacts, the series TPH IGBT is the perfect solution for powering all the sensitive electronics and security devices such as electro, data centers and telecommunications, industrial processes and systems of centralized power as required by EN 50171. All UPS TPH IGBT series can mount the main systems of communication interface such as dry contact interface, second RS232, RS485, USB, remote panel LCD, with SNMP software.

FEATURES

- Input power factor 0.99 at full load
- Output power factor 0.9
- Input current distortion THiD ≤ 3%
- High efficiency up to 98% OFFLINE mode
- Parallelable up till 8 units (as option)
- Parallel configurations with central static switch
- IGBT inverter with transfomer
- Filtered, stabilized and regulated sine wave supply
- Wide input voltage window and input frequency window, the battery usage is minimized
- Zero transfer time
- Superior overload capability
- Battery monitoring and temperature dependent charging function as option
- LCD display for measurements, alarms and power history
- Back feed protection
- Device to avoid a complete battery discharge
- Cold start from battery as option
- Emergency line transformer as option
- ON LINE – OFF LINE working settable
- RS232 and standard dry contact, USB, RS485 and SNMP as option
- LCD remote panel as option
- Stabilizer function
- Static frequency converter function
- Emergency Power Off.



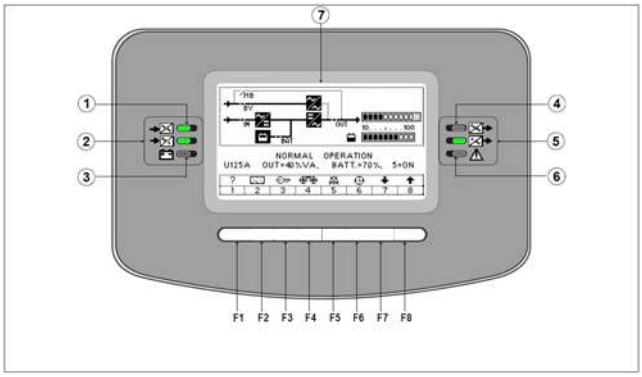
PRINCIPLES OF WORKING

The backup series is composed by: Rectifier, Inverter with transformer, Static Switch, manual by-pass and Battery.
The Rectifier-Inverter line normally feeds the users, and the Battery is kept charged by the Rectifier.
If a black out occurs, the Battery supplies power energy to users always through the Inverter. When the blackout is over, the Rectifier provides for Battery charge.
If a short circuit or an overload occurs to the users, the Static By-pass switches the load over the emergency line. When the fault is over, the Inverter feeds users.

CONTROL PANEL

The user friendly control panel si composed by three parts:

- Power Management LCD Display (PMD);
- LED indicators;
- Keys.



1. Emergency line LED Mains LED
2. Battery LED
3. By-pass LED
5. Output LED
6. Alarm LED
7. LCD display F1-8 keys

Power Management Display (PMD)

The LCD display simplifies the communication with the UPS and provides the necessary monitoring information about the UPS.
The menu driven LCD enables the access to the:

- Event log;
- Monitor the input and output U, I, f, P
- Battery runtime;
- Start up and shutdown of UPS;
- ON LINE – OFF LINE modality settable
- Diagnosis (Service Mode)
- Adjustments and testing.

LED indicators

The mimic diagram serves to indicate the general status of the UPS. The LED indicators show the power flow status and in the event of mains failure or load transfer from inverter to by-pass and vice-versa. The corresponding LED indicators will change colors from green (normal) to red (warning).

Keys

The keys allow the user to operate the UPS to perform settings and adjustments, to start up and shut down the UPS, to monitor on the LCD display the voltages, currents, frequencies and other values.

INTERFACES

The TPH IGBT is provided with three standard interfaces:

- Serial RS232
- Service USB port
- Emergency Power OFF (EPO)

Serial RS232

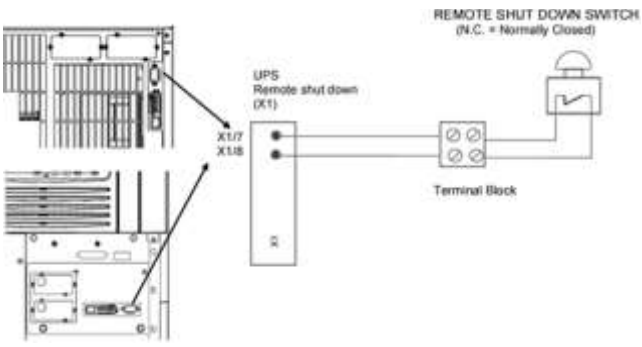
The smart port is an intelligent RS232 serial port that allows the UPS to a computer. The connector is a standard D-Type, 9 pin, female.
The software optionally allows the computer to monitor the mains voltage and the UPS status continuously.

Serial RS485

The RS485 interface allows configuration of local networks at low cost and multipoint communications via ModBus / JBus.

Emergency Power Off

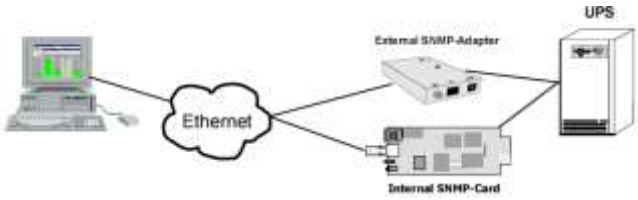
The Emergency Power Off facility must use a normally closed contact, which opens to operate the emergency stop sequence.



The emergency stop port is located at the front of the UPS TPH IGBT module. In order to allow removal, maintenance or testing of any remote emergency stop facility without disturbing the normal operation of the UPS, it is recommended that a terminal block, with linking facilities, be installed between the UPS and the stop button.

1. Use a screened cable with 1 pair (section of wire 0.6mm2) and maximum length of 100m.
2. Connect the cable as shown in figure.

SNMP card for monitoring and integration in network management. The Simple Network Management Protocol (SNMP) is a worldwide-standardized communication-protocol. It is used to monitor any device in the network via simple control language.



Dry contact interface
Optional relay card to monitor the main status of the UPS.

N+X POWER SCALABLE PARALLEL REDUNDANCY

The TPH KING UPS may be paralleled for power capacity or for redundancy up to 20 units to increase the power capacity or configuring a parallel redundant UPS system. The standard version is not provided with this feature which is optional and field upgradable.

INPUT AND OUTPUT

Model	TPH IGBT 100	TPH IGBT 120	TPH IGBT 160	TPH IGBT 200	TPH IGBT 250
Rated power kVA/kW	100/90	120/108	160/144	200/180	250/225
INPUT					
Nominal voltage	380-400-415Vac 4 wires				
Voltage tolerance	+20%, -10% (100% load) +20%, -20% (85% load) +20%, -30% (75% load) +20%, -40% (65% load)				
Input Power Factor	0.99				
Frequency tolerance	45 ÷ 65Hz				
Current distortion THDI	≤ 3% @ 75-100% load				
Inrush current	Absent				
OUTPUT					
Voltage	380 - 400 - 415V 3Ph+N				
Voltage tolerance	±1% static stability; ±3% dynamic stability				
Voltage distortion	<2% with linear load, <3% with no linear load (EN62040-3)				
Frequency	50Hz or 60Hz				
Frequency stability	0.01%				
Waveform	Sinusoidal				
Transfer time	0 ms.				
Power factor	3 : 1				
Overload at pf 0.8	125% for 10 minutes, 150% for 1 minute				
BATTERY					
Type	VRLA				
Max current @ 80% load	40 A	48 A	60 A	80 A	100 A
Nominal voltage	480Vdc				
EFFICIENCY					
ON LINE mode	Up to 94%				
OFF LINE mode	Up to 98%				
MISCELLANEOUS					
Relative humidity	90% without condensing				
Operating temperature	from 0°C to +40°C				
Noise level 1.5mt	65dBA	65dBA	68dBA	68dBA	68dBA
Interfaces	RS232, USB & EPO standard, dry contacts, SNMP, as option				
Colour	Grey RAL7016				
Dimensions w/o battery	850x1000x1900				
Net weight w/o battery	730	785	865	1000	1095
Protection degree	IP20				
STANDARDS					
Safety	EN 62040-1-1, EN 60950-1				
EMC	EN 61000-6-4, EN62040-2, EN 61000-6-2, EN 61000-4-3/4/5				
Performance	EN 62040-3				

Model	TPH IGBT 300	TPH IGBT 400	TPH IGBT 500	TPH IGBT 600	TPH IGBT 800
Rated power kVA/kW	300/270	400/360	500/450	600/540	800/720
INPUT					
Nominal voltage	380-400-415Vac 4 wires				
Voltage tolerance	+20%, -10% (100% load) +20%, -20% (85% load) +20%, -30% (75% load) +20%, -40% (65% load)				
Input Power Factor	0.99				
Frequency tolerance	45 ÷ 65Hz				
Current distortion THDI	≤ 3% @ 75-100% load				
Inrush current	Absent				
OUTPUT					
Voltage	380 - 400 - 415V 3Ph+N				
Voltage tolerance	50Hz or 60Hz				
Voltage distortion	±1%				
Frequency	±5%				
Frequency stability	< 2% with linear load < 3% with no linear load (EN62040-3)				
Waveform	Sinusoidal				
Transfer time	0 ms.				
Power factor	3 : 1				
Overload at pf 0.8	125% for 10 minutes, 150% for 1 minute				
BATTERY					
Type	VRLA				
Max current @ 80% load	170 A	220 A	280 A	340 A	430 A
Nominal voltage	480Vdc				
EFFICIENCY					
ON LINE mode	Up to 94%				
OFF LINE mode	Up to 98%				
MISCELLANEOUS					
Relative humidity	90% without condensing				
Operating temperature	from 0°C to +40°C				
Noise level 1.5mt	72dBA	72dBA	72dBA	72dBA	72dBA
Interfaces	RS232, USB & EPO standard, dry contacts, SNMP, RS485 as option				
Colour	Gray RAL7016				
Dimensions w/o battery	1500x1000x1900		2100x1000x1900		3000x1000x1900
Net weight w/o battery	1550	1720	2500	2700	3500
Protection degree	IP20				
STANDARDS					
Safety	EN 62040-1-1, EN 60950-1				
EMC	EN 61000-6-4, EN62040-2, EN 61000-6-2, EN 61000-4-3/4/5				
Performance	EN 62040-3				