

DIGITAL UPS FOR THE DIGITAL WORLD



an ATLANTIC POWER GROUP company
Mexico DF - Sao Paulo - Madrid - Istanbul - Kuwait - Hong Kong - Melbourne



ISO 9001:2008 - ISO 14001:04 - OHSAS 18001:07
Certificate No. 29 QSD 03427-TC

GDC UPS (10KVA-800KVA)

Power Availability



Reliability, Availability, Scalability, Redundancy,

User-friendliness and Maintainability,

whichever value you need,

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UPS FOR THE DIGITAL WORLD, YOUR POWER QUALITY PARTNER

Interberg GDC Series UPS Systems are on-line double conversion UPS (VFSS111 in accordance with IEC-EN-62040-3) with IGBT and transformer isolated inverter. The GDC Series UPS have a compact footprint and high quality output to provide ultimate power protection for “mission critical” applications: data processing, telecommunications, industrial processes, security and electro-medical systems. The GDC range of UPS includes 3/3-phase output models from 10 to 800kVA. 6 and 12 pulse rectifiers are optional for all the models.

Major Applications

- Information Technology
 - Data Centers
 - Servers (LAN, WAN, MAN, ERP, e-mail, web and others)
 - Networking
- Telecommunication
 - Mobile (2G, 2.5G, 3G)
 - Paging
 - Fixed (including WLL)
- Industrial Automation
 - Process (including instrumentation)
 - Motion (digital drives & robotics) and motor loads
- Transport Automation
 - Airport automation and flight booking
 - Others including railways & road transport automation & ticket booking
- Banking, Insurance and Financial Services
- Software Development Houses / Software Technology Parks (STP)
- Building Automation
 - Access Control
 - Security System
 - Fire Alarm System
 - Emergency Lighting
 - Other Critical Applications
- Medical Diagnostics
 - Magneto Resonant Imaging
 - CT Scanning
 - CathLab
- Satellite
 - Uplinking
 - Earth Stations



- A** LCD Display
- B** Air Filter
- C** Electronic control PCB
- D** N+X assistant power supply PCB
- E** Battery monitor connect terminal
- F** 220V Socket
- G** Input power switch
- H** Bypass power switch
- I** Maintain bypass switch
- J** Output switch

Easy installation

- layered freestanding obturator-ventilation
- Installed against the wall
- The favourable ventilation design
- Can pass in and out the cables from the top

Application

Application Mainly used in large IDC rooms, bank/securities settlement center, communication network management center, semi-conductor product lines and large automation production with its control system. According to the special needs of users was improved, used in large sports venues, conference room, theater, highway and railway tunnels metal halide lamp lighting system.

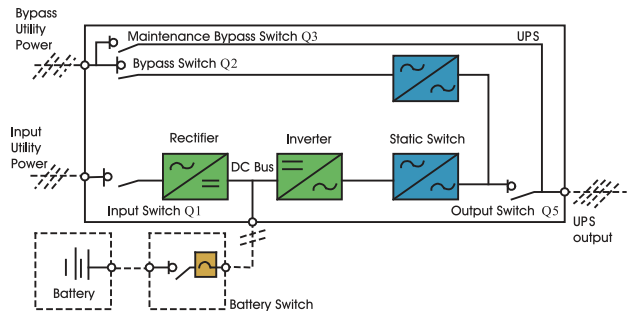
Key Features

- Use advanced 6th generation DSP and full digital control technologies to realize higher system stability.
- Output power factor is 0.9, carrying capacity than conventional UPS with 10% above, as users reduce investment cost.
- Advanced distributed active parallel technology can realize parallel operation of 6PCS UPS units without the need of centralized bypass cabinet.
- 6-inch extra large LCD that can display 12 language (English, Russian, Spanish, French and so on).
- Extra wide input voltage and frequency range make it adapt to severe power grid environment.
- Intelligent battery management maintains battery automatically to prolong the battery life.
- Standard input/output filter improves the system EMC performance.
- Extra strong capability to withstand output overload and short circuit, ensuring the system stability and system safety under extreme conditions.

Online double transform structure, double DSP control technology.

■ GDC series UPS Using real online double transform structure. This architecture is currently the best to solve the power structure. The framework can almost completely solve all the power problems, such as power utility high and low voltage, voltage instantaneous fall, reduce oscillations, high-voltage pulsed, voltage fluctuation, surge voltage, harmonic distortion, clutter interference, frequency wave power supply problems. Provide continuous, stable and pure sine wave power for the load.

■ Adopt double DSP high speed digital signal processing chip collaborative central CPU microprocessor common to the system control, feedback, measuring, display, communication etc for all-round real-time processing, and make the system parameters keep the same when environment (temperature, humidity, noise, etc.) changes. Even in the input signal distorted, can also provide accurate current, voltage, frequency and waveforms output. This technology has powerful control functions, thus realizing the computer system's comprehensive power management.



Working Principle:

■ GDC series UPS use AC-DC - AC converter. The first level transform (AC - DC) adopts SCR 3-phases full controlled rectifiers, 3-phase AC input voltage transform into stable DC bus voltage. Rectifier hold concurrently and charger function, and adopts the advanced temperature compensation technology, so that prolong battery life. Inverter main power adopts high power insulation gate bipolar transistors (IGBT) as its inverter unit. Controller adopts advanced space vector pulse width modulation (SVPWM) technology. And the DC Bus voltage inverter back to AC voltage.

■ Rectifiers and inverter work at same time when the Utility Power is normal, at the same time to supply power to the load and to the battery charge. When the utility power anomalies, rectifier stop working, turn by the battery by inverter to power supply to the load. If the battery voltage drops to discharge the termination voltage, and utility power hasn't returned to normal, UPS will shutdown (if two utility power different source and bypass the normal, system will let bypass supply power). Battery discharge and terminate voltage already preset. Inverter fault or overload, still can have external communications bypass through bypass switch Q2 and static bypass to supply power for the load. In addition, if UPS need maintenance or repair, UPS can through internal manual control maintenance bypass switch Q3 to supply power to the load. UPS normal operation, except maintenance bypass switch, all other switches are closed.

Super output overload capacity

Inverter power with a strong output overloads capacity, achieve "inversion state priority" thinking.

As we know, to measure the reliability of UPS power supply, one important indicator of the level that's strong anti-output overload. This means that when user put large non-linear load and form transient surge overload output situation, not only ensure the UPS inverter is intact, but will not overload the inverter output due to poor Bypass switch AC power supply situation. The reason is that when the UPS power supply in the implementation of the inverter AC bypass switch operation period, the City regulator may not have a regulated power supply and inverter power output characteristics of the transient voltage difference between too large to damage the UPS.

The typical overload capacity of ups as follow:

■ Three phase ups working:

110% rated load for one hour

125% rated load for ten minutes

150% rated load for one minute

■ Single phase ups working: 200% rated load for 30 seconds

■ When the user over load no more than the above range, UPS will continue to maintain the load by the inverter power supply status.

(Note: output power factor is 0.9)

With a strong anti-step of load and short circuit output capability

UPS power supply operation in the worst working conditions encountered by the user in the UPS output load 100% rated load for the input or the removal operation. The most serious situation is that UPS output is short circuit. Since the GDC UPS, configure a unique design of the output current limiting circuit. Even if the user inadvertently caused by the output short-circuit fault, it's UPS inverter will not be damaged. Typical UPS output capacity of short circuit:

■ three-phase work, the output current is limited to 160% nominal output current, 5 seconds.

■ Single-phase operation, the output current is limited to 290% nominal output current, 5 seconds.

Superior ability with three phase unbalanced load

For the three phase in/three phase out UPS, even with a peak in the ratio (crest ratio) is 3:1 in the non-linear loads like computers, they can't reduce the rated output power conditions and provide users with distortion less than 3-5% high-quality sine wave power. Moreover, as the machine is equipped with adaptive equilibrium adjustment circuit,

when followed 100% unbalanced load (one phase no-load, two phase full load), they can ensure that the three-phase phase voltage difference is less than 2%, and phase difference between the $120^\circ \pm 1^\circ$ ranges. This indicator was higher than similar products of other companies.

N + X redundant design of auxiliary power supply

Controlled circuit of auxiliary power for each provide reliable, stable power protection so that ensure all the control circuit to work properly. To ensure the normal operation of UPS systems play a key role. GDC Series UPS's auxiliary power adopt 1+1 redundancy design, when one of the auxiliary power failure, can be continued by another auxiliary power supply. UPS continue to operate normally, while the LCD screen displays this warning message.

Unique battery protection function

Battery and UPS by connecting an external battery switch, the battery switch is a "three-stage" DC switch that can be manually closed, and has a control circuit controlled by the UPS electronic tripping device. Effectively reducing the past due to battery leakage or short circuit caused the fire risk for the safe operation of the engine room has provided a guarantee. Battery switch has the following characteristics:

- And battery isolation, safe and reliable;
- Short-circuit protection;
- In case of battery voltage causes the inverter lock, then switch off automatically to avoid battery discharge damage;
- Fitted with a remote emergency stop button, emergency stop button can be used remotely disconnect the switch;
- Misuse protection;

Easy maintenance of structure design

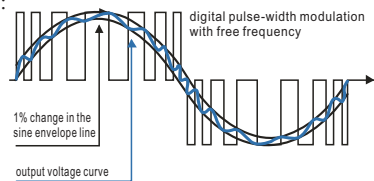
Using user-friendly control panel modular inline graphic design, to ensure reliable connection between the plug plates, the connection is configured with a connector locking mechanical "locking" device. Users simply open the cabinet door that can be observed a glance at the control panel of the UPS "self diagnosis" Status Monitor the work of the state. As a result, users can quickly access to nearly 70-90 species of fault alarm indication, and improve the maintainability of this UPS.

The efficiency of machine is up to 99%

Overview of large UPS equipment, efficiency, impact significantly on energy costs that percentage of minor differences can save considerable operating costs. Our design team from start improve efficiency and make a lot of effort. Especially for the actual operation of the load rate (example: 50% of the load operation, etc.) were carefully considered.

Clean stable output waveform

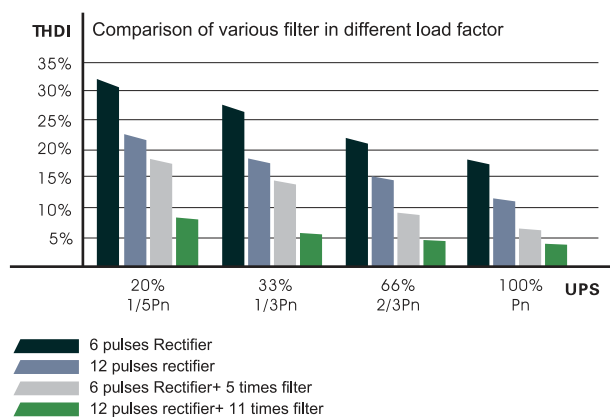
Output voltage curve 1% change in the sine envelope line digital pulse-width modulation with free frequency 250% 200% 120% 100% Rotating UPS SCR-based UPS Transistor-based UPS GDC UPS Power Demands Non-linear load 100% to ensure the non-linear load voltage distortion $\leq 3\%$ the min capacity of kinds of ups need:



High input power factor level, harmonic distortion cancellation: save cost of energy consumption, reduce power pollution

As well-known, the rectifier filtering load (such as computer, communication equipment, appliances or general UPS) was introduced to power grid largely and the power grid will be polluted, higher harmonic current that caused by pollution through the whole power supply system. Overcurrent that flow past mid line and motor load are heat abnormally. To deal with those problems, we provide some solutions to eliminate the harmonic pollution so that ensure quality of power reach the standard of Green power:

GDC series are adopted optional input filter and 12 pulses rectifier filter, the solution improves the input power factor to above 0.95, reduce the input harmonic current to 10%.



It is true that the 5 times filter is the largest in 6 pulses rectifier, and it can retrofit filter 5 times to restrain harmonic. 11 times is the largest in the 12 pulses rectifier and it can retrofit filter 11 times to restrain harmonic. Correlation table for harmonic after retrofitting filter as follows:

Harmonic times	6 pulses rectifier	6 pulses Rectifier +5 times filter	12 pulses rectifier	12 pulses Rectifier +11 times filter
5	32	2	1	1
7	3	1	1	1
11	8	7	9	3
13	3	2	4	2
17	4	3	1	1
19	2	2	1	1

harmonic suppression impact obvious with filter

Great parallel output features

There are frequency busbar and current busbar in parallel control system, they can control each UPS phase relation and flow equalize output feature. So the system not only ensure each UPS located in general UPS power supply can share load current, but also it can reduce the circulation maybe happened in parallel system to zero.

Moreover, because of sensitive circulation survey, it can survey the operative mode of UPS power supply system constantly and with high reliability (MTBF reach to 1 million hours), it is the top level in the similar type

Convenient for observation and easy-to-use display system

By LED light emitting diode constitute UPS power simulation operational process Chart with LCD screen that form the people-machine conversing menu which display UPS operation parameters and alarm/fault. This operation control of the display system is readable and easy to operate and see. Due to the design high-tech microprocessor monitoring technology, advanced "Self-diagnosis" management system and built-in Storage Unit. Therefore, users can be easily obtained as follows UPS operation information:

UPS monitoring system provide users all kinds of real-time operation parameters (input voltage and current, output voltage and current, working frequency, load percentage, apparent power and active power, battery voltage and current, temperature, etc.). Intelligent fault "Self-diagnosis" management system can provide up to 90 kinds alarm/fault information. This information is based on "control simulation screen" the words on the display and sound alarm a variety of forms such as simultaneously to the user notification, and also shows which happened alarm/fault the properties, types and time of occurrence. Obviously, this is very helpful in the user for failure analysis and exclusions, so that greatly improve UPS maintainability.

Unique Option, One-stop Service

- SNMP card
- Parallel card
- Dry contact card
- C class lighting protection case
- Outlet option
- Bypass flow equalize inductance
- Battery temperature transmitter
- JBUS/MODBUS interface card
- UPS generator room signal adapter
- 5 times harmonic or 11 times harmonic filter
- Load busbar synchronization (LBS) cable

Perfect Battery Management System

High performance battery management consists of charging technology with "constant-current then constant voltage" features and battery monitoring software with strong development function.

WE HELP YOU GET IT RIGHT - RIGHT FROM THE START.

GDC UPS (10KVA-100KVA)

Power Availability

Specifications

Model	GDC 10-100KVA													
	6P	12P	6P	12P	6P	12P	6P	12P	6P	12P	12P	12P	12P	
Rated Nominal	10KVA/9KW		20KVA/18KW		30KVA/27KW		40KVA/36KW		60KVA/54KW		80KVA/72KW		100KVA/90KW	120KVA/108KW
Rated Input Voltage	380/400/415VAC 3-phase 4-wire													
Rated Frequency	50/60HZ													
Input Parameters														
Input Voltage Range	± 25%													
Input Frequency Range	45Hz ~ 65Hz													
Input Soft Start Function	0-100% 5-300S settable													
Input Power Factor	> 0.8													
Input harmonic current(THDi)	< 20%													
Bypass														
Bypass Voltage Range	-20% ~ +15%													
Bypass Frequency Range	50/60HZ±10%													
Output Parameters														
Inverter Output Voltage	380/400/415VAC 3-phase 4-wire													
Voltage Stability	±1%(Steady status),±3%(Transient status)													
Frequency	50/60Hz													
Mains power synchronization window	± 5%													
Actually measured frequency accuracy (internal clock)	50/60Hz±0.05Hz													
Output Power Factor	0.9 (Output 90kW per 100kVA)													
Transient Response Time	<5ms													
Inverter Overload Capability	At 0.9 power factor, 110% for 1 hour, 125% for 10 minutes and 150% for 60s													
Short circuit current from inverter	3ph 1.5In for 5seconds, 1ph 2.9In for 5seconds													
DC Voltage	360/384/432/480VDC													
Maximum Bypass Capability	1000% for 100ms													
Phase Shift Characteristic	With 100% balanced load		<1°											
	With 100% imbalance load		<1°											
Total Harmonic Distortion(THDv)	100% linear load		<1%											
	100% non-linear load		<3%											
System Efficiency (full load)	Up to 94% (inverter efficiency is up to 98%)													
Rectifier Output Parameters														
Charger output voltage stability	1%													
DC Ripple Voltage	≤1%													
Operating Environmen														
Operating Temperature Range	0~40℃													
Storage Temperature	-25~70℃(inverter efficiency is up to 98%)													
Relative Humidity	0~95% (Non-condensing)													
Maximum Operating Height	≤Elevation 1000m, for elevation above 1000m, derate by 1% for every increase of 100m													
Noise (1m)	58-68dB													
Protection level	IP20													
Standard	Safety: IEC60950-1 IEC62040-1-1 UL1778 EMC IEC62040-2 CLASS C2 EN50091-2 CLASS A Design and Test IEC62040-3													
Physical Parameters														
Weight(kg)	200	220	230	250	290	330	340	360	400	440	520	770	850	
Dimension (W x D x H)mm	550x720x1200			550x720x1200				850x740x1400			1400x740x1800			

STANDARD: Conform to GB/IEC regulation : EMC:GB7260.2/IEC62040 GB/17626.2~5/IEC61000-4-2~5 SAFETY:GB4943

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GDC UPS (120KVA-800KVA)

Power Availability

Specifications

Model	GDC 120-800KVA															
	6P	12P	6P	12P	6P	12P	6P	12P	6P	12P	12P	12P	12P			
Rated Nominal	120KVA/108KW		160KVA/144KW		200KVA/180KW		300KVA/270KW		400KVA/360KW		500KVA/450KW		600KVA/540KW		800KVA/720KW	
Rated Input Voltage	380/400/415VAC 3-phase 4-wire															
Rated Frequency	50/60HZ															
Input Parameters																
Input Voltage Range	± 25%															
Input Frequency Range	45Hz~65Hz															
Input Soft Start Function	0-100% 5-300S settable															
Input Power Factor	> 0.98 (If harmonic filter is added)															
Input harmonic current(THDi)	< 4.5% (If harmonic filter is added)															
Bypass																
Bypass Voltage Range	-20% ~ +15%															
Bypass Frequency Range	50/60HZ±10%															
Output Parameters																
Inverter Output Voltage	380/400/415VAC 3-phase 4-wire															
Voltage Stability	±1%(Steady status),±3%(Transient status)															
Frequency	50/60Hz															
Mains power synchronization window	± 5%															
Actually measured frequency accuracy (internal clock)	50/60Hz±0.05Hz															
Output Power Factor	0.9 (Output 90kW per 100kVA)															
Transient Response Time	<5ms															
Inverter Overload Capability	At 0.9 power factor, 110% for 1 hour, 125% for 10 minutes and 150% for 60s															
Short circuit current from inverter	3ph 1.5In for 5seconds, 1ph 2.9In for 5seconds															
DC Voltage	360/384/432/480VDC															
Maximum Bypass Capability	1000% for 100ms															
Phase Shift Characteristic	With 100% balanced load		<1°													
	With 100% imbalance load		<1°													
Total Harmonic Distortion(THDv)	100% linear load		<1%													
	100% non-linear load		<3%													
System Efficiency (full load)	Up to 94% (inverter efficiency is up to 98%)															
Rectifier Output Parameters																
Charger output voltage stability	1%															
DC Ripple Voltage	≤1%															
Operating Environmen																
Operating Temperature Range	0~40℃															
Storage Temperature	-25~70℃ (inverter efficiency is up to 98%)															
Relative Humidity	0~95% (Non-condensing)															
Maximum Operating Height	≤Elevation 1000m, for elevation above 1000m, derate by 1% for every increase of 100m															
Noise (1m)	58-68dB															
Protection level	IP20															
Standard	Safety: IEC60950-1 IEC62040-1-1 UL1778 EMC IEC62040-2 CLASS C2 EN50091-2 CLASS A Design and Test IEC62040-3															
Physical Parameters																
Weight(kg)	980	1420	1200	1750	1350	2000	1600	2200	2100	2750	3690	6390	7390			
Dimension (W x D x H)mm	900X855X1900	1250X855X1900	1640X855X1900	1250X855X1900	1640X855X1900	2280X855X1900	2835X1000X1950	3955X1090X1950								

STANDARD: Conform to GB/IEC regulation : EMC:GB7260.2/IEC62040 GB/17626.2~5/IEC61000-4-2~5 SAFETY:GB4943

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