Pegasus ◆ UPS®

AAL®

Autometers Alliance Ltd

UNINTERRUPTIBLE POWER SUPPLIES

Upto 2400 kVA

Make in India Company

SCALABILITY EFFICIENCY RELIABILITY

ABOUT PEGASUS UPS

Autometers Alliance Ltd ranks amongst the premier UPS manufacturers in the country, manufacturing online Pegasus UPS systems upto 2400 kVA (8×300 kVA) based on European Technology sourced from **Powertronix S.p.A, Italy** and adapted to Indian operating conditions.

Autometers Alliance Ltd offers MODULAR and STAND ALONE systems designed as GREEN POWER SOLUTION, a boon for the company's ever expanding list of satisfied customers.

Powertronix S.p.A. Italy is Europe's leading designer and manufacturer of online UPS systems for over 20 years having presence in six continents across the globe. Based on its research philosophy, strong design elements and strict testing procedures, Powertronix delivers high quality and reliable products conforming to International Standards as well as meeting regional specifications. Powertronix continuously supports Autometers Alliance Ltd in technology upgradation and customized application endeavors.

PRODUCT RANGE

PRODUCT SERIES	CONFIGURATION	RATING
ALPHA 31 SERIES	3Ø INPUT - 1Ø OUTPUT	10-40 kVA
PGS-31 SERIES	3Ø INPUT I - 1Ø OUTPUT	10-60 kVA
GAMMA SERIES	3Ø INPUT - 3Ø OUTPUT	10-300 kVA
ATLAS SERIES	3Ø INPUT - 3Ø OUTPUT	60-400 kVA
ALPHA 33 SERIES	3Ø INPUT - 3Ø OUTPUT	10-500 kVA
ALPHA RM SERIES	3Ø INPUT - 3Ø OUTPUT	10-600 kVA

Customised UPS solutions & / or client 'Load Analysis' offered on demand

SALIENT FEATURES

FPGA (DSP) BASED DOUBLE CONVERSION TOPOLOGY

At input stage AC supply is converted to controlled DC and in second stage DC is converted to controlled AC which is used to support the critical loads. Due to double conversion the load is completely protected against spikes, surges and brownouts. Use of FPGA (DSP) ensures low component count and reliability of the circuit.

ACTIVE POWER FACTOR CORRECTION AT UPS INPUT

At input stage, conversion from AC to controlled DC is achieved through high frequency PWM based Converter using IGBTs. This technology offers following benefits to the user.

- Input power factor >0.99
- Very low input current distortion (<3%), sinusoidal input current waveform.

  No harmonics will be reflected back to mains, thus no pollution of the input mains
- UPS can operate with almost same capacity Generator
- Auto correction for input phase sequence reversal
- Reduced size of cabling and switchgear at the input stage

HIGH FREQUENCY PWM BASED INVERTER USING IGBTs

Conversion from DC to controlled and pollution free AC is achieved through high frequency PWM based Inverter using IGBTs with instantaneous sinewave control. The technology offers following benefits to the users.

- High efficiency
- Low noise
- Compact size
- Faster transient response

PARALLEL REDUNDANCY

The Alpha, Atlas & Gamma series of UPS systems can be used in parallel configuration. Paralleling can be done for the purpose of either redundancy or capacity enhancement. These systems can be configured in hot stand-by, 100% parallel redundant and N+1 redundant mode.

AUTO RE-TRANSFER STATIC SWITCH

These UPS systems have a unique feature of re-transferring load automatically back to inverter as long as inverter is healthy and the load is within the capacity of the UPS.

This feature is very helpful for starting of loads, which draw starting in-rush current more than capacity of the UPS. The UPS goes to bypass on sensing overload and comes back on inverter supply automatically once the load current is settled to normal level. In addition to static switch, manual bypass switch is also provided for easy maintenance.

ENERGY SAVING MODE

The UPS can be selected to operate in line-interactive mode. The efficiency in this mode is upto 98% leading to a big energy saving in applications where UPS is used as standby power source.

HIGH POWER DENSITY

The Alpha RM series of UPS provides the most compact footprint by having a best in class Power Density of 409 KW/m^2.

INDEPENDENT LCD

In RM Series each Power Module has independent LCD which displays Status and Alarms in real time.

FLEXIBILITY / UPGRADABILITY

a) Inherent N+X Redundancy

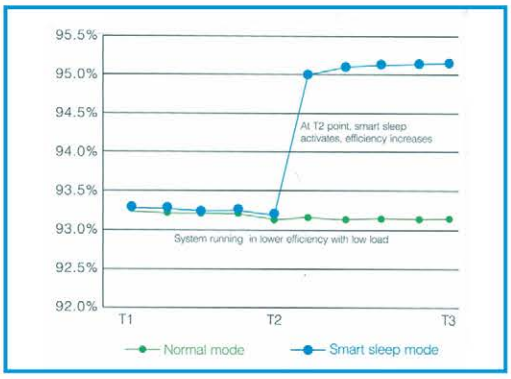
b) Hot swappable power module, bypass and monitoring module

c) Additional charging module can be added for longer back-up applications.

PROTECTION AGAINST DC SHOOT THROUGH FAULT: In any Inverter Power circuit there are possibilities of DC supply getting short circuited due to “both top & bottom IGBTs getting switched on simultaneously”. In such situation the devices may get damaged due to flow of very high current through IGBTs caused due to sudden discharge of DC link capacitors. To prevent IGBTs from getting damaged in this process Pegasus UPS controller has foolproof DC shoot through fault protection. As a result in case of DC shoot through fault occurrence, the protection will instantly switch off the IGBT & protect it.

SMART SLEEP

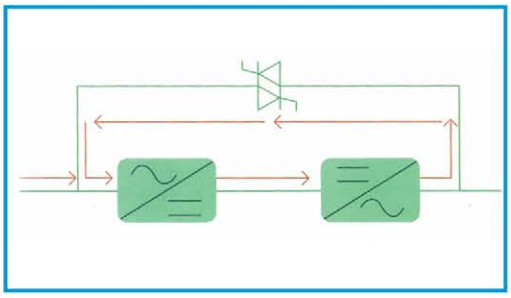
This function enables some power modules to go to sleep mode when load is relatively low, thus improving the efficiency of the remaining power modules. These modules can also be set to work in a rotation mode.



Smart Sleep

PHANTOM LOADING

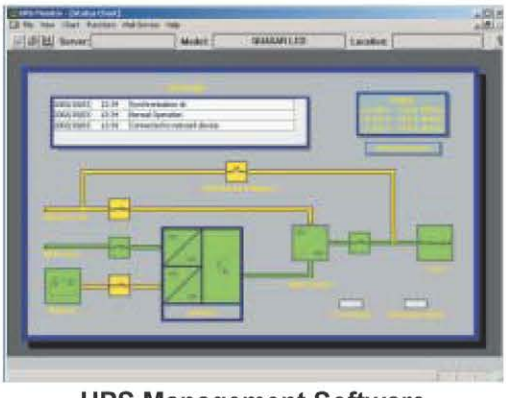
This is an advanced function which can test the UPS under different load situations without real load, saving more than 90% energy. Simulation of load can be done for load testing at factory as well as at site.



Phantom Loading

UPS MANAGEMENT SOFTWARE

UPS-Management Software is a client/server application for local, global networks and also for single workstation. The server module of the UPS Management Software is called UPSMAN, which communicates with the UPS in RS232 mode via cable, or through the network by a SNMP adapter.



UPS Management Software

THE FPGA ADVANTAGE

Core functions of PEGASUS UPS are controlled by state-of-art high performance FPGA based DSP, ensures multiple parallel processing and expandability.

Comparison of processing 256 data samples by DSP & FPGA is illustrated in Figure 1. Traditional DSP or microcontroller is processing sequentially, whereas FPGA is processing simultaneously by means of dedicated registers & multipliers, hence FPGA can be configured for faster response.

BENEFITS OF FPGA APPROACH	
Scalability / Expandability	Unlimited potential for growth & flexibility
Parallel processing	Single or multi-systems on one chip
Deterministic Design	Won't impact the part of the design already in place
Limitless Performance	Out performs traditional DSP or Micro controller
Bus-bridging & peripheral functions	Allows high level of system integration
State-of-art	Ready to use, re-configurable in the field

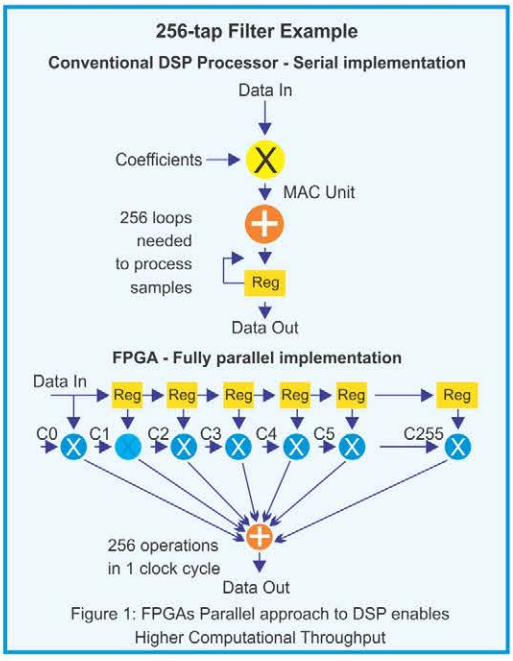


Figure 1: FPGAs Parallel approach to DSP enables Higher Computational Throughput

The FPGA Advantage

ALPHA 31 SERIES

3Ø Input - 1Ø Output

10-40 kVA

Ratings (kVA/KW)	10/9	15/13.5	20/18	40/36
INPUT				
Nominal Voltage	380/400/415 V AC (Selectable)			
Voltage Range	320 to 480V@100% Load			
Frequency	50 or 60 Hz (Selectable)			
Frequency Range	40Hz - 70Hz			
Current Distortion	4% (While input voltage distortion <1%)			
Power Factor	0.99			0.95
OUT PUT				
Voltage	220/230/240 (Selectable)			
Voltage Regulation	1.5%			
Total Harmonic Distortion	≤1% (Linear Load) ≤5% (Non Linear Load)			
Power Factor	0.9			
Crest Factor	3:1			
Overload (inverter Mode)	110% for 10 min, 130% for 1 minute 150% for 30 second			
DC LINK				
Battery Voltage	192VDC			±240VDC
SYSTEM				
Efficiency (Overall)	upto 93.50%			upto 95%
Efficiency (Inverter)	upto 92%			upto 95%
Efficiency (Eco Mode)	upto 98%			upto 98%
Display	LED + LCD			
Interface	RS232,EPO			RS232, RS485, USB
Degree of Protection	IP20			
Audible Noise	53dB@<70% Load, 66dB@>70 % Load			65dB
ENVIRONMENTAL CONDITIONS				
Operating Temperature	0-40°C			
Storage Temperature	-20°C to 70°C			
Relative Humidity	0-95% (Non - Condensing)			
Maximum Altitude Above Sea Level	1000 Meters without derating			
PHYSICAL PARAMETERS				
Dimensions (WxDxH) in mm	250x562x650		250x562x 710	600x980x 950
Approx.Weight (in Kg.)	25	27	34	170

Standard Features :

- Wide Input Voltage Range
- High Input Power Factor
- Protection against Over Voltage, Short Circuit and Over Temperature
- Auto Fan Speed Adjustment
- LCD Display Monitoring all the operational status

Optional Features :

- SNMP for Remote Monitoring
- Dry Contacts
- Parallel Kit
- AS/400 Interface
- Battery Cold Start

PGS-31 SERIES

3Ø Input - 1Ø Output

10-60 kVA

Ratings (kVA/KW)	10/9	15/13.5	20/18	30/27	40/36	50/45	60/54
INPUT							
Nominal Voltage	3ø, 380 / 400 / 415V						
Voltage Range	350 to 460						
Frequency	50 or 60 Hz (Selectable)						
Frequency Range	40 to 60Hz						
Current Distortion	<9% (Optional)						
Power Factor	0.99 (Optional)						
OUTPUT							
Nominal Voltage	220V/230V/240V						
Frequency	50 or 60 Hz (Selectable)						
Power Factor	0.9						
Voltage Regulation	Static : ±1% Dynamic : ± 5%						
Voltage Distortion	≤3% (Linear Load)						
Overload	125% for 10 Minutes						
Crest Factor	3:1						
Efficiency	Inverter : 93% Overall : 91%						
DC LINK							
Battery Voltage	384 Volts						
Voltage Tolerance	± 1%						
Voltage Ripple	< ± 1%						
STATIC BYPASS							
Switching Time	Inverter Failure : 2 ms Other Modes : 0						
ENVIRONMENTAL CONDITION							
Operating Temperature	0-40°C						
Storage Temperature	-20°C to +70°C (Not for Batteries)						
Relative Humidity	95% Non-condensing						
Maximum Altitude Above Sea Level	1000 Meters without derating						
PHYSICAL							
Dimensions (WxDxH) mm	390×910×630		530×920×860		810x870x1850		
Approx. Weight (kg.)	200	250	300	350	380	500	600
GENERAL							
Ingress protection	IP – 20						
Audible noise at 1 Mtr.	< 60dBA			< 65dBA			
Cooling	Forced Air						

Standard Features :

- High Frequency PWM Using IGBTs
- Inbuilt Isolation Transformer
- Auto Re -Transfer Static Switch
- Manual Bypass
- Extended Battery Back-Up

Optional Features :

- SNMP for Remote Monitoring
- Software for Auto Shutdown
- Potential Free Contacts for Remote Indications & Shutdown
- Management Software
- Battery Management System

GAMMA SERIES

Pegasus ◆ UPS®

3Ø Input - 3Ø Output

10-300 kVA

Ratings (kVA/KW)	10 - 300 kVA
INPUT	
Nominal Voltage	3ø, 380 / 400 / 415V (Selectable)
Voltage Range	350 to 460
Frequency	50 or 60 Hz (Selectable)
Frequency Variation	40 to 60Hz
OUTPUT	
Nominal Voltage	3ø, 380 / 400 / 415V (Selectable)
Frequency	50 or 60 Hz (Selectable)
Frequency Synchronization Range	±1%, ±2%, ±5%, ±10% (Selectable)
Power Factor	0.9
Voltage Regulation	Balanced Load ±1% Unbalanced Load ± 5%
Phase Displacement	Balanced Load 120° ± 1° Unbalanced Load 120° ± 3°
Voltage Distortion	≤3% (Linear Load)
Overload	125% for 10 Minutes
Crest Factor	3:1
Efficiency	Inverter : upto 95% Overall : upto 93%
DC LINK	
Battery Voltage	384 Volts
Voltage Regulation	± 1%
Voltage Ripple	< ± 1%
STATIC BYPASS	
Switching Time	Inverter Failure : 2 ms Other Modes : 0
ENVIRONMENTAL CONDITION	
Operating Temperature	0-40°C
Storage Temperature	-20°C to +70°C (Not for Batteries)
Relative Humidity	95% Non - Condensing
Maximum Altitude Above Sea Level	1000 Meters without derating
GENERAL	
Ingress Protection	IP – 20
Cooling	Forced Air

kVA/KW Ratings	10/9	15/13.5	20/18	30/27	40/36	50/45	60/54	80/72	100/90	120/108	160/144	200/180	300/270
Dimensions in mm (WxDxH)	440 x 900 x 1015		500 x 1025 x 1075					810 x 870 x 1850		1000 x 905 x 1965			1600 x 950 x 2100
Weight (kg)	180	205	250	300	325	360	400	700	750	900	1100	1200	1800
Noise Level in db	<45	<45	<50	<50	<50	<50	<50	<55	<55	<65	<65	<65	<70

Standard Features :

- High Frequency PWM Using IGBTs
- Inbuilt Isolation Transformer
- Auto Re-Transfer Static Switch
- Energy Saving Mode
- Parallel Redundancy
- Protection against DC Shoot through Fault

Optional Features :

- SNMP for Remote Monitoring
- Management Software
- Remote Monitoring for Alarms / Indications
- Remote Emergency Power Off
- Potential Free Contacts for Remote Indications
- Voltage Stabiliser in Bypass Line
- Battery Management System

ATLAS SERIES

Pegasus ◆ UPS®

3Ø Input - 3Ø Output

60-400 kVA

Ratings (kVA/KW)	60 - 400 kVA
INPUT	
Nominal Voltage	380 / 400 / 415 V AC (Three Phase+N)
Voltage Range	330 to 480
Frequency	50 or 60 Hz (Selectable)
Frequency Range	40Hz to 60Hz
Current Distortion	≤ 3% (while Input voltage distortion is <4%)
Power Factor	0.99
OUTPUT	
Nominal Voltage	380 / 400 / 415 V AC (Three Phase+N)
Frequency	50 or 60 Hz (Selectable)
Voltage Regulation	Static : ±1% Dynamic : ± 5%
Power Factor	0.9
Voltage Distortion	≤ 3% (Linear Load)
Overload	125% for 10 Minutes
Crest Factor	3:1
Efficiency	Inverter : 95% Overall : 93%
Parallelability	Upto 4 Systems
DC LINK	
Battery Voltage	672 - 720 Volts
STATIC BYPASS	
Switching Time	Inverter Failure : 2 ms Other Modes : 0
ENVIRONMENTAL CONDITION	
Operating Temperature	0-40°C
Storage Temperature	-20°C to +70°C (Not for Batteries)
Relative Humidity	95% Non - Condensing
Maximum Altitude Above Sea Level	1000 Meters without derating
GENERAL	
Ingress Protection	IP – 20

kVA / KW Ratings	60/54	80/72	100/90	120/108	160/144	200/180	250/225	300/270	400/360
Dimensions in mm (WxDxH)	810 x 870 x 1850		1000 x 905 x 1965			1600 x 950 x 2100			1850 x 950 x 2100
Weight (kg)	550	700	850	1000	1200	1400	1800	2000	2200
Noise Level in db	<65			<65		<70			

Standard Features :

- Active Power Factor Correction at UPS Input
- FPGA (DSP) Based Double Conversion Topology
- Parallel redundancy
- Energy Saving Mode
- Isolation Transformer at Inverter output
- Protection against DC Shoot through Fault
- Four quadrant operation for handling regenerative loads

Optional Features :

- SNMP for Remote Monitoring.
- Isolation Transformer at UPS Input
- Management Software
- Remote Monitoring for Alarms/ Indications
- Remote Emergency Power Off
- Potential Free Contacts for Remote Indications
- Voltage Stabiliser in Bypass Line
- Battery Management System

ALPHA 33 SERIES

Pegasus ◆ UPS®

3Ø Input - 3Ø Output

10-500 kVA

Ratings (kVA/KW)	10-500 kVA
Technology	Double Conversion True Online Topology
INPUT	
Voltage	3Ph+N+PE 380 / 400 / 415 V (Line-Line)
Voltage Range	304-478 V AC
Power Factor	>0.99
Frequency range	40-70Hz
OUTPUT	
Voltage	380 / 400 / 415 V (Line-Line Nominal), Selectable at Site
Voltage Regulation	1% for Balanced Load, 1.5% for Unbalanced Load.
Voltage Distortion	<1% (Linear Load) <5.5% (Non-Linear Load)
Frequency	50 Hz or 60Hz (Selectable)
Frequency Variation	±0.01% (in Free-Running Mode)
Overload Capacity	110% for 60 Minutes, 125% for 10 Minutes, 150% for 1 Minutes.
DC LINK	
Battery Voltage	± 192 VDC to 264 VDC
Charging Current	20% of System Power
Low Battery Cut-off	1.7V/ Cell
SYSTEM	
Display	LCD & LED
Degree of Protection	IP20
Interface : Standard	RS-232, RS-485, Dual Input Kit
Interface : Optional	SNMP, Dry Contacts
Temperature range of Operation	0 – 40°C
Relative Humidity	0 – 95% (Non - Condensing)

Rating kVA/KW	Input Current Distortion	Output Power Factor	System Efficiency		Weight (Kg.)	Dimension WxDxH (mm)	Noise
			Over all	Inverter			
10/10	<4%	1	95%	95%	31	250x660x530	<55dB
15/15	<4%	1	95%	95%	31	250x660x530	
20/18	<3%	0.9	95%	95%	50	250x680x770	
30/30	<3%	1	95%	95%	52	250x680x770	
40/40	<3%	1	96%	96%	61	250x836x770	
60/60	<3%	1	95.5%	95.5%	170	600x980x950	68dB
80/80	<3%	1	96%	96%	210	600x980x1150	
90/90	<3%	1	95.5%	95.5%	231	600x980x1400	
100/100	<3%	1	96%	96%	210	600x980x1150	
120/120	<3%	1	95.5%	95.5%	266	600x980x1400	
150/150	<3%	1	96%	96%	305	650x960x1600	
200/200	<3%	1	96%	96%	350	650x960x1600	72dB
250/250	<3%	1	96%	96%	445	650x960x2000	
300/300	<3%	1	96%	96%	490	650x960x2000	
400/400	<3%	1	96%	96%	810	1300x1100x2000	
500/500	<3%	1	96%	96%	900	1300x1100x2000	

Standard Features :

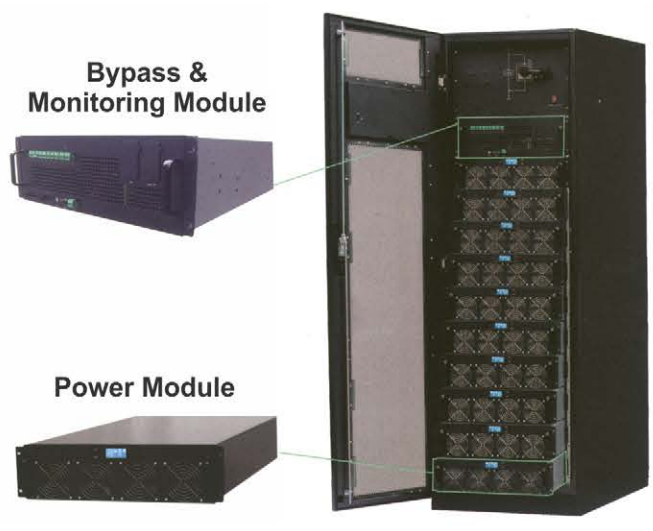
- High Efficiency upto 96%
- High Input PF>0.99, Input current THDI <3% (while input voltage distortion is <1%)
- Multi Protections : Over Temperature Protection with 8 Sensors, Overload, Battery Under Voltage, Fan Failure, Short - Circuit
- Battery Cold Start
- Modular Design of Subsystem, Convenient for Field Maintenance
- Intelligent Battery Management with Smart Charging Control
- High Power Density

ALPHA RMS (RACK-MOUNT SERIES)

Pegasus ◆ UPS®

3ØInput - 3Ø Output

10-600 kVA



Ratings (kVA/KW)	10kVA - 600kVA		
Technology	Double Conversion True Online Topology		
INPUT			
Phase	3Ph+N+PE 380 / 400 / 415 V (Line-Line)		
Voltage Range	276-480V		
Input Current Distortion	<3%*(While input voltage distortion is <1%)		
Power Factor	>0.99		
Frequency Range	40-70Hz		
OUTPUT			
Voltage	380 / 400 / 415 V (Line-Line Nominal)		
Voltage Regulation	1.5%		
Voltage Distortion	<1% (Linear Load) <5.5% (Non-Linear Load)		
Frequency Variation (in Free-Running Mode)	±0.01%		
Frequency	50Hz or 60Hz (Selectable)		
Phase Tolerance	120°±0.5° (Balanced and Unbalanced Load)		
Crest Factor	3:1		
Overload	110%, 60 minutes	125%, 10 minutes	150%, 1 minute
DC LINK			
Battery Voltage	±192VDC to ±264VDC		
Charge Power	20% of System Power		
Low Battery Cut-Off	1.7V/ Cell		
SYSTEM			
Overall Efficiency in Normal Mode	upto 95%		
Efficiency in ECO Mode	upto 99%		
Efficiency in Battery Mode	upto 95%		
Display	7" Touch Colour LCD & LED		
Degree of Protection	IP20		
Interface : Standard	RS-232, RS-485, EPO, Dry Contacts		
Interface : Optional	SNMP		
Temperature Range of Operation	0 – 40°C		
Relative Humidity	0 – 95% (Non-Condensing)		
Audible Noise (1 Meter away)	56dB(One Module)		

Note: 10KW module can be set as 1/1, 3/1, 3/3 and 1/3 Power connection.
15KW onwards modules can only be set as 3/3 connection.
*For 10KW&15KW Modules input current distortion is <4%.

Man-Machine Interface

Standard Features :

- Modular design convenient for field maintenance, upgradation and redundancy
- High power density
- Independent LCD
- Isolated Air Flow
- Flexibility / Scalability
- Waveform Recording
- Smart Sleep
- Phantom Loading
- Programmable Potential Free Contacts

ALPHA RMS (RACK-MOUNT SERIES)

Pegasus ◆ UPS®

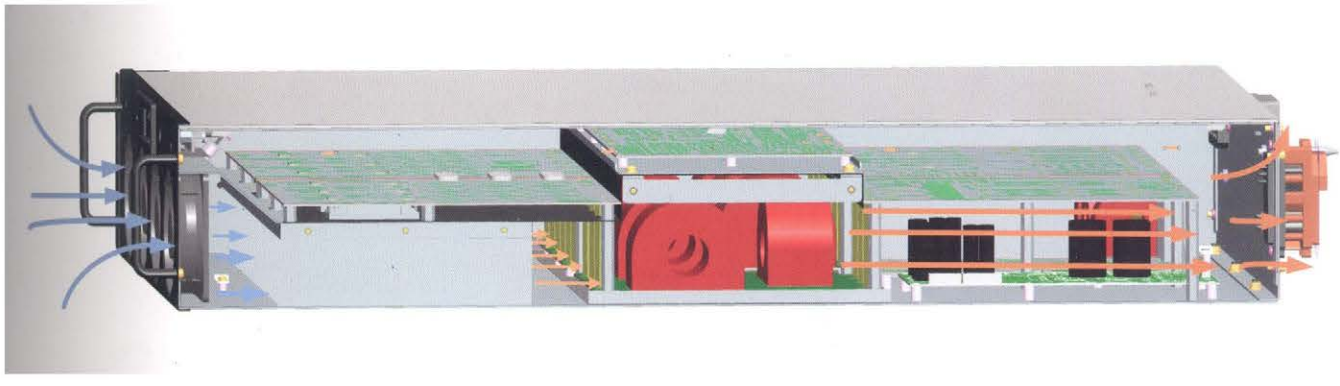
3Ø Input - 3Ø Output

10-600 kVA

Model	Module Rating (kVA/KW)	Maximum No.of Modules	Maximum kVA Rating	Module Size WxDxH (mm)	Module Weight (Kg.)	Cabinet Size WxDxH (mm)	Cabinet Weight (Kg.)
RM020/10X	10/10	2	20kVA/20KW	436X590X85 (2U)	15.3	485X697X398	42
RM030/10X	10/10	3	30kVA/30KW			485X751X575	51
RM040/10X	10/10	4	40kVA/40KW			485X697X575	55
RM060/10X	10/10	6	60kVA/60KW			485X751X1033	70
RM030/15X	15/15	2	30kVA/30KW		15.5	485X697X398	42
RM045/15X	15/15	3	45kVA/45KW			485X751X575	55
RM090/15X	15/15	6	90kVA/90KW			485X751X1033	70
RM060/20	20/18	3	60kVA/54KW	440X590X134 (3U)	22	600X900X1100	105
RM120/20	20/18	6	120kVA/108KW			600X900X1600	145
RM200/20	20/18	10	200kVA/180KW			600X900X2000	179
RM150/25X	25/25	6	150kVA/150KW	460X790X134 (3U)	32	600X1100X1600	165
RM250/25X	25/25	10	250kVA/250KW			600X1100X2000	220
RM500/25X	25/25	20	500kVA/500KW			2000X1050X2000	660
RM180/30X	30/30	6	180kVA/180KW		34	600X1100X1600	165
RM300/30X	30/30	10	300kVA/300KW			600X1100X2000	220
RM600/30X	30/30	20	600kVA/600KW			2000X1050X2000	660
RM400/40X	40/40	10	400kVA/400KW	510X700X178 (4U)	44	1300X1100X2000	450
RM500/50X	50/50	10	500kVA/500KW		45		

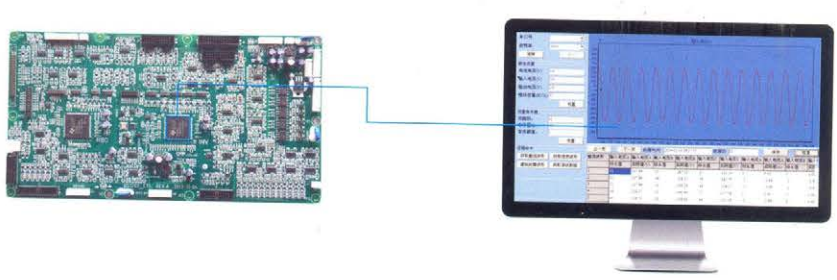
ISOLATED AIR FLOW

The PCB Boards and Heat sinks are mounted on two different layers which ensures satisfactory performance of the UPS even in dusty environment.



CRITICAL WAVEFORM RECORDING

UPS can record the data of the critical parameters automatically when faults occurs. The recorded wave forms and data can be utilised for fault analysis later on.



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AAL®

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