

Power Solution Specialist



INVT Power System

Power Solution Specialist

INVT Power System (Shenzhen) Co.,LTD
Tel: (86-755)26782480
Fax: (86-755)26782664
E-mail: upssales@invtr.com.cn
Http: www.invtr-power.com
Add: No.1 Building, Gaofa Scientific Industrial Park,
Longjing, Nanshan District, Shenzhen, China





About us

INVT Power, a key high-tech company, subsidiary company of INVT Group (Stock code: 002334), is the leading total power solution provider in China.

Over the past years, we are being dedicated to providing high quality products and service to global customers. So far, we have gained more than 600 patents and our customers and partners are from more than 80 countries and areas in government, finance, internet, communication, traffic, electric and industry. With the high quality and top-class services, we are adding values to all our customers.

We aim at offering fast customized solutions to our customers and continuous innovation for more competitive products and services.

Warmly welcome to be our distributor and partner. Meanwhile, we can provide OEM and ODM production and service for the clients all around the world.



Shenzhen Industrial park



Suzhou Industrial park



Fuyong production base



INVT Headquarter



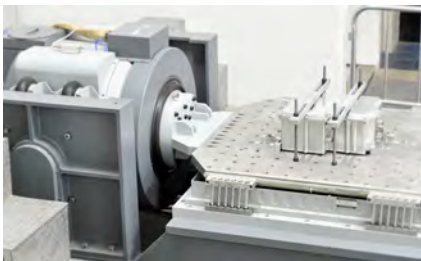
How we make difference

Research and Innovation

- 12 Research centers
- 13% sales revenue for research and innovation
- IPD integrated products development system
- TUV witness Qualification LAB in Power Industry
- 900 Intellectual Property Right,30% more than average level



- CNAS National LAB
- TUV Witness Qualification LAB
- UL Witness Qualifications LAB



Mechanical Test Lab



Lightning Strike Test Lab



Performance Test Lab



Thermal Test Lab



Components Test Lab



Environmental Test Lab



EMC Lab



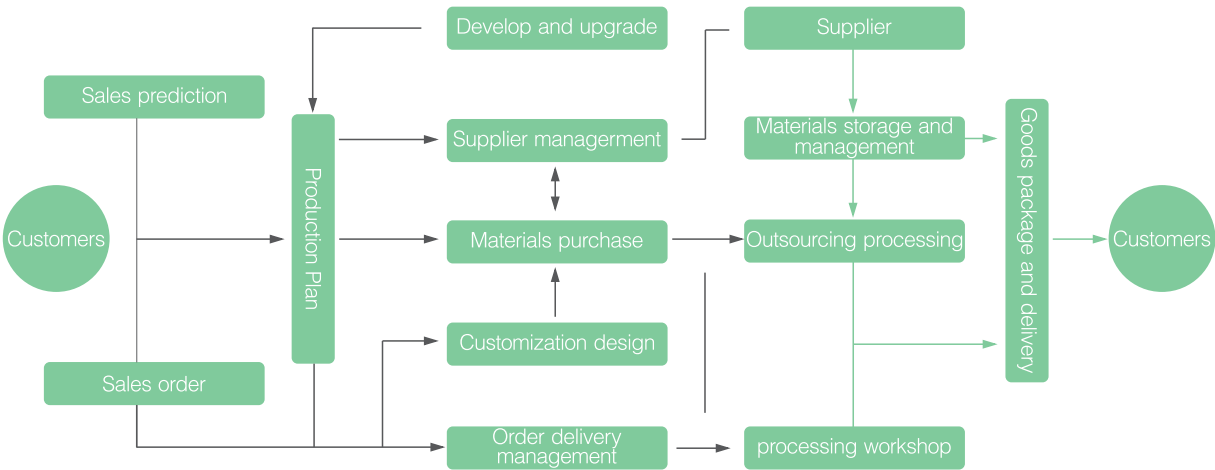
Heat Shock Lab



Production Management System

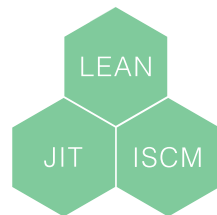
INVT Power ensures high quality products and fast response to our customers by applying advanced Supply Chain Management System based on Quality Control Management, Delivery Management, Service and Strategic Control System.

INVT applies Standardized Operational System. We standardizes the operational process for production, ensuring effectiveness, quality and cost control.



High Efficiency Supply

INVT Power adopts the most advanced international production mode as ISCM, JIT and LEAN, ensuring high efficiency and fast supply.



Honor

A state-level Hi-tech enterprise

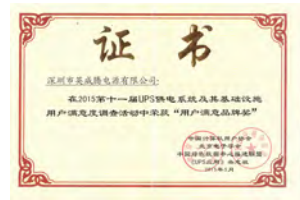
National outstanding energy-saving enterprise

Famous brand of Guangdong province

Top 100 independent innovation enterprise

Top 10 China customer satisfaction brand

Procurement finalists brand by central governments



Quality Assurance

We apply comprehensive quality assurance to ensure the quality control of the whole product life circle



- R&D and production management system certificated by TUV and ISO9001:2008
- Environmental Management System: ISO14001: 2004
- Occupational Health and Safety Management OHSAS 18001:2007



Contents



RM Series Modular Online UPS (25-600kVA)	01
RM Series Modular Online UPS (20-200kVA)	07
RM Series Modular Online UPS (10-90kVA)	09
RM Series In-built Battery Modular Online UPS(20-60kVA)	11
HT33 Series Tower Online UPS (60-500kVA)	13
HT33 Series Tower Online UPS (10-40kVA)	15
HT33-TX Series Tower Online UPS (10-40kVA)	17
HT31 Series Tower Online UPS (10-40kVA)	19
HT11 Series Tower Online UPS (6-20kVA)	21
HT11 Series Tower Online UPS (1-3kVA)	23
HR11 Series Rack Online UPS (1-10kVA)	25
BU Series Offline UPS	27
DIV Series Power Inverter	28
DR Series Telecom Rectifier	29
Smart Remote Monitor	30
Smart Charging Module	31
Energy Absorbing Unit	32
Bypass Cabinet	33
PB Series Smart Power Distribution Unit	34
Battery Cabinet	35
MF Series Sealed Lead Acid Battery	36

RM Series Modular Online UPS

25-600kVA (380V/400V/415V)

The RM series modular UPS provides the most compact footprint of less than 2m² with maximum capacity of 900kVA. With best reliability and high performance, it has been leading the domestic market for years.

RM series is considered to be the best power protection solution for large data centers, as well as for sensitive electronics.



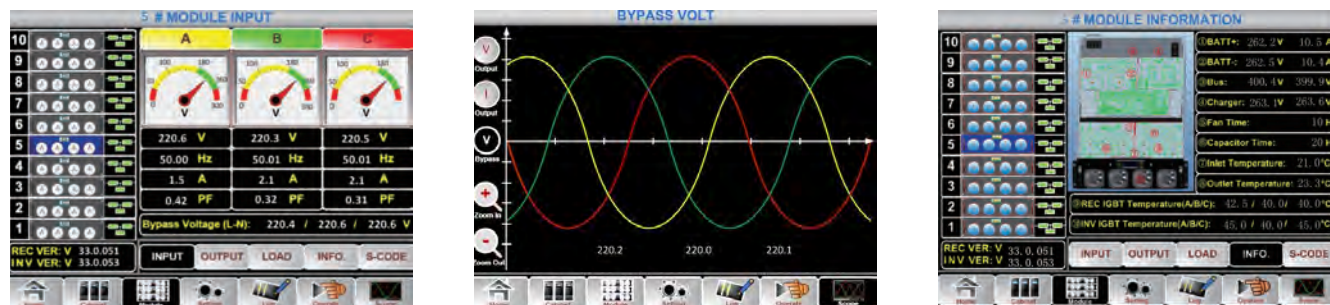
Independent LCD for Each Power Module

Each power module has an independent LCD, gives users' direct overview of status data and alarms in real time.



Friendly Interface

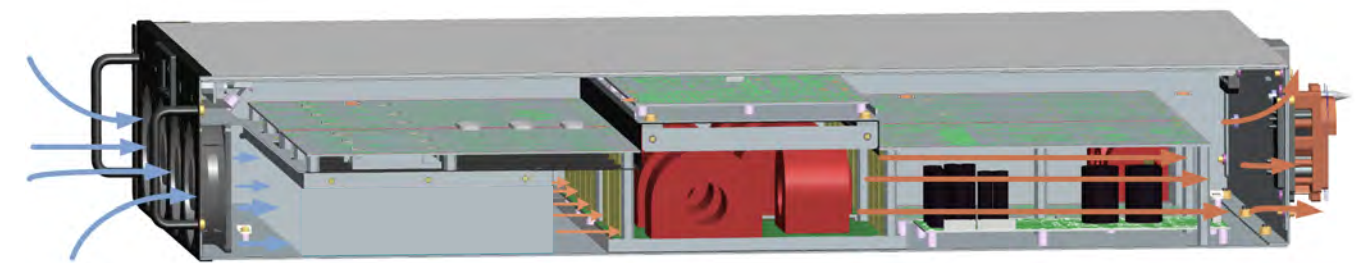
Provide graphical and text based information of alarms, status data, instructions that users can have more friendly and safer operation.



Isolated Air Flow

The dedicated and redundant hot-swappable power modules take the most unique structure design. In this design, the PCB boards and heat-sinkers are in two completely different layers, which allows the UPS run in dusty environments, significantly improving its stability and environmental adaptability.

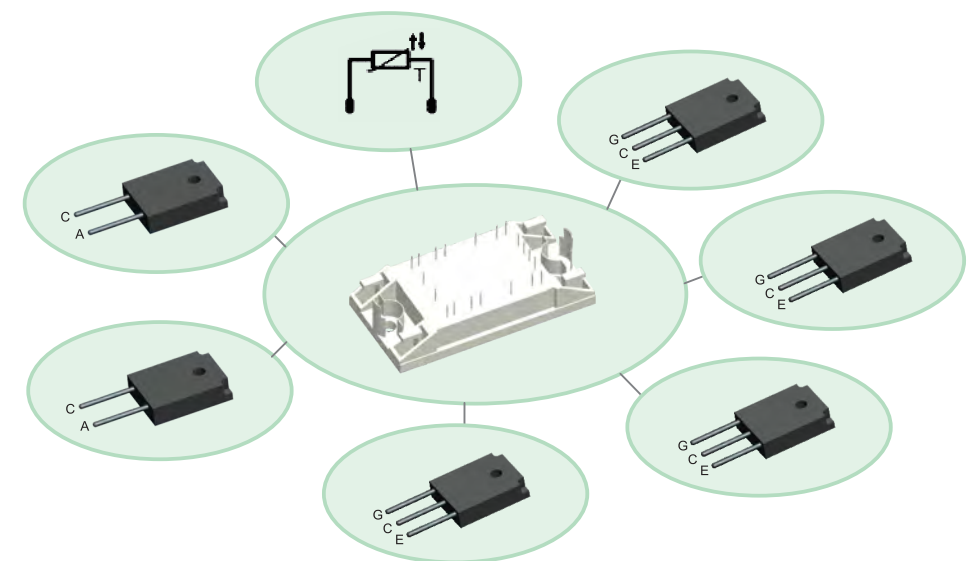
- Cooling air flows in the lower layer, keeping the upper PCB free of dust
- One air flow channel ensures fans redundancy, even one fan fails, power module can run normally



Unique Design for High Reliability

Instead of discrete IGBT and SCR components, RM series UPS uses modular IGBT and SCR in Rectifier and Inverter, bringing in extremely high reliability.

- All components in one module, less fault points, higher reliability
- All components integrated as one modular design, smaller disparity
- Less space needed, UPS with compact design and higher power design
- Integrated inner thermal sensors display IGBT inner temperature directly



High Density ,Modular, Scalable

- High power density, footprint for 300kVA is 0.66m², power density 409kW/m², saving valuable data center space
- Scalable from 30kVA to 900kVA, max 30 power modules in parallel



Three units in parallel

- Inherently N+X redundant
- Hot swappable power module and bypass & monitoring module
- Additional charging module, extra charging current 50A × N for long time back up application



Bypass & Monitoring module



Power module



Comprehensive Monitoring Management

In each power module, information of critical components is monitored and displayed in real time, giving customers a view of inner status of the system and providing reminder information for maintenance.

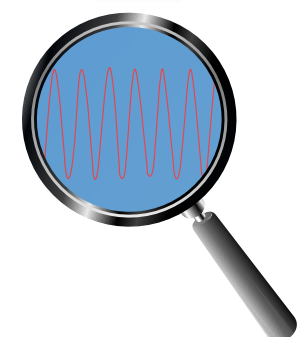
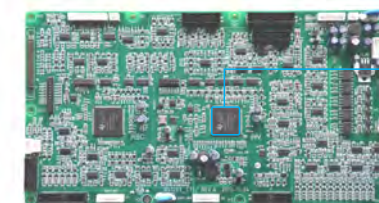
- Maintenance reminder, running time of capacitors and fans displayed and recorded
- Comprehensive temperature monitoring for thermal abnormal detection
- Intelligent battery charger for long battery life



Critical Waveform Recording

UPS can record and save the data of the main parameters automatically when faults happen for further analysis.

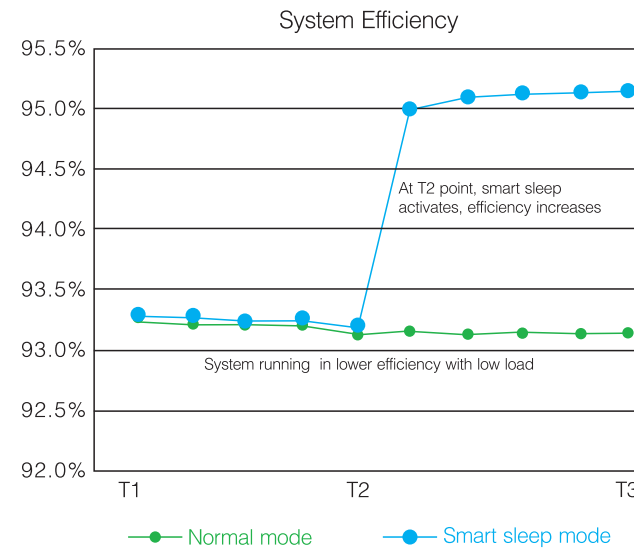
- Can record data information and present as waveform for further analysis
- Can easily spot the causes of the failures, avoid future similar faults



Smart Sleep

Smart Sleep function can intelligently make some power modules go to sleep when load is relatively low, improving the efficiency of the remaining power modules and saving customers on power and cooling costs.

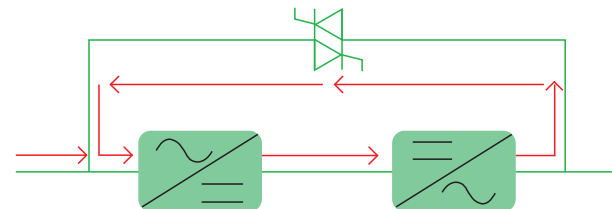
- Improving efficiency ,reducing power and cooling costs
- Easy setting with just two steps. Customers can select sleep mode and rotation period
- Power modules working in rotation, prolong the life time



Self-aging

Self-aging is an advanced function applied in all three phase UPS, Self-aging function can test UPS under different load situation without real load, saving more than 90% of energy.

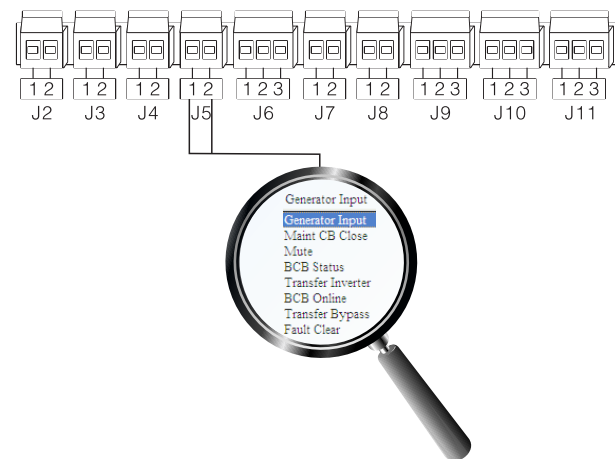
- Simulate different load conditions without connecting to any real load, saving 90% of energy
- On site setting supported, easy for factory testing



Programmable Dry Contacts

Programmable dry contacts are available in all RM and HT33 series UPS. Customers can easily expand or modify the definition of each port.

- Abundant options with three inputs and four outputs, all programmable
- Easy setting, just pull the drop-down menu and set
- Compatible with all the RM and HT33



Specification

MODEL	RM600/30X	RM300/30X	RM180/30X	RM500/25X	RM250/25X	RM150/25X	
Capacity	600kVA/540kW	300kVA/270kW	180kVA/162kW	500kVA/500kW	250kVA/250kW	150kVA/150kW	
Power module	PM30X(30kVA/27kW)			PM25X(25kVA/25kW)			
INPUT							
Phase	3 Phase + Neutral + Ground,400V/415V(line-line)						
Voltage range	304-478Vac (line-line),full load; 228V-304Vac (line-line),load decreases linearly according to the min phase voltage						
Frequency range	40Hz-70Hz						
Power factor	>0.99						
THDi	THDi<3% @ 100% linear load						
OUTPUT							
Voltage	380V/400V/415V						
Voltage regulation	1.5%						
Power factor	0.9			1.0			
THDu	THD<1%(linear load),THD<5.5%(non-linear load)						
Crest factor	3:1						
Overload capability	110% for 1 hour; 125% for 10 min ;150% for 1 min; >150% for 200 ms						
BATTERY							
Voltage	±240VDC						
Charge power precision	±1%						
Charge power	20%*System Power						
SYSTEM							
System efficiency	Normal mode:95% ;ECO mode:99% ;Battery mode:95%						
Display	10.4" color touch screen LCD + LED + Keyboard						
IP class	IP20						
Interface	Standard :RS232,RS485,Dry contacts, USB; Optional: SNMP, Expansion dry contact card						
Operation/Storage temperature	0-40℃ /-40-70℃						
Relative humidity	0-95%(non-condensing)						
Noise	72dB @ 100% load, 68dB @ 45% load (1 meter away)	65dB @ 100% load, 62dB @ 45% load (1 meter away)		72dB @ 100% load, 68dB @ 45% load (1 meter away)	65dB @ 100% load, 62dB @ 45% load (1 meter away)		
PHYSICAL							
Weight	Cabinet	660kg	220kg	165kg	660kg	220kg	165kg
	Power Module	PM30X:34kg			PM25X:32kg		
Dimension (W*D*H) (mm)	Cabinet	2000*1050*2000	600*1100*2000	600*1100*1600	2000*1050*2000	600*1100*2000	600*1100*1600
	Power Module	PM30X/ PM25X:460*790*134					

RM Series Modular Online UPS

RM series is modular online UPS for sensitive equipments. The single cabinet power rating covers from 20kVA to 200kVA. With the latest IGBT three-level and full DSP control technology, the RM series delivers the best of combination of reliability, hot-swappable and flexibility.

The RM series develops the in-built transformer type range from 20kVA-60kVA for customer's choices.



RM060/20-TX

Features

Modular design

Up to 20 power modules in parallel online hot-swappable
N+X redundancy

Independent charger

Independent charger for each module and intelligently control the whole charging process, prolong the life time of the battery

Battery cold start

UPS can be powered on from the battery without utility

Easy connection access

Top and bottom cable entry connection
are supported, more convenient for site installation

Modular design with transformer

Modular UPS up to 60kVA with in-built isolation transformer, meeting different requirement for customers

High power density

200kVA with footprints of about 0.5m², saving valuable data center space

Integrated IGBT design

Integrated IGBT in one module, less failure points with higher performance and reliability

Friendly interface

Touch LCD display with abundant information

Independent air channel

Cooling air runs in isolated channel, keeping PCB free of dust



Specification

MODEL		RM200/20	RM120/20	RM060/20	RM060/20-TX (In-built transformer)
		200kVA/180kW	120kVA/108kW	60kVA/54kW	60kVA/48kW
Power module		PM20(20kVA)			
INPUT					
Phase		3 Phase + Neutral + Ground,380V/400V/415V(line to line)			
Voltage range		304-478Vac (line-line),full load; 228V-304Vac (line-line),load decrease linearly according to the min phase voltage			
Frequency range		40Hz-70Hz			
Power factor		>0.99			
THDi		THDi<3% @ 100% linear load			
OUTPUT					
Voltage		380V/400V/415V			
Voltage regulation		1.5%			
Power factor		0.9			0.8
THDu		THD<1%(linear load),THD<5.5%(non-linear load)			
Crest factor		3:1			
Overload capability		110% for 1 hour; 125% for 10 min ;150% for 1 min; >150% for 200 ms			
BATTERY					
Voltage		±240VDC			
Charge power		20%*System Power			
Charge voltage precision		±1%			
SYSTEM					
System efficiency		Normal mode:95% ;ECO mode:99% ;Battery mode:95%			
Display		LCD+LED, Touch Screen +Keyboard			
IP Class		IP20			
Interface		Standard:RS232,RS485,Dry contacts; Optional: SNMP			
Operation/Storage temperature		0-40℃/-40-70℃			
Relative humidity		0-95%(non-condensing)			
Noise		55dB (1 meter away)			
PHYSICAL					
Weight	Cabinet	179kg	145kg	105kg	400kg
	Power Module	22kg			
Dimension (W*D*H)	Cabinet	600*900*2000(mm)	600*900*1600(mm)	600*900*1100(mm)	600*900*1600(mm)
	Power Module	440*590*134(mm)			

RM Series Modular Online UPS

The rack modular, scalable, hot-swappable, online double conversion UPS ranging from 10 to 90kVA, with its flexible configuration of 3/3, 3/1 and 1/1, compact structure, is the ideal choice for small and medium data center.



Features

Rack modular design

Modular design, compatible with 19" standard rack cabinet, convenient to be integrated with servers

High power density

10/15kVA power module in 2U height, saving great amount of space, easy for capacity expansion

Integrated solution for data center

UPS can be integrated with battery cabinet, PDU and external maintenance bypass, offering excellent choice for data center

Intelligent charging management

The system intelligently control the whole process of the charging and discharging, effectively improving the life time of the battery

Flexible configuration

The system can be configured to 3/3, 3/1 and 1/1 without derating

Friendly interface

7" touch color LCD with graphic display, more information displayed and easier for customer to operate

Smart sleep function

System can intelligently shutdown some power modules to increase total load rate, achieving higher efficiency

Self-aging mode

Energy internal circle technology, system can run with full load ,saving more than 90% energy

Specification

MODEL	RM060/10X	RM040/10X	RM020/10X	RM090/15X	
Capacity	60kVA/60kW	40kVA/40kW	20kVA/20kW	90kVA/90kW	
Power module	PM10X(10kVA/10kW)		PM15X(15kVA/15kW)		
INPUT					
Phase	3P+ N + G (380/400/415V)				
Voltage range	304-478Vac (line-line),100% load; 228-304Vac, load derated from 100%-75% linearly				
Frequency range	40Hz-70Hz				
Power factor	>0.99				
THDi	THDi<4% @ 100% linear load				
OUTPUT					
Voltage	3 phase:380/400/415V 1 phase:220/230/240V				
Voltage regulation	1.5%				
Power factor	1.0				
THDu	THD<1%(linear load),THD<5.5%(non-linear load)				
Crest factor	3:1				
Overload capability	110% for 1 hour; 125% for 10 min ;150% for 1 min; >150% for 200 ms				
BATTERY					
Voltage	±240VDC				
Charge Power	20%*System Power				
Charge voltage precision	±1%				
SYSTEM					
System efficiency	Normal mode:95% ;ECO mode:98% ;Battery mode:94.5%				
Display	7.0" Color touch screen LCD + LED + Keyboard				
IP Class	IP20				
Interface	Standard :RS232,RS485,Dry contacts; Optional: SNMP				
Operation/Storage temperature	0-40℃ /-25-70℃				
Relative humidity	0-95%(non-condensing)				
Noise	56dB @ 50% load (1 meter away)				
PHYSICAL					
Weight	Cabinet	70kg	51kg	42kg	70kg
	Power Module	15.3kg			15.5kg
Dimension (W*D*H) (mm)	Cabinet	485*751*1033	485*697*575 (11U)	485*697*398 (7U)	485*751*1033
	Power Module	436*590*85 (2U)		436*590*85 (2U)	

RM Series In-built Battery Modular Online UPS

20-60kVA (380V/400V/415V)

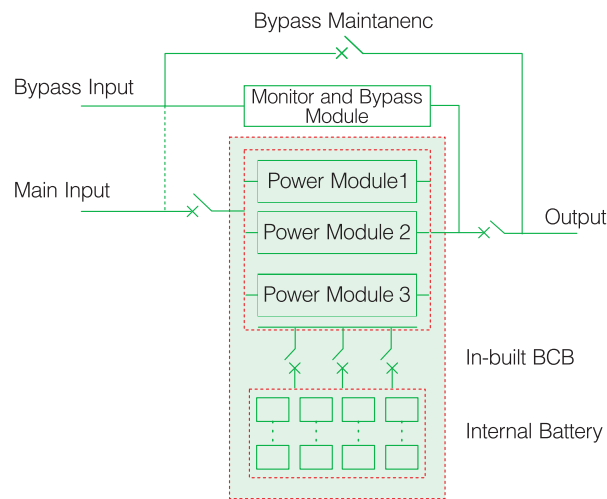
RM060/20B series are modular online UPS with hot-swappable battery. The single cabinet power rating covers from 20kVA to 60kVA which delivers the best of combination of reliability, hot-swappable and flexibility.

With intelligent battery protection and management technology, RM060/20B realises a compact total power solution which is easy for installation, maintenance and power expansion.



Features

- Modular design with swappable battery package
- Monitor system for battery
- Integrated IGBT module with improved performance and reduced size
- Easy for installation and maintenance
- Easy for power expansion and backup time expansion
- Intelligent protection technology for safe and reliable hot swappable battery package of the system
- Smart charging management system, intelligently control the whole process of the charging and discharging, effectively improving the life time of the battery
- Battery cold start
- Friendly human machine interface with touch screen



Specification

MODEL	RM060/20B (In-built Battery)	
Capacity	60kVA/54kW	
Power module	PM20(20kVA/18kW)	
INPUT		
Phase	3 Phase + Neutral + Ground,380V/400V/415V(line to line)	
Voltage range	-20%-25%	
Frequency range	40Hz-70Hz	
Power factor	>0.99	
THDi	THDi<3% @100% linear load	
OUTPUT		
Voltage regulation	1.5%	
THDu	THD<1%(linear load),THD<5.5%(non-linear load)	
Power factor	0.9	
Crest factor	3:1	
Overload capability	110% for 1 hour; 125% for 10 min ;150% for 1 min; >150% for 200 ms	
BATTERY		
Voltage	±240VDC	
Charge power	20%*System Power	
Charge power precision	±1%	
SYSTEM		
System efficiency	Normal mode:95%;ECO mode:98%; Battery mode:95%	
Display	LCD+LED, Touch Screen +Keyboard	
IP class	IP20	
Interface (Communication port)	Standard:RS232,RS485,Dry contacts; Optional: SNMP	
Installation/Connection	Top or bottom cable connection	
Operation/Storage temperature	0-40℃/-40-70℃	
Relative humidity	0-95%(non-condensing)	
Noise	55dB(1 meter away)	
PHYSICAL		
Weight	Cabinet	205kg;
	Power Module	PM20:22kg
	Battery package	10kg(without battery)
Dimension (W*D*H) (mm)	Cabinet	600*1020*2000
	Power Module	PM20/PM15/PM10:440*590*134
	Battery package	120*824*177

HT33 Series Tower Online UPS
60-500kVA (380V/400V/415V)

HT33 series three phase UPS offers advanced technology that increase performance and reliability: three high speed DSPs with completed digital control fully ensure high quality of power supply, high input power factor and low input current distortion. It also offers humanization design: full front access of serviceability and user friendly interface.



Application

- IDC(Internet Data center),ISP,IT Room, Service Center
- Precision instruments,Intelligent equipments

Features

- High efficiency, up to 96%
- High input PF>0.99; Input current THDi<3%
- Muti-protection, over-temperature protection with 8 sensors, over-load, battery under voltage, fan failures, short-circuit
- Battery cold start
- Battery management with smart charging control, greatly extend the battery life
- High power density
- Parallel up to 1500kVA
- Modular design of subsystem, convenient for field maintenance
- Friendly operation interface, color touch LCD screen

Specification

MODEL		HT33060X	HT33080X	HT33090X	HT33100X	HT33120X	HT33150X	HT33200X	HT33250X	HT33300X	HT33400X	HT33500X
Capacity		60kVA	80kVA	90kVA	100kVA	120kVA	150kVA	200kVA	250kVA	300kVA	400kVA	500kVA
INPUT												
Phase		3Phase+N+PE,380V/400V/415V(line to line)										
Voltage range		304-478Vac (line-line),full load; 228V-304Vac (line-line),load decrease linearly according to the min phase voltage										
Frequency range		40-70Hz										
THDi		<3%(Full linear load)										
Power factor		>0.99										
OUTPUT												
Voltage		380V/400V/415V(line to line)										
Voltage regulation		±1.5%										
THDu		<1%(linear load),<5.5%(none-linear load)										
Power factor		0.9										
Frequency range		50/60Hz										
Frequency precision		0.01%										
Overload capability		110% for 60 min; 125% for 10 min;150% for 1 min;>150% for 200 ms										
BATTERY												
Voltage		±240VDC										
Charge power		20%*System Power										
Voltage precision		1%										
SYSTEM												
Efficiency	Normal	95%	96%	95%	96%	95%	96%					
	Battery	95%	96%	95%	96%	95%	96%					
Display		Color LCD touch screen+ LED+ Keyboard										
IP class		IP20										
Interface		Standard: RS232, RS485,USB, Dry contact(programmable) Option: SNMP,AS400, Parallel kit, Battery cold start(standard for 250kVA above), Lightning protection components, Dust filter, LBS										
Operation/storage		0-40℃,-40-70℃										
Relative humidity		0-95%(non-condensing)										
Noise		68dB @ 100% load, 65dB @ 45% load						72dB @ 100% load, 69dB @ 45% load				
PHYSICAL												
Weight(kg)		170	210	231	210	266	305	350	445	490	810	900
Dimension(W*D*H)(mm)		600*980*950	600*980*1150	600*980*1400	600*980*1150	600*980*1400	650*960*1600	650*960*1600	650*960*2000	650*960*2000	1300*1100*2000	1300*1100*2000

HT33 Series Tower Online UPS

HT33 series UPS applies advanced technology that increases performance and reliability: two high speed DSPs with completed digital control to ensure high quality of power supply, high input power factor and low input current distortion.



Application

- IDC(Internet Data center),ISP,Computer Room, Service Center
- Precision instruments,Intelligent equipments

Features

- High efficiency, up to 96%
- High input PF>0.99;Input current THDi<4%
- Multi-protection, over-temperature protection with 8 sensors, over-load, battery under voltage, fan failures, short-circuit
- Four circuit breakers, providing full protection when fault happens
- Battery cold start
- Battery management with smart charging control, greatly extend the battery life
- Parallel up to 8 units
- Friendly operation interface, high-resolution LCD screen

Specification

MODEL		HT33010XS	HT33015XS	HT33020XS	HT33030XS	HT33040XS
		HT33010XL	HT33015XL	HT33020XL	HT33030XL	HT33040XL
Capacity		10kVA	15kVA	20kVA	30kVA	40kVA
INPUT						
Phase		3Ph+N+PE,380V/400V/415V(line-line)				
Voltage range		304-478Vac (line-line),full load; 228V-304Vac (line-line),load decrease linearly according to the min phase voltage				
Frequency range		40-70Hz				
THDi		<4%		<3%		
Power factor		>0.99				
OUTPUT						
Voltage		380/400/415VAC (line-line)				
Voltage regulation		1.5%				
THDu		<1% (linear load),<5.5% (non-linear load)				
Power factor		1.0		0.9		
Frequency range		50/60Hz				
Frequency precision		0.01%				
Overload capability		110% for 60 min; 125% for 10 min;150% for 1 min;>150% for 200 ms				
BATTERY						
Voltage		±240VDC				
Charge power		20%*System Power				
Voltage precision		1%				
SYSTEM						
System efficiency	Normal	95%		95%		96%
	Battery	94.5%		95%		96%
Display		LCD + LED + Keyboard				
IP Class		IP20				
Interface		Standard: RS232, RS485,Dual input kit; Option: SNMP, Dry contacts, Parallel kit, Battery cold start				
Operation temperature		0-40℃				
Relative humidity		0-95%(non-condensing)				
Noise		<55dB (1 meter away)				
PHYSICAL						
Weight(kg)		51.5	51.5	89	89	140
		31	31	50	52	61
Dimension (W*D*H)(mm)		250*840*715	250*840*715	350*738*1335	350*738*1335	500*840*1400
		250*660*530	250*660*530	250*680*770	250*680*770	250*836*770

HT33-TX Series Tower Online UPS

10-40kVA (380V/400V/415V)

HT33-TX series in-built transformer three phase UPS applies advanced technology that increases performance and reliability: two high speed DSPs with completed digital control fully ensure high quality of power supply, high input power factor and low input current distortion. With in-built transformer, the HT33-TX is providing more safety to critical load.



Application

- IDC(Internet Data center),ISP,IT Room, Service Center
- Precision instruments,Intelligent equipments

Features

- In-built galvanic isolation transformer
 - High input PF>0.99;Input current THDi<4%
 - Multi-protection, over-temperature protection with 8 sensors, over-load, battery under voltage, fan failures, short-circuit
 - Four circuit breakers, providing full protection when fault happens
- Battery cold start
 - Battery management: smart charging control, auto maintenance, greatly extend the battery life
 - Parallel up to 8 units
 - Friendly operation interface, high-resolution LCD screen

Specification

MODEL	HT33010X-TX		HT33020X-TX	HT33030X-TX	HT33040X-TX
Capacity	10kVA		20kVA	30kVA	40kVA
INPUT					
Phase	3Ph+N+PE,380V/400V/415V(line-line)				
Voltage range	304-478Vac (line-line),full load; 228V-304Vac (line-line),load decrease linearly according to the min phase voltage				
Frequency range	40-70Hz				
THDi	<4%		<3%		
Power factor	>0.99				
OUTPUT					
Voltage	380/400/415VAC (line-line)				
Voltage regulation	1.5%				
THDu	<1% (linear load), <5.5% (non-linear load)		<1%(linear load),<5%(non-linear load)		
Power factor	0.9				
Frequency range	50/60Hz				
Frequency precision	±0.01%				
Overload capability	110% for 60 min; 125% for 10 min;150% for 1 min;>150% for 200ms				
BATTERY					
Voltage	±240VDC				
Charge power	20%*System Power				
Voltage precision	1%				
SYSTEM					
System efficiency	Normal mode: 92%				
	ECO mode: 95%				
	Battery mode: 92%				
Display	LCD + LED + Keyboard				
IP class	IP20				
Interface	Standard: RS232, RS485,Dual input kit; Option: SNMP, Dry contact, Parallel kit, Battery cold start				
Operation temperature	0-40℃				
Relative humidity	0-95%(non-condensing)				
Noise	<55dB (1 meter away)				
PHYSICAL					
Weight(kg)	200	220	240	300	
Dimension (W*D*H)(mm)	350*738*1335				500*840*1400

HT31 Series Tower Online UPS
10-40kVA (220V/230V/240V)

HT31 series is online double-conversion UPS with fully DSP controlled technology. With high input and output power factor, self-adjusting output frequency and network management, HT31 is perfect choice for computers, telecommunication equipments and other sensitive devices.



Application

IDC(Internet Dater Center),network,servers and workstations,office etc

Features

- Wide range of input voltage and high input power factor
 - Output PF of 0.9
 - Full protection of overvoltage, circuit short and over temperature
- LCD display, monitoring all the operation status
 - Auto fan speed adjustment
 - Abundant interface: RS232,USB, SNMP, Intelligent Card

Specification

MODEL	HT3110S	HT3115L	HT3120L	HT3140L
	HT3110L			
Capacity	10kVA	15kVA	20kVA	40kVA
Phase	Three phase in , Single phase out			
Input voltage range	50%-125%(220VAC/230VAC/240VAC)			
	100% load@80%-125%; 90% load@70%-80% 80% load@60%-70%; 65% load@50%-60%			
Input PF	0.95			0.99
Input frequency range	40Hz-70Hz			
Output PF	0.9			
Output voltage	220V/230V/240V			
Voltage regulation	1.5%			
THDu	1% (full linear load); 5%(non-linear load)			
Battery voltage	192VDC			±240VDC
Battery type/number	12V,9Ah*16	External	External	External
	External			
System efficiency	Normal :93.5%; ECO :98%; Battery:92%			Normal:95%; ECO:98%; Battery:95%
Noise(1 meter away)	<53dB@<70%load;66dB@>70%load			65dB @ 100%load, 62dB @ 45%load
Overload capability (Inverter mode)	110%:for 10 min ;130%:for 1 min ; 150%:for 30 sec (shut down the bypass after 1 min)			
Overload capability (Battery mode)	110%: shut down after 10 min; 125%:shut down after 10 sec; >125%: shut down after 1 sec			
Crest factor	3:1			
Display	LED+LCD			
Interface	Standard:RS232,EPO Optional: USB, SNMP, Dry contacts			Standard: RS232, RS485, USB, Dry contacts Optional: SNMP,AS/400, parallel kit, Battery cold start
W*D*H(mm)	250*562*770	250*562*650	250*562*710	600*980*950
	250*562*650			
Weight(kg)	69	27	34	170
	25			

HT11 Series Tower Online UPS
6-20kVA (220V/230V/240V)

HT11 series, ranging from 6kVA to 20kVA, is online double-conversion UPS with fully DSP controlled technology. For 6kVA and 10kVA, the UPS has inbuilt output transformer for different application.

With high input and output power factor, self-adjusting output frequency and network management, HT11 is perfect choice for computers, telecommunication equipments and other sensitive devices.



In-built Transformer Type

Application

IDC(Internet Dater Center),network,servers and workstations,office etc

Features

- Wide range of input voltage and high input power factor
 - Output PF of 0.9
 - Full protection of overvoltage, circuit short and over temperature
- LCD display, monitoring all the operation status
 - Auto fan speed adjustment
 - Abundant interface: RS232,USB, SNMP, Intelligent Card
 - Inbuilt output transformer

Specification

MODEL	HT1106S	HT1110S	HT1115L	HT1120L	HT1106S-TX	HT1110L-TX
	HT1106L	HT1110L			HT1106L-TX	
Capacity	6kVA	10kVA	15kVA	20kVA	6kVA	10kVA
Phase	Single phase in, Single phase out					
Input voltage range	50%-125%(220VAC/230VAC/240VAC)					
	100% load@80%-125%; 90% load@70%-80% 80% load@60%-70%; 65% load@50%-60%					
Input PF	0.99		0.98		0.99	
Input frequency range	40Hz-70Hz					
Output PF	0.9				0.8	
Output voltage	220V/230V/240V				110/220VAC	
Voltage regulation	±1%				±2%	
THDu	≤1%(linear) ; ≤5% (non-linear)			1%(linear); 5%(non-linear)		
Battery voltage	192VDC					
Battery type/number	12V,7Ah*16	12V,9Ah*16	External	External	12V,7Ah*16	External
	External	External			External	
System efficiency	Normal mode:93%; ECO mode:98%; Battery mode:92%		Normal mode:93.5%; ECO mode:98%; Battery mode:92%		Normal mode:88% ECO mode:93%; Battery mode:87%	
Noise(1 meter away)	<48dB@<70%load; <58dB@>70%load		<48dB@<70%load; 60dB@>70%load		<48dB@<70%load; <60dB@>70%load	
Overload capability (Inverter mode)	110%:for 10 min ;130%:for 1min ; 150%:for 30 sec (shut down the bypass after 1 min)					
Overload capability (Battery mode)	110%: shut down after 10 min; 125%:shut down after 10 sec; >125%: shut down after 1 sec					
Crest factor	3:1					
Display	LED+LCD					
Interface	Standard:RS232,EPO Optional: SNMP, USB, Dry Contacts,Parallel Kit, ECO Kit, External Battery Cable (standard model), Maintenance Bypass,					
W*D*H (mm)	250*562*650	250*562*650	250*562*650	250*562*710	250*504*945	250*504*885
	250*504*480	250*504*480			250*504*945	
Weight(kg)	59	65	27	34	104	78
	18	20			65	

HT11 Series Tower Online UPS

1-3kVA (220V/230V/240V)

HT11 series is online double-conversion UPS with full DSP control technology. With high input and output power factor, self-adjusting output frequency and network management, HT11 is a perfect choice for computers, telecommunication equipments and other sensitive devices.



Application

IDC(Internet Dater Center),network,servers and workstations, control system, communication system, office,PC etc

Features

- Wide range of input voltage while input PF>97%
- LCD/LED display, monitoring all the operation status
- Output PF of 0.9, more powerful load capability
- Auto fan speed adjustment
- Full protection of overvoltage, circuit short and over temperature

Specification

MODEL	I	HT1101S	HT1101L	HT1102S	HT1102L	HT1103S	HT1103L
	II	HT1101S- II	HT1101L- II	HT1102S- II	HT1102L- II	HT1103S- II	HT1103L- II
Capacity		1kVA		2kVA		3kVA	
Phase		Single Phase in, Single Phase out					
Input voltage		110VAC-288VAC					
		100% load@>176VAC; 80% load@>154VAC; 70% load@>132VAC; 50% load@>110VAC					
Input PF		≥0.97					
Input frequency		40Hz ~ 70Hz					
Output PF	I	0.9					
	II	0.8					
Output voltage		220V/230V/240V					
Voltage regulation		± 1 %					
THDu		THD≤2%(linear)					
		THD≤5.5%(non-linear)		THD≤5%(non-linear)		THD≤5%(non-linear)	
Crest factor		3:1					
Efficiency		87.0%		91.0%		90.0%	
Noise		<43dB@<70%Load, <47dB@>70%Load		<45dB@<70%Load, <50dB@>70%Load		<45dB@<70%Load, <50dB@>70%Load	
Overload capability		Inverter	105% ~ 130%: to bypass after 1 min; 150%: to bypass after 30 sec				
		Battery	105% ~ 130%:shut down after 10 sec; 150%:shut down after 5 sec				
Battery voltage	I	36VDC		72VDC		96VDC	
	II	24VDC		48VDC		72VDC	
Battery type/number	I	12V,7Ah*3	External	12V,7Ah*6	External	12V,7Ah*8	External
	II	12V,7Ah*2	External	12V,7Ah*4	External	12V,7Ah*6	External
Max charging current		1A	8A	1A	8A	1A	8A
Interface		RS232,EPO					
Optional		Intelligent kits, USB(B Type),SNMP, Dry contact					
W*D*H(mm)	I	144*353*222		190*374*336		190*426*336	
	II	144*353*222		190*374*336		190*374*336	
Weight(kg)	I	10.5	5	21	8.5	24.5	9.5
	II	10	6	17	11	22	12

HR11 Series Rack Online UPS

1-10kVA (220V/230V/240V)

HR11 series is online double-conversion UPS with fully DSP controlled technology. With 19" standard rack design, self-adjusting output frequency and network management, HR11 is a perfect choice for computers, IT equipments and other sensitive devices.



Application

IDC(Internet Dater Center),network,servers and workstations, control system, communication system, office, PC etc

Features

- Wide range of input voltage while input PF>99%
- Output PF of 0.9
- Full protection of overvoltage, circuit short and over temperature
- LCD/LED display, monitoring all the operation status
- 19" standard cabinet and battery cabinet
- Automatic fan speed adjustment
- Abundant interface：RS232,USB, SNMP, Intelligent Card

Specification

MODEL	HR1101S	HR1102S	HR1103S	HR1106S	HR1110S
	HR1101L	HR1102L	HR1103L	HR1106L	HR1110L
Capacity	1kVA	2kVA	3kVA	6kVA	10kVA
Input voltage range	110VAC-288VAC				
	100% load@>176VAC; 80% load@>154VAC 70% load@>132VAC; 50% load@>110VAC				
Input frequency	40-70Hz				
Input PF	≥0.97			≥0.99	
Voltage regulation	± 1 %				
Output frequency	50/60Hz				
Output PF	0.9				
Overload capability (Inverter mode)	105%-130%: to bypass 1 min; 150%: to bypass after 30 sec			110%: to bypass after 10 min; 130%: to bypass after 1 min; 150%: to bypass after 30 sec, shutdown after 1min	
Overload capability (Battery mode)	105%-130%: shutdown after 10 sec; 150%: shutdown after 5 sec			110%: shutdown after 10 min; 125%: shutdown after 10 sec; >125%: shutdown after 1 sec	
Crest factor	3:1				
Efficiency	87%	91%	90%	92%	
Display	LED+LCD				
Battery voltage	36VDC	72VDC	96VDC	192VDC	
Battery type/number	12V,7Ah*3	12V,7Ah*6	12V,7Ah*8	12V,7Ah*16	12V,9Ah*16
	External				
Interface	RS232,SNMP				
Optional	USB, SNMP, Dry contacts			USB, SNMP, ECO kit, Dry contacts, Battery cabinet	
Operation temperature	0-40℃				
Relative humidity	0-95%(non-condensing)				
W*D*H(mm)	440*430*86	440*480*173	440*480*173	438*680*218	438*680*218
	440*430*86	440*480*86	440*480*86	438*680*130	438*680*130
Weight(kg)	11.5	25	31	62	70.5
	7	8	9.5	18.5	21.5

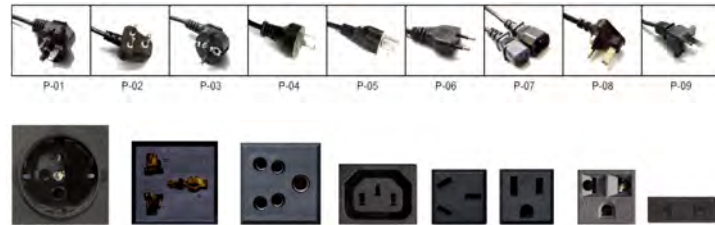
BU Series Offline UPS 600-3000VA

The BU series is offline UPS with the most advanced DSP control technology which can protect the sensitive device from utility fail, over/under voltage, surges, transients, spikes and other electrical abnormalities. With automatic boot voltage regulation and wide input voltage range, BU is a good choice to be applied to all kinds of complex power environment.



Features

- Automatic booting when the utility recovers
- Wide range of input voltage
- Alarm and mute
- Auto recharging
- Overvoltage and circuit short protection
- Interface of RJ45/11 and USB



Specification

MODEL	BU500	BU600	BU800	BU1000	BU1200	BU1500	BU2000	BU3000
Capacity	500VA	600VA	800VA	1000VA	1200VA	1500VA	2000VA	3000VA
Input voltage	110/120VAC or 220/230/240VAC						220VAC	
Input voltage range	85-150VAC/145-290VAC						175-275VAC	
Input frequency	50/60Hz(Auto sensing)						50Hz	
Output voltage	110/120VAC or 220/230/240VAC						220VAC	
Output voltage range	102-132VAC/200-255VAC						200-240VAC	
Output frequency	50/60Hz±0.5Hz						50Hz±0.5Hz	
Wave form	PWM (DC mode)						PWM(DC mode)	
Transfer time	Typical 2-6ms,Max≤ 10ms						≤ 10ms	
QTY & capacity of battery	12V,4.5Ah*1	12V,7Ah*1	12V,9Ah*1	12V,7Ah*2	12V,7.5Ah*2	12V,9Ah*2	12V,7Ah*4	12V,9Ah*4
Charging period	period 4-6h to 90% capacity						10-16hours	
Protection	Low voltage, overload and short circuit protection							
Operation temperature	0-40℃ ,							
Humidity	20%-90%(non-condensing)						20%-90%(non-condensing)	
Noise	≤40dB							
Net weight(kg)	5.5	4	6	10.2	10.2	10.6	19	21
Dimension	250*95*140	305*85*140		335*118*190		340*110*265	408*145*220	
Optional	LED/LCD,RJ45/11&USB							

DIV Series Power Inverter 500-6000VA

Features

- CPU control technology
- SPWM technology with pure sine wave
- Powerful load capability and high compatibility
- Advanced reverse noise technology
- Settable to AC model and DC model
- Fault protection
- Interface: RJ45,Dry contacts



Specification

MODEL	DIV500	DIV1000	DIV2000	DIV3000	DIV4000	DIV5000	DIV6000
Capacity	500VA	1000VA	2000VA	3000VA	4000VA	5000VA	6000VA
DC Input	Input voltage(Vdc)		12V/24V/48V/110V/220V				
	Reverse noise current		10%				
AC Bypass	Bypass volt(Vac)		265V-185V(±10V)				
	Input current(A)		2.3	4.5	9.1	13.6	18.2
	Transfer time(ms)		≤5ms				
AC Output	Rated capacity(VA)		500VA	1000VA	2000VA	3000VA	4000VA
	Output power(W)		400W	800W	1600W	2400W	2800W
	Voltage and Frequency		220Vac, 50Hz				
	Rated current(A)		1.8	3.6	7.2	10.8	14.5
	Voltage precision(V)		220±1.5%				
	Frequency precision(Hz)		50±0.1%				
	Wave form		Sine wave				
	THDu		3%				
	Transient response		5%				
	Power factor(PF)		0.8/0.7				
	Overload capability		120%, 30 sec				
	Efficiency		≥85%				
	Transfer to bypass		≤5ms				
Environment	Isolation(IN/OUT)		1500Vac, 1min				
	Noise(1 meter)		≤40dB				
	Operation temperature		-25℃ - +50℃				
	Humidity		0-90%(non-condensing)				
	Altitude(m)		≤2000				
Mechanical	Standard (W*D*H)(mm)		482*356*88 (500VA;1kVA;2kVA) 482*388*88 (3kVA;4kVA;5kVA) 482*400*176 (6kVA)				
	Weight(kg)		8.5KG(500VA,1000VA,2000VA,3000VA);12KG(4000VA) ; 1				

DR Series Telecom Rectifier

The DR series is specially designed to meet the demand for the compact flexible high performance high reliability power supply . The system's 19 inches and 7U standard structure adapts to various telecom cabinet and racks. The rectifier efficiency is up to 97%, while the standard efficiency is up to 92%.

Features

- Wide input voltage: 85-300V AC
- Wide temperature: -30℃-65℃
- Hot-plug and easy maintenance
- Full range of protection
- Advanced battery management
- Interface of RS232/485/SNMP, Dry contacts



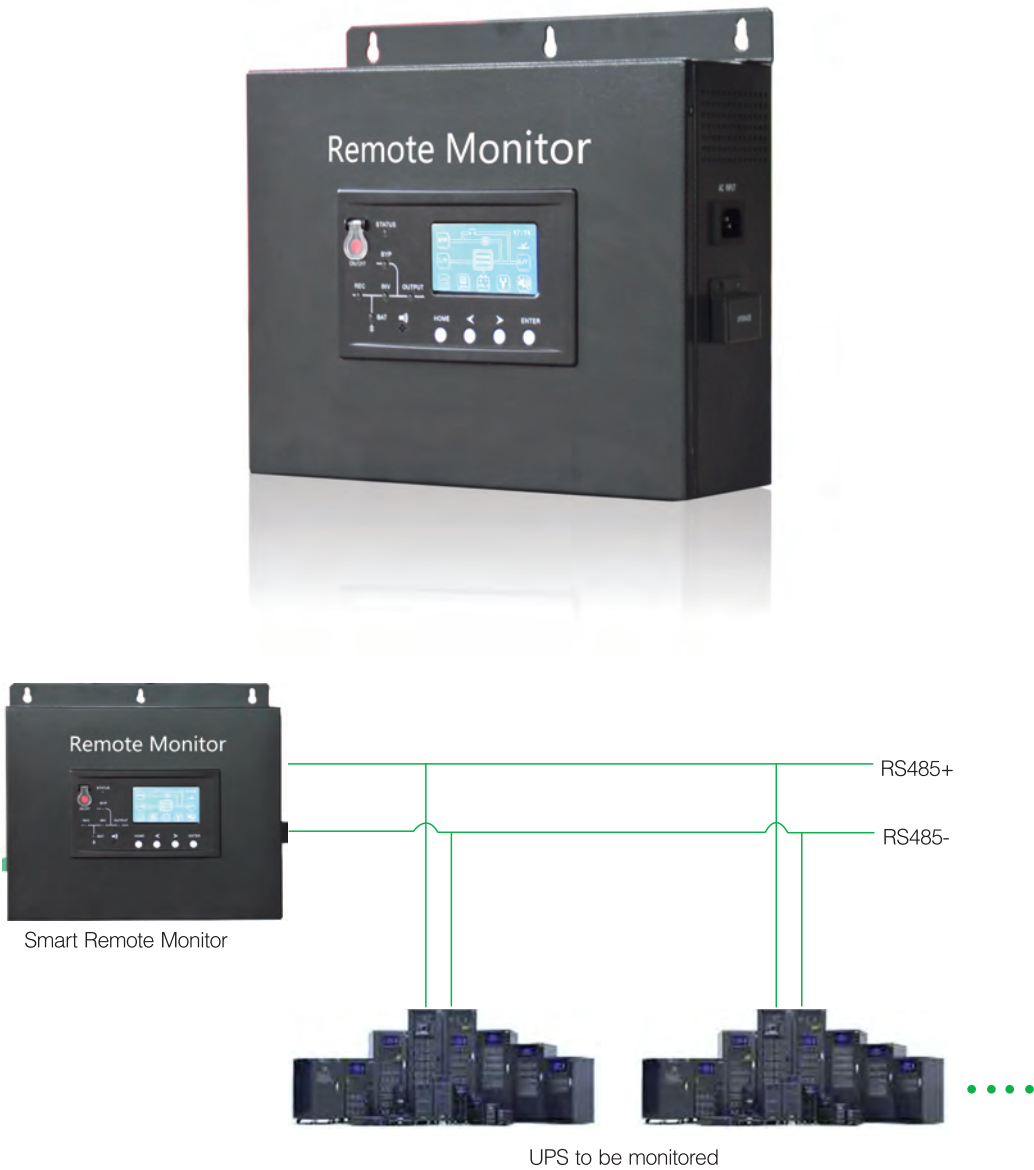
Specification

MODEL		DR48250	DR48120
AC Input	Voltage	85-300VAC	85-300VAC
	Frequency	45-65Hz	45-65Hz
	Power factor	0.99	≥0.99
DC Output	Voltage	-42-58.5V	-42-58.5V
	Current	100A/1P*2+63A/1P*4+32A/1P*2 32A/1P*2+16A/1P*2+10A/1P*2	63A/1P*2+32A/1P*2 16A/1P*4
	Ripple	< 200 mV peak to peak,	< 200 mV peak to peak,
	Load regulation	0.5%	0.5%
	Current sharing	5%	≤5%
	Parallel rectifier module	1-5	1-4
	Efficiency	Rectifier :97% Standard:92%	Rectifier :97% Standard:92%
Protection	Over current	Input: fuse; Output: fuse	Input: fuse; Output: fuse
	Over voltage /Temperature	Yes	Yes
	LED/Alarm	Yes	Yes
Environment	Noise(1 meter)	50dB	≤50dB
	Operation /Storage temperature	-30℃--+65℃/ - 40℃-70℃	-30℃--+65℃/ - 40℃-70℃
	Relative humidity	10%-95%(non-condensing)	10%-95%(non-condensing)
Mechanical W*D* H (mm)	Subrack	483*334*310	483*371*222
	Rectifier module	103*231*84	208*106*42
Weight(kg)	Subrack	17.2	13
	Rectifier module	2.4	1.7

Smart Remote Monitor

Smart Remote Monitor has been specifically designed to provide detailed information of the running UPS over a long distance, which is suitable to be used in data center, IDC, monitor and control room and other applications. The Smart Remote Monitor displays and monitors the parameters and status of the UPS in real time, ensuring the safe running of the UPS system.

Solution



Smart Charging Module

Smart Charging Module is designed for large current charging application where long back up time is required. The charging module is compatible with 30kVA power module based RM series and modular-designed HT33 series and can provide additional maximum current of $50A \times N$.

Features

Modular and hot-swappable design

Modular and hot-swappable design, the same size and out1ook as 30KVA power module

Large charging current

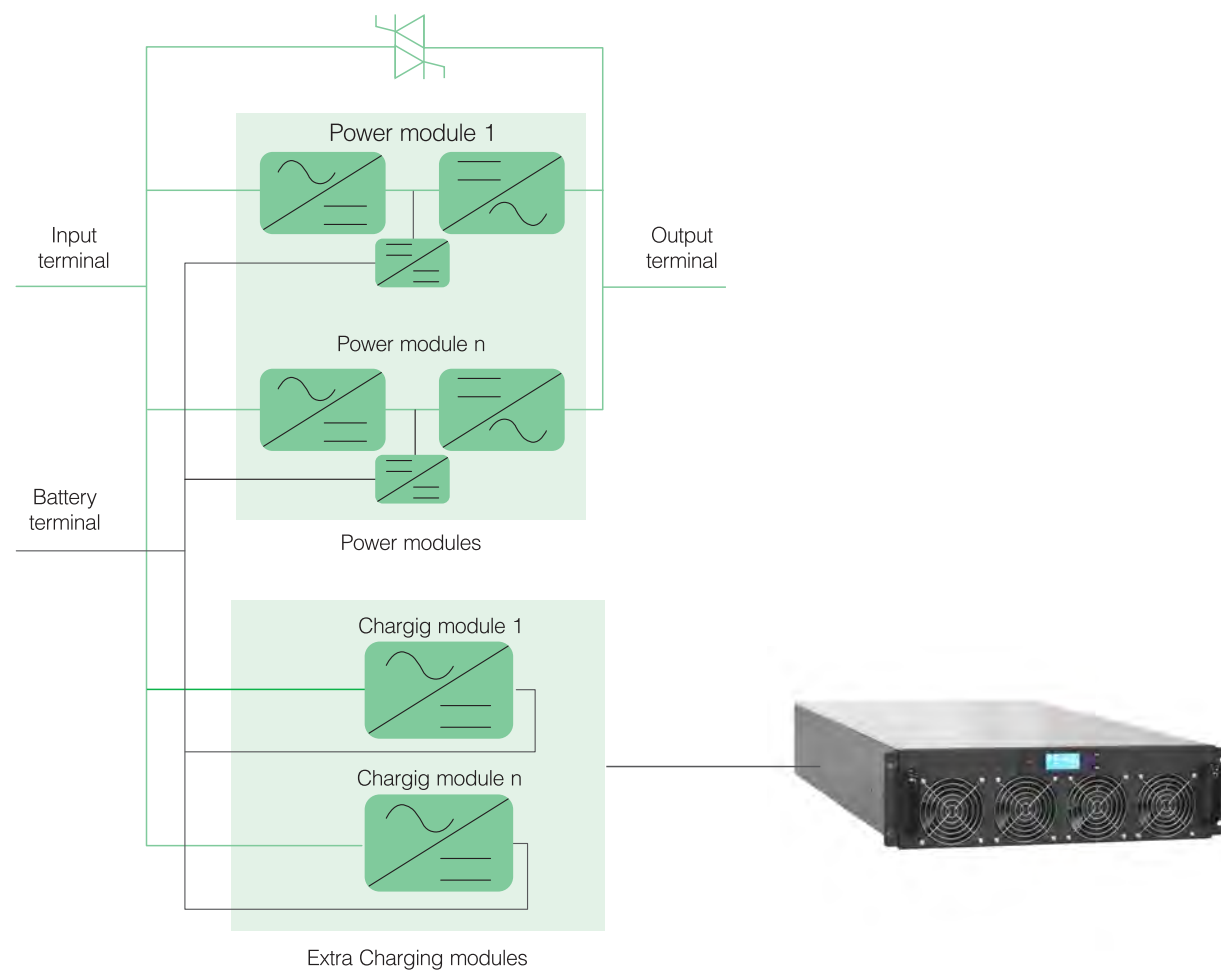
Each power module can provide a maximum current of 50A and charging current can be set from 0-50A

Compatibility

Compatible with 30kVA power module based RM series and modular-designed HT33 series, easy for the UPS to expand charging capacity

Display

A high resolution LCD is placed in front of the panel. User can conveniently view the charging parameter in real time

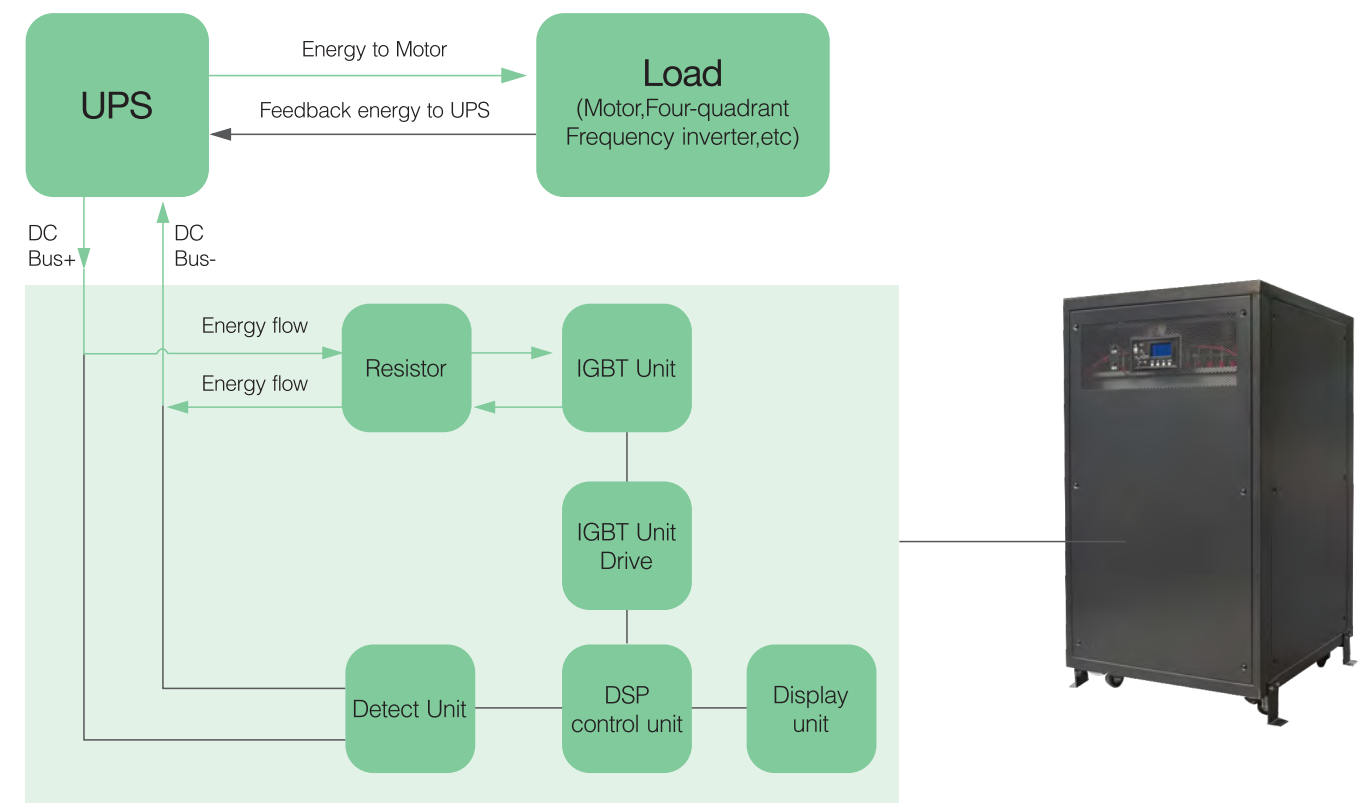


Energy Absorbing Unit

The intelligent Back-feed Absorbing Unit (BAU) is designed to cooperate with the UPS for industrial applications, where the energy is feeding back to the UPS from load. BAU provides an excellent solution for these cases.

Application

Motor braking current(A)	60	90	150	300
UPS type	RM120/30X	RM180/30X	RM300/30X	RM600/30X
RM/BAU	RM/BAU120			2xRM/BAU120
Max feedback energy that can be absorbed	48kW	72kW	120kW	2x120kW



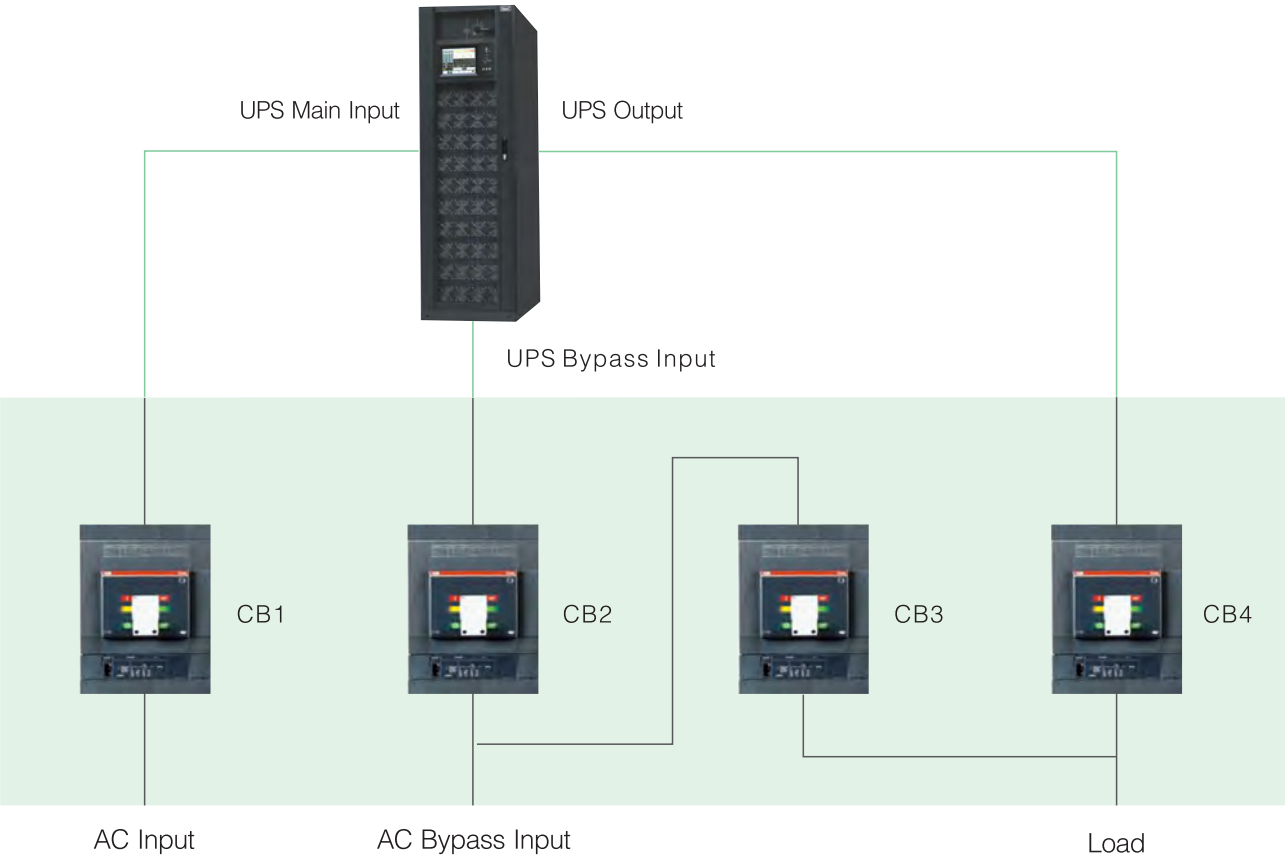
Bypass Cabinet

Bypass cabinet is external PDU cabinet holding Main Input CB1, Bypass Input CB2, Maintenance Bypass CB3 and Output CB4.

The bypass cabinet is available as 100A, 225A and 400A for customers.

Application

Circuit Breaker(CB)	Rating(A)	Suitable Range for UPS
CB1-CB4	100A	10-40kVA,three phase UPS
CB1-CB4	225A	60-120kVA,three phase UPS
CB1-CB4	400A	160-250kVA,three phase UPS



PB Series Smart Power Distribution Unit

Description

PB series smart power distribution unit is integrated with power input, output, and monitoring system with a 7 inches colorful touch screen. The friendly monitoring system can provide information on power distribution, protection, parameters display and management .With communication of RS485, customer can remotely monitor the information on the system, both main and bypass.

The system meets high reliability and safety standards with all CB from Schneider or ABB and all switches and copper bars isolated by protection board. Customers can choose surge protection and SPD as optional. The system can be set to dual input and output, and can be maintained without cutting off the power.



Application

Size(H*W*D)	H(mm)	W(mm)	D(mm)
Optional	2000/2200	600/800	1000/1100/1200
Weight	80 ~ 240kg		
Rated power	20 ~ 400kVA		
Display	7 Inch Touch Color Screen		
Interface	RS485*2+USB*1		
Electrical characteristics			
Rated isolation voltage	AC 50Hz/60Hz, 690V		
Rated operation voltage	AC 50Hz/60Hz, 400V(Three Phase), 230V(Single phase)		
Input	Un = 380V(3L + N + PE) Or Un = 220V(1L + N + PE)		
Output	Max 168 single phase out(depends on customers' need)		
Input switch breaking capability	≥25kA		
Input switch breaking capability	6kA		
Surge protection	OBO surge Protection Module (Optional)		
IP protection	IP20		
Test characteristics			
Main	Main Monitor: Status of CB, Voltage, Current, Active Power, Apparent Power, THD, PF, Frequency, Neutral Line Current, Voltage between neutral and earth		
Branch parameter	Status of CB, Voltage, Current, Active Power, THD, PF, Frequency, Neutral Line Current		
Warning	Low voltage, over voltage, overload, over frequency limit, abnormal Voltage between neutral and earth CB fault Main three level current threshold, Branch two level current threshold		
Environment			
Operation temperature	-10℃ - +65℃		
Humidity	95%(Non condensing)		
Altitude	≤2000m		
Other	No dust, no vibration or impact		

Battery Cabinet

The battery cabinet is made of cold rolled steel or galvanization plates of high mechanical performance and bearing capacity. The compact structure with electrostatic spraying makes the cabinet more wear-resistant, corrosion-resistant and fireproofing.

The cabinet is designed as assembly type which is convenient for transportation. All these guarantee the reliability and safety for the UPS.



Specification

Model	Colour	Materials	Weight	Layer	Size(mm)	QTY of Battery
C1A	Computer grey and black	Steel plates or galvanized plates	4.5kg	1	540*210*230	17AH, 6PCS;24AH, 4PCS; 38AH 3PCS;
C3	Computer grey or black	Steel plates or galvanized plates	9kg	1	585*470*320	17AH, 12PCS;24AH, 8PCS; 38AH ,6PCS; 65AH, 3PCS; 100AH 3PCS;
C6	Computer grey or black	Steel plates or galvanized plates	18kg	2	585*470*615	17AH ,28PCS;24AH, 12PCS; 38AH, 12PCS; 65AH, 6PCS; 100AH 6PCS;
C8	Computer grey or black	Steel plates or galvanized plates	21kg	2	780*470*615	17AH 40PCS;24AH, 26PCS; 38AH, 20PCS;65AH ,8PCS; 100AH, 8PCS;
C12	Computer grey or black	Battery terminal	45kg	4	780*470*900	12AH,40PCS;24AH,30PCS; 38AH,24PCS;65AH,12PCS; 100AH,12PCS;
C16	Computer grey or black	Steel plates or galvanized plates	45kg	4	780*470*1190	24AH,32PCS;38AH,32PCS; 65AH,16PCS;100AH,16PCS;
C20	Computer grey or black	Steel plates or galvanized plates	58kg	4	950*470*1190	24AH,40PCS;38AH,40PCS; 65AH,20PCS;100AH,20PCS;
C40-100	Computer grey or black	Steel plates or galvanized plates	110kg	5*2	950*880*1190	65AH,40PCS; 100AH,40PCS;
C40-120	Computer grey or black	Steel plates or galvanized plates	120kg	4*2	950*880*1475	120AH,40PCS;
G40-150	Computer grey or black	Steel plates or galvanized plates	150kg	4*2	1100*1070*1480	150AH,40PCS;
G40-200	Computer grey or black	Steel plates or galvanized plates	200kg	4*2	1900*1230*1260	200AH,40PCS;

MF Series Sealed Lead Acid Battery
2V/6V/12V (4AH-3000AH)

- Long life expectancy
- Maintenance free
- Low self discharging
- High reliability



Specification

Model	RatedVoltage(V)	Capacity(Ah)	Dimension(±1mm)				Weight±5%
			Length	Width	Height	Total Height	kg
			mm	mm	mm	mm	
MF4-12	12	4	91	71	102	108	1.4
MF7-12	12	7	151	65	94	100	2.15
MF9-12	12	9	151	65	96	100	2.5
MF12-12	12	12	151	98	95	101	3.4
MF17-12	12	17	181	77	167	171	5.2
MF24-12	12	24	166	175	125	129	7.6
MF38-12	12	38	197	165	170	170	12.4
MF65-12	12	65	350	167	179	179	19.6
MF100-12	12	100	328	171	214	220	30.5
MF120-12	12	120	410	176	227	227	33.5
MF150-12	12	150	482	170	242	242	44.5
MF200-12	12	200	522	238	218	222	60
MF250-12	12	250	520	269	220	224	69.5
MF4-6	6	4	70	47	101	107	0.65
MF7-6	6	7	151	34	94	100	1.08
MF9-6	6	9	98	56	117	117	1.35
MF12-6	6	12	151	50	94	100	1.7
MF100-6	6	100	195	170	207	213	16.5
MF150-6	6	150	260	180	247	251	23.5
MF200-6	6	200	250	125	362	366	31
MF300-6	6	300	295	178	345	350	47
MF100-2	2	100	171	72	206	211	6.3
MF150-2	2	150	172	102	205	227	8.1
MF200-2	2	200	173	111	330	364	13.5
MF250-2	2	250	173	111	330	364	15.5
MF300-2	2	300	171	151	330	364	18.5
MF350-2	2	350	171	151	330	364	21
MF400-2	2	400	210	176	330	367	25.5
MF450-2	2	450	210	176	330	367	28
MF500-2	2	500	241	175	330	365	32
MF600-2	2	600	302	175	330	367	37
MF800-2	2	800	410	175	330	367	52
MF1000-2	2	1000	475	175	330	367	61
MF1200-2	2	1200	475	175	330	367	71
MF1500-2	2	1500	400	350	345	382	92
MF2000-2	2	2000	490	350	345	382	119
MF2500-2	2	2500	490	350	345	382	140
MF3000-2	2	3000	710	350	345	382	184