

Flexible Modular Parallel Redundancy UPS 15-1200KVA

REL3300 Series

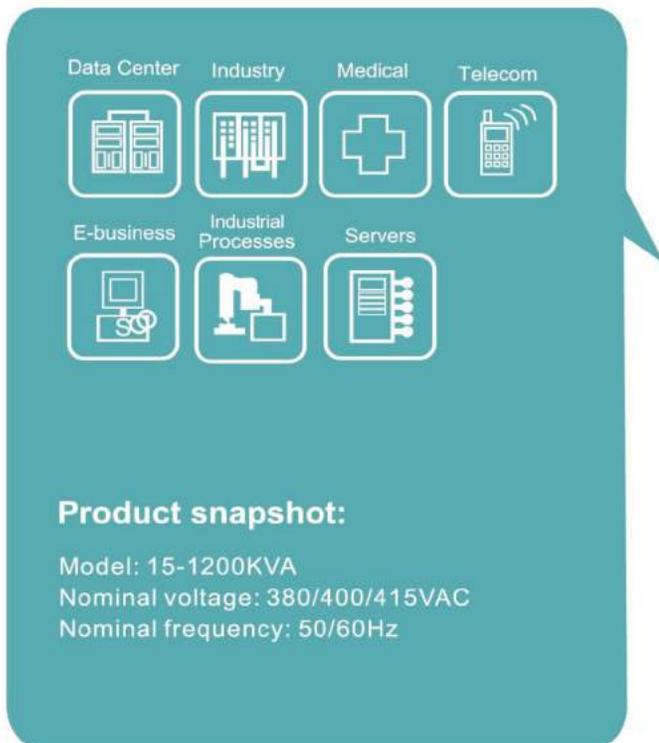
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REL3300 Series

Flexible Modular Parallel Redundancy UPS 15-1200KVA



Data Center Industry Medical Telecom

E-business Industrial Processes Servers

Product snapshot:

Model: 15-1200KVA
Nominal voltage: 380/400/415VAC
Nominal frequency: 50/60Hz



Application:

IDC(Internet Data Center), computing center, ISP (Internet Service Provider), Telecom, Finance bank and securities, Tax, hospital system, industrial automation, precision equipment, etc.

REL3300 series is modular online UPS for sensitive equipments. The single cabinet power rating covers from 15KVA to 300KVA which delivers the best of combination of reliability, hot-swappable and flexibility. With the latest IGBT three-level technology and DSP control, REL3300 achieves a high input power factor, low THDi Modular design with N+X redundancy and online hot swapping, easy to expand the capacity Full DSP control of high stability, reliability and safety Integrated IGBT module with improved performance and reduced size

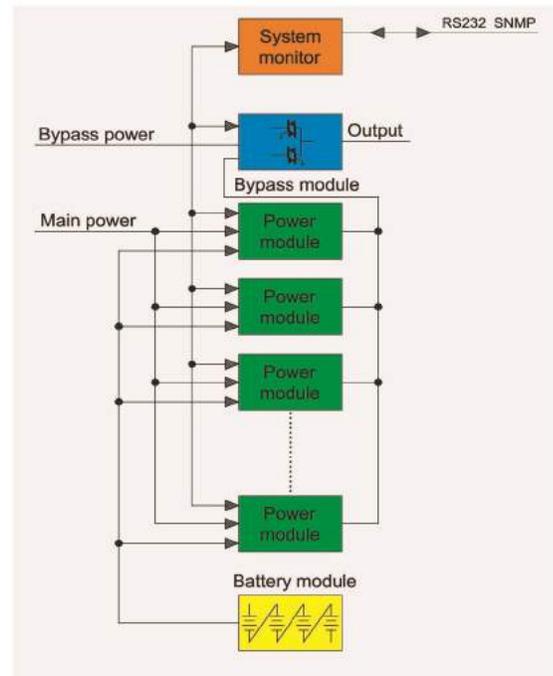
Working principle

Modular UPS use double conversion on-line structure, including the rectifier, inverter, battery charger, control circuit, the input and output battery connector breaker. Have function that is input power factor compensation. All modules can be online hot-swappable , provide the highest level of availability, and maintainability.

If one power module failure will not affect the system normal working , power module can be online hot-swappable all power module parallel is managed by the control board, in accordance with the unified parameters running, one power module fault can be automatically exit parallel system, will not cause harm to the whole parallel system.

Modular UPS system use independent static bypass module, do not use multiple static bypass structure, avoid caused overload damage Modules because of multiple bypass module uneven current when UPS turn to bypass working. The module parallel output voltage accuracy is $\pm 1\%$, parallel circulation current $< 1\%$.

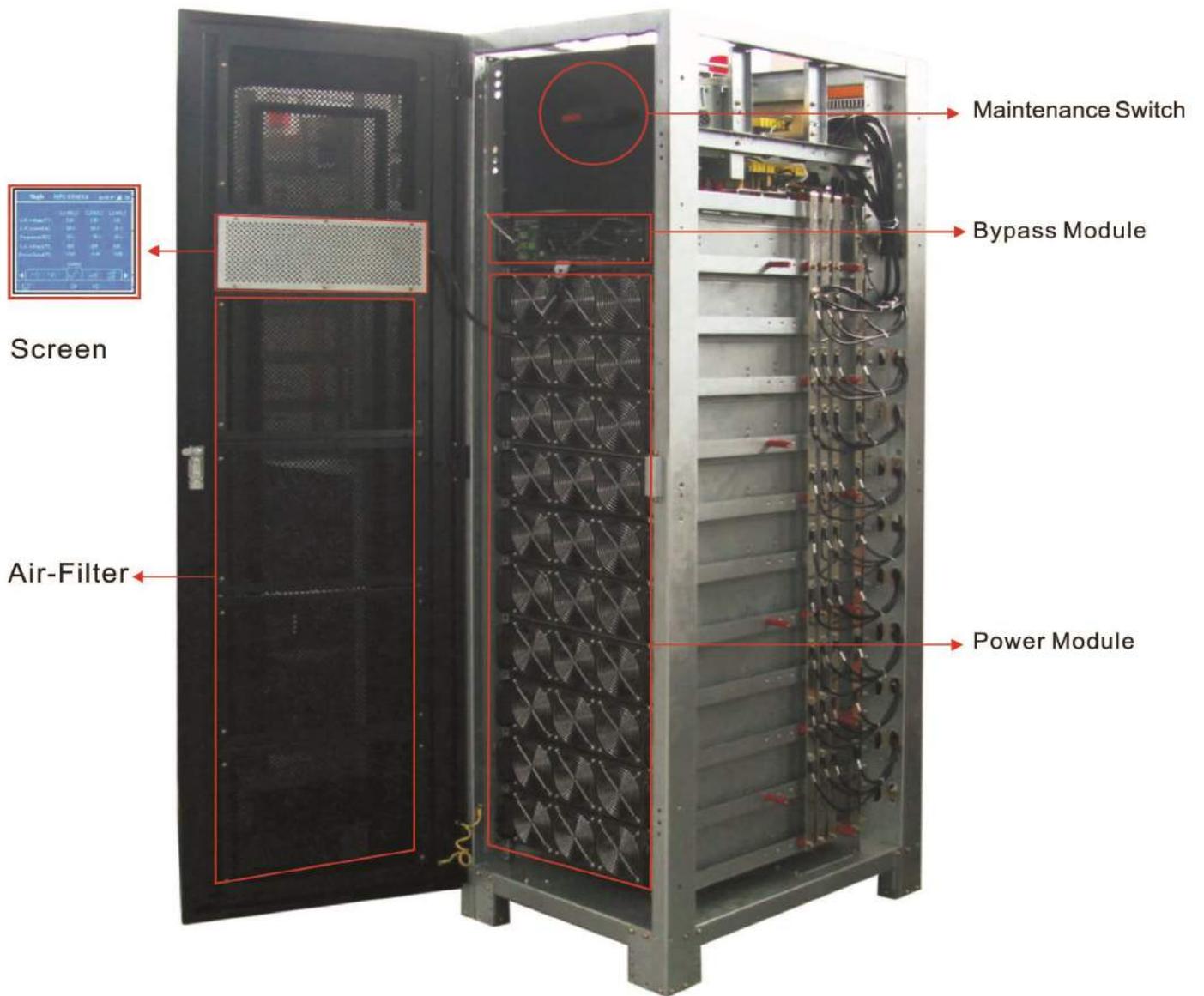
Static bypass module contains bypass static switch only, excluded static switch of the main circuit output; therefore, replacing static bypass module will not cause the system power down or transfer manual maintenance bypass, which can realize online hot-swap replacement.



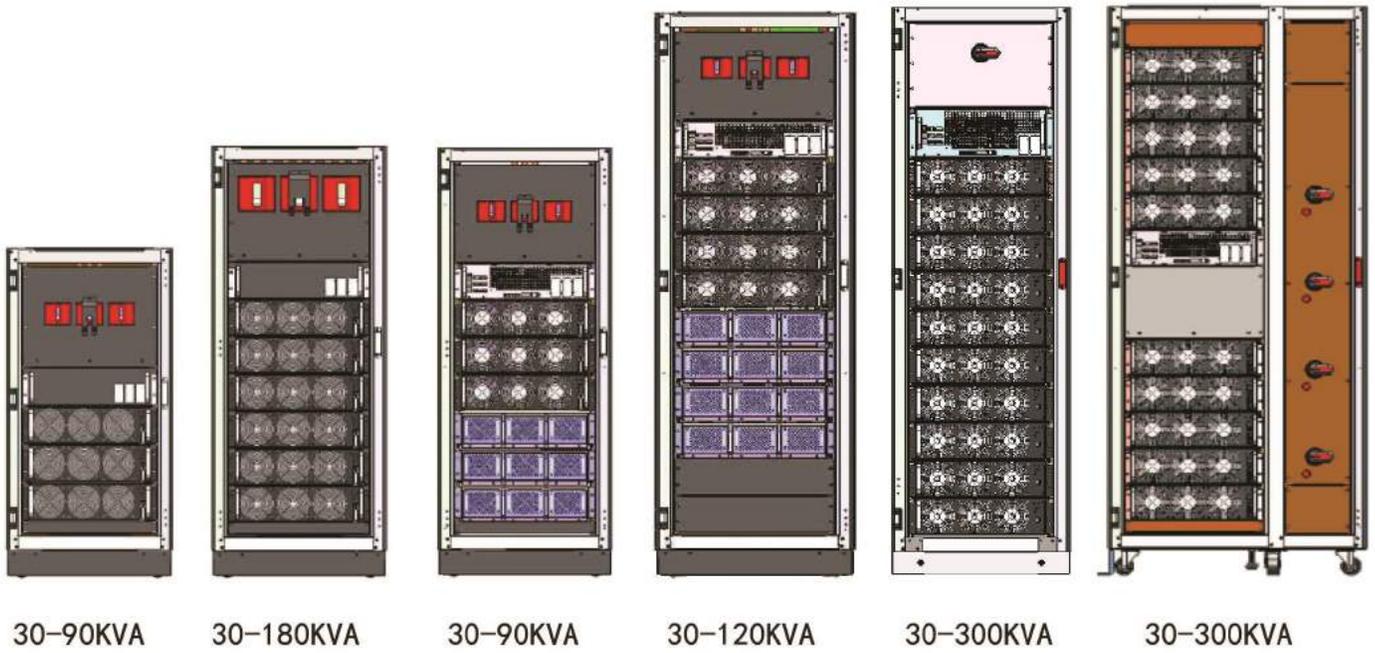
Features:

- Superior energy saving :
Efficiency $> 96\%$ at 50%-75% rated load, and $> 95\%$ at 25% rated load; Input PF > 0.99 , input THDi $< 3\%$.
- Easy-to-install:
Top or bottom cabling, no need of input cabling cabinet.
- Easy-to-maintain:
Full front access, UPS failed part can be replaced shortly.
- Easy-to-modify:
The number of battery cells can be configured flexibly, so the original batteries can be used when modifying the legacy system; moreover, the battery cell can be replaced in time when it fails without interrupting the normal operation of UPS.
- Extra large LCD that can display 12 language (Chinese ,English ,Russian, French, Spanish and so on).
- Provide large LCD touch screen (optional).
- Each UPS module provide 4.5KW charge capacity. equivalent to 10 to 12A.
- Advanced DSP full digital control technologies realize higher system stability, online capacity expansion and maintenance.
- Advanced distributed active parallel technology realizes parallel operation of 4 UPS units and online capacity expansion without centralized bypass cabinet.
- Adaptive to severe power grid environment due to extra wide input voltage and frequency ranges.
- Intelligent battery management maintains battery automatically to prolong the battery life.
- The machine system for modular structure, consists of 1 to 10 module's biggest single module to 40kw.
- UPS power module supporting hot swappable, capacity upgrade extremely simple.
- Super ability for overload and short circuit, ensure the system stability and safety under the limit state of system.
- Core control adopts advanced DSP and digital technology, the system stability is higher.

Constructional Drawing



Configuration Scheme:



Hot-swap Power Module:

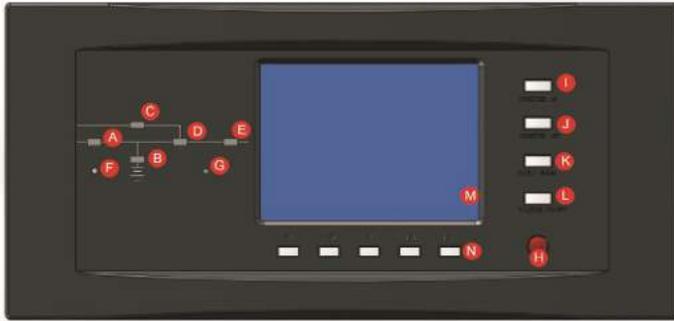


Hot-swap Battery Module:



Battery module

Display screen:

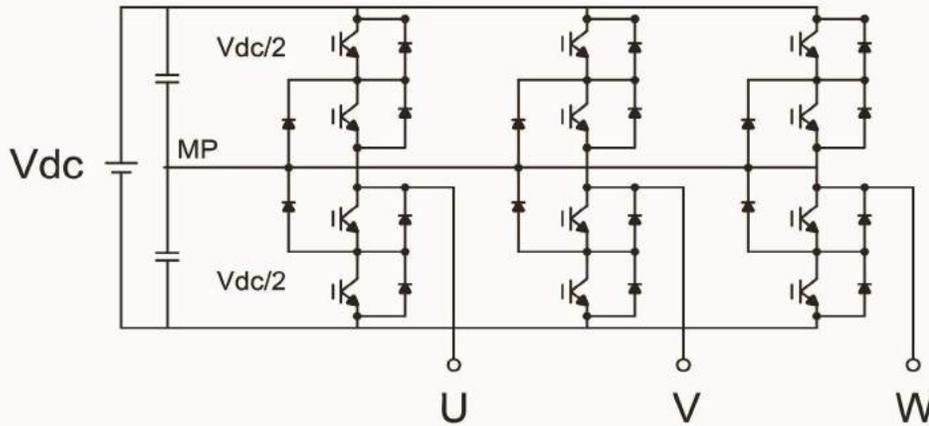


- | | |
|------------------------------|--|
| A Rectifier indicator | I Inverter start button |
| B Battery indicator | J Inverter shutdown button |
| C Bypass indicator | K Fault clear button |
| D Inverter indicator | L Alarm mute button |
| E Load indicator | M LCD(can display 12 kinds of language) |
| F Alarm indicator | N F1~F5 Menu keys |
| G Buzzer | |
| H EPO button | |

Excellent Electrical Performance

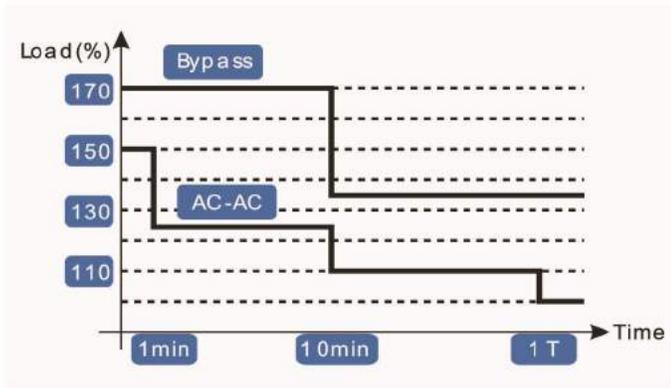
The three level inverter technology

3 ph/4w three level MOSFET inverter: use lower switch frequency get higher level transformer output voltage, therefore switch consumption is small and get high efficiency, at the same time can improve EMI filter capacity and get lower input THDI.



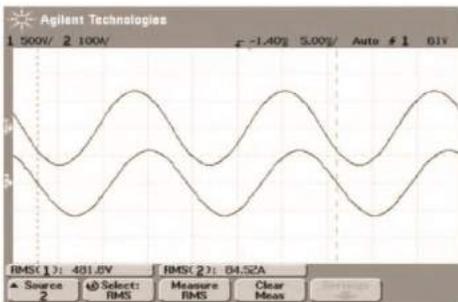
Super strong overload capacity

Effectively reduce caused by load mutation overload output switching times, to ensure the safety and stable operation of the system. The largest extent, ensure the power supply reliability of the equipment, below is output voltage and current wave.



- Normal mode
 - ▶ 100-105% continues
 - ▶ 105-110% , 1hour
 - ▶ 110-125% , 10mins
 - ▶ 125-150% , 1min
- Bypass
 - ▶ 100-135% long term
 - ▶ 135-170% 10mins
 - ▶ 1000% 100ms

Over load output voltage wave and THDV



120KVA Output THDV 380V rating voltage		
	100% Linear	100% nonlinear
THDV_A(%)	0.27%	0.96%
THDV_B(%)	0.40%	1.17%
THDV_C(%)	0.31%	1.33%

Super charge ability

Each power module has a separate charging system, to avoid the single board failure caused charge problem, and intelligent management for battery.

Battery Charging capacity :

- 3.375KW @if the ambient temp is 0°C ~30°C, No output power duration
- 3.0KW @if the ambient temp is 30°C~35°C, No output power duration.
- 2.7 KW @if the ambient temp is 35°C~40°C, No output power duration

Ripple Voltage at battery charging :

Ripple voltage < 1.414%(RMS value) nominal battery voltage at float charging or const voltage boost charging.

(notes: battery cable max. long is 10m.)

End Cell Voltage :

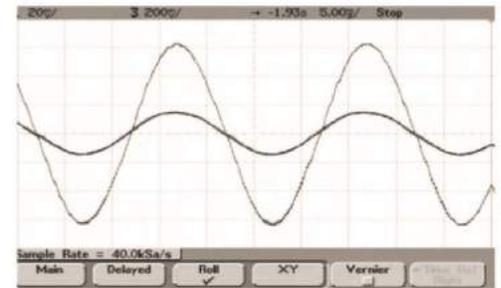
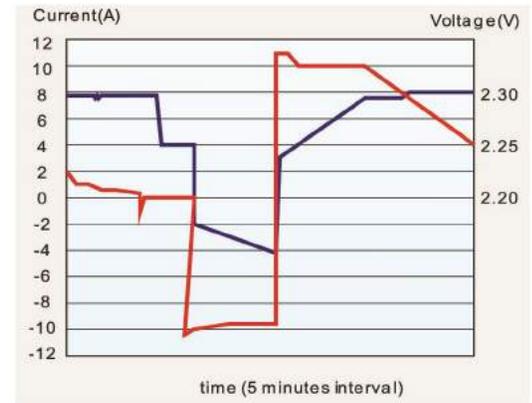
1.67V/cell (can be set by Background setting)

Voltage for charge:

Equalize charge: 2.35/cell Float charge: 2.27/cell (can be set by Background setting)

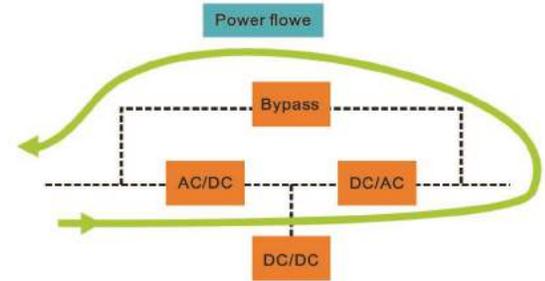
Input power factor

In all the condition of load and voltage input power factor is 1. This means that the input current demand lower. So the input cable, air switch demand lower, it will reduce the cost. In addition, because UPS appears as pure resistance of the mains grid power, reduce the operation cost. Most of the traditional system power factor is 0.8, leading to higher front-end costs and operating costs. Require additional capacitors in power factor correction, this is extra spending, lead to lower efficiency. Please see the input voltage and current wave.



Advantage-self aging

The unit can aging itself in full load condition without any actual load. All the unit will be aging in factory at least 8 hours. Also can be used as AC or DC back feed load to burn-in AC or DC product



The Design Concept of High Efficiency and Energy Saving Environmental Protection

The machine efficiency

Under the condition of the same power module can achieve greater load capacity, can save a lot for the customer at the same time because the cost of efficiency loss, Using the newest switching devices (CoolMOS) + intelligent control technology, realize super wide Efficient operation area, under 25% to 100% load rate are in the best running state, especially In a typical 45% to 75% range, efficiency is as high as 96% For customers to save investment.

The whole machine efficiency

Improve the system output power and the reliability of the system can achieve greater load capacity, better protect customers load equipment operation safety.

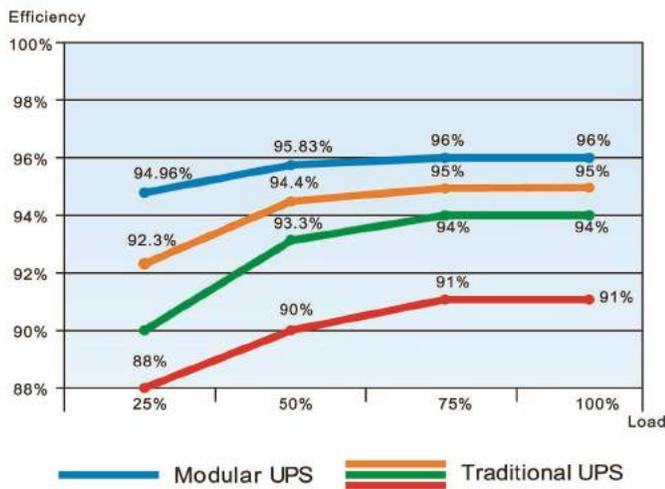
Single static bypass

When use multiple independent small power bypass module will produce machine uneven flow caused by bypass module impedance mismatch, so single static bypass design can avoid this problem and can use maintenance switch realize hot-swap when repair UPS, to improve system stability and reliability.

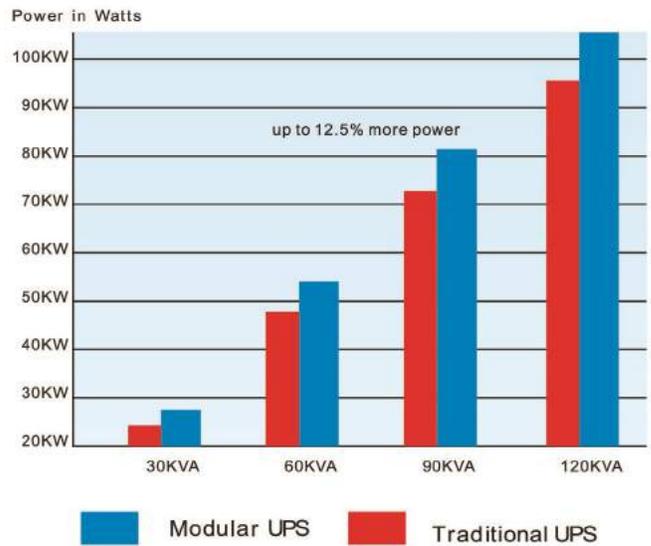
The input current is sine wave and PF is 1

150KVA input THDI and PF with 400V rating voltage		
	100% linear	100% nonlinear
THDi_A(%)	2.760	3.430
THDi_B(%)	2.830	2.800
THDi_C(%)	2.650	2.420
PF_A	0.9999	0.9999
PF_B	0.9999	0.9999
PF_C	0.9999	0.9999

Efficiency contrast form



Output power factor contrast



Modular UPS compared with traditional UPS			
	Modular UPS	1+ 1Parallel	Tradition UPS
Redundancy	0-900%	100%	—
Reliability	Ultra high	High	General
Expandable	High Expandable	—	—
The highest efficiency	≥96%	≥75%	92%
Repair Method	Module Hot-Swap	Circuit board and parts	Circuit board and parts
MTRR	≤5min	> 1Hour	> 1 hour
Input THDI	≤3%	12-33%	12-33%
Input PF	>3%	0.7~ 0.99	0.7~ 0.99
Foot print	Less	High	General
Upfront investment proportion	Low	High	Middle
Cost Performance	High	Low	—
Price	Moderation	High	Low

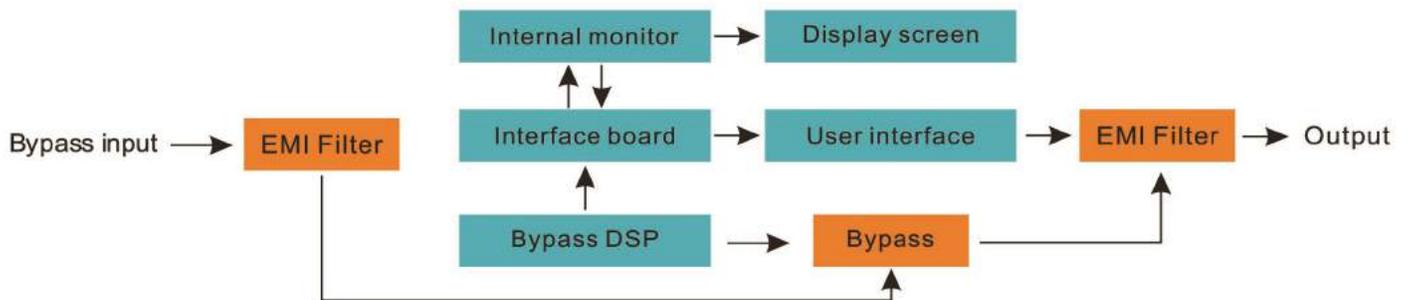
High Availability Configuration Structure

Static switch module:

- System standard configuration module
- Adop SCR and AC contactor in parallel
- High reliability, strong overload ability: 1000% for 1min
- Transfer time less than 1ms
- Have strong self-test , inter-lock and full-protection function



STS Module

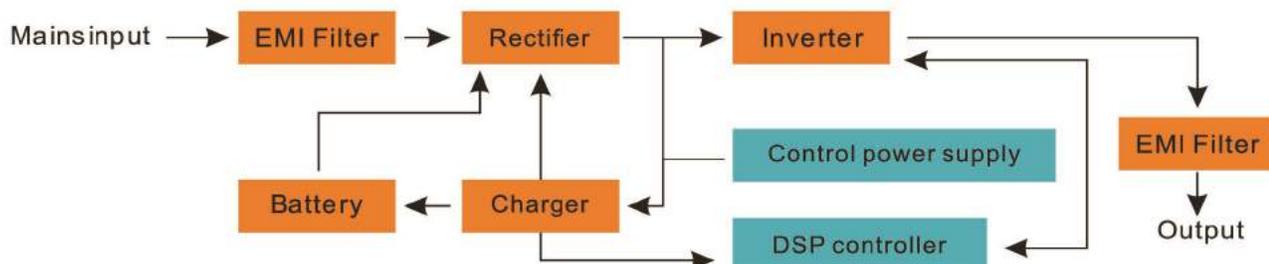


Power Module:

- Freedom choice of capacity configuration according demand, easy to expand
- Online double-conversion design to ensure the output quality
- Each module has independent digital intelligent control
- Each module can work independently
- Each module has a separate charging system
- All modules can be hot-swappable , easy for online maintenance
- Each UPS module provide 4.5KW charge capacity. equivalent to 10 to 12A



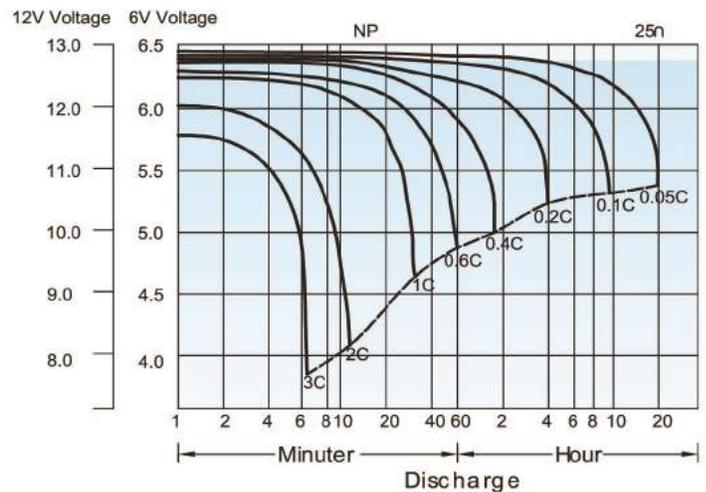
Power Module



Rich Management Interface

Advanced battery management

- All floating automatic conversion
- Temperature compensation
- Discharge to suspend automatic voltage regulation
- Battery self-diagnosis and self-inspection
- Battery capacity prediction
- Discharge time estimates
- Low voltage forecasting warning



Data recorder

Every 10 ms records a core electrical data, and in Fault occurs, the freezing failure 1 to 1.5 before work. The core of the cycle frequency electrical data Accurately record the cause of failure, to help the accident diagnosis and accurate positioning Rapid diagnosis to improve maintainability, the data will be recorded before a failure or overload occur.

Advanced self-diagnosis

- Inverter and rectifier circuit working condition monitoring
- Battery capacity and status detection
- Equipment working environment temperature testing
- Ease of maintenance and management of equipment
- Can each fan of fault detection, and replace the fan without power



Model	REL3300	
Capacity	15-1200KVA	
Main input		
Input Voltage	380V/400V/415V	
Input Frequency Range	50/60Hz	
Power Factor	Full load>0.99 ,Half load >0.98	
THDi	THDi<3%	
Input Power Soft-start Function	5-30s settable	
Input Voltage Ranges	228V-476V;-20% ~ 25% at Full load ; linear derating at -25% ~ -40%; can take 70% load at -40%	
Frequency Range	40-70HZ	
Battery		
Battery Voltage	±240VDC(Default),12V Battery 30~40pcs can be choose	
Charge Voltage accuracy	±1%	
Bypass		
Bypass Input Voltage	380/400/415VAC 3-phase 4-wire	
Voltage Range	Default value is -20%~+15%; -40%, -30%, -10% ~ +10%, +15% , other ranges can be set via software	
Overload Capacity	Long term at 135% rated load ,150%<load<180% more than 10 min,load>1000% 100ms	
Ouput		
Inverter Output Voltage	380/400/415VAC 3-phase 4-wire	
Voltage Accuracy	±0.5% (balanced load) , ±1% (unbalanced load)	
THDV	THDV<1% (linear load) , THDV<3% (nonlinear load)	
Power Factor	0.9 / 1.0	
Three Phase Angle accuracy	120°± 0.5°	
Current Crest Ratio	3:1	
Overload Capacity	110%1h , 125%10mins , 150%1mins , > 150%200ms	
Transfer Time	0ms,15ms (Eco Mode)	
System		
Frequency	50Hz/60Hz (Settable)	
Mains synchronization range	±2Hz(Default value), adjustable with step of 0.5Hz within range of +/- 0.5Hz - 3Hz	
Protection Level	IP20	
Communication Ports	RS232,RS485,dry contact, SNMP card, EPO, generator port	
System efficiency	>96% at load above 50%, >95% at load above 25%	
Operation Temperature	0-40°C	
Storage Temperature	-25°C ~ 70°C (without battery)	
Humidity	0-95% (no-condensing)	
Noise(dB)	55-62dB,Adjusted with load	
Net Weight	15KVA power module : 20KG	20KVA power module : 20KG
	30KVA power module : 35KG	40KVA power module : 35KG
Dimension (W x D x H)mm	3 module cabinet	600X900X1135
	6 module cabinet	600X900X1535
	10 module cabinet	600x900x2000/900X900X2000 (with side cabinet)
	power module	440X650X132(3U)-15KVA/20KVA/30KVA/40KVA



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