PSW-Series Multi-Range DC Power Supply 250V & 800V

GW Instek debuts PSW 250V and 800V models after the introduction of the PSW series, making the PSW series, the single-output, multi-range, and programmable switching DC power supply, to become a maximum power of 1080W and a coverage of 15 models including 30V, 80V, 160V, 250V, and 800V rated voltage and 360W, 720W, and 1080W output power. Multi-range operation can flexibly and effectively set voltage and current. Users can arrange three PSW units in parallel the maximum to augment its application range by higher output current.(Max. power in parallel is 3.24KW.) Flexible multi-range operation and parallel combinations fully satisfy different power application requirements.

PSW 250V/800V can meet high voltage application requirements for industries and sectors like the battery industry, automobile electronics, LED lighting, capacitive load products and power industry related manufacturers and R&D institutions. 250V and 800V models, same as that of other PSW models, have C.C/C.V priority mode, adjustable slew rate setting and output on/off delay function. The C.C priority mode can be used for DUTs with diode characteristics to prevent DUTs from being damaged by inrush current. The adjustable slew rate function of the PSW series allows users to set rise time (from low electric potential to high electric potential) and fall time (from high electric potential to low electric potential) for output voltage or output current. When voltage or current level is changed, the adjustable slew rate can be applied to verify DUT's characteristics. For instance, to simulate automobile battery slowly charging and discharging DUT's input terminal, voltage slew rate (0.1V/s) will be used to test incrementally decreasing Vmax to 0V and incrementally increasing 0V to Vmax. The output on/off delay function is to set output delay time. When many PSW units are being used, each unit's on/off delay time can be set independently that can be applied to multi sequence system applications and also can simulate multi sequence power output.

The PSW power supply series has a bleeder control circuit which is in parallel with the output terminal. When power is off or load is disconnected, bleeder resistor will discharge the filter capacitor. In addition, bleeder resistor can be turned on and off through settings. When bleeder circuit is on, the discharge speed of filter capacitor will increase. The PSW series provides OVP and OCP. The preset protective value is 110% of the rated voltage and current. Output will be turned off immediately once the voltage and current is higher than the preset value.

PSW Parallel and Series Operation Arrangements

PARALLEL OPERATION(3 UNITS)

MODEL	SINGLE UNIT	2 UNITS	3UNITS
PSW 30-36	30V/36A	30V/72A	30V/108A
PSW 30-72	30V/72A	30V/144A	30V/216A
PSW 30-108	30V/108A	30V/216A	30V/324A
PSW 80-13.5	80V/13.5A	80V/27A	80V/40.5A
PSW 80-27	80V/27A	80V/54A	80V/81A
PSW 80-40.5	80V/40.5A	80V/81A	80V/121.5A
PSW 160-7.2	160V/7.2A	160V/14.4A	160V/21.6A
PSW 160-14.4	160V/14.4A	160V/28.8A	160V/43.2A
PSW 160-21.6	160V/21.6A	160V/43.2A	160V/64.8A
PSW 250-4.5	250V / 4.5A	250V / 9A	250V/ 13.5A
PSW 250- 9	250V / 9A	250V/ 18A	250V / 27A
PSW 250- 13.5	250V / 13.5A	250V/ 27A	250V / 40.5A
PSW 800 - 1.44	800V / 1.44A	800V / 2.88A	800V / 4.32A
PSW 800 - 2.88	800V / 2.88A	800V / 5.76A	800V / 8.64A
PSW 800 - 4.32	800V / 4.32A	800V / 8.64A	800V / 12.96A

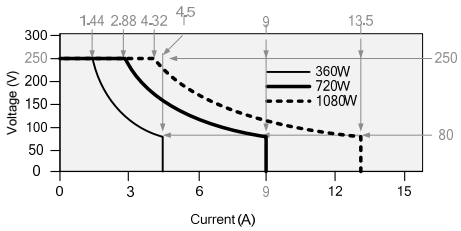
SERIES OPERATION(2 UNITS)

MODEL	SINGLE UNIT	2 UNITS
PSW 30-36	30V/36A	60V/36A
PSW 30-72	30V/72A	60V/72A
PSW 30-108	30V/108A	60V/108A
PSW 80-13.5	80V/13.5A	160V/13.5A
PSW 80-27	80V/27A	160V/27A
PSW 80-40.5	80V/40.5A	160V/40.5A
PSW 160-7.2	160V/7.2A	320V/7.2A
PSW 160-14.4	160V/14.4A	320V/14.4A
PSW 160-21.6	160V/21.6A	320V/21.6A
PSW 250-4.5	250V / 4.5A	N/A
PSW 250- 9	250V / 9A	N/A
PSW 250- 13.5	250V / 13.5A	N/A
PSW 800 - 1.44	800V / 1.44A	N/A
PSW 800 - 2.88	800V / 2.88A	N/A
PSW 800 - 4.32	800V / 4.32A	N/A

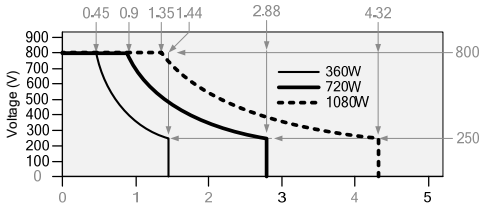
N/A: PSW 250V/800V can not be arranged in series.

Multi-Range Operation

In the comparison with the maximum power output of the conventional power supply that is calculated by the maximum output voltage multiplies by the maximum output current, the PSW series has a unique characteristic of multi-range output (voltage x current). This distinguishing feature, under the same maximum power output range, can output a higher voltage with a smaller current and vice versa. For instance, for a conventional power supply with a maximum power output of 720W, the maximum voltage and current outputs are likely to be 90V and 8A respectively. Comparatively, PSW 250-9, with the maximum power output of 720W, provides voltage and current output ranges of 0~250V and 0~9A. The maximum current of 9A will be provided when the maximum voltage is 80V and the maximum voltage of 250V for current of 2.88A. The following diagrams illustrate the characteristics of PSW output voltage and current.



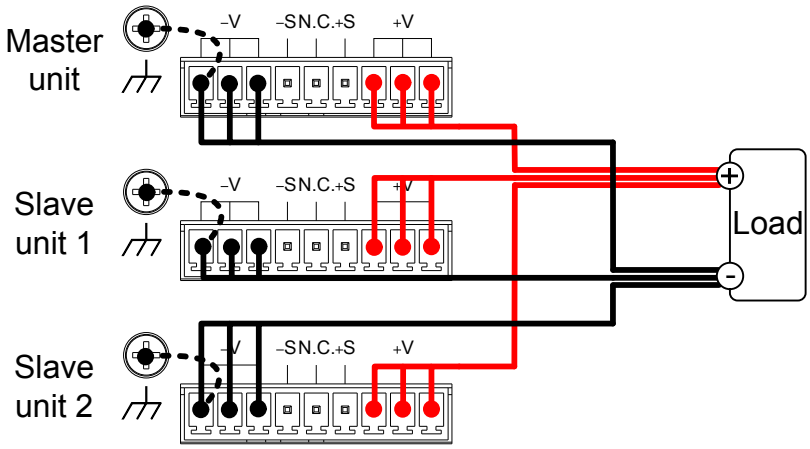
PSW 250V Series Operational Curve



PSW 800V Series Operational Curve

250V/800V Parallel Connections

The PSW 250V/800V Series can be connected in parallel to produce threefold rated current to augment power output capacity (Max. power is 3.24KW). The PSW-Series, with multi-range feature and parallel arrangement, is a high power density and great performance to price ratio instrument.

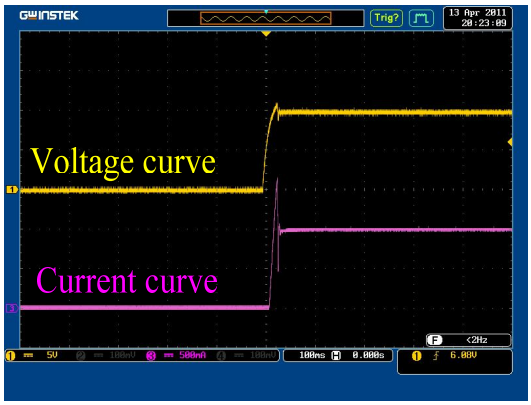


Parallel

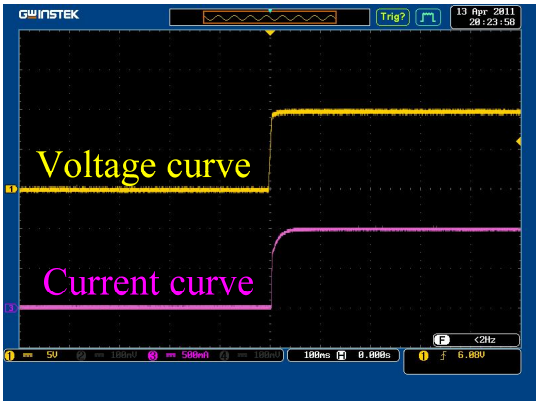
C.V/C.C Priority Selection

The PSW series has C.C and C.V priority mode which sufficiently satisfies market demands. For special application requirements and specific demands, power supply system must be equipped with advanced functions. The C.C. priority mode of the PSW series allows power supply to operate under C.C. mode instead of C.V mode during the transient output so as to effectively protect DUTs. The conventional power supply normally operates under C.V mode when output is turned on that will instantly produce a high inrush current on load with diode characteristics. By using the I-V curve of LED as an example, the conventional power supply can not conduct the related test and measurement operation. Connect LED with power supply under C.V mode and activate output operation. When the voltage exceeds the forward voltage of LED, current will abruptly increase and exceed the preset current limit. Once the inrush current is detected, power supply will convert C.V mode into C.C mode. After the transition, current seems to be more stable. However, the peak current at the crossover of C.C. and C.V is likely to induce damage to DUTs. The C.C. priority mode of the PSW series allows

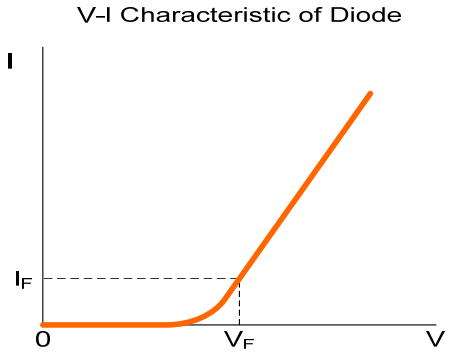
power supply to operate under C.C. mode to avoid peak current during the transient output so as to effectively prevent DUTs from being damaged by inrush current.



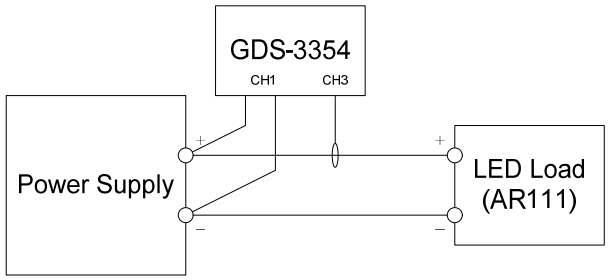
Under the conventional C.V mode, inrush current and surge voltage appeared at forward voltage (Vf) of LED.



Under C.C priority mode, inrush and surge voltage are effectively restrained.



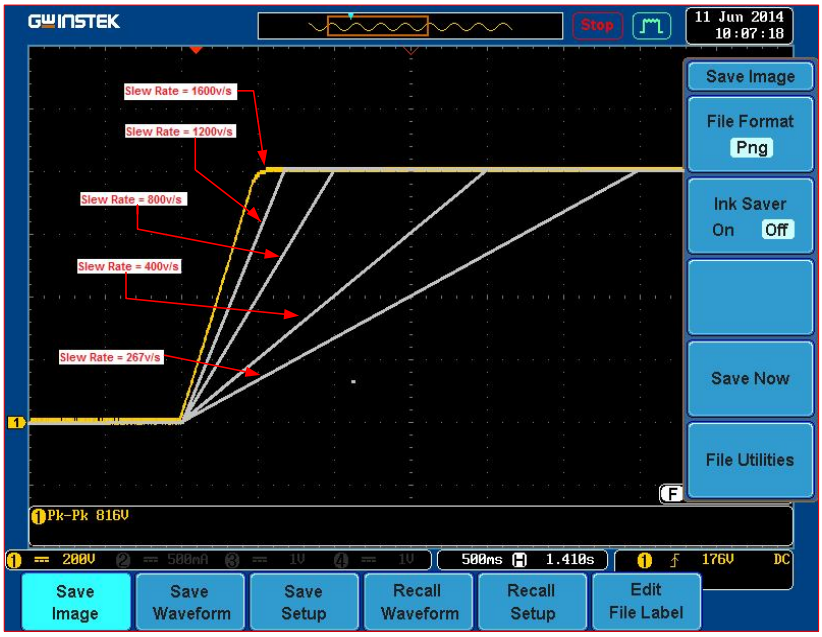
V-I Characteristics for Diode



GDS-3354 digital oscilloscope is used to test LED under C.V priority mode and C.C priority mode respectively.

Adjustable Slew Rate

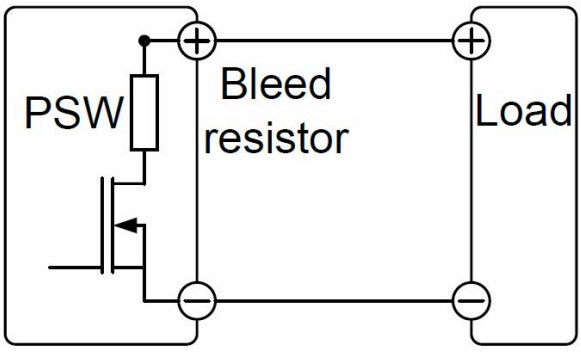
The adjustable current and voltage slew rate of the PSW series, through setting rise time and fall time of voltage and current, allows users to verify DUTs' performance during changing voltage and current process. Additionally, the slew rate regulation mitigates the voltage fluctuation to effectively prevent DUTs from being damaged by inrush current. This function is especially suitable for tests on capacitive load.



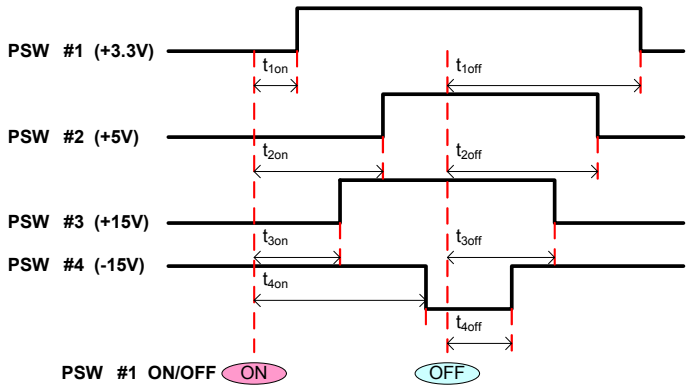
PSW 800-4.32 (slew rate)

Bleeder Control Circuit

The PSW power supply series has a bleeder control circuit which is in parallel with the output terminal. When power is off or load is disconnected, bleeder resistor will discharge the filter capacitor. Without a bleeder resistor, the filter capacitor of power could still be charged with electricity that poses a potential danger. In addition, for ATE system, bleeder resistor allows PSW to bleeder current rapidly so as to prepare itself for the next operation.



Output On/Off Delay



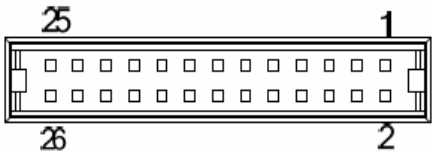
The Example of Output On/Off Delay Control for Multiple PSW Units

The output on/off delay feature enables the setting at a specific time delay for output on after the power supply output is turned on, and a specific time delay for output off after the power supply output is turned off. When multiple PSW units are used, the on/off delay time of each unit can be set respectively referring to fix time points.

External Analog Remote Control Terminal

On the rear panel of the PSW Series power supply, a 26-pin analog control terminal is designed to perform remote control and monitoring functions. External voltage or resistor can be utilized to set output voltage and current. The power supply output on/off control and master power shut-down can also be controlled by using the external switch. The analog control terminal is complied with the Mil 26-pin connector (OMRON XG4 IDC plug) standard.

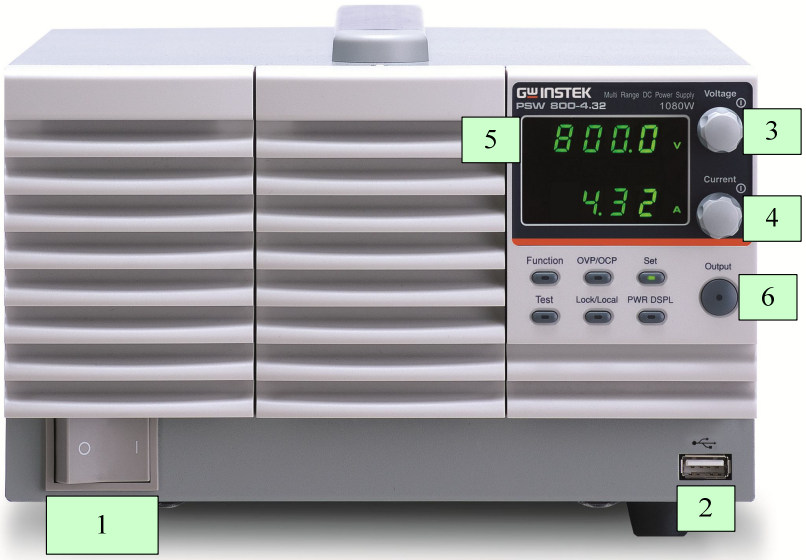
(1) External voltage controls voltage/current output
(2) External resistor controls voltage/current output
(3) External switch controls output
(4) External switch controls master power shut-down
(5) External DMM measures voltage output
(6) External DMM measures current output



Features, Advantages and Customer's Benefits

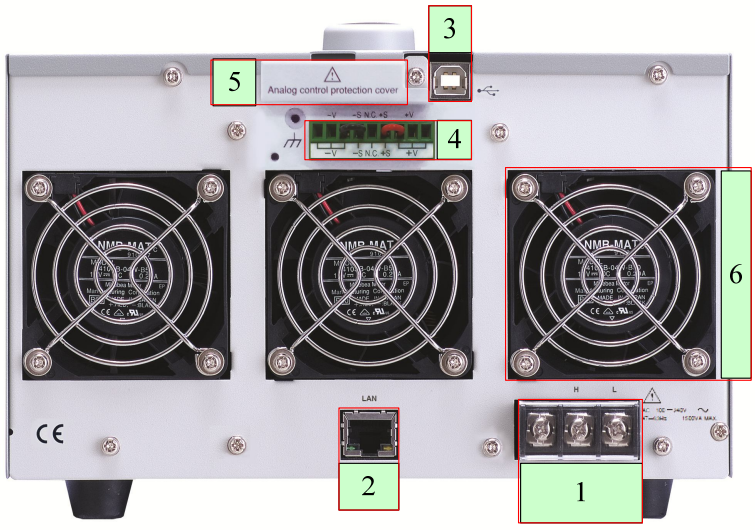
Features	Advantages	Benefits
15 PSW models offer 360/720/1080W and 30/80/160/250/800V output selections.	Broader selection models to meet various output applications and all models are easy-to-use.	Familiar models save cost and time.
Multi-range operation	Provide high voltage and current application range under rated power condition.	Single PSW unit is very flexible for voltage and current output operations.
Adjustable Slew Rate	The rise and fall time of voltage and current are determined by applications.	It is beneficial to customers in testing and analyzing DUT characteristics.
PSW in series(except 250V/800V) or in parallel arrangement.	Provide higher voltage and current output capacity.	Meet high power application requirements.
C.C & C.V priority mode	Intelligent C.C and C.V switch at power on, instead of conventional C.V mode.	Avoid damage done by inrush current under C. V mode.
LAN, USB, external analog remote control terminal and GPIB-USB adaptor are available.	Support multiple communications protocols and connection monitor applications.	Satisfy users in remote operation and automatic control.
Compact sized	It is convenient to carry.	Highly portable, space saver
External analog remote control terminal	Monitor via simple voltage, resistor, and on/off switch.	Easy-to-use operation
Rack installation design meets US EIA and Japan JIS standards.	Dedicated rack for PSW augmentation	PSW system installation meets many countries' standards such as that in the US and Japan.

Front Panel



1 Power switch	3 Voltage knob	5 Display
2 USB A port	4 Current knob	6 Output key

Rear Panel



1 AC input	3 USB B port	5 Analog control connector
2 LAN	4 Output terminals	6 FAN

PSW-Series Product Positioning

1 Features such as high voltage output range, better line regulation, load regulation, wide model selections, better precision, C.C/C.V priority mode, and adjustable slew rate together make the PSW series the great performance to price ratio selection among all other multi-range DC power supplies available in the market today.

2 The multi-range selection and parallel arrangement provide the flexibility of power utilization for industrial applications.

3 The PSW-series can replace the existing PSH-Series and be defined as the advanced version of the PSH series.

Target Markets and Associated Features

1 The adjustable slew rate function can be used to simulate automobile battery slowly charging and discharging DUT's input terminal.

2 The C.C priority mode is ideal for the test and verification of the LED lighting industry and load with diode characteristics.

3. 250V/800V high voltage models can be applied in high voltage requirements such as LED light tube and battery cell pack.

4. 250V/800V models are ideal for semiconductor equipment power supply. For instance, in testing ceramic capacitor and Varistor products, constant voltage and constant temperature reliability tests are required.

Features Comparison

	GW INSTEK	KIKUSUI	Matsusada
	PSW-Series	PAS-Series	RK-Series
Multi Range Output (V & I)	V	X	X
CC/CV Priority	V	X	X
CC/CV slew rate	V	X	X
PF Up to 0.95 (with 120VAC Input)	V	V	X
Series(except 250V/800V) & Parallel Operation	V	V	V
External Analog Control Interface	V	V	V
Multi Interface RS-232	USB/LAN	USB/RS-232/TP-Bus	USB/LAN/RS-232/RS-485

/ USB / LAN(Standard)			
GPIB Interface	**V**	**V**	**V**
Digital Panel Control (with Function Key)	**V**	**V**	**X**
Protection : OPP、OVP、OTP	**V**	**V**	**V**

Key Dates for Product Announcement

1. Distributor Announcement & Demo Unit order and Shipping (July 22, 14')
2. Global Market Announcement & Mass quantity orders fulfillment (Aug 6, 14')

Ordering Information

PSW 250-4.5 (0~250V / 0~4.5A / 360W) Multi-Range DC Power Supply
PSW 250-9 (0~250V / 0~9A / 720W) Multi-Range DC Power Supply
PSW 250-13.5 (0~250V / 0~13.5A / 1080W) Multi-Range DC Power Supply
PSW 800-1.44 (0~800V / 0~1.44A / 360W) Multi-Range DC Power Supply
PSW 800-2.88 (0~800V / 0~2.88A / 720W) Multi-Range DC Power Supply
PSW 8000-4.32 (0~800V / 0~4.32A / 1080W) Multi-Range DC Power Supply

Accessories

User Manual x 1
Power cord (360W/720W)
Power cord (1080W)
High voltage output terminal cover
USB Cable
High voltage output terminal
PSW-008 Basic Accessory Kit: (Air filter x1, Analog control protection dummy x1, Analog control lock level x1)

Optional Accessories

GET-002	Extended terminal
PSW-002	Simple IDC Tool
PSW-003	Contact Removal Tool

PSW-006	Parallel operation cable for 2 units.
PSW-007	Parallel operation cable for 3 units.
GRA-410-J	Rack mount adapter (JIS)
GRA-410-E	Rack mount adapter (EIA)
GTL-130	Test leads: 2 x red, 2 x black
GUG-001	GPIB to USB adapter
GTL-240	USB Cable
57RG-30B00201	Large filter (720W/1080W)

Service Policy

1. **1 year warranty. PSW-Series** Multi-Range DC Power Supply carries a standard warranty for 1 year.
2. **Service Support.** The service instructions in the Service Manual will help distributors repair damage units promptly. The parts-swapping service support is provided by Good Will Instrument to facilitate the repair jobs done at the distributor's site.
3. **Marcom Material and Service Manual Download Through Website**. GoodWill Instrument continues to provide after sales support through its website. The most updated version of service manual and Marcom material of the PSW series will be posted on the distributor zone of GWInstek's website at http://www.gwinstek.com.tw.

Specifications

Model	PSW 250-4.5	PSW 250-9	PSW 250-13.5	PSW 800-1.44	PSW 800-2.88	PSW 800-4.32
OUTPUT RATING						
Voltage	0 ~ 250V	0 ~ 250V	0 ~ 250V	0 ~ 800V	0 ~ 800V	0 ~ 800V
Current	0 ~ 4.5A	0 ~ 9A	0 ~ 13.5A	0 ~ 1.44A	0 ~ 2.88A	0 ~ 4.32A
Power	360W	720W	1080W	360W	720W	1080W
REGULATION (CV)						
Load	**0.05% of rating + 5mV**					
Line	**0.05% of rating + 3mV**					
REGULATION (CC)						
Load	**0.1% of rating + 5mA**					
Line	**0.1% of rating + 5mA**					
RIPPLE & NOISE (Noise Bandwidth 20MHz ; Ripple Bandwidth = 1MHz)						

CV p-p	80mV	100mV	120mV	150mV	200mV	200mV
CV rms	15mV	15mV	15mV	30mV	30mV	30mV
CC rms	10mA	20mA	30mA	5mA	10mA	15mA
Voltage	0.1%+200mV	0.1%+200mV	0.1%+200mV	0.1%+400mV	0.1%+400mV	0.1%+400mV
Current	0.1%+5mA	0.1%+10mA	0.1%+15mA	0.1%+2mA	0.1%+4mA	0.1%+6mA
READBACK ACCURACY						
Voltage	0.1%+200mV	0.1%+200mV	0.1%+200mV	0.1%+400mV	0.1%+400mV	0.1%+400mV
Current	0.1%+5mA	0.1%+10mA	0.1%+15mA	0.1%+2mA	0.1%+4mA	0.1%+6mA
RESPONSE TIME						
Raise Time	100ms	100ms	100ms	150ms	150ms	150ms
Fall Time(Full load)	150ms	150ms	150ms	300ms	300ms	300ms
Fall Time(No load)	1200ms	1200ms	1200ms	2000ms	2000ms	2000ms
Load Transient Recover Time(Load change from 50 to 100%)	2ms	2ms	2ms	2ms	2ms	2ms
PROGRAMMING RESOLUTION (By PC Remote Control Mode)						
Voltage	5mV	5mV	5mV	14mV	14mV	14mV
Current	1mA	1mA	1mA	1mA	1mA	1mA
MEASUREMENT RESOLUTION (By PC Remote Control Mode)						
Voltage	5mV	5mV	5mV	14mV	14mV	14mV
Current	1mA	1mA	1mA	1mA	1mA	1mA
SERIES AND PARALLEL CAPABILITY						
Parallel Operation	Up to 3 units including the master unit					
Series Operation	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**
PPROTECTION FUNCTION						
OVP	10% to 110% of rated output voltage range					
OCP	10% to 110% of rated output current range					
OHP	Activated by elecated internal temperature					
FRONT PANEL DISPLAY ACCURACY						
Voltage	0.1% ± 2 digits	0.1% ± 2 digits	0.1% ± 2 digits	0.1% ± 4 digits	0.1% ± 4 digits	0.1% ± 4 digits
Current	0.1% ± 5 digits	0.1% ± 10 digits	0.1% ± 20 digits	0.1% ± 2 digits	0.1% ± 4 digits	0.1% ± 6 digits
ENVIRONMENT CONDITION						
Operation Temp	0℃ to 50℃					
Storage Temp	—25℃ to 70℃					
Operating Humidity	20% to 85% RH					

GW INSTEK
Simply Reliable

Storage Humidity	90% RH or Less					
TEMP COEFFICIENT(after 30 minutes warm up)						
Voltage	100ppm/℃					
Current	200ppm/℃					
OTHER						
Analog Control	Yes					
Interface	USB/LAN/GPIB(Option)					
FAN	With thermal sensing control					
Power Source	85VAC ~ 265VAC, 50/60Hz, Single phase					
Dimension & Weight	71(W) x 124(H) x 350(D)mm; Approx. 3kg	142.5(W) x 124(H) x 350(D)mm; Approx. 5kg	214(W) x 124(H) x 350(D)mm; Approx. 7kg	71(W) x 124(H) x 350(D)mm; Approx. 3kg	142.5(W) x 124(H) x 350(D)mm; Approx. 5kg	214(W) x 124(H) x 350(D)mm; Approx. 7kg

Specifications subject to change without notice SWC0000DC

Overseas Sales Department

Good Will Instrument Co., Ltd