



**GAMATRONIC™**

*Our Power Your Confidence*

# **MODULAR DC POWER SUPPLIES & SYSTEMS**

*DC Power Systems  
DC/AC Inverters  
Static Switches  
DC/DC Converters*



## Power PS System 1UDC+

The Gamatronic 1UDC+ power system provides controlled and regulated DC power to sensitive equipment while simultaneously charging a battery bank. The system also supplies backup power during mains failure. Max system capacity is 2500A.

The 1UDC+ contains a 19" 1U subrack that houses up to 3 hot-plugged rectifiers, or 2 rectifiers + controller and an ELVD device.

Max system capacity: up to 13 subracks (38 rectifiers + controller), up to 2500A (48 Vdc).

Basic shelves:

1UDC+ **type 1**- includes a 19" 1U subrack with up to 3 rectifiers.

1UDC+ **type 2**- includes a 19" 3U with up to 2 rectifiers + SC 1UDC+ controller and an Electronic LVD device.

## Features

- 96 % efficiency
- Each 1U shelf 48V/100A @ 33A modules (200 A @ 66 A modules)
- Digitally controlled intelligent power module
- One to three hotswap rectifiers per shelf
- Active current sharing among rectifiers
- Universal input voltage
- Built-in dual 70 A Electronic Low Voltage Disconnect device (ELVD) for battery protection
- Option to connect two external LVD contactors of up to 1600 A
- Advanced battery management
- Up to two battery sets handled in one system
- Automatic and preprogrammed battery test (for each battery string)
- Remote notification of system alarms (optional)
- Breaking alert by modem (optional)
- All functions accessible directly from the controller



# PS1UDC+ SPECIFICATIONS

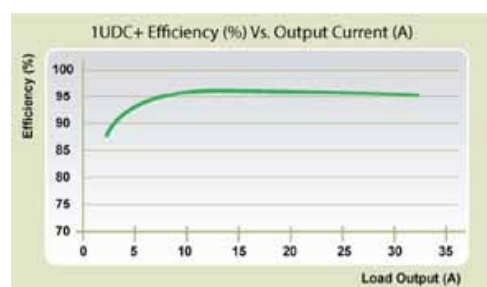


	1UDC 12 V / 40A	1UDC 24 V / 40A	1UDC 24 V / 50A	1UDC 48 V / 33A	1UDC 48 V / 50A	1UDC 48 V / 75A
<b>AC INPUT</b>						
Nominal voltage	230 Vac					
Voltage range	185 ~ 275 Vac full power; 85 ~ 300 Vac with derating					
Max. current <sup>1</sup> (full load)	N*3 A	N*6 A	N*8 A	N*10 A	N*15 A	N*21 A
Frequency	40 ~ 70 Hz					
Power factor (full load)	≥0.99					
Protection	Input fuses; relay disconnects input @ >300 Vac					
<b>DC OUTPUT</b>						
Maximum configuration	38 rectifier modules + controller					
Maximum system output	1520 A, 13.5 V, 20.5 kW	1520 A, 27 V, 41 kW	1900 A, 27 V, 51.3 kW	1255 A, 54 V, 68 kW	1900 A, 54 V, 103kW	2850 A, 54 V, 154 kW
Voltage (default)	13.5 ±0.1 Vdc	27 ±0.1 Vdc	27 ±0.1 Vdc	54 ±0.2 Vdc	54 ±0.2 Vdc	
Adjustable range (Vdc)	11.5 ~ 14.5 Vdc	23 ~ 29 Vdc	23 ~ 29 Vdc	43 ~ 58 Vdc		
Regulation (line & load)	±0.5%, ±0.25% with controller					
Nominal current <sup>1</sup>	N*40 A	N*40 A (Vin>195Vac) N*20 A (Vin=110Vac)	N*50 A (Vin>195Vac) N*20 A (Vin=110Vac)	N*33.3 A (Vin>195Vac) N*16 A (Vin=110Vac)	N*50 A (Vin>195Vac) N*25 A (Vin=110Vac)	N*75 A (Vin>195Vac) N*32 A (Vin=110Vac)
Ripple & noise @ bw=30 MHz	150 mV p-p, 30 mV rms	150 mV p-p, 30 mV rms	150 mV p-p, 30 mV rms	200 mV p-p, 40 mV rms		
Psophometric noise	-52 dBm over 600 Ω (<2 mv)					
Efficiency (30-70% load)	up to 91 % @230 Vac up to 90 % @115 Vac	up to 94 % @230 Vac up to 93 % @115 Vac	up to 94 % @230 Vac up to 93 % @115 Vac	up to 96 % @230 Vac up to 95 % @115 Vac	up to 96 % @230 Vac up to 95 % @115 Vac	up to 97 % @230 Vac up to 96 % @115 Vac
Overload current <sup>1</sup>	N*42 A (Vin>200 Vac)	N*42 A (Vin>200 Vac)	N*52 A (Vin>200Vac)	N*35 A (Vin>200 Vac)	N*55 A (Vin>200 Vac)	N*80 A (Vin>200 Vac)
Short circuit current, Vo=0	<N*20 A (Vin=230 Vac)					N*40 A (Vin>230 Vac)
Over-voltage protection	15 Vac	30 Vac	30 Vac	59.5 Vac		
Protection	Current limited; short-circuit proof; output fuse					
Walk-in time	10 s					
Hold-up time@nom.input	20 ms (90% load, output decays to 11.5 V)	20 ms (90% load, output decays to 23V)	20 ms (90% load, output decays to 23V)	20 ms (90% load, output decays to 46 V)		
Output current indication	Alphanumeric LCD on system controller; 4-LED bar graph on rectifier front panel					
Active current sharing	±10 % accuracy at full load					
<b>GENERAL</b>						
System controller <sup>2</sup>	Full status monitoring and communication with a PC, dedicated GUI, USB, RJ45					
Withstand voltage (1 min) <sup>3</sup>	3000Vac input/output, 1500Vac input/ground					
Ambient temp., operation	-10 ~ 70 °C, output derated above 50 °C by 5%/°C					-10 ~ 75 °C <sup>4</sup>
Ambient temp., storage	-20 ~ 80 °C					
Humidity	<95 % non-condensing, equipped with standard PS1UDC+ rack					
EMC	ETSI, EN 300 386 V1.5.1 (2010-05), EN 55022 Class B, EN 61000-4-2/3/4/5/6/11, EN 61000-3-2, EN 61000-3-3					
Safety	IEC 60950					
Dimensions (subrack)	H=44 mm (1U), W=3x146 mm (19"), D=320 (w/o terminals), 360 (with terminals)					
Dimensions (1 module)	H=44 mm (1U), W=146 mm (19"), D=260 mm					H=44, W=146, D=330
Weight (subrack)	Empty subrack (2.6 kg) + 2 modules (2.8 kg) + controller (0.6 kg) = 6.0 kg					10 kg
Weight (1 module)	1.4 kg					2 kg
<b>ELVD</b>						
Max. withstand current	2x70 Adc or 1x120 Adc					

All specifications are typical and subject to change without prior notice.  
 We have additional versions of this products with different power configurations.

## Notes:

1. N=number of modules.
2. The basic system includes a system controller and up to two rectifier modules.
3. Equivalent dc test voltage is applied to overcome Y-capacitors' leakage current to ground. Output is floating (not grounded) during test.
4. Output derated above 50 °C, by 4 % / °C.
5. 48V/66A rectifier is available.



## 19" Subrack Options for the 1UDC+ Power System

### Gamatronic's 2U subrack for the 1UDC+ power system holds 1 shelf.

The 2U subrack fits a standard 19" rack, and includes:

- Dc distribution panel
- 6 load circuit breakers
- Battery circuit breaker
- Choice of 10 A or 30 A breakers, or a mix of both.



Additional available items include:

- The rectifiers and controller modules
- Shelves for the modules
- ELVD

### Gamatronic's 3U subrack for the 1UDC+ power system holds 2 shelves.

The 3U subrack fits a standard 19" rack, and includes:

- Dc distribution panel
- 6 load circuit breakers
- Battery circuit breaker
- Choice of 10 A or 30 A circuit breakers, or a mix of both.



Additional available items include:

- The rectifiers and controller modules
- Shelves for the modules
- ELVD

## DC/AC Modular Inverter

The IPU 1000 employs high-frequency PWM technology and a microprocessor that controls all operations and diagnostics.

### Features

- Up to 30 modules in parallel, up to 30kVA
- Employs high frequency PMW technology
- Microprocessor controls all diagnostics and operation
- Power density (2 kVA in 1U 19" shelf; 1 kVA in 1U 9.5" cabinet)
- Lightweight
- Standalone or parallel operation
- Parallel capability for N+1 redundancy
- High efficiency
- Continuous input DC current
- Optional: bypass (for standalone operation)



## IPU1000 Technical Specifications

Power (kVA)	0.5 kVA	1 kVA
Topology	Dual high frequency conversion	
Control	Dual 8-bit RISC microcontroller	
<b>Input</b>		
Voltage	24 Vdc nominal (21~30 Vdc)	48 Vdc nominal (42~60 Vdc)
Current	21 A (max.)	20 A (max.)
Psophometric noise	<2 mV at full load	
Low voltage shutdown	21 ± 0.5 Vdc	42 ± 0.5 Vdc
<b>Output</b>		
Voltage	220/230 Vac	
Power	500 VA / 300 W	1000 VA / 700 W *
Frequency	50/60 Hz ± 0.1 %	
Synchronization range	45~66 Hz	
Synchronization system	Digital PLL	
Waveform	Pure sine wave	
THD	1.5 % max. for linear load	
	4 % max. for nonlinear load	
Crest factor	3:1 max. for nonlinear load	
Voltage regulation (line & load)	±1 % (static)	
<b>General</b>		
Parallel configuration	Up to 30 units in parallel, active current sharing	
Efficiency (dc-ac)	88 % @ 24 Vdc	90 % @ 48 Vdc
	1500 Vac input-output	
Isolation voltage	1500 Vac output-chassis	
	500 Vdc input-chassis	
Protection	Output over-voltage, output overload & short circuit (inherent by pulse-by-pulse), LVD (low input voltage disconnection), over-temperature	
Display	5 LEDs indicate load level and exceptional conditions	
LED indications	Status, ON, dc low voltage, overload	
Safety	IEC 950 (EN 60950)	
EMC (including shelf)	EN 300-386-2, EN 50082-1, EN 55022	
Audible noise	<50 dbA @1.5 m	
Temperature	-10 ~ +50 °C	-10 ~ +45 °C
Signalization	2 dry contacts (fault indication)	
Dimensions HxWxD (mm)	44 x 243 x 202	
Weight (without shelf)	1.5 kg	

All specifications are typical and subject to change without prior notice.

\* 1000 VA / 1000 W is available.

## STSW Static Switch

Gamatronic STSW static switches provides an instantaneous load transfer from one power source to another, to ensure continuous operation of sensitive and critical electronic equipment. This considerably increases reliability of inverters and UPS systems. Available in single-phase and three-phase models.

### Features

- Automatic static switch increases AC output reliability and overload capability
- Instantaneous load transfer from inverter to bypass and vice versa
- Simple, userfriendly control panel: two control buttons, 7 LED indicators
- Audible alarm sounds when failure or switch to bypass is detected
- Protects load against illegal bypass voltages



## Static Switch Modules

### ATS 19" 1U 16A/1PH

- Backfeed protection
- Unsynchronized transfer
- Total power monitoring by meter, web and SNMP
- Free bundle software
- Automatic transfer switch
- Event alert by email and trap



## STATIC SWITCH SPECIFICATIONS

	Single-phase (220/230 Vac)		Three-phase (3x380/3x400 Vac)
	With backfeed protection	Standard	
Type	Common neutral (neutral line in = neutral line out)		
Model name and Nominal power	STSW1BF-06, 6 kVA	STSW1-10, 10 kVA STSW1-15, 15 kVA	STSW3-10, 10 kVA STSW3-20, 20 kVA STSW3-30, 30 kVA
Input voltage range (phase-neutral, Vac)	187 ~ 242 or 197 ~ 253 (selectable)		
Input frequency range (Hz)	50 ±2, 50 ±4, 60 ±2, 60 ±4 (selectable)		
Transition time in synchronized mode (ms)	<3 ms		
Transition time in non-synchronized mode (ms)	<15 ms		
Indications and communication	6 LEDs, 3 buttons, audible alarm + dry contact relay, RS232 interface		
Efficiency (%)	99.9		
Dimensions (H, W, D, mm)	44 x 480 x 252 (19", 1U)	135 x 480 x 210 (19", 3U)	Customized
Weight (kg)	4	5	up to 15
Connections	Terminals		
Safety	Complies with IEC 950 (EN 60950)		

All specifications are typical and subject to change without prior notice.

# 1UDC+ DC-DC Converters



Experience the power of precision.

The 1UDC dc-to-dc converter module converts a nominal 48 V (42 V to 59 V) or 24 Vdc (21.5 V to 29 V) into a precise 12 or 24 or 48 V output.

Multiple 1UDC modules can also be operated in a parallel, active current sharing configuration for greater output power and to provide N+1 redundancy.

## Features

- Compatible with 1U power supplies
- Accommodates a range of system configurations
- Two voltage converters with different output voltages (48 Vdc or 24 Vdc) can be used
- Controllable via 1UDC controller
- Connect multiple converters in parallel for redundancy and higher output

These dc-dc converter modules convert a nominal 48 V (42 V ~ 59 V) or 24 V (21.5 V – 29 V) into a precise 12 or 24 or 48 V output.

Multiple 1UDC modules can also be operated in a parallel configuration with active current sharing for greater output power and to provide N+1 redundancy.

## DC-DC Converters Technical Specifications

Input-output (Vdc)	48-24	48-12	24-48	24-12
<b>Input</b>				
Voltage range (Vdc)	49 ~ 59		20.5 ~ 29	
Max. current (A)	17	10.5	30	20
Efficiency @ 50 % load (%)	>88		>85	
Protection	input OVP; reversed polarity connection			
Low voltage protection	Stops at Vin < 41 Vdc		Stops at Vin < 20	
Restart operation	Automatic at Vin > 46		Automatic at Vin > 23	
<b>Output</b>				
Voltage (Vdc)	24	12	48	12
Power (W)	600	300	500	300
Current limit (A)	25 A, folds back to 9 A at short circuit	25 A, folds back to 12 A at short circuit	10.5 A, folds back to 5 A at short circuit	25, folds back to 12 A at short circuit
Voltage adjustment (Vdc)	21.5 ~ 26.5	12 ~ 14	44 ~ 54	12 ~ 14
Voltage regulation (%)	±1			
Ripple (mVrms)	50			
Protection	Short circuit, overload, output OVP, over-temperature			
Display	4 LED bar graph displays load level; overload, ON			
Parallel operation	10 % accuracy with active current sharing			
<b>General</b>				
Ambient temperature (°C)	-10 ~ 50			
Humidity (%)	95, non-condensing			
Dimensions (mm)	H = 44, W = 146, D = 260			
Weight (kg)	0.8			
Withstand voltage (Vdc)	Input – output: 1500 Input – chassis: 1500 Output – chassis: 1500			
Cooling	Forced air, fan speed control			
Safety	IEC 950, EN 60950			
EMC	EN 55022, EN 61000-4-2/3/4/5/6/11, EN 61000-3-2, EN 61000-3-3			

All specifications are typical and subject to change without prior notice.  
 Additional voltages and power ranges are available in this family of products.



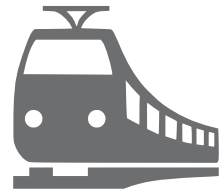
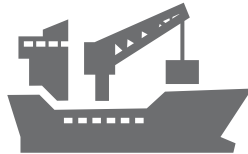
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You can benefit from Gamtronic's wide range of products worldwide. Our representatives in the UK, China, South Africa, Brazil, and Israel will be happy to help you find a solution that will best serve your needs.

## **GAMATRONIC - *Our Power, Your Confidence***



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