## **GW INSTEK**

#### POWER SUPPLIES CATALOG



# World-Class Quality and Performance Affordable Price A Wide Range of Selections

Originally known and founded in 1975 as Good Will Instrument, GW Instek is the first professional manufacturer in Taiwan specializing in electrical test and measurement instruments. GW Instek began as a manufacturer of power supplies and quickly expanded into developing high precision electronic test and measurement instruments. After 49 years in the test and measurement industry, GW Instek has grown to become one of the most recognized manufacturers of instruments in the world. Today, GW Instek has more than 300 items ranging from oscilloscopes, spectrum analyzers, signal sources, DC power supplies, AC power sources, digital meters, LCR meters, other specific application meters to video surveillance systems.

Think of the word "innovation" and it's easy to think of R&D, new inventions, faster processing and groundbreaking technologies. At GW Instek, we focus on another type of innovation that is based on flexibility, manageability and efficient performance in real-world test applications. We call this "customer-focused" innovation and we strongly believe in it. By listening to our customers around the world, we are able to anticipate their needs and respond quickly to emerging trends. So when one of our customers introduces an exciting new technology, GW Instek is ready to test it.

Whether our customers are designing products with the ability to change people's lives, educating and training the engineers of tomorrow, or discovering new technologies that solve complex problems, GW Instek can be trusted to perform reliably and accurately in even the most demanding test environments. How can we be sure? We have the numbers to back it up. Actually, we have just one: 40. That's the number of in-house quality and performance verification tests each GW Instek product must pass before it leaves our facilities. This thorough process starts with environmental, safety and durability testing in the product design phase, through to burn-in and shipping tests ahead of final inspection and packing. Furthermore, our two manufacturing facilities in Taiwan and China all adhere to ISO quality and environmental management standards, as well as European CE safety regulations. That's why GW Instek products can be trusted to test.

At GW Instek, quality is reflected not in higher cost, but in greater value. We pride ourselves on the quality, reliability and affordability of our test and measurement instruments. With each of our products often in use for decades, it's not hard to understand the importance of measuring a product's value not by price, but by lifetime cost. This importance is deep-rooted to us; we have consistently produced products with some of the industry's lowest total cost per ownership. Reducing the total cost per ownership of our products allows us to provide exceptional value, reliability and performance with leading service and support over the lifetime of a product. That's why year after year, GW Instek can be trusted to perform reliably.

The industries we serve are as diverse as they are specialized. Our experience and expertise allow us to deliver high-performance test solutions that address the unique requirements of each client. GW Instek provides customized solutions that are backed by reliable products, comprehensive after-sales support, warranty, calibration services, and one of the industry's lowest Total Cost per Ownership.

### **GWINSTEK**

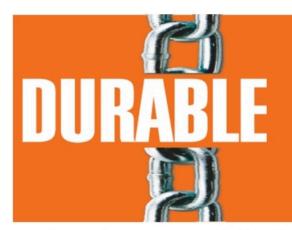
Simply Reliable



## 49 Years of Reputation & Trust

We take prides in creating more than 49 years of satisfied customer experiences throughout the world. Today, GW Instek is considered the most Reliable Brand for professional measurement instruments with supreme quality and the **lowest TCO - Total Cost per Ownership**.

We invite you to be part of GW Instek success story and help perpetuate this value.



## Uncompromised Durability

With an overriding commitment to provide highly durable products, GW Instek is your most **Reliable choice** when it comes to selecting the best measurement instruments with the **lowest TCO - Total Cost per Ownership**. Highly durable products mean long product lifetime capable of reducing operation & maintenance costs. This is definitely what you need to consider before investing.



## Your Most Trustworthy Partner

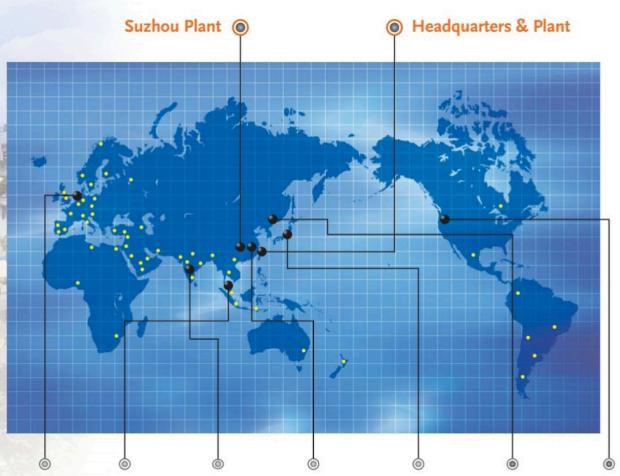
Being your most trustworthy and Reliable Partner, GW Instek promises to proactively provide insightful business solutions and products with the lowest TCO – Total Cost per Ownership, assisting your business to thrive in the highly competitive world. From feasibility evaluation, product selection, solution adaptation to timely after-sales service, we are dedicated to serving each individual customer and making your professional life easier than ever.

1975	Good Will Instrument Co., Ltd was Established as a Power Supply Manufacturer.
1983	The Kaohsiung Branch was Established.
1985	The Taichung Branch was Established.
1989	Good Will Southeast Asia (Malaysia) was Established.
1991	Instek America Corp. was Established.
1993	Taiwan Headquarters was ISO-9002 Certified. Granted the National Small and Medium Enterprise Award. Granted the Industrial Technology Advancement Award of Distinction.
1996	Good Will Southeast Asia (Malaysia) was ISO-9002 Certified.
1998	Taiwan Headquarters was ISO-9001 Certified.
1999	Taiwan Headquarters was ISO-14001 Environmental Management Certified.  Good Will Instrument Co., Ltd. Delivered Initial Public Offer on Taiwan's Over-The-Counter Security Exchange (OTC).
2000	The CNLA Electricity Calibration Laboratory Certification was Granted.  Good Will Instrument was Went Public on the Taiwan Stock Exchange.
2001	Good Will Instrument Suzhou was Established.
2002	Taiwan Headquarters was ISO-9001 : 2000 Certified.
2003	Suzhou Subsidiary was ISO-9001 : 2000 Certified.
2004	Instek Electronics Shanghai was Established.
2005	Global Operational Headquarters was Established in Taiwan.  The Brand new CIS (Corporate Identity System) was Introduced.
2006	Instek Japan Corporation was Established.
2007	Good Will Instrument Korea was Established.
2009	The Group Quality Award of Business Excellence Performance Model from the Chinese Society for Quality was Granted.
2010	Marketing office was set up in India.
2011	GW Instek won Taiwan Excellence Award for GDS-1000-U Series, AFG-3000 Series, PEL-2000 Series and GDM-8261.
2012	GW Instek won Technology Innovation Award for GDS-3000 Series and GSP-930.  Acquired Japan TEXIO Technology Corporation.
2013	Instek Digital was Merged to Become a Member of GW Instek Business Group.  GW Instek Cooperated with Hitachi and EMIC to Establish GW Alliance in Suzhou, China.  GW Instek won Technology Innovation Award for PPH-1503 and AFG-2225.
2014	GW Instek won Technology Innovation Award (Gold) for GDS-300 full Touch Screen Oscilloscope.  European Subsidiary was Established in the Netherlands.
2015	GW Instek won Taiwan Excellence Award for GDS-300/200 Series and PEL-3000 Series.
2016	GW Instek won Taiwan Excellence Award for GDS-2000E Series and GSP-9330.
2017	GW Instek won Taiwan Excellence Award for C-1100 and GPM-8213.
2018	GW Instek won Taiwan Excellence Award for C-1200 and GDM-906X Series.
2019	GW Instek INDIA LLP was Established.
	GW Instek won Taiwan Excellence Award for GPT-12000 Series and SKTS-5000.
2020	GW Instek won Taiwan Excellence Award for C-3200 and GPM-8310.
2021	GW Instek won Taiwan Excellence Award for GDS-30 <mark>00A Series, PPX-Series, GPP-3</mark> 060/6030 and GSM-20H10 and GPM-8310.









Europe Subsidiary

Malaysia Subsidiary

India Subsidiary

China Subsidiary

Japan Subsidiary

**Korea Subsidiary** 

U.S.A. Subsidiary















#### Comprehensive Electronic Measurement Solutions

Becoming the highest customer value TMI products and services provider in the global market is the vision of GW Instek and this vision, in the meantime, has always been the managerial objective ever since the establishment of the company. Over the span of 44 years' continuous refinement and progression, GW Instek began as a manufacturer of the earliest models of analog power supplies and has rapidly expanded to provide users of nowadays with more than 300 products consisting of 500 MHz Digital Oscilloscope, High-Power D.C. Power Supplies, High-Power D.C. Electronic Loads, 3 GHz Spectrum Analyzer, 80 MHz /25 MHz Arbitrary Waveform Generator, Programmable D.C. Power Supplies, A.C.(D.C.) Power Source, 6 1/2 Digit Dual Measurement Multi-Meter, 10 MHz High Frequency LCR Meter, and All-in-one electronic Safety Testers, etc. so as to not only fully satisfy users' demands in the process of product development, verification, production, test and quality assurance, but also meet comprehensive and complete equipment requirements for a wide extent of tests, including military industry and scientific research.

Manufacturers of various industrial electronic and consumer electronic products are seeking ways to reduce production costs down in order to keep up with the market competitiveness while facing the dramatic changes of the global electronic industry. The design of the new generation programmable switching power supply satisfies the recharging test applications for high power batteries. The built-in Sink Current Circuit not only effectively expedites the voltage fall time during output off mode, but also prevents reverse voltage from happening so as to effectively protect the power supply. Reverse voltage occurs when external voltage is higher than the internal voltage of the power supply once the external unit is fully charged. The new generation Programmable Switching D.C. Power Supply adopts Interleaved PFC (Power Factor Correction Circuit) and DC/DC module circuit to effectively reduce high frequency ripples during output on and to meet the requirements of low ripple applications.

In recent years, we have successfully constructed power measurement functions on Digital Storage Oscilloscopes. Via the combination of Power Management App and internal measurement hardware module, we have simplified the required power measurement equipment. With respect to AC/DC Power Source products, we have met the international regulation (Energy Star) for low standby mode power consumption measurement requirements. To meet the requirements of all-in-one equipment, we have combined A.C. power source with power meter measurement functions. All-in-one equipment provides convenience for measurement and system integration, and most importantly, it strengthens the market competitiveness and dramatically enhances functionality. In the future, we will devote our efforts to strengthening single instrument's performance, including A. user interface; B. measurement items; C. measurement accuracy; and D. measurement speed to meet the recent industrial requirements from power supply manufacturing, automotive electronics, and green energy industry.

More than a simple instrument provider, GW Intek, with scores of practically appplied experiences in instruments, is now offering this specific catalog for power supplies to betterly provide users with a conceptaully systematic combination, further assisting our customers acheiving the purposes of both products applications and measurements.

**Uncompromised Durability** with Highest Quality Standard

#### **Editing and Synthesis of Power Supply Output Waveform**

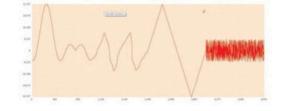
In the development and verification process of electronic products, signal generators are often utilized to generate test signals or simulate signals for testing and specification/ function verification of the designed electronic circuit. Common test signals include Sine, Square, Triangle, Ramp, Pulse, Noise, Burst waveform and communications modulation waveform etc. Signal generators provide a variety of test waveforms that can meet a variety of applications, however, signal generators generally only provide 10Vp-p signal output, which cannot meet the requirement of the test signals for high-voltage outputs. Using a signal generator with a GW Instek ASR series power source can provide high-voltage output test signals.

Select AC power output mode (AC-INT Mode) or AC/DC power output mode (AC+DC-INT Mode) of ASR-Series to set AC power output or AC&DC power output; select External AC signal source mode (AC-EXT Mode) or External AC/DC signal source mode (AC+DC-EXT Mode) to use the ASR series as an amplifier, which can directly amplify and output external input signals by the ASR series; select External AC signal superimposition mode (AC-ADD Mode) or External AC/DC signal superimposition mode (AC+DC-ADD Mode) to superimpose and output the external input signals and the voltage signals set by the ASR series. Signal generator+ASR-3000 provides a maximum signal output of 400Vrms/±570Vdc/999.9Hz, and signal generator+ASR-2000 provides a maximum signal output of 350Vrms/±500Vdc/999.9Hz.

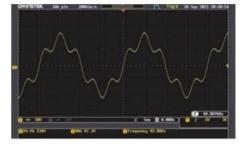
In addition, the editing and synthesis of power waveforms can also be realized via the PC Software provided by the ASR series. PC Software's built-in Arbitrary Waveform Function (ARB) editing function can directly save the edited test waveforms to a USB flash drive and upload it to the ASR series or directly transmit them to the ASR series through a communications interface (USB, LAN, RS-232 or GPIB) for the output to the DUT. The ARB editing screen has a canvas with a horizontal axis of 4096 points (0–4095) and a vertical axis of 16bits resolution (-32767 ~ +32767) for users to edit user-defined arbitrary waveforms. Editing methods include 1) Draw hand-drawn pen mode; 2) Line straight line mode; 3) Insert function mode Sine, Square, Triangle, Exponential Rise, Exponential Fall, Noise, DC and Harmonic Synthesizer; 4) Oscilloscope directly imports waveforms (GDS-3000 only); 5) Mathematical synthesis waveform modes: Add, Subtract, Multiply. The examples in the figures below are i). Sine waveform mathematically synthesized 1/4 amplitude & 5 times frequency Sine waveform; ii) Sinc waveform starting from 90 degrees and lasting 1024 points to connect with two cycles of hand-drawn waveforms; connect the Triangle waveform starting from 0 degree and last for 1024 points; and finally connect the Noise waveform.



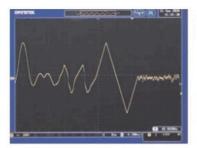
Sine+(1/4 Amplitude& 5 Times feq.) Sine Waveform



Sinc+Draw+Triangle+Noise Waveform



Shown on Oscilloscope



Shown on Oscilloscope

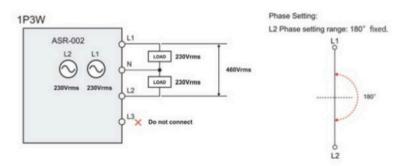
#### Single-phase AC Power Source and Applications of Three-phase System

AC power is a power supply whose voltage amplitude and current direction change periodically. AC power is often used as a source of household power and industrial power. AC power is mainly divided into single-phase and three-phase power supplies. Single-phase power includes a live wire and a neutral wire. In most cases, household power and general commercial power are provided by single-phase power, since single-phase power has the advantages of simple wiring and low design cost. Three-phase power includes three live wires and a neutral wire. The three live wires have same frequency, same voltage amplitude and the phase difference of 120 degrees. The advantages of the three-phase power are small power loss, better power output efficiency, stable current, and operating under a larger power load, therefore, three-phase power is often utilized in industries, power grids, and places with large power load requirements.

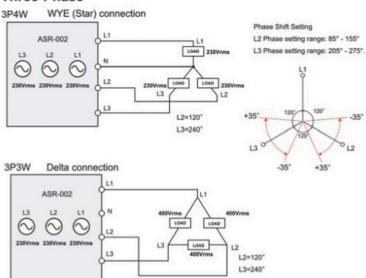
GW Instek ASR-2000/3000 Series are a single-phase AC+DC Power Source. ASR-3000 Series provides a maximum power output of 4kVA/400Vrms/±570Vdc, which not only outputs AC sine wave, square wave, triangle wave, but also allows users to edit 16 sets of arbitrary waveforms. Furthermore, the powerful ASR-2000/3000 Series AC power source can measure Vrms, Vavg, Vpeak, Irms, Iavg, Ipeak, IpkH, P, S, Q, PF, CF, Voltage Harmonic and Current Harmonic, and set the start /stop phase of the output waveform to generate sequential AC and DC power output.

ASR-2000/3000 Series have an option of ASR-002 three-phase power controller to achieve voltage multiplication and meet the output requirements of 1P3W, 3P3W, and 3P4W power output. Users use a computer to communicate with ASR-002 and ASR-002 synchronously controls signals so as to control the output amplitude, frequency and phase angle of three ASR-2000/3000 Series to provide a three-phase power output. ASR-2000/3000+ASR-002 is a practical single-phase three-phase AC output solution.

\*Functions of ASR-Series are limited when ASR-Series applied to ASR-002. Please refer to ASR-2000/3000 for detailed information.



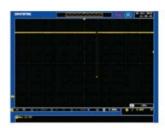
#### Three-Phase



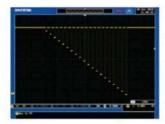
#### ISO-16750-2 Pretest with ASR-2000 Series

The applications of electronic technology products are growing at a fast pace in our daily lives. Other than mobile phones, tablet computers or general consumer electronics, electronic technology products are also utilized in the automotive industry, including LED headlights / taillights, HUD (Head Up Display), adaptive front lighting, tire pressure monitoring system, ABS system, GPS, windshield wiper, AV system, etc. In order to ensure the safety of drivers and passengers as well as driving, vehicle manufacturers are required to have a higher product stability and stricter quality control standards for electronic devices installed in the automobile.

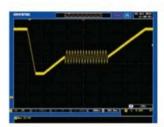
Vehicle driving process is an extremely harsh challenge for electronics manufacturers manufacturing automotive electronics. Rough-road driving, vibration from a piston-engine, electrical systems exposed to low or high temperatures, temporary exposure to unknown chemical mixtures, alternator overvoltage, and momentary drop in supply voltage all may cause the product to malfunction. Therefore, the environmental reliability requirements of automotive electronic products will be more rigorously regulated. At present, the ISO-16750 has been widely adopted and referenced by relevant automotive electronics manufacturers. ISO-16750 contains 5 parts. In addition to ISO-16750-1 General, the rest are ISO-16750-2 Electrical loads, ISO-16750-4 Climate loads, and ISO-16750-5 Chemical loads. The sequence mode of ASR-2000 can arbitrarily edit the voltage test waveform, which is very suitable for generating the verification waveform of ISO-16750-2 Electrical loads.



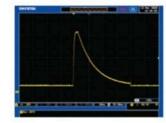
Momentary drop in supply voltage by ASR-2000 Series



Reset behavior at voltage drop by ASR-2000 Series



Starting profile by ASR-2000 Series



Load dump by ASR-2000 Series

#### ASR-2000 for the Applications of ISO-16750-2 Verification Items are as Follows:

#### **Direct Current Supply Voltage**

ASR-2000 Series provides the maximum / minimum supply voltage to verify the DUT of a full range of 12V power supply system and the 24V power supply system.

#### Overvoltage

ASR-2000 Series simulates the occurrence of overvoltage when the generator regulator fails.

#### Superimposed Alternating Voltage

The internal resistance parameter requirements of the power supply is not considered. ASR-2000 Series collocating with a signal generator can simulate power output to have the frequency change from 1 to 999.9Hz.

#### Slow Decrease And Increase of Supply Voltage

ASR-2000 Series sequence mode can simulate the battery being gradually charged and discharged.

#### Momentary Drop in Supply Voltage

Setting ASR-2000 Series power supply voltage to be interrupted instantaneously can simulate the effect caused by the melting of the conventional fuse component in another circuit. ASR-2000 Series can provide a minimum power interruption output of 100us.

#### Reset Behaviour at Voltage Drop

ASR-2000 Series can flexibly set different voltage drop times to test the reset behaviour of the DUT.

#### Starting Profile

The starting profile generated by ASR-2000 Series can verify the characteristics of the DUT during and after the car ignition.

#### Load Dump

Load dump is generated when the battery powering the generator or inductive component is instantaneously disconnected. If the parameter requirements of the input impedance of the power supply are not considered, editing the ASR-2000's Series sequence mode can obtain the waveforms of ISO-16750 test A and test B.

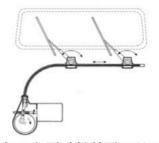
#### Reversed Voltage

ASR-2000 Series reversed output can meet the verification requirements of various automotive electronic products.

#### Vehicle Power Supply Simulation and Windshield Wiper Motor Application

With the popularity of technology and the evolution of electronic products, the electronic components used in today's cars are also becoming more diverse. Power windows, power mirrors, parking sensors, windshield wiper motors, etc., use batteries as a source of power. However, during the running of the vehicle, the supplied power supply is not constant. In order to ensure that the electronic components of the vehicle can still work normally under the condition of power supply fluctuation, the power supply can be used to simulate the abnormal output that may be generated by the battery to perform functional tests on the vehicle electronic products that is conducive to screen out defective components and products during the product testing phase.

Take the windshield wiper motor as an example. The processes of the windshield wiper motor operation generally include: 1 The rotation of the motor drives the back and forth of the windshield wiper. 2 Each time the windshield wiper is stationary, the windshield wiper must stay at the edge of the viewing angle without obstructing the driver's line of sight. 3 When the two windshield wipers are brushed at the same time, there should be no collision. The motor operating voltage range is DC: 10V ~ 15V, and its maximum operating current will be different at low speed or high speed. In order to verify that the varying power supply voltage does not affect the operation of the windshield wiper motor, the DC power supply can be used directly to generate a series of varying power outputs to the windshield wiper motor. The following figure shows the variable power supply for testing the windshield wiper motor. As follows, after a stable DC power supply, an unstable power supply output is provided to the windshield wiper motor and its operation is evaluated.



Schematic Windshield Wiper Motor

**PSW-Series Test Scripts Function** 

The PSW Test Script function can be used to plan a continuous set of voltage changes. Users can edit the output voltage, current and execution time separately. For individual steps, OVP, OCP, voltage rise/fall slope or current rise/fall slope, and constant voltage or constant current priority mode can be set.

By editing the required power change output (eg. 200 cycles) on the Excel table, then loading the Excel table into the PSW stand-alone unit to perform the stand-alone automated execution, users can perform the above power output to verify the operation of the windshield wiper motor by a stand-alone unit.

Step	Point	Output	Time(sec)	Voltage (	Current (	A OVP(V)	OCP(A)	Bleeder	IV Mode	Vsr up(V/	s Vsr down	[Isr up(A/s]	Isr down(AIR(c	ohm)	Beeper	Sense Ave	Jump to	Jump Cnt
1	start	On	7200	13.5		6 MAX	MIN	ON	CVHS	MAX	MAX	MAX	MAX					
2		On	1.5	12		6 MAX	MIN	ON	CVHS	MAX	2	MAX	MAX					
3		On	15	12		4 MAX	MIN	ON	CVHS	MAX	MAX	MAX	MAX					
- 4		On	1.6	15.2		6 MAX	MIN	ON	CVHS	2	MAX 2	MAX	MAX					
- 5		On	45	15.2		6 MAX	MIN	ON	CVHS	MAX	MAX	MAX	MAX					
6		On	1.6	12		6 MAX	MIN	ON	CVHS	MAX	2	MAX	MAX				3	569
7	end	On	1	13.5		6 MAX	MIN	ON	CVHS	MAX	MAX	MAX	MAX				1	199
8																		
9																		
10																		
11																		
12																		

With the Test Script function provided by GW Instek, it is very easy to perform the complex power output control under Excel editing. For users, there is no need to install an additional software, and there is no cumbersome step. Hence, using the PSW to perform complex sequential power outputs is a simple task.



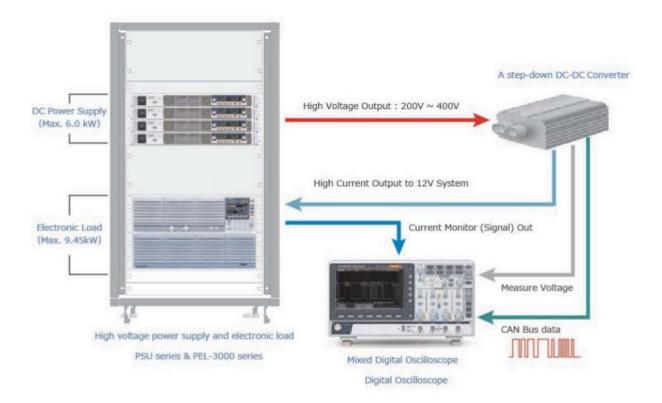
PSW Built-in Resistance Variable Function Simulating Battery Output Resistance and Wire Harness

In addition, for the simulation of the real power supply situation at the factory, PSW can simulate the battery to supply power to the windshield wiper motor and activate PSW's built-in resistance variable function to set the built-in resistance value to simulate the battery output resistance and Wire Harness's resistance. By so doing, PSW can verify the output characteristics of the windshield wiper motor before it is installed in the car.

#### Car DC-DC Converter Effectiveness Evaluation

The output voltage of common electric vehicle batteries is high voltage ranging from 200V to 400V. In order to drive conventional 12V vehicle electronic devices, e.g. instrument panel display, lighting, electronic control unit (ECU), etc., the high-voltage output battery often transforms the high voltage of the battery into a 12V output through the step-down DC-DC converter. The step-down DC-DC converter is generally required to provide a stable voltage output, even if its input source cannot be maintained at a stable output. Therefore, the output characteristic test of the step-down DC-DC converter is very important. Generally, a high-voltage power supply can be used to simulate the input of the step-down DC-DC converter, and a large-capacity electronic load can be used to simulate vehicle electronic devices to test the output capability of the step-down DC-DC converter.

The PSU high-voltage model includes a voltage output range from 200V to 400V, and it can achieve a power output of 6KW through parallel connection, which can be used to simulate the battery output of the electric vehicle. The PEL-3955 can simulate the power consumption of a 12V automotive electronic device and output the monitored current to the oscilloscope for observation.

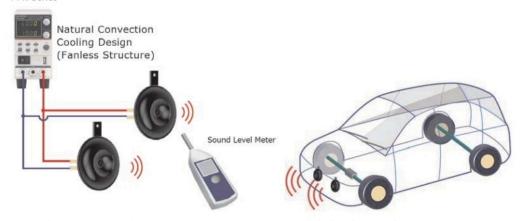


PSU can set the sequential power output to generate a set of varying power outputs to the step-down DC-DC converter to evaluate the Line Regulation characteristics of the step-down DC-DC converter. In addition, setting the PEL-3955 to operate under the Dynamic mode, users can evaluate the transient recovery time and load regulation of the step-down DC-DC converter. According to the load waveform of the vehicle device, users can edit the PEL-3955's sequence function to generate the load waveform so as to verify the output capability of the step-down DC-DC converter.

#### The Reliability Test of Vehicle Horn

Vehicle Horn is often used in transportation such as cars, motorcycles, trucks, buses, trains, etc. During the travel of the vehicle, the Vehicle Horn can sound to warn other vehicles or draw attention to avoid danger. If the sound intensity of the Vehicle Horn is to be measured during the burn-in test, the fanless PFR series power supply best meets such test requirements. The PFR series fanless design structure can quietly output power to the Vehicle Horn and the sequential output power function Test Script allows users to edit the burn-in test process.

#### **PFR-Series**



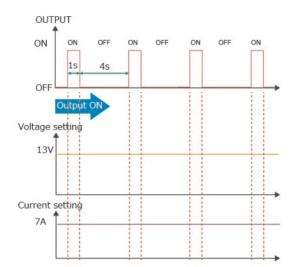
A Sound Measurement of the Vehicle Horn

A Car Equipped Vehicle Horn

#### Edited Test Script to PFR for Burn-in Test:

	A	В	С	D	E	F		Voltage: 13.0V	
1	memo H	lone test						Current : 7.0A	
2	DisplayItem V	T							
}	CycleItems N	Number	Start Step	End step				Cycle : 50,000	
1	Cycle	50000	2	3			N.		
5	Step P	Point	Output	Time(sec)	Voltage(V)	CurrentA)			
5	1 S	Start	Off	0.5	0				
7	2		On	1	13			8. <del>7</del>	
8	3		Off	4	13		7		
9	4 E	End	Off	0.5	0		7		
10									

#### PFR Output Waveform for Burn-in Test:



#### **LED Test Application**

The light-emitting diode is a special diode. Its main structure is the same as that of a common diode. It is composed of a P-type and N-type semiconductor. It uses the different characteristics of the forward bias and reverse bias of the P-N junction to turn on or off. The voltage-current output relationship when applying a forward bias to a light-emitting diode (see Fig. 1.). When the applied forward bias is greater than the Vf value, the diode begins to emit light, and the luminosity of the LED is directly related to the magnitude of the driving current. The larger the current value, the stronger the illuminance. If the current value is too large and exceeds the rated current value, the LED will have permanent damage.

In the actual test process of the LED, the conventional power supply output is usually under the CV mode. When the forward bias voltage is greater than the Vf value of the LED, the LED may be given a surge current due to the instantaneous conduction. If this surge current exceeds the rated maximum current value, it may cause permanent damage to the LED.

The CC priority mode function designed by GW Instek on the power supplies allows the output of the power supply to run under the CC mode preferentially to avoid the surge current and prevent the LED from being damaged by the surge current during the LED test.

Note: PFR series, PLR series, PSW series, PSU series, PSB-1000 series support the CC priority mode function.

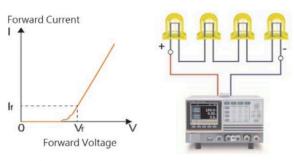
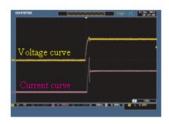
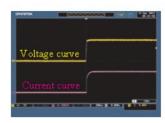


Fig. 1.: V-I Characteristic Chart

Illustrations of PSB-1000 Connecting to LEDs



Under the Conventional C.V Mode, Inrush Current and Surge Voltage Appeared at Forward Voltage (Vf) of LED



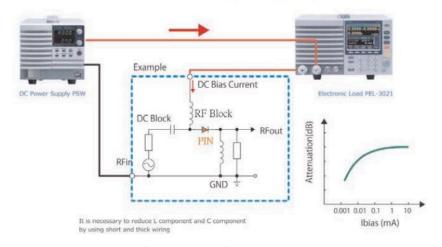
Under C.C Priority Mode, Inrush and Surge Voltage are Effectively Restrained

#### Precise Control RF Attenuator with PEL-3021

PSW+PEL-3000 can form a low-cost, high-accuracy, high-resolution current output controller. Typical RF Attenuators often use PIN diodes as microwave switches and microwave attenuators. In high frequency applications, providing a PIN diode forward bias or reverse bias can control whether the high frequency signal RFin can be output to RFout.

As shown in the figure below, the DC Block component is nearly short-circuited for the high-frequency RFin signal, so the RFin signal can pass directly. The RF Block is nearly open-circuited for the high-frequency RFin signal, so that the RFin signal is output to the RFout via the DC Block and the PIN diode. Precise control of the DC current flowing through the PIN diode allows precise determination of how much RFin signal is attenuated and then be output to RFout.

The PEL-3021 has a high resolution setting of 0.01mA. It can increase the DC control current by the increment of 10uA to observe the relationship between the measurement signal RFin and RFout, and further draw the attenuation curve of the RF Attenuator. The RF Attenuator's automated measurement can automatically increase the load current value using the PEL-3021's Sequence Function and simultaneously trigger the external device to conduct measurement using the Trigger Output function.

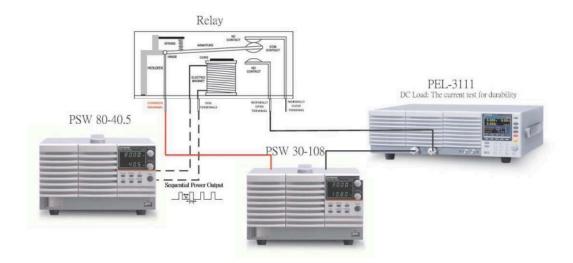


Bias Current vs. Attenuations

#### Reliability Test for Relay Using GW PSW Power Supply and PEL-3111 E. Load

How do you conduct relay connection point (N.O. / N.C.) tests? How do you test the life cycle of relay's connection point (N.O. / N.C.)? How do you evaluate the connection resistance of connection point (N.O. / N.C.) after multiple tests? How do you evaluate the speed for operating connection point (N.O. / N.C.)?

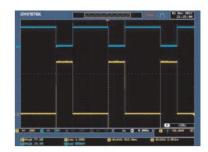
Relay, functioning to produce mechanical on-off movement by receiving electric signal to change electro magnet, is often applied to control other electronic device via receiving electronic signal. Voltage exerted on relay's coil allows current to pass through coil and magnetizes core. Armature is then be pulled by core due to electromagnetic force. Hence, a mechanical on-off movement is produced.



As shown on the top diagram, PSW 30-108, Relay and PEL-3111 are connected by series. PEL-3111 is set to 80A current sink. Each time, Relay's NO-COM is closed, NO-COM is tested for its current reliability. In the meantime, PSW 80-40.5 is utilized to output sequential power supply to produce control signal to control Relay's NO-COM.

One GW Instek PSW 80-40.5 can meet the actual measurement requirements via planning Relay's control signal. It not only controls signal's voltage, current, time and period, but also determines the number of operating cycle. There are totally 20,000 steps and each step can be set from 50ms to 20 days. The number of cycle can reach 1 billion or infinite by different specifications. Relay's control signal can only verify the mechanical characteristics of NO-COM and NC-COM. For further electric characteristic verification of NO-COM and NC-COM, PSW 30-108 and PEL-3111 must be concurrently utilized to produce C.C. output. Based upon Relay's specifications, the combined application of two instruments can conduct fast current switching test and provide large current verification, including current withstanding value and current withstanding time so as to ensure Relay's quality.

#### Waveforms Measured



Ch1: Current Waveform



Ch2: Voltage Waveform for Relay 80A for 1s and 0A for 2s

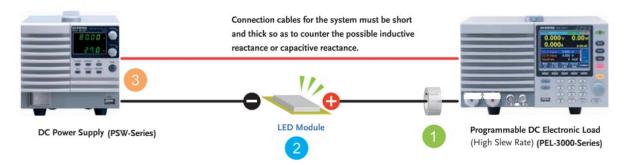
#### Note:

NO: The NO pin is open to com pin in general unless the power provides to the coil. So it calls Normally Open Terminal of Relay. NC: The NC pin is short to com pin in general unless the power provides to the coil. So it calls Normally Closed Terminal of Relay. NO-COM: Its a connection status between NO pin and COM pin. It is short when power provides the coil; otherwise, it keeps open.

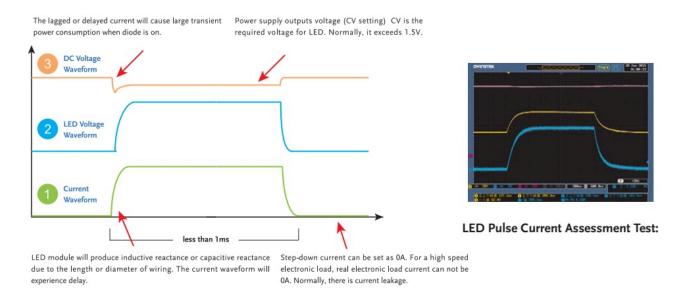
#### **LED Pulse Current Assessment Test**

Electronic load simulates actual loads by drawing current. The drawn current is called load current for power supply that can be used to test the characteristics of power supply or battery. By placing an electronic load in series with a power supply and a load (such as LED Module) and by setting different constant current conditions on the electronic load, the electronic load can draw different current targets from the system loop. The PEL-3000 series features the fast slew rate and the sequence function to simulate real and fast load changes.

The following diagram illustrates a pulse current test system composed of a programmable DC electronic load and a DC power supply to conduct tests on LED illumination characteristics.



Programmable DC electronic loads, after settings, simulate DUT's pulse current (fast load changes) capability by drawing large and small current. Electronic loads produce pulse current and collocate with the sequence function to execute tests on fast or arbitrary waveform current. Oscilloscope monitors voltage waveform changes for LED and current source. Oscilloscope with a current probe can monitor current waveform in real time.



#### Benefits of PEL-3000 Series Applications

#### Construct A Large Pulse Current Source with Lower Costs

Normally, bipolar power is fast in response but it is also very expensive. Therefore, equipment for large pulse current is expensive. The feature of fast switching of electronic load can be used to construct pulse current source with lower costs.

#### Rating Current Requires Only 1.5V Input Voltage

Power supply outputs voltage - the required voltage of LED is approximately 1.5V, which requires only 1.5V peak value. PEL-3021(175W) can satisfy 35A pulse current requirement with 1.5V voltage input.

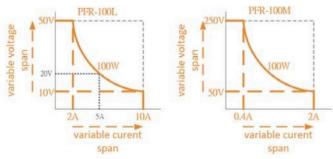
#### For Constant Current Usages and Multiple DUT Applications

Constant current source can be used on changing characteristics for diode device of LED, surface processing (electroplating), pulse charging of rechargeable battery, burn-out of various fuses, and current sensor applications.

#### The Benefits That PFR-100 Power Supply Can Provide in Burn-in Test

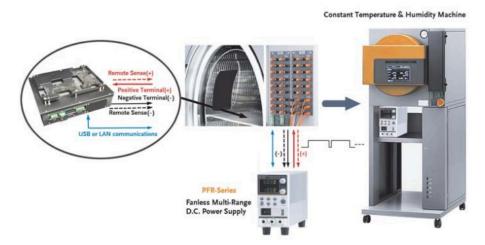
Burin-in is one of many common methods manufacturers utilize to sort out defective components and products during the testing process of the electronic products. Burn-in test is normally conducted in the factory before shipment and after products are completely assembled. Burn-in process helps manufacturers sieve out defective components so as to prevent defective products from being sold to customers. Burn-in test requires additional space for power supplies and its power consumption for a long period of time will increase energy demand and electric bill. Burn-in test is a tremendous cost challenge to all manufacturers in terms of space, electric power and man power. To tackle this cost challenge, GW Instek PFR series can easily assist manufacturers in solving all difficult problems.

- \* With respect to space, the PFR series provides better space flexibility in the limited test area by its 3U height (H:124/W:70/D:300 mm) and as light as a total weight of 2.5kg.
- \* Pertaining to power saving, the PFR series, a high-efficiency power conversion power supply, adopts high-efficiency PWM design comparing with low-efficiency linear power supplies. Hence, the PFR series is capable of saving electricity during long-time burn-in test. Compared the same 100W output power supplies, the PFR series requires 143W of input power, while the linear power supplies with 0.5 efficiency require 200W of input power. After a full year of burn-in test, the PFR series will consume 1235 kWh and the linear power supplies will consume 1728kWh. For three years of burn-in test, the PFR series only consumes 3703kWh and linear power supplies consume 5184kWh.
- \* The PFR series is a five-fold multi-range power supply, which allows users to arbitrarily adjust voltage and current within the rated power. This function allows users to adjust the voltage and current settings according to the maximum output power. Compared with the conventional 100W power supplies with maximum output 20V/5A, the 100W PFR-100L provides a maximum output of 50V@2A or 10V@10A, and the PFR-100M provides an output of up to 250V@0.4A or 50V@2A.



Voltage/Current Operating Area

- \* In terms of personnel operation, the Test Script function of PFR series edits sequential power outputs based upon customer's burn-in test process and executes automatically during the burn-in procedures. Additionally, the built-in USB, RS- 232/485 communications of the PFR series allow testing personnel to remotely control or execute self-defined programs to realize automated tests and reduce manpower investment during burn-in process.
- \* For power supplies connected to the inside of the Chamber, the phenomenon of voltage drop is often happened due to the long wiring. The PFR series provides the Remote Sense function to compensate the voltage drop so as to ensure an accurate voltage output to the DUT. The operator does not need to adjust voltage for voltage drop.
- \* Conventional power supplies produce fan noise while in operation. Power supplies with fan design will absorb dust in the fan filter during long-term operation. The accumulated dust may affect the air circulation inside the power supply. Poor air circulation inside the power supply will cause the internal components of the power supply to function under a high-temperature environment. The components that work in the high-temperature environment for a long time will shorten the life cycle of the power supply. The fanless PFR series without fan noise is suitable for a quiet working environment, furthermore, fanless design is ideal for clean and quiet test environment (e.g. clean room). The fanless PFR series can prolong its life cycle during burn-in test.



Schematic Diagram for Burn-in Test

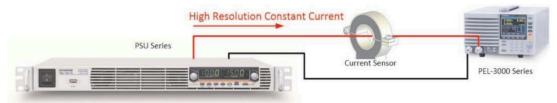
#### Best-fitting Electronic Load for Your Test (Single Channel or Multiple Channels?)

Electronic loads are often simulated as the characteristics (constant resistance, constant voltage or constant current) of the DUTs to test whether the output capability of the battery, power supply, solar cell, or power supply unit meets user's requirements. Unlike using general resistive components to test batteries and power supplies, electronic loads can dynamically switch simulated resistors, voltages or currents, customize the rise and fall times of current sink, and even edit a complex and continuous load change.

#### THE BASIC APPLICATIONS OF THE SINGLE-CHANNEL DC ELECTRONIC LOAD PEL-3000 SERIES

#### **Current Sensor Evaluation**

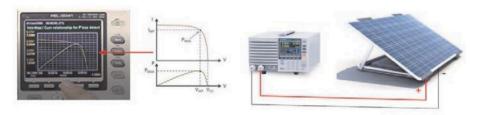
The PEL-3000 series provides three current levels: high, medium and low. The minimum current resolution of 0.01 mA can be selected based upon the test requirements. If a PEL-3000 collocating with a DC power supply, a high-precision constant current power supply can be formed to evaluate the current sensor.



**Current Sensor Evaluation** 

#### Solar Panel I-V Curve Display & MPPT Measurement

The MPPT Function can be done by the PEL-3000 series to simulate the operating current of the solar panel ranging from zero to the maximum current value, and at the same time measuring the output voltage and power of the solar panel to obtain the solar panel output voltage/current/power curve. The MPPT Function of the PEL-3000 series not only provides users with the Pmax, Vmp, Imp, Isc, Voc values of the solar panel, but also tracks the maximum power point of the solar panel in different shade conditions.



I-V Curve of The Solar Panel

Connections Between PEL-3041 and Solar Panel



Measurements for MPPT

#### Remark:

Pmax→ Maximum Power Point V<sub>MP</sub>→ Voltage at Maximum Power I<sub>MP</sub>→ Current at maximum power Voc→ Open Circuit Voltage

Isc→ Short Circuit Current

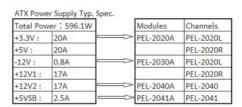
#### Best-fitting Electronic Load for Your Test (Single Channel or Multiple Channels?)

If users need to measure multiple sets of batteries or power supply units at a time, or evaluate multi-channel power output in the circuit, the multi-channel DC electronic load PEL-2000A will be the best measurement solution. PEL-2000A can evaluate the simultaneous power output capability of multiple power supplies, or test the output current of multiple power supplies by sequentially loading each output current according to the time interval defined by each output.

#### THE BASIC APPLICATIONS OF THE MULTI-CHANNEL DC ELECTRONIC LOAD PEL-2000A SERIES

#### The Output Test of PC Power Supply

Power supply output devices with small-power, multi-group and different specifications such as the ATX power supply for PCs can use PEL-2000A to evaluate the synchronous power output of multiple power supplies. A typical ATX power supply has 6 outputs. In order to ensure that the ATX power supply can provide sufficient power output when the 6 channels output simultaneously, the PEL-2000A can perform dynamic mode and load regulation tests on six outputs at the same time, or users can edit the Program mode to customize the severe test conditions to automatically determine the Pass or Fail of the ATX

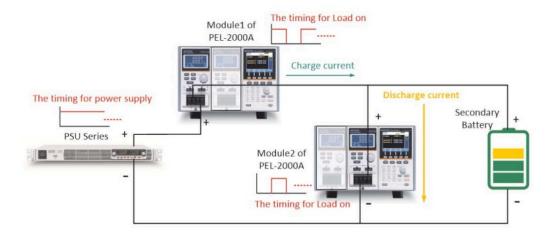




Test Diagram for ATX Power Supply

#### **Battery Evaluation Test**

Automated testing of high-speed battery charge and high-speed discharge can be achieved by using the PEL-2000A electronic load module in series and parallel with the power supply. The automated switching operation between the module and the module of the PEL-2000A can greatly shorten the test time and increase the reliability during the measurement process while comparing with the manual operation.



Automated Charge/ Discharge Test with PEL-2000A

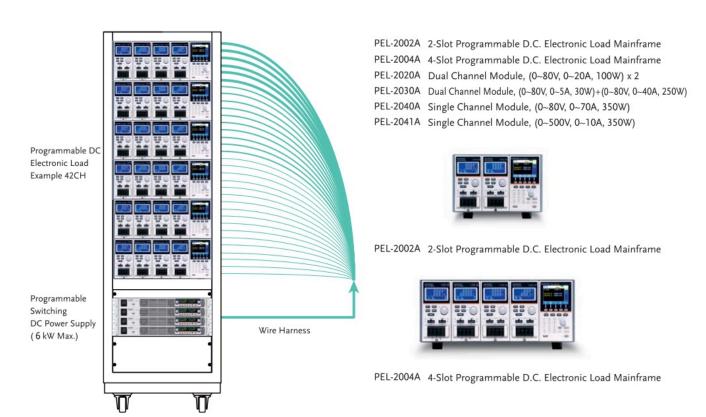
#### **Automotive Wire Harness Performance Test System**

#### Automotive Wire Harness Uses Multi-Channel and Continuous Power Supply Test System

Electric wire, installed in the automobile, plays an important role in supplying power and transmitting signals. The importance of electric wire has increased in the wake of the evolution of automotive electronization. For safe and comfortable driving, the reliability test for automotive wire harness is essential. The multi-channel test system, composed of a DC electronic load and a large current power supply, saves time in testing each wire harness and saves space for placing test instruments.

DC power supply and DC electronic load can be rack mounted by customers' electric power wiring test requirements. The following diagram shows many units of PEL-2000A series were used for providing power to multi-channel automotive wire harness in a long period of time.

The PEL-2000A series saves system rack space and costs. The series can flexibly arrange the required number of channels according to the actual requirements of DUTs. The series can also simulate many automotive devices to conduct continuous tests.



The PEL-2000A series saves system rack space and costs. The PEL-2000A series programmable DC electronic load, via USB or GPIB, can conduct independent control over multiple channels. By using custom-made monitor software, the series can simultaneously control many independent channels.

Test terminal and rack can be custom made. Users' test wire harness required terminal can be jointly mounted on a rack.

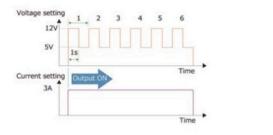
#### **Test Script Applications-Solving Complex Test Patterns**

The uniqueness of GW Instek Test Script function is to streamline test operator's complex measurement work by directly planning a set of changing voltage and current parameters via Microsoft Excel and uploading the edited Excel file to GW Instek power supplies so as to execute sequential power outputs. The following four test applications with different test patterns were easily executed by GW Instek Test Script function without software programming.

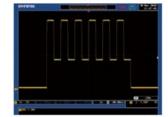
Test Script allows users to run repetitive cycle tests by setting parameters including output voltage, current, time, cycle, OVP, OCP, Bleeder, etc. Four GW Instek Power supplies support Test Script, including PFR, PSU, PSB, and PSW.



#### Parrern 1: Pulse output







Waveform Measurement

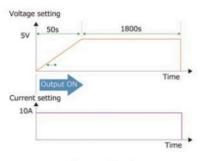
Settings: Set and execute a pattern that switches 12V/1sec to 5V/1sec for 6 times with the current setting of 3A.

#### Test Script Setting:

28	CycleItem	Number	Start Step	End Step							
	Cycle										
	2										
	Step	Point	Output	Time(sec)	Voltage (V	Current (A	Beeper	Sense Aver	Jump to	Jump Cnt	Trig
	1	Start	On	0.5	0	0					
	2		On	1	12	3	On				
	3		On	1	5	3			2	5	
	4	end	On	1	0	. 0					

#### **Test Script Applications - Solving Complex Test Patterns**

#### Parrern 2: Aging test with a controlled rise time



**Pattern Setting** 

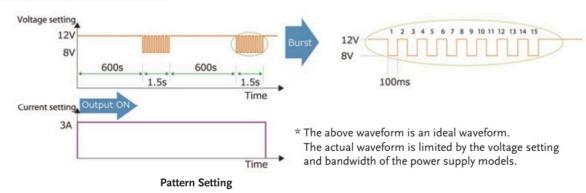
Waveform Measurement

The output voltage rises from 0V to 5V in 50 seconds at current setting of 10A and maintains the settings for 30 minutes and then output is turned off automatically.

#### **Test Script Setting:**



#### Parrern 3: Add burst noise



Burst signals are applied in the middle of the constant voltage output. For example, a continuous voltage output generates a burst noise that fluctuates between 12V and 8V. Each burst signal is 100ms and the burst signals last 1.5s that appears after every 10 minutes (600 s) of constant 12V output.

#### **Test Script Setting:**

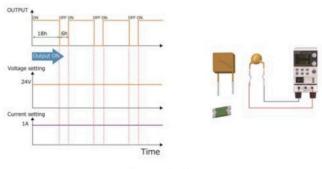


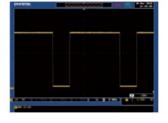


Waveform Measurement

#### **Test Script Applications - Solving Complex Test Patterns**

#### Parrern 4: Lifetime test



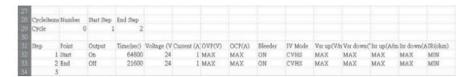


**Pattern Setting** 

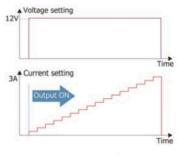
Waveform Measurement

For durability tests such as lights, heaters, etc., pattern that repeats for 18-hour output on and 6-hour output off for 100 days is as follows.

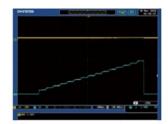
#### **Test Script Setting:**



#### Parrern 5: PPTC device (Resettable fuse) test



**Pattern Setting** 



Waveform Measurement

A test example of self-resetting PTC verifies its open circuit characteristic by increasing current from 0 to 3A with 16-step resolutions. Test Script can easily execute a series of different currents under a constant voltage setting to test the blown and reset characteristic of a self-resetting PTC.

#### **Test Script Setting:**

	ema Number	Start Step	End Step												
Cycle		1 1	16												
Step	Point	Output	Time(sec)	Voltage (V	Current (A)	OVP(V)	OCP(A)	Bleeder	IV Mode	Var up(V	'n Vsr down(	'Isr up(A/m	Isr down(A	IR(ohm)	Beep
	1 Start	On	0.1	12	0.1875	MAX	MAX	ON	CCHS	MAX	MAX	MAX	MAX	MIN	
	2	On	0.1	12	0.375	MAX	MAX	ON	CCHS	MAX	MAX	MAX	MAX	MIN	
	3	On	0.1	12	0.5625	MAX	MAX	ON	CCHS	MAX	MAX	MAX	MAX	MIN	
	4	On	0.1	12	0.75	MAX	MAX	ON	CCHS	MAX	MAX	MAX	MAX	MIN	
	5	On	0.1	12	0.9375	MAX	MAX	ON	CCHS	MAX	MAX	MAX	MAX	MIN	
	6	On	0.1	12	1.125	MAX	MAX	ON	CCHS	MAX	MAX	MAX	MAX	MIN	
	7	On	0.1	12	1.3125	MAX	MAX	ON	CCHS	MAX	MAX	MAX	MAX	MIN	
	8	On	0.1	12	1.5	MAX	MAX	ON	CCHS	MAX	MAX	MAX	MAX	MIN	
1 11	9	On	0.1	12	1,6875	MAX	MAX	ON	CCHS	MAX	MAX	MAX	MAX	MIN	
	10	On	0.1	12	1.875	MAX	MAX	ON	CCHS	MAX	MAX	MAX	MAX	MIN	
	11	On	0.1	12	2.0625	MAX	MAX	ON	CCHS	MAX	MAX	MAX	MAX	MIN	
	12	On	0.1	12	2.25	MAX	MAX	ON	CCHS	MAX	MAX	MAX	MAX	MIN	
	13	On	0.1	12	2,4375	MAX	MAX	ON	CCHS	MAX	MAX	MAX	MAX	MIN	
	14	On	0.1	12	2.625	MAX	MAX	ON	CCHS	MAX	MAX	MAX	MAX	MIN	
	15	On	0.1	12		MAX	MAX	ON	CCHS	MAX	MAX	MAX	MAX	MIN	
	16 End	On	0.1	12	3	MAX	MAX	ON	CCHS	MAX	MAX	MAX	MAX	MIN	

#### To Fulfil High Power Testing Requirements

#### High-Performance AC/DC Power Supply

#### ASR-6450/6600



4.5kVA/6kVA

#### ASR-6450-09/ASR-6600-12





ASR-6450-13.5/ASR-6600-18

#### Application Fields:

- CRPS Server Power Supply Testing
- Three-Phase Motor Protection Device Testing
- . High Power UPS Testing
- . High Power Inverter Testing
- · Aerospace Equipment Testing

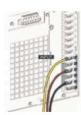
Para	allel Models	ASR-6450-09	ASR-6600-12	ASR-6450-13.5	ASR-6600-18					
	Power Type	Three-phase Four-wire Y connection  380 Vac to 460 Vac ±10 % (Line Voltage)  1P2W / 1P3W / 3P4W( Y connection)								
AC Input	Voltage									
	Mode									
	Output Capacity	1P2W / 3P4W: 9kVA 1P3W: 6kVA	1P2W / 3P4W: 12kVA 1P3W: 8kVA	1P2W / 3P4W: 13.5kVA 1P3W: 9kVA	1P2W/3P4W:18kVA 1P3W: 12kVA					
AC Output	Phase Voltage		0	350V						
	Line Voltage	1P3W: 0~700V / 3P4W: 0~606.2V								
	Maximum Current	Single-phase : 90A Polyphase : 30A	Single-phase :120A Polyphase : 40A	Single-phase :135A Polyphase : 45A	Single-phase : 180A Polyphase : 60A					
	Output Capacity	9kW	12kW	13.5kW	18kW					
DC Output	Voltage		-500V	~ +500V						
	Maximum Current	90A	120A	135A	180A					

The ASR-6000 series offers 9kVA, 12kVA, 13.5kVA, and 18kVA models capable of outputting up to 18kVA AC (single/three-phase) and 18kW DC high power. The series features high-efficiency power output and stable and reliable power quality, making it suitable for high power related product testing applications.

#### Single Unit Provides AC Single/Three-phase Input Function



AC One-phase Input



AC Three-phase Input (Delta Connection)



AC Three-phase Input (Y Connection)

The ASR-6000 series is GW Instek's first programmable AC/DC power source that supports AC single/three-phase input.

AC three-phase input supports delta (Delta) and star (Y) wiring methods Advantages:

a .ASR-6000 can use mains in most countries around the world (ex. Mainland China, Southeast. Asia, India, Europe...)AC single-phase 220V input can help test software development engineers work with the ASR-6000 on mains in the office. No additional three-phase power source is required.

 ASR-6000 can be used immediately in various regions around the world and is not affected by differences in power grids in different countries.

Note: 1. The AC input three-phase Y connection method must be connected to the N wire, otherwise the ASR-6000 cannot be turned on.

2. ASR-6000 AC voltage input range AC 200V ~ AC240V.

#### To Fulfil High Power Testing Requirements

#### AC Single/Three-phase Output + Multi-channel Output Function



The ASR-6000 series has diverse output functions, including three modes: 1P2W, 1P3W and 3P4W. The maximum output for phase voltage is 350Vrms and the maximum output for line voltage is

In AC three-phase output (3P4W) mode, each phase supports independent output settings. Taking ASR-6600 as an example, The maximum output of each phase reaches 2kVA, supporting power supply testing of up to three DUTs to meet the needs of server power modules, Testing requirements for high-power AC power products such as electric vehicle chargers and uninterruptible power supply systems.independent output settings. Taking ASR-6600 as an example, The maximum output of each phase reaches 2kVA, supporting power supply testing of up to three DUTs to meet the needs of server power modules, Testing requirements for high-power AC power products such as electric vehicle chargers and uninterruptible power supply systems.

#### AC Balanced/Unbalanced Three-phase Output Modes





**AC Balanced Three-phase** 

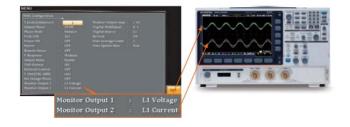
The ASR-6000 series has unbalanced and balanced three-phase output modes. In the AC three-phase output mode, users can set the phase angles of L1, L2 and L3 for control.



#### AC Unbalanced Three-phase

Main applications: Three-phase input power supply products, when emulating unbalanced three-phase input and phase loss, the ability of three-phase power input products to restore balanced three-phase.

#### **Voltage and Current Output Monitoring Functions**



ASR-6000 provides dual-channel voltage and current monitoring, allowing instant output of voltage and current signals of each phase to an oscilloscope for measurement.

#### **Advanced Web Server Control Features**







ASR-6000 provides a full range of web control functions, including:

- \* View system and information, and network configuration
- \* Monitor measurements
- \* Set/Operate ASR-6000
- \* Sequence Function/Simulate Function/Edit Waveform
- \* Data logger function

AF					
AE			GPE-4323	212W, 4-Channel, Linear DC Power Supply	D68
AEL-5002-350-18.75	50V/18.75A/1875W AC & DC Electronic Load	D129	GPE-3060	3-channel, 385W linear DC Power Supply	D65
AEL-5003-350-28	350V/28A/2800W AC & DC Electronic Load	D129	GPE-6030	3-channel, 385W linear DC Power Supply	D65
AEL-5004-350-37.5	350V/37.5A/3750W AC & DC Electronic Load	D129	GPP-1326	Single-Output Programmable DC Power Supply	D58
AEL-5006-350-56	350V/56A/5600W AC & DC Electronic Load	D129	GPP-2323	Dual-Output Programmable DC Power Supply	D58
AEL-5008-350-75	350V/75A/7500W AC & DC Electronic Load	D129	GPP-3323	Three-Output Programmable DC Power Supply	D58
AEL-5012-350-112.5	350V/112.5A/111250W AC & DC Electronic Load	D129	GPP-3060	385W Triple-channel Programmable DC Power Supply	D50
AEL-5015-350-112.5	350V/112.5A/15000W AC & DC Electronic Load	D129	GPP-3610H	36V/10A Single Channel Programmable DC Power Supply	D54
AEL-5019-350-112.5	350V/112.5A/18750W AC & DC Electronic Load	D129	GPP-3650	385W Triple-channel Programmable DC Power Supply	D50
		D129	GPP-4323	Four-Output Programmable DC Power Supply	D58
AEL-5023-350-112.5	350V/112.5A/22500W AC & DC Electronic Load				
AEL-5002-425-18.75	425V/18.75A/1875W AC & DC Electronic Load	D129	GPP-6030	385W Triple-channel Programmable DC Power Supply	D50
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AEL-5012-425-112.5	425V/112.5A/11250W AC & DC Electronic Load	D129	GPR-1820HD	360W Linear DC Power Supply	D71
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PEL-5006G-600-420 PEL-5004G-1200-160 PEL-5005G-1200-200 PEL-5006G-1200-240	600V/280A/4000kW High Power DC Electronic Load 600V/350A/5000kW High Power DC Electronic Load 600V/420A/6000kW High Power DC Electronic Load 1200V/160A/4000kW High Power DC Electronic Load 1200V/200A/5000kW High Power DC Electronic Load 1200V/240A/6000kW High Power DC Electronic Load	D135 D135 D135 D135 D135
PEL-5006G-600-420 PEL-5004G-1200-160 PEL-5005G-1200-200 PEL-5006G-1200-240	600V/280A/4000kW High Power DC Electronic Load 600V/350A/5000kW High Power DC Electronic Load 600V/420A/6000kW High Power DC Electronic Load 1200V/160A/4000kW High Power DC Electronic Load 1200V/200A/5000kW High Power DC Electronic Load	D135 D135 D135 D135
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PEL-5006G-600-420 PEL-5004G-1200-160 PEL-5005G-1200-200 PEL-5006G-1200-240 PF PFR-100M PFR-100L	600V/280A/4000kW High Power DC Electronic Load 600V/350A/5000kW High Power DC Electronic Load 600V/420A/6000kW High Power DC Electronic Load 1200V/160A/4000kW High Power DC Electronic Load 1200V/200A/5000kW High Power DC Electronic Load 1200V/240A/6000kW High Power DC Electronic Load 1200V/240A/6000kW High Power DC Electronic Load	D135 D135 D135 D135 D135
PEL-5006G-600-420 PEL-5004G-1200-160 PEL-5005G-1200-200 PEL-5006G-1200-240 PF PFR-100M PFR-100L	600V/280A/4000kW High Power DC Electronic Load 600V/350A/5000kW High Power DC Electronic Load 600V/420A/6000kW High Power DC Electronic Load 1200V/160A/4000kW High Power DC Electronic Load 1200V/200A/5000kW High Power DC Electronic Load 1200V/240A/6000kW High Power DC Electronic Load 1200V/240A/6000kW High Power DC Electronic Load Fanless Multi-range DC Power Supply Fanless Multi-range DC Power Supply 207W, 3-Channel, Programmable Linear DC Power Supply	D135 D135 D135 D135 D135
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PSB-003	Accessory Parallel Connection kit (for horizontal installation),	D31	PSW-720L15	30V/36A*1 160V/7.2A*1 720W Multi-Range DC Power Supply	D9
	Kit includes: (PSB-007 Joint Kit, Horizontal bus bar x 2 , PSB-005 x1)		PSW-720L22	40V/27A*2 720W Multi-Range DC Power Supply	D9
PSB-004	Accessory Parallel Connection kit (for vertical installation) Kit	D31	PSW-720L24	40V/27A*1 80V/13.5A*1 720W Multi-Range DC Power Supply	D9
	includes:(PSB-007 Joint Kit, Verical bus bar x 2, PSB-005x1)		PSW-720L25	40V/27A*1 160V/7.2A*1 720W Multi-Range DC Power Supply	D9
PSB-005	Accessory Parallel Connection Signal Cable	D31	PSW-720L44	80V/13.5A*2 720W Multi-Range DC Power Supply	D9
PSB-006 PSB-007	Accessory Serial Connection Signal Cable	D31	PSW-720L45	80V/13.5A*1 160V/7.2A*1 720W Multi-Range DC Power Supply	D9
P3B-007	Accessory Joint Kit: Includes 4 Joining plates, [M3x6]screws x 4 ; [M3x8]screw x 2	D31	PSW-720L55	160V/7.2A*2 720W Multi-Range DC Power Supply	D9
PSB-008	Accessory RS232C Cable (PSB-2000 Only)	D31	PSW-720H66	250V/4.5A*2 720W Multi-Range DC Power Supply	D9
PSB-2400H	400W Multi-Range Programmable Switching DC Power Supply	D31	PSW-720H68	250V/4.5A*1 800V/1.44A*1 720W Multi-Range DC Power Supply	D9
PSB-2400L	400W Multi-Range Programmable Switching DC Power Supply	D31	PSW-720H88	800V/1.44A*2 720W Multi-Range DC Power Supply	D9
PSB-2400L2	800W Multi-Range, 2-Channel, Programmable Switching	D31	PSW800-1.44	360W Multi-Range Programmable Switching DC Power Supply	D15
. 35 2 10022	DC Power Supply	551	PSW800-2.88	720W Multi-Range Programmable Switching DC Power Supply	D15
PSB-2800H	800W Multi-Range Programmable Switching DC Power Supply	D31	PSW800-2.88 PSW800-4.32	0 0 0 11.7	D15
PSB-2800L	800W Multi-Range Programmable Switching DC Power Supply	D31	PSW800-4.32 PSW80-13.5	1080W Multi-Range Programmable Switching DC Power Supply	D15
PSB-2800LS	800W Slave (Booster) Unit For Current Extension Only	D31	PSW80-13.5 PSW80-27	360W Multi-Range Programmable Switching DC Power Supply	
PSH-2018A	360W Programmable Switching DC Power Supply	D33		720W Multi-Range Programmable Switching DC Power Supply	D15
PSH-2018A PSH-3610A	360W Programmable Switching DC Power Supply 360W Programmable Switching DC Power Supply	D33	PSW80-40.5	1080W Multi-Range Programmable Switching DC Power Supply	D15
PSH-3620A	720W Programmable Switching DC Power Supply	D33	PSW-1080L111	30V/36A*3 1080W Multi-Range DC Power Supply	D9
PSH-3630A	1080W Programmable Switching D.C. Power Supply	D33	PSW-1080L112	30V/36A*2 40V/27A*1 1080W Multi-Range DC Power Supply	D9
			PSW-1080L114	30V/36A*2 80V/13.5A*1 1080W Multi-Range DC Power Supply	D9
PSP-2010	200W Programmable Switching DC Power Supply	D34	PSW-1080L115	30V/36A*2 160V/7.2A*1 1080W Multi-Range DC Power Supply	D9
PSP-405	200W Programmable Switching DC Power Supply	D34	PSW-1080L122	30V/36A*1 40V/27A*2 1080W Multi-Range DC Power Supply	D9
PSP-603	200W Programmable Switching DC Power Supply	D34	PSW-1080L124	30V/36A*1 40V/27A*1 80V/13.5A*1 1080W Multi-Range	D9
PSS-2005	100W Programmable Linear DC Power Supply	D61		DC Power Supply	
PSS-3203	96W Programmable Linear DC Power Supply	D61	PSW-1080L125	30V/36A*1 40V/27A*1 160V/7.2A 1080W Multi-Range	D9
PST-3201	96W Triple Output Programmable DC Power Supply	D64		DC Power Supply	
PST-3202	158W Triple Output Programmable DC Power Supply	D64	PSW-1080L144	30V/36A*1 80V/13.5A*2 1080W Multi-Range DC Power Supply	D9
PSU 6-200	1200W Programmable Switching DC Power Supply	D19	PSW-1080L145	30V/36A*1 80V/13.5A*1 160V/7.2A*1 1080W Multi-Range	D9
PSU 8-180	1440W Programmable Switching DC Power Supply	D19		DC Power Supply	
PSU 12.5-120	1500W Programmable Switching DC Power Supply	D19	PSW-1080L155	30V/36A*1 160V/7.2A*2 1080W Multi-Range DC Power Supply	D9
PSU 15-100	1500W Programmable Switching DC Power Supply	D19	PSW-1080L222	40V/27A*3 1080W Multi-Range DC Power Supply	D9
PSU 20-76	1520W Programmable Switching DC Power Supply	D19	PSW-1080L224	40V/27A*2 80V/13.5A*1 1080W Multi-Range DC Power Supply	D9
PSU 30-50	1500W Programmable Switching DC Power Supply	D19	PSW-1080L225	40V/27A*2 160V/7.2A*1 1080W Multi-Range DC Power Supply	D9
PSU 40-38	1520W Programmable Switching DC Power Supply	D19	PSW-1080L244	40V/27A*1 80V/13.5A*2 1080W Multi-Range DC Power Supply	D9
PSU 50-30	1500W Programmable Switching DC Power Supply	D19	PSW-1080L245	40V/27A*1 80V/13.5A*1 160V/7.2A*1 1080W Multi-Range	D9
PSU 60-25	1500W Programmable Switching DC Power Supply	D19		DC Power Supply	
PSU 80-19	1520W Programmable Switching DC Power Supply	D19	PSW-1080L255	40V/27A*1 160V/7.2A*2 1080W Multi-Range DC Power Supply	D9
PSU 100-15	1500W Programmable Switching DC Power Supply	D19	PSW-1080L444	80V/13.5A*3 1080W Multi-Range DC Power Supply	D9
PSU 150-10	1500W Programmable Switching DC Power Supply	D19	PSW-1080L445		D9
PSU 300-5	1500W Programmable Switching DC Power Supply	D19		80V/13.5A*2 160V/7.2A*1 1080W Multi-Range DC Power Supply	
PSU 400-3.8	1520W Programmable Switching DC Power Supply	D19	PSW-1080L455 PSW-1080L555	80V/13.5A*1 160V/7.2A*2 1080W Multi-Range DC Power Supply	D9 D9
PSU 600-2.6	1560W Programmable Switching DC Power Supply	D19		160V/7.2A*3 1080W Multi-Range DC Power Vupply	
PSU-001	Accessory Front Panel Filter kit(factory Installed)	D19	PSW-1080H666	250V/4.5A*3 1080W Multi-Range DC Power Supply	D9
PSU-01A	Accessory Joins a Vertical Stack of 2 PSU Units Together.	D19	PSW-1080H668	250V/4.5A*2 800V/1.44A*1 1080W Multi-Range DC Power Supply	D9
	2U-Sized Handles x2, Joining Plates x2		PSW-1080H688	250V/4.5A*1 800V/1.44A*2 1080W Multi-Range DC Power Supply	D9
PSU-01B	Accessory Bus Bar for 2 units in Parallel Operation	D19	PSW-1080H888	800V/1.44A*3 1080W Multi-Range DC Power Supply	D9
PSU-01C	Accessory Cable for 2 units in Parallel Operation	D19	PSW-001	Accessory Accessory Kits	D15
PSU-02A	Accessory Joins a Vertical Stack of 3 PSU units Together.	D19	PSW-002	Accessory Simple IDC Tool	D15
	3U-sized handles x2, Joining Plates x2		PSW-003	Accessory Contact Removal Tool	D15
PSU-02B	Accessory Bus Bar for 3 units in Parallel Operation	D19	PSW-004	Accessory Basic Accessory Kit for 30V/80V/160V Models	D15
PSU-02C	Accessory Cable for 3 units in Parallel Operation	D19	PSW-005	Accessory Series Operation Cable for 2 units(for 30V/80V/160V)	D15
PSU-03A	Accessory Joins a Vertical Stack of 4 PSU units Together.	D19	PSW-006	Accessory Parallel Operation Cable for 2 units	D15
	4U-sized Handles x2, Joining Plates x2		PSW-007	Accessory Parallel Operation Cable for 3 units	D15
PSU-03B	Accessory Bus Bar for 4 units in Parallel Operation	D19	PSW-008	Accessory Basic Accessory Kit for 250V/800V Models	D15
PSU-03C	Accessory Cable for 4 units in Parallel Operation	D19	PSW-009	Accessory Output Terminal Cover for 30V/80V/160V Models	D15
PSU-232	Accessory RS232 Cable with DB9 Connector kit	D19	PSW-010	Accessory Large Filter (Type II/III)	D15
PSU-485	Accessory RS485 Cable with DB9 Connector kit	D19	PSW-011	Accessory Output Terminal Cover for 250V/800V Models	D15
PSU-GPIB	Accessory PSU GPIB Interface Card (Factory Installed)	D19	PSW-012	Accessory High Voltage Output Terminal for 250V/800V Model	D15
PSU-ISO-I	Accessory Isolated Current Remote Control Card	D19	SP		
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PSU-ISO-V	Accessory Isolated Voltage Remote Control Card	D19	SPD-3606	375W, 3-Channel, Programmable Switching DC Power Supply	D36
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PSW160-14.4	720W Multi-Range Programmable Switching DC Power Supply	D15	SPS-1820	360W Switching DC Power Supply	D35
PSW160-21.6	1080W Multi-Range Programmable Switching DC Power Supply	D15	SPS-2415	360W Switching DC Power Supply	D35
		D15	SPS-3610	360W Switching DC Power Supply	D35
PSW/160.7 2					
PSW160-7.2 PSW250-13.5	360W Multi-Range Programmable Switching DC Power Supply 1080W Multi-Range Programmable Switching DC Power Supply	D15	SPS-606	360W Switching DC Power Supply	D35



Stemming from the design and manufacture demands of electronic industries, GW Instek offers diverse power supply product lines to meet user's demand for a variety of applications. Based on different needs, the product lines can be divided into several categories including DC Power Supply, AC Power Source, DC Electronic Load and Source Measure Unit.

For DC Power Supply, the products can be briefly categorized by the following types, Technic, Programmable or Non-programmable, Single or Multiple Outputs, High Precision or Affordable Price, Dual Range and Wide Combinations of Voltage and Current, which can be selected to meet the application requirements.

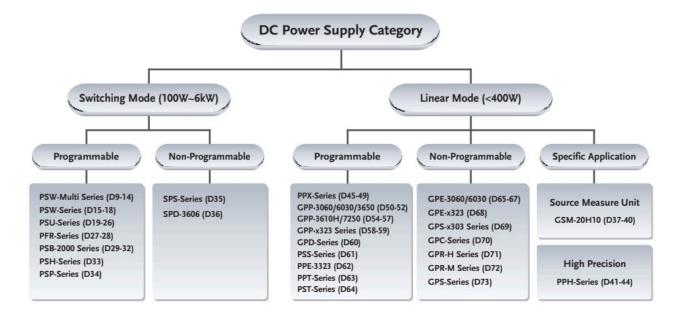
Precision source meter is the latest product offering a four-quadrant power supply, which can accurately utilize voltage or current and measure voltage and/or current at the same time.

GW Instek offers more than 100 power supply products, Which are suitable for the requirements of Electronic Assembly Testing, Education, Component Testing, Wireless Product Testing, Burn-in, Battery-Power Product Testing Automotive, Aerospace industries and so on.

#### **PRODUCTS**

- Programmable & Single Channel DC Power Supply
- Non-Programmable & Single Channel DC Power Supply
- · Programmable & Multiple Channel DC Power Supply
- Non-Programmable & Multiple Channel DC Power Supply
- Source Measure Unit

#### GENERAL SELECTION GUIDE OF POWER SUPPLY BY APPLICATION



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PSW-Series		٧	V	٧	V	D15-18
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PFR-Series		V		V		D27-28
PSB-2000 Series		V	V	V	V	D29-32
PSH-Series		V	V	V	V	D33
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GSM-20H10	V	V	V	V		D37-40
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#### GENERAL SELECTION GUIDE OF DC POWER SUPPLY BY TECHNIC

Technic	Channel	Programmability	Display	Model Series	Page
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	1	1	LED	PSU-Series	D19-26
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JE 220 A. C.	1		LED	PSB-2400L/PSB-2800L/PSB-2400H/PSB-2800H/PSB-2800LS	D29-32
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	1	] <sub>N</sub> p	LED	GPR-M Series	D72
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Linear	2	Programable		GPD-2303S	
	3	1	LED	GPD-3303S	D60
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	3	ĺ	LED	PPE-3323	D62
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	3		LCD	GPE-3060	DCE 67
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	2			GPS-2303	
	3		LED	GPS-3303	D69
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#### GENERAL SELECTION GUIDE OF DC POWER SUPPLY BY CHANNEL

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			LED	GPR-H Series	D71
			LED	GPR-M Series	D72
			LED	GPS-1830D/GPS-1850D/GPS-3030D/GPS-3030DD	D73
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		Switching	LED	SPD-3606	D36
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#### PROGRAMMABLE & SINGLE CHANNEL DC POWER SUPPLY

8 180 1440 FSU 8-180 LED Switching R5-232, R5-485, USB, LAN, Analog Control, (OPI)CPIB 155 100 1500 FSU 8-180 LED Switching R5-232, R5-485, USB, LAN, Analog Control, (OPI)CPIB 155 100 1500 FSU 8-195 LED Switching R5-232, R5-485, USB, LAN, Analog Control, (OPI)CPIB 190 1520 FSU 8-195 LED Switching R5-232, R5-485, USB, LAN, Analog Control, (OPI)CPIB 190 1520 FSU 8-195 LED Switching R5-232, R5-485, USB, LAN, Analog Control, (OPI)CPIB 190 1520 FSU 8-195 LED Switching R5-232, R5-485, USB, LAN, Analog Control, (OPI)CPIB 190 1520 FSU 8-195 LED Switching R5-232, R5-485, USB, LAN, Analog Control, (OPI)CPIB 190 190 190 190 190 190 190 190 190 190	Voltage(V)	Current(A)	Total Power(W)	Model Name	Display	Technic	Interface	Page
S								
15			N. W. W. W.	27 37 37 37 37 37 37 37 37				
30	15							20000000
80	30	50	1500	PSU 30-50	LED			D19-26
9	50	30	1500	PSU 50-30	LED	Switching	RS-232, RS-485, USB, LAN, Analog Control, (Opt)GPIB	
10	80	19	1520	PSU 80-19	LED	Switching	RS-232, RS-485, USB, LAN, Analog Control, (Opt)GPIB	
17.5   17.0   15.00   PSU 12.5-120   LED   Switching   S-322, RS-485, LSB, LAN, Analog Control, (Opt)CPIB   D19-16   D	9	- 5	45	PPH-1503	LCD	Linear	USBCDC, LAN, GPIB	D41-44
15	10	5	50	PPX-1005	LCD	Linear	USBCDC, LAN, RS-232, RS-485, (Opt)GPIB	D45-49
20	12.5	120	1500	PSU 12.5-120	LED	Switching	RS-232, RS-485, USB, LAN, Analog Control, (Opt)GPIB	D19-26
20	15	3	45	PPH-1503	LCD	Linear	USBCDC, LAN, GPIB	D41-44
20   5   100   PPX-2005   LCD   Linear   LCD	20	1	20	GSM-20H10	LCD	Linear	RS-232, USBTMC, LAN, GPIB	D37-40
20   5   100   PSX-2005   LCD   Linear   LCD   Linear   LCD   Linear   LCD   Linear   LCD   Linear   LCD	20	2	40	PPX-2002	LCD	Linear	USBCDC, LAN, RS-232, RS-485, (Opt)GPIB	D45.49
20	20	5	100	PPX-2005	LCD	Linear	USBCDC, LAN, RS-232, RS-485, (Opt)GPIB	D45-45
20	20	5	100	PSS-2005	LCD	Linear	RS-232, (Opt)GPIB	D61
20	20		200	PSP-2010	LCD	Switching	RS-232	D34
30   36   360   PSW 30.36   LED   Switching   LAN, USB, Analog Control, (Opt)CPIB, RS-232   D15.18			360	PSH-2018A	LCD			554
19-18   19-1	20		1520	PSU 20-76	LED	Switching	RS-232, RS-485, USB, LAN, Analog Control, (Opt)GPIB	D33
108   108   1080   PSW 30-108   LED   Switching   LAN, USB, Analog Control, (Opt)GPIB, RS-232   1080   PSS-3203   LCD   Linear   Linear   Linear   LAN, USB, Analog Control, (Opt)GPIB, RS-232   105-18			360		LED	Switching	LAN, USB, Analog Control, (Opt)GPIB, RS-232	
32   3   96   PSS-3293   LCD   Linear   RS-232, (Opt)GPIB   D61								D15-18
32								
156								D61
36   3   108   PPX.3603   LCD   Linear   USBCDC, LAN, RS-232, RS-485, LOPS)CPIB   D54.57					_			D58-59
36   3   108   PPX-3603   LCD   Linear   USBCDC, RS-232, RS-485, (DPJCPIB   D54-57   S45   D54-57	11.75.05		150.507					D45-49
36   10   360					_		, , , , , , , , , , , , , , , , , , , ,	
36   20   720   PSH-3620A   LCD   Switching   RS-232, (Opt)CPIB			2,3131,07	GPP-3610H			USBCDC, RS-232, (Opt)LAN, GPIB	D54-57
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40   27   360								D33
40   54   720   PSW 40-54   LED   Switching   LAN, USB, Analog Control, (Opt)GPIB, RS-232   D15-18								
40   81   1080   PSW 40-81   LED   Switching   LAN, USB, Analog Control, (Opt)GPIB, RS-232   D34   D40   S   200   PSP-405   LCD   Switching   RS-232, RS-485, USB, LAN, Analog Control, (Opt)GPIB   D19-26   D1								
40   S   200								D15-18
100   38   1520   PSU 40-38   LED   Switching   RS-232, RS-485, USB, LAN, Analog Control, (Opt)GPIB   D19-26								
Decomposition   Decompositio								
Columbridge								
RS-232, RS-485, USBCDC, LAN, Analog Control, (Opt)GPIB   D19-26			30 /A H /					
To   To   To   To   To   To   To   To								
Society	1727-172					U		2015/7/2020 1
Solution   Solution								D54-57
80								D15-18
80   40.5   1080   PSW 80-40.5   LED   Switching   LAN, USBCDC, Analog Control, (Opt)GPIB   D15-18								D20 22
80         80         PSB-2800L         LED         Switching         RS-232, USBCDC, Analog Control, (Opt)GPIB         D29-32           80         80         800         PSB-2800LS         LED         Switching         RS-232, USBCDC, Analog Control, (Opt)GPIB         D29-32           100         1         100         PPX-10H01         LCD         Linear         USBCDC, LAN, RS-232, RS-485, (Opt)GPIB         D45-49           100         15         1500         PSU 100-15         LED         Switching         RS-232, RS-485, USBCDC, LAN, Analog Control, (Opt)GPIB         D19-26           150         10         1500         PSU 150-10         LED         Switching         RS-232, RS-485, USBCDC, LAN, Analog Control, (Opt)GPIB         D19-26           160         7.2         360         PSW 160-7.2         LED         Switching         LAN, USBCDC, Analog Control, (Opt)GPIB, RS-232         D15-18           160         11.4         720         PSW 160-21.6         LED         Switching         LAN, USBCDC, Analog Control, (Opt)GPIB, RS-232         D15-18           200         0.1         20         GSM-20H10         LCD         Linear         RS-232, USBTMC, LAN, (Opt)GPIB, RS-232         D27-28           250         2         100         PFR-100M         LED								4 100 100 100 100
80   80   800   PSB-2800LS   LED   Switching   RS-232, USBCDC, Analog Control, (Opt)GPIB   100   1   100   PPX-10H01   LCD   Linear   USBCDC, LAN, RS-232, RS-485, (Opt)GPIB   D45-49   100   15   1500   PSU 100-15   LED   Switching   RS-232, RS-485, USBCDC, LAN, Analog Control, (Opt)GPIB   150   10   1500   PSU 150-10   LED   Switching   RS-232, RS-485, USBCDC, LAN, Analog Control, (Opt)GPIB   160   7.2   360   PSW 160-7.2   LED   Switching   LAN, USBCDC, Analog Control, (Opt)GPIB, RS-232   160   14.4   720   PSW 160-14.4   LED   Switching   LAN, USBCDC, Analog Control, (Opt)GPIB, RS-232   160   21.6   1080   PSW 160-21.6   LED   Switching   LAN, USBCDC, Analog Control, (Opt)GPIB   D37-40   20   GSM-20H10   LCD   Linear   RS-232, USBTMC, LAN, (Opt)GPIB   D37-40   250   2   100   PFR-100M   LED   Switching   LAN, USBCDC, Analog Control, (Opt)GPIB, RS-232   D27-28   250   4.5   360   PSW 250-4.5   LED   Switching   LAN, USBCDC, Analog Control, (Opt)GPIB, RS-232   D27-28   250   9   720   PSW 250-9   LED   Switching   LAN, USBCDC, Analog Control, (Opt)GPIB, RS-232   D15-18   250   13.5   1080   PSW 250-13.5   LED   Switching   LAN, USBCDC, Analog Control, (Opt)GPIB, RS-232   D15-18   250   3.8   1520   PSU 400-3.8   LED   Switching   RS-232, RS-485, USBCDC, LAN, Analog Control, (Opt)GPIB   D19-26								D15-18
100			175.5.70					D29-32
150							, , , , , , , , , , , , , , , , , , , ,	D45 40
150								D43-43
160         7.2         360         PSW 160-7.2         LED         Switching         LAN, USBCDC, Analog Control, (Opt)GPIB, RS-232         D15-18           160         14.4         720         PSW 160-14.4         LED         Switching         LAN, USBCDC, Analog Control, (Opt)GPIB, RS-232         D15-18           160         21.6         1080         PSW 160-21.6         LED         Switching         LAN, USBCDC, Analog Control, (Opt)GPIB         D37-40           200         0.1         20         GSM-20H10         LCD         Linear         RS-232, USBTMC, LAN, (Opt)GPIB         D37-40           250         2         100         PFR-100M         LED         Switching         RS-232, RS-485, USBCDC, LAN, (Opt) GPIB, RS-232         D27-28           250         4.5         360         PSW 250-4.5         LED         Switching         LAN, USBCDC, Analog Control, (Opt)GPIB, RS-232         D15-18           250         9         720         PSW 250-9         LED         Switching         LAN, USBCDC, Analog Control, (Opt)GPIB, RS-232         D15-18           250         13.5         1080         PSW 250-13.5         LED         Switching         LAN, USBCDC, Analog Control, (Opt)GPIB, RS-232         D15-18           400         3.8         1520         PSU 300-5 <td></td> <td></td> <td>1779/9/2707</td> <td></td> <td></td> <td></td> <td></td> <td>D19-26</td>			1779/9/2707					D19-26
160         14.4         720         PSW 160-14.4         LED         Switching         LAN, USBCDC, Analog Control, (Opt)GPIB, RS-232         D15-18           160         21.6         1080         PSW 160-21.6         LED         Switching         LAN, USBCDC, Analog Control, (Opt)GPIB         D15-18           200         0.1         20         GSM-20H10         LCD         Linear         RS-232, USBTMC, LAN, (Opt)GPIB         D37-40           250         2         100         PFR-100M         LED         Switching         RS-232, RS-485, USBCDC, LAN, (Opt) GPIB, RS-232         D27-28           250         4.5         360         PSW 250-4.5         LED         Switching         LAN, USBCDC, Analog Control, (Opt)GPIB, RS-232         D15-18           250         9         720         PSW 250-9         LED         Switching         LAN, USBCDC, Analog Control, (Opt)GPIB, RS-232         D15-18           250         13.5         1080         PSW 250-13.5         LED         Switching         LAN, USBCDC, Analog Control, (Opt)GPIB, RS-232         D15-18           400         3.8         1500         PSU 300-5         LED         Switching         RS-232, RS-485, USBCDC, LAN, Analog Control, (Opt)GPIB         D19-26           600         2.6         1560         PSU 60					_			
160   21.6   1080   PSW 160-21.6   LED   Switching   LAN, USBCDC, Analog Control, (Opt)GPIB   200   0.1   20   GSM-20H10   LCD   Linear   RS-232, USBTMC, LAN, (Opt)GPIB   D37-40   250   2   100   PFR-100M   LED   Switching   RS-232, RS-485, USBCDC, LAN, (Opt) GPIB, RS-232   D27-28   250   4.5   360   PSW 250-4.5   LED   Switching   LAN, USBCDC, Analog Control, (Opt)GPIB, RS-232   250   9   720   PSW 250-9   LED   Switching   LAN, USBCDC, Analog Control, (Opt)GPIB, RS-232   D15-18   250   13.5   1080   PSW 250-13.5   LED   Switching   LAN, USBCDC, Analog Control, (Opt)GPIB, RS-232   300   5   1500   PSU 300-5   LED   Switching   RS-232, RS-485, USBCDC, LAN, Analog Control, (Opt)GPIB   400   3.8   1520   PSU 400-3.8   LED   Switching   RS-232, RS-485, USBCDC, LAN, Analog Control, (Opt)GPIB   400   2.6   1560   PSU 600-2.6   LED   Switching   RS-232, RS-485, USBCDC, LAN, Analog Control, (Opt)GPIB   800   1.44   360   PSW 800-1.44   LED   Switching   LAN, USBCDC, Analog Control, (Opt)GPIB, RS-232   800   2.88   720   PSW 800-2.88   LED   Switching   LAN, USBCDC, Analog Control, (Opt)GPIB   D15-18   800   3   400   PSB-2400H   LED   Switching   RS-232, USBCDC, Analog Control, (Opt)GPIB   D29-32   800   4.32   1080   PSW 800-4.32   LED   Switching   LAN, USBCDC, Analog Control, (Opt)GPIB, RS-232   D15-18   D1								D15-18
200         0.1         20         GSM-20H10         LCD         Linear         RS-232, USBTMC, LAN, (Opt)GPIB         D37-40           250         2         100         PFR-100M         LED         Switching         RS-232, RS-485, USBCDC, LAN, (Opt) GPIB, RS-232         D27-28           250         4.5         360         PSW 250-4.5         LED         Switching         LAN, USBCDC, Analog Control, (Opt)GPIB, RS-232         D27-28           250         9         720         PSW 250-9         LED         Switching         LAN, USBCDC, Analog Control, (Opt)GPIB, RS-232         D15-18           250         13.5         1080         PSW 250-13.5         LED         Switching         LAN, USBCDC, Analog Control, (Opt)GPIB, RS-232         D15-18           300         5         1500         PSU 300-5         LED         Switching         RS-232, RS-485, USBCDC, LAN, Analog Control, (Opt)GPIB         D19-26           400         3.8         1520         PSU 400-3.8         LED         Switching         RS-232, RS-485, USBCDC, LAN, Analog Control, (Opt)GPIB         D19-26           600         2.6         1560         PSU 600-2.6         LED         Switching         RS-232, RS-485, USBCDC, LAN, Analog Control, (Opt)GPIB         D19-26           800         1.44         360					_			D13-10
250         2         100         PFR-100M         LED         Switching         RS-232, RS-485, USBCDC, LAN, (Opt) GPIB, RS-232         D27-28           250         4.5         360         PSW 250-4.5         LED         Switching         LAN, USBCDC, Analog Control, (Opt) GPIB, RS-232         D15-18           250         9         720         PSW 250-9         LED         Switching         LAN, USBCDC, Analog Control, (Opt) GPIB, RS-232         D15-18           250         13.5         1080         PSW 250-13.5         LED         Switching         LAN, USBCDC, Analog Control, (Opt) GPIB, RS-232         D15-18           300         5         1500         PSU 300-5         LED         Switching         RS-232, RS-485, USBCDC, LAN, Analog Control, (Opt) GPIB         D19-26           400         3.8         1520         PSU 400-3.8         LED         Switching         RS-232, RS-485, USBCDC, LAN, Analog Control, (Opt) GPIB         D19-26           600         2.6         1560         PSU 600-2.6         LED         Switching         RS-232, RS-485, USBCDC, LAN, Analog Control, (Opt) GPIB         D19-26           800         1.44         360         PSW 800-1.44         LED         Switching         LAN, USBCDC, Analog Control, (Opt) GPIB, RS-232         D15-18           800 <td< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>D37-40</td></td<>								D37-40
250         4.5         360         PSW 250-4.5         LED         Switching         LAN, USBCDC, Analog Control, (Opt)GPIB, RS-232         D15-18           250         9         720         PSW 250-9         LED         Switching         LAN, USBCDC, Analog Control, (Opt)GPIB, RS-232         D15-18           250         13.5         1080         PSW 250-13.5         LED         Switching         LAN, USBCDC, Analog Control, (Opt)GPIB, RS-232         D15-18           300         5         1500         PSU 300-5         LED         Switching         RS-232, RS-485, USBCDC, LAN, Analog Control, (Opt)GPIB         D19-26           400         3.8         1520         PSU 400-3.8         LED         Switching         RS-232, RS-485, USBCDC, LAN, Analog Control, (Opt)GPIB         D19-26           600         2.6         1560         PSU 600-2.6         LED         Switching         RS-232, RS-485, USBCDC, LAN, Analog Control, (Opt)GPIB         D19-26           800         1.44         360         PSW 800-1.44         LED         Switching         LAN, USBCDC, Analog Control, (Opt)GPIB, RS-232         D15-18           800         2.88         720         PSW 800-2.88         LED         Switching         LAN, USBCDC, Analog Control, (Opt)GPIB, RS-232         D15-18           800					_			
250         9         720         PSW 250-9         LED         Switching         LAN, USBCDC, Analog Control, (Opt)GPIB, RS-232         D15-18           250         13.5         1080         PSW 250-13.5         LED         Switching         LAN, USBCDC, Analog Control, (Opt)GPIB, RS-232         D15-18           300         5         1500         PSU 300-5         LED         Switching         RS-232, RS-485, USBCDC, LAN, Analog Control, (Opt)GPIB         D19-26           400         3.8         1520         PSU 400-3.8         LED         Switching         RS-232, RS-485, USBCDC, LAN, Analog Control, (Opt)GPIB         D19-26           600         2.6         1560         PSU 600-2.6         LED         Switching         RS-232, RS-485, USBCDC, LAN, Analog Control, (Opt)GPIB         D19-26           800         1.44         360         PSW 800-1.44         LED         Switching         LAN, USBCDC, Analog Control, (Opt)GPIB, RS-232         D15-18           800         2.88         720         PSW 800-2.88         LED         Switching         LAN, USBCDC, Analog Control, (Opt)GPIB         D29-32           800         3         400         PSB-2400H         LED         Switching         LAN, USBCDC, Analog Control, (Opt)GPIB, RS-232         D15-18           800         4.32			1/2/1//					
250         13.5         1080         PSW 250-13.5         LED         Switching         LAN, USBCDC, Analog Control, (Opt)GPIB, RS-232           300         5         1500         PSU 300-5         LED         Switching         RS-232, RS-485, USBCDC, LAN, Analog Control, (Opt)GPIB           400         3.8         1520         PSU 400-3.8         LED         Switching         RS-232, RS-485, USBCDC, LAN, Analog Control, (Opt)GPIB         D19-26           600         2.6         1560         PSU 600-2.6         LED         Switching         RS-232, RS-485, USBCDC, LAN, Analog Control, (Opt)GPIB         D19-26           800         1.44         360         PSW 800-1.44         LED         Switching         LAN, USBCDC, Analog Control, (Opt)GPIB, RS-232         D15-18           800         2.88         720         PSW 800-2.88         LED         Switching         LAN, USBCDC, Analog Control, (Opt)GPIB, RS-232         D15-18           800         3         400         PSB-2400H         LED         Switching         RS-232, USBCDC, Analog Control, (Opt)GPIB         D29-32           800         4.32         1080         PSW 800-4.32         LED         Switching         LAN, USBCDC, Analog Control, (Opt)GPIB, RS-232         D15-18								D15-18
300         5         1500         PSU 300-5         LED         Switching         RS-232, RS-485, USBCDC, LAN, Analog Control, (Opt)GPIB         D19-26           400         3.8         1520         PSU 400-3.8         LED         Switching         RS-232, RS-485, USBCDC, LAN, Analog Control, (Opt)GPIB         D19-26           600         2.6         1560         PSU 600-2.6         LED         Switching         RS-232, RS-485, USBCDC, LAN, Analog Control, (Opt)GPIB         D19-26           800         1.44         360         PSW 800-1.44         LED         Switching         LAN, USBCDC, Analog Control, (Opt)GPIB, RS-232         D15-18           800         2.88         720         PSW 800-2.88         LED         Switching         LAN, USBCDC, Analog Control, (Opt)GPIB, RS-232         D15-18           800         3         400         PSB-2400H         LED         Switching         RS-232, USBCDC, Analog Control, (Opt)GPIB, RS-232         D29-32           800         4.32         1080         PSW 800-4.32         LED         Switching         LAN, USBCDC, Analog Control, (Opt)GPIB, RS-232         D15-18						-	, , , , , , , , , , , , , , , , , , , ,	
400         3.8         1520         PSU 400-3.8         LED         Switching         RS-232, RS-485, USBCDC, LAN, Analog Control, (Opt)GPIB         D19-26           600         2.6         1560         PSU 600-2.6         LED         Switching         RS-232, RS-485, USBCDC, LAN, Analog Control, (Opt)GPIB         D19-26           800         1.44         360         PSW 800-1.44         LED         Switching         LAN, USBCDC, Analog Control, (Opt)GPIB, RS-232         D15-18           800         2.88         720         PSW 800-2.88         LED         Switching         LAN, USBCDC, Analog Control, (Opt)GPIB, RS-232         D15-18           800         3         400         PSB-2400H         LED         Switching         RS-232, USBCDC, Analog Control, (Opt)GPIB         D29-32           800         4.32         1080         PSW 800-4.32         LED         Switching         LAN, USBCDC, Analog Control, (Opt)GPIB, RS-232         D15-18								
1560   PSU 600-2.6   LED   Switching   RS-232, RS-485, USBCDC, LAN, Analog Control, (Opt)GPIB								D19-26
800         1.44         360         PSW 800-1.44         LED         Switching         LAN, USBCDC, Analog Control, (Opt)GPIB, RS-232           800         2.88         720         PSW 800-2.88         LED         Switching         LAN, USBCDC, Analog Control, (Opt)GPIB, RS-232           800         3         400         PSB-2400H         LED         Switching         RS-232, USBCDC, Analog Control, (Opt)GPIB         D29-32           800         4.32         1080         PSW 800-4.32         LED         Switching         LAN, USBCDC, Analog Control, (Opt)GPIB, RS-232         D15-18								
800         2.88         720         PSW 800-2.88         LED         Switching         LAN, USBCDC, Analog Control, (Opt)GPIB, RS-232         D15-18           800         3         400         PSB-2400H         LED         Switching         RS-232, USBCDC, Analog Control, (Opt)GPIB         D29-32           800         4.32         1080         PSW 800-4.32         LED         Switching         LAN, USBCDC, Analog Control, (Opt)GPIB, RS-232         D15-18						U		
800         3         400         PSB-2400H         LED         Switching         RS-232, USBCDC, Analog Control, (Opt)GPIB         D29-32           800         4.32         1080         PSW 800-4.32         LED         Switching         LAN, USBCDC, Analog Control, (Opt)GPIB, RS-232         D15-18								D15-18
800 4.32 1080 PSW 800-4.32 LED Switching LAN, USBCDC, Analog Control, (Opt)GPIB, RS-232 D15-18								D29-32
						-		
	800	6	800	PSB-2800H	LED	Switching	RS-232, USBCDC, Analog Control, (Opt)GPIB	D29-32

#### NON-PROGRAMMABLE & SINGLE CHANNEL DC POWER SUPPLY

Voltage(V)	Current(A)	Total Power(W)	Model Name	Display	Technic	Remark	Page
8	30	240	GPR-0830HD	LED	Linear	Rear-Panel Output	D71
12	30	360	SPS-1230	LED	Switching	Rear-Panel Output	D35
18	3	54	GPS-1830D	LED	Linear	Rear-Panel Output	D73
18	5	90	GPS-1850D	LED	Linear		D/3
18	10	180	GPR-1810HD	LED	Linear	Rear-Panel Output	D72
18	20	360	SPS-1820	LED	Switching	Rear-Panel Output	D35
18	20	360	GPR-1820HD	LED	Linear	Rear-Panel Output	D71
24	15	360	SPS-2415	LED	Switching		D35
30	3	90	GPS-3030D	LED	Linear	Rear-Panel Output	D.72
30	3	90	GPS-3030DD	LED	Linear		D73
30	6	180	GPR-3060D	LED	Linear	Rear-Panel Output	D72
32	6	192	GPE-1326	LCD	Linear		D68
35	10	350	GPR-3510HD	LED	Linear	Rear-Panel Output	D71
36	10	360	SPS-3610	LED	Switching	Rear-Panel Output	D35
60	3	180	GPR-6030D	LED	Linear	Rear-Panel Output	D72
60	6	360	SPS-606	LED	Switching	Rear-Panel Output	D35
60	6	360	GPR-6060D	LED	Linear	Rear-Panel Output	
75	5	375	GPR-7550D	LED	Linear	Rear-Panel Output	D71
110	3	330	GPR-11H30D	LED	Linear	Rear-Panel Output	D/1
300	1	300	GPR-30H10D	LED	Linear	Rear-Panel Output	

#### PROGRAMMABLE & MULTIPLE CHANNEL DC POWER SUPPLY

	/oltage(V)	Current(A)	Power per CH	Total Power(\V/	Model Name	Channel	Display	Technic	Interface	Page
	15	3	45	lotal Fower(w	Model Name	Channel	Display	Technic	Interface	rage
CH1	9	5	45	63	PPH-1503D	2	LCD	Linear	USBTMC, LAN, GPIB	
CH2	12	1.5	18						535 A	1
CH1	15 9	3 5	45 45	81	PPH-1506D	2	LCD	Linear	USBTMC, LAN, GPIB	755 52565 7 787 .
CH2	12	3	36	8'	FFH-1300D		LCD	Linear	OSBI MC, LAN, GFIB	D41-44
	15	3	45					11 - 11	7	1
CH1	9	5	45	81	PPH-1510D	2	LCD	Linear	USBTMC, LAN, GPIB	
CH2	4.5 12	10 3	45 36					II TOUR		
CH1	18	3	54	20000	5	75.0	1910/0	1.654.4	254.13.76	
CH2	18	3	54	138	PPT-1830	3	LED	Linear	GPIB	D63
CH3	6 30	5	30 180	_	1					
CH1	30	6	180	385	GPP-3060	3	LCD	Linear	USBCDC, RS-232,	D50-53
CH3	1.8/2.5/3.3/5.0	5	25						(Opt)LAN, GPIB	D30-33
CH1	30	3	90	180	GPD-2303S	2	LED	Linear	USBCDC	
CH2 CH1	30 30	3	90 90	776-2				1537/4	201 27 1	- 1
CH2	30	3	90	195	GPD-3303S	3	LED	Linear	USBCDC	
CH3	2.5/3.3/5.0	3	15		100 × 00 × 00 × 00 × 00 × 00 × 00 × 00	5757	10.7010	1 100000	40.57,737,8338	1000
CH1	30	3	90					A comment		D60
CH2 CH3	30 5	3	90 15	195	GPD-4303S	4	LED	Linear	USBCDC	********
CH4	5	1	5							
CH1	30	3	90			_		The contracts		1
CH2	30	3	90	195	GPD-3303D	3	LED	Linear	USBCDC	
CH3	2.5/3.3/5.0	3	15 96		CDD CTTT	-			USBCDC, RS-232,	<del>                                     </del>
CH2	32	3	96	192	GPP-2323	2	LCD	Linear	(Opt)LAN, GPIB	]
CH1	32	3	96	222	CDD 2202		165	11	USBCDC, RS-232,	]
CH2 CH3	32 1.8/2.5/3.3/5.0	3 5	96 25	217	GPP-3323	3	LCD	Linear	(Opt)LAN, GPIB	DE0 E0
CH3	32	3	96							D58-59
CH2	32	3	96	212	GPP-4323	4	LCD	Linear	USBCDC, RS-232,	
CH3	5	1	5	-1.2	G11-4325	770	Leb	Linear	(Opt)LAN, GPIB	
CH4 CH1	15 32	3	15 96	1						
CH2	-32	3	96	207	PPE-3323	3	LED	Linear	RS-232	D62
CH3	3.3 / 5	3	15	20000	100-100-100	187.5	A347A	III SANCESCO	33.86.335 87	202
CH1	36	1.5	54	100					caus.	1200000
CH2 CH3	36 6	1.5	54 18	126	PPT-3615	3	LED	Linear	GPIB	D63
CH1	32	2	64					The same parts		
CH2	32	2	64	158	PST-3202	3	LED	Linear	RS-232(O), GPIB	
CH3	6	5	30					The state of the s	-1	D64
CH1	32 32	1	32 32	96	PST-3201	3	LED	Linear	RS-232(O), GPIB	50.
CH3	32	i	32	,,,	131-3201	,	LLD	Linear	K3-232(0), GFIB	
CH1	60	3	180	200,000	AT 2 A 1 LA 1 LA 2 LA 2 LA 2 LA 2 LA 2 LA			I Wastell	USBCDC, RS-232,	
CH2	60	3	180	385	GPP-6030	3	LCD	Linear	(Opt)LAN, GPIB	D50-53
CH3	1.8/2.5/3.3/5.0 80	5 40	25 400						RS-232, USB, Analog Control,	
CH2	80	40	400	800	PSB-2400L2	2	LED	Switching	(Opt)GPIB	D29-32
CH1	30	36	360	720	PSW-720L11	2	LED	Switching	LAN, USB, Analog Control,	
CH2 CH1	30 30	36 36	360 360						(Opt)GPIB, RS-232 LAN, USB, Analog Control,	- I
CH2	40	27	360	720	PSW-720L12	2	LED	Switching	(Opt)GPIB, RS-232	
CH1	30	36	360	720	PSW-720L14	2	LED	Switching	LAN, USB, Analog Control,	1 1
CH2	80	13.5	360	720	1011720211	-		J	(Opt)GPIB, RS-232	
CH1	30 160	36 7.2	360 360	720	PSW-720L15	2	LED	Switching	LAN, USB, Analog Control, (Opt)GPIB, RS-232	
CH1	40	27	360	720	PSW-720L22	2	LED	Switching	LAN, USB, Analog Control,	1 1
CH2	40	27	360	720	P3W-/20L22	2	LED	Switching	(Opt)GPIB, RS-232	]
CH1	40	27	360	720	PSW-720L24	2	LED	Switching	LAN, USB, Analog Control,	
CH2 CH1	80 40	13.5 27	360 360	705	DEW TOOLS			E. 1. 1.1	(Opt)GPIB, RS-232 LAN, USB, Analog Control,	
CH2	160	7.2	360	720	PSW-720L25	2	LED	Switching	(Opt)GPIB, RS-232	D9-12
CH1	80	13.5	360	720	PSW-720L44	2	LED	Switching	LAN, USB, Analog Control,	]
CH2 CH1	80 80	13.5 13.5	360 360				32000		(Opt)GPIB, RS-232 LAN, USB, Analog Control,	
CH2	160	7.2	360	720	PSW-720L45	2	LED	Switching	(Opt)GPIB, RS-232	
CH1	160	7.2	360	720	PSW-720L55	2	LED	Switching	LAN, USB, Analog Control,	1 1
CH2	160	7.2	360	,20	. 541-720233			Juncining	(Opt)GPIB, RS-232	, I
CH1 CH2	250 250	4.5 4.5	360 360	720	PSW-720H66	2	LED	Switching	LAN, USB, Analog Control, (Opt)GPIB, RS-232	
CH1	250	4.5	360	700	DCW/ 7201100	_	LED	Coult - Live	LAN, USB, Analog Control,	1 1
CH2	800	1.44	360	720	PSW-720H68	2	LED	Switching	(Opt)GPIB, RS-232	, l
CH1	800	1.44	360	720	PSW-720H88	2	LED	Switching	LAN, USB, Analog Control,	
CH2 CH1	800 30	1.44 36	360 360						(Opt)GPIB, RS-232	$\vdash$
CH2	30	36	360	1080	PSW-1080L111	3	LED	Switching	LAN, USB, Analog Control,	
CH3	30	36	360						(Opt)GPIB, RS-232	Į 1
CH1	30	36	360	1080	PSW-1080L112	3	LED	Switching	LAN, USB, Analog Control,	
CH2 CH3	30 40	36 27	360 360	1080	P3W-1080L112	,	LED	Switching	(Opt)GPIB, RS-232	
CH1	30	36	360		.520.3500				LAN, USB, Analog Control,	1
CH2	30	36	360	1080	PSW-1080L114	3	LED	Switching	(Opt)GPIB, RS-232	D9-12
CH3	80	13.5	360		-	_				
CH1	30 30	36 36	360 360	1080	PSW-1080L115	3	LED	Switching	LAN, USB, Analog Control,	
CH3	160	7.2	360					25	(Opt)GPIB, RS-232	
CH1	30	36	360			640			LAN, USB, Analog Control,	]
CH2	40	27 27	360	1080	PSW-1080L122	3	LED	Switching	(Opt)GPIB, RS-232	
CH3	40	41	360						1	

V	oltogo(M)	Current/A)	Dower nor CH	Total Downs/(V/)	Model Name	Classic	Dicalou	- I ·		Dogo			
	oltage(V)			Total Power(w)	Model Name	Channel	Display	Technic	Interface	Page			
CH1	30	36	360						LAN, USB, Analog Control,	1			
CH2	40	27	360	1080	PSW-1080L124	3	LED	Switching	(Opt)GPIB, RS-232				
CH3	80	13.5	360			1			(				
CH1	30	36	360		Delvi 10001 105				LAN, USB, Analog Control,				
CH2	40	27	360	1080	PSW-1080L125	3	LED	Switching	(Opt)GPIB, RS-232				
CH3	160	7.2	360						(0)40.10,100.00	4			
CH1	30	36	360						LAN, USB, Analog Control,				
CH2	80	13.5	360	1080	PSW-1080L144	3	LED	Switching	(Opt)GPIB, RS-232				
CH3	80	13.5	360						(0)1/01/10/102				
CH1	30	36	360						LAN, USB, Analog Control,				
CH2	80	13.5	360	1080	PSW-1080L145	3	LED	Switching	(Opt)GPIB, RS-232				
CH3	160	7.2	360						(				
CH1	30	36	360						LAN, USB, Analog Control,				
CH2	160	7.2	360	1080	PSW-1080L155	3	LED	Switching	(Opt)GPIB, RS-232	l,			
CH3	160	7.2	360						(				
CH1	40	27	360	3000	DCIV/ 10001 000		150	C. Archite	LAN, USB, Analog Control,				
CH2	40	27	360	1080	PSW-1080L222	3	LED	Switching	(Opt)GPIB, RS-232				
CH3	40	27	360	1					C. C	1			
CH1	40	27	360	3000	DEIV 10001 004		150	Control to a	LAN, USB, Analog Control,	1			
CH2	40	27	360	1080	PSW-1080L224	3	LED	Switching	(Opt)GPIB, RS-232				
CH3	80	13.5	360						, , , ,	-			
CH1	40	27	360	3000	DCIV/ 1000/ 225			C. D. Line	LAN, USB, Analog Control,				
CH2	40	27	360	1080	PSW-1080L225	3	LED	Switching	(Opt)GPIB, RS-232				
CH3	160	7.2	360	2									
CH1	40	27	360	3000	DC1V/ 10001 244		LED	C. dalahina	LAN, USB, Analog Control,				
CH2	80	13.5	360	1080	PSW-1080L244	3	LED	Switching	(Opt)GPIB, RS-232				
CH3	80	13.5	360						(				
CH1	40	27	360	1080	DCW/ 10901 245	3	LED	Switching	LAN, USB, Analog Control,				
CH2	80	13.5	360	1080	PSW-1080L245	PSW-1080L245	F3W-1000LZ43	F3W-1000LZ43	3	LED	Switching	(Opt)GPIB, RS-232	D9-12
CH3	160 40	7.2	360 360				-		-				
	160		360	1080	PSW-1080L255	3	LED	Switching	LAN, USB, Analog Control,				
CH2 CH3	160	7.2 7.2	360	1080	PSW-1080L255	3   LED	Switching	(Opt)GPIB, RS-232	(Opt)GPIB, RS-232				
CH3	80	13.5	360							Ú.			
CH2	80	13.5	360	1080	PSW-1080L444	3	LED	Switching	LAN, USB, Analog Control,				
CH2	80	13.5	360	1000	F3W-1000E444	,	LED	Switching	(Opt)GPIB, RS-232				
CH1	80	13.5	360	2						1			
CH2	80	13.5	360	1080	PSW-1080L445	3	LED	Switching	LAN, USB, Analog Control,				
CH2	160	7.2	360	1000	F3W-1000L443	,	LED	Switching	(Opt)GPIB, RS-232	4			
CH1	80	13.5	360						1 14.	1			
CH2	160	7.2	360	1080	PSW-1080L455	3	LED	Switching	LAN, USB, Analog Control,				
CH2	160	7.2	360	1000	. 5 # - 10001-433		LLD	Switching	(Opt)GPIB, RS-232				
CH3	160	7.2	360						2 22 2				
CH2	160	7.2	360	1080	PSW-1080L555	3	LED	Switching	LAN, USB, Analog Control,				
CH2	160	7.2	360	1000	- 5 W-1000E333	,	LLD	Switching	(Opt)GPIB, RS-232				
CH1	250	4.5	360						15 Total /4 1				
CH2	250	4.5	360	1080	PSW-1080H666	3	LED	Switching	LAN, USB, Analog Control,	4			
CH3	250	4.5	360	1000	1341100011000		LLD	Jwitching	(Opt)GPIB, RS-232				
CH1	250	4.5	360				2						
CH2	250	4.5	360	1080	PSW-1080H668	3	LED	Switching	LAN, USB, Analog Control,				
CH2	800	1.44	360	1000	. 5 # 100011000	,	LLD	Januaring	(Opt)GPIB, RS-232				
CH3	250	4.5	360						4 100 436				
CH1	800	1,44	360	1080	PSW-1080H688	3	LED	Switching	LAN, USB, Analog Control,	1			
	800	1.44	360	1000	F3 W-1000H000	3	LED	Switching	(Opt)GPIB, RS-232				
CH3	800	1.44	360				7		00 TATA 0000 1				
CH1	800	1.44	360	1080	PSW-1080H888	3	LED	Switching	LAN, USB, Analog Control,				
CH2	800	1.44	360	1000	13 W 100011000	,	LED	Switching	(Opt)GPIB, RS-232				
CH3	000	1.44	300										

#### NON-PROGRAMMABLE & MULTIPLE CHANNEL DC POWER SUPPLY

Vo	oltage(V)	Current(A)	Power per. CH	Total Power(W)	Model Name	Channel	Display	Technic	Page
CH1	30	6	180		20045 AV72-VIVE		7.4554		NO. 2015
CH2	30	6	180	375	SPD-3606	3	LED	Switching	D36
CH3	5	3	15					4	(40000)
CH1	30	6	180	n			·	7 -41741674 -67	V.
CH2	30	6	180	385	GPE-3060	3	LCD	Linear	
CH3	5	5	25		3 - 3 - 3 - 3 - 3 - 3 - 3 - 3 - 3 - 3 -				DCF C7
CH1	60	3	180					7	D65-67
CH2	60	3	180	385	GPE-6030	3	LCD	Linear	
CH3	5	5	25			,			
CH1	32	3	96	192	GPE-2323	2	LCD	Linear	
CH2	32	3	96	172	GFE-E3E3	-	200	Linear	
CH1	32	3	96				7/2	1 150551	
CH2	32	3	96	217	GPE-3323	3	LCD	Linear	
CH3	1.8/2.5/3.3/5.0	5	25	0					D68
CH1	32	3	96	212	GPE-4323 4			Linear	
CH2	32	3	96			4	LCD		
CH3	5	1	5						
CH4	15	1	15			u s			
CH1	30	3	90	180	GPS-2303	2	LED	Linear	
CH2	30	3	90	100		5 5 2			
CH1	30	3	90	2	GPS-3303	3	LED	Linear	
CH2	30	3	90	195					
CH3	5	3	15	9		9			D69
CH1	30	3	90					T. UPST.	
CH2	30	3	90	200	GPS-4303	4	LED	Linear	
CH3	2.2 ~ 5.2	1	5.2	200	013 4505		LLD	Linear	
CH4	8 ~ 15	1	15	7	4	2	1		
CH1	30	6	180	100000000000000000000000000000000000000	225/85/89	3 19	30,500		
CH2	30	6	180	375	GPC-3060D	3	LED	Linear	
CH3	5	3	15						D70
CH1	60	3	180			, ,		1 450200	D/0
CH2	60	3	180	375	GPC-6030D	3	LED	Linear	
CH3	5	3	15					L Transfer	

#### **Dual-channel/Triple-channel Programmable Switching DC Power Supply**



#### **PSW-Multi Series**

USB













#### **FEATURES**

- \* Multi-channel: Maximum 720W for Dualchannel Module and Maximum 1080W for Triple-channel Models: The PSW-Multi Series Aslo Features a New Built-in Function That Allows Individualor Synchronizd Output Control of Eachvoltage Module Output Latency Between Channels with the Same Voltage Module is Less Than 0.1ms
- \* Multiple Voltage Combinations: Low Voltage Combinations Can be Selected From 30V/ 40V/80V/160V; High Voltage Combinations Can be Selected From 250V/800V
- \* Advanced Web Server: Executes SCPI Commands; Web Controls Through Server; Data Log; Edit Sequence
- \* CC/CV Priority Mode Selection is Ideal for **Battery and LED Industries**
- \* Adjustable Rising and Falling Slew Rate
- \* 720W/1080W Adopt 1/3, 1/2 Rack Mount Frame Designs (Standard EIA/JIS)
- \* Standard Communications Interfaces: LAN, USB, External Analog Remote Control Terminal
- \* Optional Communications Interfaces: GPIB-USB Adapter, RS232-USB Cable
- \* Support LabVIEW Driver

GRA-410-J/E Rack Mount Kit (JIS/EIA) For · PSW-Series





PSW-Multi Series is a dual-channel or triple-channel wide range output programmable switching DC power supply. The maximum output power can reach 1080W. There are 13 dual-channel models with a rated power of 720W, and 24 triple-channel models with a rated power of 1080W. The rated voltages of low voltage modules are 30V, 40V, 80V, 160V. The rated voltages of high voltage modules are 250V and

The CV/CC priority selection of the PSW-Multi Series is a very useful feature for DUT protection. The conventional power supply normally operates under CV mode when the power output is turned on. This could bring a high inrush current to the capacitive load or current-intensive load at the power output-on stage. Taking the I-V curve verification of LED as an example, it becomes a very challenging task to perform this measurement using a conventional power supply.

With LED connected to a power supply under CV mode as the initial setting, when the power output is turned on and the voltage rises to the LED forward voltage, the current will suddenly peak up and exceed the preset value of current limit. Upon detecting this high current, the power supply starts the transition from CV mode to CC mode. Though the current becomes stable after the CC mode being activated, the current spike occurred at the CV and CC crossover point may possibly damage the DUT. At the power output-on stage, the PSW-Multi Series is able to operate under CC priority to limit the current spike occurred at the threshold voltage and therefore protects DUT from the inrush current

The adjustable slew rate of the PSW-Multi Series allows users to set for either output voltage or output current, a specific rise time from low to high level transition, and a specific fall time from high to low level transition. This facilitates the characteristic verification of a DUT during voltage or current level changes with controllable slew rates. Most manufacturing tests of lighting device or large capacitor during power output-on are associated with the occurrence of high surge current, which can greatly reduce the life time of the DUT. To prevent inrush current from damaging current-intensive devices, a smooth and slow voltage transition during power On-Off can significantly reduce the pike current and protect the device from high current damage.

The OVP and OCP are provided with the PSW-Multi Series. Both OVP and OCP levels can be selected, with default level set at 110%, of the rated voltage/current of the power supply. When any of the protection levels is tripped, the power output will be switched off to protect the DUT. The PSW-Multi Series provides USB Host/Device and LAN interfaces as standard, GPIB-USB adapter and RS232-USB cable as optional. The LabVIEW driver and the Data Logging PC software are supported on all the available interfaces. An analog control/monitoring connector is also available on the rear panel for external control of power On/Off and external monitoring of power output Voltage and Current.

#### **DUAL-CHANNEL MODELS ARE AS FOLLOWS**

MODEL	CH1	CH2	SIZE
PSW-720L11	30.00V	30.00V	1/3 Rack 3U
PSW-720L12	30.00V	40.00V	1/3 Rack 3U
PSW-720L14	30.00V	80.00V	1/3 Rack 3U
PSW-720L15	30.00V	160.0V	1/3 Rack 3U
PSW-720L22	40.00V	40.00V	1/3 Rack 3U
PSW-720L24	40.00V	80.00V	1/3 Rack 3U
PSW-720L25	40.00V	160.0V	1/3 Rack 3U
PSW-720L44	80.00V	80.00V	1/3 Rack 3U
PSW-720L45	80.00V	160.0V	1/3 Rack 3U
PSW-720L55	160.0V	160.0V	1/3 Rack 3U
PSW-720H66	250.0V	250.0V	1/3 Rack 3U
PSW-720H68	250.0V	800.0V	1/3 Rack 3U
PSW-720H88	800.0V	800.0V	1/3 Rack 3U

#### TRIPLE-CHANNEL MODELS ARE AS FOLLOWS

MODEL	CH1	CH2	CH3	SIZE
PSW-1080L111	30.00V	30.00V	30.00V	1/2 Rack 3U
PSW-1080L112	30.00V	30.00V	40.00V	1/2 Rack 3U
PSW-1080L114	30.00V	30.00V	80.00V	1/2 Rack 3U
PSW-1080L115	30.00V	30.00V	160.0V	1/2 Rack 3U
PSW-1080L122	30.00V	40.00V	40.00V	1/2 Rack 3U
PSW-1080L124	30.00V	40.00V	80.00V	1/2 Rack 3U
PSW-1080L125	30.00V	40.00V	160.0V	1/2 Rack 3U
PSW-1080L144	30.00V	80.00V	80.00V	1/2 Rack 3U
PSW-1080L145	30.00V	80.00V	160.0V	1/2 Rack 3U
PSW-1080L155	30.00V	160.0V	160.0V	1/2 Rack 3U
PSW-1080L222	40.00V	40.00V	40.00V	1/2 Rack 3U
PSW-1080L224	40.00V	40.00V	80.00V	1/2 Rack 3U
PSW-1080L225	40.00V	40.00V	160.0V	1/2 Rack 3U
PSW-1080L244	40.00V	80.00V	80.00V	1/2 Rack 3U
PSW-1080L245	40.00V	80.00V	160.0V	1/2 Rack 3U
PSW-1080L255	40.00V	160.0V	160.0V	1/2 Rack 3U
PSW-1080L444	80.00V	80.00V	80.0V	1/2 Rack 3U
PSW-1080L445	80.00V	80.00V	160.0V	1/2 Rack 3U
PSW-1080L455	80.00V	160.0V	160.0V	1/2 Rack 3U
PSW-1080L555	160.0V	160.0V	160.0V	1/2 Rack 3U
PSW-1080H666	250.0V	250.0V	250.0V	1/2 Rack 3U
PSW-1080H668	250.0V	250.0V	800.0V	1/2 Rack 3U
PSW-1080H688	250.0V	800.0V	800.0V	1/2 Rack 3U
PSW-1080H888	800.0V	800.0V	800.0V	1/2 Rack 3U
	//			, =

#### Notes:

- \*1: At 85 ~ 132Vac or 170 ~ 265Vac, constant load.
- \*2: From No-load to Full-load, constant input voltage. Measured at the sensing point in Remote Sense.
- \*3: Measure with JEITA RC-9131B (1:1) probe \*4: Measurement frequency bandwidth is 10Hz to 20MHz.
- \*5: Measurement frequency bandwidth is 5Hz to 1MHz.
- \*6: From 10% to 90% of rated output voltage, with rated resistive load.

- \*7: From 10% to 90% of rated output voltage, with rated resistive load.

  \*8: Time for output voltage to recover within 0.19% + 10mV of its rated output for a load change from 50 to 100% of its rated output the service of the servic input voltage.

SPECIFICATIONS										
SPECIFICATIONS  Module Type			1	2	4	5	6	8		
H/L Voltage Classicfication		-	L	L	L	L	н	Н		
Rated output voltage		V	30	40	80	160	250	800		
Rated output current		A	36	27	13.5	7.2	4.5	1.44		
Rated output power		W	360	360	360	360	360	360		
Power ratio  Constant Voltage Mode		/=/	3 30-36	3 40-27	3 80-13.5	3.2 160-7.2	3.125 <b>250-4.5</b>	3.2 800-1.44		
Line regulation (*1)		mV	18	23	43	83	128	403		
Load regulation (°2)		mV	20	25	45	85	130	405		
Ripple and noise (*3)	p-p (*4)	mV	60	60	60	60	80	150		
	r.m.s. (45)	mV	7	7	7	12	15	30		
Temperature coefficient		ppm/℃		output voltage, after a 3		0.6				
Remote snese compensation voltage (single wire) Rise time (*6)	Rated load	V ms	0.6 50	0.6 50	0.6 50	0.6	100	1 150		
Rise time (~0)	No load	ms	50	50	50	100	100	150		
Fall time (*7)	Rated load	ms	50	50	50	100	150	300		
	No load	ms	500	500	500	1000	1200	2000		
Transient response time (*8)		ms	1	1	1	2	2	2		
Constant Current Mode			30-36	40-27	80-13.5	160-7.2	250-4.5	800-1.44		
Line regulation (*1) Load regulation (*9)		mA mA	41 41	32 32	18.5 18.5	12.2	9.5 9.5	6.44 6.44		
Ripple and noise	r.m.s.	mA	72	54	27	15	10	5		
Temperature coefficient		ppm/℃		output current, after a 3						
Protection Function	2	FF	30-36	40-27	80-13.5	160-7.2	250-4.5	800-1.44		
Over voltage protection (OVP)	Setting range	V	3-33	4-44	8-88	16-176	20-275	20-880		
	Setting accuracy		± (2% of rated outpu		100000	A 20 2 C				
Over current protection (OCP)	Setting range	A	3.6-39.6 ± (2% of rated outpu	2.7-29.7	1.35-14.85	0.72-7.92	0.45-4.95	0.144-1.584		
Over temperature protection (OTP)	Setting accuracy Operation		± (2% of rated output Turn the output off	as surreint)						
Low AC input protection (AC-FAIL)	Operation		Turn the output off							
Power limit (POWER LIMIT)	Operation		Over power limit.							
	Value (fixed)		Approx. 105% of rate							
Analog Programming and Monitoring	at 22 0C + 5 0C		30-36	40-27	80-13.5	160-7.2	250-4.5	800-1.44		
External voltage control output voltage  External voltage control output current	at 23 °C ± 5 °C at 23 °C ± 5 °C			ty: $\pm 0.5\%$ of rated output ty: $\pm 1\%$ of rated output of						
External voltage control output current  External resistor control output voltage	at 23 °C ± 5 °C			ty: ±1.5% of rated output ty: ±1.5% of rated output						
External resistor control output current	at 23 °C ± 5 °C		Accuracy and linearit	ty: ±1.5% of rated outpu	t current.					
Output voltage monitor	at 23 °C ± 5 °C		Accuracy: ±1%				Accuracy: ±2%			
Output current monitor	at 23 °C ± 5 °C		Accuracy: ±1%		4 500 00		Accuracy: ±2%			
Shutdown control				with a LOW (0V to 0.5V		O or chart circuit turn	the output off using a F	IICH W EVAn EVO an		
Output on/off control							off using a LOW (0V to			
CV/CC/ALM/PWR ON/OUT ON indicator			Photocoupler open collector output; Maximum voltage 30V, maximum sink current 8mA.							
Front Panel			30-36	40-27	80-13.5	160-7.2	250-4.5	800-1.44		
Display, 4 digits Voltage accuracy	at 23 °C ± 5 °C; ± (0.1% +	mV	20	20	20	100	200	400		
Current accuracy Indications	at 23 °C ± 5 °C; ± (0.1% +	mA	40	30 CC, VSR, ISR, DLY, RMT,	20 40 60 80 100 900	5	5	2		
Indications			RED LED's: ALM	C, VSR, ISR, DET, RIVIT,	20, 40, 60, 80, 100, 76W	, w, v, A				
Buttons				, Set, Test, Lock/Local, F	WR DSPL, Output					
Knobs			Voltage, Current	,						
USB port			Type A USB connect							
Programming and Measurement (USB, LAN, GPIB)			30-36	40-27	80-13.5	160-7.2	250-4.5	800-1.44		
Output voltage programming accuracy Output current programming accuracy	at 23 °C ± 5 °C; ± (0.1% + at 23 °C ± 5 °C; ± (0.1% +	mV mA	10 30	10 20	10 10	100	200	400		
Output current programming accuracy  Output voltage programming resolution	at 23 C ± 3 C; ± (0.176 +	mV	1	1	2	3	5	14		
Output current programming resolution		mA	1	1	1	1	1	1		
Output voltage measurement accuracy	at 23 °C ± 5 °C; ± (0.1% +	mV	10	10	10	100	200	400		
Output current measurement accuracy	at 23 °C ± 5 °C; ± (0.1% +	mA	30	20	10	5	5	2		
Output voltage measurement resolution		mV	1	1	2	3	5	14		
Output current measurement resolution		mA	30-36	1 40.07	1 00.33.5	1 160-7.2	250-4.5	800-1.44		
Input Characteristics Efficiency	100Vac	%	77	<b>40-27</b> 78	80-13.5 78	79	79	80		
	200Vac	%	79	80	80	81	81	82		
Input Characteristics				Dual Channel			Triple Channel			
Norminal input rating				0Hz to 60Hz, single pha	se		1000			
Input voltage range			85Vac ~ 265Vac							
Input frequency range										
Maximum input current	100Vac		47Hz ~ 63Hz	10		25	15			
75	100Vac 200Vac	A	47Hz ~ 63Hz	10			15 7.5			
Inrush current	100Vac 200Vac	A	47Hz ~ 63Hz				15 7.5 Less than 75A			
- 10 mg/s	200Vac			5			7.5			
Inrush current	200Vac	A	0.99	5 Less than 50A		2 2 3	7.5 Less than 75A			
Inrush current Maximum input power Power factor	200Vac	A	0.99	5 Less than 50A		) } }	7.5 Less than 75A			
Inrush current Maximum input power Power factor Hold-up time	200Vac	A	0.99	5 Less than 50A 1000			7.5 Less than 75A 1500			
Inrush current Maximum input power Power factor	200Vac	A	0.99 0.97 20ms or greater	5 Less than 50A	ISB Class: CDC/Commu	nications Device Class	7.5 Less than 75A 1500 Triple Channel			
Inrush current Maximum input power Power factor  Hold-up time Interface Capabilities	200Vac	A	0.99 0.97 20ms or greater TypeA: Host, TypeB:	5 Less than 50A 1000 Dual Channel			7.5 Less than 75A 1500 Triple Channel			
Inrush current Maximum input power Power factor  Hold-up time Interface Capabilities USB LAN GPIB	200Vac	A	0.99 0.97 20ms or greater TypeA: Host, TypeB: MAC Address, DNS	5 Less than 50A 1000 Dual Channel Slave, Speed: 1.1/2.0, U IP Address, User Passwi (GPIB to USB Adapter)			7.5 Less than 75A 1500 Triple Channel			
Inrush current Maximum input power Power factor Hold-up time Interface Capabilities USB LAN CPIB Environmental Conditions	200Vac	A	0.99 0.97 20ms or greater TypeA: Host, TypeB: MAC Address, DNS Optional: GUG-001	5 Less than 50A 1000 Dual Channel Slave, Speed: 1.1/2.0, U IP Address, User Passw			7.5 Less than 75A 1500 Triple Channel			
Inrush current Maximum input power Power factor Hold-up time Interface Capabilities USB LAN GPIB Environmental Conditions Operaing temperature	200Vac	A	0.99 0.97 20ms or greater  TypeA: Host, TypeB: MAC Address, DNS Optional: GUG-001 0 °C to 50 °C	5 Less than 50A 1000 Dual Channel Slave, Speed: 1.1/2.0, U IP Address, User Passwi (GPIB to USB Adapter)			7.5 Less than 75A 1500 Triple Channel			
Inrush current Maximum input power Power factor  Hold-up time Interface Capabilities USB LAN GPIB Environmental Conditions Operaing temperature Storage temperature	200Vac	A	0.99 0.97 20ms or greater TypeA: Host, TypeB: MAC Address, DNS Optional: GUG-001 0°C to 50°C -25°C to 70°C	5 Less than 50A 1000 Dual Channel Slave, Speed: 1.1/2.0, U IP Address, User Passw (GPIB to USB Adapter) Dual Channel			7.5 Less than 75A 1500 Triple Channel			
Inrush current Maximum input power Power factor Hold-up time Interface Capabilities USB LAN GPIB Environmental Conditions Operaing temperature	200Vac	A	0.99 0.97 20ms or greater  TypeA: Host, TypeB: MAC Address, DNS Optional: GUG-001 0 °C to 50 °C	S Less than 50A 1000  Dual Channel Slave, Speed: 1.1/2.0, U IP Address, User Passw (GPIB to USB Adapter) Dual Channel			7.5 Less than 75A 1500 Triple Channel			
Inrush current Maximum input power Power factor  Hold-up time Interface Capabilities USB LAN CPIB Environmental Conditions Operaing temperature Storage temperature Operating humidity	200Vac	A	0.99 0.97 20ms or greater TypeA: Host, TypeB: MAC Address, DNS Optional: GUG-001 0°C to 50°C 25°C to 70°C 20% to 85% RH; No	S Less than 50A 1000  Dual Channel Slave, Speed: 1.1/2.0, U IP Address, User Passw (GPIB to USB Adapter) Dual Channel			7.5 Less than 75A 1500 Triple Channel			
Inrush current Maximum input power Power factor  Hold-up time Interface Capabilities USB LAN CPIB Environmental Conditions Operaing temperature Storage temperature Operating humidity Storage humidity Altitude General Specifications	200Vac	A	0.99 0.97 20ms or greater  TypeA: Host, TypeB: MAC Address, DNS Optional: GUG-001 0 °C to 50 °C -25 °C to 70 °C 20% to 85% RH; No	5 Less than 50A 1000  Dual Channel Slave, Speed: 1.1/2.0, UP Address, User Passwi (GPIB to USB Adapter) Dual Channel condensation condensation Dual Channel			7.5 Less than 75A 1500  Triple Channel s, Subnet Mask  Triple Channel			
Inrush current Maximum input power Power factor  Hold-up time Interface Capabilities  USB LAN CPIB Environmental Conditions Operaing temperature Storage temperature Operating humidity Storage humidity Altitude General Specifications Weight	200Vac 100Vac 200Vac main unit only	A VA kg	0.99 0.97 20ms or greater  TypeA: Host, TypeB: MAC Address, DNS Optional: GUG-001 0 °C to 50 °C -25 °C to 70 °C 20% to 85% RH; No	Succession Superior S			7.5 Less than 75A 1500  Triple Channel s, Subnet Mask Triple Channel  Triple Channel Approx. 7.7kg			
Inrush current Maximum input power Power factor  Hold-up time Interface Capabilities USB LAN GPIB Environmental Conditions Operaing temperature Storage temperature Operating humidity Storage humidity Altitude General Specifications Weight Dimensions	200Vac 100Vac 200Vac	A VA	0.99 0.97 20ms or greater TypeA: Host, TypeB: MAC Address, DNS Optional: GUG-001 0°C to 50°C -25°C to 70°C 20% to 85% RH; No 90% RH or less; No Maximum 2000m	5 Less than 50A 1000  Dual Channel Slave, Speed: 1.1/2.0, U IP Address, User Passwa (GPIB to USB Adapter) Dual Channel condensation condensation Dual Channel Approx. 5.4kg 142 x 124 x 350			7.5 Less than 75A 1500  Triple Channel s, Subnet Mask  Triple Channel			
Inrush current  Maximum input power  Power factor  Hold-up time Interface Capabilities  USB  LAN  CPIB Environmental Conditions Operaing temperature Storage temperature Operating humidity Storage humidity Altitude General Specifications Weight Dimensions Cooling	200Vac 100Vac 200Vac main unit only	A VA kg	0.99 0.97 20ms or greater TypeA: Host, TypeB: MAC Address, DNS Optional: GUG-001 0°C to 50°C -25°C to 70°C 20% to 85% RH; No 90% RH or less; No Maximum 2000m	5 Less than 50A 1000  Dual Channel Slave, Speed: 1.1/2.0, L IP Address, User Passw (CPIB to USB Adapter) Dual Channel condensation condensation  Dual Channel Approx. 5.4kg 1142 x 124 x 350 y internal fan	ord, Gateway IP Address	Instrument IP Addres	7.5 Less than 75A 1500  Triple Channel s, Subnet Mask Triple Channel  Triple Channel Approx. 7.7kg			
Inrush current Maximum input power Power factor  Hold-up time Interface Capabilities USB LAN CPIB Environmental Conditions Operaing temperature Storage temperature Operating humidity Storage humidity Altitude Ceneral Specifications Weight Dimensions Cooling EMC	200Vac 100Vac 200Vac main unit only	A VA kg	0.99 0.97 20ms or greater  TypeA: Host, TypeB: MAC Address, DNS Optional: GUG-001 0 °C to 50 °C -25 °C to 70 °C 20% to 85% RH; No 90% RH or less; No Maximum 2000m  Forced air cooling by Complies with the E	Sucess than 50A 1000  Dual Channel Slave, Speed: 1.1/2.0, U IP Address, User Passwa (GPIB to USB Adapter)  Dual Channel condensation  condensation  Dual Channel Approx. 5.4kg 142 x 124 x 350 yinternal fan urropean EMC directive f	ord, Gateway IP Address	Instrument IP Addres	7.5 Less than 75A 1500  Triple Channel s, Subnet Mask Triple Channel  Triple Channel Approx. 7.7kg			
Inrush current  Maximum input power  Power factor  Hold-up time Interface Capabilities  USB  LAN  CPIB Environmental Conditions Operaing temperature Storage temperature Operating humidity Storage humidity Altitude General Specifications Weight Dimensions Cooling	200Vac 100Vac 200Vac main unit only	A VA kg	0.99 0.97 20ms or greater TypeA: Host, TypeB: MAC Address, DNS Optional: GUG-001 0°C to 50°C -25°C to 70°C 20% to 85% RH; No Maximum 2000m Forced air cooling by Complies with the Ei Complies with the Ei	5 Less than 50A 1000  Dual Channel Slave, Speed: 1.1/2.0, L IP Address, User Passw (CPIB to USB Adapter) Dual Channel condensation condensation  Dual Channel Approx. 5.4kg 1142 x 124 x 350 y internal fan	ord, Gateway IP Address	Instrument IP Addres	7.5 Less than 75A 1500  Triple Channel s, Subnet Mask Triple Channel  Triple Channel Approx. 7.7kg			
Inrush current Maximum input power Power factor  Hold-up time Interface Capabilities USB LAN GPIB Environmental Conditions Operaing temperature Storage temperature Storage temperature Operating humidity Storage humidity Altitude General Specifications Weight Dimensions Cooling EMC Safety	200Vac  100Vac 200Vac  main unit only (WxHxD)	A VA kg	0.99 0.97 20ms or greater  TypeA: Host, TypeB: MAC Address, DNS Optional: GUG-001 0°C to 50°C -25°C to 70°C 20% to 85% RH; No Maximum 2000m  Forced air cooling by Complies with the Ei Complies with the Ei No abnormalities at No abnormalities at	Sucess than 50A 1000  Dual Channel Slave, Speed: 1.1/2.0, U IP Address, User Passwa (GPIB to USB Adapter)  Dual Channel  condensation  condensation  Dual Channel Approx. 5.4kg 142 x 124 x 350 pi internal fan uropean EMC directive f uropean Low Voltage Di 1500 Vac for 1 minute 3000 Vac for 1 minute	ord, Gateway IP Address or Class A test and mea	Instrument IP Addres	7.5 Less than 75A 1500  Triple Channel  s, Subnet Mask  Triple Channel  Triple Channel  Approx. 7.7kg			
Inrush current Maximum input power Power factor  Hold-up time Interface Capabilities USB LAN GPIB Environmental Conditions Operaing temperature Storage temperature Storage temperature Operating humidity Storage humidity Altitude General Specifications Weight Dimensions Cooling EMC Safety	200Vac  100Vac 200Vac  main unit only (WxHxD)  Between input and chassis Between input and output	A VA kg	0.99 0.97 20ms or greater TypeA: Host, TypeB: MAC Address, DNS Optional: GUG-001 0°C to 50°C -25°C to 70°C 20% to 85% RH; No 90% RH or less; No Maximum 2000m Forced air cooling by Complies with the E Complies with the E No abnormalities at No abnormalities at	5 Less than 50A 1000  Dual Channel Slave, Speed: 1.1/2.0, U PR Address, User Passw (GPIB to USB Adapter) Dual Channel  condensation  condensation  Dual Channel Approx. 5.4kg 142 x 124 x 350 y internal fan uropean EMC directive f uropean EMC directive f uropean Tow Voltage Di 1500 Vac for 1 minute 500 Vdc for 1 minute	ord, Gateway IP Address or Class A test and meas rective and carries the Ci	Instrument IP Addres	7.5 Less than 75A 1500  Triple Channel  s, Subnet Mask  Triple Channel  Triple Channel  Approx. 7.7kg			
Inrush current  Maximum input power  Power factor  Hold-up time Interface Capabilities  USB  LAN  CPHB Environmental Conditions  Operating humidity  Storage temperature  Operating humidity  Altitude  General Specifications  Weight  Dimensions  Cooling  EMC  Safety  Withstand voltage	200Vac  100Vac 200Vac  200Vac  main unit only (WxHxD)  Between input and chassis Between input and output Between output and chassis	A VA kg	0.99 0.97 20ms or greater  TypeA: Host, TypeB: MAC Address, DNS Optional: GUG-001 0°C to 50°C -25°C to 70°C 20% to 85°R H; No 90% RH or less; No Maximum 2000m  Forced air cooling by Complies with the Ei Complies with the Ei No abnormalities at No abnormalities at No abnormalities at	5 Less than 50A 1000  Dual Channel Slave, Speed: 1.1/2.0, U IP Address, User Passw (CPIB to USB Adapter) Dual Channel Condensation Condensation Condensation Dual Channel Approx. 5.4kg 142 x 124 x 350 y internal fan uropean EMC directive f uropean Low Voltage Di 1500 Vac for 1 minute f 500 Vdc for 1 minute f	ord, Gateway IP Address or Class A test and meas rective and carries the Ci	Instrument IP Addres	7.5 Less than 75A 1500  Triple Channel  s, Subnet Mask  Triple Channel  Triple Channel  Approx. 7.7kg			
Inrush current Maximum input power Power factor  Hold-up time Interface Capabilities USB LAN GPIB Environmental Conditions Operaing temperature Storage temperature Storage temperature Operating humidity Storage humidity Altitude General Specifications Weight Dimensions Cooling EMC Safety	200Vac  100Vac 200Vac  main unit only (WxHxD)  Between input and chassis Between input and chassis Between input and chassis	A VA kg	0.99 0.97 20ms or greater TypeA: Host, TypeB: MAC Address, DNS Optional: GUG-001 0°C to 50°C -25°C to 70°C 20% to 85% RH; No 90% RH or less; No Maximum 2000m Forced air cooling by Complies with the E Complies with the E No abnormalities at No abnormalities at	5 Less than 50A 1000  Dual Channel Slave, Speed: 1.1/2.0, U IP Address, User Passw (GPIB to USB Adapter) Dual Channel condensation  condensation  Dual Channel Approx. 5.4kg 142 x 124 x 350 y internal fan uropean EMC directive f uropean Low Voltage Di 1500 Vac for 1 minute 500 Vdc for 1 minute fo 1500 Vdc for 1 minute fo	ord, Gateway IP Address or Class A test and meas rective and carries the Ci	Instrument IP Addres	7.5 Less than 75A 1500  Triple Channel  s, Subnet Mask  Triple Channel  Triple Channel  Approx. 7.7kg			
Inrush current  Maximum input power  Power factor  Hold-up time Interface Capabilities  USB  LAN  CPHB Environmental Conditions  Operating humidity  Storage temperature  Operating humidity  Altitude  General Specifications  Weight  Dimensions  Cooling  EMC  Safety  Withstand voltage	200Vac  100Vac 200Vac  main unit only (WxHxD)  Between input and chassis Between input and chassis Between input and chassis Between input and output	A VA kg	0.99 0.97 20ms or greater  TypeA: Host, TypeB: MAC Address, DNS Optional: GUG-001 0 °C to 50 °C -25 °C to 70 °C 20% to 85% RH; No 90% RH or less; No Maximum 2000m  Forced air cooling by Complies with the Ei Complies with the Ei No abnormalities at No abnormalities at No abnormalities at No abnormalities at Sou Vdc, 100 MΩ or 500 Vdc, 100 MΩ or 500 Vdc, 100 MΩ or	5 Less than 50A 1000  Dual Channel Slave, Speed: 1.1/2.0, L IP Address, User Passw (GPIB to USB Adapter) Dual Channel condensation condensation  Dual Channel Approx. 5.4kg 142 x 124 x 350 y internal fan uropean EMC directive furopean Low Voltage Di 1500 Vac for 1 minute for more more more more of 30V, 40V, 80V, 80V, 80V, 80V, 80V, 80V, 80V, 8	ord, Gateway IP Address or Class A test and meat rective and carries the Ci r 30V, 40V, 80V, 160V m or 250V, 800V models	Instrument IP Addres	7.5 Less than 75A 1500  Triple Channel  s, Subnet Mask  Triple Channel  Triple Channel  Approx. 7.7kg			
Inrush current Maximum input power Power factor  Hold-up time Interface Capabilities USB LAN CPIB Environmental Conditions Operaing temperature Storage temperature Operating humidity Altitude General Specifications Weight Dimensions Cooling EMC Safety Withstand voltage	200Vac  100Vac 200Vac  main unit only (WxHxD)  Between input and chassis Between input and chassis Between input and chassis	A VA kg	0.99 0.97 20ms or greater  TypeA: Host, TypeB: MAC Address, DNS Optional: GUG-001 0 °C to 50 °C -25 °C to 70 °C 20% to 85% RH; No 90% RH or less; No Maximum 2000m  Forced air cooling by Complies with the Ei Complies with the Ei No abnormalities at No abnormalities at No abnormalities at No abnormalities at Sou Vdc, 100 MΩ or 500 Vdc, 100 MΩ or 500 Vdc, 100 MΩ or	5 Less than 50A 1000  Dual Channel Slave, Speed: 1.1/2.0, U Pl Address, User Passav (CP18 to USB Adapter) Dual Channel  condensation  condensation  Dual Channel Approx. 5.4kg 142 x 124 x 350 y internal fan uropean Low Voltage Di 1500 Vac for 1 minute 3000 Vac for 1 minute for 1500 Vdc for 1 minute for more more	ord, Gateway IP Address or Class A test and meat rective and carries the Ci r 30V, 40V, 80V, 160V m or 250V, 800V models	Instrument IP Addres	7.5 Less than 75A 1500  Triple Channel  s, Subnet Mask  Triple Channel  Triple Channel  Approx. 7.7kg			

# **Dual-channel/Triple-channel Programmable Switching DC Power Supply**



PSW-Multi Series(Three-channel)



PSW-Multi Series (Two-channel)



PSW-Multi Series (LV) Three-channel Models Rear Panel



PSW-Multi Series (HV) Three-channel Models Rear Panel



PSW-Multi Series (LV) Two-channel Models Rear Panel



PSW-Multi Series (HV) Two-channel Models Rear Panel

#### ORDERING INFORMATION

Dual Channel N	nodei
PSW-720L11	30V/36A*2 720W Multi-Range DC Power Supply
PSW-720L12	30V/36A*1 40V/27A*1 720W Multi-Range DC Power Supply
PSW-720L14	30V/36A*1 80V/13.5A*1 720W Multi-Range DC Power Supply
PSW-720L15	30V/36A*1 160V/7.2A*1 720W Multi-Range DC Power Supply
PSW-720L22	40V/27A*2 720W Multi-Range DC Power Supply
PSW-720L24	40V/27A*1 80V/13.5A*1 720W Multi-Range DC Power Supply
PSW-720L25	40V/27A*1 160V/7.2A*1 720W Multi-Range DC Power Supply
PSW-720L44	80V/13.5A*2 720W Multi-Range DC Power Supply
PSW-720L45	80V/13.5A*1 160V/7.2A*1 720W Multi-Range DC Power Supply
PSW-720L55	160V/7.2A*2 720W Multi-Range DC Power Supply
PSW-720H66	250V/4.5A*2 720W Multi-Range DC Power Supply
PSW-720H68	250V/4.5A*1 800V/1.44A*1 720W Multi-Range DC Power Supply
PSW-720H88	800V/1.44A*2 720W Multi-Range DC Power Supply

#### **Triple Channel Model**

PSW-1080L111	30V/36A*3 1080W Multi-Range DC Power Supply
PSW-1080L112	30V/36A*2 40V/27A*1 1080W Multi-Range DC Power Supply
PSW-1080L114	30V/36A*2 80V/13.5A*1 1080W Multi-Range DC Power Supply
PSW-1080L115	30V/36A*2 160V/7.2A*1 1080W Multi-Range DC Power Supply
PSW-1080L122	30V/36A*1 40V/27A*2 1080W Multi-Range DC Power Supply
PSW-1080L124	30V/36A*1 40V/27A*1 80V/13.5A*1 1080W Multi-Range DC Power Supply
PSW-1080L125	30V/36A*1 40V/27A*1 160V/7.2A 1080W Multi-Range DC Power Supply
PSW-1080L144	30V/36A*1 80V/13.5A*2 1080W Multi-Range DC Power Supply
PSW-1080L145	30V/36A*1 80V/13.5A*1 160V/7.2A*1 1080W Multi-Range DC Power Supply
PSW-1080L155	30V/36A*1 160V/7.2A*2 1080W Multi-Range DC Power Supply
PSW-1080L222	40V/27A*3 1080W Multi-Range DC Power Supply
PSW-1080L224	40V/27A*2 80V/13.5A*1 1080W Multi-Range DC Power Supply
PSW-1080L225	40V/27A*2 160V/7.2A*1 1080W Multi-Range DC Power Supply
PSW-1080L244	40V/27A*1 80V/13.5A*2 1080W Multi-Range DC Power Supply
PSW-1080L245	40V/27A*1 80V/13.5A*1 160V/7.2A*1 1080W Multi-Range DC Power Supply
PSW-1080L255	40V/27A*1 160V/7.2A*2 1080W Multi-Range DC Power Supply
PSW-1080L444	80V/13.5A*3 1080W Multi-Range DC Power Supply
PSW-1080L445	80V/13.5A*2 160V/7.2A*1 1080W Multi-Range DC Power Supply
PSW-1080L455	80V/13.5A*1 160V/7.2A*2 1080W Multi-Range DC Power Supply
PSW-1080L555	160V/7.2A*3 1080W Multi-Range DC Power Supply
PSW-1080H666	250V/4.5A*3 1080W Multi-Range DC Power Supply
PSW-1080H668	250V/4.5A*2 800V/1.44A*1 1080W Multi-Range DC Power Supply
PSW-1080H688	250V/4.5A*1 800V/1.44A*2 1080W Multi-Range DC Power Supply
PSW-1080H888	800V/1.44A*3 1080W Multi-Range DC Power Supply

Apart from the differences in output type, each unit differs at output channels and voltage. The PSW-720 is dual channel output and PSW-1080 is triple channel output.

GUR-001B USB to RS-232 Cable (#4-40 UNC), 3000mm

#### ACCESSORIES:

Power Cord x1 (Region dependent)

GTL-123	Test Lead x 1 (30V/40V/80V/160VOne low voltage module for each channel)
GTL-240	USB Cable"L" Type x1
PSW-004	Basic Accessories Kit x1 (30V/40V/80V/160V low voltage module)
PSW-008	Basic Accessories Kit x1 (250V/800V high voltage module)
PSW-009	Output terminal cover (30V/40V/80V/160V low voltage module)
PSW-011	Output terminal cover (250V/800V high voltage module)
PSW-012	High voltage output terminal (250V/800V high voltage module)

#### **OPTIONAL ACCESSORIES**

P2M-001	Accessory Kit
PSW-002	Simple IDC Tool
PSW-003	Contact Removal Tool
GUG-001	GPIB to USB Adaptor
GRA-410-J	Rack Mount Kit(JIS)
GRA-410-E	Rack Mount Kit(KIA)
GET-001	Extended Terminal with max. 30A (30V/40V/80V/160V low voltage module)
GET-002	Extended Terminal with max. 10A (250V/800V high voltage module)
GET-005	Extended European Terminal with max. 20A (30V/40V/80V/160V low voltage module)
GTL-130	Test Lead: 2x red, 2x black (250V/800V high voltage module)
GTL-248	GPIB Cable, 2000mm
GTL-250	GPIB Cable, 600mm
GUR-001A	USB to RS-232 Cable (M3), 3000mm



## 

When the power supply is configured that the total output (Current x Voltage output) is less than the rated power output, it functions as a typical Constant Current (CC) and Constant Voltage (CV) power supply.

However, when the power supply is configured such that the total output power (Current x Voltage Output) exceeds the rated power output, the effective output is actually limited to the operation area of the unit.

#### B. MULTI-CHANNEL

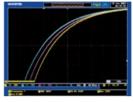


Figure 1

Multi-Channel, Dual-channel or triple-channel; the output latency between channels for same voltage module is less than 0.1ms.

When using a single-channel power supply for parallel multiple voltage output testing, there are different delays and slew rate settings, resulting in longer voltage output delay times and lack of control. The PSW-Multi Series features a built-in synchronous output control function (F130) that allow Dual-channel or triple-channel; the output latency between channels for same voltage module is less than 0.1ms.

It can fulfill diverse testing applications, for example: multi-channel digital device testing, electronic circuit verification, battery charging and discharging testing, and more.

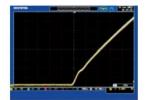


Figure 2

When using a single-channel power supply with three units connected in parallel through the backplane for synchronized output, each unit will experience a voltage output latency of approximately 5 to 10 ms. (Figure 1)

The waveform of PSW-Multi Series in triple-channel synchronized output mode exhibits voltage output latency times less than 0.1 ms for each channel (with the same voltage model) (Figure 2)

## **Dual-channel/Triple-channel Programmable Switching DC Power Supply**

#### ADVANCED WEB SERVER









Figure 1

Figure 2

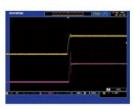
Figure 3 Figure 4

SCPI commands can be issued directly on the browser, examples are as follows: Direct control of PSW-Multi series power supplies on the browser. (Figure 1)

Data Log can be performed on the browser. For standard web server, the fastest data log time interval is 1 second. PSW-Multi series also provide paid version (active by option license key), the fastest data log time interval is 0.1 seconds and the data save to USB drive directly. (Figure 2) Sequences can be edited on the browser. (Figure 3)

The above advanced web server functions are new functions of PSW-Multi. Currently, there is no plan to update the advanced web server in the existing PSW-Series (Single Channel). (Figure 4)

#### D. CV / CC PRIORITY SELECTION



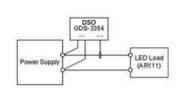
The Inrush Current and Surge Voltage occur at LED Forward Voltage(Vf)Under C.V Priority



The CC Priority Feature Effectively Limits the Occurrence of Inrush Current and Surge Voltage when the Supplied Voltage Rises to the LED Forward Voltage



V-I Characteristic of Diode

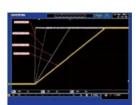


Using GDS-3354 DSO to Test LED Operation Under CV Priority and **CC** Priority Respectively

The PSW-Multi Series provides CC Mode and CV Mode to fit various applications in the general purpose market. To get into critical application niches, however, the power supply needs to provide advanced features

to meet the specific requirements. The CC and CV Priority Selection enable the power supply to run under CC priority, rather than normal CV priority, at the output-on stage.

#### ADJUSTABLE SLEW RATE

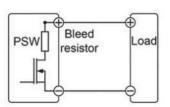


The Adjustable Rise Time of the PSW 30V Module



The Adjustable Rise Time of the PSW 800V Module

**BLEEDER CONTROL** 

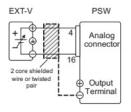


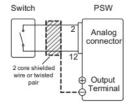
PSW-Multi Series Built-in Bleed Resistor

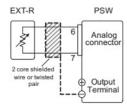
The PSW-Multi Series has adjustable slew rates for the level transition of both Current and Voltage. This gives the PSW-Multi Series power supply the ability to set specific rise time and fall time of the Voltage and Current drawn from the power supply to verify DUT performance during the Voltage/Current level transition. The feature also provides the benefit to slow down the voltage transition at the power output-on to protect DUT from inrush current damage. This is especially useful for the test of heavycurrent-drawn devices like capacitors.

The PSW-Multi Series employs a bleed resistor in parallel with the output terminal. Bleed resistor is designed to dissipatch the power from the power supply filter capacitors when power is turned off and the load is disconnected. Without a bleed resistor, power terminal may remain charged on the filter capacitors for some time and be potentially hazardous. In addition, bleed resistor also allows for smoother voltage regulation of the power supply as the bleed resistor acts as a minimum voltage load. The bleed resistance can be turned on or off using the configuration setting.

#### G. EXTERNAL ANALOG REMOTE CONTROL







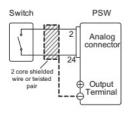
External Voltage Control of the Voltage Output

DMM 10
Analog connector

V MON
0 - 10V
16
Output
Terminal

External DMM Monitoring of the Output Voltage

External Switch Control of the Main Power Shut-down



DMM 11 Analog connector

External Resistance control of the Voltage Output

External Switch Control of the Output On/Off

External DMM Monitoring of the Output Current

Output Terminal

On the rear panel of the PSW-Multi Series power supply, a 26-pin Analog Control connector is available to perform lots of remote control and monitoring functions. The output voltage and current can be set using external voltage or resistance.

The power supply output on/off and main power shut-down can also be controlled using external switches. This Analog Control Connector is complied with the Mil 26 pin connector(OMRON XG4 IDC plug) standard.

0→ 10V

#### VARIOUS INTERFACES SUPPORT & EXTENDED TERMINAL BOX











0



**GET-001** 





**GUG-001** 

GPIB to USB Extended Terminal
Adapter (for PSW 30V/40V/80V/160V)

GET-002

Extended Terminal (for PSW 250V/800V) (for PSW 30V/40V/80V/160V)

**GET-005** 

#### Rear Panel for PSW-Multi Series

The PSW-Multi Series provides USB Host port in the front panel for easy access of stored data, such as test script program. In the rear panel, a USB Device port is available for remote control or I & V data logging of power output through a PC controller. The LAN interface, which meets DHCP standard, is provided as a standard feature of the PSW-Multi Series for system communications and ATE applications.

An Extender Terminal box (P/N: GET-001/GET-002/GET-005) is provided as optional accessory to extend the power output form the rear panel to the front side. This extender terminal gives R&D or QC engineers convenience to do the jobs without frequently reaching the output terminal at the rear side of the PSW-Multi Series.

#### I. USING THE RACK MOUNT KIT



Rack Mount Kit GRA-410-J (JIS)

The PSW-Multi Series has an optional Rack Mount Kit (GW Instek part number: [JIS] GRA-410-J, [EIA] GRA-410-E[EIA]) that can be used to hold



Rack Mount Kit GRA-410-E (EIA)

6x PSW models, 3x PSW-720 models, 2x PSW-1080 models or a combination of all models (1x PSW, 1x PSW-720 and 1x PSW-1080).

## Programmable Switching DC Power Supply (Multi-Range DC Power Supply)



#### **PSW-Series**



#### **FEATURES**

- \* Voltage Rating: 30V/40V/80V/160V/250V/800V, Output Power Rating: 360W~1080W
- \* Multi-range Voltage & Current Combinations in One Power Supply
- \* C.V/C.C Priority; Particularly Suitable for the Battery and LED Industry
- \* Adjustable Slew Rate
- \*\* Series Operation(2 units in Series)for(30V/40V /80V/160V), Parallel Operation(3 units in Parallel) for (30V/40V/80V/160V/250V/800V)
- \* High Efficiency and High Power Density
- \* 1/2, 1/3, 1/6 Rack Mount Size Design (EIA/JIS Standard) for 360W, 720W, 1080W
- \* Standard Interface : LAN, USB, Analog Control Interface
- \* Optional Interface : GPIB-USB Adaptor, RS232-USB Cable
- \* LabVIEW Driver



PSW 80-40.5 (0~80V, 0~40.5A, 1080W)



PSW 80-27 (0~80V, 0~27A, 720W)



PSW 80-13.5 (0~80V, 0~13.5A, 360W)

The PSW-Series is a single-output multi-range programmable switching DC Power Supply covering a power range up to 1080W. This series of products include eighteen models with the combination of 30V, 40V, 80V, 160V, 250V and 800V rated voltages and 360W, 720W and 1080W maximum output powers. The multi-range feature allows the flexible and efficient configuration of voltage and current within the rated power range. As the PSW-Series can be connected in series for maximum 2 units or in parallel for maximum 3 units, the capability of connecting multiple PSW-Series units for higher voltage or higher current output provides a broad coverage of applications. With the flexibility of multi-range power utilization and series/parallel connection, the PSW-Series significantly reduces the users' cost for various power supply products to accommodate the projects with different power requirements.

The C.V/C.C priority selection of the PSW-Series is a very useful feature for DUT protection. The conventional power supply normally operates under C.V mode when the power output is turned on. This could bring a high inrush current to the capacitive load or current-intensive load at the power output-on stage. Taking the I-V curve verification of LED as an example, it becomes a very challenging task to perform this measurement using a conventional power supply. With LED connected to a power supply under C.V mode as the initial setting, when the power output is turned on and the voltage rises to the LED forward voltage, the current will suddenly peak up and exceed the preset value of current limit. Upon detecting this high current, the power supply starts the transition from C.V mode to C.C mode. Though the current becomes stable after the C.C mode being activated, the current spike occurred at the C.V and C.C crossover point may possibly damage the DUT. At the power output-on stage, the PSW-Series is able to operate under C.C priority to limit the current spike occurred at the threshold voltage and therefore protects DUT from the inrush current damage.

The adjustable slew rate of the PSW-Series allows users to set for either output voltage or output current, a specific rise time from low to high level transition, and a specific fall time from high to low level transition. This facilitates the characteristic verification of a DUT during voltage or current level changes with controllable slew rates. Most manufacturing tests of lighting device or large capacitor during power output-on are associated with the occurrence of high surge current, which can greatly reduce the life time of the DUT. To prevent inrush current from damaging current-intensive devices, a smooth and slow voltage transition during power On-Off can significantly reduce the spike current and protect the device from high current damage.

The OVP and OCP are provided with the PSW-Series. Both OVP and OCP levels can be selected, with default level set at 110%, of the rated voltage/current of the power supply. When any of the protection levels is tripped, the power output will be switched off to protect the DUT. The PSW-Series provides USB Host/Device and LAN interfaces as standard, GPIB-USB adapter and RS232-USB cable as optional. The LabView driver and the Data Logging PC software are supported on all the available interfaces. An analog control/monitoring connector is also available on the rear panel for external control of power On/Off and external monitoring of power output Voltage and Current.

#### PARALLEL OPERATION (3 UNITS)

MODEL	SINGLE UNIT	2 UNITS	3 UNITS
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 40-27	40V/27A	40V/54A	40V/81A
PSW 40-54	40V/54A	40V/108A	40V/162A
PSW 40-81	40V/81A	40V/162A	40V/243A
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 40-27	40V/27A	80V/27A
PSW 40-54	40V/54A	80V/54A
PSW 40-81	40V/81A	80V/81A
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	N/A	N/A
PSW 250-9	N/A	N/A
PSW 250-13.5	N/A	N/A
PSW 800-1.44	N/A	N/A
PSW 800-2.88	N/A	N/A
PSW 800-4.32	N/A	N/A

SPECIFICATIONS										
SPECIFICATIONS	PSW 30-36	PSW 30-72	PSW 30-108	PSW 40-27	PSW 40-54	PSW 40-81	PSW 80-13.5	PSW 80-27	PSW 80-40.5	
OUTPUT RATING	7,7,71,07,7,7,7	3 - 33 - 33 - 3		25-75-17-25-75-75-	Total Machine Control	1011		3.5.00	5.5.15.15.15.15	
Voltage	0 ~ 30V	0 ~ 30V	0 ~ 30V	0 ~ 40V	0 ~ 40V	0 ~ 40V	0 ~ 80V	0 ~ 80V	0 ~ 80V	
Current	0 ~ 36A	0 ~ 72A	0 ~ 108A	0 ~ 27A	0 ~ 54A	0~ 81A	0 ~ 13.5A	0 ~ 27A	0 ~ 40.5A	
Power	360W	720W	1080W	360W	720W	1080W	360W	720W	1080W	
REGULATION(CV)										
Load Line	20mV	20mV	20mV	25mV	25mV	25mV	45mV	45mV	45mV	
REGULATION(CC)	18mV	18mV	18mV	23mV	23mV	23mV	43mV	43mV	43mV	
Load	41mA	77mA	113mA	32mA	59mA	86mA	18.5mA	32mA	45.5mA	
Line	41mA	77mA	113mA	32mA	59mA	86mA	18.5mA	32mA	45.5mA	
RIPPLE & NOISE (N	loise Bandwidt	h 20MHz; Ripp	le Bandwidth=	IMHz)						
CV p-p	60mV	80mV	100mV	60mV	80mV	100mV	60mV	80mV	100mV	
CV rms CC rms	7mV 72mA	11mV 144mA	14mV 216mA	7mV	11mV	14mV	7mV 27mA	11mV 54mA	14mV 81mA	
PROGRAMMING AC		144mA	ZIOTIA	54mA	108mA	162mA	2711174	3411174	OTHIA	
Voltage	0.1% +10mV	0.1% +10mV	0.1% +10mV	0.1%+10mV	0.1%+10mV	0.1%+10mV	0.1% +10mV	0.1% +10mV	0.1% +10mV	
Current	0.1% + 10mV	0.1% + 10mV	0.1% + 100mA	0.1%+10mV	0.1%+50mA	0.1%+80mA	0.1% + 10mA	0.1% + 30mA	0.1% + 40mA	
MEASUREMENT ACC		0.170 1 001181	0.170 1 1001181		240.070.70000	200000000000000000000000000000000000000				
Voltage	0.1% +10mV	0.1% +10mV	0.1% +10mV	0.1%+10mV	0.1%+10mV	0.1%+10mV	0.1% +10mV	0.1% +10mV	0.1% +10mV	
Current	0.1% +30mA	0.1% +60mA	0.1% +100mA	0.1%+20mA	0.1%+50mA	0.1%+80mA	0.1% +10mA	0.1% +30mA	0.1% +40mA	
RESPONSE TIME										
Raise Time	50ms	50ms	50ms	50ms	50ms	50ms	50ms	50ms	50ms	
Fall Time(Full Load)	50ms	50ms	50ms	50ms	50ms	50ms	50ms	50ms	50ms	
Fall Time(No Load)	500ms	500ms	500ms	500ms	500ms	500ms	500ms 1ms	500ms 1ms	500ms 1ms	
Load Transient Recover Time (Load change from 50~100%)	1ms	1ms	lms	1ms	lms	lms	ims	Ims	Ims	
PROGRAMMING RE	SOLUTION (By	PC Remote Cont	rol Mode)							
Voltage	1mV	1mV	1mV	1mV	1mV	1mV	2mV	2mV	2mV	
Current	1mA	2mA	3mA	1mA	2mA	3mA	1mA	2mA	3mA	
MEASUREMENT RES	OLUTION (By	PC Remote Cont	rol Mode)							
Voltage	1mV	1mV	1mV	1mV	1mV	1mV	2mV	2mV	2mV	
Current	1mA	2mA	3mA	1mA	2mA	3mA	1mA	2mA	3mA	
SERIES AND PARALL	EL CAPABILITY									
Parallel Operation	TO A STREET STREET STREET	including the m								
Series Operation	•	including the ma	ster unit							
PROTECTION FUNC				17 20000000						
OVP	3~33V	3~33V	3~33V	4 ~ 44V	4 ~ 44V	4 ~ 44V	8~88V	8~88V	8~88V	
OCP	3.6 ~39.6A	5~79.2A	5~118.8A	2.7 ~ 29.7A	5 ~ 59.4A	5 ~ 89.1A	1.35~14.85A	2.7~29.7A	4.05~44.55A	
ОНР	,	lecated internal t	emperatures							
FRONT PANEL DISP										
Voltage	0.1%±20mV	0.1%±20mV	0.1%±20mV	0.1%+20mV 0.1%+30mA	0.1%+20mV	0.1%+20mV	0.1%±20mV	0.1%±20mV	0.1%±20mV	
Current	0.1%±40mA	0.1%±70mA	0.1%±100mA	U.1%+3UMA	0.1%+60mA	0.1%+80mA	0.1%±20mA	0.1%±40mA	0.1%±50mA	
ENVIRONMENT CO										
Operation Temp	0°C ~ 50°C									
Storage Temp Operating Humidity	-25°C ~ 70°C	H; No condensat	ion							
Storage Humidity		ess; No condensa								
READ BACK TEMP C										
Voltage		f rated output vo	ltage : after a 30	minute warm-u	p					
Current		f rated output cu								
OTHER										
Analog Control	Yes									
Interface		IB-USB(Option)	RS232-USB(Op	tion)						
Fan		sensing control	11							
POWER SOURCE		C, 47~63Hz, sin	gle phase		T		1	Ī*	I	
DIMENSIONS		142(W)x124(H)	214(W)x124(H)	71 (W)x124(H)	142(W)x124(H)	214(W)x124(H)		142(W)x124(H)	214(W)x124(H)	
& WEIGHT	x350(D) mm;	x350(D)mm;	x350(D) mm;	x350(D) mm;	x350(D) mm;	x350(D) mm;	x350(D) mm;	x350(D) mm;	x350(D) mm;	
ye	Approx. 3kg	Approx. 5.3kg	Approx. 7.5kg	Approx. 3kg	Approx. 5.3kg	Approx. 7.5kg	Approx. 3kg	Approx. 5.3kg	Approx. 7.5kg	

PSW-001 PSW-002 PSW-003 PSW-004 PSW-005 PSW-006 PSW-007

# Programmable Switching DC Power Supply (Multi-Range DC Power Supply)

SPECIFICATIONS									
SI ECII ICATIONS	PSW 160-7.2	PSW 160-14.4	PSW 160-21.6	PSW 250-4.5	PSW 250-9	PSW 250-13.5	PSW 800-1.44	PSW 800-2.88	PSW 800-4.3
OUTPUT RATING									
Voltage	0 ~ 160V	0 ~ 160V	0 ~ 160V	0 ~ 250V	0 ~ 250V	0 ~ 250V	0 ~ 800V	0 ~ 800V	0 ~ 800V
Current	0 ~ 7.2A	0 ~ 14.4A	0 ~ 21.6A	0 ~ 4.5A	0 ~ 9A	0 ~ 13.5A	0 ~ 1.44A	0 ~ 2.88A	0 ~ 4.32A
Power	360W	720W	1080W	360W	720W	1080W	360W	720W	1080W
REGULATION(CV)									
Load	85mV	85mV	85mV	130mV	130mV	130mV	405mV	405mV	405mV
Line	83mV	83mV	83mV	128mV	128mV	128mV	403mV	403mV	403mV
REGULATION(CC)									
Load	12.2mA	19.4mA	26.6mA	9.5mA	14mA	18.5mA	6.44mA	7.88mA	9.32mA
Line	12.2mA	19.4mA	26.6mA	9.5mA	14mA	18.5mA	6.44mA	7.88mA	9.32mA
RIPPLE & NOISE (N					B				
CV p-p CV rms	60mV 12mV	80mV 15mV	100mV 20mV	80mV 15mV	100mV 15mV	120mV 15mV	150mV 30mV	200mV 30mV	200mV 30mV
CC rms	15mA	30mA	45mA	10mA	20mA	30mA	5mA	10mA	15mA
PROGRAMMING AC	CLIBACY				201101	33.1.2.1			
	0.1% +100mV	0.1% +100mV	0.1% +100mV	0.1%+200mV	0.1%+200mV	0.1%+200mV	0.1%+400mV	0.1%+400mV	0.1%+400mV
Voltage Current	0.1% + 100mV	0.1% +100mV 0.1% +15mA	0.1% +100mV	0.1%+200HV 0.1%+5mA	0.1%+200mV 0.1%+10mA	0.1%+200mV 0.1%+15mA	0.1%+2mA	0.1%+4mA	0.1%+6mA
MEASUREMENT ACC		3,						2	
Voltage	0.1% +100mV	0.1% +100mV	0.1% +100mV	0.1%+200mV	0.1%+200mV	0.1%+200mV	0.1%+400mV	0.1%+400mV	0.1%+400mV
Current	0.1% +100mV 0.1% +5mA	0.1% +100mV 0.1% +15mA	0.1% +100mV 0.1% +20mA	0.1%+200HV 0.1%+5mA	0.1%+200mV	0.1%+200mV 0.1%+15mA	0.1%+400mV	0.1%+4mA	0.1%+400mV
RESPONSE TIME	3.170 7311121	3.170 7131124	21170 .201117						
	100ms	100ms	100ms	100ms	100ms	100ms	150ms	150ms	150ms
Raise Time Fall Time(Full Load)	100ms	100ms	100ms	150ms	150ms	150ms	300ms	300ms	300ms
Fall Time(No Load)	1000ms	1000ms	1000ms	1200ms	1200ms	1200ms	2000ms	2000ms	2000ms
Load Transient Recover Time	2ms	2ms	2ms	2ms	2ms	2ms	2ms	2ms	2ms
(Load change from 50~100%)	_					-			
PROGRAMMING RE	SOLUTION (By	PC Remote Cont	rol Mode)						
Voltage	3mV	3mV	3mV	5mV	5mV	5mV	14mV	14mV	14mV
Current	1mA	2mA	3mA	1mA	1mA	1mA	1mA	1mA	1mA
MEASUREMENT RES	OLUTION (By	PC Remote Cont	rol Mode)						
Voltage	3mV	3mV	3mV	5mV	5mV	5mV	14mV	14mV	14mV
Current	1mA	2mA	3mA	1mA	1mA	1mA	1mA	1mA	1mA
SERIES AND PARALL	EL CAPABILITY								
Parallel Operation	Up to 3 units	including the ma	aster unit	3	3	3	3	3	3
Series Operation	Up to 2 units i	ncluding the ma	ster unit	N/A	N/A	N/A	N/A	N/A	N/A
PROTECTION FUNC	TION								
OVP	16~176V	16~176V	16~176V	20~275V	20~275V	20~275V	20~880V	20~880V	20~880V
OCP	0.72~7.92A	1.44~15.84A	2.16~23.76A	0.45~4.95A	0.9~9.9A	1.35~14.85A	0.144~1.584A	0.288~3.168A	0.432~4.752
OHP	Activated by e	lecated internal t	emperatures		7			Y	
FRONT PANEL DISP		7212007 0007 0007 0007							
Voltage	0.1%±100mV	0.1%±100mV	0.1%±100mV	0.1%±200mV	0.1%±200mV	0.1%±200mV	0.1%±400mV	0.1%±400mV	0.1%±400mV
Current	0.1%±100mV 0.1%±5mA	0.1%±100mV	0.1%±100mV	0.1%±200mV 0.1%±5mA	0.1%±200mV 0.1%±10mA	0.1%±200mV 0.1%±20mA	0.1%±400mV 0.1%±2mA	0.1%±400mV 0.1%±4mA	0.1%±400mV 0.1%±6mA
ENVIRONMENT CO		200000000000000000000000000000000000000							
	20.300000000000000000000000000000000000								
Operation Temp	0°C ~ 50°C								
Storage Temp Operating Humidity	-25°C ~ 70°C	H; No condensat	ion						
Storage Humidity		ss; No condensa							
READ BACK TEMP C									
Voltage	Total Control of the	rated output vol	tage : after a 20	minute warm	2				
Current		rated output voi							
OTHER	_00ppiii/ C 0i	output cu		wate waitif-u	F				
17.7.7.9.9.1.7.00.199.10.039.00.1	Yes								
Analog Control Interface	na 100 Billiana menangan ang an	B-USB(Option)/	RS232-LISRION	tion)					
Fan		sensing control	эгэг озы(ор						
POWER SOURCE		C, 47~63Hz, sin	gle phase						
	202310000000000000			71.010~124/10	142010-1240	214(W)x124(H)	71 (W)x124(H)	142(W)x124(H)	214040-12441
DIMENSIONS & WEIGHT	71 (W)x124(H) x350(D) mm;	142(W)x124(H) x350(D) mm;	214(W)x124(H) x350(D) mm;	x350(D) mm;	142(W)x124(H) x350(D)mm;	x350(D) mm;	x350(D) mm;	x350(D) mm;	214(W)x124(H) x350(D) mm;
& WEIGHT	Approx. 3kg	Approx. 5.3kg	Approx. 7.5kg	Approx. 3kg	Approx. 5.3kg	Approx. 7.5kg	Approx. 3kg	Approx. 5.3kg	Approx. 7.5kg
	LL	6	LL						

PSW-008 PSW-009 PSW-010 PSW-011 PSW-012















**PSW-Series** 

#### ORDERING INFORMATION

PSW 30-36	(0~30V/0~36A/360W) Multi-Range DC Power Supply
PSW 30-72	(0~30V/0~72A/720W) Multi-Range DC Power Supply
PSW 30-108	(0~30V/0~108A/1080W) Multi-Range DC Power Supply
PSW 40-27	(0~40V/0~27A/360W) Multi-Range DC Power Supply
PSW 40-54	(0~40V/0~54A/720W) Multi-Range DC Power Supply
PSW 40-81	(0~40V/0~81A/1080W) Multi-Range DC Power Supply
PSW 80-13.5	(0~80V/0~13.5A/360W) Multi-Range DC Power Supply
PSW 80-27	(0~80V/0~27A/720W) Multi-Range DC Power Supply
PSW 80-40.5	(0~80V/0~40.5A/1080W) Multi-Range DC Power Supply
PSW 160-7.2	(0~160V/0~7.2A/360W) Multi-Range DC Power Supply
PSW 160-14.4	(0~160V/0~14.4A/720W) Multi-Range DC Power Supply
PSW 160-21.6	(0~160V/0~21.6A/1080W) Multi-Range DC Power Supply
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 800-4.32	(0~800V/0~4.32A/1080W) Multi-Range DC Power Supply

#### ACCESSORIES:

PSW-012

GTL-123 Test Lead x 1 (for PSW 30V/40V/80V/160V), Power Cord x 1 (Region dependent), GTL-240 USB Cable " L " Type x 1, PSW-004 Basic Accessories Kit x 1 (for PSW 30V/40V/80V/160V), Includes : M4 Terminal screws and washers x 2, Air Filter x 1, Analog control protection dummy x 1, Analog control lock lever x 1, M8 terminal bolts, nuts and washers x 2

PSW-004 Basic Accessories Kit x1 (30V/40V/80V/160V low voltage module)
PSW-008 Basic Accessories Kit for PSW 250V/800V models PSW-009 Output Terminal Cover for 30V/40V/80V/160V models Output Terminal Cover for 250V/800V models High Voltage Output Terminal for 250V/800V model PSW-011

#### **OPTIONAL ACCESSORIES**

PSW-001	Accessory Kit	PSW-010	Large filter (Type II/III)
	Simple IDC Tool	GTL-248	GPIB Cable, Double Shielded, 2000mm
PSW-003	Contact Removal Tool	GTL-250	GPIB Cable, Double Shielded, 600mm
PSW-005	Cable for 2 Units of PSW-Series in Series	GUR-001A	USB to RS-232 Cable, 300mm(H3)
	Mode Connection (for PSW 30V/40V/80V/160V)	GUR-001B	RS-232 to USB Adapter with #4-40 UNC
PSW-006	Cable for 2 Units of PSW-Series in Parallel Mode		Rivet Nut
	Connection	GUG-001	GPIB to USB Adaptor
PSW-007	Cable for 3 Units of PSW-Series in Parallel Mode	GRA-410-J	Rack Mount Kit (JIS)
	Connection	GRA-410-E	Rack Mount Kit (EIA)
GET-001	Extended Terminal with max. 30A(for PSW 30V/40V	//80V/160V	
GET-002	Extended Terminal with max. 10A (for PSW 250V/8	00V)	
GET-005	Extended European Terminal with max. 20A (for P.	SW 30V/40V	//80V/160V)
GTL-130	Test lead: 2 x red, 2 x black(for PSW 250V/800V)		

#### PSW-Series (LV) Rear Panel



PSW-Series (HV) Rear Panel



GRA-410-J/E Rack Mount Kit (JIS/EIA)

For : PSW-Series





GTL-130 Test lead, 1200mm, 18AWG, UL 3239 (for PSW 250V/800V)



GUR-001A USB to RS-232 Cable (for PSW-Series, 300mm)



GUG-001 GPIB to USB Adapter (for GDS-3000Series, PSW-Series)



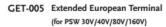
**GET-001** Extended Terminal



(for PSW 30V/40V/80V/160V)

**GET-002** Extended Terminal (for PSW 250V/800V)













#### **PSU-Series**



#### **FEATURES**

- \* Voltage Output : 6V/8V/12.5V/15V/20V/30V/40V/ 50V/60V/80V/100V/150V/300V/400V/600V
- \* Power Output: 1200W ~ 1560W
- \* C.V/C.C Priority Mode
- \* Adjustable Voltage/Current Rise and Fall Time
- \* Series/Parallel Connection: Max. 2 units (Models Under 300V)/4 units of The Same Model
- \* High Efficiency and High Power Density
- \* 1U Height and 19"Rack Mount Size
- \* Three sets of Preset Function
- \* Bleeder Control Function
- \* Internal Resistance Function
- \* Panel Lock Function
- \* Protection : OVP, OCP, OHP, UVL, AC Fail, FAN Fail
- \* Standard : USB, LAN, RS-232, RS-485, Analog Control
- \* Option : GPIB, Isolated Analog Interface (Voltage Control/Current Control)

GW Instek PSU-Series, a DC power supply with high power density design, is 1U in height and compatible with 19" Rack Mount Size. The series is suitable for test system installation or system integration by flexibly selecting models for the integration into the existing test system. The PSU-Series, featuring superior voltage and current control functions, comprises fifteen models with output voltage/current ranging from 6V/200A to 600V/2.6A. The Series is suitable for different test conditions and DUTs, including electronic components testing, micro resistors, relays, shunt resistors, 12V/24V/48V battery simulation, and automotive electronic device testing.

The PSU-HV series is ideal for the primary input of DC/DC converter and servomotor production application. PSU is often integrated into component test systems such as aging test equipment for capacitors; 600V DC bias applications; aging test equipment for diode; semiconductor production equipment; automotive electronics; and ECU for V8 engine or V12 engine, etc.

Utilizing same model units of the PSU-Series to conduct series and parallel connections can increase total output power, total current or total voltage. The wide voltage and current output ranges of the PSU-Series can fully satisfy various voltage and current measurement requirements. The PSU-Series is a single power output DC programmable power supply, which outputs 1200W to 1560W. The PSU-Series provides maximum 2 units in series connection (models under 300V) to achieve maximum 600V or 4 units in parallel connection to obtain maximum 800A and the maximum output power of 6.24 kilowatts.

The PSU-Series allows settings for CC priority or CV priority. Under CC or CV mode, users can adjust slew rate for output voltage or current based upon test requirements. There are two kinds of slew rate settings: high speed priority and slew rate priority. High speed priority sets slew rate at the maximum speed to reach CC or CV mode. Slew rate priority allows users to set slew rate for CC or CV mode in order to control rise or fall slew rate. Slew rate priority mode is ideal for motor tests by adjusting the rise time of output voltage to protect DUT from being damaged by inrush current occurred at turn-on.

Comparing with other 1U power supplies available in the market, PSU supports a most complete array of interfaces, including USB, LAN, RS-232, RS-485, analog control interface, GPIB (option), isolated analog interface (voltage control), and isolated analog interface (current control). Via the multi-drop mode, PSU will not need any switch/hub and GPIB cable for remote control and slave unit augmentation when using LAN, USB or GPIB. This feature can help users save costs on augmentation equipment for connecting slave while using LAN or USB.

The PSU-Series provides users with flexible settings of High/Low Level or Trigger input/Trigger output signals with pulse width of  $1\sim60$ ms. Trigger input controls PSU to output or upload preset voltage, current and memory parameters. While outputting or uploading preset voltage, current and memory parameters PSU can produce corresponding Trigger output signals.

#### **PSU-Series Model Selection Table**

1.5kW 1U High	6-200	8-180	12.5-120		20-76	30-50	40-38	50-30	60-25	80-19	100-15	150-10	300-5	400-3.8	600-2.6
Voltage	6.000 V	8.000 V	12.50 V	15.00 V	20.00 V	30.00 V	40.00 V	50.00 V	60.00 V	80.00 V	100.0 V	150.0 V	300.0 V	400.0 V	600.0 V
Current	200.0 A	180.0 A	120.0 A	100.0 A	76.00 A	50.00 A	38.00 A	30.0 A	25.00 A	19.00 A	15.00 A	10.00 A	5.000 A	3.800 A	2.600 A
Power	1200 W	1440 W	1500 W	1500 W	1520 W	1500 W	1520 W	1500 W	1500 W	1520 W	1500 W	1500 W	1500 W	1520 W	1560 W
3kW 2U High	6-400(B)	8-360(B)	12.5-240(B)	15-200(B)	20-152(B)	30-100(B)	40-76(B)	50-60(B)	60-50(B)	80-38(B)	100-30(B)	150-20(B)	300-10(B)	400-7.6(B)	600-5.2(B)
Voltage	6.000 V	8.000 V	12.50 V	15.00 V	20.00 V	30.00 V	40.00 V	50.00 V	60.00 V	80.00 V	100.0 V	150.0 V	300.0 V	400.0 V	600.0 V
Current	400.0 A	360.0 A	240.0 A	200.0 A	152.0 A	100.0 A	76.00 A	60.00 A	50.00 A	38.00 A	30.00 A	20.00 A	10.00 A	7.600 A	5.200 A
Power	2400 W	2880 W	3000 W	3000 W	3040 W	3000 W	3040 W	3000 W	3000 W	3040 W	3000 W	3000 W	3000 W	3040 W	3120 W
	6-600(B)	8-540(B)	12.5-360(B)	15-300(B)	20-228(B)	30-150(B)	40-114(B)	50-90(B)	60-75 (B)	80-57(B)	100-45(B)	150-30(B)	300-15(B)	400-11.4(B)	600-7.8(B)
	6-600(C)	8-540(C)	12.5-360(C)	15-300(C)	20-228(C)	30-150(C)	40-114(C)	50-90(C)	60-75 (C)	80-57(C)	100-45(C)	150-30(C)	300-15(C)	400-11.4(C)	600-7.8(C)
	6-600(D)	8-540(D)	12.5-360(D)	15-300(D)	20-228(D)	30-150(D)	40-114(D)	50-90(D)	60-75(D)	80-57(D)	100-45(D)	150-30(D)	300-15(D)	400-11.4(D)	600-7.8(D)
Voltage	6.000 V	8.000 V	12.50 V	15.00 V	20.00 V	30.00 V	40.00 V	50.00 V	60.00 V	80.00 V	100.0 V	150.0 V	300.0 V	400.0 V	600.0 V
Current	600.0 A	540.0 A	360.0 A	300.0 A	228.0 A	150.0 A	114.0 A	90.0 A	75.00 A	57.00 A	45.00 A	30.00 A	15.00 A	11.40 A	7.800 A
Power	3600 W	4320 W	4500 W	4500 W	4560 W	4500 W	4560 W	4500 W	4500 W	4560 W	4500 W	4500 W	4500 W	4560 W	4680 W
	6-800(B)	8-720(B)	12.5-480(B)	15-400(B)	20-304(B)	30-200(B)		50-120(B)	60-100(B)	80-76(B)	100-60(B)	150-40(B)	300-20(B)	400-15.2(B)	600-10.4(B)
	6-800(C)	8-720(C)	12.5-480(C)	15-400(C)	20-304(C)	30-200(C)	40-152(C)	50-120(C)	60-100(C)	80-76(C)	100-60(C)	150-40(C)	300-20(C)	400-15.2(C)	600-10.4(C)
40 High	6-800(D)	8-720(D)	12.5-480(D)	15-400(D)	20-304(D)	30-200(D)	40-152(D)	50-120(D)	60-100(D)	80-76(D)	100-60(D)	150-40(D)	300-20(D)	400-15.2(D)	600-10.4(D)
Voltage	6.000 V	8.000 V	12.50 V	15.00 V	20.00 V	30.00 V	40.00 V	50.00 V	60.00 V	80.00 V	100.0 V	150.0 V	300.0 V	400.0 V	600.0 V
Current	800.0 A	720.0 A	480.0 A	400.0 A	304.0 A	200.0 A	152.0 A	120.0 A	100.0 A	76.0 A	60.00 A	40.00 A	20.00 A	15.20 A	10.40 A
Power	4800 W	5760 W	6000 W	6000 W	6080 W	6000 W	6080 W	6000 W	6000 W	6080 W	6000 W	6000 W	6000 W	6080 W	6240 W

Note: B: Input voltage 170–265VAC, single phase; C: Input voltage 180–253VAC, three-phase three-wire; D: Input voltage 360–440VAC, three-phase four-wire; No CE certificate.

SPECIFICATIONS																	
Model		PSU	6-200	8-180	12.5-120	15-100	20-76	30-50	40-38	50-30	60-25	80-19	100-15	150-10	300-5	400-3.8	600-2.6
Rated output voltage (*1)		V	6	8	12.5	15	20	30	40	50	60	80	100	150	300	400	600
Rated output current (*2)		A	200	180	120	100	76	50	38	30	25	19	15	10	5	3.8	2.6
Rated output power		w	1200	1440	1500	1500	1520	1500	1520	1500	1500	1520	1500	1500	1500	1520	1560
Constant Voltage Mode		PSU	6-200	8-180	12.5-120	15-100	20-76	30-50	40-38	50-30	60-25	80-19	100-15	150-10	300-5	400-3.8	600-2.6
Line regulation (*3)		mV	2.6	2.8	3.25	3.5	4	5	6	7	8	10	12	17	32	42	62
Load regulation (°4)		mV	2.6	2.8	3.25	3.5	4	5	6	7	8	10	12	17	32	42	62
Ripple and noise (*5)	p-p (*6)	mV mV	60	60	60	60	60	60	60	60	60	80	80	100	150	200	300
rippie and noise (~5)			8	8	00	8	8	8	8	8		8	8			40	
T	r.m.s. (¢7)	mV	-		0		0				8		0	10	25	40	60
Temperature coefficient		ppm/°C	100ppm/℃	atter a 30 m	inute warm-u												
Remote snese compensation voltage (single wire)		V		1	310	- 1	1	1.5	2	2	3	4	5	5	- 5	5	5
Rise time (*8)	Rated load	ms	80	80	80	80	80	80	80	80	80	150	150	150	150	200	250
- 11.0	No load	ms	80	80	80	80	80	80	80	80	80	150	150	150	150	200	250
Fall time (*9)	Rated load	ms	10	50	50	50	50	80	80	80	80	150	150	150	150	200	250
	No load	ms	500	600	700	700	800	900	1000	1100	1100	1200	1500	2000	2500	3000	4000
Transient response time (*10)		ms	1.5	1.5	1	1	1	. 1	. 1	. 1	1	1	1	2	2	2	2
Constant Current Mode		PSU	6-200	8-180	12.5-120	15-100	20-76	30-50	40-38	50-30	60-25	80-19	100-15	150-10	300-5	400-3.8	600-2.6
Line regulation (*3)		mA	22	20	14	12	9.6	7	5.8	5	4.5	3.9	3.5	3	2.5	2.38	2.26
Load regulation (°11)	1	mA	45	41	29	25	20.2	15	12.6	11	10	8.8	8	7	6	5.76	5.52
Ripple and noise (*12)	r.m.s.	mA	400	360	240	200	152	125	95	85	75	57	45	35	25	17	12
Temperature coefficient		ppm/°C	100ppm/°C		inute warm-u												1 2
Protection Function		PSU	6-200	8-180	12.5-120	15-100	20-76	30-50	40-38	50-30	60-25	80-19	100-15	150-10	300-5	400-3.8	600-2.6
Over voltage protection (OVP)	Setting range	٧	0.6 - 6.6	0.8-8.8	1.25 - 13.75	1.5 - 16.5	2 - 22	3 - 33	4 - 44	5 - 55	5 - 66	5 - 88	5 - 110	5 - 165	5 - 330	5 - 440	5 - 660
5 NO.9 NO.0 CO	Setting accuracy	mV	60	80	125	150	200	300	400	500	600	800	1000	1500	3000	4000	6000
Over current protection (OCP)	Setting range	A	5 - 220	5-198	5 - 132	5 - 110	5 - 83.6	5 - 55	3.8 - 41.8	3 - 33	2.5 - 27.5	1.9 - 20.9	1.5 - 16.5	1 - 11	0.5 - 5.5	0.38 - 4.18	0.26 - 2.86
	Setting accuracy	mA	4000	3600	2400	2000	1520	1000	760	600	500	380	300	200	100	76	52
Under voltage limit (UVL)	Setting range		0 - 6.3	0 - 8.4	0 - 13.12	0 - 15.75	0 - 21	0 - 31.5	0 - 42	0 - 52.5	0 - 63	0 - 84	0 - 105	0 - 157.5	0 - 315	0 - 420	0 - 630
Over temperature protection (OHP)	Operation		Turn the ou														
Incorrect sensing connection protection (SENSE)	Operation		Turn the ou														
Low AC input protection (AC-FAIL)	Operation		Turn the ou														
Shutdown (SD)	Operation		Turn the ou														2
Power limit (POWER LIMIT)	Operation		Over power	-													
Analog Programming and Monitoring	оренинен	PSU	6-200	8-180	12.5-120	15-100	20-76	30-50	40-38	50-30	60-25	80-19	100-15	150-10	300-5	400-3.8	600-2.6
External voltage control output voltage		1.50			0.5% of rated			20.30	10-30	30.30	30-23	30-13	.00/13	.50 10	2003	.00 3.0	230 2.0
External voltage control output voltage  External voltage control output current	_	<del> </del>			1% of rated o												2
	_	<del></del>			1% of rated o												
External resistor control output voltage			-														
External resistor control output current		-			1.5% of rated	output curre	nt.										
Output voltage monitor			Accuracy: ±														
Output current monitor			Accuracy: ±		1.0111.1011.	0.00											
Shutdown control	1	7			a LOW (0V t												
Output on/off control					Turn the out								5V) or open	circuit.			
1 (C) (C)	-	_			g a HIGH (4.5			urn the outpo	it off using a	LOW (UV to t	0.5V) or short	-circuit.					
Alarm clear control					(0V to 0.5V)												
CV/CC/ALM/PWR ON/OUT ON indicator		_			ctor output; N												
Trigger out					ut = 0.8V; mi												-
Trigger in					t voltage = 0.8												
Front Panel		PSU	6-200	8-180	12.5-120	15-100	20-76	30-50	40-38	50-30	60-25	80-19	100-15	150-10	300-5	400-3.8	600-2.6
Display, 4 digits Voltage accuracy	0.1% +	mV	12	16	25	30	40	60	80	100	120	160	200	300	600	800	1200
Current accuracy	0.2% +	mA	600	540	360	300	228	150	114	90	75	57	45	30	15	11.4	7.8
Indications					, A, VSR, ISR					RED LED's: A	LM, ERR						
Buttons			Lock/Local(	(Unlock), PRO	OT(ALM_CLR	), Function (M	<ol><li>M1), Test(M2)</li></ol>	), Set(M3), S	nift, Output								
Knobs		3	Voltage, Cu	rrent													8
USB port		2.000	Type A USB	connector													
Programming and Measurement (RS-232/485, USB	, LAN, GPIB)	PSU	6-200	8-180	12.5-120	15-100	20-76	30-50	40-38	50-30	60-25	80-19	100-15	150-10	300-5	400-3.8	600-2.6
Output voltage programming accuracy	0.05% +	mV	3	4	6.25	7.5	10	15	20	25	30	40	50	75	150	200	300
Output current programming accuracy	0.2% +	mA	200	180	120	100	76	50	38	30	25	19	15	10	5	3.8	2.6
Output voltage programming resolution		mV	0.2	0.27	0.4	0.5	0.7	1	1.3	1,7	2	2.7	3.4	5.2	10.2	13.6	20.4
Output current programming resolution		mA	6	6	4	3.3	2.5	1.7	1.2	1	0.8	0.65	0.5	0.34	0.19	0.13	0.09
Output voltage measurement accuracy	0.1% +	mV	6	8	12.5	15	20	30	40	50	60	80	100	150	300	400	600
Output current measurement accuracy	0.2% +	mA	400	360	240	200	152	100	76	60	50	38	30	20	10	7.6	5.2
Output current measurement accuracy  Output voltage measurement resolution		mV	0.2	0.27	0.4	0.5	0.7	1	1.3	1.7	2	2.7	3.4	5.2	10.2	13.6	20.4
Output voltage measurement resolution  Output current measurement resolution	<del>                                     </del>	mA	6	6	4	3.3	2.5	1.7	1.3	1.7	0.8	0.65	0.5	0.34	0.19	0.13	0.09
		PSU	6-200	-		15-100	20-76	30-50	40-38	50-30	60-25		100-15			400-3.8	
Input Characteristics		P50		8-180	12.5-120 ~ 60Hz, single		20-76	30-30	40-38	30-30	60-25	80-19	100-15	150-10	300-5	400-3.8	600-2.6
Norminal input rating	1	-	85Vac - 265		- oursz, singi	- priase											
Input voltage range	1	<del></del>	47Hz ~ 63H	22.22													0
Imput frequency range	100% - 10000	<b>.</b>		16.													
Maximum input current	100Vac / 200Vac	A	21 / 11	0.4													-
Inrush current			Less than 5	UA													9
Maximum input power		VA	2000														
Power factor	100Vac / 200Vac		0.99 / 0.98														
Efficiency (*13)	100Vac / 200Vac	%	76.5 / 79	78/81	82 / 85	82 / 85	83 / 86	83 / 86	84 / 87	84 / 87	84 / 87	84 / 87	84 / 87	84 / 87	84 / 87	84 / 87	84 / 87
Hold-up time			20ms or gre														
Interface Capabilities		PSU	6-200	8-180	12.5-120	15-100	20-76	30-50	40-38	50-30	60-25	80-19	100-15	150-10	300-5	400-3.8	600-2.6
USB	5				ve, Speed: 1.1						y**	7		7 8	7	× -	· 5
LAN					ddress, User			dress, Instrur	nent IP Addre	ss, Subnet M	task						
RS-232 / RS-485			Complies w	ith the EIA23	2D / EIA485 S	Specifications											- 10
GPIB (Factory Option)			SCPI - 1993		compliant inte		55	.V	· 20 - 1 - 1 - 1 - 1	18	al .		0	9 -	2 2 2		a 1, 8
Isolated Analog Control Interface (Factory Option)		PSU	6-200	8-180	12.5-120	15-100	20-76	30-50	40-38	50-30	60-25	80-19	100-15	150-10	300-5	400-3.8	600-2.6
Voltage Control					gnals for prog												
Current Control	2				signals for pr					ls.							
Environmental Conditions		PSU	6-200		12.5-120		20-76	30-50	40-38	50-30	60-25	80-19	100-15	150-10	300-5	400-3.8	600-2.6
Operaing temperature			0.C-20.C														
Storage temperature	1		-25 °C ~ 70														9
Operating humidity	_	1		RH; No con	densation												
		<del></del>		less; No con													
Storage humidity Altitude	_	_	Maximum 2		ore transition												
		PSU	6-200	8-180	12.5-120	15-100	20-76	30-50	40-38	50-30	60-25	80-19	100-15	150-10	300-5	400-3.8	600-2.6
General Specifications	mala				12.5-120	15-100	20-76	30-30	40-38	30-30	60-25	80-19	100-15	130-10	300-3	400-3.8	600-2.6
Weight	main unit only	kg	Less than 8														
	(W×H×D)	mm	423 × 43.6 >		1.5												
Dimensions																	- 39
Cooling			Forced air c														
Cooling EMC			Complies w	ith the Europ	ean EMC dire												
Cooling EMC Safety			Complies w	ith the Europ ith the Europ	ean EMC dire ean Low Volt	age Directive	73/23/EEC a	nd carries th	e CE-marking.	i e							
Cooling EMC Safety Withstand voltage			Complies w Complies w AC to Chass	ith the Europ ith the Europ sis : 1500Vac	ean EMC dire ean Low Volt /1min; AC to	age Directive Output termi	73/23/EEC a nal : 3000Vac	nd carries th	e CE-marking. ≤150V; Outpi	ut terminal to		00Vdc/1min;	150 <vout≦< td=""><td>600; Output te</td><td>erminal to Cl</td><td>nassis : 1500V</td><td>/dc/1min</td></vout≦<>	600; Output te	erminal to Cl	nassis : 1500V	/dc/1min
Cooling EMC Safety			Complies w Complies w AC to Chass	ith the Europ ith the Europ sis : 1500Vac	ean EMC dire ean Low Volt	age Directive Output termi	73/23/EEC a nal : 3000Vac	nd carries th	e CE-marking. ≤150V; Outpi	ut terminal to		00Vdc/1min;	150 <vout≦< td=""><td>600; Output te</td><td>erminal to Cl</td><td>nassis : 1500V</td><td>/dc/1min</td></vout≦<>	600; Output te	erminal to Cl	nassis : 1500V	/dc/1min

- Notes:
  (\*1) Minimum voltage is guaranteed to maximum 0.2% of the rated output voltage.
  (\*2) Minimum current is guaranteed to maximum 0.4% of the rated output current.
  (\*2) All SP 132Vac or 170 265Vac, constant load.
  (\*3) At SP 132Vac or 170 265Vac, constant load.
  (\*4) From No-load to Full-load, constant input voltage. Measured at the sensing point in Remote Sense.
  (\*5) Measurement frequency bandwidth is 10Hz 20MHz.
  (\*6) Measurement frequency bandwidth is 10Hz 20MHz.
  (\*7) Measurement frequency bandwidth is 10Hz 1MHz.
  (\*8) From 10% 90% of rated output voltage, with rated resistive load.
  (\*9) From 90% 10% of rated output voltage, with rated resistive load.
  (\*10) Time for output voltage to recover within 0.5% of its rated output for a load change from 10 90% of its rated output current. Voltage set point from 10% 100% of rated output.
  - (\*11) For load voltage change, equal to the unit voltage rating, constant input voltage.

    (\*12) For 6V 20V model the ripple is measured at 2V rated output voltage and full output current.

    For other models, the ripple is measured at 10 100% output voltage and full output current.

    (\*14) If install the front panel filter kit, the temperature is guaranteed to 40° C.

SPECIFIC ALICINS																	
SPECIFICATIONS		PSU	6-400	8-360	12.5-240	15-200	20-152	30-100	40-76	50-60	60-50	80-38	100-30	150-20	300-10	400-7.6	600-5.2
Rated output voltage (*1)		V	6	8	12.5-240	15-200	20-132	30-100	40-76	50	60	80	100-30	150-20	300-10	400-7.6	600
Rated output current (*2)		A	400	360	240	200	152	100	76	60	50	38	30	20	10	7.6	5.2
Rated output power		w	2400	2880	3000	3000	3040	3000	3040	3000	3000	3040	3000	3000	3000	3040	3120
Constant Voltage Mode		PSU	6-400	8-360	12.5-240	15-200	20-152	30-100	40-76	50-60	60-50	80-38	100-30	150-20	300-10	400-7.6	600-5.2
Line regulation (*3)		mV		ted output vo		13-200	20-132	30-100	40-70	30.00	00-30	00-30	100-50	130-20	300-10	400-7.0	000-3.2
Load regulation (*4)		mV		ted output vo													-
	00	mV mV		75		71	75	20	75	75	71	100	100	120	300	300	500
Ripple and noise (*5)	p-p (*6)		75		75	75	75	75	75	77.50	75	10000	100	120			
	r.m.s. (*7)	mV	10	10	10	10	10	10	10	10	10	15	15	25	35	35	120
Temperature coefficient		ppm/°C			inute warm-up				-	1 10	507.00		100				_
Temperature stability										line, load & te	mp.						
Warm-up drift			Less than 0.	.05% of rated	output voltag	ge +ZmV ove	r 30 minutes										
Remote snese compensation voltage (single wire)		V	1	1	1	1	1	1.5	2	2	3	4	5	5	5	5	5
Rise time (*8)	No load	ms	80	80	80	80	80	80	80	80	80	150	150	150	150	200	250
Fall time (±9)	Rated load	ms	10	50	50	50	50	80	80	80	80	150	150	150	150	200	250
	No load	ms	500	600	700	700	800	900	1000	1100	1100	1200	1500	2000	2500	3000	4000
Transient response time (*10)		ms	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Constant Current Mode		PSU	6-400	8-360	12.5-240	15-200	20-152	30-100	40-76	50-60	60-50	80-38	100-30	150-20	300-10	400-7.6	600-5.2
Line regulation (+3)	-	mA	0.05% of ra	ted output cu	irrent		>1 3	5 S	-	k (5)		1.	10	<u> </u>		0 6	
Load regulation (*11)		mA		ed output cur			28.0.	505 3010				1% of rated	output currer	nt			
Load regulation thermal drift		c v.i	Less than 0.	.1% of rated	output curren	t over 30 mir	utes followin	g load change	2.		10000	.0 (2).0 (2)			er odube e	53 - N/A	
Ripple and noise (*12)	r.m.s.	mA	850	800	650	590	520	290	185	137	107	85	69	58	30	20	15
Temperature coefficient		ppm/°C	100ppm/°C	after a 30 m	inute warm-up	)	v	- 1	1	A C		- 1	V				- 17
Temperature stability	ģ.		0.05% of ra	ted output cu	irrent over 8h	rs interval fol	lowing 30 mi	nutes warm-u	p. Constant	ine, load & te	тр.						
Warm-up drift		X	6-15V mod	el : Less than	0.5% rated o	utput current	t over 30 min	utes following	power on ;	20-600V mod	el : Less than	0.25% rated	output currer	nt over 30 mir	nutes followin	ng power on.	
Protection Function		PSU	6-400	8-360	12.5-240	15-200	20-152	30-100	40-76	50-60	60-50	80-38	100-30	150-20	300-10	400-7.6	600-5.2
Over voltage protection (OVP)	Setting range	V	0.6 - 6.6	0.8-8.8	1.25 - 13.75	1.5 - 16.5	2 - 22	3 - 33	4 - 44	5 - 55	5 - 66	5 - 88	5 - 110	5 - 165	5 - 330	5 - 440	5 - 660
	Setting accuracy	mV	60	80	125	150	200	300	400	500	600	800	1000	1500	3000	4000	6000
Over current protection (OCP)	Setting range	A	5 - 440	5-396	5 - 262	5 - 220	5 - 167.2	5 - 110	5 - 83.6	5 - 66	5 - 55	3.8 - 41.8	3 - 33	2 - 22	1 - 11	0.76 - 8.36	0.52 - 5.72
	Setting accuracy	A	- 8	7.2	4.8	4	3.04	2	1.52	1.2	1	0.76	0.6	0.4	0.2	0.152	0.104
Under voltage limit (UVL)	Setting range		0 - 6.3	0 - 8.4	0 - 13.12	0 - 15.75	0 - 21	0 - 31.5	0 - 42	0 - 52.5	0 - 63	0 - 84	0 - 105	0 - 157.5	0 - 315	0 - 420	0 - 630
Over temperature protection (OHP)	Operation	~	Turn the ou									- 77					
Incorrect sensing connection protection (SENSE)	Operation	7.	Turn the ou														-
Low AC input protection (AC-FAIL)	Operation		Turn the ou														-
Shutdown (SD)	Operation		Turn the ou														-
Power limit (POWER LIMIT)	Operation		Over power														-
TOWN HIME (TOWN CHAIT)	Value (fixed)			% of rated o	utnut nower												-
Front Panel	value (lixeu)	PSU	6-400	8-360	12.5-240	15-200	20-152	30-100	40-76	50-60	60-50	80-38	100-30	150-20	300-10	400-7.6	600-5.2
Display, 4 digits Voltage accuracy	0.1% +	mV	12	16	25	30	40	60	80	100	120	160	200	300	600	800	1200
Current accuracy	0.2% +	mA	1200	1080	720	600	456	300	228	180	150	114	90	60	30	22.8	15.6
Indications	U.E./U +	IIIA								ED LED's: AL			20	- 00		22.0	13.0
Buttons	7	7			OT(ALM_CLR)					ED EED 3. ME	in, Lini						
Knobs		2	Voltage, Cu		JI (MEMILCEN	, runction(s	nij, reselwiz	, seelwist, si	in, Output								-
USB port		15	Type A USB														-
Programming and Measurement (RS-232/485, USB	LAN CRIP	PSU	6-400	8-360	12.5-240	15-200	20-152	30-100	40-76	50-60	60-50	80-38	100-30	150-20	300-10	400-7.6	600-5.2
	0.05% +	mV	3	4	6.25	7.5	10	15	20	25	30	40	50	75	150	200	300
Output voltage programming accuracy	0.2% +			4	0.23		10		20					13			5.2
Output current programming accuracy				260	240	200	152		76					20			
	0.2% +	mA	400	360	240	200	152	100	76	60	50	38	30	20	10	7.6	
Output voltage programming resolution	0.2% +	mV	0.2	0.27	0.4	0.5	0.7	1 /	1.3	1.7	2	2.7	3.4	5.2	10 10.2	13.6	20.4
Output voltage programming resolution Output current programming resolution		mV mA	0.2 12	0.27 12	0.4 8	0.5 6.6	0.7 5	3.4	1.3 2.4	1.7	2	2.7	3.4	5.2 0.68	10 10.2 0.38	13.6 0.26	20.4 0.18
Output voltage programming resolution Output current programming resolution Output voltage measurement accuracy	0.1% +	mV mA mV	0.2 12 6	0.27 12 8	0.4 8 12.5	0.5 6.6 15	0.7 5 20	3.4 30	1.3 2.4 40	1.7 2 50	2 1.6 60	2.7 1.3 80	3.4 1 100	5.2 0.68 150	10 10.2 0.38 300	13.6 0.26 400	20.4 0.18 600
Output voltage programming resolution Output current programming resolution Output voltage measurement accuracy Output current measurement accuracy		mV mA mV mA	0.2 12 6 800	0.27 12 8 720	0.4 8 12.5 480	0.5 6.6 15 400	0.7 5 20 304	1 3.4 30 200	1.3 2.4 40 152	1.7 2 50 120	2 1.6 60 100	2.7 1.3 80 76	3.4 1 100 60	5.2 0.68 150 40	10 10.2 0.38 300 20	13.6 0.26 400 15.2	20.4 0.18 600 10.4
Output voltage programming resolution Output current programming resolution Output voltage measurement accuracy Output current measurement accuracy Output current measurement resolution	0.1% +	mV mA mV mA mV	0.2 12 6 800 0.2	0.27 12 8 720 0.27	0.4 8 12.5 480 0.4	0.5 6.6 15 400 0.5	0.7 5 20 304 0.7	1 3.4 30 200	1.3 2.4 40 152 1.3	1.7 2 50 120	2 1.6 60 100 2	2.7 1.3 80 76 2.7	3.4 1 100	5.2 0.68 150 40 5.2	10 10.2 0.38 300 20 10.2	13.6 0.26 400 15.2 13.6	20.4 0.18 600 10.4 20.4
Output voltage programming resolution Output current programming resolution Output voltage measurement accuracy Output current measurement accuracy Output current measurement resolution Output current measurement resolution	0.1% +	mV mA mV mA mV	0.2 12 6 800 0.2	0.27 12 8 720 0.27 12	0.4 8 12.5 480 0.4 8	0.5 6.6 15 400 0.5 6.6	0.7 5 20 304 0.7 5	1 3.4 30 200 1 3.4	1.3 2.4 40 152 1.3 2.4	1.7 2 50 120 1.7 2	2 1.6 60 100 2 1.6	2.7 1.3 80 76 2.7 1.3	3.4 1 100 60 3.4	5.2 0.68 150 40 5.2 0.68	10 10.2 0.38 300 20 10.2 0.38	13.6 0.26 400 15.2 13.6 0.26	20.4 0.18 600 10.4 20.4 0.18
Output voltage programming resolution Output current programming resolution Output voltage measurement accuracy Output current measurement accuracy Output current measurement resolution Output current measurement resolution Input Characteristics	0.1% +	mV mA mV mA mV	0.2 12 6 800 0.2 12 6-400	0.27 12 8 720 0.27 12 8-360	0.4 8 12.5 480 0.4 8 12.5-240	0.5 6.6 15 400 0.5	0.7 5 20 304 0.7	1 3.4 30 200	1.3 2.4 40 152 1.3	1.7 2 50 120	2 1.6 60 100 2	2.7 1.3 80 76 2.7	3.4 1 100 60	5.2 0.68 150 40 5.2	10 10.2 0.38 300 20 10.2	13.6 0.26 400 15.2 13.6	20.4 0.18 600 10.4 20.4
Output voltage programming resolution Output current programming resolution Output voltage measurement accuracy Output current measurement accuracy Output voltage measurement resolution Output current measurement resolution Input Characteristics Norminal input rating	0.1% +	mV mA mV mA mV	0.2 12 6 800 0.2 12 6-400 B type: 1P2	0.27 12 8 720 0.27 12 8-360 W 200V mod	0.4 8 12.5 480 0.4 8 12.5-240	0.5 6.6 15 400 0.5 6.6	0.7 5 20 304 0.7 5	1 3.4 30 200 1 3.4	1.3 2.4 40 152 1.3 2.4	1.7 2 50 120 1.7 2	2 1.6 60 100 2 1.6	2.7 1.3 80 76 2.7 1.3	3.4 1 100 60 3.4	5.2 0.68 150 40 5.2 0.68	10 10.2 0.38 300 20 10.2 0.38	13.6 0.26 400 15.2 13.6 0.26	20.4 0.18 600 10.4 20.4 0.18
Output voltage programming resolution Output current programming resolution Output voltage measurement accuracy Output current measurement accuracy Output voltage measurement resolution Output current measurement resolution Input Characteristics Norminal input rating Input voltage range	0.1% +	mV mA mV mA mV	0.2 12 6 800 0.2 12 6-400 8 type: 1P2 B type: 1P2	0.27 12 8 720 0.27 12 8-360 W 200V mod	0.4 8 12.5 480 0.4 8 12.5-240	0.5 6.6 15 400 0.5 6.6	0.7 5 20 304 0.7 5	1 3.4 30 200 1 3.4	1.3 2.4 40 152 1.3 2.4	1.7 2 50 120 1.7 2	2 1.6 60 100 2 1.6	2.7 1.3 80 76 2.7 1.3	3.4 1 100 60 3.4	5.2 0.68 150 40 5.2 0.68	10 10.2 0.38 300 20 10.2 0.38	13.6 0.26 400 15.2 13.6 0.26	20.4 0.18 600 10.4 20.4 0.18
Output voltage programming resolution Output current programming resolution Output voltage measurement accuracy Output voltage measurement accuracy Output current measurement resolution Output voltage measurement resolution Output current measurement resolution input Characteristics Norminal input rating Input voltage range Input frequency range	0.1% + 0.2% +	mV mA mV mA mV mA PSU	0.2 12 6 800 0.2 12 6-400 B type: 1P2 B type: 1P2 47Hz ~ 63H	0.27 12 8 720 0.27 12 8-360 W 200V mod W 170 ~ 265	0.4 8 12.5 480 0.4 8 12.5-240	0.5 6.6 15 400 0.5 6.6	0.7 5 20 304 0.7 5	1 3.4 30 200 1 3.4	1.3 2.4 40 152 1.3 2.4	1.7 2 50 120 1.7 2	2 1.6 60 100 2 1.6	2.7 1.3 80 76 2.7 1.3	3.4 1 100 60 3.4	5.2 0.68 150 40 5.2 0.68	10 10.2 0.38 300 20 10.2 0.38	13.6 0.26 400 15.2 13.6 0.26	20.4 0.18 600 10.4 20.4 0.18
Output voltage programming resolution Output current programming resolution Output voltage measurement accuracy Output current measurement accuracy Output current measurement resolution Output current measurement resolution Input Characteristics Norminal input rating Input voltage range Input voltage range Input fearurery range Maximum input current	0.1% +	mV mA mV mA mV	0.2 12 6 800 0.2 12 6-400 8 type: 1P2 8 type: 1P2 47Hz – 63H 8 type: 22A	0.27 12 8 720 0.27 12 8-360 W 200V mod W 170 ~ 265	0.4 8 12.5 480 0.4 8 12.5-240 lels	0.5 6.6 15 400 0.5 6.6 15-200	0.7 5 20 304 0.7 5	1 3.4 30 200 1 3.4	1.3 2.4 40 152 1.3 2.4	1.7 2 50 120 1.7 2	2 1.6 60 100 2 1.6	2.7 1.3 80 76 2.7 1.3	3.4 1 100 60 3.4	5.2 0.68 150 40 5.2 0.68	10 10.2 0.38 300 20 10.2 0.38	13.6 0.26 400 15.2 13.6 0.26	20.4 0.18 600 10.4 20.4 0.18
Output voltage programming resolution Output current programming resolution Output voltage measurement accuracy Output voltage measurement accuracy Output voltage measurement resolution Output current measurement resolution Input Characteristics Norminal input rating Input voltage range Input frequency range Maximum input current Inrush current	0.1% + 0.2% + 200Vac	mV mA mV mA mV mA PSU	0.2 12 6 800 0.2 12 6-400 8 type: 1P2 8 type: 1P2 47Hz - 63H 8 type: 22A 8 type: 1P2	0.27 12 8 720 0.27 12 8-360 W 200V mod W 170 ~ 265	0.4 8 12.5 480 0.4 8 12.5-240	0.5 6.6 15 400 0.5 6.6 15-200	0.7 5 20 304 0.7 5	1 3.4 30 200 1 3.4	1.3 2.4 40 152 1.3 2.4	1.7 2 50 120 1.7 2	2 1.6 60 100 2 1.6	2.7 1.3 80 76 2.7 1.3	3.4 1 100 60 3.4	5.2 0.68 150 40 5.2 0.68	10 10.2 0.38 300 20 10.2 0.38	13.6 0.26 400 15.2 13.6 0.26	20.4 0.18 600 10.4 20.4 0.18
Output voltage programming resolution Output voltage measurement accuracy Output voltage measurement accuracy Output voltage measurement accuracy Output current measurement resolution Output current measurement resolution Input voltage measurement resolution Input Characteristics Norminal input rating Input voltage range Input frequency range Maximum input current Inrush current Power factor	0.1% + 0.2% +	mV mA mV mA mV mA PSU	0.2 12 6 800 0.2 12 6-400 B type: 1P2 B type: 1P2 47Hz - 63H B type: 22A B type: 1P2 0.98 @1 Ph	0.27 12 8 720 0.27 12 8-360 W 200V mod W 170 ~ 265 Iz W 200V mod ase 200Vac	0.4 8 12.5 480 0.4 8 12.5-240 lels Vac	0.5 6.6 15 400 0.5 6.6 15-200	0.7 5 20 304 0.7 5 20-152	1 3.4 30 200 1 3.4 30-100	1.3 2.4 40 152 1.3 2.4 40-76	1.7 2 50 120 1.7 2 50-60	2 1.6 60 100 2 1.6 60-50	2.7 1.3 80 76 2.7 1.3 80-38	3.4 1 100 60 3.4 1 100-30	5.2 0.68 150 40 5.2 0.68 150-20	10 10.2 0.38 300 20 10.2 0.38 300-10	13.6 0.26 400 15.2 13.6 0.26 400-7.6	20.4 0.18 600 10.4 20.4 0.18 600-5.2
Output voltage programming resolution Output voltage measurement accuracy Output voltage measurement accuracy Output voltage measurement accuracy Output current measurement resolution Output voltage measurement resolution Input Characteristics Norminal input rating Input voltage range Input requency range Maximum input current Inrush current Inrush current Efficiency (*13)	0.1% + 0.2% + 200Vac	mV mA mV mA mV mA PSU	0.2 12 6 800 0.2 12 6-400 B type: 1P2 47Hz ~ 63H B type: 22A B type: 1P2 0.98 @1 Ph	0.27 12 8 720 0.27 12 8-360 W 200V mod ase 200Vac 81	0.4 8 12.5 480 0.4 8 12.5-240 lels	0.5 6.6 15 400 0.5 6.6 15-200	0.7 5 20 304 0.7 5	1 3.4 30 200 1 3.4	1.3 2.4 40 152 1.3 2.4	1.7 2 50 120 1.7 2	2 1.6 60 100 2 1.6	2.7 1.3 80 76 2.7 1.3	3.4 1 100 60 3.4	5.2 0.68 150 40 5.2 0.68	10 10.2 0.38 300 20 10.2 0.38	13.6 0.26 400 15.2 13.6 0.26	20.4 0.18 600 10.4 20.4 0.18
Output voltage programming resolution Output current programming resolution Output current programming resolution Output voltage measurement accuracy Output voltage measurement accuracy Output voltage measurement resolution Output current measurement resolution Input characteristics Norminal input rating Input voltage range Input requency range Maximum input current Inrush current Power factor Efficiency (?13) Hold-up time	0.1% + 0.2% + 200Vac	mV mA mV mA mV mA PSU	0.2 12 6 800 0.2 12 6-400 B type: 1P2 47Hz ~ 63H B type: 22A B type: 22A 9 type: 29 0.98 @1 Ph 78.5 20ms or gree	0.27 12 8 720 0.27 12 8-360 W 200V mod W 170 ~ 265 iz W 200V mod ase 200Vac	0.4 8 12.5 480 0.4 8 12.5-240 iels Vac	0.5 6.6 15 400 0.5 6.6 15-200	0.7 5 20 304 0.7 5 20-152	1 3.4 30 200 1 3.4 30-100	1.3 2.4 40 152 1.3 2.4 40-76	1.7 2 50 120 1.7 2 50-60	2 1.6 60 100 2 1.6 60-50	2.7 1.3 80 76 2.7 1.3 80-38	3.4 1 100 60 3.4 1 100-30	5.2 0.68 150 40 5.2 0.68 150-20	10 10.2 0.38 300 20 10.2 0.38 300-10	13.6 0.26 400 15.2 13.6 0.26 400-7.6	20.4 0.18 600 10.4 20.4 0.18 600-5.2
Output voltage programming resolution Output voltage measurement accuracy Output voltage measurement accuracy Output voltage measurement accuracy Output current measurement resolution Output current measurement resolution Output current measurement resolution input Characteristics Norminal input rating Input voltage range Input woltage range Input must current Inrush current Power factor Efficiency (*13) Hold-up time Interface Capabilities	0.1% + 0.2% + 200Vac	mV mA mV mA mV mA PSU	0.2 12 6 800 0.2 12 6-400 B type : 1P2 47Hz ~ 63H B type : 1P2 47Hz ~ 63H 78.5 20ms or gre 6-400	0.27 12 8 720 0.27 12 8-360 W 200V mod W 170 ~ 2655 Iz W 200V ac 81 acter 8-360	0.4 8 12.5 480 0.4 8 12.5-240 lels Vac	0.5 6.6 15 400 0.5 6.6 15-200	0.7 5 20 304 0.7 5 20-152	1 3.4 30 200 1 3.4 30-100	1.3 2.4 40 152 1.3 2.4 40-76	1.7 2 50 120 1.7 2 50-60	2 1.6 60 100 2 1.6 60-50	2.7 1.3 80 76 2.7 1.3 80-38	3.4 1 100 60 3.4 1 100-30	5.2 0.68 150 40 5.2 0.68 150-20	10 10.2 0.38 300 20 10.2 0.38 300-10	13.6 0.26 400 15.2 13.6 0.26 400-7.6	20.4 0.18 600 10.4 20.4 0.18 600-5.2
Output voltage programming resolution Output current programming resolution Output voltage measurement accuracy Output voltage measurement accuracy Output current measurement resolution Output uvoltage measurement resolution Output current measurement resolution Input Characteristics Norminal input rating Input though range Input requency range Maximum input current Inrush current Inrush current Efficiency (*13) Hold-up time Interface Capabilities USB	0.1% + 0.2% + 200Vac	mV mA mV mA mV mA PSU	0.2 12 6 800 0.2 12 6-400 B type: 1P2 B type: 1P2 6 type: 1P2 0.98 @1 Ph 78.5 20ms or gre 6-400 TypeA: Hos	0.27 12 8 720 0.27 12 8-360 W 200V mod W 170 ~ 265 iz W 200V ac 81 aster 8-360 st, Type8 : Sla	0.4 8 12.5 480 0.4 8 12.5-240 els Vac  12.5-240 els Less than 85	0.5 6.6 15 400 0.5 6.6 15-200	0.7 5 20 304 0.7 5 20-152	1 3.4 30 200 1 3.4 30-100	1.3 2.4 40 152 1.3 2.4 40-76	1.7 2 50 120 1.7 2 50-60	2 1.6 60 100 2 1.6 60-50	2.7 1.3 80 76 2.7 1.3 80-38	3.4 1 100 60 3.4 1 100-30	5.2 0.68 150 40 5.2 0.68 150-20	10 10.2 0.38 300 20 10.2 0.38 300-10	13.6 0.26 400 15.2 13.6 0.26 400-7.6	20.4 0.18 600 10.4 20.4 0.18 600-5.2
Output voltage programming resolution Output current programming resolution Output current programming resolution Output voltage measurement accuracy Output voltage measurement accuracy Output voltage measurement resolution Output current measurement resolution Input Characteristics Norminal input rating Input voltage range Input voltage range Input frequency range Maximum input current Inrush current Power factor Efficiency (*13) Hold-up time Interface Capabilities USB LAN	0.1% + 0.2% + 200Vac	mV mA mV mA mV mA PSU	0.2 12 6 800 0.2 12 6-400 B type: 1P2 47Hz - 63H B type: 22A 8 type: 22A 20ms or gre 6-400 TypeA: Hoto MAC Addre	0.27 12 8 720 0.27 12 8-360 W 200V mod W 170 ~ 265 Iz W 200V ac 81 sater 8-360 8, t, TypeB: Sis, SN, SIPA	0.4 8 12.5 480 0.4 8 12.5-240 els Less than 85 12.5-240 ddress, User i	0.5 6.6 15 400 0.5 6.6 15-200	0.7 5 20 304 0.7 5 20-152	1 3.4 30 200 1 3.4 30-100	1.3 2.4 40 152 1.3 2.4 40-76	1.7 2 50 120 1.7 2 50-60	2 1.6 60 100 2 1.6 60-50	2.7 1.3 80 76 2.7 1.3 80-38	3.4 1 100 60 3.4 1 100-30	5.2 0.68 150 40 5.2 0.68 150-20	10 10.2 0.38 300 20 10.2 0.38 300-10	13.6 0.26 400 15.2 13.6 0.26 400-7.6	20.4 0.18 600 10.4 20.4 0.18 600-5.2
Output voltage programming resolution Output voltage measurement accuracy Output voltage measurement accuracy Output voltage measurement accuracy Output voltage measurement resolution Output current measurement resolution Output current measurement resolution Input Characteristics Norminal input rating Input voltage range Input frequency range Maximum input current Inrush current Power factor Efficiency (*13) Hold-up time Interface Capabilities USB USB LAN RS-232 / RS-485	0.1% + 0.2% + 200Vac	mV mA mV mA mV mA PSU	0.2 12 6 800 0.2 12 6-400 8 type: 1P2 47Hz ~ 63H 8 type: 22A 8 type: 22A 5 type: 1P2 0.98 @1 Th 78.5 20ms or gre 6-400 TypeA: Hot MAC Addrec Complies w	0.27 12 8 720 0.27 12 8-360 W 200V mod W 170 ~ 265 Iz W 200V mod ase 200Vac ase 200Vac 8-360 8-360 st, TypeB : Sla sts, TypeB : Sla	0.4 8 12.5 480 0.4 8 12.5-240 lels Vac  85 12.5-240 12.5-240 12.5-240 12.5-240 12.5-240 12.5-240 12.5-240 12.5-240 12.5-240 12.5-240 12.5-240 12.5-240	0.5 6.6 15 400 0.5 6.6 15-200	0.7 5 20 304 0.7 5 20-152	1 3.4 30 200 1 3.4 30-100	1.3 2.4 40 152 1.3 2.4 40-76	1.7 2 50 120 1.7 2 50-60	2 1.6 60 100 2 1.6 60-50	2.7 1.3 80 76 2.7 1.3 80-38	3.4 1 100 60 3.4 1 100-30	5.2 0.68 150 40 5.2 0.68 150-20	10 10.2 0.38 300 20 10.2 0.38 300-10	13.6 0.26 400 15.2 13.6 0.26 400-7.6	20.4 0.18 600 10.4 20.4 0.18 600-5.2
Output voltage programming resolution Output current programming resolution Output voltage measurement accuracy Output voltage measurement accuracy Output current measurement resolution Output current measurement resolution Output current measurement resolution Input Characteristics Norminal input rating Input voltage range Input requency range Maximum input current Inrush current Power factor Efficiency (*13) Hold-up time Interface Capabilities USB LAN RS-232 / RS-485 GPIB (Factory Option)	0.1% + 0.2% + 200Vac	mV mA mV mA mV mA PSU  A	0.2 12 6 800 0.2 12 6-400 B type: 1P2 8 type: 1P2 998@1 Ph 78.5 20ms or gre 6-400 TypeA: Hot MAC Adder w SCPI - 1993	0.27 12 8 720 0.27 12 8-360 W 200V mod ase 200Vac 81 sater 8-360 it, TypeB : Slass, DNS IP A ith the EIA23, IEEE 488.2	0.4 8 12.5 480 0.4 8 12.5-240 lels Vac lels Less than 85 12.5-240 ave, Speed: 1. ddress, User 120 / EIABS 5 compliant internal in	0.5 6.6 15 400 0.5 6.6 15-200 100A. 85 15-200 USB C Password, G Specifications	0.7 5 20 304 0.7 5 20-152 86 20-152 ass : CDC (Cdateway IP Addes	3.4 30 200 1 3.4 30-100 86 30-100	1.3 2.4 40 152 1.3 2.4 40-76 87 40-76	1.7 2 50 120 1.7 2 50-60 87 87	2 1.6 60 100 2 1.6 60-50 87	2.7 1.3 80 76 2.7 1.3 80-38	3.4 1 100 60 3.4 1 100-30	5.2 0.68 150 40 5.2 0.68 150-20	10 10.2 0.38 300 20 10.2 0.38 300-10	13.6 0.26 400 15.2 13.6 0.26 400-7.6	20.4 0.18 600 10.4 20.4 0.18 600-5.2
Output voltage programming resolution Output current programming resolution Output current programming resolution Output current measurement accuracy Output current measurement accuracy Output current measurement resolution Output current measurement resolution Input characteristics Norminal input rating Input thating Input requency range Maximum input current Inrush current Power factor Efficiency (*13) Hold-up time Interface Capabilities USB LAN RS-232 / RS-485 GPIB (Factory Option) Environmental Conditions	0.1% + 0.2% + 200Vac	mV mA mV mA mV mA PSU	0.2 12 6 800 0.2 12 6-400 B type: 1P2 6-400 B type: 2P2 B type: 2P2 0.98 @1 Ph 78.5 20ms or gre 6-400 TypeA: Hoto MAC Addre Complies w SCPI - 1993 6-400	0.27 12 8 720 0.27 12 8-360 W 200V mod w 170 ~ 265 iz W 200V ac 81 sater 8-360 st, TypeB : Sls	0.4 8 12.5 480 0.4 8 12.5-240 lels Vac  85 12.5-240 12.5-240 12.5-240 12.5-240 12.5-240 12.5-240 12.5-240 12.5-240 12.5-240 12.5-240 12.5-240 12.5-240	0.5 6.6 15 400 0.5 6.6 15-200 100A. 85 15-200 USB C Password, G Specifications	0.7 5 20 304 0.7 5 20-152	1 3.4 30 200 1 3.4 30-100	1.3 2.4 40 152 1.3 2.4 40-76	1.7 2 50 120 1.7 2 50-60	2 1.6 60 100 2 1.6 60-50	2.7 1.3 80 76 2.7 1.3 80-38	3.4 1 100 60 3.4 1 100-30	5.2 0.68 150 40 5.2 0.68 150-20	10 10.2 0.38 300 20 10.2 0.38 300-10	13.6 0.26 400 15.2 13.6 0.26 400-7.6	20.4 0.18 600 10.4 20.4 0.18 600-5.2
Output voltage programming resolution Output voltage measurement accuracy Output voltage measurement accuracy Output voltage measurement accuracy Output voltage measurement resolution Output current measurement resolution Input voltage measurement resolution Input Characteristics Norminal input rating Input voltage range Input frequency range Maximum input current Inrush current Power factor Efficiency (*13) Hold-up time Interface Capabilities USB USB USB CAN RS-232 / RS-485 CPIB (Factory Option) Environmental Conditions Operaing temperature	0.1% + 0.2% + 200Vac	mV mA mV mA mV mA PSU  A	0.2 12 6 800 0.2 12 6-400 B type: 1P2 8 type: 1P2 8 type: 1P2 98 @ 1Ph 78.5 20ms or gre 6-400 TypeA: Hot MAC Addrec Complies w SCPI-1993 6-400 0°C - 50°C	0.27 12 8 720 0.27 12 8 720 0.27 12 8-360 W 200V mod w 170 ~ 265 iz W 200V mod ase 200Vac 81 sater 8-360 tit, TypeB : Sli tit	0.4 8 12.5 480 0.4 8 12.5-240 lels Vac lels Less than 85 12.5-240 ave, Speed: 1. ddress, User 120 / EIABS 5 compliant internal in	0.5 6.6 15 400 0.5 6.6 15-200 100A. 85 15-200 USB C Password, G Specifications	0.7 5 20 304 0.7 5 20-152 86 20-152 ass : CDC (Cdateway IP Addes	3.4 30 200 1 3.4 30-100 86 30-100	1.3 2.4 40 152 1.3 2.4 40-76 87 40-76	1.7 2 50 120 1.7 2 50-60 87 87	2 1.6 60 100 2 1.6 60-50 87	2.7 1.3 80 76 2.7 1.3 80-38	3.4 1 100 60 3.4 1 100-30	5.2 0.68 150 40 5.2 0.68 150-20	10 10.2 0.38 300 20 10.2 0.38 300-10	13.6 0.26 400 15.2 13.6 0.26 400-7.6	20.4 0.18 600 10.4 20.4 0.18 600-5.2
Output voltage programming resolution Output current programming resolution Output current programming resolution Output current measurement accuracy Output current measurement accuracy Output current measurement resolution Output current measurement resolution Input characteristics Norminal input rating Input thating Input requency range Maximum input current Inrush current Power factor Efficiency (*13) Hold-up time Interface Capabilities USB LAN RS-232 / RS-485 GPIB (Factory Option) Environmental Conditions	0.1% + 0.2% + 200Vac	mV mA mV mA mV mA PSU  A	0.2 12 6 800 0.2 12 6-400 8 type: 1P2 47Hz - 63H 8 type: 1P2 7HHz - 63H 0.98 @1 Ph 78.5 20ms or gre 6-400 TypeA: Hot MAC Addre Complies w SCPI - 1993 6-400 0 'C - 50' C -25' C - 70' -25' C - 70' -25' C - 70' -25' C - 70'	0.27 12 8 720 0.27 12 8-360 W 200V mod W 170 - 265 W 200V mod ase 200Vac 81 atter 8-360 ut, TypeB : Sid stypeB : Sid stype	0.4 8 12.5 480 0.4 8 12.5-240 lels Vac lels Less than 85 12.5-240 leve, Speed: 1. ddress, User 20 / EIA485 compliant inte	0.5 6.6 15 400 0.5 6.6 15-200 100A. 85 15-200 USB C Password, G Specifications	0.7 5 20 304 0.7 5 20-152 86 20-152 ass : CDC (Cdateway IP Addes	3.4 30 200 1 3.4 30-100 86 30-100	1.3 2.4 40 152 1.3 2.4 40-76 87 40-76	1.7 2 50 120 1.7 2 50-60 87 87	2 1.6 60 100 2 1.6 60-50 87	2.7 1.3 80 76 2.7 1.3 80-38	3.4 1 100 60 3.4 1 100-30	5.2 0.68 150 40 5.2 0.68 150-20	10 10.2 0.38 300 20 10.2 0.38 300-10	13.6 0.26 400 15.2 13.6 0.26 400-7.6	20.4 0.18 600 10.4 20.4 0.18 600-5.2
Output voltage programming resolution Output current programming resolution Output voltage measurement accuracy Output voltage measurement accuracy Output current measurement resolution Output uottage measurement resolution Output current measurement resolution Input characteristics Norminal input rating Input thating Input thating Input fequency range Maximum input current Inrush current Efficiency (*13) Hold-up time Interface Capabilities USB LAN RS-232 / RS-485 GPIB (Factory Option) Environmental Conditions Operating temperature Storage temperature Operating humidity	0.1% + 0.2% + 200Vac	mV mA mV mA mV mA PSU  A	0.2 12 6 800 0.2 12 6-400 B type: 1P2 6-400 B type: 1P2 8 type: 2PA 17Hz - 631 B type: 2PA 17Hz - 631 MAC Addre Complies w SCPI - 1993 6-400 0 'C - 50' C 25' C - 70' 20% ~ 85%	0.27 12 8 720 0.27 12 8-360 W 200V mod w 170 - 265's 12 8-360 W 200V mod se 200Vac 81 8-360 tt, TypeB: Sl, ss, DNS IP A th the EIA23 IEEE 488.2 ( 8-360 (*14) CRH; No con:	0.4 8 12.5 480 0.4 8 12.5-240 els Less than 85  12.5-240 ave, Speed: 1. ddress, User 12.5-240 densation	0.5 6.6 15 400 0.5 6.6 15-200 100A. 85 15-200 USB C Password, G Specifications	0.7 5 20 304 0.7 5 20-152 86 20-152 ass : CDC (Cdateway IP Addes	3.4 30 200 1 3.4 30-100 86 30-100	1.3 2.4 40 152 1.3 2.4 40-76 87 40-76	1.7 2 50 120 1.7 2 50-60 87 87	2 1.6 60 100 2 1.6 60-50 87	2.7 1.3 80 76 2.7 1.3 80-38	3.4 1 100 60 3.4 1 100-30	5.2 0.68 150 40 5.2 0.68 150-20	10 10.2 0.38 300 20 10.2 0.38 300-10	13.6 0.26 400 15.2 13.6 0.26 400-7.6	20.4 0.18 600 10.4 20.4 0.18 600-5.2
Output voltage programming resolution Output current programming resolution Output voltage measurement accuracy Output voltage measurement accuracy Output voltage measurement resolution Output current measurement resolution Output current measurement resolution input Characteristics Norminal input rating Input voltage range Input frequency range Maximum input current Inrush current Power factor Efficiency (*13) Hold-up time Interface Capabilities USB LAN RS-222 / RS-485 GPIB (Factory Option) Environmental Conditions Operaing temperature Storage temperature	0.1% + 0.2% + 200Vac	mV mA mV mA mV mA PSU  A	0.2 12 6 800 0.2 12 12 6 400 B type: 1P2 8 type: 1P2 47Hz - 631 8 type: 22A 8 type: 22A 8 type: 1P2 0.98 @1 Ph 78.5 20ms or gre 6-400 TypeA: Hoto MAC Addre Complies w SCPI - 1993 6-400 0 'C - 50' C 25' C - 70' 20% ~ 85% 90% RH or	0.27 12 8 720 0.27 12 8 8-360 W 200V mod W 170 ~ 265 Iz W 200V mod ase 200Vac 81 sater 8-360 tit, TypeB: Sla sss, DNS IP A tith the IA23 (*14) C C RH; No coniless; No con	0.4 8 12.5 480 0.4 8 12.5-240 els Less than 85  12.5-240 ave, Speed: 1. ddress, User 12.5-240 densation	0.5 6.6 15 400 0.5 6.6 15-200 100A. 85 15-200 USB C Password, G Specifications	0.7 5 20 304 0.7 5 20-152 86 20-152 ass : CDC (Cdateway IP Addes	3.4 30 200 1 3.4 30-100 86 30-100	1.3 2.4 40 152 1.3 2.4 40-76 87 40-76	1.7 2 50 120 1.7 2 50-60 87 87	2 1.6 60 100 2 1.6 60-50 87	2.7 1.3 80 76 2.7 1.3 80-38	3.4 1 100 60 3.4 1 100-30	5.2 0.68 150 40 5.2 0.68 150-20	10 10.2 0.38 300 20 10.2 0.38 300-10	13.6 0.26 400 15.2 13.6 0.26 400-7.6	20.4 0.18 600 10.4 20.4 0.18 600-5.2
Output voltage programming resolution Output current programming resolution Output voltage measurement accuracy Output voltage measurement accuracy Output current measurement resolution Output uottage measurement resolution Output current measurement resolution Input characteristics Norminal input rating Input thating Input thating Input fequency range Maximum input current Inrush current Efficiency (*13) Hold-up time Interface Capabilities USB LAN RS-232 / RS-485 GPIB (Factory Option) Environmental Conditions Operating temperature Storage temperature Operating humidity	0.1% + 0.2% + 200Vac	mV mA mV mA mV mA PSU  A	0.2 12 6 800 0.2 12 6-400 B type: 1P2 6-400 B type: 1P2 8 type: 2PA 17Hz - 631 B type: 2PA 17Hz - 631 MAC Addre Complies w SCPI - 1993 6-400 0 'C - 50' C 25' C - 70' 20% ~ 85%	0.27 12 8 720 0.27 12 8 8-360 W 200V mod W 170 ~ 265 Iz W 200V mod ase 200Vac 81 sater 8-360 tit, TypeB: Sla sss, DNS IP A tith the IA23 (*14) C C RH; No coniless; No con	0.4 8 12.5 480 0.4 8 12.5-240 els Less than 85  12.5-240 ave, Speed: 1. ddress, User 12.5-240 densation	0.5 6.6 15 400 0.5 6.6 15-200 100A. 85 15-200 USB C Password, G Specifications	0.7 5 20 304 0.7 5 20-152 86 20-152 ass : CDC (Cdateway IP Addes	3.4 30 200 1 3.4 30-100 86 30-100	1.3 2.4 40 152 1.3 2.4 40-76 87 40-76	1.7 2 50 120 1.7 2 50-60 87 87	2 1.6 60 100 2 1.6 60-50 87	2.7 1.3 80 76 2.7 1.3 80-38	3.4 1 100 60 3.4 1 100-30	5.2 0.68 150 40 5.2 0.68 150-20	10 10.2 0.38 300 20 10.2 0.38 300-10	13.6 0.26 400 15.2 13.6 0.26 400-7.6	20.4 0.18 600 10.4 20.4 0.18 600-5.2
Output voltage programming resolution Output voltage measurement accuracy Output voltage measurement accuracy Output voltage measurement accuracy Output current measurement resolution Output current measurement resolution Input voltage measurement resolution Input Characteristics Norminal input rating Input voltage range Input frequency range Maximum input current Inrush current Power factor Efficiency (*13) Hold-up time Interface Capabilities USB	0.1% + 0.2% + 200Vac	mV mA mV mA mV mA PSU  A	0.2 12 6 800 0.2 12 12 6 400 B type: 1P2 8 type: 1P2 47Hz - 631 8 type: 22A 8 type: 1P2 78.5 20ms or gre 6-400 TypeA: Hoto MAC Addre Complies w SCPI - 1993 6-400 0 'C - 50' C 25' C - 70' 20% - 85% 90% RH or	0.27 12 8 720 0.27 12 8 8-360 W 200V mod W 170 ~ 265 Iz W 200V mod ase 200Vac 81 sater 8-360 tit, TypeB: Sla sss, DNS IP A tith the IA23 (*14) C C RH; No coniless; No con	0.4 8 12.5 480 0.4 8 12.5-240 els Less than 85  12.5-240 ave, Speed: 1. ddress, User 12.5-240 densation	0.5 6.6 15 400 0.5 6.6 15-200 100A. 85 15-200 USB C Password, G Specifications	0.7 5 20 304 0.7 5 20-152 86 20-152 ass : CDC (Cdateway IP Addes	3.4 30 200 1 3.4 30-100 86 30-100	1.3 2.4 40 152 1.3 2.4 40-76 87 40-76	1.7 2 50 120 1.7 2 50-60 87 87	2 1.6 60 100 2 1.6 60-50 87	2.7 1.3 80 76 2.7 1.3 80-38	3.4 1 100 60 3.4 1 100-30	5.2 0.68 150 40 5.2 0.68 150-20	10 10.2 0.38 300 20 10.2 0.38 300-10	13.6 0.26 400 15.2 13.6 0.26 400-7.6	20.4 0.18 600 10.4 20.4 0.18 600-5.2
Output voltage programming resolution Output current programming resolution Output voltage measurement accuracy Output voltage measurement accuracy Output voltage measurement resolution Output current measurement resolution Output current measurement resolution input Characteristics Norminal input rating Input voltage range Input frequency range Maximum input current Inrush current Power factor Efficiency (*13) Hold-up time Interface Capabilities USB LAN RS-232 / RS-485 GPIB (Factory Option) Environmental Conditions Operaing temperature Storage temperature Storage temperature Storage humidity Altitude	0.1% + 0.2% + 200Vac	mV mA mV mA mV mA PSU  A  PSU  PSU	0.2 12 6 800 0.2 12 6-400 B type: 1P2 47Hz - 63H 8 type: 1P2 47Hz - 63H 0.98 @1 Fh 78.5 20ms or gre 6-400 TypeA: Hot MAC Addre Complies w SCPI - 1993 6-400 0' C - 50' C - 70' 20% ~ 85% 90% RH or Maximum 2	0.27 12 8 720 0.27 12 8-360 W 200V mod W 170 ~ 265 Iz V 200V mod ase 200Vac 81 atter 8-360 it, TypeB: Sla ith the ElA23 , IEEE 488.2 8-360 (*14) C RH; No com less; No com 0000m 8-360	0.4 8 12.5 480 0.4 8 12.5-240 lels Vac lels Less than 85 12.5-240 ave, Speed: 1. ddress, User 12.5-240 ddress, User 12.5-240 ddress discontinuation densation densation	0.5 6.6 15 400 0.5 6.6 15-200 100A. 85 15-200 172.0, USB C Password, G pecifications rface 15-200	0.7 5 20 304 0.7 5 20-152 86 20-152 20-152 20-152	3.4 30 200 1 3.4 3.4 30-100 86 30-100 30-100	1.3 2.4 40 152 1.3 2.4 40-76 87 40-76 40-76 40-76 40-76	1.7 2 50 120 1.7 2 50-60 87 50-60 87	2 1.6 60 100 2 1.6 60-50 87 60-50	2.7 1.3 80 76 2.7 1.3 80-38	3.4 1 100 60 3.4 1 100-30 87	5.2 0.68 150 40 5.2 0.68 150-20 87 150-20	10 10.2 0.38 300 20 10.2 0.38 300-10	13.6 0.26 400 15.2 13.6 0.26 400-7.6 87 400-7.6	20.4 0.18 600 10.4 20.4 0.18 600-5.2
Output voltage programming resolution Output current programming resolution Output voltage measurement accuracy Output voltage measurement accuracy Output current measurement resolution Output uvoltage measurement resolution Output current measurement resolution Input Characteristics Norminal input rating Input thoutage range Input frequency range Maximum input current Innush current Power factor Efficiency (*13) Hold-up time Interface Capabilities USB LAN RS-232 / RS-485 CPIB (Factory Option) Environmental Conditions Operating temperature Storage temperature Operating humidity Storage humidity Altitude General Specifications	0.1% + 0.2% +	mV mA mV mA mV mA mV mA PSU  A  PSU  PSU	0.2 12 6 800 0.2 12 6-400 8 type: 1P2 6-400 8 type: 1P2 8 type: 1P2 78.5 20ms or gre 6-400 TypeA: Hoto MAC Addre Complies w SCPI - 1993 6-400 0 'C - 50' C 25' C - 70' 20% - 85% 90% RH or Maximum 2 6-400	0.27 12 8 720 0.27 12 8-360 W 200V mod W 170 - 265 Iz V 200V mod Set 200V mod It 7 - 265	0.4 8 12.5 480 0.4 8 12.5-240 lels Vac lels Less than 85 12.5-240 ave, Speed: 1. ddress, User 12.5-240 ddress, User 12.5-240 ddress discontinuation densation densation	0.5 6.6 15 400 0.5 6.6 15-200 100A. 85 15-200 172.0, USB C Password, G pecifications rface 15-200	0.7 5 20 304 0.7 5 20-152 86 20-152 20-152 20-152	3.4 30 200 1 3.4 3.4 30-100 86 30-100 30-100	1.3 2.4 40 152 1.3 2.4 40-76 87 40-76 40-76 40-76 40-76	1.7 2 50 120 1.7 2 50-60 87 50-60 87	2 1.6 60 100 2 1.6 60-50 87 60-50	2.7 1.3 80 76 2.7 1.3 80-38	3.4 1 100 60 3.4 1 100-30 87	5.2 0.68 150 40 5.2 0.68 150-20 87 150-20	10 10.2 0.38 300 20 10.2 0.38 300-10	13.6 0.26 400 15.2 13.6 0.26 400-7.6 87 400-7.6	20.4 0.18 600 10.4 20.4 0.18 600-5.2
Output voltage programming resolution Output current programming resolution Output voltage measurement accuracy Output voltage measurement accuracy Output voltage measurement resolution Output current measurement resolution Output current measurement resolution Input characteristics Norminal input rating Input toltage range Input toltage range Input requery range Maximum input current Inrush current Power factor Efficiency (*13) Hold-up time Interface Capabilities USB LAN RS-232 / RS-485 GPIB (Factory Option) Environmental Conditions Operating temperature Storage temperature Storage temperature Operating humidity Storage humidity Albitude General Specifications Weight	0.1% + 0.2% +	mV mA mV mA mV mA mV mA PSU  A  PSU  PSU  PSU	0.2 12 6 800 0.2 12 6-400 B type: 1P2 47Hz - 63F 8 type: 1P2 47Hz - 63F 8 type: 22A 5 type: 22A 5 type: 22A 0.98 @1 Fh 78.5 20ms or gre 6-400 TypeA: Hot MAC Addre Complies w SCPI - 1993 6-400 0'C - 50' C - 50' 0'C - 50' C - 70' 20% ~ 85% 90% RH or Maximum 2 6-400 Maximu	0.27 12 8 720 0.27 12 8-360 W 200V mod W 170 - 265 Iz V 200V mod Set 200V mod It 7 - 265	0.4 8 12.5 480 0.4 8 12.5-240 8 12.5-240 8 12.5-240 8 12.5-240 12.5-240 12.5-240 12.5-240 12.5-240 12.5-240 12.5-240 12.5-240	0.5 6.6 15 400 0.5 6.6 15-200 100A. 85 15-200 172.0, USB C Password, G pecifications rface 15-200	0.7 5 20 304 0.7 5 20-152 86 20-152 20-152 20-152	3.4 30 200 1 3.4 3.4 30-100 86 30-100 30-100	1.3 2.4 40 152 1.3 2.4 40-76 87 40-76 40-76 40-76 40-76	1.7 2 50 120 1.7 2 50-60 87 50-60 87	2 1.6 60 100 2 1.6 60-50 87 60-50	2.7 1.3 80 76 2.7 1.3 80-38	3.4 1 100 60 3.4 1 100-30 87	5.2 0.68 150 40 5.2 0.68 150-20 87 150-20	10 10.2 0.38 300 20 10.2 0.38 300-10	13.6 0.26 400 15.2 13.6 0.26 400-7.6 87 400-7.6	20.4 0.18 600 10.4 20.4 0.18 600-5.2
Output voltage programming resolution Output current programming resolution Output voltage measurement accuracy Output voltage measurement accuracy Output voltage measurement resolution Output current measurement resolution Output current measurement resolution input Characteristics Norminal input rating Input voltage range Input frequency range Maximum input current Inrush current Power factor Efficiency (*13) Hold-up time Interface Capabilities USB LAN RS-232 / RS-485 CPIB (Factory Option) Environmental Conditions Operaing temperature Storage temperature Operating humidity Storage humidity Altitude General Specifications Weight Dimensions	0.1% + 0.2% +	mV mA mV mA mV mA mV mA PSU  A  PSU  PSU  PSU	0.2 12 6 800 0.2 12 6-400 8 type: 1P2 6-400 8 type: 1P2 6-800 8 type: 1P2 0.98 @1 Fh 78.5 20ms or gre 6-400 TypeA: Hos MAC Addre Complies w SCPI-1993 6-400 0'C -50 'C 25' C -70' 20% ~ 85% 90% RH or Maximum 2 6-400 Less than 2 423 x 87.2 -2 Forced air c	0.27 12 8 720 0.27 12 8 720 0.27 12 8-360 W 200V mod W 170 - 265 Iz W 200V mod ase 200Vac 81 atter 8-360 It, TypeB : Sla ster 8-360 (*14) (*14) C C RH; No con less; No con 000m 8-360 0kg 8-360 0kg colling by int	0.4 8 12.5 480 0.4 8 12.5 480 0.4 8 12.5-240 lels Vac  12.5-240 lels Less than 85 12.5-240 lels Less than	0.5 6.6 15 400 0.5 6.6 15-200 100A. 85 15-200 1/2.0, USB C Password, G, G pecifications refrace 15-200	86  20-152  86  20-152  20-152	86 30-100 30-100	1.3 2.4 40 152 1.3 2.4 40-76 87 40-76 40-76 40-76 40-76	1.7 2 50 120 1.7 2 50-60 87 50-60 87	2 1.6 60 100 2 1.6 60-50 87 60-50	2.7 1.3 80 76 2.7 1.3 80-38 87 80-38	3.4 1 100 60 3.4 1 100-30 87	5.2 0.68 150 40 5.2 0.68 150-20 87 150-20	10 10.2 0.38 300 20 10.2 0.38 300-10	13.6 0.26 400 15.2 13.6 0.26 400-7.6 87 400-7.6	20.4 0.18 600 10.4 20.4 0.18 600-5.2 87 600-5.2
Output voltage programming resolution Output current programming resolution Output voltage measurement accuracy Output voltage measurement accuracy Output voltage measurement resolution Output current measurement resolution Output current measurement resolution Input Characteristics Norminal input rating Input voltage range Input frequency range Maximum input current Inrush current Power factor Efficiency (*13) Hold-up time Interface Capabilities USB LAN RS-232 / RS-485 GPIB (Factory Option) Environmental Conditions Operaing temperature Storage temperature Operating humidity Storage humidity Altitude General Specifications Weight Dimensions Cooling	0.1% + 0.2% +	mV mA mV mA mV mA mV mA PSU  A  PSU  PSU  PSU	0.2 12 6 800 0.2 12 6-400 8 type: 1P2 6-400 8 type: 1P2 8 type: 2PA 8 type: 2PA 8 type: 1P2 0.98 @1 Ph 78.5 20ms or gre 6-400 TypeA: Hoto MAC Addre Complies w SCPI - 1993 6-400 0 'C - 50' C -25' C - 70' 20% ~ 8% R or gre 6-400 Less than 24 423 x 87.2 s 6-600 Less than 24 423 x 87.2 s	0.27 12 8 720 0.27 12 8 8 720 0.27 12 8-360 W 200V mod with 172 20 8-360 W 172 8-360 W 200V mod with 172 8-360 W 172 8-360 R 172 8-360 (*14) C RH; No concless; No concoom 8-360 0kg 447.2	0.4 8 12.5 480 0.4 8 12.5-240 lels Less than 85 12.5-240 lels Less than 85 12.5-240 lels Less than 12.5-240	0.5 6.6 15 400 0.5 6.6 15-200 100A. 85 15-200 15-200 15-200 15-200 15-200 15-200	0.7 5 20 304 0.7 5 20 304 0.7 5 20-152  86  20-152  20-152  20-152	1 3.4 30 200 1 3.4 30-100 86 30-100 30-100 30-100 30-100	1.3 2.4 40 152 1.3 2.4 40-76 87 40-76 87 40-76 40-76 40-76	1.7 2 50 120 1.7 2 50-60 87  50-60  50-60	2 1.6 60 100 2 1.6 60-50 87 60-50	2.7 1.3 80 76 2.7 1.3 80-38 87 80-38	3.4 1 100 60 3.4 1 100-30 87	5.2 0.68 150 40 5.2 0.68 150-20 87 150-20	10 10.2 0.38 300 20 10.2 0.38 300-10	13.6 0.26 400 15.2 13.6 0.26 400-7.6 87 400-7.6	20.4 0.18 600 10.4 20.4 0.18 600-5.2 87 600-5.2

- Notes:

  (\*1) Minimum voltage is guaranteed to maximum 0.2% of the rated output voltage.

  (\*2) Minimum current is guaranteed to maximum 0.4% of the rated output current.

  (\*3) Single phase 200V models: 170 265Vac.

  (\*4) From No-load to Full-load, constant input voltage, Measured at the sensing point in Remote Sense.

  (\*5) Measured at rated output voltage and current with JEITA RC-9131B probe.

  (\*6) Measurement frequency bandwidth is 19Hz 20MHz.

  (\*7) Measurement frequency bandwidth is 19Hz 1MHz.

  (\*8) From 10% 90% of rated output voltage, with rated resistive load.

  (\*9) From 90% 10% of rated output voltage, with rated resistive load.

  (\*9) From 90% 10% of rated output voltage, with rated resistive load.

  (\*10) Time for output voltage or recover within 25% of firs rated output for a load change from 50 to 100% of its rated output current. Voltage set point from 10% 100% of rated output.

  (\*11) For load voltage change, equal to the unit voltage rating, constant input voltage.

  (\*12) For 6V 20V model the ripple is measured at 2V rated output voltage and full output current. For other models, the ripple is measured at 10 100% output voltage and full output current.

  (\*13) At rated output power.

SPECIFICATIONS																	
Model		PSU	6-600	8-540	12.5-360	15-300	20-228	30-150	40-114	50-90	60-75	80-57	100-45	150-30	300-15	400-11.4	600-7.8
Rated output voltage (°1)		V	6	8	12.5	15	20	30	40	50	60	80	100	150	300	400	600
Rated output current (*2)		A	600	540	360	300	228	150	114	90	75	57	45	30	15	11.4	7.8
Rated output power		w	3600	4320	4500	4500	4560	4500	4560	4500	4500	4560	4500	4500	4500	4560	4680
Constant Voltage Mode		PSU	6-600	8-540	12.5-360	15-300	20-228	30-150	40-114	50-90	60-75	80-57	100-45	150-30	300-15	400-11.4	600-7.8
Line regulation (*3)		mV	0.01% of ra	ted output vo	oltage +2mV												
Load regulation (°4)		mV		ted output vo													
Ripple and noise (*5)	p-p (*6)	mV	75	75	75	75	75	75	75	75	75	100	100	120	300	300	500
	r.m.s. (*7)	mV	10	10	10	10	10	10	10	10	10	15	15	25	35	35	120
Temperature coefficient	1	ppm/'C	_	_	inute warm-up												
Temperature stability		ppiny C			oltage over 8h		lowing 30 mi	nutes warm-i	p. Constant I	ine. load & te	mp.						
Warm-up drift					output volta												-
Remote snese compensation voltage (single wire)		v	1	1	1	1	1	1.5	2	2	3	4	5	5	5	5	5
Rise time (*8)	No load	ms	80	80	80	80	80	80	80	80	80	150	150	150	150	200	250
Fall time (*9)	Rated load	ms	10	50	50	50	50	80	80	80	80	150	150	150	150	200	250
raii time (-5)	No load	ms	500	600	700	700	800	900	1000	1100	1100	1200	1500	2000	2500	3000	4000
Transfert response time (970)	NO IORG	_	300	3	3	700	3	300	3	3	3	3	1300	3	3	3	3
Transient response time (*10)		ms PSU	6-600	8-540	12.5-360	15-300	20-228	30-150		-	,	_	100 45		300-15		600-7.8
Constant Current Mode		_						30-150	40-114	50-90	60-75	80-57	100-45	150-30	300-15	400-11.4	600-7.8
Line regulation (*3)		mA		ed output cur		ted output cu	irrent					I and Co. 1					_
Load regulation (*11)	-	mA		ed output cur								1% of rated	output curre	nt			
Load regulation thermal drift		-			output curren										-		
Ripple and noise (*12)	r.m.s.	mA	1400	1315	1060	987	900	472	275	191	138	110	92	81	30	20	15
Temperature coefficient	1	ppm/°C			inute warm-u								*	1	· · ·		
Temperature stability		· 7			rrent over 8h					ine, load & te	mp.						5
Warm-up drift					0.5% rated o					2							
A		Dett			an 0.25% rate						60.75	90.53	100 45	150.20	200.15	400.13.4	600.7.0
Protection Function	e.ut	PSU	6-600	8-540	12.5-360	15-300	20-228	30-150	40-114	50-90	60-75	80-57	100-45	150-30	300-15	400-11.4	600-7.8
Over voltage protection (OVP)	Setting range	V	0.6 - 6.6	0.8-8.8	1.25 - 13.75		2 - 22	3 - 33	4 - 44	5 - 55	5 - 66	5 - 88	5 - 110	5 - 165	5 - 330	5 - 440	5 - 660
	Setting accuracy	mV	60	80	125	150	200	300	400	500	600	800	1000	1500	3000	4000	6000
Over current protection (OCP)	Setting range	A	5 - 660	5-594	5 - 396	5 - 330	5 - 250.8	5 - 165	5 - 125.4	5 - 99	5 - 82.5	5 - 62.7	4.5 - 49.5	3 - 33	1.5 - 16.5	1.14 - 12.54	0.78 - 8.58
	Setting accuracy	A	12	10.8	7.2	6	4.56	3	2.28	1.8	1.5	1.04	0.9	0.6	0.3	0.228	0.156
Under voltage limit (UVL)	Setting range		0 - 6.3	0 - 8.4	0 - 13.12	0 - 15.75	0 - 21	0 - 31.5	0 - 42	0 - 52.5	0 - 63	0 - 84	0 - 105	0 - 157.5	0 - 315	0 - 420	0 - 630
Over temperature protection (OHP)	Operation		Turn the ou														
Incorrect sensing connection protection (SENSE)	Operation		Turn the ou														
Low AC input protection (AC-FAIL)	Operation		Turn the ou	tput off.													
Shutdown (SD)	Operation	1	Turn the ou	tput off.													9
Power limit (POWER LIMIT)	Operation		Over power	limit.													
	Value (fixed)	0.0000	Approx. 105	5% of rated o	utput power												20.000.000
Front Panel		PSU	6-600	8-540	12.5-360	15-300	20-228	30-150	40-114	50-90	60-75	80-57	100-45	150-30	300-15	400-11.4	600-7.8
Display, 4 digits Voltage accuracy	0.1% +	mV	12	16	25	30	40	60	80	100	120	160	200	300	600	800	1200
Current accuracy	0.2% +	mA	1800	1620	1080	900	684	450	342	270	225	171	135	90	45	34.2	23.4
Indications			GREEN LED	D's: CV, CC, \	, A, VSR, ISR	DLY, RMT, I	LAN, M1, M2	, M3, RUN, C	utput ON; R	ED LED's: Al	M, ERR						
Buttons			Lock/Local	(Unlock), PRO	OT(ALM_CLR	), Function (M	/1), Test(M2)	, Set(M3), Sh	ift, Output								
Knobs			Voltage, Cu	rrent	12 100	100	. 1000		72 70								
USB port		- 1	Type A USB	connector													8
Programming and Measurement (RS-232/485, US	B, LAN, GPIB)	PSU	6-600	8-540	12.5-360	15-300	20-228	30-150	40-114	50-90	60-75	80-57	100-45	150-30	300-15	400-11.4	600-7.8
Output voltage programming accuracy	0.05% +	mV	3	4	6.25	7.5	10	15	20	25	30	40	50	75	150	200	300
Output current programming accuracy	0.2% +	mA	600	540	360	300	228	150	114	90	75	57	45	30	15	11.4	7.8
Output voltage programming resolution		mV	0.2	0.27	0.4	0.5	0.7	1	1.3	1.7	2	2.7	3.4	5.2	10.2	13.6	20.4
Output current programming resolution		mA	18	18	12	9.9	7.5	5.1	3.6	3	2.4	1.95	1.5	1.02	0.57	0.39	0.27
Output voltage measurement accuracy	0.1% +	mV	6	8	12.5	15	20	30	40	50	60	80	100	150	300	400	600
Output current measurement accuracy	0.2% +	mA	1200	1080	720	600	456	300	228	180	150	114	90	60	30	22.8	15.6
Output voltage measurement resolution		mV	0.2	0.27	0.4	0.5	0.7	1	1.3	1.7	2	2.7	3.4	5.2	10.2	13.6	20.4
Output current measurement resolution	-	mA	18	18	12	9.9	7.5	5.1	3.6	3	2.4	1.95	1.5	1.02	0.57	0.39	0.27
Input Characteristics		PSU	6-600	8-540	12.5-360	15-300	20-228	30-150	40-114	50-90	60-75	80-57	100-45	150-30	300-15	400-11.4	600-7.8
-		130			iels, C type : 3					30-30	00-73	00-37	100-43	150-30	300-13	400/11.4	000-7.0
Norminal input rating Input voltage range	1				Vac, C type : 3												
	+	<del>                                     </del>	47Hz - 63H		ruc, c type : 3	JW 100~Z	Jorac, D typ	J. +W 300	THOTAL								
Input frequency range	200Vac / 400Vc-	Α.	_		M . D	٨											
Maximum input current	200Vac / 400Vac	A			A · D type 11		1 20214/ 202	Laurado III -	.L 1004 -	h 1 3000	40001 - 7 1	Laurett - FO					
Inrush current Power factor	2000/22 / 4000/				lels Less than 0.95 @ 3 Pha			r inodél Less	man 100A; D	type - 3P4W	+uuv model	Less than 50	M.				
L. 2007 14/2011 10/4	200Vac / 400Vac	01	-		_	ase 200/400V	_		- 62	0.7	0.7	6.2	67	6.2	67	0.7	0.7
Efficiency (°13)	1	%	78.5	81	85	85	86	86	87	6/	87	87	6/	6/	6/	8/	8/
Hold-up time		Dett	20ms or gro		12 5 266	15 300	20.220	20.150	40.334	E0.00	60.75	90.53	100 15	150.70	200.15	400.33.4	600.7.0
Interface Capabilities		PSU	6-600	8-540	12.5-360		20-228	30-150	40-114	50-90	60-75	80-57	100-45	150-30	300-15	400-11.4	600-7.8
USB	-				ive, Speed: 1.1												
LAN	4	-			ddress, User			iress, Instrun	ent IP Addre	ss, Subnet M	ask						
RS-232 / RS-485	1	_	-		2D / EIA485		s :?										
GPIB (Factory Option)					compliant inte				10.77	***	40			100.00	***		400
Environmental Conditions		PSU	6-600	8-540	12.5-360	15-300	20-228	30-150	40-114	50-90	60-75	80-57	100-45	150-30	300-15	400-11.4	600-7.8
Operaing temperature			0°C~50°C														
Storage temperature			-25 °C ~ 70														2.0
Operating humidity				RH; No con													
Storage humidity				less; No con	densation												
Altitude		1	Maximum 2	2000m													- 3
General Specifications		PSU	6-600	8-540	12.5-360	15-300	20-228	30-150	40-114	50-90	60-75	80-57	100-45	150-30	300-15	400-11.4	600-7.8
Weight	main unit only	kg	Less than 2	8.7kg													- 5
Dimensions	(W×H×D)	mm	423 × 130.8	× 447.2													
Cooling	1 1			cooling by int	ernal fan.												
Withstand voltage		- >				Output termi	inal : 3000Vac	/1min: Vout	≤150V:Outni	rt terminal to	Chassis:1000	0Vdc/1min: 1	50 <vout≤60< td=""><td>00; Output ter</td><td>minal to Cha</td><td>ssis:1500Vdc</td><td>/1min</td></vout≤60<>	00; Output ter	minal to Cha	ssis:1500Vdc	/1min
			1												10 4118		
Insulation resistance		- 3	Chassis and	d output term	ninal: chassis:	and AC innut	: AC innut an	d output tern	ninal: 100Mcs								

- Notes:

  (\*1) Minimum voltage is guaranteed to maximum 0.2% of the rated output voltage.

  (\*2) Minimum current is guaranteed to maximum 0.4% of the rated output current.

  (\*3) Single phase 200V models: 170-265Vac. There phase 200V models: 180-253Vac. Three phase 400V models: 360-440Vac.

  (\*4) From No-load to Full-load, constant input voltage. Measured at the sensing point in Remote Sense.

  (\*5) Measured at rated output voltage and current with JETRA RC-9131B probe

  (\*6) Measurement frequency bandwidth is 10Hz ~ 20MHz.

  (\*7) Measurement frequency bandwidth is 19Hz ~ 1MHz.

  (\*8) From 10% ~ 90% of rated output voltage, with rated resistive load.

  (\*9) From 90% ~ 10% of rated output voltage, with rated resistive load.

  (\*9) From 90% of rated output voltage, with rated resistive load.

  (\*10) Time for output voltage or recover within 25% of firs rated output for a load change from 50 ~ 100% of its rated output current. Voltage set point from 10% ~ 100% of rated output.

  (\*11) For load voltage change, equal to the unit voltage rating, constant input voltage.

  (\*12) For 6V ~ 20V model the ripple is measured at 2V ~ rated output voltage and full output current. For other models, the ripple is measured at 10 ~ 100% output voltage and full output current.

  (\*13) Single phase and three phase 200V models : at 200Vac input voltage. Three phase 400V models : at 400Vac input voltage. At rated output power.

Marie   Mari	SPECIFICATIONS																	
Mart of the protecting   Property   Proper			Den	6 900	9.720	125.490	15.400	20.304	30.200	40.152	50.120	60.100	90.76	100.60	150.40	300.20	400.15.2	600-10.4
Mart September   Mart				_														
Manufacture				_														600
Commerciation   Property   Commerciate   Pro															_			10.4
Companies (P)																		6240
Comment Comment   Comment   Comment Comment   Comment Commen	Constant Voltage Mode	1	PSU				15-400	20-304	30-200	40-152	50-120	60-100	80-76	100-60	150-40	300-20	400-15.2	600-10.4
Page	Line regulation (*3)		mV	0.01% of ra	ted output vo	oltage +2mV												
Comparison configuration   Comparison   Co	Load regulation (°4)		mV	0.01% of ra	ted output vo	oltage +5mV												
Comparison configuration   Comparison   Co		p-p (*6)	mV	75	75	75	75	75	75	75	75	75	100	100	120	300	300	500
Communication   Communicatio	,,,				10	10												120
Segret content analogs	Temperature coefficient																	120
Semination content prolific pring front			ppm/ C					laudaa 20 mi	nuter waren	n Constant	line level 8 to							
Figure   Part		-									irre, ioau & te	mp.						
Marchan   PR				Less than 0	.05% of rated	output volta	ge +2mV ove	r 30 minutes						_				
Find Security   Find			٧	1	1	1	1	1						-	-	5	,	5
Contact Composition (**P\$)	Rise time (*8)	No load	ms	80	80	80	80	80	80	80	80	80	150	150	150	150	200	250
Transfer region (17)   me   me   1   3   3   3   3   3   3   3   3   3	Fall time (*9)	Rated load	ms	10	50	50	50	50	80	80	80	80	150	150	150	150	200	250
Content Personal Pe		No load	ms	500	600	700	700	800	900	1000	1100	1100	1200	1500	2000	2500	3000	4000
Content Personal Pe	Transient response time (°10)		ms	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Care angionise (1%)				6.800	_	12 5.480	15,400		_	40.152	50,120	60-100	80.76	100-60		300-20	400.15.2	600-10.4
March   Part							13-400				30-120	00-100	80-70	100-00	130-40	300-20	400-13.2	000-10.4
Mary purple and solide   Mary   Mar								0.03% Of fa	tea output cu	irrent								
Page   Control one   Type			mA										1% of rated	output curre	nt			
Emperative californics   Sperit   Support   College   Support   Support   College   Support	Load regulation thermal drift			Less than 0	.1% of rated	output curren	t over 30 mir	nutes followin	g load chang	e.								
Control position   Control pos	Ripple and noise (*12)	r.m.s.	mA	2000	1900	1500	1390	1250	650	365	245	170	140	116	104	30	20	15
Company contacts   Company contacts   Company contact   Company	Temperature coefficient	2	ppm/°C	100ppm/°C	after a 30 m	inute warm-u	р	14			3	100	507 12	000	25	8	:24	0.0
Section   Continue		5	9					llowing 30 mi	nutes warm-L	p. Constant	line, load & te	mp.						1.7
Without Profession   150-000   150-0																		
Procession   Pro	warm-up drift										n.							e. i.
Deverlation (DVP)   Setting ready   V   O.6 to 8 at 8   123   131   13   15   15   20   20   30   40   20   50   50   50   50   50   50   5	Protection Function		PSU									60-100	80-76	100-60	150-40	300-20	400-15.2	600-10.4
Sering secretion (DCPT)   Sering ranger   A   5   80   5   72   5   5   8   5   6   5   6   5   6   5   6   6   6		Setting range																5 - 660
Description of CPT   Setting records   A			-		_													6000
Method systems (MA)	Over support protection (OCD)																	1.04 - 11.44
More respection (OHP)   Operation     Operation   Operatio	Over current protection (OCP)																	
Description   Operation   Operation   Time the cologic of			A															0.208
Exercised connection protection (EASALS)   Operation   Turn the output off.	0 1 /					0 - 13.12	0 - 15.75	0 - 21	0 - 31.5	0 - 42	0 - 52.5	0 - 63	0 - 84	0 - 105	0 - 157.5	0 - 315	0 - 420	0 - 630
Control (POWER LIM!)	Over temperature protection (OHP)	Operation		Turn the ou	tput off.						11715-111		. 1 25-15-11-7-1	10 4 17 44				
Shadow   Coperation   Coperation   Corner in (Post 1911)   Coperation	Incorrect sensing connection protection (SENSE)	Operation		Turn the ou	tput off.													
Over power limit.   Value (Field)   Value (F	Low AC input protection (AC-FAIL)	Operation		Turn the ou	tput off.													
Over power limit.   Value (Field)   Value (F	Shutdown (SD)	Operation		Turn the ou	tput off.													
Page	Power limit (POWER LIMIT)																	
First First   First   6-800   8-720   12.5-40   15-40   15-20   20.00   40.152   50.120   60-100   80.76   10.040   10.00   20.00   60-100   10.00				_		utnut noven												
Despite   Marga excursion   2014   Mrs	F+ PI	value (lixeu)	DCII		_	-	15 400	20.204	30.300	40.153	F0.120	CO 100	00.76	100.00	350.40	200.20	400 15 2	600 30 4
Comment accuracy   Q2% +																		600-10.4
CARENILED'S CV, CC, VA, VSS, LSS, DV, RMT, LAM, MI, QV, MS, RUN, Output ONE, REQ ELD'S -LAM, ERR																		1200
Lock   Lock   Lock   Lock   Lock   Lock   Lock   FROTFAIL CLR , Function (M1), Test (M2), Set (M1), Set (M1), Set (M1), Set (M1), Set (M1), Set (M1), Set (M2), Set (M1), Set (M2), Set (M1), Set (M2), Set (M1), Set (M1), Set (M2), Set (M1), Set (M2), Set (M1), Set (M2), Set (M1), Set (M2), Set (M2), Set (M1), Set (M2), Set	Current accuracy	0.2% +	mA										228	180	120	60	45.6	31.2
Voltage Current   Voltage Cu											RED LED's: Al	LM, ERR						
Post   Programming and Measurement (25-217/45s, VSB, LMA, CMB)	Buttons			Lock/Local(	Unlock), PRO	DT(ALM_CLR	), Function(N	И1), Test(M2)	, Set(M3), Sh	rift, Output								
Pegumining and Measurement (RS-231/45, USB, LNA, CPR)   PSU   6-500   8-720   12-5480   15-400   20-304   30-200   40-152   30-120   60-100   80-76   10-40   30-60   30-20   40-152   50-120	Knobs	E .	3	Voltage, Cu	rrent													
Post	USB port	2	i i	Type A USB	connector	59 A		v.,						- 6	577	25.	0	(// L
Output current programming accuracy   0.29% + m/4   3		LAN, GPIB)	PSU	6-800	8-720	12.5-480	15-400	20-304	30-200	40-152	50-120	60-100	80-76	100-60	150-40	300-20	400-15.2	600-10.4
Output voltage measurement accuracy Output voltage measurement resolution  m/M Output voltage measurement r				_														300
Designation   my				-														10.4
Dutput current programming resolution		0.275 +				-			200					_				
Dutyst voltage measurement accuracy   0.1% +   mV   6   8   12.5   15   20   30   40   50   60   80   100   150   300   400   60   60   60   60   60   80   100   150   100   40   60   60   60   60   60   60		2	_			_			1									20.4
Output corrent measurement resolution																		0.36
Cutput voltage measurement resolution				-			_											600
Culput current measurement resolution	Output current measurement accuracy	0.2% +	mA	1600	1440	960	800	608	400	304	240	200	152	120	80	40	30.4	20.8
Description   Compute Characteristics   PSU   6-800   8-720   12.5-480   15-400   2.0-304   30-200   40-152   50-120   60-100   80-76   100-60   150-40   300-20   40-15.2   60	Output voltage measurement resolution	1	mV	0.2	0.27	0.4	0.5	0.7	1	1.3	1.7	2	2.7	3.4	5.2	10.2	13.6	20.4
Input Characteristics			mA	24	24	16	13.2	10	6.8	4.8	4	3.2	2.6	2		0.76	0.52	0.36
Norminal input rating											50-120							600-10.4
B Sype : 1PXW 170 - 265Vac, C type : 3P3W 180 - 253Vac, D type : 3P4W 360 - 440Vac																		
Input frequency range		-																
Maximum input current   200Vac / 400Vac   A   B type: 14A, C type: 29A, D type 22A   Brush current   B type: 15P2W 200V model Less than 200A; C type: 3P3W 200V model Less than 100A; D type: 3P4W 400V model Less than 100A.		2							H 900									
Interfact		2001/ / 1001/-				D turn 224												
Power factor   200Vac / 400Vac   0.98 @1 Phase 200Vac / 0.95 @ 3 Phase 200/400Vac   Efficiency (°13)   % 78.5   81   85   85   86   86   87   87   87   87   87   87		zoovac / 400vac	A															
## Efficiency (*13)	2,345,345,345,45		2						/ model Less	than 100A; [	type: 3P4W	400V model	Less than 10	OA.				
Note   Compose		200Vac / 400Vac		0.98 @1 Ph			ase 200/400\	_										
Interface Capabilities	Efficiency (°13)		%	78.5	81	85	85	86	86	87	87	87	87	87	87	87	87	87
Interface Capabilities	Hold-up time		3	20ms or gre	ater			20				94	100	200	100	17		KS
TypeA: Host, TypeB: Slave, Speed: 1.1/2.0, USB Class: CDC(Communications Device Class)			PSU			12.5-480	15-400	20-304	30-200	40-152	50-120	60-100	80-76	100-60	150-40	300-20	400-15.2	600-10.4
MAC Address, DNS IP Address, User Password, Gateway IP Address, Instrument IP Address, Subnet Mask   R5-232   R5-485   Complies with the EIA232D / EIA485 Specifications																		
RS-232 / RS-485 Complies with the EIA232D / EIA485 Specifications  CPI8 (Factory Option)												ask						
SCPI - 1993, IEEE 488.2 compliant interface			-	_					, cas, mairan		Judinet IVI	work .						
Environmental Conditions  PSU 6-800 8-720 12.5-480 15-400 20-304 30-200 40-152 50-120 60-100 80-76 100-60 150-40 300-20 400-15.2 600 Operating temperature  0 0 C - 50 C (*14) Storage temperature  2.25 C - 70 C Operating humidity  2.26 S - 85% RH; No condensation Storage humidity  9/05 RH or less; No condensation Altitude  Maximum 2000m  Weight  main unit only  kg Less than 37.4kg  Less than 37.4kg  Minimum 2000m  Weight  main unit only  kg Less than 37.4kg  Minimum 2000m  Minimum 2		-						•										
Operating temperature																		
Storage temperature			PSU			12.5-480	15-400	20-304	30-200	40-152	50-120	60-100	80-76	100-60	150-40	300-20	400-15.2	600-10.4
Operating humidity   20% - 85% RH; No condensation   90% RH or less; No	Operaing temperature			0°C~50°C	(*14)													
Operating humidity   20% - 85% RH; No condensation	Storage temperature			-25 °C - 70	С													
Storage humidity		-	-			densation												
Altitude   Maximum 2000m   Foregraf Specifications   PSU   6.800   8.720   12.5-480   15-400   20-304   30-200   40-152   50-120   60-100   80-76   100-60   150-40   300-20   400-15.2   600   60-100   60-100   60-76   100-60   150-40   300-20   400-15.2   600   60-100   60-100   60-76   100-60   150-40   300-20   400-15.2   600   60-100   60-76   100-60   150-40   300-20   400-15.2   600   60-100   60-76   100-60   150-40   300-20   400-15.2   600   60-100   60-76   100-60   150-40   300-20   400-15.2   600   60-76   100-60   150-40   300-20   400-15.2   600   60-76   100-60   150-40   300-20   400-15.2   600   60-76   100-60   150-40   300-20   400-15.2   600   60-76   100-60   150-40   300-20   400-15.2   600   60-76   100-60   150-40   300-20   400-15.2   600   60-76   100-60   150-40   150																		
PSU   6-800   8-720   12.5-480   15-400   20-304   30-200   40-152   50-120   60-100   80-76   100-60   150-40   300-20   400-15.2   600   Weight   main unit only   kg   Less than 37.4 kg																		
Weight         main unit only         kg         Less than 37.4 kg           Dimensions         (WxHxD)         mm         423 x 174.4 x 447.2           Cooling         Forced air cooling by internal fan.           Withstand voltage         AC to Chassis: 1500Vac/Tmin; AC to Output terminal: 3000Vac/Tmin; Yout ≤150V; Output terminal to Chassis:1000Vdc/Tmin; 150-Vout ≤600; Output terminal to Chassis:1500Vdc/Tmin; Yout ≤150V; Output terminal to Chassis:1000Vdc/Tmin; Yout ≤150Vdc/Tmin; Yout ≤150Vdc			Dell			12 5 400	15 400	20.204	30.300	40.353	50 120	60.100	90.76	100.60	150 40	300.30	400.15.0	600 30 4
Dimensions         (WxHxD)         mm         423 x 174.4 x 447.2           Cooling         Forced air cooling by internal fan.           Withstand voltage         AC to Chassis : 1500Vac/Tmin; AC to Output terminal : 3000Vac/Tmin; Yout ≤ 150V; Output terminal to Chassis:1000Vdc/Tmin; 150-Vout ≤ 600; Output terminal to Chassis:1500Vdc/Tmin;						12.5-480	15-400	20-304	30-200	40-152	50-120	60-100	80-76	100-60	150-40	300-20	400-15.2	600-10.4
Cooling         Forced air cooling by internal fan.           Withstand voltage         AC to Chassis : 1500Vac/Tmin; AC to Output terminal : 3000Vac/Tmin; Yout ≤ 150V; Output terminal to Chassis:1000Vdc/Tmin; 150-Vout ≤ 600; Output terminal to Chassis:1500Vdc/Tmin;																		
Withstand voltage AC to Chassis: 1500Vac/Irmin; AC to Output terminal: 3000Vac/Irmin; Vout ≤150V; Output terminal to Chassis:1000Vdc/Irmin; 150-Vout ≤600; Output terminal to Chassis:1500Vdc/Irmin	Dimensions	(W×H×D)	mm															
Withstand voltage AC to Chassis: 1500Vac/Tmin; AC to Output terminal: 3000Vac/Tmin; Vout≤150V; Output terminal to Chassis:1000Vdc/Tmin; 150-Vout≤600; Output terminal to Chassis:1500Vdc/Tmin	Cooling	8	4 -	Forced air c	coling by int	ernal fan.												
							Output termi	inal : 3000Vac	/1min: Vout	≤150V: Outr	out terminal to	Chassis:100	0Vdc/1min:	150 <vout≤6< td=""><td>00; Output te</td><td>minal to Ch</td><td>assis:1500Vd</td><td>c/1min</td></vout≤6<>	00; Output te	minal to Ch	assis:1500Vd	c/1min
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answer are and a second				erinasis affic	- output sell!			, - ve input an	- susper rem		more for	.0007						

- Notes:

  (\*1) Minimum voltage is guaranteed to maximum 0.2% of the rated output voltage.

  (\*2) Minimum current is guaranteed to maximum 0.4% of the rated output current.

  (\*3) Single phase 2007 models: 170 265 Vac. Three phase 2007 models: 180 253 Vac. Three phase 4007 models : 360 440 Vac.

  (\*4) From No-load to Full-load, constant input voltage. Measured at the sensing point in Remote Sense.

  (\*5) Measurement frequency bandwidth is 10-lz. 20M Hz.

  (\*6) Measurement frequency bandwidth is 10-lz. 20M Hz.

  (\*8) From 10% 90% of rated output voltage, with rated resistive load.

  (\*9) From 90% 10% of rated output voltage, with rated resistive load.

  (\*10) Time for output voltage to recover within 2% of its rated output voltage for output voltage to recover within 2% of its rated output voltage.

  (\*11) For load voltage change, equal to the unit voltage rating, constant input voltage.

  (\*12) For 6v 20v model the ripple is measured at 2V rated output voltage.

  (\*13) Single phase and three phase 200V models: at 200Vac input voltage. Three phase 400V models: at 400Vac input voltage. At rated output power.

  (\*14) If install the front panel filter kit, the temperature is guaranteed to 40° C.

1U Handle & Bracket



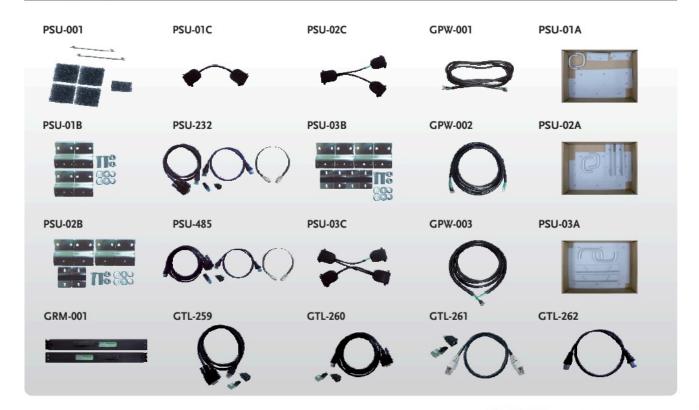






PSU-3kW PSU-4.5kW PSU-6kW

9		ORDERING	INFORMATIO	N	
PSU 6-20 PSU 8-18 PSU 12.5 PSU 15-1 PSU 20-7 PSU 30-5 PSU 40-3 PSU 50-3	80 1440W 5-120 1500W 100 1500W 76 1520W 50 1500W 38 1520W	Programmable Switching DC Power Supply	PSU 60-25 PSU 80-19 PSU 100-15 PSU 150-10 PSU 300-5 PSU 400-3.8 PSU 600-2.6	1520W 1500W 1500W 1500W 1520W	Programmable Switching DC Power Supply
1U Handle	minal cover x 1, An e(RoHS), 1U Bracke	nalog connector plug kit x 1, Output terminal M8 bolt set( et(LEFT, RoHS), 1U Bracket (RIGHT,RoHS), Power Cord(1			
PSU-01B PSU-01C PSU-02B PSU-02C PSU-03B PSU-03C PSU-232 PSU-232 PSU-01A PSU-01A PSU-02A PSU-03A PSU-15O-I	Cable for 2 units in p Bus Bar for 3 units in Cable for 3 units in Bus Bar for 4 units in RS232 Cable with DB RS485 Cable with DB Front panel filter kit( Joins a vertical state) Joins a vertical state of the state	n parallel operation (Applies to models ≤60 volts) parallel connection n parallel operation (Applies to models ≤60 volts) parallel connection n parallel operation (Applies to models ≤60 volts) parallel connection 9 connector kit 9 connector kit	plates x2	GTL-246 GTL-258 GTL-259 GTL-260 GTL-261 GRM-001 PSU-GPIB GPW-001 GPW-002 GPW-003	USB Cable, USB 2.0A-B Type Cable, 4P GPIB Cable, 2000mm RS-232 Cable with DB9 connector to RJ45 RS-485 Cable with Db9 connector to RJ45 Serial Master Cable+Terminator, 0.5M RS-485 Slave cable Slide bracket 2pcs/set ,PSU option GPIB Interface card (factory option) UL/CSA power cord 3m ,PSU option VDE power cord 3m ,PSU option PSE power cord 3m ,PSU option
Driver	LabView Driver				



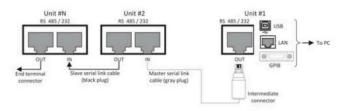
#### SERIES/PARALLEL OPERATION AND HIGH POWER DENSITY

Series Connection	1 unit	2 units
Height of sets	10	2U
PSU 6-200	6V	12V
j	200A	200A
PSU 8-180	8V	16V
	180A	180A
PSU 12.5-120	12.5V	25V
	120A	120A
PSU 15-100	15V	30V
	100A	100A
PSU 20-76	20V	40V
	76A	76A
PSU 30-50	30V	60V
	50A	50A
PSU 40-38	40V	80V
,	38A	38A
PSU 50-30	50V	100V
	30A	30A
PSU 60-25	60V	120V
	25A	25A
PSU 80-19	80V	160V
	19A	19A
PSU 100-15	100V	200V
	15A	15A
PSU 150-10	150V	300V
8	10A	10A
PSU 300-5	300V	600V
	5A	5A
PSU 400-3.8	400V	NA
	3.8A	NA
PSU 600-2.6	600V	NA
	2.6A	NA

Series Parallel	1 unit	2 units	3 units	4 units
Height of sets	10	2U	3U	4U
PSU 6-200	6V	6V	6V	6V
	200A	400A	600A	800A
PSU 8-180	8V	8V	8V	8V
	180A	360A	540A	720A
PSU 12.5-120	12.5V	12.5V	12.5V	12.5V
	120A	240A	360A	480A
PSU 15-100	15V	15V	15V	15V
	100A	200A	300A	400A
PSU 20-76	20V	20V	20V	20V
	76A	152A	228A	304A
PSU 30-50	30V	30V	30V	30V
	50A	100A	150A	200A
PSU 40-38	40V	40V	40V	40V
	38A	76A	114A	152A
PSU 50-30	50V	50V	50V	50V
	30A	60A	90A	120A
PSU 60-25	60V	60V	60V	60V
	25A	50A	75A	100A
PSU 80-19	80V	80V	80V	80V
-	19A	38A	57A	76A
PSU 100-15	100V	100V	100V	100V
	15A	30A	45A	60A
PSU 150-10	150V	150V	150V	150V
	10A	20A	30A	40A
PSU 300-5	300V	300V	300V	300V
	5A	10A	15A	20A
PSU 400-3.8	400V	400V	400V	400V
	3.8A	7.6A	11.4A	15.2A
PSU 600-2.6	600V	600V	600V	600V
	2.6A	5.2A	7.8A	10.4A

To augment output power, the PSU-series can realize two-fold rated power (models under 300V)via 2 same model units in series connection; and four-fold rated power via 4 same model units in parallel connection so as to satisfy customers with large voltage and large current requirements. 2U height units in series connection can achieve maximum 600V output. 4U height units in parallel connection can output maximum 800A and 6240W.

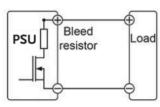
#### B. REMOTE PROGRAM CONTROL (UP TO 31 UNITS CONNECTION)



Provide RS-232, RS-485, USB, GPIB and LAN for PC to remote control Master PSU-Series. RJ-45 connector on the rear panel can connect up to 31 units.

LAN or USB remote control and augmenting slave units by using PSU-Series multi-drop mode will no longer need any switch/hub that can help customers save equipment costs.

#### C. BLEEDER CONTROL



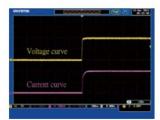
PSU-Series Built-in Bleed Resistor

The PSU-Series employs a bleed resistor in parallel with the output terminal. Bleed resistor is designed to dispatch the power from the power supply filter capacitors when power is turned off or the load is disconnected. Without a bleed resistor, power terminal may remain charged on the filter capacitors for some time and be potentially hazardous. In addition, bleed resistor also allows for smoother voltage regulation of the power supply as the bleed resistor acts as a minimum voltage load. The bleed resistance can be turned on or off using the configuration setting.

#### D. C.V/C.C PRIORITY MODE



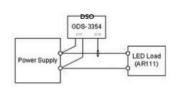
Under the conventional C.V mode, inrush current and surge voltage appeared at forward voltage(Vf) of LED.



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



V-I Characteristic of Diode



Using GDS-3354 DSO to Test LED Operation Under C.V Priority and C.C Priority Respectively

Conventional power supplies under the CV priority mode will produce inrush current and surge voltage at turn-on. The PSU-series has CV and CC priority modes.

The CC priority mode can prevent inrush current and surge voltage from occurring at turn-on to protect DUT.

<sup>\*</sup> For the detailed information please refer to User Manual

#### ADJUSTABLE SLEW RATE

	0
VOLTAGE SLEW RATE	CURRENT SLEW RATE
0.001V~0.060V/msec (PSU 6-200)	0.001A~2.000A / msec (PSU 6-200)
0.001V~0.080V/msec(PSU 8-180)	0.001A~1.800A / msec (PSU 8-180)
0.001V~0.125V/msec (PSU 12.5-120)	0.001A~1.200A / msec (PSU 12.5-120)
0.001V~0.150V/msec(PSU 15-100)	0.001A~1.000A / msec(PSU 15-100)
0.001V~0.200V/msec (PSU 20-76)	0.001A~0.760A / msec (PSU 20-76)
0.001V~0.300V/msec(PSU 30-50)	0.001A~0.500A / msec(PSU 30-50)
0.001V~0.400V/msec (PSU 40-38)	0.001A~0.380A / msec (PSU 40-38)
0.001V~0.500V/msec(PSU 50-30)	0.001A~0.300A / msec(PSU 50-30)
0.001V~0.600V/msec (PSU 60-25)	0.001A~0.250A / msec (PSU 60-25)
0.001V~0.800V/msec(PSU 80-19)	0.001A~0.190A / msec(PSU 80-19)
0.001V~1.000V/msec (PSU 100-15)	0.001A~0.150A / msec (PSU 100-15)
0.001V~1.500V/msec (PSU 150-10)	0.001A~0.100A / msec (PSU 150-10)
0.001V~1.500V/msec (PSU 300-5)	0.001A~0.025A / msec (PSU 300-5)
0.001V~2.000V/msec (PSU 400-3.8)	0.001A~0.008A / msec (PSU 400-3.8)
0.001V~2.400V/msec (PSU 600-2.6)	0.001A~0.006A / msec (PSU 600-2.6)



Adjustable Voltage Slew Rate

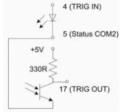
The PSU series can adjust slew rate for current and voltage. Via setting the rise and fall time of voltage and current, users can verify DUT's characteristics during voltage and current variation. Additionally, slew rate adjustment can mitigate voltage shift to effectively prevent DUT from being damaged by inrush current. This function is ideal for tests such as capacitive load and motor.

#### E. OVP,OCP AND UVL

MODEL	ОСР	OVP	UVL
PSU 6-200	5 ~ 220A	0.6 ~ 6.6V	0 ~ 6.3V
PSU 8-180	5 ~ 198A	0.8 ~ 8.8V	0 ~ 8.4V
PSU 12.5-120	5 ~ 132A	1.25 ~ 13.75V	0 ~ 13.12V
PSU 15-100	5 ~ 110A	1.5 ~ 16.5V	0 ~ 15.75V
PSU 20-76	5 ~ 83.6A	2 ~ 22V	0 ~ 21V
PSU 30-50	5 ~ 55A	3 ~ 33V	0 ~ 31.5V
PSU 40-38	3.8 ~ 41.8A	4 ~ 44V	0 ~ 42V
PSU 50-30	3 ~ 33A	5 ~ 55V	0 ~ 52.5V
PSU 60-25	2.5 ~ 27.5A	5 ~ 66V	0 ~ 63V
PSU 80-19	1.9 ~ 20.9A	5 ~ 88V	0 ~ 84V
PSU 100-15	1.5 ~ 16.5A	5 ~ 110V	0 ~ 105V
PSU 150-10	1 ~ 11A	5 ~ 165V	0 ~ 157.5V
PSU 300-5	0.5 ~ 5.5A	5 ~ 330V	0 ~ 315V
PSU 400-3.8	0.38 ~ 4.18A	5 ~ 440V	0 ~ 420V
PSU 600-2.6	0.26 ~ 2.86A	5 ~ 660V	0 ~ 630V

Once the voltage or current output exceeds the preset level of OVP or OCP, PSU will shut down output to protect DUT.UVL is for users to set the minimum output voltage from the output terminal.

#### G. TRIGGER CONTROL (TRIGGER INPUT/TRIGGER OUTPUT)



PSU-series provides users with complete trigger input and trigger output functions so as to flexibly control PSU-series. Each function is elaborated as follows.

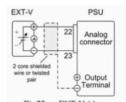
#### Trigger Input function:

- 1. Allow users to set the effective pulse width from  $0\sim60ms$  for trigger input (0: the LOW or HIGH signal of DC level for trigger input)
- 2. Receive trigger input to control PSU-series output or to output preset voltage and current.
- 3. Receive trigger input to upload preset memory parameters.

#### Trigger Output function:

- Allow users to set the effective pulse width from 0~60ms for trigger output (0: the LOW or HIGH signal of DC level for trigger output)
- 2. Set LOW or HIGH for output DC level
- PSU produces trigger output signal when setting output or changing preset value or uploading preset memory parameters.

#### H. EXTERNAL ANALOG CONTROL FUNCTION



- Pin23 → EXT-V (-)
- Pin22 → EXT-V (+)
- Wire shield → negative (-) output terminal
- EXT-R PSU

  Analog connector

  2 core shielded wire or twisted pair

  Output Terminal
- Pin22 → EXT-R
- Pin23 → EXT-R
- Wire shield → negative (-) output terminal

# Switch PSU Analog connector 2 core shielded wire or heisted pair Output Terminal

- Pin19 → Switch
- Pin20 → Switch
- Wire shield → negative (-) output terminal

#### **External Voltage Controls Voltage Range**

#### **External Resistance Controls Voltage Range**

The rear panel of the PSU-series has an analog control terminal. The external analog control interface allows external voltage or resistance to control voltage and current output; and allows power supply to output or to be turned on and off. The diagram on the upper shows typical connection methods for external control applications. For more detailed connection information please refers to user manual.

## External On-off to Control Output, on or off



## Fanless Multi-Range DC Power Supply



#### PFR-100L



#### PFR-100M



#### **FEATURES**

- \* Constant Power Output for Fivefold Multi-Range(V&I) Operation
- \* Natural Convection Cooling Design (Fanless Structure)
- \* Preset Memory Function
- \* Output ON/OFF Delay Function
- \* CV, CC Priority Mode
- \* Adjustable Slew Rate For Voltage and Current
- \* Bleeder Circuit Control
- \* Protection: OVP, OCP, AC FAIL and OTP
- \* Support Front Panel and Rear Panel Output
- \* Interface: USB,LAN,RS-232/485(std.); GPIB(opt.)
- \* Web Server Monitoring and Control
- \* External Analog Control and Monitor Function
- \* Remote Sensing Function

Model	PFR-100L	PFR-100M
Output Channel	1	1
Output Voltage	0~ 50V	0~ 250V
Output Current	0~ 10A	0~ 2A
Rated Power	100W	100W

The PFR-100 series, a small and high-performance programmable D.C. power supply, adopts natural convection design to dissipate heat. The fanless structure allows users to focus on their experiments and tests in a quiet environment. Fanless power supply will not suck in dust and foreign objects, therefore, PFR-100 series has a longer life cycle compared with that of power supplies with fan.

The PFR-100 series is a power supply with a five-fold rated power that allows users to self-define voltage and current under rated power conditions so as to satisfy them with wider voltage and current operational ranges. PFR-100 series, with rated 100W, provides two models: PFR-100L- maximum output voltage of 50V (at 2A) or maximum output current of 10A (at 10V); PFR-100M- maximum output voltage of 250V (at 0.4A) or maximum output current of 2A (at 50V).

The PFR-100 series provides front and rear panel output terminals. The front panel output terminal helps users shorten test lead replacement time while conducting adjustment on front panel's function keys. The rear panel output terminal facilitates an easy wiring operation for rackmount assembly. 3U height, 70mm width and 2.5KG in weight have greatly elevated PFR-100 series portability. Furthermore, the multi-drop mode allows users to control up to 31 PFR-100 series without using switch/Hub that help users save the equipment cost.

The LAN interface for PFR-100 is Ethernet port. PFR-100 also has a built-in web server and intuitive user interface. Users, via general browsers including Internet Explorer, Mozilla Firefox or Android cellular phones, can monitor PFR-100's test and measurement anywhere. Users not only can remotely monitor PFR-100 via internet, but also remotely observe and adjust their operating PFR-100s in the lab from your home. The outputs of PFR-100 series can be monitored including OVP, OCP, UVL; and the system information can be checked such as unit's serial number, firmware edition and internet setting. Users can remotely adjust PFR-100 settings, including output voltage/current, the slew rate for voltage/current, Bleeder circuit control, OCP, delayed time for output voltage and Buzzer settings.

The PFR-100 series provides special functionalities to meet test requirements for different load's characteristics. The CC priority mode can be applied for DUTs with diode characteristics to prevent DUT from being damaged by inrush current. A slow rise time for voltage can also protect DUT from inrush current, especially for tests on capacitive load. When power is off or load is disconnected, the activation of Bleeder circuit control will allow the bleeder resistor to consume filter capacitor's electricity. Without the bleed resistor, power supply's filter capacitor may still have electricity that is a potential hazard. For automatic testing equipment systems, the bleeder resistor allows PFR-100 series to rapidly discharge to prepare itself for the next operation.

Model		PFR-100L	PFR-100M
OUTPUT RATING		PFK-100L	PFR-100M
Rated Output Voltage		50V	250V
Rated Output Current		10A	2A
Rated Output Power		100W	100W
REGULATION(CV)			
Load Regulation (*2)		10mV	33mV
Line Regulation (*1)		3mV	5mV
REGULATION(CC)			
Load Regulation (*9)		10mA	3.2mA
Line Regulation (*1)		8mA	1.2mA
RIPPLE & NOISE (*3)			2022
Vp-p (*4)		50mV	150mV
Vr.m.s.(*5)		4mV	15mV
A r.m.s.		10mA	2mA
PROGRAMMING ACCURACY			
Voltage	0.1% of setting +	40mV	200mV
Current	0.2% of setting +	20mA	2mA
MEASUREMENT ACCURACY			
Voltage	0.1% of reading +	40mV	200mV
Current	0.2% of reading +	20mA	2mA
RESPONSE TIME			
Rise Time (*6)	Rated load	50ms	100ms
Fall Time (*7)	Rated load	100ms	200ms
	No load	500ms	1000ms
Transient Response Time (*8)		1.5ms	2ms
PROGRAMMING RESOLUTION			
Voltage		2mV	10mV
Current		1mA	0.1mA
MEASUREMENT RESOLUTION			1
Voltage		2mV	10mV
Current		1mA	0.1mA
PROTECTION FUNCTION			
Over Voltage Protection (OVP)	Setting range	5~55V	5~275V
Over Current Protection (OCP)	Setting range	1~11A	0.2~2.2A
Under Voltage Limit (UVL) Over Temperature Protection (OTP)	Setting range	0~52.5V	0~262.5V
	Operation	Turn the output off.	Turn the output off.
Low AC Input Protection (AC-Fail)	Operation	Turn the output off.	Turn the output off.







#### Rear Panel





#### **PFR-Series**

SPECIFICATIONS								
Model		PFR-100L	PFR-100M					
FRONT PANEL DISPLAY ACCURACY, 4 DIGIT	S							
	reading + reading +	40mV 20mA	200mV 2mA					
ENVIRONMENT CONDITION								
Operating Temperature Storage Temperature Operating Humidity Storage Humidity		0°C to 40°C -20°C to 70°C 20% to 80% RH; No condensation 20% to 85% RH; No condensation						
READBACK TEMP. COEFFICIENT(After A 30 M	Minute Wa	rm-up)						
Voltage Current		100ppm/°C 200ppm/°C						
OTHER								
Analog Control Interface AC Input		Yes USB,LAN,RS-232/485(std.); GPIB(opt.) 85~265VAC, 47~63Hz, single phase						
DIMENSIONS & WEIGHT								
		70(W)x124(H)x300(D)mm;	Approx, 2.5kg					

Note: \*1: At 85 ~ 132Vac or 170 ~ 265Vac, constant load.

- \*2: From No-load to Full-load, constant input voltage. Measured at the sensing point in Remote Sense.
- \*3: Measure with JEITA RC-9131B (1:1) probe \*4: Measurement frequency bandwidth is 10Hz to 20MHz.
- \*5: Measurement frequency bandwidth is 5Hz to 1MHz.
- \*6: From 10%–90% of rated output voltage, with rated resistive load.
  \*7: From 90%~10% of rated output voltage, with rated resistive load.
- $\pm$ 8: Time for output voltage to recover within 0.1% + 10mV of its rated output for a load change from 50 to 100% of its rated output current.
- \*9: For load voltage change, equal to the unit voltage rating, constant input voltage.

#### ORDERING INFORMATION

PFR-100L Fanless Multi-Range DC Power Supply

PFR-100M Fanless Multi-Range DC Power Supply (European terminals provided only)

#### ACCESSORIES:

Power cord, GTL-134 test lead, Accessory Packages

GTL-104A test lead (for PFR-100L only), GTL-105A test lead (for PFR-100M only),

GTL-204A test lead (for PFR-100L European Type Jack Terminal)

#### OPTIONAL ACCESSORIES

GTL-258 GPIB Cable, 2000mm GTL-259 RS-232 Cable with DB9 connector to RJ45 PSU-232 RS-232 Cable with DB9 Connector Kit GTL-260 RS-485 Cable with DB9 connector to RJ45 PSU-485 RS-485 Cable with DB9 Connector Kit GTL-261 Serial Master Cable+Terminator, 0.5M USB Cable (USB 2.0 Type A-TypeB Cable)

GTL-262 RS-485 Slave cable GTL-246 GRA-431-J-100/200 Rack mount Kit(JIS) with AC 100V/200V GRA-431-E-100/200 Rack mount Kit(EIA) with AC 100V/200V PFR-GPIB Optional GPIB Interface for PFR (Factory installed)





GTL-261



GTL-262

GRA-431-J/E Rack Mount Kit(JIS/EIA)





PSU-232 RS-232 Cable with DB9 Connector Kit



PSU-485 RS-485 Cable with DB9 Connector Kit



GTL-258 GPIB Cable, 2000mm



GTL-134 Test Lead



## Programmable Switching DC Power Supply (Multi-range DC Power Supply)



#### PSB-2400L2



## PSB-2400L/PSB-2400H/ PSB-2800L/PSB-2800H



#### **PSB-2800LS**



#### **FEATURES**

- \* Output Voltage Rating: 80V/800V, Output Power Rating: 400W ~ 800W
- \* Constant Power Output for Multi-Range (V & I) Operation
- \* Series and Parallel Operation (2 Units in Series or 4 Units in Parallel Maximum)
- \* 90 Degree Angle Rotatable Control Panel
- \* Sequence Function Edited by PC will be **Controlled Through Power Supply Optional** Interfaces
- \* Standard Interface : RS-232C/USB/Analog Control Interface
- \* Optional Interface : GPIB \* Preset Function (3 Points)
- \* LabVIEW Driver

The PSB-2000 Series is a high power density, programmable and multi-range output DC power supply. There are six models in the series including one power booster unit. The PSB-2000 Series has the output voltage of 0~80V and 0~800V, and the output power ranges of 0~400W and 0~800W. The multi-range output functionality facilitates flexible collocations of higher voltage and larger current under the rated power range. Both series and parallel connections can be applied to the PSB-2000 Series to fulfill the requirements of higher

The PSB-2000 Series provides three sets of preset function keys to memorize regularly used settings of voltage, current and power that users can recall rapidly. The sequence function, via RS232C, USB interface or optional GPIB interface, can connect with the computer to produce output power defined by sequence of a series of set voltage and current steps that are defined by the computer. This function is often used to establish a standard test procedure for the verification of the influence on DUTs done by the swiftly changing operating

The PSB-2000 Series protects over voltage and over current. The power supply output function will be shut down to protect DUTs while the protection mechanism is triggered to function. When conducting battery charging operation, the Hi- $\Omega$  mode of the PSB-2000 Series will prevent reverse current from damaging power supply.

The PSB-2000 Series provides analog control interfaces on the rear panel to control PSB-2000 Series output via the external voltage or to externally monitor voltage and current output status of power supply. The PSB-2000 Series panel can be rotated 90 degree angle suitable for vertical or horizontal position to accommodate the ideal space utilization.

#### SERIES OPERATION

MODEL NUMBER	SINGLE UNIT	TWO UNITS
PSB-2400L	80V/40A	160V/40A
PSB-2800L	80V/80A	160V/80A
PSB-2800LS (Booster Unit for PSB-2800L Only)	N/A	N/A
PSB-2400L2	N/A	N/A
PSB-2400H	N/A	N/A
PSB-2800H	N/A	N/A

#### PARALLEL OPERATION

MODEL NUMBER	SINGLE UNIT	TWO UNITS	THREE UNITS	FOUR UNITS
PSB-2400L	80V/40A	80V/80A	80V/120A	80V/160A
PSB-2800L	80V/80A	80V/160A	80V/240A	80V/320A
PSB-2800LS	N/A	80V/160A (PSB-2800L x 1+ PSB-2800LS x 1)	80V/240A (PSB-2800L x 1+ PSB-2800LS x 2)	N/A
PSB-2400L2	N/A	N/A	N/A	N/A
PSB-2400H	800V/3A	800V/6A	N/A	N/A
PSB-2800H	800V/6A	800V/12A	N/A	N/A

SPECIFICATIONS						
	PSB-2400L	PSB-2800L	PSB-2400L2	PSB-2400H	PSB-2800H	PSB-2800LS
OUTPUT RATING						
Voltage Current	0 ~ 80V 0 ~ 40A	0 ~ 80V	0 ~ 80V x 2CH	0 ~ 800V 0 ~ 3A	0 ~ 800V	80V
Power	0~40A 400W	0 ~ 80A 800W	0 ~ 40A x 2CH 800W	400W	0 ~ 6A 800W	80A 800W
REGULATION (CV)		33311	333.11			
Load	0.01% ± 3mV of rated vo	ltage		0.01% ± 30mV of rated voltage		N/A
Line	0.01% ± 2mV of rated vo			$0.01\% \pm 20$ mV of rated voltage		
REGULATION (CC)						
Load	0.02% ± 3mA of rated cu			0.05% ± 15mA of rated current		N/A
Line	0.01% ± 2mA of rated cu			0.05% ± 10mA of rated current		
	e Bandwidth 20MHz ; Ripple B				Date of the second	
CV p-p	90mV	150mV	90mV	250mV(only output voltage measures more than 1% of the rated voltage)	300mV (only output voltage measures more than 1% of the rated voltage)	N/A
CV rms	4mV	6mV	4mV	20mV (when current measures<2A) 35mV (when current measures>2A)	25mV (when current measures<2A) 40mV (when current measures>2A)	
CC rms	30mA	60mA	30mA	15mA	20mA	
PROGRAMMING ACCU	575					
Voltage	0.1% setting±2digits			0.1% setting±2digits		N/A
Current	0.2%setting±2digits ± 10W			0.2% setting±2digits	res mare than 10/ of out of	
READ BACK ACCURACY				±10W (only output voltage measur	es more than 1% of rated voltage)	
				0.2% reading±2digits		N/A
Voltage Current	0.2% reading±2digits 0.3% reading±2digits			0.3% reading±2digits		13//3
Power	0.5% reading±5digits			0.5% reading±Vout x 40mA		
RESPONSE TIME						
Raise Time(Full load/No load)	50ms			200ms		N/A
Fall Time(Full load)	100ms			500ms		[6]
Fall Time(No load)	500ms			1000ms		
Load Transient Recover Time (Load change from 50~100%)	lms			7ms		
PROGRAMMING RESO	LUTION					
	10mV			1001/		N/A
Voltage Current	10mV			100mV 10mA		N/A
Power	10W			10W		
MEASUREMENT RESOL	LUTION					
Voltage	10mV			100mV		N/A
Current	10mA 10W			10mA 10W		
SERIES AND PARALLEL				TOW		
Channel Number	1	1	2	1	1	Ī
Series Operation	Up to 2 Units	Up to 2 Units	N/A	N/A	N/A	For PSB-2800L
Parallel Operation	Up to 4 Units	Up to 4 Units	N/A	Up to 2 Units	Up to 2 Units	Only
Parallel with booster PSB-2800LS	1923 M3395	Up to 3 Units	N/A	N/A	N/A	
PPROTECTION FUNCT	SC 10 (10 (10 (10 (10 (10 (10 (10 (10 (10	C . I I:		0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	d- 1100/ -ftdlt	N/A
OVP (Fixed) OVP (Variable)	Output off when 110% of Output off when operating;		IV with front nanel	Output off when output voltage ex Presettable in range from 10V ~ 84		N/A
OCP (Fixed)	Output off when 110% of		with front parier	Output off when output voltage ex		
OCP (Variable)	Output off when operating; Sett		A for model number)	Presettable in range from 0.1A ~ 6.		
OHP'	Output off above heat sir	nk setting temper	ature	Output off at the internal heat sink t	emperature over setting value	
ENVIRONMENT COND						
Operation Temp	0°C ~ 40°C					N/A
Storage Temp	-20°C ~ 70°C	andancation)				
Operating Humidity Storage Humidity	30% ~ 80% RH (no dew of 30% ~ 80% RH (no dew of several severa					
OTHER						
Inrush Current	35A Max	70A Max	70A Mmax	35A Max	70A Max	70A Max
Power Consumption/Factor	560VA/0.99	1120VA/0.99	1120VA/0.99	560VA/0.99	1120VA/0.99	1120VA/0.99
Cooling Method	Forced air-cooling with fa	n motor				V.
Power Source	100VAC ~ 240VAC, 50/60H	tz, Single phase				
Interface (Standard)	RS-232C/USB					
Interface (Optional) Analog Control	GPIB Yes					
DIMENSIONS & WEIGH	2.342.77					
D.MEITOIOITO & WEIGI	210(W) x 124(H) x 290(D	)mm				
	Approx.5kg	Approx.7kg	Approx.7kg	Approx. 5kg	Approx. 6kg	Approx. 7kg
	ANDIONINE.	rippiox./Kg	APPIUM./KK	Approx. JAK	APPION, OKE	LIPPIUM. /KB

## Programmable Switching DC Power Supply (Multi-range DC Power Supply)



PSB-2400L2

**Rear Panel** 



PSB-2400L/PSB-2400H/ PSB-2800L/PSB-2800H



**PSB-2800LS** 









**PSB-003 Parallel Connection Kit for** Horizontal Installation





PSB-004 Parallel Connection Kit for Vertical Installation



#### ORDERING INFORMATION

PSB-2400L	0~80V/0~40A/400W Multi-Range DC Power Supply
PSB-2800L	0~80V/0~80A/800W Multi-Range DC Power Supply
PSB-2400L2	0~80V x 2/0~40A x 2/800W Multi-Range DC Power Supply
PSB-2400H	0~800V/0~3A/400W Multi-Range DC Power Supply
	0~800V/0~6A/800W Multi-Range DC Power Supply
PSB-2800LS	800W Slave (Booster) Unit For Current Extension Only

FREE DOWNLOAD

AC Power Cord x 1, External Control Connector (26pin), Screws for output terminals on rear panel, Protection covers for output terminals on rear panel, Protection caps for output terminals on the front panel, GND Cable, USB Cable (For Model Number : PSB-2400L; PSB-2800L; PSB-2400L2; PSB-2400H; PSB-2800H) Local Bus (For Model Number: PSB-2400L; PSB-2800L; PSB-2400L2; PSB-2400H; PSB-2800H)

OPTI	ONAL ACCESSORIES		
PSB-0		GTL-246	USB Cable GPIB Cable
	Kit Includes : (PSB-007 Joint Kit, Horizontal bus bar x 2 , PSB-005 x1)		Modular Cable
PSB-0	Parallel Connection Kit for Vertical Installation.  Kit Includes: (PSB-007 Joint Kit, Verical bus bar x 2, PSB-005 x 1)	GRA-424	Rack Mount Ki
PSB-0	95 Parallel Connection Signal Cable		
PSB-0	06 Series Connection Signal Cable		
PSB-0	Joint Kit: Includes 4 Joining Plates, (M3x6)screws x 4; (M3x8)screw x 2		
PSB-0	08 RS232C Cable (PSB-2000 Only)		

#### PSB-001 GPIB Control Board



GRJ-1101 Modular Cable



Labview Driver

PSB-008 RS-232C Cable (PSB-2000 Only)



**PSB-005 Parallel Connection** Signal Cable



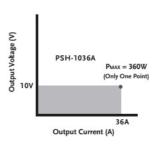
**PSB-006 Series Connection** Signal Cable



PSB-007 Joint Kit

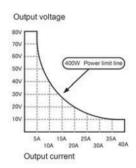


#### A. MULTI-RANGE OUTPUT OPERATION



#### The operation area of a Conventional Power Supply

Compared 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 PSB-2000 series, defying the formula, has a unique characteristic of multi-range output (voltage and 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 360W, the maximum voltage and current outputs are likely to be



The operation area of a Multi-Range Power Supply for PSB-2000 Series

10V and 36A respectively. Comparatively, PSB-2400L, with the maximum power output of 400W, provides voltage and current output ranges of 0~80V and 0~40A. The maximum current of 5A will be provided when the voltage reaches 80V and the maximum voltage of 10V for the maximum current of 40A. PSB-2400L, breaking the limitation of Pmax=Vmax x Imax,, broadens voltage and current application ranges. The following diagrams illustrate the voltage and current comparison between the multi-range output power supply and the conventional power supply.

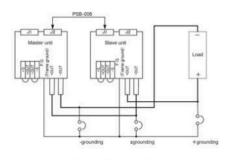
#### B. PRODUCTS IN THE SERIES

There are six models in the PSB-2000 Series. Model type, output voltage, output current and output power are as follows:

MODEL	PSB-2400L	PSB-2800L	PSB-2400L2	PSB-2400H	PSB-2800H	PSB-2800LS*
Channel Number	1	1	2	1	1	NA
Voltage Rating**	0 ~ 80V	0 ~ 80V	0 ~ 80V x 2CH	0 ~ 800V	0 ~ 800V	80V
Current Rating***	0 ~ 40A	0 ~ 80A	0 ~ 40A x 2CH	0 ~ 3A	0 ~ 6A	80A
Output Power (Max.)	400W	800W	800W	400W	800W	800W

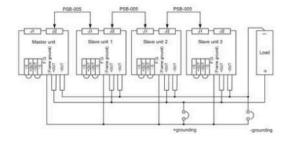
- \* PSB-2800LS, a booster unit acting as slave to extend current, can not operate alone. It must operate with PSB-2800L master.
- \*\* The maximum current under the highest output voltage is power/voltage. For instance, when PSB-2400L outputs 80V the maximum current is 400W/80V = 5A.
- \*\*\* Same as above. When PSB2400L outputs 40A the highest voltage is 400W/40A = 10V.

#### C. SERIES AND PARALLEL CONNECTIONS



**Series Connection** 

Hence, the PSB-2000 Series, with its multi-range output function and the power extension capability of series and parallel connections, is the high power density and high performance to cost ratio DC power supply, which provides



Parallel Connection

a wider range of power applications for any limited equipment space. The PSB-2000 Series is an ideal selection for testing DC power supply module, automobile lithium and lithium iron battery and electronic parts.



#### **PSH-Series**



#### **FEATURES**

- \* Wide Input Voltage Range and High Power Factor (P.F)
- \* High Efficiency and High Power Density
- \* Constant Voltage and Constant Current Operation
- \* Over Voltage, Over Current and **Over Temperature Protection**
- \* Self-Test and Software Calibration
- \* Output ON/OFF Control
- \* Low Ripple and Noise
- \* LCD Display
- \* Built-in Buzzer Alarm
- \* Standard Interface: RS-232C
- \* Optional Interface : GPIB ( IEEE-488.2 )
- \* LabVIEW Driver

The PSH-Series is a single output from 360W to 1080W, programmable switching DC power supply. OVP, OCP and OTP protect the power supply and loads from unexpected conditions. Remote sensing adds an extra level of precision by compensating cable losses between loads. The bright LCD with simultaneous parameter outputs allows effortless operation. Self-test and software calibration features also reduce maintenance overhead. SCPI commands and LabVIEW driver access through the RS-232C or the optional GPIB interface allow remote control and ATE software development capability. Modular architecture, dedicated rear-panel output, and the 19 inch 4U rack mounting option ensure that the PSH-Series is optimized for large systems.

SPECIFICATION		DC11.26304	DCI I 2620A	DCI   2626 *
CUITAUT	PSH-2018A	PSH-3610A	PSH-3620A	PSH-3630A
OUTPUT				500.1996
Voltage	20V	36V	36V	36V
Current	18A	10A	20A	30A
REGULATION (C	,			
Load	$\leq 0.1\% + 5 \text{mV}$	≤ 0.1%+5mV	≤0.1%+5mV	$\leq$ 0.1%+5mV
Line	$\leq$ 0.05%+5mV	≤ 0.05%+5mV	≤0.05%+5mV	≤ 0.05%+5mV
REGULATION (C	.C.)			
Load	≤ 0.2%+5mA	≤ 0.2%+5mA	≤0.2%+10mA	≤ 0.2%+15mA
Line	≤ 0.2%+5mA	≤ 0.2%+5mA	≤0.2%+10mA	≤ 0.2%+15mA
RIPPLE & NOISE				
Voltage (mVrms)	≤ 10mVrms	≤ 10mVrms	≤10mVrms	≤ 10mVrms
Voltage (mVp-p)	— 10mVrms  ≤ 100mVp-p	= 10mVrms ≤ 100mVp-p	= 10mVrms ≤ 100mVp-p	
voitage (iiivp-p)	20Hz~20MHz	20Hz~20MHz	20Hz~20MHz	20Hz~20MHz
Current (mArms)		≤ 0.2%	≤0.2%+20mA	≤ 0.2%+40mA
, ,	≥ 0.2%	≥ 0.2%	≥0.2%+20mA	≥ 0.2%+40mA
RESOLUTION	M-00-00-00-00-00-00-00-00-00-00-00-00-00		10000	00.000000000000000000000000000000000000
Voltage	10mV	10mV	10mV	10mV
Current	10mA	10mA	10mA	10mA
PROGRAM ACCU	IRACY			
Voltage	$\leq 0.05\% + 25 \text{mV}$	≤ 0.05%+25mV	≤ 0.05%+25mV	$\leq 0.05\% + 25 \text{mV}$
Current	≤ 0.2%+30mA	≤ 0.2%+30mA	≤ 0.2%+30mA	≤ 0.2%+30mA
READBACK RESC	LUTION (Meter)		1	
Voltage	Same as Resolution	Same as Resolution	Same as Resolution	As Resolution
Current	Same as Resolution	Same as Resolution	Same as Resolution	As Resolution
READBACK ACCU	JRACY (Meter)			
Voltage	Same as Program Accuracy	Same as Program Accuracy	Same as Program Accuracy	As Program Accurac
Current	Same as Program Accuracy	Same as Program Accuracy	Same as Program Accuracy	As Program Accurac
READBACK TEMP.	COEFFICIENT			
Voltage (25 ±5°€)	≤ 100ppm/ °C	≤100ppm/°C	≤100ppm/°C	≤100ppm/°C
RESPONSE (Rise		- · · · · · · · · · · · · · · · · · · ·	,	,
, ,	≤150mS	≤150mS	≤150mS	≤150mS
Voltage Up				
(10%~90%)	(≤95% rating load) ≤150mS	(≤95% rating load) ≤150mS	(≤95% rating load)	(≤95% rating load)
Voltage Down			≤150mS	≤150mS
(90%~10%)	(≥10% rating load)	(≥10% rating load)	(≥ 10% rating load)	(≥10% rating load)
	50% Step Load Change			
CV Mode	≤ 2mS	≤ 2mS	≤2mS	≤2mS
PROTECTION				
OVP/OCP/OTP	V	V	V	V
Rush Current	V	V	V	V
OUTPUT ON/OFF			•	· · ·
oon or onjoin	V	V	V	
INTERFACE				
	C; Optional : GPIB			
POWER SOURCE				
AC90V~250V, 50/	20.10/11.0			
DIMENSIONS &	WEIGHT			
	108(W)x142(H)x393(D)	108(W)x142(H)x393(D)	188(W)x142(H)x393(D)	268(W)x142(H)x393(D
	mm; Approx. 3.3kg	mm; Approx. 3.3kg	mm; Approx. 6.2kg	mm; Approx. 9.3kg

#### **Rear Panel**



### ORDERING INFORMATION

360W Programmable Switching DC Power Supply PSH-2018A 360W Programmable Switching DC Power Supply 720W Programmable Switching DC Power Supply PSH-3610A PSH-3620A PSH-3630A 1080W Programmable Switching DC Power Supply

ACCESSORIES: Power cord x 1

#### OPTION

Opt. 01: GPIB Interface (Factory Installed)

#### **OPTIONAL ACCESSORIES** GRA-403

GTL-232

RS-232C Cable, 9-pin Female to 9-pin, null Modem for Computer GTL-122 Test Lead, U-type to Alligator Test Lead, Max. Current 40A, 1200mm

GTL-248 GPIB Cable, Double Shielded, 2000mm

#### FREE DOWNLOAD

**PC Software** PC Software including Data Log; Remote Control Software Driver

Note: When Opt.01 GPIB interface is ordered, the standard interface RS-232C will be deleted.



The PSP-Series is a single output, 200W, programmable switching DC power supply. OVL, OCL, OTP, and OPL protect the PSP-Series and its loads from unexpected conditions. The PSP-Series has a large LCD panel with output and parameter views and a key lock feature to prevent changing the settings. The PSP-Series is suitable for generic bench-top applications in laboratories and educational institutions.

## PSP-603/405/2010







#### **FEATURES**

- \* LCD Display
- \* Output ON/OFF Control
- \* 3 Step Fan Speed Control
- \* Voltage/Current/Power Setting
- \* Key Lock to Avoid Error Operation
- \* Normal , +% & -% Output Operation Key
- \* Standard Interface: RS-232C
- \* Optional European Type Jack Terminal

#### **European Type Jack Terminal**



#### **Rear Panel**



SPECIFICATIONS OUTPUT			
Model	PSP-603	PSP-405	PSP-2010
Voltage	0 ~ 60V	0 ~ 40V	0 ~ 20V
Current	0 ~ 3.5A	0~5A	0 ~ 10A
VOLTAGE REGULATION	177. 474.74.769		
Load	< 10mV	< 10mV	< 10mV
Line	≤ 10mV ≤ 0.05%	≤ 10mV ≤ 0.05%	≤ 10mV ≤ 0.05%
CURRENT REGULATION		, and a second s	
Load	≤ 5mA	≤ 5mA	< 5mA
Line	≤ 0.05%	≤ 0.05%	≤ 0.05%
RIPPLE			
Voltage (mVrms)	< 20mV	< 20mV	< 20mV
Current (mArms)	≤ 20mV ≤ 10mA	≤ 20mV ≤ 10mA	≤ 20mV ≤ 10mA
RESOLUTION	- TOTAL	- TOTAL	_ 1011A
Voltage	20mV	10mV	10mV
Current	10mA	10mA	10mA
PROGRAM ACCURACY	1011111		
Voltage	+ 0.05%rdg+ 4digits	+ 0.05%rdg+ 3digits	+ 0.05%rdg + 3digits
Current	± 0.1%rdg + 5digits	± 0.1%rdg + 5digits	± 0.3%rdg + 10digits
READBACK (METER) RESOL	UTION		
Voltage	Same as Resolution	Same as Resolution	Same as Resolution
Current	Same as Resolution	Same as Resolution	Same as Resolution
READBACK (METER) ACCUR			I
Voltage	Same as Program Accuracy	Same as Program Accuracy	Same as Program Accur
Current PROTECTION	Same as Program Accuracy	Same as Program Accuracy	Same as Program Accur
OVL/OCL/OPL/OTP	V		
OUTPUT ON/OFF CONTR		•	
oon or onjoir contin	V	V	V
DISPLAY	\$ 100 miles		
LCD			
INTERFACE (STANDARD)			
RS-232C			
POWER SOURCE			
AC 115V/230V±15%, 50/60	Hz		
DIMENSIONS & WEIGHT			

## ORDERING INFORMATION

200W Programmable Switching DC Power Supply 200W Programmable Switching DC Power Supply PSP-2010 200W Programmable Switching DC Power Supply

ACCESSORIES:

Power cord x 1, Test lead GTL-104A x 1 , European test lead GTL-204A x 1  $\,$ 

#### **OPTIONAL ACCESSORIES**

GTL-232A RS-232C Cable GRA-428 Rack Mount Kit, 19", 3U Size

FREE DOWNLOAD

PC Software RS-232C Remote Control Software



The SPS-Series is a single output, 360W, switching DC power supply. OVP protects the SPS-Series and their loads from unexpected conditions. High regulation is maintained at 0.01%. Remote sensing adds an extra level of precision by compensating cable losses between loads. Turning the output On/Off from external device is available through Remote control terminals. The GPS-Series is an ideal solution for power-efficient bench-top or portable applications requiring high regulation.

## SPS-1230/1820/2415/3610/606





#### **FEATURES**

- \* Dual Measurement Display
- \* 0.01 % High Regulation
- \* Constant Voltage and Constant Current Operation
- \* High Efficiency
- \* High Power Density
- \* Over Voltage Protection
- \* Remote Output ON/OFF Control

SPECIFICATIONS					
OUTPUT					
	SPS-1230	SPS-1820	SPS-2415	SPS-3610	SPS-606
Voltage	0 ~ 12V	0 ~ 18V	0 ~ 24V	0 ~ 36V	0 ~ 60V
Current	0 ~ 30A	0 ~ 20A	0 ~ 15A	0 ~ 10A	0 ~ 6A
CONSTANT VOLTAGE OP	ERATION				
Regulation	Line regulation	on≤5mV			
	Load regulati	on≤5mV			
Ripple & Noise	≤5mVrms, 10	00mVp-p 20Hz ~	20MHz		
Recovery Time	≤500μS				
	(50% Load ch	nange, Minimum	load 0.5A)		
Temp. Coefficient	≤ 100ppm /°	С	***************************************		
Output Range	0 to rating vo	ltage continuous	sly adjustable		
CONSTANT CURRENT OF	PERATION				
Regulation	Line regulation	n ≦3mA			
	Load regulatio	n ≤3mA			
Ripple Current	≤3mArms (SP	S-606)			
	≤5mArms (SP	S-3610)			
	≤10mArms (S	PS-2415)			
	≤10mArms (S	PS-1820)			
	≤30mArms (S	PS-1230)			
Output Range	0 to rating cur	rent continuously	adjustable		
	(HI/LO range	switchable)			
METER					
Туре	3 1/2 digit, 0.3	9" LED display			
Accuracy	± (0.5% of rdg	+ 2digits)			
INSULATION					
Chassis and Terminal	$20M\Omega$ or above				
Chassis and AC Cord	30MΩ or abov	re ( DC 500V )			
POWER SOURCE					
AC 115V/ 230V± 15 %, 50	0.07.791.5				
<b>DIMENSIONS &amp; WEIGHT</b>	6.0 10200012				
128(W) x 151(H) x 295(D)	mm, Approx. 3.2l	kg			

#### Rear Panel



ı		ORDERING INFORMATION
	SPS-1230	360W Switching DC Power Supply
	SPS-1820	360W Switching DC Power Supply
	SPS-2415	360W Switching DC Power Supply
	SPS-3610	360W Switching DC Power Supply
	SPS-606	360W Switching DC Power Supply
	ACCESSO!	DIES -

Power cord x 1 , Test lead GTL-203A x 1

## Multiple Output Dual Range DC Power Supply



#### SPD-3606



#### **FEATURES**

- \* Three Independent, Isolated Output
- \* CH1/CH2 : Dual Output Range of 30V/6A or 60V/3A
- \* CH3 Adjustable Output: 0.1~5V/3A
- \* High Efficiency Power Conversion (Up to 25% Than Traditional Power Supply)
- \* Remote Output On/Off Control
- \* OVP to Protect the DUT
- \* OTP to Protect SPD-3606 for Reducing the Repair Rate
- \* Automatically Switches AC 115V/230V Source
- \* Full Safety Design: Reverse Polarity, CH3 Overload Protection, Safe Output Setting, C.C./C.V. Mode
- \* Compact Size, Light Weight
- \* Low Fan Acoustic Noise with Fan Speed Control Circuit
- \* Voltage/Current Protection Knob(Option)
- \* Optional European Jack Type Terminal

#### **European Type Jack Terminal**



#### Rear Panel



## GPS-001 Voltage/Current protection Knob



The SPD-3606 DC power supply provides 375W output capacity, three isolated outputs with dual-range for CH1 & CH2, highly efficient power conversion, low noise, high reliability, thorough protection, excellent value and a compact size. SPD-3606 creates a new bench mark for satisfying mainstream power supply demands. CH1 & CH2 offer dual-range output either at 30V/6A or 60V/3A per channel to accommodate a wide range of applications. SPD-3606 supports series and parallel tracking, allowing the CH1 and CH2 to be internally connected in series or parallel providing flexible output (30V/12A, 60V/6A, or 120V/3A). High power density and high power conversion efficiency lets SPD-3606 consume less energy making for a greener power supply. In addition, the high power density makes SPD-3606 weigh less than half and occupy much less space compared to linear power supplies. To avoid damage caused by improper operation, it also has OVP and OTP. The dual range AC input accepts both 115V and 230V inputs. When the instrument is on, devices can be connected and voltage/current levels can be adjusted safely from the front panel by turning off the output using the Output on/off key. The optional voltage/current protection knobs can be used to prevent accidentally changing the output levels. These knobs are useful for automated testing at fixed output levels, such as in assembly lines or product inspections.

SPECIFICATIONS OUTPUT RATINGS	
	0 201/10 (4.0 (0)/10 24
CH1/CH2 Independent	0 ~ 30V / 0 ~ 6A; 0 ~ 60V / 0 ~ 3A
CH1/CH2 Series	0 ~ 60V / 0 ~ 6A; 0 ~ 120V / 0 ~ 3A
CH1/CH2 Parallel CH3	0 ~ 30V / 0 ~ 12A; 0 ~ 60V / 0 ~ 6A
VOLTAGE REGULATION	0.1 ~ 5V / 3A
	Z
Line	≤ 0.01% + 3mV
Load	≤ 0.01% + 5mV (rating current ≤ 6A)
	≤ 0.01% + 8mV (rating current≤12A)
Ripple & Noise	≤ 5mVrms (5Hz ~ 1MHz ); ≤ 50mVpp (20Hz ~ 20MHz)
Recovery Time	≤ 100 μs (50% load change, minimum load 0.5A)
CURRENT REGULATION	
Line	$\leq 0.2\% + 3mA$
Load Diagle & Naiss	≤ 0.2% + 3mA ≤ 3mArms
Ripple & Noise	≥ 3mArms
TRACKING OPERATION	I v
Tracking Error	$\leq$ 0.5% + 10mV of master
Series Regulation	≤ 300mV
Ripple & Noise	≤ 10mVrms (5Hz ~ 1MHz); ≤ 100mVpp (20Hz ~ 20MHz)
OUTPUT ON/OFF RESPONSE	TIME
Voltage Up (10% ~ 90%)	≤ 100ms (≤ 95% rating load)
Voltage Down (90% ~ 10%)	≤ 100ms (≥10% rating load)
OVP	
Accuracy	$\pm$ (0.5% of reading + 0.5V)
METER	
Туре	3 <sup>1</sup> / <sub>2</sub> digit 0.5" LED display
Accuracy	± (0.5% of reading + 2 digits)
Resolution	100mV/10mA
INSULATION	T
Chassis & Terminal	100M Ωor above (DC 1000V)
Chassis & AC code	100MΩor above (DC 1000V)
TEMPERATURE COEFFICIENT	
Voltage	≤ 100ppm/ °C + 3mV
Current	≤ 150ppm/°C + 3mA
REMOTE CONTROL	
Output On/Off	
FAN NOISE	
<u>≤</u> 50dB	
OPERATION ENVIRONMEN	
Ambient temperature 0 ~ 40° (	C; Relative humidity≤80%
STORAGE ENVIRONMENT	
Ambient temperature -10 ~ 70	°C; Relative humidity≤70%
POWER SOURCE	19 55 Wesperson 95 85 WORDSYNEE
AC 115V/230V±15%, 50/60Hz	
DIMENSIONS & WEIGHT	

#### ORDERING INFORMATION

SPD-3606 Multiple Output Dual Range DC Power Supply

ACCESSORIES:

User manual x 1, Power cord x 1, Test lead GTL-104A x 2, GTL-105A x 1 European Test Lead GTL-201A x 1, GTL-203A x 1, GTL-204A x 2

OPTIONAL ACCESSORIES

GPS-001 Voltage/Current protection Knob



#### GSM-20H10





#### **FEATURES**

- \* Maximum Output ±210V/±1.05A/22W
- \* Built-in 4 Sequence Output Modes (Stair, Log, SRC-MEM, Custom), up to 2500 Points
- \* OVP /OTP Protection Function
- \* 0.012% Basic Measure Accuracy with 6½-digit Resolution
- \* Variable Sampling Speed
- \* SDM (Source Delay Measure) Cycle
- \* 2-, 4-, and 6-wire Remote V-source and Measure Sensing
- \* Variable Display Digits
- \* Built-in Limit Function
- \* Built-in 5 Calculation Functions
- \* 4.3" TFT LCD, Digital Number Keyboard
- \* Built-in RTC Clock
- \* Interface: RS-232, USBTMC, LAN, GPIB (Opt.)

GW Instek GSM-20H10 is a Source Measure Unit that provides highly stable DC power and instrument-grade 6½-digit multimeter measurements. While operating, it can be used as a voltage source, current source, voltmeter, ammeter, and ohmmeter, which is uniquely ideal for the evaluation of component characteristics and the test applications of production, including nanomaterials and components, semiconductor architecture, organic materials, high-efficiency illumination, passive components and material characteristics analysis, etc.

GSM-20H10 provides four-quadrant operation of  $\pm 210V/\pm 1.05A/22W$ . The first and third quadrants operate as power supplies to supply power to the load. The second and fourth quadrants function as loads to consume power internally. Voltage value, current value and resistance value can be measured while operating the power supply or load function with an accuracy of 0.012% and a resolution of  $1\mu V/10pA/10\mu\Omega$ .

With respect to sampling rate, GSM-20H10 supports a sampling rate of up to 50k points/second, which can accurately analyze the characteristics of the DUT. With the large 4.3-inch screen, all measurement settings, parameters and results can be completely displayed on the screen. The SDM (Source Delay Measure) function is provided to delay sampling when the signal changes so as to prevent the unstable signal from being captured and cause misjudgment. There are four built-in sequence output modes (Stair, Log, SRC-MEM, Custom), which can support up to 2500 points of sequence variation output.

Pertaining to protection, GSM-20H10 provides OVP/OTP modes. The design of OVP allows users to self-define the range of OVP. OTP can effectively prevent errors caused by temperature drift during the test process. For interfaces, this product supports standard SCPI commands and provides RS-232, USBTMC, LAN, GPIB (optional) interfaces to meet users' different interface needs.



#### GSM-20H10

#### Rear Panel



#### SM-01/SM-02 Digital I/O Adapter



## ORDERING INFORMATION

GSM-20H10 with GPIB Source Measure Unit
GSM-20H10 Source Measure Unit

#### ACCESSORIES:

Test Lead GTL-207A x 1, Alligator Clip x 2

#### OPTIONAL ACCESSORIES

SM-01 Digital I/O Adapter, Convert DB15 to DB9 + 8-pin micro-DIN
SM-02 Digital I/O Adapter, Convert DB15 to DB37 + 8-pin micro-DIN

GTL-246 USB Cable (USB 2.0 A-B Type, approx.. 1200mm)

GTL-248 GPIB Cable, 2000mm

NOTE: 1. Speed = Normal (1 NPLC). For 0.1 PLC, add 0.005% of range to offset specifications, except 200mV, 1A ranges, add 0.05%. For 0.01 PLC, add 0.05% of range to offset specifications, except 200mV, 1A ranges, add 0.5%.

- 2. Required to reach 0.1% of final value after Command is processed. Resistive load.  $10\mu A$  to 100mA range.
- 3. Overshoot into a fully resistive 100k  $\Omega$  load, 10Hz to 1MHz BW, adjacent ranges: 100mV typical, except 20V/200V.
- 4. Maximum time required for the output to begin to change following the receipt of:SOURce:VOLTage|CURRent <nrf> Command.
  5. Reading rates applicable for yellage or current maximum party automates off files off display of trigger data.

GRA-450-J Rack Mount kit

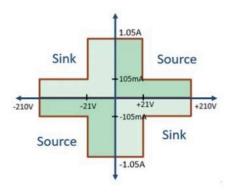
GRA-450-E Rack Mount kit

- Reading rates applicable for voltage or current measurements, autorange off, filter off, display off, trigger delay = 0, and binary reading forma.
- 6. Purely resistive lead.  $1\mu A$  and  $10\mu A$  ranges <65ms.
- 7. 1000 point sweep was characterized with the source on a fixed rang.
- Pass/Fail test performed using one high limit and one low math limit.
- 9. Includes time to re-program source to a new level before making measurement.
- 10. Time from falling edge of START OF TEST signal to falling edge of END OF TEST signal.

  11. Command processing time of :SOURce:VOLTage|CURRent: TRIGgered<nri>Command not included.

	CATIONS													
MANUALITA	Voltage		±210V											
	Current		±210V ±1.05A											
MAXIMUM	Power		22W											
RANGE	Voltage Resolution		1μV											
	Current Resolution		10pA											
		Output Voltage	±21V / ±1.05A, ±2											
		Current Limit	Min. 0.1% of rang Range		000mV	1	±2.00000V	-		±20.0000V		-		200.000V
		Programming Resolution &	Resolution		μV		±2.00000V			±20.0000V		- 4		200.000V
		Accuracy*1		Accuracy $\pm (0.02\% + 600 \mu V)$ $\pm (0.02\% + 600 \mu V)$ $\pm (0.02\% + 24 m V)$ $\pm (0.02\% + 24 m V)$										
	DC Velham	Load Regulation	0.01% of range +						3		-	107		400
	DC Voltage	Line Regulation	0.01% of range		vertex entre									
		Overshoot	<0.1% typical (ful	l scale step,resistive lo	ad, 10mA range)									
		Recovery Time	<250us (within 0.	1% plus load regulatio	n errors, 1A and 100m	A compliance.)								
		(1000% Load Change) Ripple and Noise		MHz) / 10mVpp(20H			· ·							
		Temperature Coefficient		specification)/°C (0°-										
	1	Output Current	±1.05A / ±21V, ±1											
		Voltage Limit	Min. 0.1% of rang		120 00000000	0 14		Jaco Adversaria	00.000 90			699714		Section 1997 and 199
SOURCE		Programmed Source Resolution &	Range	±1.00000μA	±10.0000µ	1 1	±100.000μA	±1.000		±10.00000r	mA	±100.00		±1.00000A
	DC Current	Accuracy *1	Resolution Accuracy	10pA ±(0.035%+600pA)	100pA ±(0.033%+2r	A)	1nA 0.031%+20nA)	±(0.034%		100nA	LuA)	1μ ±(0.066%		10μA
	DC Current	Load Regulation	0.01% of range +		±[0.03376+21	A) ±(0	1.03 1 76+20fiA)	±(0.03476	+ZUUNA)	±(0.045%+2	:µм)	±[0.000%	+20µА)	±(0.27%+900μA)
		Line Regulation	0.01% of range	Тоорк										
		Overshoot		nA step, RL = 10kΩ, 20	V range)									
		Temperature Coefficient		specification)/°C (0°-										
		Output Settling Time #2	100µs typical time	e										
		Output Rise Time (±30%)			150µs, 20V range, 100r	nA compliance								
		DC Floating Voltage		ated up to ±250VDC										
	General	Remote Sense	Up to 1V drop per		na to horo on -10									
	S244 ANA	Compliance Accuracy Range Change Overshoot *3			ng to base specification /, 2V and 20V ranges, 1									
		Minimum Compliance Value	0.1% of range	gcs between 200m	, . a and £04 langes,	vonit cypical								
		Command Processing Time *4		ms. Autorange Off: 7m	15									
		Input Resistance	>10 GΩ	remarks seeken to be take even a	0.00									
		Measurement Resolution &	Range		000mV		±2.00000V		Or Or	±20.0000V		- 2	±	200.000V
	Voltage	Accuracy	Resolution		μV		10μV			100µV	10.	4		1mV
		Temperature Coefficient	Accuracy	±(0.0125 specification)/°C (0°-	%+300μV) 18°C & 28°50°C\		±(0.012%+300μV)			±(0.015%+1.5m)	v)		±(0.0	15%+10mV)
		Voltage Burden (4-wire mode)	< 1mV	specification)/ C (0-	-18°C & 28°~30°C)									
		87 87 83	Range	±1.00000μA	±10.0000µ		±100.000μA	±1.000	000mA	±10.00000r	mA	±100.00	00mA	±1.00000A
	Current	Programmed Source Resolution &	Resolution	10pA	100pA		1nA	10r		100nA	TOX.	1μ		10μA
		Accuracy*1	Accuracy	±(0.029%+300pA)		pA) ±(0	0.025%+6nA)	±(0.0279		±(0.035%+60	IOnA)	±(0.0559		±(0.22%+570µA)
		Temperature Coefficient	±(0.1 × accuracy s	specification) / °C (0°-	-18°C & 28°~50°C)		29		33		9			
		200	15 VI VA VI	<2.00000Ω 2.00000Ω			20.000			.0000.	- 2	2.00000kΩ		20.0000kΩ
	.		Resolution		1	θμΩ	100μΩ 1mΩ			10mΩ		100mΩ		
										10mA 1mA				100μA
MEASUREMENT			Test current	D							. (0.070		I	
MEASUREMENT		23	Accuracy	Source IACC+Meas	.VACC Source IAC	 C+Meas.VACC	±(0.1%+0.003	Ω), Normal	±(0.08%+0.	03Ω), Normal		6+0.3Ω), No		±(0.06%+3Ω), Normal
MEASUREMENT		Range					±(0.1%+0.003 ±(0.07%+0.0010	Ω), Normal Ω), Enhanced	±(0.08%+0.0 ±(0.05%+0.0	03Ω), Normal 1 Ω), Enhanced	±(0.05%	6+0.3Ω), No +0.1Ω), Enh		
MEASUREMENT		Range		 Source IACC+Meas 200.000kΩ	2.00	 C+Meas.VACC 000MΩ 0Ω	±(0.1%+0.003	Ω), Normal Ω), Enhanced ΟΜΩ	±(0.08%+0.0 ±(0.05%+0.0 200.0	03Ω), Normal	±(0.05%	6+0.3Ω), No		±(0.06%+3Ω), Normal
MEASUREMENT	Resistance	Range	Accuracy	200.000kΩ	2.00	000ΜΩ	±(0.1%+0.003 ±(0.07%+0.0014 20.0000	Ω), Normal Ω), Enhanced ΟΜΩ Ω	±(0.08%+0.0 ±(0.05%+0.0 200.0	03Ω), Normal 1 Ω), Enhanced 000ΜΩ	±(0.05%	6+0.3Ω), No +0.1Ω), Enh 200.000M Ω		±(0.06%+3Ω), Normal
MEASUREMENT		Range	Accuracy  Resolution Test current	200.000kΩ 1Ω 10μA ±(0.07%+30Ω), No	2.00 2.00 2.00 2.00 2.00 2.00 2.00 2.00	000MΩ 0Ω	±(0.1%+0.003 ±(0.07%+0.0010 20.0000	Ω), Normal Ω), Enhanced 0ΜΩ Ω	±(0.08%+0.0 ±(0.05%+0.0 200.0 1	03Ω), Normal 1 Ω), Enhanced 000ΜΩ kΩ	±(0.05% >2	6+0.3Ω), No +0.1Ω), Enh 200.000M Ω	anced :	±(0.06%+3Ω), Normal
MEASUREMENT			Resolution Test current Accuracy	200.000kΩ 1Ω 10μA ±(0.07%+30Ω), No ±(0.05%+10Ω), Enl	2.00 2.00	000MΩ 0Ω μΑ	±(0.1%+0.003) ±(0.07%+0.0010) 20.0000 1000 0.5µ ±(0.11%+1kΩ	Ω), Normal Ω), Enhanced 0MΩ Ω ιA Ω), Normal	±(0.08%+0.0 ±(0.05%+0.0 200.0 1 10 ±(0.66%+10	03Ω), Normal 1 Ω), Enhanced 000MΩ kΩ l0nA	±(0.05% >2	6+0.3Ω), No +0.1Ω), Enh 200.000M Ω	anced :	±(0.06%+3Ω), Normal
MEASUREMENT		Temperature Coefficient	Resolution Test current Accuracy ±(0.15 × accuracy	200.000kΩ 1Ω 10μA ±(0.07%+30Ω), No ±(0.05%+10Ω), Enh specification)/°C (0°-	2.00 pormal ±(0.11%+3 ananced ±(0.05%+10 -18°C & 28°-50°C)	000MΩ 0Ω iµA 00Ω), Normal 0Ω), Enhanced	±(0.1%+0.003) ±(0.07%+0.0014) 20.0000 1000 0.5µ ±(0.11%+1kΩ ±(0.05%+500Ω	Ω), Normal Ω), Enhanced 0MΩ Ω ιA Ω), Normal	±(0.08%+0.0 ±(0.05%+0.0 200.0 1 10 ±(0.66%+10	03Ω), Normal 1 Ω), Enhanced 000ΜΩ kΩ l0nA 0kΩ), Normal	±(0.05% >2	6+0.3Ω), No +0.1Ω), Enh 200.000M Ω	anced :	±(0.06%+3Ω), Normal
MEASUREMENT		Temperature Coefficient Source I mode, Manual OHMS	Resolution Test current Accuracy ±(0.15 × accuracy Total uncertainty	200.000kΩ 1Ω 10μA ±(0.07%+30Ω), No ±(0.05%+10Ω), Enh specification),"C (0°- = I source accuracy+	2.00  pormal ±(0.11%+3  nanced ±(0.05%+10  -18°C & 28°~50°C)  / measure accuracy (4	000MΩ 0Ω iµA 00Ω), Normal 0Ω), Enhanced wire remote ser	±(0.1%+0.003) ±(0.07%+0.0014) 20.0000 1000 0.5µ ±(0.11%+1kΩ ±(0.05%+500Ω)	Ω), Normal Ω), Enhanced 0MΩ Ω ιA Ω), Normal	±(0.08%+0.0 ±(0.05%+0.0 200.0 1 10 ±(0.66%+10	03Ω), Normal 1 Ω), Enhanced 000ΜΩ kΩ l0nA 0kΩ), Normal	±(0.05% >2	6+0.3Ω), No +0.1Ω), Enh 200.000M Ω	anced :	±(0.06%+3Ω), Normal
MEASUREMENT		Temperature Coefficient Source I mode, Manual OHMS Source V mode, Manual OHMS	Resolution Test current Accuracy ±(0.15 × accuracy Total uncertainty Total uncertainty	200.000kΩ 1Ω 10μA ±(0.07%+30Ω), No ±(0.05%+10Ω), Enh specification)/°C (0°- = I source accuracy + = V source accuracy +	2.00    cormal	000MΩ 0Ω iµA 00Ω), Normal 0Ω), Enhanced wire remote ser- wire remote ser-	±(0.1%+0.003) ±(0.07%+0.0014) 20.0000 1001 0.5 μ ±(0.11%+1kΩ ±(0.05%+500Ω)	Ω), Normal Ω), Enhanced OMΩ Ω IA Ω), Normal Ω), Enhanced	±(0.08%+0.0 ±(0.05%+0.0) 200.0 1 10 ±(0.66%+10 ±(0.35%+5k)	03Ω), Normal 1 Ω), Enhanced 000MΩ kΩ 100A 00kΩ), Normal cΩ), Enhanced	±(0.05% >2	6+0.3Ω), No +0.1Ω), Enh 200.000M Ω	anced :	±(0.06%+3Ω), Normal
MEASUREMENT		Temperature Coefficient Source I mode, Manual OHMS Source V mode, Manual OHMS G-wire OHMS Mode	Resolution Test current Accuracy ±(0.15 × accuracy Total uncertainty Total uncertainty	200.000kΩ 1Ω 10μA ±(0.07%+30Ω), Not ±(0.05%+10Ω), Enfr specification), PC (0°. = I source accuracy + 1 = V source accuracy + 2  titive ohms guard and	2.00  pormal ±(0.11%+3  nanced ±(0.05%+10  -18°C & 28°~50°C)  / measure accuracy (4	000MΩ 0Ω iµA 00Ω), Normal 0Ω), Enhanced wire remote ser- wire remote ser-	±(0.1%+0.003) ±(0.07%+0.0014) 20.0000 1001 0.5 μ ±(0.11%+1kΩ ±(0.05%+500Ω)	Ω), Normal Ω), Enhanced OMΩ Ω IA Ω), Normal Ω), Enhanced	±(0.08%+0.0 ±(0.05%+0.0) 200.0 1 10 ±(0.66%+10 ±(0.35%+5k)	03Ω), Normal 1 Ω), Enhanced 000MΩ kΩ 100A 00kΩ), Normal cΩ), Enhanced	±(0.05% >2	6+0.3Ω), No +0.1Ω), Enh 200.000M Ω	anced :	±(0.06%+3Ω), Normal
MEASUREMENT		Temperature Coefficient Source I mode, Manual OHMS Source V mode, Manual OHMS 6-wire OHMS Mode Guard Output Impedance	Accuracy  Resolution Test current  Accuracy ±(0.15 × accuracy Total uncertainty Total uncertainty Available using ac	200.000kΩ 1Ω 10μA ±(0.07%+30Ω), Not ±(0.05%+10Ω), Enfr specification), PC (0°. = I source accuracy + 1 = V source accuracy + 2  titive ohms guard and	2.00    cormal	000MΩ 0Ω iµA 00Ω), Normal 0Ω), Enhanced wire remote ser- wire remote ser-	±(0.1%+0.003) ±(0.07%+0.0014) 20.0000 1001 0.5 μ ±(0.11%+1kΩ ±(0.05%+500Ω)	Ω), Normal Ω), Enhanced OMΩ Ω IA Ω), Normal Ω), Enhanced	±(0.08%+0.0 ±(0.05%+0.0) 200.0 1 10 ±(0.66%+10 ±(0.35%+5k)	03Ω), Normal 1 Ω), Enhanced 000MΩ kΩ 100A 00kΩ), Normal cΩ), Enhanced	±(0.05% >2	6+0.3Ω), No +0.1Ω), Enh 200.000M Ω	anced :	±(0.06%+3Ω), Normal
MEASUREMENT	Resistance	Temperature Coefficient Source I mode, Manual OHMS Source V mode, Manual OHMS 6-wire OHMS Mode Cuard Output Impedance hange Rate	Accuracy  Resolution Test current Accuracy ±(0.15 × accuracy Total uncertainty Available using ac <0.1Ω in ohms m	200.000kΩ 1Ω 10μA ±(0.07%+30Ω), NH ±(0.05%+10Ω), Enh specification)/°C (0°- – I source accuracy + 1°- – V source accuracy + 2°- titive ohms guard and jode	2.00    cormal	000MΩ 0Ω iµA 00Ω), Normal 00Ω), Enhanced wire remote ser wire remote ser rd Output Curre	±(0.1%+0.003 ±(0.07%+0.0016 20.0000 1000 0.5µ ±(0.11%+1kΩ ±(0.05%+500Ω nse) ent: 50mA (except	Ω), Normal Ω), Enhanced DMΩ Ω  Ω  A  1), Normal 1), Enhanced t 1A range). Ac	±(0.08%+0.0 ±(0.05%+0.0) 200.0 1 1 100 ±(0.66%+1/4 ±(0.35%+5k)	03Ω), Normal 1 Ω), Enhanced 00MΩ kΩ lOnA 0kΩ), Normal ΩkΩ), Normal Ω), Enhanced dependent	±(0.05% >2	6+0.3Ω), No +0.1Ω), Enh 200.000M Ω  ACC+Meas.	anced :	±(0.06%+3Ω), Normal
MEASUREMENT	Resistance  Maximum Range C	Temperature Coefficient Source I mode, Manual OHMS Source V mode, Manual OHMS 6-wire OHMS Mode Guard Output Impedance hange Rate Auto Range Time	Accuracy  Resolution Test current  Accuracy ±(0.15 × accuracy Total uncertainty, Total uncertainty, Available using ac <0.1Ω in ohms m 75/second 40ms (fixed sourc NPLC / Trig	200.000kΩ 10μ ±(0.07%+300), Nr. ±(0.07%+300), Fr. ±(0.05%+000), Enf. ±(0.05%+000), Enf. = I source accuracy + '= - V source accuracy + '= - V source accuracy + '= title ohms guard and jode te) %6	2.00  ormal ±(0.11%+3  ianced ±(0.05%+10  -18°C & 28°-50°C)  / measure accuracy (4  I measure accuracy (4  guard sense. Max. Gua	000MΩ 0Ω μA 00Ω), Normal 00Ω), Enhanced wire remote ser wire remote ser rd Output Curre	±(0.1%+0.003 ±(0.07%+0.0016 20.0006 1000 0.5µ ±(0.11%+1kG ±(0.05%+5000 nse) ent: 50mA (except	Ω), Normal Ω), Enhanced ΟΜΩ Ω stA Ω), Normal Ω), Normal Ω), Enhanced t 1A range). Ac	±(0.08%+0.0 ±(0.05%+0.0) 200.0 1 10 ±(0.66%+10 ±(0.35%+5k	03Ω), Normal 1 Ω), Enhanced 000MΩ kΩ 100, A	±(0.05%) >2 - Source I	6+0.3Ω), No +0.1Ω), Enh 100.000M Ω  ACC+Meas.	wacc :	±(0.06%+3Ω), Normal (0.04%+1Ω), Enhanced
MEASUREMENT	Resistance  Maximum Range C  Maximum Measure	Temperature Coefficient Source I mode, Manual OHMS Source V mode, Manual OHMS G-wire OHMS Mode Guard Output Impedance hange Rate Auto Range Time Speed	Resolution Test current Accuracy ±(0.15 × accuracy) total uncertainty Total uncertai	200.000kΩ 1Ω 10μA ±(0.079%-300), N. ±(0.05%+300), N. ±(0.05%+10Ω), Ent specification)/*C (0°- 1 source accuracy + - V source accurac	2.00    cormal	000MΩ 0Ω iµA 00Ω), Normal 00Ω), Enhanced wire remote ser wire remote ser rd Output Curre	±(0.1%+0.003 ±(0.07%+0.0011 20.0000 1001 0.51μ ±(0.11%+1kΩ ±(0.05%+500Ω nse) ent: 50mA (except	Ω), Normal Ω), Enhanced ΟΜΩ Ω μ μ λ λ λ λ λ λ λ λ λ λ λ λ λ λ λ λ	±(0.08%+0.0 ±(0.05%+0.0) 200.0 1 10 10 ±(0.66%+10 ±(0.35%+5k	03Ω), Normal 1 Ω), Enhanced 000MΩ kΩ l00nA 0kΩ), Normal cΩ), Enhanced dependent leasure Pass/Fai 0RY T	±(0.05% >2 >2 Source I	6+0.3Ω), No +0.1Ω), Enh 100.000M Ω  ACC+Meas.	WACC Meas MEMORY	±(0.06%+3Ω), Normal (0.04%+1Ω), Enhanced ure Memory *9 TO GPIB
MEASUREMENT	Resistance  Maximum Range C Maximum Measure  Sequence Reading	Temperature Coefficient Source I mode, Manual OHMS Source Y mode, Manual OHMS 6-wire OHMS Mode Guard Output Impedance hange Rate Auto Range Time Speed Fast	Resolution Test current Accuracy ±(0.15 × accuracy ±(0.15 × accuracy Total uncertainty Total uncertainty Available using ac <0.0 \( \text{1} \text{in in ohms m} \) 75/second 40ms (fixed sourc NPLC / Trig Origin 0.01 / internal	200.000kΩ 1Ω 10μA ±(0.07%+3001), Ne ±(0.05%+1001), Enf specification)/°C (0°- 1 source accuracy + 2 vource accuracy + titive ohms guard and glode  TO MEMORY 2081 (2080)	2.00	000MΩ 0Ω 0Ω 0Ω 0Ω 0Ω), Normal 00Ω), Enhanced wire remote ser wire remote ser rd Output Curre  TO MEMC 1551 (151	#(0.1%+0.003 #(0.07%+0.0011) 20.0000 0.5µ #(0.11%+1160 #(0.05%+5000) nse) ent: 50mA (except	(Ω), Normal (Ω), Enhanced (Ω)	±(0.08%+0.0 ±(0.05%+0.0) 20.0.1 10 ±(0.56%+10 ±(0.35%+5k ccuracy is load 50urce-M	03Ω), Normal 1 Ω), Enhanced 0000MΩ kΩ 10nA 00kΩ), Normal αΩ), Enhanced dependent dependent leasure Pass/Fa 0RY T 7) 8	±(0.05% >2 Source I	6+0.3Ω), No +0.1Ω), Enh +0.00000M Ω  ACC+Meas.	WACC  Meas MEMORY 65 (162)	±(0.06%+3Ω), Normal (0.04%+1Ω), Enhanced ure Memory *9 TO GPIB 164 (162)
MEASUREMENT	Resistance  Maximum Range C Maximum Measure Sequence Reading Rates *7	Temperature Coefficient Source I mode, Manual OHMS Source V mode, Manual OHMS 6-wire OHMS Mode Guard Output Impedance hange Rate Auto Range Time Speed Fast 488.2	Resolution Test current Test current Test current Test current Total uncertainty Total uncertainty Available using ac <0.1\Omega in ohms m 75/second 40ms (fixed sourc NPLC / Trig Origin 0.01 / internal 0.01 / external	200.000kΩ 1Ω 10µA ±(0.0796-300), N: ±(0.0596-100), Enk specification)/*C (9'- = I source accuracy + = V source accuracy + = V source accuracy + tive ohms guard and jode TO MEMORY 2081 (2030) 1239 (1200)	2.00    2.00   2.00   3.07   3.07   4.00.15%-3   5.07   6.18°C & 28°-50°C)   7.07   7.	000MΩ 00Ω μA 00Ω), Normal 00Ω), Normal 00Ω), Enhanced wire remote ser wire remote ser rd Output Curre  S TO MEMC 1551 (151 1018 (99)	#(0.1%+0.003 #(0.07%+0.0010 20.0000 0.5p #(0.15%+18ct #(0.05%+5000 nse) ent: 50mA (except 50urce-Measure *5 PRY TC 15) 100 0) 916	Ω), Normal Ω), Enhanced Ω Ω Ω Ω Ω Ω Ω Ω Ω Ω Ω Ω Ω Ω Ω Ω Ω Ω Ω	±(0.08%+0.0 ±(0.05%+0.0 200.0 10 10 ±(0.66%+10 ±(0.35%+5k ccuracy is load Source-M TO MEMC 902 (900 830 (830	03Ω], Normal   1 Ω), Enhanced	±(0.05% >2  Source I  il test *8, *9  O CPIB 09 (840) 56 (780)	6+0.3Ω), No +0.1Ω), Enh +0.00.000M Ω 	Meas MEMORY 65 (162) 63 (160)	#(0.06%+3Ω), Normal (0.04%+1Ω), Enhanced (0.04%+1Ω) = The American ure Memory *9 TO GPIB 164 (162) 162 (160)
MEASUREMENT	Resistance  Maximum Range C Maximum Measure  Sequence Reading	Temperature Coefficient Source I mode, Manual OHMS Source V mode, Manual OHMS G-wire OHMS Mode Cuard Output Impedance hange Rate Auto Range Time Speed Fast 488.2 Medium	Resolution Test current Accuracy ±(0.15 × accuracy) ±(0.15 × accuracy) Total uncertainty Total uncerta	200.000kΩ 10 10µA ±(0.079%+300), Nc ±(0.05%+300), Nc ±(0.05%+100), Enf specification)/*C (0°- = 1 source accuracy + = V source accuracy + = V source accuracy + tive ohms guard and jodd  TO MEMORY 2081 (2030) 139 (1200) 1510 (433)	2.00	000MΩ 0Ω μA 0Ω μA 0Ω μA 0Ω μ, Normal 0Ω μ, Enhanced wire remote ser wire remote ser d Output Curre  TO MEMC 1551 (151 1018 (99) 470 (400	#(0.1%+0.003 #(0.07%+0.0011 #(0.07%+0.0011 #(0.07%+0.0011 #(0.05%+0.0011 #(0.05%+5000 #(0.05%+50	(Ω), Normal (Ω), Enhanced (Ω)	±(0.08%+0.0 ±(0.05%+0.0 200.0 10 ±(0.66%+10 ±(0.35%+5k 5ource-M TO MEMC 902 (900 830 (830 339 (343)	03Ω], Normal   1 Ω], Enhanced   1 Ω],	±(0.05% >2 Source I il test *8, *9 FO 9 (840) 56 (780) 88 (343)	6+0.3Ω), No. +0.1Ω), Enh. +0.1Ω), Enh. +0.1Ω), Enh. +0.1Ω), Enh. +0.0.000M Ω	Meas MEMORY 65 (162) 33 (126)	ure Memory *9  TO GPIB  162 (160)  162 (160)  132 (126)
MEASUREMENT	Resistance  Maximum Range C Maximum Measuru  Sequence Reading Rates 97	Temperature Coefficient Source I mode, Manual OHMS Source V mode, Manual OHMS 6-wire OHMS Mode Guard Output Impedance hange Rate Auto Range Time Speed Fast 488.2	Resolution Test current Test current Test current Test current Total uncertainty Total uncertainty Total uncertainty Available using ac <0.1\Omega in ohms m 75/second 40ms (fixed sourc NPLC / Trig Origin 0.01 / internal 0.01 / external	200.000kΩ 1Ω 10μA ±(0.07%+300), Net ±(0.05%+100), Ent specification)/°C (0°- = 1 Source accuracy + = V source accuracy + = V source accuracy + titive ohms guard and glode TO MEMORY 2081 (2030) 1239 (1200) 510 (433) 438 (380)	2.00    2.00   2.00   3.07   3.07   4.00.15%-3   5.07   6.18°C & 28°-50°C)   7.07   7.	000MΩ 00Ω μA 00Ω), Normal 00Ω), Normal 00Ω), Enhanced wire remote ser wire remote ser rd Output Curre  S TO MEMC 1551 (151 1018 (99)	#(0.1%+0.003 #(0.07%+0.0011) 20.0000 0.5µ #(0.11%+1160 #(0.05%+5000) mse) sent: 50mA (except 50urce-Measure *5 DRY TO 15) 100 0) 916 5) 47(5)	Ω), Normal Ω), Enhanced Ω Ω Ω Ω Ω Ω Ω Ω Ω Ω Ω Ω Ω Ω Ω Ω Ω Ω Ω	±(0.08%+0.0 ±(0.05%+0.0 200.0 10 10 ±(0.66%+10 ±(0.35%+5k ccuracy is load Source-M TO MEMC 902 (900 830 (830	03Ω), Normal 1 Ω), Enhanced 00000 kΩ 000A 0kΩ), Normal 0kΩ), Normal 0kΩ), Enhanced  dependent  dependent 100, Enhanced	±(0.05% >2  Source I  il test *8, *9  O CPIB 09 (840) 56 (780)	6+0.3Ω), No +0.1Ω), Enh +0.00.000M Ω 	Meas MEMORY 65 (162) 63 (160)	#(0.06%+3Ω), Normal (0.04%+1Ω), Enhanced (0.04%+1Ω) = Enhanced ure Memory *9 TO GPIB 164 (162) 162 (160)
SYSTEM	Resistance  Maximum Range C Maximum Measuru  Sequence Reading Rates 97	Temperature Coefficient Source I mode, Manual OHMS Source V mode, Manual OHMS 6-wire OHMS Mode Guard Output Impedance hange Rate Auto Range Time Speed Fast 488.2 Medium 488.2	Resolution Test current Accuracy ±(0.15 × accuracy ±(0.15 × accuracy) Total uncertainty Total uncertai	200.000kΩ 10 10µA ±(0.079%+300), Nc ±(0.05%+300), Nc ±(0.05%+100), Enf specification)/*C (0°- = 1 source accuracy + = V source accuracy + = V source accuracy + tive ohms guard and jodd  TO MEMORY 2081 (2030) 139 (1200) 1510 (433)	2.00	000MΩ 0Ω μA 0Ω μA 0Ω μA 0Ω), Finhanced wire remote ser wire remote ser d Output Curre  TO MEMC 1551 (151 1018 (99) 470 (405)	±(0.1%+0.003 ±(0.07%+0.0011 20.0000 0.5μ ±(0.17%+1kCl ±(0.15%+500Ω nse) nse) nse) nse) nse) nse) nse) nse)	(Ω), Normal (Ω), Enhanced (Ω), Enhanced (Ω) (A) (A) (A) (A) (A) (A) (A) (A) (A) (A	±(0.08%+0.0 ±(0.05%+0.0 20.0.0 1 10 ±(0.66%+1) ±(0.65%+5k ccuracy is load 5curce-M TO MEMC 902 (900 830 (830 38) (344 334 (333 374 (333 56 (47) 56 (47)	03Ω , Normal   1 Ω , Enhanced   1 Ω ,	±(0.05% >2 Source I il test *8, *9 O GPIB 09 (840) 56 (780) 88 (343) 74 (333)	6+0.3Ω), No +0.1Ω), Enh +0.00.00M Ω 	Meas MEMORY 65 (162) 33 (126) 31 (125) 44 (38)	ure Memory *9  TO GPIB 164 (162) 162 (160) 132 (126) 131 (125) 44 (38)
	Resistance  Maximum Range C Maximum Measure Sequence Reading Rates *7 (rdg,/second) for 60Hz (50Hz)	Temperature Coefficient Source I mode, Manual OHMS Source V mode, Manual OHMS G-wire OHMS Mode Guard Output Impedance hange Rate Auto Range Time Speed Fast 488.2 Medium 488.2 Normal 488.2	Resolution Test current Accuracy ±(0.15 x accuracy total uncertainty Available using ac <0.10 in ohms T5/second 40ms (fixed sourc NPLC / Trig Origin 0.01 / internal 0.01 / external 0.1 / external 1 / external 1 / external NPLC/ Trig	200.000kΩ 10 10µA ±(0.0796-300), N: ±(0.0596+100), Enl: specification)/*C (9'- = 1 source accuracy + = V source accuracy + = V source accuracy + tive ohms guard and jode TO MEMORY 2081 (2030) 1239 (1200) 510 (433) 438 (380) 59 (49)	2.00    2.00   2.00   3	000MΩ 0Ω μA 0Ω μA 0Ω μA 0Ω μN 0π μA 0Ω μN 0π μA 0Ω μN 0π μA 0π μα	±(0.1%+0.003 ±(0.07%+0.0011 20.0000 0.5μ ±(0.17%+1kCl ±(0.15%+500Ω nse) nse) nse) nse) nse) nse) nse) nse)	(Ω), Normal (Ω), Enhanced (Ω), Enhanced (Ω) (A) (A) (A) (A) (A) (A) (A) (A) (A) (A	±(0.08%+0.0 200.6 10.05%+0.0 10.0 10.0 ±(0.05%+5k ±(0.05%+5k ±(0.35%+5k ±(0.3	03Ω , Normal   1 Ω , Enhanced   1 Ω ,	±(0.05% >2    Source	6+0.3Ω), No +0.1Ω), Enh +0.00.00M Ω 	Meas MEMORY 65 (162) 63 (160) 33 (126) 31 (125) 44 (38) 44 (38) 45 (38)	#(0.06%+3Ω), Normal (0.04%+1Ω), Enhanced (0.04%+1Ω), Enhanced TO GPIB 164 (162) 162 (160) 132 (126) 131 (125) 44 (38) 44 (38) 47 (38)
SYSTEM	Maximum Range C Maximum Measure Sequence Reading Rates**/ (rdg,/second) for 60Hz (50Hz) Single Reading Operation Rates	Temperature Coefficient Source I mode, Manual OHMS Source V mode, Manual OHMS G-wire OHMS Mode Guard Output Impedance hange Rate Auto Range Time  Speed Fast 488.2 Medium 488.2 Normal 488.2 Speed	Resolution Test current Test current Test current Test current Total uncertainty Total uncertainty Available using ac <0.1Ω in ohms m 75/second 40ms (fixed sourc NPLC / Trig Origin 0.01 / internal 0.1 / external 0.1 / external 1 / internal 1 / external NPLC / Trig Origin NPLC / Trig	200.000kΩ 10 10µA ±(0.0796-300), N: ±(0.0596+100), Enl: specification)/*C (9'- = 1 source accuracy + = V source accuracy + = V source accuracy + tive ohms guard and jode TO MEMORY 2081 (2030) 1239 (1200) 510 (433) 438 (380) 59 (49)	2.00 pormal ±(0.11%+3 pormal ±(0.11%+3 ananced ±(0.05%+10 18°C & 28'-50°C) 18°C & 28'-50°C) I measure accuracy (4 I measure TO GPIB 1198 (1210) 1079 (1050) 509 (433) 438 (380) 57 (48) Measure TO GPIB	000MΩ 0Ω μA 0Ω μA 0Ω μA 0Ω μN 0π μA 0Ω μN 0π μA 0Ω μN 0π μA 0π μα	±(0.1%+0.003 ±(0.07%+0.0011 20.0000 0.5μ ±(0.17%+1kCl ±(0.15%+500Ω nse) nse) nse) nse) nse) nse) nse) nse)	(O), Normal (O), Enhanced (O), Enhanced (O)	±(0.08%+0.0 ±(0.05%+0.0 20.0.1 10.05%+0.0 ±(0.65%+15k) ±(0.35%+5k	03Ω , Normal   1 Ω , Enhanced   1 Ω ,	±(0.05% >2    Source	6+0.3Ω), No +0.1Ω), Enh +0.00.00M Ω 	Meas MEMORY 65 (162) 63 (160) 33 (126) 31 (125) 44 (38) 44 (38) 70 GPI	are Memory *9  TO GPIB 164 (162) 162 (160) 132 (126) 144 (38) 44 (38) 45 (38) 48 (38)
SYSTEM	Resistance  Maximum Range C Maximum Measure  Sequence Reading Rates *7 (rdg,/second) for 60Hz (50Hz)  Single Reading Operation Rates	Temperature Coefficient Source I mode, Manual OHMS Source V mode, Manual OHMS G-wire OHMS Mode Guard Output Impedance hange Rate Auto Range Time Speed Fast 488.2 Medium 488.2 Normal 488.2 Speed Fast(488.2)	Resolution Test current Accuracy ±(0.15 × accuracy) ±(0.15 × accuracy) Total uncertainty. Total uncertainty. Total uncertainty Total uncer	200.000kΩ 10 10µA ±(0.0796-300), N: ±(0.0596+100), Enl: specification)/*C (9'- = 1 source accuracy + = V source accuracy + = V source accuracy + tive ohms guard and jode TO MEMORY 2081 (2030) 1239 (1200) 510 (433) 438 (380) 59 (49)	2.00	000MΩ 0Ω μA 0Ω μA 0Ω μA 0Ω μN 0π μA 0Ω μN 0π μA 0Ω μN 0π μA 0π μα	±(0.1%+0.003 ±(0.07%+0.0011 20.0000 0.5μ ±(0.17%+1kCl ±(0.15%+500Ω nse) nse) nse) nse) nse) nse) nse) nse)	(Ω), Normal (Ω), Enhanced (Ω), Enhanced (Ω) (A) (A) (A) (A) (A) (A) (A) (A) (A) (A	±(0.08%+0.0 ±(0.05%+0.0 20.0.0 1 10 ±(0.66%+10.66%+	03Ω , Normal   1 Ω , Enhanced   1 Ω ,	±(0.05% >2    Source	6+0.3Ω), No +0.1Ω), Enh +0.00.00M Ω 	Meas MEMORY 65 (162) 63 (160) 33 (126) 31 (125) 44 (128) easure Pass TO GP (81)	are Memory *9  TO GPIB 164 (162) 162 (160) 132 (125) 44 (38) 44 (38) 75 ail test *8, *9 3
SYSTEM	Maximum Range C Maximum Measure Sequence Reading Rates**/ (rdg,/second) for 60Hz (50Hz) Single Reading Operation Rates	Temperature Coefficient Source I mode, Manual OHMS Source V mode, Manual OHMS G-wire OHMS Mode Guard Output Impedance hange Rate Auto Range Time Speed Fast 488.2 Medium 488.2 Normal 488.2 Speed Fast(488.2) Medium(488.2)	Resolution Test current Accuracy ±(0.15 x accuracy ±(0.15 x accuracy total uncertainty Total uncertainty Total uncertainty Total uncertainty Available using ac <0.10 in ohms 75/second 40ms (fixed sourc NPLC / Trig Origin 0.01 / internal 0.1 / external 1 / external 1 / external 1 / external NPLC / Trig Origin 0.01 / internal 0.01 / internal 0.01 / internal	200.000kΩ 10 10µA ±(0.0796-300), N: ±(0.0596+100), Enl: specification)/*C (9'- = 1 source accuracy + = V source accuracy + = V source accuracy + tive ohms guard and jode TO MEMORY 2081 (2030) 1239 (1200) 510 (433) 438 (380) 59 (49)	2.00	000MΩ 0Ω μA 0Ω μA 0Ω μA 0Ω μN 0π μA 0Ω μN 0π μA 0Ω μN 0π μA 0π μα	±(0.1%+0.003 ±(0.07%+0.0011 20.0000 0.5μ ±(0.17%+1kCl ±(0.15%+500Ω nse) nse) nse) nse) nse) nse) nse) nse)	(Ω), Normal (Ω), Enhanced (Ω), Enhanced (Ω) (A) (A) (A) (A) (A) (A) (A) (A) (A) (A	±(0.08%+0.0 ±(0.05%+0.0 200.6 10 ±(0.66%+1/4 ±(0.35%+5k) ccuracy is load Source-M TO MEMC 902 (900 830 (83/3) 334 (33/3) 56 (47) 56 (47) 64 (4	03Ω , Normal   1 Ω , Enhanced   1 Ω ,	±(0.05% >2    Source	6+0.3Ω), No +0.1Ω), Enh +0.00.00M Ω 	Meas MEMORY 65 (162) 63 (160) 33 (126) 33 (125) 44 (38) easure Pass TO GPI 79 (83) 69 (70)	±(0.06%+3Ω), Normal (0.04%+1Ω), Enhanced (0.04%+1Ω), Enhanced TO GPIB 164 (162) 162 (160) 132 (26) 131 (125) 44 (38) 44 (38) 48 (38) 49 (38)
SYSTEM	Resistance  Maximum Range C Maximum Measure  Sequence Reading Rates 97  GoHz (SOHz)  Single Reading Operation Rates (rdg,/second) for 60Hz (SOHz)	Temperature Coefficient Source I mode, Manual OHMS Source V mode, Manual OHMS 6-wire OHMS Mode Guard Output Impedance hange Rate Auto Range Time Speed Fast 488.2 Medium 488.2 Normal 488.2 Normal 488.2 Speed Frast(488.2) Medium(488.2) Medium(488.2) Medium(488.2) Medium(488.2)	Resolution Test current Accuracy ±(0.15 × accuracy) ±(0.15 × accuracy) Total uncertainty. Total uncertainty Tinternal 1.1 internal 1.2 internal 1.3 internal 1.4 internal 1.5 internal 1.5 internal 1.7 int	200.000kΩ 10 10µA ±(0.0796-300), N: ±(0.0596+100), Enl: specification)/*C (9'- = 1 source accuracy + = V source accuracy + = V source accuracy + tive ohms guard and jode TO MEMORY 2081 (2030) 1239 (1200) 510 (433) 438 (380) 59 (49)	2.00	000MΩ 0Ω μA 0Ω μA 0Ω μA 0Ω μN 0π μA 0Ω μN 0π μA 0Ω μN 0π μA 0π μα	±(0.1%+0.003 ±(0.07%+0.0011 20.0000 0.5μ ±(0.17%+1kCl ±(0.15%+500Ω nse) nse) nse) nse) nse) nse) nse) nse)	(Ω), Normal (Ω), Enhanced (Ω), Enhanced (Ω) (A) (A) (A) (A) (A) (A) (A) (A) (A) (A	±(0.08%+0.0 ±(0.05%+0.0 20.0.1 10 ±(0.66%+15) ±(0.35%+5k ccuracy is load Source-M TO MEMM 902 (900 830 (833) 339 (343) 374 (333) 55 (47) easure <sup>19</sup> (easure <sup>19</sup> (easur	03Ω , Normal   1 Ω , Enhanced   1 Ω ,	±(0.05% >2    Source	6+0.3Ω), No +0.1Ω), Enh 100.000M Ω 	Meas MEMORY 65 (162) 33 (126) 33 (126) 44 (38) 44 (38) 79 (83) 69 (70) 35 (30)	±(0.06%+3Ω), Normal (0.04%+1Ω), Enhanced (0.04%+1Ω), Enhanced TO GPIB 164 (162) 162 (160) 132 (26) 131 (125) 44 (38) 44 (38) 48 (38) 49 (38)
SYSTEM	Maximum Range C Maximum Massure Sequence Reading Rates *7 (rdg,/second) for 60Hz (50Hz)  Single Reading Operation Rates (rdg,/second) for 60Hz (50Hz)	Temperature Coefficient Source I mode, Manual OHMS Source V mode, Manual OHMS 6-wire OHMS Mode Guard Output Impedance hange Rate Auto Range Time Speed Fast 488.2 Medium 488.2 Normal 488.2 Speed Fast 488.2 Normal 488.2 Speed Fast 488.2 Speed Fast 588.2 Speed Fast 588.2 Speed Fast 588.2 Speed Fast 588.2 Speed Speed Fast 588.2 Speed Speed Fast 588.2 Speed Speed Speed Speed Speed Speed Speed Speed Speed	Resolution Test current Accuracy ±(0.15 x accuracy ±(0.15 x accuracy total uncertainty Total uncertainty Total uncertainty Total uncertainty Available using ac <0.10 in ohms 75/second 40ms (fixed sourc NPLC / Trig Origin 0.01 / internal 0.1 / external 1 / external 1 / external 1 / external NPLC / Trig Origin 0.01 / internal 0.01 / internal 1 / internal NPLC / Trig Origin NPLC / Trig Origin NPLC / Trig Origin	200.000kΩ 10 10plA ±(0.0796+300r), Nr. ±(0.0596+100r), Enf. specification)/"C (0°- 1 source accuracy + - V source accuracy + - V source accuracy + - W sou	2,000   2,000   3	000MΩ 0Ω μA 0Ω μA 0Ω μA 0Ω μN 0π μA 0Ω μN 0π μA 0Ω μN 0π μA 0π μα	±(0.1%+0.003 ±(0.07%+0.0011 20.0000 0.5μ ±(0.17%+1kCl ±(0.15%+500Ω nse) nse) nse) nse) nse) nse) nse) nse)	(Ω), Normal (Ω), Enhanced (Ω), Enhanced (Ω) (A) (A) (A) (A) (A) (A) (A) (A) (A) (A	±(0.08%+0.0 ±(0.05%+0.0 200.6 1 10 ±(0.05%+0.0 1 10 ±(0.05%+1sh ±(0.35%+sh ±(	03Ω , Normal   1 Ω , Enhanced   1 Ω ,	±(0.05% >2    Source	6+0.3 Ω), No +0.1 Ω), Enh +0.00,	Meas MEMORY 65 (162) 63 (160) 79 (83) 1725 (144) (38) 1725 (145) 172 (145) 173 (145) 1	#(0.06%+3Ω), Normal (0.04%+1Ω), Enhanced (0.04%+1Ω), Enhanced TO GPIB 164 (162) 162 (160) 132 (126) 131 (125) 44 (38) 44 (38) 44 (38) 45 (38) 47 (38) 47 (38)
SYSTEM	Maximum Range C Maximum Measure Sequence Reading Rates *7 (rdg, second) for 60Hz (50Hz) Single Reading Operation Rates (rdg, second) for 60Hz (50Hz) Component Interface Handler	Temperature Coefficient Source I mode, Manual OHMS Source V mode, Manual OHMS G-wire OHMS Mode Guard Output Impedance hange Rate Auto Range Time  Speed Fast 488.2 Medium 488.2 Normal 488.2 Speed Fast(488.2) Medium(488.2) Medium(488.2) Medium(488.2) Speed Fast Fast Fast Fast Fast Fast Fast Fast	Resolution Test current Accuracy ±(0.15 × accuracy total uncertainty Available using ac 0.01 Ω in ohms m 75/second 40ms (fixed sourc NPLC / Trig Origin 0.01 / internal 0.1 / external 1 / external 1 / external NPLC / Trig Origin 0.01 / internal 1 / internal 0.1 / internal	200.000kΩ 10 10µA ±(0.0796+300), Nr. ±(0.0596+300), Nr. ±(0.0596+100), Enh specification)/*C (Ø'- = V source accuracy + = V source accuracy + tive ohms guard and jodd the company of the	2.00 pormal ±(0.11%+3 paramated ±(0.05%+10 18°C & 28"-50°C) 18°C & 28"-50°C) measure accuracy (4 I measure TO GPIB 1198 (1210) 1079 (1050) 509 (433) 438 (380) 57 (48) Measure TO GPIB 256 (256) 167 (166) 49 (42) Measure TO GPIB 0.04 mrs (1.08 ms)	000MΩ 0Ω μA 0Ω μA 0Ω μA 0Ω μN 0π μA 0Ω μN 0π μA 0Ω μN 0π μA 0π μα	±(0.1%+0.003 ±(0.07%+0.0011 20.0000 0.5μ ±(0.17%+1kCl ±(0.15%+500Ω nse) nse) nse) nse) nse) nse) nse) nse)	(Ω), Normal (Ω), Enhanced (Ω), Enhanced (Ω), Enhanced (Ω), Enhanced (Ω), Normal (Ω), Normal (Ω), Enhanced (Ω), Enhanced (Ω), Enhanced (Ω), Enhanced (Ω), (Ω), Normal (Ω), Nor	±(0.08%+0.0 ±(0.05%+0.0 20.0.1 10 ±(0.66%+10	03Ω , Normal   1 Ω , Enhanced   1 Ω ,	±(0.05% >2    Source	6+0.3Ω), No +0.1Ω), Enh +0.1Ω), Enh +0.00, OMM Ω 	Measaure MeMoRY 4 (38) 33 (126) 33 (126) 37 (128) 44 (38) 45 (50) 69 (70) 79 (83) 35 (30) 35 (	are Memory *9  TO GPIB 164 (162) 162 (160) 132 (126) 131 (125) 44 (38) 44 (38) 45 (38) 46 (38) 47 (38) 48 (38) 49 (38) 49 (38) 49 (38) 40 (38) 41 (38) 41 (38)
SYSTEM	Maximum Range C Maximum Massure Sequence Reading Rates *7 (rdg,/second) for 60Hz (50Hz)  Single Reading Operation Rates (rdg,/second) for 60Hz (50Hz)	Temperature Coefficient Source I mode, Manual OHMS Source V mode, Manual OHMS Source V mode, Manual OHMS G-wire OHMS Mode Guard Output Impedance hange Rate Auto Range Time  Speed Fast 488.2 Medium 488.2 Normal 488.2 Speed Fast(488.2) Medium(488.2) Normal Fast Medium(488.2) Normal Fast Medium(488.2) Normal	Resolution Test current Accuracy  ±(0.15 × accuracy) ±(0.15 × accuracy)  ±(0.15 × accuracy) Total uncertainty. Total uncertainty Tiggin 0.01 / internal 0.1 / internal 0.1 / internal 0.1 / internal 0.1 / internal NPLC / Trig Origin 0.01 / internal 0.1 / internal	200.000kΩ 10 10µA ±(0.079%+30Q), Nc ±(0.05%+30Q), Nc ±(0.05%+10Q), Eni specification)/*C (0° -1 source accuracy + -V source accuracy +	2.00	000MΩ 0Ω μA 0Ω μA 0Ω μA 0Ω μN 0π μA 0Ω μN 0π μA 0Ω μN 0π μA 0π μα	±(0.1%+0.003 ±(0.07%+0.0011 20.0000 0.5μ ±(0.17%+1kCl ±(0.15%+500Ω nse) nse) nse) nse) nse) nse) nse) nse)	(Ω), Normal (Ω), Enhanced (Ω), Enhanced (Ω) (A) (A) (A) (A) (A) (A) (A) (A) (A) (A	±(0.08%+0.0 ±(0.05%+0.0 20.0.0 1 10 ±(0.66%+1) ±(0.66%+1) ±(0.35%+5k  ccuracy is load  Source-M TO MEMC 902 (900 830 (830 339 (341 334 (333 55 (47) 56 (47) 67 (48asure '97) 881) 70) 381) ss/Fail test 2PIB 0.5 ms) 0.5 ms)	03Ω , Normal   1 Ω , Enhanced   1 Ω ,	±(0.05% >2    Source	6+0.3 Ω), No +0.1 Ω), Enh 100.000 M Ω 	Meas MMMORY 65 (162) 33 (125) 33 (125) 34 (138) 69 (70) 33 (127) 57 (157) 6	ure Memory *9  TO GPIB 164 (162) 162 (160) 132 (126) 131 (125) 44 (38) 44 (38) 47 (38) 47 (38) 48 (38) 49 (38) 49 (38) 41 (38) 41 (38) 42 (38) 43 (38) 44 (38) 45 (38) 46 (38)
SYSTEM	Maximum Range C Maximum Measure Sequence Reading Rates *7 (rdg,/second) for 60Hz (50Hz) Single Reading Operation Rates (rdg,/second) for 60Hz (50Hz) Component Interface Handler Time for 60Hz (50Hz) *8,*10	Temperature Coefficient Source I mode, Manual OHMS Source V mode, Manual OHMS G-wire OHMS Mode Guard Output Impedance hange Rate Auto Range Time  Speed Fast 488.2 Medium 488.2 Normal 488.2 Speed Fast(488.2) Medium(488.2) Medium(488.2) Medium(488.2) Speed Fast Fast Fast Fast Fast Fast Fast Fast	Resolution Test current Test current Accuracy ±(0.15 x accuracy Total uncertainty. Only internal 0.0.1 / internal 1 / internal 1 / internal 1 / internal NPLC / Trig Origin 0.01 / internal 1 / internal 0.1 / internal 0.1 / internal 0.1 / internal 0.1 / internal	200.000kΩ 10 10pA ±(0.079%-10C), N. ±(0.05%-10C), Eni- specification)/**C (0°- 1- source accuracy + - V source	2.00 pormal ±(0.11%+3 paramated ±(0.05%+10 18°C & 28"-50°C) 18°C & 28"-50°C) measure accuracy (4 I measure TO GPIB 1198 (1210) 1079 (1050) 509 (433) 438 (380) 57 (48) Measure TO GPIB 256 (256) 167 (166) 49 (42) Measure TO GPIB 0.04 mrs (1.08 ms)	000MΩ 0Ω μA 0Ω μA 0Ω μA 0Ω μN 0π μA 0Ω μN 0π μA 0Ω μN 0π μA 0π μα	±(0.1%+0.003 ±(0.07%+0.0011 20.0000 0.5μ ±(0.17%+1kCl ±(0.15%+500Ω nse) nse) nse) nse) nse) nse) nse) nse)	(Ω), Normal (Ω), Enhanced (Ω), Enhanced (Ω), Enhanced (Ω), Enhanced (Ω), Normal (Ω), Normal (Ω), Enhanced (Ω), Enhanced (Ω), Enhanced (Ω), Enhanced (Ω), (Ω), Normal (Ω), Nor	±(0.08%+0.0 ±(0.05%+0.0 20.0.0 1 10 ±(0.66%+1) ±(0.66%+1) ±(0.35%+5k  ccuracy is load  Source-M TO MEMC 902 (900 830 (830 339 (341 334 (333 55 (47) 56 (47) 67 (48asure '97) 881) 70) 381) ss/Fail test 2PIB 0.5 ms) 0.5 ms)	03Ω , Normal   1 Ω , Enhanced   1 Ω ,	±(0.05% >2    Source	6+0.3 Ω), No +0.1 Ω), Enh 100.000 M Ω 	Measaure MeMoRY 4 (38) 33 (126) 33 (126) 37 (128) 44 (38) 45 (50) 69 (70) 79 (83) 35 (30) 35 (	ure Memory *9  TO GPIB 164 (162) 162 (160) 132 (126) 131 (125) 44 (38) 44 (38) 47 (38) 47 (38) 48 (38) 49 (38) 49 (38) 41 (38) 41 (38) 42 (38) 43 (38) 44 (38) 45 (38) 46 (38)
SYSTEM	Maximum Range C Maximum Range C Maximum Measure Sequence Reading Rates *7 (rdg,/second) for 60Hz (50Hz)  Single Reading Operation Rates (rdg,/second) for 60Hz (50Hz)  Component Interface Handler Time for 60Hz (50Hz) *4, 10  Load impedance	Temperature Coefficient Source I mode, Manual OHMS Source V mode, Manual OHMS G-wire OHMS Mode Guard Output Impedance hange Rate Auto Range Time Speed Fast 488.2 Medium 488.2 Normal 488.2 Speed Fast(488.2) Medium(488.2) Speed Fast Medium(488.2) Speed Fast Medium(488.2) Speed Fast Medium(488.2) Medium(488.2) Medium(488.2) Speed Fast Medium Normal	Resolution Test current Accuracy ±(0.15 × accuracy total uncertainty Available using ac 0.01Ω in ohms m 75/second 40ms (fixed sourc NPIC/ Trig Origin 0.01 / internal 0.1 / external 1 / internal 1 / external NPIC/ Trig Origin 0.01 / internal 1 / internal 1 / internal 1 / internal 0.1 / internal NPIC / Trig Origin 0.00 / internal 0.1 / internal 0.1 / internal	200.000kΩ 10 10pA ±(0.079%-10C), N. ±(0.05%-10C), Eni- specification)/**C (0°- 1- source accuracy + - V source	2.00	000MΩ 0Ω μA 0Ω μA 0Ω μA 0Ω μN 0π μA 0Ω μN 0π μA 0Ω μN 0π μA 0π μα	±(0.1%+0.003 ±(0.07%+0.0011 20.0000 0.5μ ±(0.17%+1kCl ±(0.15%+500Ω nse) nse) nse) nse) nse) nse) nse) nse)	(Ω), Normal (Ω), Enhanced (Ω), Enhanced (Ω) (A) (A) (A) (A) (A) (A) (A) (A) (A) (A	±(0.08%+0.0 ±(0.05%+0.0 20.0.0 1 10 ±(0.66%+1) ±(0.66%+1) ±(0.35%+5k  ccuracy is load  Source-M TO MEMC 902 (900 830 (830 339 (341 334 (333 55 (47) 56 (47) 67 (48asure '97) 881) 70) 381) ss/Fail test 2PIB 0.5 ms) 0.5 ms)	03Ω , Normal   1 Ω , Enhanced   1 Ω ,	±(0.05% >2    Source	6+0.3 Ω), No +0.1 Ω), Enh 100.000 M Ω 	Meas MMMORY 65 (162) 33 (125) 33 (125) 34 (138) 69 (70) 33 (127) 57 (157) 6	ure Memory *9  TO GPIB 164 (162) 162 (160) 132 (126) 131 (125) 44 (38) 44 (38) 47 (38) 47 (38) 48 (38) 49 (38) 49 (38) 41 (38) 41 (38) 42 (38) 43 (38) 44 (38) 45 (38) 46 (38)
SYSTEM	Maximum Range C Maximum Measure Sequence Reading Rates *7 (rdg,/second) for 60Hz (50Hz) Single Reading Operation Rates (rdg,/second) for 60Hz (50Hz) Component Interface Handler Time for 60Hz (50Hz) *8,*10	Temperature Coefficient Source I mode, Manual OHMS Source V mode, Manual OHMS Source V mode, Manual OHMS 6-wire OHMS Mode Guard Output Impedance hange Rate Auto Range Time  Speed Fast 488.2 Medium 488.2 Normal 488.2 Speed Fast(488.2) Medium(488.2) Normal 488.2 Speed Fast Medium Normal Fast Medium(488.2) Normal Fast Medium(488.2) Normal	Resolution Test current Test current Accuracy ±(0.15 x accuracy Total uncertainty. Only internal 0.0.1 / internal 1 / internal 1 / internal 1 / internal NPLC / Trig Origin 0.01 / internal 1 / internal 0.1 / internal 0.1 / internal 0.1 / internal 0.1 / internal	200.000kΩ 10 10pA ±(0.079%-10C), N. ±(0.05%-10C), Eni- specification)/**C (0°- 1- source accuracy + - V source	2.00	000MΩ 0Ω μA 0Ω μA 0Ω μA 0Ω μN 0π μA 0Ω μN 0π μA 0Ω μN 0π μA 0π μα	±(0.1%+0.003 ±(0.07%+0.0011 20.0000 0.5μ ±(0.17%+1kCl ±(0.15%+500Ω nse) nse) nse) nse) nse) nse) nse) nse)	(Ω), Normal (Ω), Enhanced (Ω), Enhanced (Ω) (A) (A) (A) (A) (A) (A) (A) (A) (A) (A	±(0.08%+0.0 ±(0.05%+0.0 20.0.0 1 10 ±(0.66%+1) ±(0.66%+1) ±(0.35%+5k  ccuracy is load  Source-M TO MEMC 902 (900 830 (830 339 (341 334 (333 55 (47) 56 (47) 67 (48asure '97) 881) 70) 381) ss/Fail test 2PIB 0.5 ms) 0.5 ms)	03Ω , Normal   1 Ω , Enhanced   1 Ω ,	±(0.05% >2    Source	6+0.3 Ω), No +0.1 Ω), Enh 100.000 M Ω 	Meas MMMORY 65 (162) 33 (125) 33 (125) 34 (138) 69 (70) 33 (127) 57 (157) 6	ure Memory *9  TO GPIB 164 (162) 162 (160) 132 (126) 131 (125) 44 (38) 44 (38) 47 (38) 47 (38) 48 (38) 49 (38) 49 (38) 41 (38) 41 (38) 42 (38) 43 (38) 44 (38) 45 (38) 46 (38)
SYSTEM	Resistance  Maximum Range C Maddmum Measure  Sequence Reading Rates *7 (rdg,/second) for 60Hz (50Hz)  Single Reading Operation Rates (rdg,/second) for 60Hz (50Hz)  Component Interface Handler Time for 60Hz (50Hz) *4,**10  Load Impedance Differential Mode V Common Mode fix Common Mode fix	Temperature Coefficient Source I mode, Manual OHMS Source V mode, Manual OHMS 6-wire OHMS Mode Guard Output Impedance hange Rate Auto Range Time Speed Fast 488.2 Medium 488.2 Normal 488.2 Speed Fast Medium 488.2 Speed Fast Medium 688.2 Speed Fast Medium 688.2 Normal 688.2 Speed Fast Medium 688.2 Normal	Resolution Test current Accuracy  ±(0.15 × accuracy) ±(0.15 × accuracy) ±(0.15 × accuracy) Total uncertainty. Total uncertainty Tiggin 0.01 / internal 1 / internal	200.000kΩ 10 10µA ±(0.0796-300), Nr. ±(0.0596-100), Enforce specification)/*C (0°) = I Source accuracy + = V	2.00	000MΩ 0Ω μA 0Ω μA 0Ω μA 0Ω μN 0π μA 0Ω μN 0π μA 0Ω μN 0π μA 0π μα	±(0.1%+0.003 ±(0.07%+0.0011 20.0000 0.5μ ±(0.17%+1kCl ±(0.15%+500Ω nse) nse) nse) nse) nse) nse) nse) nse)	(Ω), Normal (Ω), Enhanced (Ω), Enhanced (Ω) (A) (A) (A) (A) (A) (A) (A) (A) (A) (A	±(0.08%+0.0 ±(0.05%+0.0 20.0.0 1 10 ±(0.66%+1) ±(0.66%+1) ±(0.35%+5k  ccuracy is load  Source-M TO MEMC 902 (900 830 (830 339 (341 334 (333 55 (47) 56 (47) 67 (48asure '97) 881) 70) 381) ss/Fail test 2PIB 0.5 ms) 0.5 ms)	03Ω , Normal   1 Ω , Enhanced   1 Ω ,	±(0.05% >2    Source	6+0.3 Ω), No +0.1 Ω), Enh 100.000 M Ω 	Meas MMMORY 65 (162) 33 (125) 33 (125) 34 (138) 69 (70) 33 (127) 57 (157) 6	ure Memory *9  TO GPIB 164 (162) 162 (160) 132 (126) 131 (125) 44 (38) 44 (38) 47 (38) 47 (38) 48 (38) 49 (38) 49 (38) 41 (38) 41 (38) 42 (38) 43 (38) 44 (38) 45 (38) 46 (38)
SYSTEM	Resistance  Maximum Range C Maximum Measure  Sequence Reading Rates *7 (rdg,/second) for 60Hz (50Hz)  Single Reading Operation Rates (rdg,/second) for 60Hz (50Hz)  Component Interface Handler Time for 60Hz (50Hz) **, *10 Load Impedance Differential Mode V Common Mode Vo Commo	Temperature Coefficient Source I mode, Manual OHMS Source V mode, Manual OHMS 6-wire OHMS Mode Guard Output Impedance hange Rate Auto Range Time Speed Fast 488.2 Medium 488.2 Normal 488.2 Speed Fast Medium 488.2 Speed Fast Medium 688.2 Speed Fast Medium 688.2 Normal 688.2 Speed Fast Medium 688.2 Normal	Resolution Test current Accuracy  ±(0.15 × accuracy) ±(0.15 × accuracy) total uncertainty. Total uncertainty Tiggin 0.01 / internal 1 / internal 1 / internal NPLC / Trig Origin 0.01 / internal 1 / internal NPLC / Trig Origin 0.01 / internal 1 / internal 1 / internal 1 / internal 1 / internal Stable into 20,000 250VPk 250VDC >10GΩ, <1000pF	200.000kΩ 10 10µA ±(0.0796-300), Nr. ±(0.0596-100), Enforce specification)/*C (0°) = I Source accuracy + = V	2.00	000MΩ 0Ω μA 0Ω μA 0Ω μA 0Ω μN 0π μA 0Ω μN 0π μA 0Ω μN 0π μA 0π μα	±(0.1%+0.003 ±(0.07%+0.0011 20.0000 0.5μ ±(0.17%+1kCl ±(0.15%+500Ω nse) nse) nse) nse) nse) nse) nse) nse)	(Ω), Normal (Ω), Enhanced (Ω), Enhanced (Ω) (A) (A) (A) (A) (A) (A) (A) (A) (A) (A	±(0.08%+0.0 ±(0.05%+0.0 20.0.0 1 10 ±(0.66%+1) ±(0.66%+1) ±(0.35%+5k  ccuracy is load  Source-M TO MEMC 902 (900 830 (830 339 (341 334 (333 55 (47) 56 (47) 67 (48asure '97) 881) 70) 381) ss/Fail test 2PIB 0.5 ms) 0.5 ms)	03Ω , Normal   1 Ω , Enhanced   1 Ω ,	±(0.05% >2    Source	6+0.3 Ω), No +0.1 Ω), Enh 100.000 M Ω 	Meas MMMORY 65 (162) 33 (125) 33 (125) 34 (138) 69 (70) 33 (127) 57 (157) 6	ure Memory *9  TO GPIB 164 (162) 162 (160) 132 (126) 131 (125) 44 (38) 44 (38) 47 (38) 47 (38) 48 (38) 49 (38) 49 (38) 41 (38) 41 (38) 42 (38) 43 (38) 44 (38) 45 (38) 46 (38)
SYSTEM	Resistance  Maximum Range C Maximum Measure  Sequence Reading Rates *7 (rdg,/second) for 60Hz (50Hz)  Single Reading Operation Rates (rdg,/second) for 60Hz (50Hz)  Component Interface Handler Time for 60Hz (50Hz) *8,*10	Temperature Coefficient Source I mode, Manual OHMS Source V mode, Manual OHMS 6-wire OHMS Mode Guard Output Impedance hange Rate Auto Range Time Speed Fast 488.2 Medium 488.2 Normal 488.2 Speed Fast Medium 488.2 Speed Fast Medium 688.2 Speed Fast Medium 688.2 Normal 688.2 Speed Fast Medium 688.2 Normal	Resolution Test current Test current Test current Test current Test current Test current Total uncertainty. Trigorigin 0.01 / internal 1 / internal 2504 / internal 1 /	200.000kΩ 10 10µA ±(0.0796+300), N: ±(0.0596+300), N: ±(0.0596+300), N: =V source accuracy + =V source accuracy + tive ohms guard and jode TO MEMORY 2081 (2030) 510 (433) 438 (380) 57 (48)	2.00	000MΩ 0Ω μA 0Ω μA 0Ω μA 0Ω μN 0π μA 0Ω μN 0π μA 0Ω μN 0π μA 0π μα	±(0.1%+0.003 ±(0.07%+0.0011 20.0000 0.5μ ±(0.17%+1kCl ±(0.15%+500Ω nse) nse) nse) nse) nse) nse) nse) nse)	(Ω), Normal (Ω), Enhanced (Ω), Enhanced (Ω) (A) (A) (A) (A) (A) (A) (A) (A) (A) (A	±(0.08%+0.0 ±(0.05%+0.0 20.0.0 1 10 ±(0.66%+1) ±(0.66%+1) ±(0.35%+5k  ccuracy is load  Source-M TO MEMC 902 (900 830 (830 339 (341 334 (333 55 (47) 56 (47) 67 (48asure '97) 881) 70) 381) ss/Fail test 2PIB 0.5 ms) 0.5 ms)	03Ω , Normal   1 Ω , Enhanced   1 Ω ,	±(0.05% >2    Source	6+0.3 Ω), No +0.1 Ω), Enh 100.000 M Ω 	Meas MMMORY 65 (162) 33 (125) 33 (125) 34 (138) 69 (70) 33 (127) 57 (157) 6	ure Memory *9  TO GPIB 164 (162) 162 (160) 132 (126) 131 (125) 44 (38) 44 (38) 47 (38) 48 (38) 49 (38) 49 (38) 41 (38) 41 (38) 42 (38) 43 (38) 44 (38) 45 (38) 46 (38)
SYSTEM	Resistance  Maximum Range C Maximum Measure  Sequence Reading Rates *7 (rdg,/second) for 60Hz (50Hz)  Single Reading Operation Rates (rdg,/second) for 60Hz (50Hz)  Component Interface Handler Time for 60Hz (50Hz) *4, *10  Load Impedance Differential Mode V Common Mode Iso Over Range Max. Voltage Drop Max. Sense lead Re	Temperature Coefficient Source I mode, Manual OHMS Source V mode, Manual OHMS G-wire OHMS Mode Guard Output Impedance hange Rate Auto Range Time Speed Fast 488.2 Medium 488.2 Normal 488.2 Speed Fast(488.2) Medium(488.2) Speed Fast Medium(488.2) Speed Fast Medium(488.2) Medium(488.2) Medium(488.2) Medium(488.3) Normal Voltage Bage Bage Lation	Resolution Test current Accuracy ±(0.15 × accuracy ±(0.15 × accuracy total uncertainty Available using ac 0.1Ω in ohms m 75/second 40ms (fixed sourc NPLC / Trig Origin 0.01 / internal 0.1 / external 1 / internal 1 / external NPLC / Trig Origin 0.01 / internal 1 / internal 0.1 / internal 1 / internal	200.000kΩ 10 10µA ±(0.0796+300), N: ±(0.0596+300), N: ±(0.0596+300), N: =V source accuracy + =V source accuracy + tive ohms guard and jode TO MEMORY 2081 (2030) 510 (433) 438 (380) 57 (48)	2.00	000MΩ 0Ω μA 0Ω μA 0Ω μA 0Ω μN 0π μA 0Ω μN 0π μA 0Ω μN 0π μA 0π μα	±(0.1%+0.003 ±(0.07%+0.0011 20.0000 0.5μ ±(0.17%+1kCl ±(0.15%+500Ω nse) nse) nse) nse) nse) nse) nse) nse)	(Ω), Normal (Ω), Enhanced (Ω), Enhanced (Ω) (A) (A) (A) (A) (A) (A) (A) (A) (A) (A	±(0.08%+0.0 ±(0.05%+0.0 20.0.0 1 10 ±(0.66%+1) ±(0.66%+1) ±(0.35%+5k  ccuracy is load  Source-M TO MEMC 902 (900 830 (830 339 (341 334 (333 55 (47) 56 (47) 67 (48asure '97) 881) 70) 381) ss/Fail test 2PIB 0.5 ms) 0.5 ms)	03Ω , Normal   1 Ω , Enhanced   1 Ω ,	±(0.05% >2    Source	6+0.3 Ω), No +0.1 Ω), Enh 100.000 M Ω 	Meas MMMORY 65 (162) 33 (125) 33 (125) 34 (138) 69 (70) 33 (127) 57 (157) 6	ure Memory *9  TO GPIB 164 (162) 162 (160) 132 (126) 131 (125) 44 (38) 44 (38) 47 (38) 47 (38) 48 (38) 49 (38) 41 (38) 41 (38) 42 (38) 43 (38) 44 (38) 45 (38)
SYSTEM	Resistance  Maximum Range C Maximum Measure  Sequence Reading Rates *7 (rdg_/second) for 60Hz (50Hz)  Single Reading Operation Rates (rdg_/second) for 60Hz (50Hz)  Component Interface Handler Time for 60Hz (50Hz) *4, *10  Load Impedance Differential Mode V Common Mode So Common Mode So Common Mode So Over Range Max. Voltage Drop Max. Sense lead Re Sense lead Re Sense lead Re	Temperature Coefficient Source I mode, Manual OHMS Source I mode, Manual OHMS Source Mode, Manual OHMS G-wire OHMS Mode Guard Output Impedance hange Rate Auto Range Time  Speed Fast 488.2 Medium 488.2 Normal 488.2 Speed Fast(488.2) Medium(488.2) Normal 688.2 Medium(488.2) Normal 688.2 Normal 688.2 Speed Fast(488.2) Medium(688.2) Normal 688.2 Speed Fast Medium Normal	Resolution Test current Accuracy  ±(0.15 × accuracy) ±(0.15 × accuracy) total uncertainty. Total uncertainty Tiggin 0.01 / internal 1 / internal 1 / internal NPLC / Trig Origin 0.01 / internal 1 / internal 1 / internal 1 / internal 1 / internal 3 / internal 1	200.000kΩ 10 10µA ±(0.0796+300), N: ±(0.0596+300), N: ±(0.0596+300), N: =V source accuracy + =V source accuracy + tive ohms guard and jode TO MEMORY 2081 (2030) 510 (433) 438 (380) 57 (48)	2.00	000MΩ 0Ω μA 0Ω μA 0Ω μA 0Ω μN 0π μA 0Ω μN 0π μA 0Ω μN 0π μA 0π μα	±(0.1%+0.003 ±(0.07%+0.0011 20.0000 0.5μ ±(0.17%+1kCl ±(0.15%+500Ω nse) nse) nse) nse) nse) nse) nse) nse)	(Ω), Normal (Ω), Enhanced (Ω), Enhanced (Ω) (A) (A) (A) (A) (A) (A) (A) (A) (A) (A	±(0.08%+0.0 ±(0.05%+0.0 20.0.0 1 10 ±(0.66%+1) ±(0.66%+1) ±(0.35%+5k  ccuracy is load  Source-M TO MEMC 902 (900 830 (830 339 (341 334 (333 55 (47) 56 (47) 67 (48asure '97) 881) 70) 381) ss/Fail test 2PIB 0.5 ms) 0.5 ms)	03Ω , Normal   1 Ω , Enhanced   1 Ω ,	±(0.05% >2    Source	6+0.3 Ω), No +0.1 Ω), Enh 100.000 M Ω 	Meas MMMORY 65 (162) 33 (125) 33 (125) 34 (138) 69 (70) 33 (127) 57 (157) 6	ure Memory *9  TO GPIB 164 (162) 162 (160) 132 (126) 131 (125) 44 (38) 44 (38) 47 (38) 48 (38) 49 (38) 49 (38) 41 (38) 41 (38) 42 (38) 43 (38) 44 (38) 45 (38) 46 (38)
SYSTEM SPEED+5	Resistance  Maximum Range C Maximum Measure  Sequence Reading Rates *7 (rdg,/second) for 60Hz (50Hz)  Single Reading Operation Rates (rdg,/second) for 60Hz (50Hz)  Component Interface Handler Time for 60Hz (50Hz) *8, *10  Load Impedance Differential Mode Is Common Mode Iso Over Range Max. Voltage Drop Max. Sense lead Re Sense input Imped Guard Offset Volta Sense input Imped Guard Offset Volta	Temperature Coefficient Source I mode, Manual OHMS Source I mode, Manual OHMS 6-wire OHMS Mode Guard Output Impedance hange Rate Auto Range Time Speed Fast 488.2 Medium 488.2 Normal 488.2 Speed Fast Medium 488.2 Speed Fast Medium 488.2 Speed Fast Medium 488.2 Speed Fast Medium Speed Fast Medium Normal Voltage Itage I	Resolution Test current Test current Test current Accuracy ±(0.15 x accuracy Total uncertainty Total uncertainty Total uncertainty Total uncertainty Available using ac <0.1Ω in ohms m 75/second 40ms (fixed sourc NPLC / Trig Origin 0.01 / internal 0.1 / external 1 / internal 1	200.000kΩ 10 10µA ±(0.0796-300), N: ±(0.0596+100), Enf: specification)/*C (0'*) = I source accuracy + = V sou	2.00    2.00   3.00   3.00   3.00   4.00.15%-10   4.00.55%-10   4.00.55%-10   4.00.55%-10   4.00.55%-10   4.00.55%-10   4.00.55%-10   4.00.55%-10   5.00.56%	000MΩ 00Ω μA 00Ω), Normal 00Ω), Enhanced wire remote ser wire remote ser rd Output Curre  \$ TO MEMC 1151 (151 1018 (99) 470 (400) 5 (48) 5 (48)	±(0.1%+0.003 ±(0.07%+0.0011 20.0000 0.5μ ±(0.17%+1kCl ±(0.15%+500Ω nse) nse) nse) nse) nse) nse) nse) nse)	(Ω), Normal (Ω), Enhanced (Ω), Enhanced (Ω) (A) (A) (A) (A) (A) (A) (A) (A) (A) (A	±(0.08%+0.0 ±(0.05%+0.0 20.0.0 1 10 ±(0.66%+1) ±(0.66%+1) ±(0.35%+5k  ccuracy is load  Source-M TO MEMC 902 (900 830 (830 339 (341 334 (333 55 (47) 56 (47) 67 (48asure '97) 881) 70) 381) ss/Fail test 2PIB 0.5 ms) 0.5 ms)	03Ω , Normal   1 Ω , Enhanced   1 Ω ,	±(0.05% >2    Source	6+0.3 Ω), No +0.1 Ω), Enh 100.000 M Ω 	Meas MMMORY 65 (162) 33 (125) 33 (125) 34 (138) 69 (70) 33 (127) 57 (157) 6	ure Memory *9  TO GPIB 164 (162) 162 (160) 132 (126) 131 (125) 44 (38) 44 (38) 47 (38) 48 (38) 49 (38) 49 (38) 41 (38) 41 (38) 42 (38) 43 (38) 44 (38) 45 (38) 46 (38)
SYSTEM SPEED+5	Resistance  Maximum Range C Maximum Measure  Sequence Reading Rates *7 (rdg,/second) for 60Hz (50Hz)  Single Reading Operation Rates (rdg,/second) for 60Hz (50Hz)  Component Interface Handler Time for 60Hz (50Hz) *4, *10  Load Impedance Differential Mode 't Common Mode Iso Ower Range Max. Voltage Drop Max. Sense lead Re Sense Input Imped Guard Offset Voltas Source Cuttput Mod	Temperature Coefficient Source I mode, Manual OHMS Source V mode, Manual OHMS G-wire OHMS Mode Guard Output Impedance hange Rate Auto Range Time Speed Fast 488.2 Medium 488.2 Normal 488.2 Speed Fast(488.2) Medium(488.2) Speed Fast Medium Normal Fast Medium(488.2) Medium(488.2) Medium(488.3) Normal Medium(488.3) Speed Fast Medium Normal Voltage latge	Resolution Test current Accuracy  ±(0.15 × accuracy ±(0.15 × accuracy total uncertainty Available using ac 0.1Ω in ohms m 75/second 40ms (fixed sourc NPLC / Trig Origin 0.01 / internal 0.1 / external 1 / internal 1 / external 1 / external NPLC / Trig Origin 0.01 / internal 1 / internal NPLC / Trig Origin 0.01 / internal 1 / internal NPLC / Trig Origin 0.01 / internal 1 / internal 1 / internal NPLC / Trig Origin 0.01 / internal 1	200.000kΩ 10 10µA ±(0.0796-300), N: ±(0.0596+100), Enf: specification)/*C (0'*) = I source accuracy + = V sou	2.00	000MΩ 00Ω μA 00Ω), Normal 00Ω), Enhanced wire remote ser wire remote ser rd Output Curre  \$ TO MEMC 1151 (151 1018 (99) 470 (400) 5 (48) 5 (48)	±(0.1%+0.003 ±(0.07%+0.0011 20.0000 0.5μ ±(0.17%+1kCl ±(0.15%+500Ω nse) nse) nse) nse) nse) nse) nse) nse)	(Ω), Normal (Ω), Enhanced (Ω), Enhanced (Ω) (A) (A) (A) (A) (A) (A) (A) (A) (A) (A	±(0.08%+0.0 ±(0.05%+0.0 20.0.0 1 10 ±(0.66%+1) ±(0.66%+1) ±(0.35%+5k  ccuracy is load  Source-M TO MEMC 902 (900 830 (830 339 (341 334 (333 55 (47) 56 (47) 67 (48asure '97) 881) 70) 381) ss/Fail test 2PIB 0.5 ms) 0.5 ms)	03Ω , Normal   1 Ω , Enhanced   1 Ω ,	±(0.05% >2    Source	6+0.3 Ω), No +0.1 Ω), Enh 100.000 M Ω 	Meas MMMORY 65 (162) 33 (125) 33 (125) 34 (138) 69 (70) 33 (127) 57 (157) 6	ure Memory *9  TO GPIB 164 (162) 162 (160) 132 (126) 131 (125) 44 (38) 44 (38) 47 (38) 48 (38) 49 (38) 49 (38) 41 (38) 41 (38) 42 (38) 43 (38) 44 (38) 45 (38) 46 (38)
SYSTEM SPEED+5	Resistance  Maximum Range C Maximum Measure  Sequence Reading Rates *7 (rdg,/second) for 60Hz (50Hz)  Single Reading Operation Rates (rdg,/second) for 60Hz (50Hz)  Component Interface Handler Time for 60Hz (50Hz) *4, *10  Load Impedance Differential Mode V Common Mode Isc Common Mode So Common Mode So Serse lead Re Source Output Mo Source Wemory Lis Source Output Mo Source Output Mo Source Memory Lis	Temperature Coefficient Source I mode, Manual OHMS Source V mode, Manual OHMS G-wire OHMS Mode Guard Output Impedance hange Rate Auto Range Time Speed Fast 488.2 Medium 488.2 Normal 488.2 Speed Fast(488.2) Medium(488.2) Speed Fast Medium Normal Fast Medium(488.2) Medium(488.2) Medium(488.3) Normal Medium(488.3) Speed Fast Medium Normal Voltage latge	Resolution Test current Accuracy  ±(0.15 × accuracy) ±(0.15 × accuracy) ±(0.15 × accuracy) Total uncertainty. Total uncertainty Tiggin 0.01 / internal 1 / inter	200.000kΩ 10 10µA ±(0.0794-300), N. ±(0.0594-300), N. ±(0.0594-300), N. ±(0.0594-100), Eni specification)/*C (0°- = 1 source accuracy + = V source accuracy + = 10 Me  TO MEMORY 2081 (2030) 139 (1200) 131 (433) 438 (380) 59 (49) 57 (48)	2.00	000MΩ 0Ω μA 0Ω μA 0Ω μA 0Ω μA 0Ω μN 0π μA 0Ω μN 0π μA 0Ω μN 0π μA 0π μΑ	±(0.1%+0.003 ±(0.07%+0.0010 20.0000 0.5µ ±(0.11%+1kG ±(0.05%+500Ω nse) nse) nse) nse) nse) nse) nse) nse)	(Ω), Normal (Ω), Enhanced (Ω), Enhanced (Ω) (A) (A) (A) (A) (A) (A) (A) (A) (A) (A	±(0.08%+0.0 20.0.1 ±(0.05%+0.0 10 10 ±(0.66%+1) ±(0.66%+1) ±(0.35%+5k  ccuracy is load  Source-M TO MEMC 902 (900 830 (833 389 (344 334 (333 55 (47) 64 (47) 64 (47) 65 (48) 65 (47) 65 (48) 65 (47) 65 (47) 65 (47) 66 (48) 67 (68) 68 (48) 69 (50 (58) 60 (5	03Ω], Normal   0], Enhanced   000000	=(0.05% >2	6+0.3 Ω), No +0.1 Ω), Enh 100.000 M Ω 	Meas MMMORY 65 (162) 33 (125) 33 (125) 34 (138) 69 (70) 33 (127) 57 (157) 6	ure Memory *9  TO GPIB 164 (162) 162 (160) 132 (126) 131 (125) 44 (38) 44 (38) 47 (38) 47 (38) 48 (38) 49 (38) 41 (38) 41 (38) 42 (38) 43 (38) 44 (38) 45 (38)
SYSTEM SPEED+5	Resistance  Maximum Range C Maximum Measure  Sequence Reading Rates *7 (rdg,/second) for 60Hz (50Hz)  Single Reading Operation Rates (rdg,/second) for 60Hz (50Hz)  Component Interface Handler Time for 60Hz (50Hz) *4, *10  Load Impedance Differential Mode 't Common Mode Iso Ower Range Max. Voltage Drop Max. Sense lead Re Sense Input Imped Guard Offset Voltas Source Cuttput Mod	Temperature Coefficient Source I mode, Manual OHMS Source V mode, Manual OHMS G-wire OHMS Mode Guard Output Impedance hange Rate Auto Range Time Speed Fast 488.2 Medium 488.2 Normal 488.2 Speed Fast(488.2) Medium(488.2) Speed Fast Medium Normal Fast Medium(488.2) Medium(488.2) Medium(488.3) Normal Medium(488.3) Speed Fast Medium Normal Voltage latge	Resolution Test current Test current Test current Test current Test current Test current Total uncertainty Origin 0.01 / internal 1 / internal	200.000kΩ 10 10µA ±(0.0796-300), N: ±(0.0596-100), Enf: specification)/*C (0°) = I source accuracy + = V sour	2.00    2.00   3.00   3.00   3.00   4.00.15%-10   4.00.55%-10   4.00.55%-10   4.00.55%-10   4.00.55%-10   4.00.55%-10   4.00.55%-10   4.00.55%-10   5.00.56%	DOOMΩ OQ IµA OQO), Normal OO), Enhanced wire remote ser wire remote ser rd Output Curre  S TO MEMC 11551 1511 1018 (99) 470 (409) 55 (48) 57 (48)	±(0.1%+0.003 ±(0.07%+0.0010 20.0000 1000 0.5 µ ±(0.17%+1kct ±(0.05%+5000 nse) nse) nse) ent: 50mA (except  50urce-Measure *5 RY TC 151 1000 00 916 50 477 00 455 5 5	(Ω), Normal (Ω), Enhanced (Ω), Enhanced (Ω) (A) (A) (A) (A) (A) (A) (A) (A) (A) (A	±(0.08%+0.0 20.0.1 ±(0.05%+0.0 10 10 ±(0.66%+1) ±(0.66%+1) ±(0.35%+5k  ccuracy is load  Source-M TO MEMC 902 (900 830 (833 389 (344 334 (333 55 (47) 64 (47) 64 (47) 65 (48) 65 (47) 65 (48) 65 (47) 65 (47) 65 (47) 66 (48) 67 (68) 68 (48) 69 (50 (58) 60 (5	03Ω], Normal   0], Enhanced   000000	=(0.05% >2	6+0.3 Ω), No +0.1 Ω), Enh 100.000 M Ω 	Meas MMMORY 65 (162) 33 (125) 33 (125) 34 (138) 69 (70) 33 (127) 57 (157) 6	ure Memory *9  TO GPIB 164 (162) 162 (160) 132 (126) 131 (125) 44 (38) 44 (38) 47 (38) 47 (38) 48 (38) 49 (38) 41 (38) 41 (38) 42 (38) 43 (38) 44 (38) 45 (38)
SYSTEM SPEED+5	Resistance  Maximum Range C Maximum Measure  Sequence Reading Rates *7 (rdg,/second) for 60Hz (\$0Hz)  Single Reading Operation Rates (rdg,/second) for 60Hz (\$0Hz)  Component Interface Handler Time for 60Hz (\$0Hz) **, *10  Load Impedance Differential Mode V Common Mode Isc Common Mode So Common Mode So Sense lead Re Sense lead Re Sense Input Imped Guard Offset Volta; Source Voltage Max. Voltage Drop Max. Sense lead Re Source Output Mo Source Memory Lis Memory Buffer Programmability Digital I/O Connect	Temperature Coefficient Source I mode, Manual OHMS Source V mode, Manual OHMS G-wire OHMS Mode Guard Output Impedance hange Rate Auto Range Time  Speed Fast 488.2 Medium 488.2 Normal 488.2 Speed Fast(488.2) Medium(488.2) Speed Fast(488.2) Medium(488.2) Speed Fast(488.2) Medium(488.2) Speed Fast(488.2) Medium(488.3) Speed Fast Medium Normal Voltage Itage lation	Resolution Test current Accuracy ±(0.15 × accuracy total uncertainty Available using ac 0.1Ω in ohms m 75/second 40ms (fixed sourc NPLC / Trig Origin 0.01 / internal 0.1 / external 1 / internal 1 / internal 1 / external NPLC / Trig Origin 0.01 / internal 1 / internal NPLC / Trig Origin 0.01 / internal 1 / internal 1 / internal 1 / internal 1 / internal NPLC / Trig Origin 0.01 / internal 1 /	200.000kΩ 10 10µA ±(0.0796+300), N. ±(0.0596+300), N. ±(0.0596+300), N. ±(0.0596+300), N. ±(0.0596+300), P. = V source accuracy + =	2.00    2.00   3.00   3.00   3.00   3.00   4.00.05%-10.05%	000MΩ 0Ω μA 0Ω μA 0Ω μA 0Ω μA 0Ω μN 0π μA 0Ω μN 0π μA 0Ω μN 0π μA 0π μα	±(0.1%+0.003 ±(0.07%+0.001) 20.0000 1001 0.5µ ±(0.11%+1kC) ±(0.05%+500Ω nse) nse) nse) nse) nse) nse) nse) nse)	(Ω), Normal (Ω), Enhanced (Ω), Enhanced (Ω) (A) (A) (A) (A) (A) (A) (A) (A) (A) (A	±(0.08%+0.0 ±(0.05%+0.0 20.0.1 10 ±(0.65%+5k) ±(0.35%+5k)  ccuracy is load  Source-M TO MEMC 902 (900 33.9 (343 334 (333 55 (471) 55 (47) easure 9 279 (300 389 (350	03Ω), Normal 1 Ω), Enhanced 00MΩ kΩ 00nA kΩ 00nA k(c), Normal dependent  dependent  3 8 9) 8 9) 9 7 8) 9 3 3 9 3 3	=(0.05% >2	6+0.3 Ω), No +0.1 Ω), Enh 100.000 M Ω 	Meas MMMORY 65 (162) 33 (125) 33 (125) 34 (138) 69 (70) 33 (127) 57 (157) 6	ure Memory *9  TO GPIB 164 (162) 162 (160) 132 (126) 131 (125) 44 (38) 44 (38) 47 (38) 47 (38) 48 (38) 49 (38) 49 (38) 41 (38) 41 (38) 42 (38) 43 (38) 44 (38) 45 (38) 46 (38)
SYSTEM SPEED+5	Resistance  Maximum Range C Maximum Measure  Sequence Reading Rates *7 (rdg,/second) for 60Hz (50Hz)  Single Reading Operation Rates (rdg,/second) for 60Hz (50Hz)  Component Interface Handler Time for 60Hz (50Hz) *4, *10  Load impedance Differential Mode V Common Mode Isc Over Range Max. Voltage Drop Max. Sense lead Re Sense Input Imped Guard Offset Voltag Source Output Mo Source Memory Li Source Memory Li Source Memory Li Remote Interface Programmability Digital I/O Connec	Temperature Coefficient Source I mode, Manual OHMS Source V mode, Manual OHMS G-wire OHMS Mode Guard Output Impedance hange Rate Auto Range Time  Speed Fast 488.2 Medium 488.2 Normal 488.2 Speed Fast(488.2) Medium(488.2) Speed Fast(488.2) Medium(488.2) Speed Fast(488.2) Medium(488.3) Speed Fast(488.2) Medium(488.3) Speed Fast Medium Normal Voltage Itage lation	Resolution Test current Accuracy  ±(0.15 x accuracy Total uncertainty Origin 0.01 / internal 0.01 / external 1 / internal 1	200.000kΩ 10 10µA ±(0.0796-300), N: ±(0.0596-300), N: ±(0.0596-300), N: ±(0.0596-100), Enf: specification)/*C (0°) = I source accuracy + = V source accura	2.00    2.00   3.00   3.00   3.00   3.00   3.00   3.00   3.00   4.00.15%-10   4.00.55%-10   4.00.55%-10   4.00.55%-10   4.00.55%-10   5.00.56%-10   5.00.56%-10   6.00.56%	DOOMΩ OQ IµA OQO), Normal OO), Enhanced wire remote ser wire remote ser rd Output Curre  TO MEMC 1151 (151 1018 (99) 470 (400) 5 (48) 5 (48) 5 (48)	±(0.1%+0.003 ±(0.07%+0.0010 20.0000 1000 0.5µ ±(0.11%+1kct ±(0.05%+5000 nse) nse) nse) ent: 50mA (except  50urce-Measure *5 07 100 100 100 100 100 100 100 100 100	(O), Normal (O), Enhanced (O), Enhanced (O)	±(0.08%+0.0 ±(0.05%+0.0 20.0.1 10 ±(0.65%+5k) ±(0.35%+5k)  ccuracy is load  Source-M TO MEMC 902 (900 33.9 (343 334 (333 55 (471) 55 (47) easure 9 279 (300 389 (350	03Ω), Normal 1 Ω), Enhanced 00MΩ kΩ 00nA kΩ 00nA k(c), Normal dependent  dependent  3 8 9) 8 9) 9 7 8) 9 3 3 9 3 3	=(0.05% >2	6+0.3 Ω), No +0.1 Ω), Enh 100.000 M Ω 	Meas MMMORY 65 (162) 33 (125) 33 (125) 34 (138) 69 (70) 33 (127) 57 (157) 6	ure Memory *9  TO GPIB 164 (162) 162 (160) 132 (126) 131 (125) 44 (38) 44 (38) 47 (38) 47 (38) 48 (38) 49 (38) 49 (38) 41 (38) 41 (38) 42 (38) 43 (38) 44 (38) 45 (38) 46 (38)
SYSTEM SPEED+5	Resistance  Maximum Range C Maximum Measure  Sequence Reading Rates *7 (rdg,/second) for 60Hz (50Hz)  Single Reading Operation Rates (rdg,/second) for 60Hz (50Hz)  Component Interface Handler Time for 60Hz (50Hz) *4, *10  Load Impedance Differential Mode 't Common Mode Iso Over Range Max. Voltage Drop Max. Sense lead Re Sense Input Imped Guard Offset Volta Source Cuttput Mo Source Memory Lis Memory Buffer Programmability Digital I/O Connec Remote Interface Insulation	Temperature Coefficient Source I mode, Manual OHMS Source V mode, Manual OHMS G-wire OHMS Mode Guard Output Impedance hange Rate Auto Range Time  Speed Fast 488.2 Medium 488.2 Normal 488.2 Speed Fast(488.2) Medium(488.2) Speed Fast(488.2) Medium(488.2) Speed Fast Medium Normal Voltage tage lation	Resolution Test current Accuracy  ±(0.15 × accuracy total uncertainty Available using ac 0.1Ω in ohms m 75/second 40ms (fixed sourc NPLC / Trig Origin 0.01 / internal 0.1 / external 1 / internal 1 / external 1 / external NPLC / Trig Origin 0.01 / internal 1 / internal NPLC / Trig Origin 0.01 / internal 1 / internal 1 / internal NPLC / Trig Origin 0.01 / internal NPLC / Trig Origin 0.01 / internal 1 / internal NPLC / Trig Origin 0.01 / internal 1 / internal 2 / intern	200.000kΩ  10  10µA  ±(0.0796+300), Nr. ±(0.0596+300), Nr. ±(0.0596+300), Nr. ±(0.0596+300), Nr. = Specification)/*C (θ' = 1 Source accuracy + 1	2.00   2.00   2.00   3.07   3.	000MΩ 00 μA 000j, Normal 000j, Normal 000j, Enhanced wire remote ser wire remote ser wire remote ser 10 Output Curre 11 1018 (99) 470 (405 470 (40	±(0.1%+0.003 ±(0.07%+0.001) 20.0000 1000 0.5µ ±(0.17%+1kΩ ±(0.15%+500Ω nse) nse) nse) nse) nse) nse) nse) nse)	(Ω), Normal (Ω), Enhanced (Ω), Enhanced (Ω) (A) (A) (A) (A) (A) (A) (A) (A) (A) (A	±(0.08%+0.0 ±(0.05%+0.0 20.0.1 10 ±(0.65%+0.1 ±(0.65%+5k  ccuracy is load  Source-M TO MEMC 902 (900 33.98 (343 334 (333 55 (471 55 (47) 162,PIB 33) 337 (333 55 (471 55 (47) 163,PIB 339 (0.55 ms) 0.5 ms)	03Ω), Normal 1 Ω), Enhanced 00MΩ kΩ 00nA kΩ 00nA k(k), Normal dependent dependent  3 8 9) 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	=(0.05% >2	6+0.3 Ω), No +0.1 Ω), Enh 100.000 M Ω 	Meas MMMORY 65 (162) 33 (125) 33 (125) 34 (138) 69 (70) 33 (127) 57 (157) 6	ure Memory *9  TO GPIB 164 (162) 162 (160) 132 (126) 131 (125) 44 (38) 44 (38) 47 (38) 47 (38) 48 (38) 49 (38) 49 (38) 41 (38) 41 (38) 42 (38) 43 (38) 44 (38) 45 (38) 46 (38)
SYSTEM SPEED+5	Resistance  Maximum Range C Maximum Range C Maximum Measure Sequence Reading Rates *7 (rdg./second) for 60Hz (S0Hz)  Single Reading Operation Rates (rdg./second) for 60Hz (S0Hz)  Component Interface Handler Time for 60Hz (S0Hz) *8, *10  Load Impedance Differential Mode V Common Mode to Common Mode so Over Range Max. Voltage Drop Max. Sense lead Re Sense Input Imped Guard Offset Voltag Source Output Mo Source Output Mo Source Memory Li Memory Buffer Programmability Digital I/O Connec Remote Interface Insulation Operation Environ Operation Environ Operation Environ	Temperature Coefficient Source I mode, Manual OHMS Source V mode, Manual OHMS Source V mode, Manual OHMS G-wire OHMS Mode Guard Output Impedance hange Rate Auto Range Time  Speed Fast 488.2 Medium 488.2 Normal 488.2 Speed Fast(488.2) Medium Medium Normal Normal Normal Speed Fast Medium Normal	Resolution Test current Accuracy  ±(0.15 x accuracy) ±(0.15 x accuracy) total uncertainty. Total uncertainty Tig Origin 0.01 / internal 1 / internal 1 / internal 1 / internal NPLC / Trig Origin 0.01 / internal 1 / i	200.000kΩ 10 10μA ±(0.079%+300), N. ±(0.05%+300), N. ±(0.05%+100), Eni specification)/*C (Φ' = 1 Source accuracy + = V source accuracy + = 10 MEMORY 2081 (2030) 510 (433) 438 (380) 59 (49) 57 (48)  10 pF typical  11 pF typical  12 pF typical  13 15 16 17 18 18 18 19 19 19 10 10 10 10 10 10 10 10 10 10 10 10 10	2.00	000MΩ 00 μA 000j, Normal 000j, Normal 000j, Enhanced wire remote ser wire remote ser wire remote ser 10 Output Curre 11 1018 (99) 470 (405 470 (40	±(0.1%+0.003 ±(0.07%+0.001) 20.0000 1000 0.5µ ±(0.17%+1kΩ ±(0.15%+500Ω nse) nse) nse) nse) nse) nse) nse) nse)	(Ω), Normal (Ω), Enhanced (Ω), Enhanced (Ω) (A) (A) (A) (A) (A) (A) (A) (A) (A) (A	±(0.08%+0.0 ±(0.05%+0.0 20.0.1 10 ±(0.65%+5k ±(0.35%+5k  ccuracy is load  Source-M TO MEMC 902 (900 33.98 (343 334 (333 55 (471) 55 (47) 162,PIB 33) 337 (333 55 (471) 65,PIB 30,0.5 ms) 0.5 ms)	03Ω), Normal 1 Ω), Enhanced 00MΩ kΩ 00nA kΩ 00nA k(k), Normal dependent dependent  3 8 9) 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	=(0.05% >2	6+0.3 Ω), No +0.1 Ω), Enh 100.000 M Ω 	Meas MMMORY 65 (162) 33 (125) 33 (125) 34 (138) 69 (70) 33 (127) 57 (157) 6	ure Memory *9  TO GPIB 164 (162) 162 (160) 132 (126) 131 (125) 44 (38) 44 (38) 47 (38) 47 (38) 48 (38) 49 (38) 49 (38) 41 (38) 41 (38) 42 (38) 43 (38) 44 (38) 45 (38) 46 (38)
SYSTEM SPEED+5	Resistance  Maximum Range C Maximum Masuru  Sequence Reading Rates *7 (rdg,/second) for 60Hz (50Hz)  Single Reading Operation Rates (rdg,/second) for 60Hz (50Hz)  Component Interface Handler Time for 60Hz (50Hz) *4, *10  Load Impedance Differential Mode Iv Common Mode Ivo Common Mode Vo Common Mode Vo Common Mode Ivo Common Mode Vo Co	Temperature Coefficient Source I mode, Manual OHMS Source V mode, Manual OHMS Source V mode, Manual OHMS G-wire OHMS Mode Guard Output Impedance hange Rate Auto Range Time  Speed Fast 488.2 Medium 488.2 Normal 488.2 Speed Fast(488.2) Medium Medium Normal Normal Normal Speed Fast Medium Normal	Resolution Test current Test current Test current Test current Test current Test current Total uncertainty Origin 0.01 / internal 1 /	200.000kΩ 10 10µA ±(0.0796+300), Ni. ±(0.0596+300), Ni. ±(0.0596+100), Enf. specification)/*C (9° + = V source accuracy + = V sourc	2.00	000MΩ 00 μA 000j, Normal 000j, Normal 000j, Enhanced wire remote ser wire remote ser wire remote ser 10 Output Curre 11 1018 (99) 470 (405 470 (40	±(0.1%+0.003 ±(0.07%+0.001) 20.0000 1000 0.5µ ±(0.17%+1kΩ ±(0.15%+500Ω nse) nse) nse) nse) nse) nse) nse) nse)	(Ω), Normal (Ω), Enhanced (Ω), Enhanced (Ω) (A) (A) (A) (A) (A) (A) (A) (A) (A) (A	±(0.08%+0.0 ±(0.05%+0.0 20.0.1 10 ±(0.65%+5k ±(0.35%+5k  ccuracy is load  Source-M TO MEMC 902 (900 33.98 (343 334 (333 55 (471) 55 (47) 162,PIB 33) 337 (333 55 (471) 65,PIB 30,0.5 ms) 0.5 ms)	03Ω), Normal 1 Ω), Enhanced 00MΩ kΩ 00nA kΩ 00nA k(k), Normal dependent dependent  3 8 9) 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	=(0.05% >2	6+0.3 Ω), No +0.1 Ω), Enh 100.000 M Ω 	Meas MMMORY 65 (162) 33 (125) 33 (125) 34 (138) 69 (70) 33 (127) 57 (157) 6	ure Memory *9  TO GPIB 164 (162) 162 (160) 132 (126) 131 (125) 44 (38) 44 (38) 47 (38) 47 (38) 48 (38) 49 (38) 49 (38) 41 (38) 41 (38) 42 (38) 43 (38) 44 (38) 45 (38) 46 (38)
SYSTEM SPEED+5	Resistance  Maximum Range C Maximum Range C Maximum Measure Sequence Reading Rates *7 (rdg./second) for 60Hz (S0Hz)  Single Reading Operation Rates (rdg./second) for 60Hz (S0Hz)  Component Interface Handler Time for 60Hz (S0Hz) *8, *10  Load Impedance Differential Mode V Common Mode to Common Mode so Over Range Max. Voltage Drop Max. Sense lead Re Sense Input Imped Guard Offset Voltag Source Output Mo Source Output Mo Source Memory Li Memory Buffer Programmability Digital I/O Connec Remote Interface Insulation Operation Environ Operation Environ Operation Environ	Temperature Coefficient Source I mode, Manual OHMS Source V mode, Manual OHMS G-wire OHMS Mode Guard Output Impedance hange Rate Auto Range Time  Speed Fast 488.2 Medium 488.2 Normal 488.2 Speed Fast(488.2) Medium(488.2) Speed Fast(488.2) Medium(488.2) Speed Fast (488.2) Medium(488.2) Speed Fast (488.2) Medium(488.3) Speed Fast (488.2) Speed Fast (488.2) Medium (488.2) Speed Fast (488.2) Speed Fast (488.2) Medium (488.2) Speed Fast (488.2) Speed Fast (488.2) Medium (488.2) Speed Fast (488.2) Speed Fast (488.2) Speed Fast (488.2) Medium (488.2) Speed (488.2) Speed (488.2) Speed (488.2) Speed (488.2) Medium (488.2) Speed (488.2) Speed (488.2) Medium (488.2) Speed (488	Resolution Test current Accuracy  ±(0.15 x accuracy) ±(0.15 x accuracy) total uncertainty. Total uncertainty. Total uncertainty Tiggin 0.01 / internal 1 / internal 1 / internal 1 / internal NPLC / Trig Origin 0.01 / internal 1 / inte	200.000kΩ 10 10µA ±(0.0796+300), Ni. ±(0.0596+300), Ni. ±(0.0596+100), Enf. specification)/*C (9° + = V source accuracy + = V sourc	2.00	000MΩ 00 μA 000j, Normal 000j, Normal 000j, Enhanced wire remote ser wire remote ser wire remote ser 10 Output Curre 11 1018 (99) 470 (405 470 (40	±(0.1%+0.003 ±(0.07%+0.001) 20.0000 1000 0.5µ ±(0.17%+1kΩ ±(0.15%+500Ω nse) nse) nse) nse) nse) nse) nse) nse)	(Ω), Normal (Ω), Enhanced (Ω), Enhanced (Ω) (A) (A) (A) (A) (A) (A) (A) (A) (A) (A	±(0.08%+0.0 ±(0.05%+0.0 20.0.1 10 ±(0.65%+5k ±(0.35%+5k  ccuracy is load  Source-M TO MEMC 902 (900 33.98 (343 334 (333 55 (471) 55 (47) 162,PIB 33) 337 (333 55 (471) 65,PIB 30,0.5 ms) 0.5 ms)	03Ω), Normal 1 Ω), Enhanced 00MΩ kΩ 00nA kΩ 00nA k(k), Normal dependent dependent  3 8 9) 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	=(0.05% >2	6+0.3 Ω), No +0.1 Ω), Enh 100.000 M Ω 	Meas MMMORY 65 (162) 33 (125) 33 (125) 34 (138) 69 (70) 33 (127) 57 (157) 6	ure Memory *9  TO GPIB 164 (162) 162 (160) 132 (126) 131 (125) 44 (38) 44 (38) 47 (38) 47 (38) 48 (38) 49 (38) 49 (38) 41 (38) 41 (38) 42 (38) 43 (38) 44 (38) 45 (38) 46 (38)

#### A. MAXIMUM OUTPUT: ±210V/±1.05A/22W

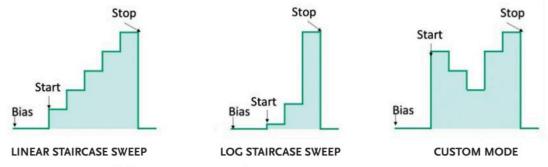


The power source output of the GSM-20H10 has two ranges.

The voltage range is  $\pm 21$  volts, and the current is  $\pm 1.05A$ . The voltage range is  $\pm 210$  volts, and the current range is  $\pm 105$ mA. The power capacity is 22W.

Provide a full range of four-quadrant measurement without duty cycle limit.

## B. BUILT-IN 4 SEQUENCE OUTPUT MODES, UP TO 2500 POINTS



GSM-20H10 Source Measure Unit provides four sequence output modes: linear staircase, log staircase, SRC-MEM (source memory) and Custom (self-defined).

With these output modes, users can quickly generate output as needed. The total number of sequence points is 2,500.

#### C. OVP/OTP PROTECTION FUNCTION



In terms of protection, GSM-20H10 provides OVP/OTP protection modes; in the design of OVP, users can define the range of OVP, and the protection of OTP can effectively prevent errors caused by temperature drift during the test process.

#### D. 0.012% BASIC MEASURE ACCURACY WITH 6½DIGIT RESOLUTION



GSM-20H10 provides a measurement accuracy of up to 0.012%, and provides a meter display function of up to  $6\frac{1}{2}$  digits, allowing users to have more accurate results when measuring small signals...

#### E. VARIABLE SAMPLING SPEED

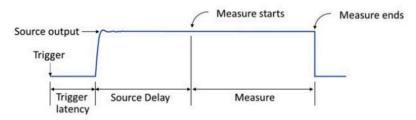


The sampling rate of GSM-20H10 is variable. Therefore, users can choose the sampling rate from 0.01 PLC to 10 PLC according to their needs.

SAMPLING MODE	FAST	MEDIUM	NORMAL	HIGH	OTHER
Speed, NPLC	0.01	0.1	1	10	User defined
Digit	3½	4½	5½	6½	Selectable

Where NPLC represents the number of power line cycles, for example, AC power frequency is 50Hz, 1 PLC means 20ms, 2 PLC means 40ms, and so on.

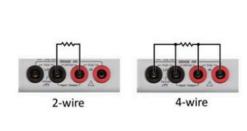
#### F. SDM (SOURCE DELAY MEASURE) CYCLE

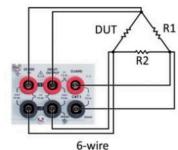


The initial state of the source output may be unstable. If the meter starts measuring after the source is output, users can set the source delay to start the meter measurement after passing the unstable period so as to obtain stable measurement results.

GSM-20H10 Source Measure Unit delay range is 0 to 9999.999 seconds.

#### G. 2-, 4-, AND 6-WIRE REMOTE V-SOURCE AND MEASURE SENSING





Other than 2-wire, GSM-20H10 also provides 4-wire and 6-wire resistance measurements.

4-wire measurement eliminates the effect of lead resistance, realizing accurate measurement of small resistances below 100ohm at high currents.

6-wire combining 4-wire connection and the protection of ohm characteristics eliminate the effects of internal parallel resistance, realizing the resistance measurement of a tiny wire.

#### H. VARIABLE DISPLAY DIGITS



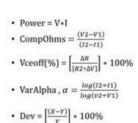
The display bits of GSM-20H10 are variable. Therefore, users can choose the number of display bits among 3.5, 4.5, 5.5, and 6.5 bits according to their needs.

#### I. BUILT-IN LIMIT FUNCTION



GSM-20H10 has three built-in Pass/Fail limit line tests with a total of 11 sets.

#### BUILT-IN 5 CALCULATION FUNCTIONS





GSM-20H10 provides five built-in calculation functions: Power, Offset Compensation Ohms, Voltage Coefficient, Varistor Alpha, and Percent Deviation.

## Programmable High Precision DC Power Supply



#### PPH-1503





## PPH-1503D/1506D/1510D



#### **FEATURES**

- \* 3.5"TFT LCD Display
- \* High Measurement Resolution: 1mV/0.1µA for 5mA range.
- \* Transient Recovery Time: ≦40µS within 100mV; <80µs within 20mV
- \* Current Sink Function
- \* Pulse Current Measurement (Pulse width min.: 33us)
- \* Long Integration Current Measurement
- \* Built-in DVM Measurement Function
- \* Sequence Function (Sequence power output)
- \* Built-in Battery Simulation Function (CH1 of PPH-15xxD)
- \* OVP, OCP, OTP & Temperature Display for **Heat Sink**
- \* Support USB (Device & Host)/GPIB/LAN
- \* Five Groups of Save/Recall Setting
- \* External Relay Control

#### PPH-1503 Rear Panel



#### PPH-1503D/1506D/1510D Rear Panel



PPH-Series high precision measurement capability achieves the maximum resolution of 1mV/0.1μA and the smallest pulse current width of 33 µs that satisfy customers' measurement application requirements of high resolution and pulse current. Fast load current variation will result in voltage sag for general power supplies that will have an impact on DUT's internal circuit operation. PPH-Series is equipped with the excellent transient recovery time, which can, in less than 40μs, recover the output voltage to within 100mV of the previous voltage output when the current level changes from 10% to 100% of the full scale. Furthermore, conventional power supplies do not have sufficient response speed to promptly respond to set voltage value once the set voltage is changed. PPH-15xxD has a rise time of 0.2ms and a fall time of 0.3ms, which are 100 times faster than that of conventional power supplies. Therefore, PPH-15xxD can provide DUT with a stable output voltage even when DUT is operating under large transient current output. The internal high-speed sampling circuit design of PPH-15xxD, with the sample rate of 64K, can conduct pulse current measurement without using a current probe and oscilloscope. The current read back accuracy is 0.2%+1μA (equals to 11μA) at 5mA range, and the read back resolution is 0.1 µA that allow DUT to be measured with a high accuracy level. Unlike battery, general power supplies, which do not have the characteristics of fast transient recovery time, can not maintain a stable power supply for cellular phone, wireless device, and wearable device which produce large transient pulse current load for hundreds of µs to dozens of ms when in use. PPH-15xxD, different from general power supplies, has the characteristics of fast transient recovery time. While simulating battery to output pulse current, PPH-15xxD can quickly compensate the voltage drop caused by pulse current. PPH-15xxD's CH1 has the built-in battery simulation function, which can define output impedance settings so as to accurately simulate battery's impedance characteristics during battery discharge. Fast transient recovery time and built-in battery simulation function together facilitate PPH-15xxD to accurately simulate battery's real behavior pattern so as to conduct product tests.

PPH-15xxD is not only suitable for simulating battery, charger and supplying power to DUT, but also ideal for simulating an electronic load to conduct discharge tests with its sink current capability. The sink current function allows PPH-15xxD to simulate a voltage source with the sink current capability. The maximum sink current of PPH-15xxD's CH1 is 3.5A and for CH2 is 3A. Long integration current measurement can be utilized to conduct average current measurement for periodical pulse current in a long period of time that is applied to analyze power consumption for a period of time. One of the applications is to measure the average power consumption of a cellular phone in use so as to conduct the internal RF module parameter analysis. The maximum pulse current measurement range of CH1 is 5A and for CH2 is 3A. The built-in sequence function of CH1 provides users with 1000 steps to edit sequential outputs, including voltage, current and execution time. The built-in DVM function of CH2 has a voltage range from 0 to +20VDC that saves users the cost of purchasing an additional voltage meter.

PPH-15xxD provides OTP function and shows heat sink temperature on the upper right corner of the display screen. Other

than that, features such as five sets of system setting values for the SAVE/RECALL function, 10 sets of Power On Setup Settings, Key-Lock function to prevent unauthorized inputs, temperature-controlled fan to reduce noise, hardcopy to save screen information, and external relay control device together augment PPH-15xxD's usability. PPH-Series supports test requirements of Profile1, Profile2 and Profile3 from USB Power Delivery(PD) constructed by USB-IF association.

#### SELECTION GUIDE

Model	PPH-1503	PPH-1503D	PPH-1506D	PPH-1510D	
Channel	1	2	2	2	
Dual Range Output Channel 1  Channel 2	0~15V/0~3A or 0~9V/0~5A	0-15V/0-3A or 0-9V/0-5A 0-12V/0-1.5A	0~15V/0~3A or 0~9V/0~5A 0~12V/0~3.0A	0~15V/0~3A or 0~9V/0~5A Rear Terminal: 0~10A(0~ 4.5V) 0~12V/0~3.0A	
Display	3.5 Inch TFT LCD	3.5 Inch TFT LCD	3.5 Inch TFT LCD	3.5 Inch TFT LCD	
Current Measurement Range	5A/5mA	5A/500mA/ 5mA(CH1)	5A/500mA/ 5mA(CH1)	10A/500mA/ 5mA(CH1)	
CV&CC	1	1	1	1	
Built-in DVM Measurement Function	1	√ (CH2)	✓ (CH2)	√ (CH2)	
Pulse Current Measurement	1	1	1	1	
Long integration Current Measurement	1	1	1	1	
Battery Simulation	NA	√ (CH1)	√ (CH1)	√ (CH1)	
Automated Sequential Ouput	1	√ (CH1)	√ (CH1)	√ (CH1)	
High Measurement Resolution	✓ (1mV/0.1 µ A)	✓ (1mV/0.1 µ A)	✓ (1mV/0.1 µ A)	✓ (1mV/0.1 µ A	
Sink Current Capability	✓ (Max: 2A)	✓ (Max: 3.5A)	✓ (Max: 3.5A)	✓ (Max: 3.5A)	
Selectable Output From Front or Rear Panel	1	1	1	1	
Relay Output Control	1	1	1	1	
Memory	5 Sets	5 Sets	5 Sets	5 Sets	
Sample Rate	60K	64K	64K	64K	
Lock Function	1	1	1	1	
Protection Function	OVP/OTP/OCP	OVP/OTP/OCP	OVP/OTP/OCP	OVP/OTP/OCP	
Four Wire Output Open Circuit Protection	NA	1	1	1	
Temperature Display for Heat Sink	NA	1	1	1	
Standard Interface: GPIB LAN, USB, Analog Control USB Interface LAN	√ √ (CDC) √	√ √ (TMC) √	√ √ (TMC) √	√ √ (TMC) √	

#### ORDERING INFORMATION

PPH-1503 (0~15V/0~3A or 0~9V/0~5A) High Precision DC Power Supply

PPH-1503D (CH1:0~15V/0~3A or 0~9V/0~5A;CH2:0~12V/0~1.5A) High Precision Dual Channel Output DC Power Supply PPH-1506D (CH1:0-15V/0-3A or 0-9V/0-5A;CH2:0-12V/0-3A) High Precision Dual Channel Output DC Power Supply (CH1:0~15V/0~3A or 0~9V/0~5A,0~4.5V/0~10A(Rear terminal);CH2:0~12V/0~3A)High Precision Dual Channel PPH-1510D Output DC Power Supply

ACCESSORIES

Power cord (Region dependent), Test lead GTL-207A x 1, GTL-203A x 1, GTL-204A x 1

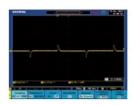
OPTIONAL ACCESSORIES

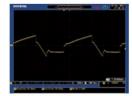
USB Cable (USB 2.0, A-B Type) GRA-450-J Rack Mount kit GRA-450-E Rack Mount kit

SPECIFICATIONS Model	PPH-1503 PPH-1503D		PPH-1	506D	PPH-15	10D	
OUTPUT RATING							
Number of Output Channel	1	2		2		2	
Channel No.	Ch 1	Ch 1	Ch 2	Ch 1	Ch 2	Ch 1	Ch 2
Power	45W	45W 0 ~ 15V or 0 ~ 9V	18W 0 ~ 12V	45W	36W 0 ~ 12V	45W 0 ~ 15V or 0 ~ 9V	36W 0 ~ 12V
Voltage Current	0 ~ 15V or 0 ~ 9V 0 ~ 3A or 0 ~ 5A	0 ~ 15V or 0 ~ 9V 0 ~ 3A or 0 ~ 5A	0 ~ 12V 0 ~ 1.5A	0 ~ 15V or 0 ~ 9V 0 ~ 3A or 0 ~ 5A	0 ~ 12V 0 ~ 3.0A	0 ~ 15V or 0 ~ 9V 0 ~ 3A or 0 ~ 5A	0 ~ 12V 0 ~ 3.0A
Current	0 - 3A 01 0 - 3A	0 - 3A 0I 0 - 3A	0 - 1,3A	0 - 3A 01 0 - 3A	0 - 3.0A	Rear:0~10A(under 0~4.5V)	0 - 3.0A
Output Voltage Rising Time	0.15ms (10% ~ 90%)	0.20ms (10% ~ 90%)		0.20ms (10% ~ 90%)		0.20ms (10% ~ 90%)	
Output Voltage Falling Time	0.65ms (90% ~ 10%)	0.30ms (90% ~ 10%)		0.30ms (90% ~ 10%)	-	0.30ms (90% ~ 10%)	
STABILITY							
Voltage Current	0.01%+0.5mV 0.01%+50 µ A	0.01%+3.0mV		0.01%+3.0mV		0.01%+3.0mV	
REGULATION (CV)	0.0176+30 µ A						
Load	0.01%+2mV	0.01%+2mV		0.01%+2mV		0.01%+2mV	
Line	0.5mV	0.5mV		0.5mV		0.5mV	
REGULATION (CC)							
Load Line	0.01%+1mA 0.5mA	0.01%+1mA 0.5mA		0.01%+1mA 0.5mA		0.01%+1mA 0.5mA	
RIPPLE & NOISE (20Hz~20M	5.40000000000	U.JIIIA		U.JIIIA		U.SIIIA	
CV p-p	8mV	≤5A:8mVp-p(20Hz~	20MHz)	≤5A:8mVp-p(20Hz~	- 20MHz)	≤5A:8mVp-p(20Hz~	20MHz)
	7000					>5A : 12mVp-p (20Hz~20MHz)	
CV rms	1mV	3mV(0~1MHz)		3mV(0~1MHz)		3mV(0~1MHz)	
CC rms PROGRAMMING ACCURAC	_			_			
Voltage	0.05%+10mV	0.05%+10mV		0.05%+10mV		0.05%+10mV	
Current(Ch1:5A,10A/CH2:1.5A,3A)	0.16%+5mA	0.16%+5mA(5A/1.5A)		0.16%+5mA(5A/3A)		0.16%+5mA(5A/3A)	
Current (500mA)	_	0.16%+0.5mA		0.16%+0.5mA	_	0.16%+0.5mA	_
Current (5mA )	777 17	0.16%+5μΑ	<u> </u>	0.16%+5μΑ		0.16%+5μΑ	
READBACK ACCURACY							
Voltage	0.05%+3mV	0.05%+3mV	0.05%+3mV	0.05%+3mV	0.05%+3mV	0.05%+3mV	0.05%+3mV
Current (Ch1:5A,10A/CH2:1.5A,3A)	0.2%+400μA(5A)	0.2%+400μA(5A)	0.2%+400μΑ	0.2%+400μA(5A)	0.2%+400μΑ	0.2%+400μA(5A)	0.2%+400μΑ
Current (500mA)	-	0.2%+100μΑ	_	0.2%+100μΑ	_	0.2%+100μΑ	
Current (5mA )	0.2%+1μA	0.2%+1μA	0.2%+1μΑ	0.2%+1μA	0.2%+1μA	0.2%+1μΑ	0.2%+1μA
RESPONSE TIME			1				
Transient Recovery Time	<40μS (within 100mV)	<40µS (within 100mV, R		<40μS(within 100mV,		<40μS(within 100mV, F	
(Response to 1000% Load Change)	<80μS(within 20mV)	<50μS(within 100mV,Front) <80μS(within 20mV)		<50μS (within 100mV,F	ront)	<50μS (within 100mV,Front)	
				<80μS(within 20mV)		<80μS(within 20mV)	
PROGRAMMING RESOLUT			T	T			
Voltage	2.5mV	2,5mV	2,5mV	2,5mV	2,5mV	2,5mV	2,5mV
Current (5A range)	1.25mA	1,25mA(5A)	1,25mA	1,25mA(5A)	1,25mA	1,25mA(5A)	1,25mA
Current (500mA range) Current (5mA range)		0.125mA 1,25μA	-	0.125mA 1,25μA	_	0.125mA 1,25μA	_
READBACK RESOLUTION		1,23μΑ		1,23µА		1,23μΑ	
Voltage	1mV	1mV	1mV	1mV	1mV	1mV	1mV
Current (5A range)	0.1mA	0.1mA(5A)	0.1mA(1.5A)	0.1mA(5A)	0.1mA(3A)	0.1mA(5A)	0.1mA(3A)
Current (500mA range)	7_	0.01mA	_	0.01mA		0.01mA	
Current (5mA range)	0.1μΑ	0.1μΑ	0.1μΑ	0.1μΑ	0.1μΑ	0.1μΑ	0.1μΑ
PROTECTION FUNCTION							
OVP Accuracy	50mV	Ch1: 0.8V	Ch2: 50mV	Ch1: 0.8V	Ch2: 50mV	Ch1: 0.8V	Ch2: 50mV
OVP Resolution	10mV	10mV	10mV	10mV	10mV	10mV	10mV
DVM							
DC Readback Accuracy (23°C ± 5°C)	±0.05%+3mV		±0.05%+3mV		±0.05%+3mV		±0.05%+3mV
Readbck Resolution Input Voltage Range	1mV 0 ~ 20VDC	_	1mV 0 ~ 20VDC	_	1mV 0 ~ 20VDC	_	1mV 0 ~ 20VDC
Maximum Input Voltage	<u>-</u>		-3V, +22V	20.77	-3V, +22V		-3V, +22V
Input Resistance and Capacitance	100000M Ω		20ΜΩ		20ΜΩ		20M Ω
PROGRAMMABLE OUTPUT	RESISTANCE						
Range		$0.001 \Omega \sim 1.000 \Omega$		0.001 Ω ~ 1.000 Ω		$0.001 \Omega \sim 1.000 \Omega$	
Programming Accuracy	_	$0.5\% + 10 \text{ m}\Omega$ $1\text{m}\Omega$	i -	0.5% + 10 m Ω 1m Ω	_	0.5% + 10 m Ω 1m Ω	_
Resolution		111177		111122		111177	
PULSE CURRENT MEASURE		F. A. FA F. A 65.	-	F. A. FA F. A/G.		F . A . F A . F . A . (5	
Trigger Level High Time/low Time/	5mA ~ 5A, 5mA/Step	5mA ~ 5A, 5mA/Step		5mA ~ 5A, 5mA/Step		5mA ~ 5A, 5mA/Step	
Average Time	33.3µs ~ 833ms, 33.3µs/Step	33.3μs ~ 833ms, 33.3μs/Step		33.3μs ~ 833ms, 33.3μs/Step		33.3μs – 833ms, 33.3μs/Step	
Trigger Delay	0 ~ 100ms,10μs/Steps	33.3μs/Step 0 ~ 100ms,10 μ s/Steps		0 ~ 100ms,10 μ s/Steps		0 ~ 100ms,10μs/Steps	
Average Readings	1 ~ 100	1 ~ 100		1 ~ 100		1 ~ 100	
Long Integration Pulse Time	15 ~ 635	1S ~ 63S		15 - 635		15 ~ 63S	
Long Integration Measurement Time	850ms(60Hz)/840ms(50Hz)~60s,or Auto time 16.7ms/Steps(60Hz),20ms/Steps(50Hz)	850ms(60Hz)/840ms(50Hz)~60s,or Auto time 16.7ms/Steps(60Hz),20ms/Steps(50Hz)		850ms(60Hz)/840ms(50Hz)~60s,or Auto time 16.7ms/Steps(60Hz),20ms/Steps(50Hz)		850ms(60Hz)/840ms(50Hz)~60s,or Auto ti 16.7ms/Steps(60Hz),20ms/Steps(50Hz)	
Long Integration Trigger Mode	Rising, Falling, Neither	Rising, Falling, Neither		Rising, Falling, Neithe	r steps(Junz)	Rising, Falling, Neither	(20112)
OTHERS							
Output Terminal	Front/Rear Panel	Front/Rear Panel	Rear Panel	Front/Rear Panel	Rear Panel	Front/Rear Panel	Rear Panel
DVM Input	Front/Rear Panel	_	Front Panel	_	Front Panel	_	Front Panel
Relay Control Connector	150mA/15V, 5V output, 100mA	150mA/15V, 5V output		150mA/15V, 5V outpu		150mA/15V, 5V output	
Operation Temperature	0 ~ 40°C	0 ~ 40°C	Control C	0 ~ 40°C	- (TT)	0 ~ 40°C	
Operation Humidity	< 80%	< 80%		< 80%		< 80%	
Storage Temperature	-20°C ~ 70°C	-20°C ~ 70°C		-20°C ~ 70°C		-20°C ~ 70°C	
Storage Humidity	< 80%	< 80%		< 80%		< 80%	
PC REMOTE INTERFACES							
	GPIB/USB/LAN	GPIB/USB/LAN		GPIB/USB/LAN		GPIB/USB/LAN	
Standard STANK CARACITY		d a a	do a mini	al 3 a	d o o =::	d 1 0	
CURRENT SINK CAPACITY			Ch2: 0-5V:2A;	Ch1:0-4V:3.5A;	Ch2:0-5V:3A; 5-12V:3A-(0.25A/V)	Ch1:0-4V:3.5A;	Ch2:0-5V:3A;
	2A(Vout≤5V); 2A.0.1*(Vout.5)	Ch1:0-4V:3.5A;		4~15V:3.5A-(0.25A/V)		4~15V:3.5A-(0.25A/V)	5~12V:3A-(0.25A/
CURRENT SINK CAPACITY	2A-0.1*(Vout-5)	4~15V:3.5A-(0.25A/V)		*(Vset-4V)	*(Vset-5V)	*(Vset-4V)	*(Vset-5V)
CURRENT SINK CAPACITY Sink Current Rating			512V:2A-(0.1A/V) *(Vset-5V)	*(Vset-4V)	*(Vset-5V)	*(Vset-4V)	*(Vset-5V)
CURRENT SINK CAPACITY	2A-0.1*(Vout-5)	4~15V:3.5A-(0.25A/V)		*(Vset-4V)	*(Vset-5V)	*(Vset-4V)  5 Sets	*(Vset-5V)
CURRENT SINK CAPACITY Sink Current Rating MEMORY Save/Recall	2A-0.1*(Vout-5) (Vout>5V)	4~15V:3.5A-(0.25A/V) *(Vset-4V)		, ,	*(Vset-5V)		*(Vset-5V)
CURRENT SINK CAPACITY Sink Current Rating MEMORY Save/Recall POWER	2A-0.1*(Vout-5) (Vout>5V) 5 Sets	415V:3.5A-(0.25A/V) *(Vset-4V) 5 Sets	*(Vset-5V)	5 Sets		5 Sets	
CURRENT SINK CAPACITY Sink Current Rating MEMORY Save/Recall	2A-0.1*(Vout-5) (Vout>5V)	4~15V:3.5A-(0.25A/V) *(Vset-4V)	*(Vset-5V)	, ,			

## Programmable High Precision DC Power Supply

#### FAST RESPONSE TO LOAD AND VOLTAGE CHANGES



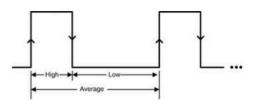


**PPH-Series** 

Conventional Power Supply

When DUT such as cellular phone switches to idling, receiving or transmitting mode, the current drawn from power supply changes over tenfold. The sudden current change will cause the supplied voltage to drop as well. The conventional power supply is considered a dull device since it will take several milliseconds for the dropped voltage to return to the original level. PPH-Series is designed to simulate battery response when a significant voltage drop occurs. Recovery time of 40 µs or less is guaranteed when the maximum voltage drop is within 100mV.

#### PULSE CURRENT MEASUREMENTS



**Pulse Current Measurement** 

PPH-Series DC power supply can perform current measurements for pulsing loads. To avoid false pulse detection, users can use a trigger level of up to 5A. All pulses, noise or other transients that are less than set trigger level will be ignored. The manual integration time range setting is 33 us to 833,333 us. Pulse current measurement can measure transient current consumption to provide the information for the allocation of power supply system for products' preliminary design, i.e. power supply circuits, battery selections for clients' product analyses. Portable communications products, i.e. RF modules and designs based upon blue tooth system can better use pulse current measurement function.

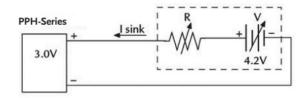
#### **BUILT-IN DIGITAL VOLTMETER**



#### **DVM Input for PPH-Series**

The built-in Digital Volt-Meter (DVM) of PPH-Series has a dedicated input terminal located on the front panel. With the DC voltage measurement range from 0 to +20VDC, PPH-Series not only provides power supply for DUT but also measures the voltage on DUT. The read back accuracy reaches ±(0.05%+3mV) and read back resolution is 1mV. Users are able to save the cost of purchasing an extra voltage meter. Furthermore, DVM measurements can be remotely controlled by SCPI commands via a PC.

#### SINK CURRENT FUNCTION



PPH-Series and an Electrical Potential Circuit

When connecting with an electric potential circuit and the output voltage of the tested electric potential circuit is greater than that of PPH-Series by approximately 0.3V to 2.5V, PPH-Series will automatically convert its power supply role to the sink current role acting as a load of voltage source. At this time, the voltage setting of PPH-Series can be regarded as the CV setting of an electronic load. A single PPH-Series can be used to charge battery and to simulate battery's load to consume power without extra instruments. PPH-Series is ideal for tests on battery and portable charger.

#### LONG INTEGRATION CURRENT MEASUREMENT



Long Integration Current Measurement

Long integration current measurement is to measure the average current of periodical pulse current in a long period of time. The measured pulse current must be a complete periodical waveform or multiple complete periodical waveforms. The total measurement time is up to 60 seconds. Measurements can be taken from pulse's positive edge trigger or negative edge trigger. Users can also take measurements from the beginning of power output. Long integration current measurement is to analyze power consumption for a period of time. For instance, users can measure the average power consumption of a cellular phone in use to analyze its internal RF module parameters.

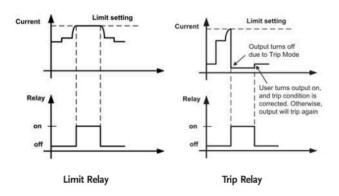
#### MEASUREMENTS FOR POWER CONSUMPTION ANALYSIS



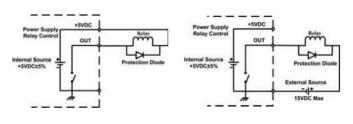
#### Voltage and Current Waveforms of the Receiving Signals of a Cellular Phone

One particular requirement of power consumption for portable wireless communications devices is Pulse Current. Portable devices such as cellular phones must transmit and receive (detect) signal periodically by drawing pulse current instead of constant current from battery to ensure devices' sound connection in network. To analyze the transient power consumption of a DUT, the peak of short pulse current and average current measurements over a long period of time are crucial. PPH-Series provides pulse current and long integration functions, the former can measure the peak value of a pulse, the latter can measure the average value of pulses. PPH-Series provides DUT with pulse current measurement and analyzes the transient power consumption to qualify the device for specified power consumption requirements.

#### G. EXTERNAL RELAY CONTROL



#### Relay Can be Driven by Using Internal +5V or External Power Source :



#### +5VDC Relay Output

Using the +5VDC relay output to drive an external relay. Ensure the current does not exceed 150mA.

#### **External Power Source**

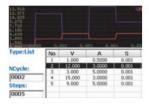
Using an external power source to drive the external relay. The voltage of the source can not exceed 15V and the current can not exceed 150mA.

PPH-Series provides Limit relay and Trip relay modes and is equipped with corresponding output ports, in which output signals control external relay. Under Limit relay mode and the current limit is reached, PPH-Series will switch from Constant Voltage to Constant Current automatically. Under "Trip relay" mode and the current limit is reached, PPH-Series will turn output off. Furthermore, External Relay control can be used if users simultaneously use other devices for test system. When "Limit Relay" mode is selected and the current limit is reached, External

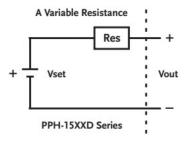
Relay control signal will go high and will return back to the low level when the current level goes back below the constant current setting. When "Trip Relay" mode is selected and the current limit is reached, the relay control signal will go high and the output is disabled. When the output goes back on and the current is less than the current setting, the relay control signal will back to the low level. Users can use relay control signal to control other devices for test system.

#### Н

#### SEQUENCE FUNCTION



BATTERY SIMULATION FUNCTION



**Battery Equivalent Model** 

#### **Functional Setting Page for Sequence Function**

For the practical usage, PPH-15xxD can be programmed to output a sequential voltage variation according to the requirements. There are 1000 steps for users to edit output voltage, current and execution time. Programmable execution time range is from 0.001 second to 3600 seconds and the resolution is 0.001 second. Programmable recurring frequency is from 1 to 9999 or it can be set to infinite execution (set recurring frequency to 0).

PPH-15xxD's battery simulation function is equivalent to a variable resistance circuit internally connected in series to simulate battery's output impedance. The function can also be regarded as a power supply with a variable internal resistor. The variable internal resistance range is from  $0.000\Omega$  to  $1.000\Omega$  and the resolution is  $1m\Omega$ . PPH-15xxD can be utilized as a battery or an ideal voltage source Vset to be connected with variable resistance Res in series. The following diagram shows battery simulation to produce output voltage Vout.

## Programmable High-precision DC Power Supply



#### **PPX-Series**



#### **FEATURES**

- \* CV, CC Priority Start Function
- \* Four Levels of Current Measurement Resolution (min. 0.1µA)/Two Levels of Voltage Measurement Resolution (min. 0.1mV)
- \* Power Output ON/OFF Delay Function
- \* Adjustable Voltage and Current Slew Rate
- \* Bleeder Circuit Control
- \* Delayed Over-current Protection(OCP Delay)
- \* Sequential Power Output Function
- \* Remote Sensing Function & Data Logger
- \* 10 Sets of Memory Function
- \* Over Voltage Protection, Under Voltage Limit, Over Current Protection, Over Temperature Protection, AC Alarm Function
- \* Supports K-Type Thermocouple Temperature Measurement
- \* Interfaces: USB, LAN, RS-232, RS-485, Analog Control; Opt: GPIB

The PPX-Series programmable high-precision DC power supplies include six models; PPX-1005 (10V/5A/50W), PPX-2002 (20V/2A/40W), PPX-2005 (20V/5A/100W)), PPX-3601 (36V/1A/36W), PPX-3603(36V/3A/108W), and PPX-10H01(100V/1A/100W). This series has the output low noise (0.35mVrms) and fast transient response characteristics (<50µs) of conventional linear power supplies. It also provides constant voltage and constant current priority output modes, and the series can also set the voltage and current rising/falling slew rates separately, and the delay time for the output to be turned on and off.

The PPX-Series has four current levels and two voltage levels to provide users with high-precision measurements, and via the Data Logger function, the measurement records can be stored in the USB for long-term measurement and recording of IoT devices, portable devices, wearable devices, and sensor components.

In order to extend the use time of portable devices and wearable devices, manufacturers are not only committed to improving the operating efficiency of the circuit, but also reducing standby power consumption as much as possible. In order to satisfy users' low-power measurement applications, GW Instek has launched the PPX-Series with current measurement resolutions (0.1µA, 1µA, 10µA, 0.1mA) and voltage measurement resolutions (0.1mV, 1mV) to provide power for portable devices and wearable devices. When the device enters the sleep mode or the standby mode, the PPX series can still measure the subtle current changes of the DUT.

The PPX-Sseries provides the Test Sequence function, which allows users to arbitrarily define output waveforms. The voltage rising or falling time and the voltage maintenance time of each step can be set. For the operation, users can directly edit parameters on the front panel of the PPX-Series, or the CSV file can be edited via computer and imported into the PPX-Series, and the PPX-Series can be remotely edited. In addition, the OCP Delay function of the PPX-Series allows users to flexibly adjust the time to enable the over-current protection according to the characteristics of the DUT to protect the DUT and at the same time to test the current change of the DUT within a certain period of time.

Other than voltage, current, and power measurement, the PPX-Series also supports temperature measurement. While collocating with a K Type Thermocouple, the temperature range can be measured from -200°C ~ +1372°C. Supported standard communication interfaces include USB, LAN, RS-232, RS-485 and optional GPIB interface.





**PPX-Series** 



	le	PPX-1005	PPX-2002	PPX-2005	PPX-3601	PPX-3603	PPX-10H01
Output Voltage Output Current Output Power CONSTANT VO Line Regulation Load Regulation Transient Respon Ripple Noise(Vrn Rise Time" Ra	le						
Output Current Output Power CONSTANT VO Line Regulation Load Regulation Transient Respoor Ripple Noise(Vrn Rise Time** Ra							
Output Power  CONSTANT VO  Line Regulation Load Regulation Transient Respon Ripple Noise(Vrn Rise Time" Ra		10.000V	20.000V	20.000V	36.000V	36.000V	100.00V
Line Regulation Load Regulation Transient Respon Ripple Noise(Vrn Rise Time" Ra		5.0000A 50W	2.0000A 40W	5.0000A 100W	1.0000A 36W	3.0000A 108W	1.0000A 100W
Line Regulation Load Regulation Transient Respon Ripple Noise(Vrn Rise Time" Ra	ITACE ODERATION		1011	10011	30₩	100 W	100₩
Load Regulation Transient Respon Ripple Noise(Vrn Rise Time" Ra	LIAGE OPERATION						
Transient Respon Ripple Noise(Vrn Rise Time" Ra		±(0.01% of setting+1mV)	±(0.01% of setting+1mV)	±(0.01% of setting+1mV)	±(0.01% of setting+3mV)	±(0.01% of setting+3mV)	±(0.01% of setting+7mV)
Ripple Noise(Vrn Rise Time Ra		±(0.01% of setting+2mV) <50μs	±(0.01% of setting+2mV) <50μs	±(0.01% of setting+3mV) <50μs	±(0.01% of setting+3mV) <50μs	±(0.01% of setting+4mV) <50μs	±(0.01% of setting+7mV) <100μs
Rise Time" Ra	2000 2000 1000	0.35mVrms/<6mVpp	0.5mVrms/<8mVpp	0.5mVrms/<8mVpp	0.8mVrms/<10mVpp	0.8mVrms/<10mVpp	1.2mVrms/<15mVpp
	ted load	20ms	50ms	50ms	50ms	50ms	100ms
	load	20ms	50ms	50ms	50ms	50ms	100ms
	ted load	10ms	20ms	20ms	20ms	20ms	50ms
	load	100ms	150ms	150ms	150ms	150ms	250ms
Setting Range (10		0V 10.5V	0V - 21.0V	0V - 21.0V	0V - 37.8V	0V - 37.8V	0V 105.0V
Setting Resolutio Setting Accuracy		1mV	1mV	1mV	1mV	1mV	10mV
	pensation Voltage(single line)	±(0.03% of setting+3mV)	±(0.03% of setting+5mV)	±(0.03% of setting+5mV)	±(0.03% of setting+8mV)	±(0.03% of setting+8mV)	±(0.03% of setting+20m 3V
Temperature Coe		100 ppm/°C	100 ppm/°C	100 ppm/°C	100 ppm/°C	100 ppm/°C	100 ppm/°C
•	, ,		100 ppiniy C	тоо ррпп/ С	тоо ррппу с	тоо ррппу с	тоо ррппу с
	RRENT OPERATIO	V - ( V - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 -	(0.000/ 5 200 4)	10 000/ C 050 A)	(0.000/ 5 70 4)	10.000/ C 350 A)	10.000/ C 50.41
Line Regulation		±(0.02% of setting+250μA)	±(0.02% of setting+100μA) ±(0.02% of setting+100μA)	±(0.02% of setting+250μA) ±(0.02% of setting+250μA)	±(0.02% of setting+50μA) ±(0.02% of setting+50μA)	± (0.02% of setting+150μA)	±(0.02% of setting+50μA)
Load Regulation Ripple Noise(Arn	ne*2\	±(0.02% of setting+250μA) 2mA	±(0.02% of setting+100μA)	±(0.02% of setting+250μA) 2mA	±(0.02% of setting+50μA) 400μA	±(0.02% of setting+150μA) 1mA	±(0.02% of setting+50μA
Setting Range (10		0A - 5.25A	0A - 2.1A	0A - 5.25A	0A – 1.05A	0A - 3.15A	0A 1.05A
Setting Resolutio		0.1mA	0.1mA	0.1mA	0.1mA	0.1mA	0.1mA
Setting Accuracy	1 1437 N. S.	±(0.05% of setting+3.0mA)	±(0.05% of setting+1.0mA)	±(0.05% of setting+3.0mA)	±(0.05% of setting+0.5mA)	±(0.05% of setting+1.5mA)	±(0.05% of setting+1.0mA
Temperature Coe		200 ppm/°C	200 ppm/°C	200 ppm/°C	200 ppm/°C	200 ppm/°C	200 ppm/°C
MEASUREMEN'	T AND DISPLAY		· · · · · · · · · · · · · · · · · · ·				
Voltage Range F	4	10.000V	20.000V	20.000V	36.000V	36.000V	100.00V
L	0	1.0000V	2.0000V	2.0000V	3.6000V	3.6000V	10.000V
Current Range F	355	5.0000A	2.0000A	5.0000A	1.0000A	3.0000A	1.0000A
N		500.00mA	200.00mA	500.00mA	100.00mA	300.00mA	100.00mA
ŀ		50.000mA 5.0000mA	20.000mA 2.0000mA	50.000mA 5.0000mA	10.000mA 1.0000mA	30.000mA 3.0000mA	10.000mA 1.0000mA
	/oltage(H)	1mV	1mV	1mV	1mV	1mV	10mV
	Voltage(L)	0.1mV	0.1mV	0.1mV	0.1mV	0.1mV	1mV
	Current(H)	0.1mA	0.1mA	0.1mA	0.1mA	0.1mA	0.1mA
	Current(M)	0.01mA	0.01mA	0.01mA	0.01mA	0.01mA	0.01mA
	Current(L)	0.001 mA	0.001mA	0.001mA	0.001mA	0.001mA	0.001mA
	Current(LL)	0.0001mA	0.0001mA	0.0001mA	0.0001mA	0.0001mA	0.0001mA
	/oltage(H/L)	±(0.03% of rdg + 2mV)	±(0.03% of rdg + 4mV)	±(0.03% of rdg + 5mV)	±(0.03% of rdg + 6mV)	±(0.03% of rdg + 8mV)	±(0.03% of rdg + 15mV)
하는 사이 등이 아이들에 살아왔다.	Temperature Coefficient*(TYP.)	100 ppm/°C ±(0.05% of rdg + 2.5mA)	100 ppm/°C ±(0.05% of rdg + 1.0mA)	100 ppm/°C ±(0.05% of rdg + 2.5mA)	100 ppm/°C ±(0.05% of rdg + 0.4mA)	100 ppm/°C	100 ppm/°C
	Current(H/M) Current(L/LL)	±(0.03% of rdg + 2.5mA) ±(0.1% of rdg + 40μA)	±(0.1% of rdg + 24μA)	±(0.03% of rdg + 2.5mA) ±(0.1% of rdg + 40μA)	±(0.1% of rdg + 16μA)	±(0.05% of rdg + 1.2mA) ±(0.1% of rdg + 28μA)	$\pm$ (0.05% of rdg + 1.0mA) $\pm$ (0.1% of rdg + 24 $\mu$ A)
	Temperature Coefficient (TYP.)	200 ppm/°C	200 ppm/°C	200 ppm/°C	200 ppm/°C	200 ppm/°C	200 ppm/°C
TEMPERATURE N		200 ppini/ C	200 ppini, C	200 ppin/ C	200 ppin/ C	200 ppm/ C	200 ppin/ C
		-200°C+1372°C					
Temperature (K-Type Thermoc	Range ouple) Resolution	0.25°C					
(K-1)pe Thermoci	Accuracy	±(0.5% + 2°C)					
PROTECTION							
Over Voltage	Operation	Turns the output off, displays	OVP and lights ALARM				
Protection(OVP)	Setting Range	0.5V - 11.0V	1.0V - 22.0V	1.0V ~ 22.0V	1.8V ~ 39.6V	1.8V ~ 39.6V	5.0V - 110.0V
		(5% to 110% of the rated ou	tput voltage)				
	Setting Accuracy	±(1% of rating)					
Over Current	Operation	Turns the output off, displays		10		4	1 200,000,000,000
Protection(OCP)	Setting Range	0.25A ~ 5.5A	0.1A - 2.2A	0.25A - 5.5A	0.05A 1.1A	0.15A - 3.3A	0.05A - 1.1A
	Setting Accuracy	(5% to 110% of the rated our ±(1% of rating)	tput current)				
Over Temperature		Turns the output off, displays	OTP and lights ALARM				
Protection(OTP)							
OTHER							
Interface Capabi	lities LAN	MAC Address, DNS IP Addre	ess, User Password, Gateway I	P Address, Instrument IP Add	ress, Subnet Mask		
.per 2005-19 1 - 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	USB	Type A: Host, Type B: Slave,		the state of the s			
	RS-232/RS-485		2/RS-485 specifications (exclu				
Nominal Input Vo Input Frequency I		100Vac / 120Vac / 220Vac / 2 47Hz – 63Hz	40Vac(±10%), 50Hz / 60Hz, s	ingle phase			
Max. Inrush Curre		25Amax	20Amax	30Amax	35Amax	40Amax	30Amax
Max. Power Consu	2000	200VA	150VA	300VA	150VA	300VA	300VA
		0°C - 40°C					
Operaing Temper		-20°C 70°C 20% 80% RH; No condens	ation				
Storage Temperatu	ity	20% – 85% RH; No condens 20% – 85% RH; No condens					

NOTE: \*1. Time for output voltage to recover within ±(0.1% + 10mV) of its rated output for a load change from 50% to 100% of its rated output current

\*2. Measurement frequency bandwidth is 5 Hz to 1 MHz

\*3. Measurement frequency bandwidth is 10 Hz to 20 MHz

\*4. From 10%–90% of rated output voltage, with rated resistive load

\*5. From 90%–10% of rated output voltage, with rated resistive load

\*6. Temperature coefficient: after a 30 minute warm-up

\*7. Before connecting the power plug to an AC line outlet, make sure the voltage selector switches of the bottom panel in the correct position.It might be damaged the instrument by connecting to the wrong AC line voltage

# **Programmable High-precision DC Power Supply**

#### Rear Panel



## GRA-441-J/E Rack Mount Kit(JIS/EIA)



#### ORDERING INFORMATION

PPX-1005 10V/5A/50W Programmable High-precision DC Power Supply
PPX-2002 20V/2A/40W Programmable High-precision DC Power Supply
PPX-2005 20V/5A/100W Programmable High-precision DC Power Supply
PPX-3601 36V/1A/36W Programmable High-precision DC Power Supply
PPX-3603 36V/3A/108W Programmable High-precision DC Power Supply
PPX-10H01 100V/1A/100W Programmable High-precision DC Power Supply

#### **ACCESSORIES**

Power Cord, Test Lead (GTL-104A for PPX-1005/PPX-2005/PPX-3603, 1m, 10A) (GTL-105A for PPX-2002/PPX-3601, 1m, 3A) (GTL-204A for PPX-1005/PPX-2005/PPX-3603<br/>
Terminal>, 1m, 10A) (GTL-203A for PPX-2002/PPX-3601/PPX-10H01<br/>
European Type Jack Terminal>, 1m, 3A) (GTL-201A, Ground lead for European Type Jack Terminal)

#### **OPTIONAL ACCESSORIES**

GTL-246 USB Cable (USB 2.0 Type A-Type B Cable,4)
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GTL-205A Temperature probe adapter (thermal coupling, K-Type), about 1000mm

GTL-258 GPIB Cable, 2000mm

GTL-259 RS-232 Cable with DB9 connector to RJ45
GTL-260 RS-485 Cable with DB9 connector to RJ45
GTL-261 Serial Master Cable+Terminator, 0.5M

GTL-262 RS-485 Slave cable
GRA-441-J Rack for PPX-Series (JIS)
GRA-441-E Rack for PPX-Series (EIA)
PPX-G GPIB Interface (factory installed)

## A. DISPLAY MODE



Voltage and Current



Voltage, Current and Wattage



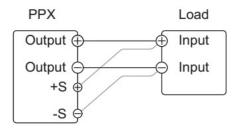
Voltage, Current and Sequence Test



Voltage, Current and Temperature Measurement

which are convenient for users to switch to different display modes according to test requirements.

## B. REMOTE SENSING



#### REMOTE SENSING CONNECTION DIAGRAM

The Remote Sensing function can be used to compensate for the voltage drop caused by the resistance on the test connection lead from the power output to the load. PPX-1005/2002/2005/3601/3603 compensates for voltages up to 1 volt, and PPX-10H01 compensates

The PPX-Series has four display modes, namely 1) voltage and

current 2) voltage, current and wattage 3) voltage, current and Sequence Test 4)voltage, current and temperature measurement,

for voltages up to 3 volts. When testing, choose a test connection lead with a voltage drop less than the compensation voltage of the PPX series as much as possible.



Blue: Temperature Control on with no GTL-205A Connected



White: Temperature Control on with GTL-205A Connected

The PPX-Series can measure DUT temperature while outputting power. Before measuring the temperature, please use the optional accessory GTL-205A (temperature probe adapter with K-type thermocouple) to connect the DUT and TC input terminals on the front panel of the PPX-Series respectively. During the measurement process, users can set the monitoring



Green: Output Safe is Activated and Output is on with GTL-205A Connected



Red: The Alarm of Short Circuit Occurs From Temperature Measurement

temperature for the DUT. Once the measurement temperature reaches the monitoring temperature value, the PPX-Series will stop the output. The PPX-Series can measure the temperature range of -200.0 $^{\circ}$ C ~1372.0 $^{\circ}$ C (-328.0 $^{\circ}$ F ~2501.6 $^{\circ}$ F). Users can choose the display unit as °C or °F according to the requirement.

## D. DATA LOGGER



**Appears** 

Dlog Icon



Save Data Log Into USB Disk

The PPX-Series can record the measured voltage, current and temperature data to a USB flash drive or can be remotely controlled to read the data. Data sampling interval is 0.1~999.9 seconds.

## E. SEQUENCE TEST

**Data Logger Function** 



SEQ Run in Cycle Mode

The Sequence Test function allows users to plan the PPX-Series to execute a sequential power output. The PPX-Series will automatically execute the planned power output to the DUT to realize automated measurement. The PPX-Series can store



SEQ Stop in Cycle Mode

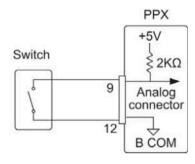
# Model R\_V Slew Rate/ F\_V Slew Rate Setting Range PPX-1005 0.0001V/ms ~ 0.1V/ms PPX-2002 0.0001V/ms ~ 0.2V/ms PPX-2005 0.0001V/ms ~ 0.2V/ms PPX-3601 0.0001V/ms ~ 0.36V/ms PPX-3603 0.0001V/ms ~ 0.5V/ms PPX-10H01 0.001V/ms ~ 0.5V/ms

## Voltage Rising/Falling Slew Rate

The PPX-Series can adjust the slew rate of current and voltage. Via setting the rising and falling time of voltage and current, users can verify the performance of the DUT during the voltage/current changes. In addition, the adjustment of the slew

rate slows down the voltage transfer, which can effectively avoid the damage of the inrush current to the DUT, therefore, the series is especially suitable for the testing of capacitive loads and motors.

## G. ANALOG REMOTE CONTROL

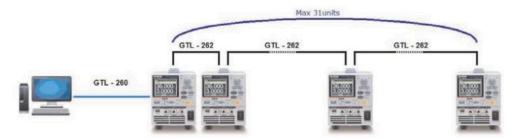


**External Control of Output** 

The PPX-Series supports the analog control function, including external voltage to control voltage output/current output, external resistance to control voltage output/current output, external

control of power output, trigger input/trigger output, and voltage/current monitoring.

## H. MULTIPLE UNIT CONNECTION



## Multiple Unit Connection

The PPX series can connect up to 31 units. The PC is connected to the first unit of PPX through GTL-260, and the remaining PPX units are connected in a daisy-chained method via GTL-262. When using PPX-Series Multiple Unit Connection for remote program

control and slave expansion, there is no need to use other remote control equipment (E.g. switch/Hub), which can help users save equipment purchase costs.

# Triple-channel Programmable DC Power Supply



## GPP-3060/6030/3650





#### **FEATURES**

- \* 4.3"TFT LCD Display
- \* Setting Resolution: 1mV/0.1mA; Read Back Resolution: 0.1mV/0.1mA
- \* Low Ripple Noise: ≦1mVrms/≦2mArms
- \* Transient Response Time: ≦100µs
- Load Function (CC, CV, CR mode)
- \* Tracking Series and Parallel Function without Additional External Wiring
- \* Utilizing Hardware to Realize Over Voltage Protection/Over Current Protection/Over Temperature Protection
- \* Delay Function/Output Monitoring Function/ **Output Recorder Function**
- \* Supports Setting Value, Measurement Value and Output Waveform Display
- \* Sequential Output Function and Built-in **8 Template Waveforms**
- \* The Output Recorder Function Records the Output Voltage & Current Parameters with a Minimum Recording Interval of 1 Second
- \* Provides 10 Sets of Memory for Each Sequence/Delay/Recorder/Panel Setting Condition
- \* GPP-3060/6030 Supports a USB (Type A) **Output Terminal**
- \* Intelligent Temperature Control Fan Effectively Reduces Noise
- \* Standard: RS-232, USB, Ext I/O Optional (manufacturer installed only): LAN, LAN+GPIB

GPP-3060 and GPP-6030 triple-channel programmable DC power supplies are extension models of the GPP-X323 series. The maximum output power of these three models is 385W. GPP-3650 supports CH1/CH2: 0 ~ 36V / 0 ~5A output; CH3 supports 1.8V, 2.5V, 3.3V, 5.0V / 5A. GPP-3060 supports CH1/CH2: 0 ~ 30V / 0 ~ 6A output; GPP-6030 supports CH1/CH2: 0 ~ 60V / 0 ~ 3A output; CH3 of both models supports 1.8V, 2.5V, 3.3V, 5.0V/5A.

GPP-3650, GPP-3060 and GPP-6030 inherit the high program resolution (1mV/0.1mA) and read back resolution (0.1mV/0.1mA) of the GPP series with low-ripple noise characteristics ≤1mVrms/≤ 2mArms and ≦100µs output transient recovery ability. An independent output on-off switch is provided for each channel.

For series and parallel applications of CH1 and CH2, the tracking function can automatically switch to series or parallel output without additional external wiring. Multiple display modes including single channel or multi-channel setting value, measurement value and waveform display to collocate with the built-in output monitoring function allow users to set the monitoring conditions according to their needs so as to generate an alarm or stop the output during the measurement process in order to stop the measurement and protect the customer's DUT. The output recorder function can record the voltage/current of the output process in the internal memory, and save the result as a (\*.REC) or (\*.CSV) file, and then save it to a USB flash drive. The unique load function of the GPP series can arbitrarily set CH1/CH2 as power supply or load function. For example, one channel is set as power output, and the other channel is set as load function to consume the power of the DUT to satisfy simple battery charging and discharging or load characteristic test by a single power supply. The sequence output function allows users to edit the power output waveforms by themselves, and also allows users to set the sequential constant voltage (CV) or constant current (CC) load waveforms such as serial power output or dynamic load simulation test. Channel 3 (CH3) incorporates 3A USB (Type A) output terminal, which can be used for USB charging test.

Pertaining to measurement protections, OVP/OCP/OPP/OTP protection functions are provided. The protection mechanism of OVP/OCP/OTP is implemented by hardware circuits, which has a faster response time to protect equipment or DUT while comparing with competitors who use software for protection. The OVP and OCP functions allow users to set the protection action point according to the conditions of the DUT. OPP only provides protection during the operation of the load function.

In addition, GPP-3650, GPP-3060 and GPP-6030 incorporate terminal output on the rear panel, and include a voltage remote sensing terminal. Users can choose front panel or rear panel terminal output, which is convenient for stand-alone or rack operation. Output value setting and Sequence/ The Delay/Recorder functions provide 10 sets of internal memory, which can be uploaded/stored by a USB flash drive.



## GPP-6030

## GRA-449-J Rack Mount Kit (JIS)



## GRA-449-E Rack Mount Kit (EIA)



## Rear Panel

## **European Type Jack Terminal**



# **Triple-channel Programmable DC Power Supply**

SPECIFI	CATIONS									
31 ECII I	CAITONS	GPP-30	GPP-3060 GPP-6030						0	
Output Mode			5				GPP-3650			
Number of Channe	1	CH1 CH2	CH3	CH1	CH2	CH3	CH1	CH2	CH3	
Voltage		0 ~ 30.000V 0 ~ 30.000V	1.8V/2.5V/3.3V/5.0V,±5%	0 ~ 60.000V	0 ~ 60.000V	1.8V/2.5V/3.3V/5.0V,±5%	0 ~ 36.000V	0 ~ 36.000V	1.8V/2.5V/3.3V/5.0V,±5%	
Current		0 ~ 6.0000A 0 ~ 6.0000A	5A (USB Port 3A)	0 ~ 3.0000A	0 ~ 3.0000A	5A (USB Port 3A)	0 ~ 5.0000A	0 ~ 5.0000A	5A (USB Port 3A)	
Tracking Series Vol	tage / Current	0 - 60.000V / 0 - 6.0000A		0 - 120.000V	/ 0 ~ 3.0000A			/ 0 - 5.0000A		
Tracking Parallel Vo	oltage / Current	0 ~ 30.000V / 0 ~ 12.0000A		0 ~ 60.000V /	0 ~ 6.0000A	-	0 ~ 36.000V /	0~10.0000A		
Warning		0 ~ 30.0007 / 0 ~ 12.00000								
Constant Voltage C	peration									
Line Regulation		≤ 0.01% + 3mV	≤ 3mV	≤ 0.01%	+ 3mV	≤ 3mV	≤ 0.01%	6 + 3mV	≤ 3mV	
Load regulation		≤ 0.01% + 5mV (rating current ≤ 10A	≤ 5mV	≤ 0.01% + 5mV (rat	ting current ≤ 10A)	≤ 5mV	≤ 0.01% + 5mV (ra	ating current ≤ 10A)	≤ 5mV	
Ripple & noise (5H:	z-1MHz)	≤1mVrms	≤ 2mVrms	≤1m\		≤ 2mVrms		Vrms	≤ 2mVrms	
E-84 975,595	205				≤100µs					
Transient recovery	time	7		(50% lc	oad change · minin	num load 0.5A)				
Temperature coeffic	cient			(0.000	≤ 300ppm/°(					
Constant Current C					_ = = = = = = = = = = = = = = = = = = =	· .				
Line Regulation	perunon	I.			≤ 0.01% + 3m	nA.				
Load regulation		5			≤ 0.01% + 3m					
Ripple & noise		>			≤ 2mArms					
Resolution					_22111111113					
	Voltage	1mV		2m	ıV.		2r	mV		
Programming	Current	0.2mA	1	0.1		†	0.1			
	Voltage	0.1mV	1 :	0.11		- 25 2	0.1		· ·	
Reedback	Current	0.1mA	1	0.1		Ť		mA		
Tracking Operation			6							
		≤ 0.1% +10mV of Master		≤ 0.2% +20m	nV of Master		≤ 0.1% +10r	mV of Master		
Tracking error		(No Load, with load add load	1	(No Load, with		1		h load add load		
	8 95 - E	regulation ≤200mV)	_	regulation	≤200mV)	1	regulation	n ≤200mV)		
X-2-2-2-2-2-2-2-2-2-2-2-2-2-2-2-2-2-2-2	Line	≤ 0.01% + 3mV		≤ 0.01%	+ 3mV	I		6 + 3mV		
Parallel regulation	Lood	≤ 0.01% + 5mV (rating current ≤ 10A		≤ 0.01% + 5mV (rat	ting current ≤ 10A)		≤ 0.01% + 5mV (ra	ating current ≤ 10A)		
	Load	≤ 0.02% + 5mV (rating current > 10A			ting current > 10A)	Ī		ating current > 10A)		
entra a tat	Line	≤ 0.01% + 5mV	1	≤ 0.01%		†		6 + 5mV		
Series regulation	Load	≤ 200mV	1	≤ 200		†		00mV		
Ripple & noise		≤2mVrms(5Hz-1MHz)	1	≤2mVrms(5	Hz-1MHz)			5Hz-1MHz)		
Note				Tracking	g is not supported i	n LOAD mode.	1 272-637 60 507	and one of	70	
Meter										
Full Scale	Voltage	32.0000V	1.8V/2.5V/3.3V/5.0V	62.00		1.8V/2.5V/3.3V/5.0V		V000V	1.8V/2.5V/3.3V/5.0V	
The second secon	Current	6.2000A	4	3.20		1		000A		
Programming	Voltage	5 digits	4	5 di		1		igits		
Resolution	Current	5 digits	4	5 di		1		igits		
Reedback	Voltage	6 digits	-	6 di		1		igits		
Resolution	Current	5 digits		5 di				igits	b 5	
Setting accuracy	Voltage	± (0.03% of reading + 10mV)	4	± (0.03% of rea		1		rading + 10mV)		
	Current	± (0.3% of reading + 10mA)	-	± (0.3% of rea		1		ading + 10mA)		
Readback accuracy	Voltage Current	± (0.03% of reading + 10mV) ± (0.3% of reading + 10mA)	+	± (0.03% of rea ± (0.3% of rea		+		ading + 10mV) ading + 10mA)		
DC Load Mode	Carrent	I (0.570 of reading 1 form)		2 (0.570 0) 100	ung i runny		2 (0.570 01100	iding i roming		
	Voltage	1 ~ 32.00V		1 - 62	2.00V		1 ~ 36	5.5.00V		
Display	Current	0 ~ 6.200A		0 ~ 3.		Ī		.200A		
- 10	Power	0 ~ 50.00W		0 ~ 50			0 ~ 50			
	CH1/CH2	1.500V - 32.00V		1.500V -		I		- 36.50V		
CV Mode	Setting Accuracy	≤±(0.1% + 30mV)		≤±(0.1%				+ 30mV)		
	Reedback Accuracy	≤±(0.1% + 30mV)		≤±(0.1%				+ 30mV)		
4	Resoltion	10mV	_	10r		1		lmV		
6.5	CH1/CH2	0 ~ 6.200A	-	0 ~ 3.		1		.200A		
CC Mode	Setting Accuracy	≤±(0.3% + 10mA)		≤±(0.3%				+ 10mA)		
	Reedback Accuracy	≤±(0.3% + 10mA)	-	≤±(0.3%		1		+ 10mA)		
2	Resoltion CH1/CH2	1mA 1Ω- 1kΩ	-	1m 1Ω-		-		mA 1kΩ		
20	CHI/CHZ	≤±(3% + 1Ω)	+	<±(3%		+		6 + 1Ω)		
	Setting Accuracy	(voltage≥0.1V, and current≥0.1A)	1	≤±(376 (voltage≥0.1V, ar	- /	t		nd current≥0.1A)		
CR Mode	27 % 589	(voltage≥0.1V, and current≥0.1A) ≤±(3% + 1Ω)	-	(voitage≥0.1v, ar ≤±(3%		+		ina current≥0.1A) 6 + 1Ω)		
	Reedback Accuracy	(voltage≥0.1V, and current≥0.1A)	1	(voltage≥0.1V, ar		†		nd current≥0.1A)		
	Resoltion	1Ω	1	(voitage_o.rv, ar		1		Ω		
Protection			+			·	·			
7 3	Power Mode	OFF,ON(0.5V-35.0V)	Fixed 5.5V	OFF,ON(0		Fixed 5.5V		0.5V-38.0V)	Fixed 5.5V	
OVP	Load Mode	OFF,ON(1.5V-35.0V)		OFF,ON(1	.5V-65.0V)		OFF,ON(1	1.5V-38.0V)		
	Setting Accuracy	72 72 72	70		±100mV		n	24	%	
	Resoltion	OFF ON (DOFA C FOA)	2.14(1)(0.0)	OFF ONLY	100mV	2 14/1100	OFF OFF	UEV E EUV?	2 14 (1100)	
2000	Power Mode Load Mode	OFF,ON(0.05A-6.50A) OFF,ON(0.05A-6.50A)	3.1A(USB port)	OFF,ON(0.		3.1A(USB port)		.05A-5.50A) .05A-5.50A)	3.1A(USB port)	
OCP	Setting Accuracy	±20mA	<u> </u>	JFF,014(0.	varta.avrtj		JFF,014(0	(JJA-J.JUA)		
	Resoltion	10mA								
	Between chassis	*** 1.7000.0.400.000								
Insulation	and terminal	20MΩ or above (DC 500V)								
resistance	Between chassis	20MO or about (DC 500M								
NO. OF STREET	and DC power cord	30MΩ or above (DC 500V)								
General										
		Indoor use, Altitude: ≤ 2000m								
Operation Environr	ment	Ambient temperature: 0 ~ 40°C								
-p		Relative humidity: ≤ 80%	dagran: 2							
7.50		Installation category: II / Pollution TEMPERATURE: -10°C ~ 70°C	r degree: Z							
Storage Environme	nt									
Power Iron		HUMIDITY: ≤70% AC 100V/120V/220V/230V±10%, 5	0/60H-							
Power Input Power Consumptio	n	900VA, 680W	OLOGIC							
. oner consumptio		CD User manual x1, Quick Start m	anual x1. Power Code x1							
Accessories		Test lead: GTL-104A x 3								
1.2		(Europe) Test lead: GTL-204A x 3,	GTL-201A x1							
Dimensions		213 (W) x 145 (H) x 362 (D) mm								
Weight	₹	Approx. 10kg								
		·							3736	

## ORDERING INFORMATION

**GPP-3060** 385W Triple-channel Programmable DC Power Supply **GPP-6030** 385W Triple-channel Programmable DC Power Supply

GPP-3650 385W Triple-channel Programmable DC Power Supply

ACCESSORIES

Power cord, test lead: GTL-104A x 3, European test leads: GTL-204A x 3, GTL-201A x 1

OPTIONAL ACCESSORIES

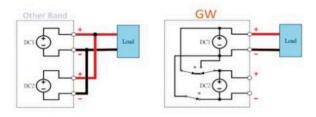
GTL-246 USB Cable GRA-449-E Rack Mount Kit (EIA) GRA-449-J Rack Mount Kit (JIS)

INTERFACE

Standard: RS-232, USB, Ext I/O, Optional (manufacturer installed only): LAN, GPIB+LAN

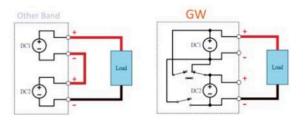
NOTE: Contact local sales if you have issues with Interface purchase.

## A. TRACKING SERIES AND PARALLEL FUNCTION



## **Output in Parallel Connections**

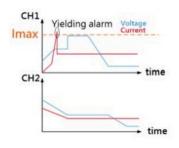
For series and parallel applications of CH1 and CH2, the tracking function of the GPP-Series utilizes the internal circuit to automatically switch the output to serial or parallel output without additional external wiring, providing users with convenience not only in operating procedures but also a more stable output.



#### **Output in Series Connections**

The tracking function design of other brands requires additional external wiring connections for the output in series or parallel. However, excessively long, thin or inconsistent external wiring may cause inaccurate voltage or current output.

## B. OUTPUT MONITORING FUNCTION



**Output Monitoring** 

The output monitoring function allows users to set the monitoring conditions according to the requirements, including the voltage, current, and power greater than or less than the setting and the logical relationship of AND, OR. It also allows users to sound

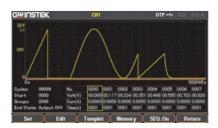


**Monitoring Function Setting** 

alarms or stop the output during the measurement process, stop the measurement, and protect the customer's DUT. Both Channel could be monitored simultaneously as well.

\* Channel 3 does not support the output monitoring function.

## C. SEQUENCE OUTPUT FUNCTION



Output Waveform of the GPP-6030/3060

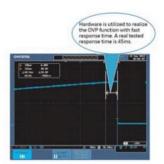
The GPP-Series provides a sequential output function on Channel 1 and Channel 2. This function not only allows users to edit the power output waveform, but also allows users to set the sequential constant voltage (CV) or constant current (CC) load waveform, i.e. a serial power output or a simulation test of a dynamic load. The maximum settable points for sequence function are 2048, and interval range of each point can be set from 1 to 300 seconds. In order to simplify the setting of waveform editing, the GPP-Series has 8 built-in Templet waveforms in sequence output function for

users to directly apply for output, including Sine, Pulse, Ramp, Stair Up, Stair Dn, Stair UpDn, Exp Rise, and Exp Fall waveforms.

The editing data of the sequence output can be stored in the internal 10 sets of the memory, or to be saved by USB flash drive (Save/Recall) and saved as \*.SEQ or \*.CSV file; The stored \*.CSV can be exported into Excel for editing and analysis. The final edited file can be imported to (Save/Recall) of the power supply using a USB flash drive.

# Triple-channel Programmable DC Power Supply

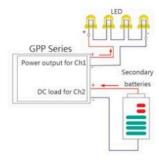
## D. HARDWARE PROTECTION FUNCTION(OVP/OCP/OTP)



**OVP Trigger** 

The protection mechanism of OVP/OCP/OTP is implemented by hardware circuit, which has the advantage of faster response time than competitors who use software to achieve protection. When it is detected that the voltage of the DUT exceeds the setting value of the OVP, the output of the power supply can be stopped in a short time to achieve the purpose of protecting the DUT.

## E. LOAD FUNCTION



GPP-Series Application

The CH1/CH2 of the GPP series is designed with the load function. A single power supply can meet the basic battery charging and discharging test requirements. It can provide power output in channel 1 and channel 2. The rated constant voltage load (CV), rated constant current load (CC) and maximum  $1k\Omega$  constant resistance load (CR) function are built-in to allow users to conduct discharging test without using an electronic load. In application, users can also set either that one channel of the single GPP series as the power output, one channel as the load function to consume the power of the DUT, or that both channels as load functions to consume the power of different loads simultaneously.

## F. OUTPUT DELAY FUNCTION

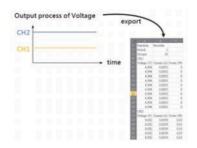


**GPP-Series Delayed Waveform** 

Output delay function allows users to edit the timing waveform of the power output on/off when the front panel voltage and current settings are unchanged. In order to simplify the setting of waveform editing, the GPP-Series has three built-in timing modes in the delay output function, including Fixtime, Increase, Decline for users to apply directly. The editing data of the output delay can be stored in

the internal 10 sets of memory, or to be saved by USB flash drive (Save/Recall) and saved as \*.DLY or \*.CSV file. The stored \*.CSV can be exported into Excel for editing and analysis. The final edited file can be exported to (Save/Recall) of the power supply using a USB flash drive.

#### G. OUTPUT RECORDER FUNCTION



GWINSTEK ON BIC OTP === EM BIN 
Recorder : On REC Channels : OH O'R
REC Pariol : OH s
REC Groups : 002148
REC Pariol : MEM:RECORDO0



**Schematic Diagram for Recorder Function** 

**Recorder Function Setting** 

Save as\*.REC

The output recorder function records the voltage & current parameters of the output process. The recording interval of each point can be set according to user's requirements, and the shortest interval is 1 second and the longest is 300 seconds. The results can be stored in \*.REC or \*.CSV format to the power supply or directly

saved in the USB flash drive. The stored \*.CSV can be exported into Excel to conduct the future analysis. (\*.REC can be saved to 2048 records, \*.CSV can be saved to 614400 records)

<sup>\*</sup> Channel 3 does not support the output recorder function

# Single Channel Programmable DC Power Supply



## GPP-3610H/7250





#### **FEATURES**

- \* GPP-3610H: 36V/10A; GPP-7250: 72V/5A; 4.3" TFT LCD Display
- \* Programming Resolution: 1mV/0.2mA (GPP-3610H); 2mV/0.1mA (GPP-7250)
- \* Readback Resolution: 0.1mV/0.1mA
- \* Low Ripple Noise: ≤1mVrms/≤2mArms
- \* Transient Response Time: ≤100ms
- \* Load Function (CC, CV, CR Mode)
- \* Utilizes Hardware to Realize Over Voltage Protection/Over Current Protection/ **Over Temperature Protection**
- \* Delay Function/Output Monitoring Function/ **Output Recorder Function**
- \* Supports Setting Value, Measurement Value and Output Waveform Display
- \* Sequential Output Function and 8 Built-in **Template Waveforms**
- \* The Output Recorder Function Records the Output Voltage & Current Parameters With a Minimum Recording Interval of 1 Second
- \* Sequence/Delay/Recorder/Panel Setting Conditions Respectively Provide 10 Sets of **Internal Storage Memory**
- \* Intelligent Temperature-controlled Fan **Effectively Reduces Noise**
- \* Standard Interface: RS-232, USB, Ext I/O
- \* Optional Interface (Manufacturer Installed Only): LAN, GPIB+LAN

 ${\sf GPP\ programmable\ DC\ power\ supply\ series\ incorporates\ two\ 360W\ models,\ namely\ the\ 36V/10A\ {\sf GPP-3610H\ }}$ and the 72V/5A GPP-7250. GPP-3610H provides high programming resolution (1mV/0.2mA) and readback resolution (0.1mV/0.2mA); GPP-7250 provides high programming resolution (2mV/0.1mA) and readback resolution (0.1mV/0.1mA), and the best low ripple noise characteristics ≤1mVrms (5Hz~1MHz)/≤ 2mArms and output transient recovery capability  $\!\leq\! 100 \mu s.$ 

GPP-3610H and GPP-7250 provide a variety of display modes, including channel setting values, measurement values, and waveform display. Using the output monitoring function of the GPP-Series, users can set monitoring conditions according to their needs, generate an alarm or stop output during the measurement process, stop the measurement and protect the customer's DUT. The GPP series provides an output recorder function, the voltage/current of the output process can be recorded in the internal memory, and the results can be saved as (\*.REC) or (\*.CSV) file and transferred to a USB. The saved \*.CSV can be later exported into Excel for analysis.

GPP-3610H and GPP-7250 are designed with a load function of up to 100W. The GPP-3610H provides 36V/10A power output, and has built-in maximum 36.5V constant voltage load (CV), maximum 10.2A constant current load (CC) and maximum  $1k\Omega$  constant resistance load (CR) functions. GPP -7250 provides 72V/5A power output, and has built-in maximum 72.5V constant voltage load (CV), maximum 5.2A constant current load (CC) and maximum  $1k\Omega$  constant resistance load (CR) functions

The output of GPP-3610H and GPP-7250 provides the sequence output function, which not only allows users to edit the power output waveform, but also allows users to set a sequence of constant voltage (CV) or constant current (CC) load waveform. For example, sequential power output or dynamic load simulation testing. In order to simplify the settings of waveform editing, the GPP-Series has 8 built-in waveforms in the templet waveform from the sequence output function, including Sine, Pulse, Ramp, Stair Up, Stair Dn, Stair UpDn, Exp Rise, Exp Fall waveforms, providing users to apply for output directly.

The complete protection functions comprise OVP, OCP, OPP, and OTP. The protection mechanism of OVP, OCP, and OTP is implemented by hardware circuits. Compared with competitors that use software to implement protection, it has the advantage of fast response time. The OVP and OCP functions allow users to set the protection action point based on the conditions of the DUT. OPP only protects the operation of the load function. The delay function can set the length of time during which the power output is on or off.

In addition, the Trigger In/Trigger Out function can synchronize external devices. The intelligent temperaturecontrolled fan can adjust the speed according to the temperature of the power transistor to reduce unnecessary noise. The output value setting and Sequence/Delay/Recorder functions respectively provide 10 sets of internal storage memory, and can be exported/stored using a USB. In addition to standard RS-232 and USB remote interfaces, GPP-3610H and GPP-7250 also have optional LAN or LAN+GPIB interfaces to meet different user needs.



**GPP-7250** 

## **OUTPUT FUNCTION LIST**

Model	GPP-7250/3610H
Functions	CH1
Sequence Output Function	✓
Load Functions (CC, CV, CR mode)	✓
Output Delay Function	✓
Output Monitoring Function (10 sets)	✓
Output Recorder Function	✓
Panel Save/Recall	✓

## **OPERATING RANGE**

Model	Number of Output	CH1
GPP-3610H	1	0-36V/0-10A
GPP-7250	1	0-72V/0-5A

#### Rear Panel

## **European Type Jack Terminal**





# Single Channel Programmable DC Power Supply

SPECIFICATIONS						
SPECIFICATIONS		GPP-3610H	GPP-7250			
OUTPUT MODE		GFF-3010FI	GFF-7230			
Number of Channel		I CH1	CH1			
Voltage		0 ~ 36.000V	0 ~ 72.000V			
Current		0 ~ 10.0000A	0 ~ 72.000¥			
Constant Voltage Operation		0 - 10.0000A	0 ~ 3.0000A			
Line Regulation		≤ 0.01% + 3mV				
Load Regulation		< 0.01% + 5mV				
Ripple & Noise (5Hz-1MHz)		≤2mVrms				
Transient Recovery Time		≤ 100µs (50% load change, minimum load				
Temperature Coefficient		≤ 300ppm/°C				
CONSTANT CURRENT OPERA	TION					
ine Regulation		≤ 0.01% + 3mA				
oad Regulation		≤ 0.01% + 3mA				
Ripple & Noise		≤ 2mArms				
RESOLUTION		C Ellis villa				
Programming	Voltage/Current	1mV / 0.2mA	2mV / 0.1mA			
Reedback	Voltage/Current	0.1mV / 0.2mA	0.1mV / 0.1mA			
METER						
Full Scale	Voltage/Current	36.5000V / 10.2000A	72.5000V / 5.2000A			
Programming Resolution	Voltage/Current	5 digits / 6 digits				
Reedback Resolution	Voltage/Current	6 digits / 6 digits				
	Voltage	± (0.03% of reading + 10mV)				
Setting Accuracy	Current	± (0.3% of reading + 10mA)				
2 812 1786	Voltage	± (0.03% of reading + 10mV)				
Readback Accuracy	Current	± (0.3% of reading + 10mA)				
OC LOAD MODE		(				
	Voltage	1 ~ 36.50V	1 ~ 72.50V			
Display	Current	0 ~ 10.200A	0 ~ 5.200A			
	Power	0 ~ 100.00W	0 ~ 100.00W			
	CH1	1.500V ~ 36.50V	1.500V ~ 72.50V			
CV Mode	Setting/Reedback Accuracy	≤±(0.1% + 30mV)	≤±(0.1% + 30mV)			
7.500.000	Resoltion	10mV	10mV			
	CH1	0 ~ 10.200A	0 ~ 5.200A			
CC Mode	Setting/Reedback Accuracy	≤±(0.3% + 10mA)	≤±(0.3% + 10mA)			
	Resoltion	1mA	1mA			
	CH1	1Ω ~ 1kΩ	$1\Omega \sim 1k\Omega$			
		$\leq \pm (3\% + 1\Omega)$	≤±(3% + 1Ω)			
CR Mode	Setting/Reedback Accuracy	(voltage≥0.1V, and current≥0.1A)	(voltage≥0.1V, and current≥0.1A)			
	Resoltion	1Ω	1Ω			
PROTECTION						
	Power Mode	OFF,ON(0.5V ~ 38.0V)	OFF,ON(0.5V ~ 75.0V)			
	Load Mode	OFF,ON(1.5V ~ 38.0V)	OFF,ON(1.5V ~ 75.0V)			
OVP	Setting Accuracy	±100mV				
	Resoltion	100mV				
	Power Mode	OFF,ON(0.05A ~ 10.5A)	OFF,ON (0.05A ~ 5.50A)			
	Load Mode	OFF,ON(0.05A ~ 10.5A)	OFF,ON(0.05A ~ 5.50A)			
OCP	Setting Accuracy	±20mA	,,			
	Resoltion	10mA				
Varior 1911 1911 1911		Between chassis and terminal : 20MΩ or above	(DC 500V)			
nsulation Resistance		Between chassis and DC power cord : 30MΩ or				
GENERAL			The same American Artists			
		Indoor use, Altitude: ≤ 2000m				
Operation Environment		Ambient temperature: 0 ~ 40°C / Relative humidity: ≤ 80%				
- F		Installation category: II / Pollution degree: 2				
Storage Environment		TEMPERATURE: -10°C ~ 70°C / HUMIDITY: ≤70°C	9%			
Power Input		AC 100V/120V/220V/230V±10%, 50/60Hz	***			
Power Consumption		900VA, 680W				
Dimensions & Weight		213 (W) x 145 (H) x 362 (D) mm ; Approx. 10kg				
A CIBIT		(11) A 1 13 (11) A 332 (D) HIIII , Approx. Tokg				

## ORDERING INFORMATION

GPP-3610H 36V/10A Single Channel Programmable DC Power Supply
GPP-7250 72V/5A Single Channel Programmable DC Power Supply

ACCESSORIES :

Power Cord ; Test Lead : GTL-104A  $\times$  1, GTL-105A  $\times$  1

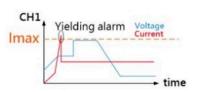
OPTIONAL ACCESSORIES

GTL-246 USB Cable GRA-449-E Rack Mount Kit (EIA) GRA-449-J Rack Mount Kit (JIS)

INTERFACE

Optional (manufacturer installed only): LAN Interface; GPIB+LAN Interface

## A. OUTPUT MONITORING FUNCTION



**Output Monitoring** 

The output monitoring function allows users to set the monitoring conditions according to the requirements, including voltage, current, and power greater than or less than the setting and the logical relationship of AND, OR. It also allows users to



**Monitoring Function Setting** 

sound alarms or stop the output during the measurement process, stop the measurement, and protect the customer's DUT.

#### SEQUENCE OUTPUT FUNCTION



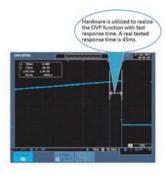
Output Waveform of the GPP-Series

GPP-3610H and GPP-7250 provide the sequence output function, which not only allows users to edit the power output waveform, but also allows users to set a sequence of constant voltage (CV) or constant current (CC) load waveform for instance, a serial power output or a simulation test of a dynamic load. The sequence editing point can set up to 2048 steps, and the interval time of each step can be set from 1 to 300 seconds. In order to simplify the settings of waveform editing, the GPP series has 8 built-in waveforms in the templet waveform in the sequence output function, including Sine,

Pulse, Ramp, Stair Up, Stair Dn, Stair UpDn, Exp Rise, Exp Fall waveforms for users to apply output directly.

The edited data output by sequence can be stored in the instrument's internal 10 sets of memory, or can be accessed using a USB flash drive (Save/Recall) and saved as \*.SEQ or \*.CSV file. The saved \*.CSV can be exported to Excel for editing and analysis. The edited files can be uploaded (Save/Recall) into the instrument using a USB flash drive.

## C. HARDWARE PROTECTION FUNCTION(OVP/OCP/OTP)



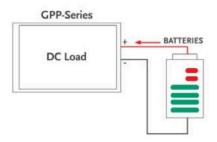
**OVP Trigger** 

The protection mechanism of OVP/OCP/OTP is implemented by hardware circuit, which has the advantage of faster response time than competitors who use software to achieve protection. When it

is detected that the voltage of the DUT exceeds the setting value of the OVP, the output of the power supply can be stopped in a short time to achieve the purpose of protecting the DUT.

# Single Channel Programmable DC Power Supply

## D. LOAD FUNCTION



**GPP-Series Application** 

GPP-3610H and GPP-7250 are designed with a load function of up to 100W. GPP-3610H has built-in maximum 36.5V constant voltage load (CV), maximum 10.2A constant current load (CC) and maximum  $1k\Omega$  constant resistance load (CR) functions.

GPP-7250 has built-in maximum 72.5V constant voltage load (CV), maximum 5.2A constant current load (CC) and maximum  $1k\Omega$  constant resistance load (CR) functions, so users can perform discharge tests without using an additional electronic load.

## E. OUTPUT DELAY FUNCTION

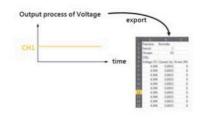


**GPP-Series Delayed Waveform** 

Output delay function (Delay) allows users to edit the power output on/off timing waveform while the front panel voltage and current settings remain unchanged. In order to simplify the settings of waveform editing, the GPP series has 3 built-in timing modes in the delay output function in a standalone instrument, including Fixtime, Increase, and Decline, for users to apply directly.

The edited data output by output delay can be stored in the instrument's internal 10 sets of memory, or can be accessed using a USB flash drive (Save/Recall) and saved as \*.DLY or \*.CSV file. The saved \*.CSV can be exported to Excel for editing and analysis. The edited files can be uploaded (Save/Recall) into the instrument using a USB flash drive.

## F. OUTPUT RECORDER FUNCTION



GUINSTEK CHI REC OTP --- IN REC OTP --- IN REC Charmels : CHI CHZ
REC Charmels : CHI CHZ
REC Chard : 1001s
REC Groups : 002048
REC Path : MEM:/RECORD00



**Schematic Diagram for Recorder Function** 

**Recorder Function Setting** 

Save as\*.REC

The output recorder function records the voltage & current parameters of the output process. The recording interval of each point can be set according to user's requirements, and the shortest interval is 1 second and the longest is 300 seconds. The results can be stored in \*.REC or \*.CSV format to the power

supply or directly saved in a USB flash drive. The stored \*.CSV can be exported into Excel to conduct the future analysis. (\*.REC can record up to 2018 lots, \*.CSV can record up to 614400 lots)

# Multi-output Programmable DC Power Supply



## GPP-1326/2323/3323/4323



#### **FEATURES**

- \* 4.3" TFT LCD Display
- \* Supports Setting Value, Measurement Value and Output Waveform Display
- \* Load Function (CC, CV, CR Mode)
- \* Setting Resolution: 1mV/0.1mA; Read Back Resolution: 0.1mV/0.1mA
- \* Low Ripple Noise: ≦350µVrms/≦2mArms
- \* Transient Response Time: ≦50μs
- \* Tracking Series and Parallel Function without Additional External Wiring
- \* Utilizing Hardware to Realize Over Voltage Protection/Over Current Protection/Over Temperature Protection
- \* Delay Function/Output Monitoring Function/ Output Recorder Function
- \* Intelligent Temperature Control Fan Effectively Reduces Noise
- \* Sequential Output Function and Built-in 8 Template Waveforms
- \* The Output Recorder Function Records The Output Voltage & Current Parameters with A Minimum Recording Interval of 1 Second
- \* Provides 10 Sets of Memory for Each Sequence /Delay/Recorder/Panel Setting Condition
- \* GPP-3323 Supports A USB(Type A) Output Terminal
- \* Standard: RS-232, USB, Ext I/O; Optional (Manufacturer Installed Only): LAN, GPIB+LAN
- \* Compatible with Commands of GPD-X303S Series

# With the maximum output power of 217W, the GPP-Series, the multi-channel programmable DC power supply, includes four models: GPP-1326 (0–32V/0–6A) for single-channel output and GPP-2323 for dual-channel output (CH1:0–32V/0–3A, CH2:0–32V/0–3A), GPP-3323 for three-channel output (CH1: 0–32V/0–3A, CH2:0–32V/0–3A, CH3: 1.8V, 2.5V, 3.3V, 5.0V/5A) and GPP-4323 for four-channel output (CH1:0–32V/0–3A, CH2:0–32V/0–3A, CH3:0–5V/0 ~1A, CH4: 0~15V/0–1A). This series not only provides high program resolution (1mV/0.1mA) and read back resolution (0.1mV/0.1mA), but also features optimal low-ripple noise characteristics $\leq$ 350µVrms/ $\leq$ 2mArms and output transient recovery capability $\leq$ 50µs. Independent output on-off switch is provided for each channel.

For series and parallel applications of CH1 and CH2, the tracking function of the GPP-Series utilizes the internal circuit to automatically switch the output to serial or parallel output without additional external wiring, providing users with convenience not only in operating procedures but also a more stable output. The tracking function design of other brands requires additional external wiring connections for the output in series or parallel. However, excessively long, thin or inconsistent external wiring may cause inaccurate voltage or current output.

The GPP-Series offers a variety of display modes, including single or multi-channel setting values, measurement values, and waveform displays. The Monitor function of the GPP-Series allows users to set monitoring conditions according to requirements, sound alarms or stop output during the measurement process, and stop measurement and protect the customer's DUT. The GPP-Series provides output recorder function, which records the voltage/current of the output process to the internal memory, and the result can be stored as a (\*.REC) or (\*.CSV) file, which can then be transferred to the USB flash drive. The stored \*.CSV can be exported to the Excel to conduct the future analysis.

The CH1/CH2 of the GPP-Series are designed with the load function. A single power supply can set one channel as the power output, and one channel for the load function to consume the power of the DUT so as to meet the basic charging and discharging test requirements for battery. Channel 1 and channel 2 not only provide 32V/3A power output, but also feature built-in maximum 32V constant voltage load (CV), maximum 3.2A constant current load (CC) and maximum  $1k\Omega$  constant resistance load (CR) function.

The GPP-Series provides the sequential output function on Channel 1 and Channel 2. This function not only allows users to edit the power output waveform, but also allows users to set the sequential constant voltage (CV) or constant current (CC) load waveform, i.e. a serial power output or a simulation test of a dynamic load. In order to simplify the setting of waveform editing, the GPP-Series has 8 built-in Templet waveforms in the sequence output function for users to directly apply for output, including Sine, Pulse, Ramp, Stair Up, Stair Dn, Stair UpDn, Exp Rise, Exp Fall waveforms.

The sound protection functions include OVP/OCP/OPP/OTP, in which the protection mechanism for OVP/OCP/OTP is implemented by hardware circuit that has the advantage of faster response time compared with competitors who adopt software to achieve protections. The OVP/OCP functions allow users to set the protection action point (except CH3 of GPP-3323) according to the conditions of the DUT. The OPP is only activated during the operation of the load function. The Delay Function sets the length of time during channel 1 or channel 2 power output on or during power output off.

In addition, the Trigger In/Trigger Out functions synchronize external devices. The GPP-3323 channel 3 adds a 3A USB (Type A) output terminal for USB charging test. The intelligent temperature-controlled fan can adjust the speed according to the temperature of the power transistor so as to reduce unnecessary noise. The output value setting and the Sequence/Delay/Recorder functions provide 10 sets of internal memory for use, and can be loaded/stored using a USB flash drive. In addition to the standard RS-232 and USB remote interfaces, the GPP-Series also has an optional LAN or LAN+GPIB interface to facilitate different requirements. The commands of the GPP-Series conform to SCPI requirements and are compatible with the commands of the GPD-X303S Series.

## European Type Jack Terminal



## Rear Panel (LAN+GPIB)



#### Rear Panel (LAN)



Rear Panel



#### **OUTPUT FUNCTION LIST**

4	GPP-4323								
Model		GPP-3323							
Number	GPP-	2323							
	GPP-1326								
Number of Outputs	СН1	CH2	CH3	CH4					
Sequence Output Function	1	1							
Load Functions (CC, CV, CR mode)	1	1							
Output Delay Function	1	1							
Output Monitoring Monitor(10 sets)	1	1	(CPP3323 not supported)	1					
Output Recorder Function	1	1	(CPP-3323 not supported)	1					
Panel Save/Recall	1	1	1	1					

# **Multi-output Programmable DC Power Supply**

SPECIFICA	TIONS										
SPECIFICA	110143	GPP-1326	GP	P-2323		GPP-33	323	GPP-4323			
OUTPUT MODE					l .						
Number of Channel		CH1	CH1	CH2	CH1	CH2	CH3	CH1	CH2	CH3	CH4
Voltage		0 ~ 32.000V	0 ~ 32.000V	0 ~ 32.000V	0 ~ 32.000V	0 ~ 32.000V	1.8V/2.5V/3.3V/5.0V, ±5%	0 ~ 32.000V	0 ~ 32.000V	0 ~ 5.000V	0 ~ 15.000V
Current		0~6.0000A	0 ~ 3.0000A	0 ~ 3.0000A	0 ~ 3.0000A	0 ~ 3.0000A	5A (USB Port 3A)	0 ~ 3.0000A	0 ~ 3.0000A	0 ~ 1.0000A	0 ~ 1.0000A
Tracking Series Voltage/	Current	c 4.		/ / 0 ~ 3.0000A	0 ~ 64.000V /			0 ~ 64.000V			- X
Tracking Parallel Voltage		. 32	0 ~ 32.000\	/ / 0 ~ 6.0000A	0 ~ 32.000V /	0 ~ 6.0000A	12	0 ~ 32.000V	0 ~ 6.0000A		17
	23 output current from the 2 terminals	should Not exceed 5A.									
CONSTANT VOLTAGE O	OPERATION							1			
Line Regulation		≤ 0.01% + 3mV		1% + 3mV	≤ 0.01% ≤ 0.01%+3mV(rat		≤ 3mV		≤ 0.01% +		
Load Regulation		≤ 0.01%+3mV (rating current≤ 3A) ≤ 0.02%+5mV (rating current>3A)		rating current≤3A) rating current>3A)	≤ 0.01 %+3 mV (rail		≤ 5mV		0.01%+3mV(ratin 0.02%+5mV(ratin		
Ripple & Noise (5Hz-1M	(Hz)	≤0.5mVrms		5mVrms	≤0.35m		≤2mVrms	≤0.35n			Vrms
	-	≤100µs		50µs	_0.5511		≤100µs	_0.551	≤50µs		***************************************
Transient Recovery Time					-	change · minimu					
Temperature Coefficient		≤ 300ppm/°C									
CONSTANT CURRENT	OPERATION										
Line Regulation		≤ 0.2% + 3mA									
Load Regulation		≤ 0.2% + 3mA									
Ripple & Noise		≤4mArms	≤ 2	mArms		≤ 2mArm	15		≤ 2mArr	ns	
Resolution	14. h		1	101-4	3			I a	3-1//03		
Programming Reedback	Voltage/Current	1mV / 0.2mA 1mV / 0.2mA		/ 0.1mA / / 0.1mA	1mV / 0.1mV /			2	1mV / 0.1 0.1mV / 0.		
TRACKING OPERATION	Voltage/Current	Imv / 0.2mA	0.1111	v / 0.1mpc	v.imv/	U.IIIIA			0.1mv / 0.	IIIIA	
TRACKING OPERATION	(CHI/CH2)		<+/0.195+10mV	of Master(0~32V))	≤±(0.1%+10mV of	Master(032VI)		≤±(0.1%+10mV o	F.Master(0, 321/1)		
Tracking Error				ith load add load	(No Load, with	1 11		(No Load, with		1	
•			A CONTRACTOR OF THE PARTY OF TH	on≤100mV)	regulation			regulation			
	Line	1	≤ 0.01	1% + 3mV	≤ 0.01%	+ 3mV		≤ 0.01%	+ 3mV		
Parallel Regulation	11	-		rating current≤3A)	≤ 0.01%+3mV(rat				ting current≤3A)	1	-
	Load		≤ 0.02%+5mV	(rating current>3A)	≤ 0.02%+5mV(ra	ting current>3A)		≤ 0.02%+5mV(ra	ating current>3A)	1	
Series Regulation	Line		≤ 0.01	1% + 5mV	≤ 0.01%	+ 5mV		≤ 0.01%	+ 5mV	]	
	Load		≤ 1	100mV	≤ 100	)mV		≤ 100mV			
Ripple & Noise			≤1mVrms	s(5Hz-1MHz)	≤1mVrms (5	Hz-1MHz)		≤1mVrms(5	Hz-1MHz)		
	e Tracking function, and Tracking is no	t supported in LOAD mode.									
METER	14-h		22.0000		33.0000V	2 22224			33.0000V / 3.	00004	
Full Scale	Voltage/Current	33.0000V / 6.2000A		V / 3.2000A s / 5 digits	5 digits /	1,000,000	1.8V/2.5V/3.3V/5.0V	3	Carried Co Auto		
Programming Resolution Reedback Resolution	Voltage/Current Voltage/Current	5 digits / 5 digits 6 digits / 5 digits	_	s / 5 digits	6 digits /			5 digits / 5 digits 5 digits / 6 digits		_	
er acestro a successión de	Voltage	± (0.03% of reading + 10mV)		reading + 10mV)	± (0.03% of rea			± (0.03% of readin			
Setting Accuracy	Current	± (0.3% of reading + 10mA)		eading + 10mA)	± (0.3% of rea				± (0.3% of reading		
	Voltage	± (0.03% of reading + 10mV)	± (0.03% of	reading + 10mV)	± (0.03% of rea	ding + 10mV)		,	± (0.03% of reading		
Readback Accuracy	Current	± (0.3% of reading + 10mA)	± (0.3% of r	eading + 10mA)	± (0.3% of read	ding + 10mA)			± (0.3% of reading	g + 10mA)	
DC LOAD MODE										12	
	Voltage	1 ~ 33.00V		33.00V	1 ~ 33			1 ~ 3:			
Display	Current	0 - 6.200A		3.200A	0 ~ 3.			0 ~ 3.			
	Power	0 – 100.00W		50.00W	0 ~ 50	V-1-12-V-V-		0 ~ 50	27-22-100		
CV Mode	CH1/CH2	1.500V ~ 33.00V		~ 33.00V	1.500V ~	22.00 (1.07)		1.500V -		-	
CV Mode	Setting/Reedback Accuracy Resoltion	≤±(0.1% + 30mV) 10mV		% + 30mV) 0mV	≤±(0.1% -			≤±(0.1% 10r		+	
1	CH1/CH2	0 ~ 3.200A		3.200A	0 - 3.:		- Augretic	0 - 3.		1	
CC Mode	Setting/Reedback Accuracy	≤±(0.3% + 10mA)		% + 10mA)	≤±(0.3% -		A993	≤±(0.3%		1	
prox.00000000	Resoltion	1mA		1mA	1m			1n		1	
	CH1/CH2	1Ω- 1kΩ		)- 1kΩ	1Ω-			1Ω-		1	
CR Mode	Setting/Reedback Accuracy	≤±(3% + 1Ω)	≤±(3	1% + 1Ω)	≤±(3%	+1Ω)		≤±(3%	+ 1Ω)	]	
Ch Widde		(voltage≥0.1V, and current≥0.1A)	(voltage≥0.1V,	and current≥0.1A)	(voltage≥0.1V, ar				nd current≥0.1A)		
	Resoltion	10		1Ω	10	)		1	Ω		
PROTECTION								-		055.00	055.51
	Power Mode	OFF,ON(0.5V - 35.0V)	OFF,ON(	0.5V ~ 35.0V)	OFF,ON(0.5	5V ~ 35.0V)	Fixed 5.5V	OFF,ON(0.	5V ~ 35.0V)	(0.5V-6.0V)	
OVP	Load Mode	OFF,ON(1.5V ~ 35.0V)	OFF,ON(	1.5V ~ 35.0V)	OFF,ON(1.5	SV ~ 35.0V)		OFF,ON(1.	5V ~ 35.0V)	10.00	
70.00	Setting Accuracy	±100mV								100	
1	Resoltion	100mV									
	Power Mode	OFF,ON (0.05A ~ 7.00A)		0.05A - 3.50A)	OFF,ON(0.0		3.1A(USB port)	OFF,ON(0.0		OFF,ON(0.0	05A – 1.20A)
ОСР	Load Mode	OFF,ON (0.05A ~ 7.00A)	OFF,ON(0	0.05A - 3.50A)	OFF,ON(0.0	5A ~ 3.50A)		OFF,ON(0.0	05A ~ 3.50A)		
10/30/20	Setting Accuracy	±20mA									
	Resoltion	10mA	10 h. /p.=	rom n							
Insulation Resistance		Between chassis and terminal : 20M									
GENERAL		Between chassis and DC power cor	u : 30IVE/ OF above	(DC 300V)							
Operation Environment		Indoor use, Altitude: ≤ 2000m; Am	hient temperature	r 0 = 40°C / Palatina	humidity < 2094 - I-	stallation categor	c II. / Pollution degree: 3				
Storage Environment	1	TEMPERATURE: -10°C ~ 70°C / HL		10 c / Neiative			, I omation degree 2				
Power Input		AC 100V/120V/220V/230V±10%, 5						(3			
Power Consumption		360W		160W		420W	9		420W		
Dimensions & Weight		213 (W) x 145 (H) x 312 (D) mm;	Approx. 7.5kg								
				_	_	_		_	_	_	

## ORDERING INFORMATION

CPP-1326 (32V/6A) Single-Output Programmable DC Power Supply
CPP-2323 (32V/3A\*2) Dual-Output Programmable DC Power Supply
GPP-3323 (32V/3A\*2; 1.8V or 2.5V or 3.3V or 5V/5A\*1) Three-Output Programmable DC Power Supply
CPP-4323 (32V/3A\*2; 5V/1A; 15V/1A) Four-Output Programmable DC Power Supply

ACCESSORIES:

Power cord x 1

GPP-1326 Test Lead GTL-104A x 1, GTL-105A x 1

GPP-2323 Test Lead GTL-104A x 2, GTL-105A x 2

GPP-3323 Test Lead GTL-104A x 3

European Test Leads : GPP-1326 GTL-203A x 1, GTL-204A x 1, GTL-201A x 1 GPP-2323 GTL-204A x 2, GTL-201A x 1 GPP-4323 GTL-203A x 2, GTL-201A x 1 GPP-3323 GTL-204A x 3, GTL-201A x 1

OPTIONAL ACCESSORIES

GRA-449-J Rack Mount Kit (JIS) GTL-246 USB Cable GRA-449-E Rack Mount Kit (EIA)

OPTIONS (Manufacturer Installed Only)

LAN Interface; GPIB+LAN Interface



# GPD-2303S/3303S/ 4303S/3303D









## **FEATURES**

- \* 2, 3 and 4 Independent Isolated Output
- \* 4 LED Display Sets : 3 Digits After Decimal Point (GPD-2303S/3303S/4303S)
- \* Minimum Resolution: GPD-2303S/3303S/4303S (1mV/1mA) GPD-3303D (100mV/10mA)
- \* Digital Panel Control (Rotary Encoder Switch, Rubber Key With Indicator)
- \* User-Friendly Operation, Coarse / Fine Volume Control
- \* 4 Sets Save / Recall
- \* Key-Lock
- \* Output ON/OFF
- \* Tracking Series and Parallel Mode
- \* Smart Cooling Fan Achieving Low Noise
- \* Compact Design
- \* PC Software & USB Driver
- \* USB Standard Interface
- \* Optional European Jack Type Terminal

## **Rear Panel**



## **European Type Jack Terminal**



The GPD-Series is a cutting edge, economical, high resolution programmable power supply, Which is equipped with 2, 3 and 4 independent output channels and support a maximum output from 180Watt to 195Watt. The power supplies include four sets of memory for voltage and current setting, a USB remote interface, high resolution (GPD-2303S / GPD-3303S / GPD-4303S) and intelligent fan control to reduce noise. The durable features along with the free output monitoring software make the GPD-Series suitable for any lab as well as the LED industry.

SPECIFICATIO												
	GPD-2303S GPD-3303S G		GPD	)-4303S		GPD-3303D						
OUTPUT												
Channel	CH1	CH2	CH1	CH2	CH3	CH1	CH2	CH3	CH4	CH1	CH2	CH3
Voltage	0~30V	0~30V	0~30V	0~30V	2.5/3.3/5.0V	0~30V	0~30V	0~5V	0~5V	0~30V	0~30V	2.5/3.3/5.0
***								5.001V~10V				
Current	0~3A	0~3A	0~3A	0~3A	3A	0~3A	0~3A	0~3A	0~1A	0~3A	0~3A	3A
304 Oc. 20	3577	12 W	200 AV	- W		51.51	50 - 40.	or 0~1A	0,000	007.5	30 10	874
CONSTANT VOL	TAGE	OPERA	TION					U~IA				
Regulation	Line re	ine regulation ≤ 0.01%+3mV										
					3mV(rating	current	≤ 3A);	≤ 0.02%	+5mV	(rating	urrent	>3A)
Ripple & Noise			Hz~1N							, ,		,
Recovery Time	≤100 p	us (50	%Load	change	e, Minimum	load 0	.5A)					
Temp.Coefficient	≤300p	pm / °	С									
CONSTANT CUR	RENT	OPERA	TION									
Regulation	Line re	gulatio	n≤0.2	%+3m	A; Load regi	ulation	≤ 0.2%	+3mA				
Ripple Current	≤3mA											
TRACKING OPER	RATION	1										
Regulation of			on <u>≤</u> 0.0									
PAR.	Load regulation $\leq 0.01\%+3$ mV (rating current $\leq 3$ A); $\leq 0.02\%+5$ mV (rating current $> 3$ A)											
Regulation of			on ≤0.0		mV							
SER.	Load regulation≤100mV ≤0.1%±10mV (10 ~ 30V) no load, with load added load regulation ≤100mV											
Tracking Error	≥ 0.19	6±10m	V (10 ~	30V) r	no load, with	i load a	idded l	oad regul	ation :	≤100m\	<u> </u>	
METER	Carren			v								
Display					Display (full							4"LED Displa
				" LED I	Display (full	scale:3	3.2A)		- 15		-	4"LED Displa
Resolution		e: 1mV nt: 1mA							- 11	Voltage:		
Program				PDC.	+10 digits)				- 18		363.632.63	RDG+2 digit
_					10 digits)				- 1		*	RDG+2 digit
Readback					+10 digits)				- 13		•	RDG+2 digit
Aaccuracy(25±5°C)					. ,							RDG+2 digit
CH3 SPECIFICAT		(0	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		ro digita)					Currentia	(0.570 01	NDG12 digit
	IONS		/ 2 EV	112 21/1	5V )±8%	0 51/	/ 5~10	۸/		( 2.5V/	2 21//51	/ \+00/
Output Voltage Output Current			3A	13.541	JV J±676	2012-0-200	/ 0~1A		- 10	3A	3.34/34	1-0/0
Regulation			1.2	egulati	on<	35 65 9	regulati		- 10	Line reg	ulation	<
(25±5°C)	-	200		+3mV			6+3mV			0.01%+		_
(23.5 0 )				regulat			regulat			Load re		1 ≤
SAVE TO PROTE MATERIALS				+3mV			6+3mV			0.01%+		
Repple & Noise	3.		<u> </u>	/rms(5	Hz~1MHz)	<u>&lt;2m</u>	Vrms (5	Hz~1MF	1z)	< 1mVr	ms(5Hz	~1MHz)
KEY LOCK												
Yes	RECALI											
MEMERY SAVE	LECALI	-										
MEMERY SAVE/I												
MEMERY SAVE/I 4 sets POWER SOURCE	E											
4 sets		0V±10	%, 50/	60Hz;	Power consu	umptio	n : 490	VA max.				

## ORDERING INFORMATION

GPD-2303S GPD-2303S 2 Channels, 180W Programmable Linear DC Power Supply GPD-3303S GPD-3303S 3 Channels, 195W Programmable Linear DC Power Supply GPD-4303S GPD-4303S 4 Channels, 195W Programmable Linear DC Power Supply GPD-3303D GPD-3303D 3 Channels, 195W Programmable Linear DC Power Supply

## ACCESSORIES:

GPD-2303S Test Lead GTL-104A x 2, European Test Lead GTL-204Ax2, GTL-201A x 1

GPD-3303S Test Lead GTL-104A x 2,GTL-105A x 1; European Test Lead GTL-203A x 1, GTL-204A x 2, GTL-201A x 1 GPD-4303S Test Lead GTL-104A x 2,GTL-105A x 2; European Test Lead GTL-203A x 2, GTL-204A x 2, GTL-201A x 1

GPD-3303D Test Lead GTL-104A x 2,GTL-105A x 1; European Test Lead GTL-203A x 1, GTL-204A x 2, GTL-201A x 1

#### OPTIONAL ACCESSORIES

GTL-246 USB Cable

FREE DOWNLOAD

PC Software including Data Log Labview Driver

# **Programmable Linear DC Power Supply**



## PSS-2005/3203



#### **FEATURES**

- \* Digitized Programmable Interface
- \* High Resolution 10mV, 1mA
- \* High Stability, Low Drift
- \* Over-Voltage, Over-Current, Over Temperature Protection
- \* Intelligent Fan Control (Change by Output Power)
- \* Built-in Buzzer Alarm
- \* LabVIEW Driver
- \* Standard Interface: RS-232C
- \* Optional Interface : GPIB (IEEE-488.2)
- \* Optional European Jack Type Terminal

## **European Type Jack Terminal**



## Rear Panel



The PSS-Series is a single output, 96W or 100W, programmable linear DC power supply. OVP, OCP, and OTP protect the PSS series and their loads from unexpected conditions. The LCD panel simultaneously displays output and other parameters and the regulated cooling fan ensures low noise for comfortable operation. RS232C and GPIB interfaces, SCPI command sets and LABVIEW drivers make remote control and ATE software development easier. (Note: only RS-232C or GPIB can be installed at one time) The compact PSS series is suitable for any high resolution bench-top or rack mount application.

SPECIFICATIONS						
SFECIFICATIONS	PSS-2005	PSS-3203				
OUTPUT	133-2003	133-3203				
Voltage	0 ~ 20V	0 ~ 32V				
Current	0 ~ 5A	0 ~ 3A				
OVP	0 ~ 21V	0 ~ 33V				
LOAD REGULATION						
Voltage	< 3mV ( < 5mV, rating current >					
Current	≤ 3mA (≤ 5mA, rating current >	3.0A)				
LINE REGULATION						
Voltage	≤ 3mV					
Current	≤ 3mA					
RESOLUTION	1					
Voltage	10mV					
Current OVP	1mA (2mA, rating current > 3.0A	( )				
PROGRAM ACCURACY (25 ±	1974 C. SE.					
The state of the s	< 0.05%+20mV					
Voltage Current	≤ 0.05%+20mV   ≤ 0.1%+5mA (+10mA, rating cut)	rrent > 3 OA )				
OVP	< 0.05%+20mV	1011 2 3.04 )				
RIPPLE & NOISE (20Hz ~ 20M	_					
Voltage	Ripple ≤ 1mVrms/3mVp-p ; Nois	e < 2mVrms/30mVp-p				
Current	≤ 3mArms (≤ 5mArms, rating co					
TEMPERATURE COEFFICIEN						
Voltage						
Current	≤ 100ppm+3mV ≤ 100ppm+3mA					
READBACK RESOLUTION	≤ reoppiii siiix					
Voltage	10mV					
Current	1mA (2mA, rating current > 3.0A	()				
READBACK ACCURACY(25 ±						
Voltage	< 0.05%+10mV					
Current	≤ 0.1%+5mA (10mA rating curre	ent > 3.0A )				
READBACK TEMPERATURE C						
Voltage	< 100ppm+10mV					
Current	≤ 100ppm+5mA (10mA rating c	urrent > 3.0A)				
RESPONSE TIME	1 = 11					
Voltage Up (10%~90%)	< 100mS					
Voltage Down (90%~10%)	≤ 100mS ( ≥10% rating load )					
DRIFT						
Voltage	< 100ppm+10mV					
Current	≤ 150ppm+10mA					
INTERFACE						
Standard : RS-232C; Option :	GPIB					
POWER SOURCE	T147					
AC 100V/120V/220V±10%, 23	30V (+10%/-6%), 50/60Hz					
DIMENSIONS & WEIGHT	(,0,0,0,0,,00,00,00					
108(W) x 142(H) x 318(D) mr	n. Approx. 4.8kg					
(,	, Tr ,					

#### ORDERING INFORMATION

PSS-2005 100W Single Output Programmable DC Power Supply PSS-3203 96W Single Output Programmable DC Power Supply

ACCESSORIES :

Power cord x 1 Test lead GTL-104A x 1 (PSS-2005) or GTL-105A x 1 (PSS-3203) European Test Lead GTL-204A x 1 (PSS-2005) or GTL-203A x 1 (PSS-3203)

OPTION

Opt.01: GPIB Interface (factory installed)

OPTIONAL ACCESSORIES

GTL-232 RS-232C Cable, 9-pin Female to 9-pin, null Modem for Computer

GRA-408 Rack Adapter Panel (19" 4U)
GTL-248 GPIB Cable, Double Shielded, 2000mm

FREE DOWNLOAD

PC Software PC Software including Data Log; Remote Control Software

**Driver** LabView Drive

Note: When Opt.01 GPIB interface is ordered, the standard interface RS-232C will be deleted.



## PPE-3323







## **FEATURES**

- \* Easy Operation with UP/DOWN Key
- \* High Resolution: 10mV, 1mA
- \* Over Voltage Protection (by Software)
- \* 50 Sets Memory
- \* Self Test and Software Calibration
- \* Auto Step Running With Timer Setting
- \* Triple Output
- \* Auto Tracking
- \* RS-232C Communication
- \* High Stability, Low Drift
- \* 4 Digit Display
- \* IEC Safety Regulation

## Rear Panel



The PPE-Series is a 3-channel, programmable linear DC power supply with 207W output. The PPE-Series features OVP and OCP and is compliant with all major safety standards (UL, CSA, and IEC) for safe, reliable operation. The digital interface and smart features simplify operation and configuration with output limit store/recall functions, tracking, serial operation, and auto stepping for continuous testing. The series has PC software and SCPI commands as standard for remote control and PC interfacing via RS-232C. The versatile PPE-Series is ideal for high-level applications requiring high resolution, multiple outputs, and an extra level of safety.

SPECIFICATIONS	
OUTPUT	0~+32V,0~ -32V,3.3V/5V FIXED
Voltage Current	0~+3A,0~-3A,3A FIXED
OVP	0~+33V.0~-33V
LOAD REGULATION	0-+331,0331
Voltage	≤6mV
Current	≦3mA
LINE REGULATION	
Voltage	≤3mV
Current	≤3mA
RESOLUTION	
Voltage Current	10mV (20mV rating voltage > 36V)
OVP	1mA (2mA rating current > 3.5A) 10mV(20mV rating voltage > 36V)
PROGRAM ACCURACY (25±5°	
Voltage	≤0.05% + 25mV ( + 50mV rating voltage > 36 V )
Current	≤0.2% + 10mA
OVP	≤2% + 0.6V
RIPPLE & NOISE (20Hz ~ 20M	
Voltage	Ripple 1mVrms / 3mVp-p Noise 2mVrms / 30mVp-p
Current	S3mA rms (≤5mA rms rating current > 3.5A)
TEMPERATURE COEFFICIENT	
Voltage	≤100ppm + 3mV
Current	≤150ppm + 3mA
READBACK RESOLUTION/AC	CURACY (25± 5°C)
Voltage	10mV ( 20mV rating voltage > 36V )
Current	1mA (2mA rating current > 3.5A)
Voltage	≤0.05% + 25mV ( + 50mV rating voltage > 36V )
Current	≤0.2% + 10mA
RESPONSE TIME	4100 O
VOLTAGE UP 10% ~ 90% VOLTAGE DOWN 90% ~ 10%	≤100mS ≤100mS (≥ rating load )
READBACK TEMPERATURE CO	
Voltage	≤100ppm + 10mV ( + 20mV rating voltage > 36V )
Current	≤150ppm + 10mA
DRIFT	
Voltage	≤100ppm + 10mV
Current	≤150ppm + 10mA
TRACK OPERATION	
Tracking Error	≤0.1% + 50mV
Series Regulation	≤50mV
PARALLEL OPERATION (PPT-S	
Program Accuracy	Voltage $\leq$ 0.05% + 25mV ( + 50mV rating voltage > 36V ) Current $\leq$ 0.2% + 20mA
(25±5°C)	Current $\leq 0.2\% + 20$ mA OVP $\leq 2\% + 0.6$ V
Load Effect	Voltage ≤3mV rear output (≤6mV front output )
	Current ≤6mA (≤12mA rating current > 3.5A)
Source Effect	Voltage ≤3mV; Current ≤6mÅ
MEMORY	
Store/Recall	50 sets
TIMER	
Setting Time	1 second ~ 99 minutes (Max. 99 minutes x 50 sets)
Resolution	1 second
Function	for output working loop (Auto Step running )
STANDARD INTERFACE	
RS-232C	
POWER SOURCE	
AC 100V/120V/ 220V/240V±10	0%, 50/60Hz
DIMENSIONS & WEIGHT	
255(W) x 145(H) x 346(D) mm	; Approx. 10kg
. , . , . , . ,	

ORDERING INFORMATION										
PPE-3323 207W Triple Output Programmable DC Power Supply										
Model	Independent Series Parallel Display Type W									
PPE-3323	(0~32V/0~3A)x2,(5V/3A)FIXED	64V/3A	32V/6A	LED	10					
ACCESSORIES :										
Power cord x 1	, Test lead GTL-105A x 3									
OPTIONAL A	ACCESSORIES									
GRA-401 Rac	k Mount Kit									
FREE DOWN	ILOAD									
PC Software R	emote Control Software									



## PPT-1830/PPT-3615







#### **FEATURES**

- \* Easy Operation with UP/DOWN Key
- \* High Resolution: 10mV, 1mA
- \* Over Voltage Protection, Over Current Protection (PPT-Series by Hardware)
- \* 50 Sets Memory
- \* Self Test and Software Calibration
- \* Auto Step Running With Timer Setting
- \* FRONT/REAR Output and Sense Switch Selectable
- \* Triple Output
- \* Auto Series and Parallel Operation
- \* Auto Tracking
- \* IEEE-488.2 and SCPI Compatible Command set
- \* GPIB Standard Interface
- \* LabVIEW Driver
- \* High Stability, Low Drift
- \* 4 Digit Display
- \* IEC Safety Regulation

## Rear Panel



The PPT-Series a is 3-channel, programmable linear DC power supply with 138W or 126W outputs. The PPT-Series features OVP and OCP and is compliant with all major safety standards(UL, CSA, and IEC) for safe, reliable operation. For extra precision, the PPT-Series includes remote sensing that adds an extra level of precision by compensating cable losses between loads. The digital interface and smart features simplify operation and configuration with output limit store/recall functions, automatic tracking, automatic serial or parallel operation, and auto stepping for continuous testing. The series has Labview drivers and SCPI commands as standard for remote control and PC interfacing via GPIB. The versatile PPT-Series is ideal for high-level applications requiring high resolution, multiple outputs, and an extra level of safety.

SPECIFICATIONS							
MODEL	PPT-1830	PPT-3615					
OUTPUT							
Voltage	0~18Vx2,0~6Vx1	0~36Vx2,0~6Vx1					
Current	0~3Ax2,0~5Ax1	0~1.5Ax2,0~3Ax1					
OVP	0~20Vx2,0~7Vx1	0~38.5Vx2,0~7Vx1					
LOAD REGULATION	< 2-V	+1					
Voltage Current	≤ 3mV rear output (≤ 6mV front output ≤ 3mA (≤ 6mA rating current > 3.5A)	it)					
LINE REGULATION	,						
Voltage	≤3mV						
Current	≤3mA						
RESOLUTION							
Voltage Current	10mV (20mV rating voltage > 36V) 1mA (2mA rating current >3.5A)						
OVP	10mV( 20mV rating voltage > 36V )						
PROGRAM ACCURACY (25 ±5°	C)						
Voltage	≤0.05% + 25mV ( + 50mV rating voltag ≤0.2% + 10mA	ge > 36 V )					
Current OVP	≤0.2% + 10mA ≤2% + 0.6V						
RIPPLE & NOISE (20Hz ~ 20M							
Voltage	Ripple 1 mVrms / 3 mVp-p						
Current	Noise 2mVrms / 30mVp-p ≤3mA rms (≤5mA rms rating current	> 3.5A.)					
TEMPERATURE COEFFICIENT		~ 3.3K j					
Voltage	≤100ppm + 3mV						
Current	≤150ppm + 3mA						
READBACK RESOLUTION/AC							
Voltage	10mV (20mV rating voltage > 36V)						
Current Voltage	1mA (2mA rating current > 3.5A ) ≤0.05% + 25mV ( + 50mV rating voltage	ze > 36V )					
Current	≤0.2% + 10mA	50.7					
RESPONSE TIME							
<b>VOLTAGE UP</b> 10% ~ 90%	≤100mS						
VOLTAGE DOWN 90% ~ 10%	≤100mS (≥ rating load )						
READBACK TEMPERATURE CO	EFFICIENT ≤100ppm + 10mV ( + 20mV rating vol	261/1					
Voltage Current	≤150ppm + 10mV ( + 20mV rating voil ≤150ppm + 10mA	age > 30V )					
DRIFT							
Voltage	≤0.03% + 6mV						
Current	≤0.1% + 6mA						
TRACK OPERATION							
Tracking Error Series Regulation	≤0.1% + 50mV ≤50mV						
PARALLEL OPERATION	1 = 301114						
Program Accuracy	Voltage ≤ 0.05% + 25mV ( + 50mV ra	ating voltage > 36V)					
(25±5°C)	Current ≤ 0.2% + 20mA						
Load Effect	OVP ≤2% + 0.6V Voltage ≤3mV rear output (≤6mV f	ront output \					
	Current ≤6mA (≤12mA rating curre						
Source Effect	Voltage ≤3mV; Current ≤6mA	** 1 (per 100 p = 7 * 0.00 <b>p</b> = 7 * 0.00 p = 7 * 0.00					
MEMORY							
Store/Recall	50 sets						
TIMER							
Setting Time Resolution	1 second ~ 255 minutes (Max. 255 min 1 second	iutes x 50 sets)					
Function	for output working loop (Auto Step rur	ning)					
STANDARD INTERFACE							
GPIB							
POWER SOURCE	20/ 50/6011-						
AC 100V/120V/ 220V/240V±10	J%, 50/60Hz						
255 (W) x 145 (H) x 346 (D) mm	: Approx. 10kg						
255(11) x 145(11) x 540(D) 111111	1. Ab. o 1948						

ORDERING INFORMATION								
PPT-1830 138W Triple Output Programmable DC Power Supply PPT-3615 126W Triple Output Programmable DC Power Supply								
Model	Independent	Series	Parallel	Display Type	Weight (kg)			
PPT-1830	(0~18V/0~3A)x2,(0~6V/0~5A)x1	36V/3A	18V/6A	LED	10			
PPT-3615	PPT-3615 (0~36V/0~1.5A)x2,(0~6V/0~3A)x1		36V/3A	LED	10			
	ACCESSORIES: Power cord x 1, Test lead GTL-105A x 3, GTL-104A x 3							
OPTIONAL	ACCESSORIES							
GRA-401 Rack Mount Kit GTL-204A European test lead x 3 GTL-248 GPIB Cable, Double Shielded, 2000mm								
FREE DOW	NLOAD							
Driver La	bView Driver							



## PST-3201/3202









## **FEATURES**

- \* Digitized Programmable Interface
- \* High Resolution 10mV, 1mA
- \* 192 x 128 LCD Display, Simultaneously **Shows Settings and Measuring Result**
- \* Over-Voltage, Over-Current, Over **Temperature Protection**
- \* Intelligent Fan Control (Changes by Output Power)
- \* 100 Sets Memory
- \* Auto Step Running With Timer Setting
- \* Auto Series and Parallel Function
- \* LabVIEW Driver
- \* Standard Interface : RS-232C
- \* Optional Interface : GPIB (IEEE-488.2)
- \* Optional European Jack Type Terminal

## **European Type Jack Terminal**



## Rear Panel



PST-Series is a 3-channel, 96W or 158W, programmable linear DC power supply. High resolution is maintained at 10mV, 1mA (3A). OVP, OCP, and OTP protect the PST-Series and its loads from unexpected conditions. PST-Series is capable of independent, series or parallel operation for increased flexibility. The large LCD display conveniently displays all outputs and configurations simultaneously to simplify operation. The programmable interface allows automatic stepping, 100 sets of memory and comprehensive timing operations. GPIB and RS232C interfaces, Labview drivers and SCPI compatibility allow easy ATE software development and remote control. The versatile PST-Series is ideal for high resolution, multiple output, automated operations such as production testing and rack mounting systems.

SPECIFICATIONS							
SI ECH ICANONS	PST-3202	PST-3201					
OUTPUT	F31-3202	F31-3201					
- 779/22	0~32Vx2, 0~6Vx1	0.3314.3					
Voltage Current	0~2Ax2, 0~5Ax1	0~32Vx3 0~1Ax3					
OVP	0~33Vx2, 0~7Vx1	0~33Vx3					
LOAD REGULATION		0 33173					
Voltage	≤ 3mV (≤ 5mV rating current >	3 OA)					
Current	≤ 3mA (≤ 5mA rating current >						
LINE REGULATION							
Voltage	< 3mV						
Current	≤ 3mA						
RESOLUTION	231114						
Voltage	10mV						
Current	1mA (2mA, rating current >3.0A	1)					
OVP	10mV						
PROGRAM ACCURACY(25							
Voltage	≤ 0.05%+20mV						
Current	≤ 0.1%+5mA (+10mA, rating cu	irrent>3 0A)					
OVP	≤ 0.05%+20mV	inent/3.0A)					
RIPPLE & NOISE(20Hz~20		in a 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2					
Voltage	Ripple: ≤ 1mVrms/3mVp-p; No						
Current	≤ 3mArms (≤ 5mArms, rating o	current >3.0A)					
	FEMPERATURE COEFFICIENT (0 ~ 40 °C)						
Voltage	≤ 100ppm+3mV						
Current	≤ 100ppm+3mA						
READBACK RESOLUTION							
Voltage Current	10mV (20mV, rating voltage >36						
eurrent	1mA(2mA, rating current >3.0A	)					
READBACK ACCURACY(25		h 200					
Voltage	≤ 0.05%+10mV(+20mV, rating						
Current	≤ 0.1%+5mA(+10mA, rating cu	rrent>3.0A)					
READBACK TEMPERATUR		1. 200					
Voltage	≤ 100ppm+10mV(+20mV, rating						
Current	≤ 150ppm+10mA(+20mA, ratin	g current >3.0A)					
RESPONSE TIME							
Voltage Up (10%~90%) Voltage Down (90%~10%)	≤ 100mS						
. ,	≤ 100mS (≥ 10% rating load)						
DRIFT							
Voltage	≤ 100ppm+10mV(+20mV, ratin	g voltage >36V)					
Current	≤ 150ppm+10mA						
TRACK OPERATION							
Tracking Error	≤ 0.1%+20mV						
Series(Load Effect)	≤ 20mV						
PARALLEL OPERATION							
Program Accuracy (25±5°C)		≤ 0.1%+10mA, OVP ≤ 0.05%+20mV					
Load Effect	Voltage ≤ 3mV(≤ 5mV, rating co	urrent>3.0A); Current< 6mA					
Source Effect	Voltage ≤ 3mV;Current ≤ 6mA						
MEMORY							
Store/Recall	100 Sets						
TIMER							
Setting Time	0.1 second~99 Minutes 59 second (Max. 99 Minutes 59 second x 100)						
Resolution	0.1 second						
Function	Auto step running (for output w	orking loop)					
INTERFACE							
Standard: RS-232C; Option	on: GPIB (IEEE488.2)						
POWER SOURCE							
AC 100V/120V/220V±109	%, 230V(+10%/-6%), 50/60Hz						
DIMENSIONS & WEIGHT							
230(W) x 140(H) x 380(D) mm , Approx.10kg							

	ORDERING	INFOR	MATION				
PST-3202 158W Triple Output Programmable DC Power Supply PST-3201 96W Triple Output Programmable DC Power Supply							
Model	Independent	Series	Parallel	Display Type	Weight (kg)		
PST-3201	(0~32V/0~1A)x3	64V/1A	32V/2A	LCD	10		
PST-3202	(0~32V/0~2A)x2,(0~6V/0~5A)x1	64V/2A	32V/4A	LCD	10		
	x 1, Test lead: GTL-104A x 3 (PST-3 est lead: GTL-204A x 3 (PST-3202) o						
Opt.01 G	PIB Interface (factory installed)						
OPTIONAL	ACCESSORIES						
GRA-407 Rack Mount Kit GTL-232 RS-232C Cable, 9-pin Female to 9-pin, null Modem for Computer							
FREE DOWNLOAD							
FREE DOW	1120712						



## GPE-3060/6030





#### **FEATURES**

- \* 1/2/3 Independent Isolated Output Channels
- \* GPE-3060 Provides CH1/CH2: 0~30V/0~6A Output; CH3 Supports 5.0V at 5A
- \* GPE-6030 Supports CH1/CH2: 0~60V/0~3A Output; CH3 Supports 5.0V at 5A
- \* Series/Parallel Tracking Function
- \* Setting/Read back Resolution: Voltage (4digits): 10mV (GPE-3060) / 20mV (GPE-6030) Current (4digits): 2mA (GPE-3060) / 1mA (GPE-6030)
- \* Output On/Off Function
- \* Simple Analog Control Interface
- \* Multiple Protection Apparatuses Such as Overvoltage and Overload Protection **Functions**

## **European Type Jack Terminal**



#### Rear Panel



The GPE-3060/6030 are high-resolution linear DC power supplies. Their primary aim is to replace the existing GPC-3060D/6030D models. The GPE-3060/6030 deliver 385 watts of output power and feature three independent isolated output channels. The GPE-3060 offers CH1/CH2 outputs of 0 to 30V and 0 to 6A, while the GPE-6030 supports CH1/CH2 outputs of 0 to 60V and 0 to 3A. Both models feature CH3 outputs 5.0V at 5A.

Series/Parallel Operation Function - In addition to the independent output between each channel, GPE-3060/6030 can perform series/parallel automatic connection tracking function. Through the parallel or series function, the output of the power supply can be controlled at 30V/12A (parallel) (GPE-3060) or 120V/3A (series) (GPE-6030) and this function can be used on CH1/CH2.

With respect to high resolution, GPE-3060 provides 10mV/2mA and GPE-6030 offers 20mV/1mA. GPE-3060/6030 adopts a new hybrid power supply design, which can save 13% of power consumption compared with the wattage of the conventional linear power supplies, and the volume and weight are significantly reduced.



**GPE-6030** 

## ORDERING INFORMATION

GPE-3060 3-channel, 385W linear DC Power Supply **GPE-6030** 3-channel, 385W linear DC Power Supply

#### ACCESSORIES .

Power Cord

Test Lead: GTL-104A x 3

European Test Leads: GTL-204A x 3, GTL-201A x 1

## DIGITAL PANEL CONTROL





The GPE-3060/6030 linear DC power supplies have a built-in digital panel control design. By long pressing and short pressing a single button, they provide efficient and user-friendly OVP (overvoltage protection) function. The OVP function provides overvoltage protection, and the panel lock function prevents voltage/current parameters from being tampered with by a third party to improve the protection of the DUT. The voltage and current setting knobs are changed to Encoder Switches to make the setting more accurate. In addition, the On/Off output button has a backlight display, which makes it easier for users to identify the current operating status of the power supply.

SPECIFICATIONS					
Model		CDE 2060 / CDE 6020			
		GPE-3060 / GPE-6030	Louis		
Channel	Lyde	CH1&CH2	CH3		
Output	Voltage	0 ~ 30.00V*2 (GPE-3060) / 0 ~ 60.00V*2 (GPE-6030)	5V,±5%		
	Current	0 ~ 6.000A*2 (GPE-3060) / 0 ~ 3.000A*2 (GPE-6030)	5A		
	Voltage/Current(MAX)	32V, 6.2A (GPE-3060) / 62V, 3.2A (GPE-6030)			
	Tracking Series	0 ~ 60V, 0 ~ 6A (GPE-3060) 0 ~ 120V, 0 ~ 3A (GPE-6030)			
	Tracking Parallel	0 ~ 30V, 0 ~ 12A (GPE-3060) 0 ~ 60V, 0 ~ 6A (GPE-6030)			
Load Regulation	Voltage	≤0.01%+5mV ≤0.02%+5mV (≥10A)	≤5mV		
	Current	≤0.1%+3mA			
Line Regulation	Voltage	≤0.01%+3mV	≤3mV		
	Current	≤0.1%+3mA			
Ripple & Noise	Constant Voltage	≤1mVrms (5Hz-1MHz)	≤1mVrms (5Hz-1MHz)		
	Constant Current	≤2mArms			
Setting /Read back Resolution	Voltage(4digits)	10mV (GPE-3060) / 20mV (GPE-6030)			
	Current(4digits)	2mA (GPE-3060) / 1mA (GPE-6030)			
Setting /Read back Accuracy	Voltage	±(0.1% of reading+30mV) (4digits) ±(0.1% of reading+200mV) (3digits)			
	Current	$\pm$ (0.3% of reading+10mA) (4digits) $\pm$ (0.3% of reading+20mA) (3digits)			
Recovery Time		$\leq$ 100 $\mu$ s (50% load change, minimum load 0.5A)	≤100μs		
Temperature Coefficient		≤300ppm/°C			
Tracking Operation	Series Regulation	Tracking error: ≤ 0.1% +10mV of Master (GPE-3060) ≤ 0.2% +20mV of Master (GPE-6030) (No Load, with load add load regulation ≤ 200mV)			
		Line : ≤ 0.01% + 5mV			
		Load : ≤ 200mV			
	Parallel Regulation	Line: $\leq 0.01\% + 3mV$ Load: $\leq 0.01\% + 5mV$ $\leq 0.02\% + 5mV (\geq 10A)$			
	Ripple & Noise	≤2mVrms(5Hz~1MHz)			
OVP	Voltage	OFF,ON (1V ~ 35.0V) (GPE-3060) OFF,ON (1V ~ 65.0V) (GPE-6030)	5.5V		
1	Resolution	1V			
	Setting Accuracy	≤±1V			
Protection	OVP	•			
Insulation	Chassis and Terminal 20M $\Omega$ or all Chassis and AC cord 30M $\Omega$ or about				
Features	Display	4.3"monochrome LCD			
	Inter-channel Isolation	•			
	Independent Output	•			
	Key Lock	•			
	Intelligent Cooling Fan	•			
	Power ON/OFF State Setting	•			
	EXT I/O Control	•			
	Display	4.3" single color LCD			
Power	Consumption	900VA,680W			
	AC Input	100V/120V/220V/230Vac±10%, 50/60Hz			
Dimensions & Weight		210 (W) x 155 (H) x 362 (D) mm, 10kg			

## B. SERIES/PARALLEL OPERATION FUNCTION



In addition to the independent output between each channel, GPE-3060/6030 can perform series/parallel automatic connection tracking function. Through the parallel or series function, the output of the power supply can be controlled at 30V/12A (parallel) (GPE-3060) or 120V/3A (series) (GPE-6030) and this function can be used on CH1/CH2.

#### C. OPTIMIZATION OF HEAT DISSIPATION



There are air inlet ducks in front of the panel to efficiently dissipate heat. Temperature controlled fan can effectively reduce fan noise.

## HIGH MEASUREMENT RESOLUTION (SETTING AND READBACK FUNCTIONS)



With respect to high measurement resolution, GPE-3060 provides 10mV/2mA and GPE-6030 offers 20mV/1mA with a readback accuracy of 30mV/10mA. GPE-3060/6030 ensure that the power output is pure and stable.

Users can easily apply the series to simulate the DUT with very small voltages or currents. Conventional low-resolution linear DC power supplies cannot achieve this function.

## PANEL OUTPUT ON/OFF OR REAR PANEL REMOTE CONTROL OUTPUT ON/OFF FUNCTION



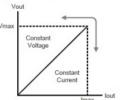


GPE-3060/6030 provide the output On/Off function. This function can avoid unnecessary damage caused by pre-output when the DUT is connected to the power supply. Users can set the voltage and current parameters in advance and confirm all connections have been completed, and manually execute output On/Off function through the front panel. Furthermore, the series provides a simple analog control function to control external output On/Off through the Remote Control terminal on the rear panel.

#### F. OPERATING MODE

#### C.V. and C.C Operation Mode

In constant voltage (CV) mode, the current limit must be set to determine its crossover point, and in constant current (CC) mode, the voltage limit must be set to determine its crossover point. When the current exceeds the crossover point, the power supply mode will switch to constant current (CC) mode.



#### Series and Parallel Mode

When the CH1/CH2 of GPE-3060/6030 linear DC power supply are in parallel connection, the total output current will increase. While in series conditions, the total output voltage will increase to twice the original single channel rated output (maximum value). Users only need to press the required series or parallel button on the front panel to perform series or parallel operation.

#### **Remote Control Settings**

GPE-3060/6030 provide a simple Remote Control function. Remote Output On/Off control can be performed through this connector. The pin definitions are as follows:



7 & 8 Short circuit is the setting of remote control.

At this time, the On/Off on the front panel will keep flashing.
9 & 10 Open circuit is the status of remote control Output On.

Power

9 & 10 Open circuit is the status of remote control Output On.
9 & 10 Short circuit is the status of remote control Output Off.

Remote Control Setting

#### **Key Lock Function**

When users output voltage and current under fixed conditions to the power supply for a long time, users can start the panel lock function to protect the safety of the DUT in order to prevent a third party other than the user from arbitrarily changing the setting parameters and causing damage to the DUT.

# **Multiple Output Linear DC Power Supply**



## **GPE-X323 Series**



#### **FEATURES**

- \* 1/2/3/4 Independent Isolated Output
- \* 4.3 Inch LCD Display
- \* Setting & Read Back Resolution 100mV/10mA (\*1)
- \* Output ON/OFF Switch
- \* Analog Control (Remote I/O) for Output ON/OFF
- \* Set View Function for Checking an Original V/I Setting During Output On
- \* Key Lock Function
- \* Tracking Series and Parallel Operation
- \* Optional European Jack Type Terminal

## **European Type Jack Terminal**



## Rear Panel



GPE-4323

The GPE-X323 series is a cutting edge, economical linear DC Power supply. The GPE-X323 series features output power from 192 to 217 watts, three independent isolated output channels (for GPE-3323), high resolution, low noise, high reliability, and compact size. The GPE-X323 series has a built-in digital panel control design to replace conventional control method. This unique design allows the GPE-X323 series linear DC power supply to provide users with more efficient functionalities, including set view and key lock so as to expedite the operation process. The key lock function protects DUTs by preventing others from changing voltage and current parameters. Additionally, output key light facilitates users in clearly reading the operational status of power supply.

SPECIFICATIONS	SPECIFICATIONS									
SPECIFICATIONS		GPE-4	323		C	GPE-3323		GPE-2323		GPE-1326
OUTPUT MODE	7	O1 L-4	323		0.23323			GIL	2323	G1 L-1320
	CH1	CH2	CH3	CH4	CH1	CH2	СН3	CH1	CH2	CH1
Number of Channel					0~32V		5V		0~32V	
Voltage Current				0~1A		0~32V	5A		0~32V	0~32V 0~6A
Tracking Series Voltage			U~IA	U~IA			JA.			U~0A
Tracking Parallel Current	0~6			_ ;		64V 6A	-		64V 6A	
CONSTANT VOLTAGE					0~	bA		0~	ъΑ	
Line Regulation	≦0.01	250 St 450 S	·/							
Load Regulation	707-111-55-600-6			na curr	ent ≦3	(A)				
Load Regulation					ent $\geq 3$					
Ripple & Noise	≦0.02 ≤1mV				ciit > 3	'A)				
Recovery Time					ge, min	imum l	oad 0	.5A)		
CONSTANT CURREN			(0.73), 7.07(0)	-	, ,					
Line Regulation	≤0.2%	\$*************								
Load Regulation										
Ripple & Noise		≦0.2%+3mA ≤3mArms								
	GOPERATION (CH1,CH2)									
		,			0 2010		1		1 . 111	
Tracking Error					0~32V)	No Lo	ad, w	ith Loa	d add l	oad
5 11 5 1	regulation≤100mV) Line:≤0.01%+3mV									
Parallel Regulation   Line: ≤0.01%+3mV   Load: ≤0.01%+3mV (rating current≤3A)										
Series Regulation					ng curre d : ≦10		A)			
	≤2mV			3.00	u . ≦ 10	JOHN				
Ripple & Noise	100000000000000000000000000000000000000		112~1	IVITIZ						
CH3 OPERATION FO	_									
Output Voltage	5.0V, ±	5%								
Output Current	5A									
Line Regulation	≦3mV									
Load Regulation	≦5mV									
Ripple & Noise	1mVrn	ıs (5Hz	~IMI	Hz)						
METER										
Voltage Resolution	100mV									
Current Resolution	10mA									
Setting Accuracy										g +6mA)
Readback Accuracy	Voltage	e±(0.19	% of re	eading	+30mV	); Curr	ent±(	0.3% of	readin	g +6mA)
INSULATION										
Chassis and Terminal	20ΜΩ									
Chassis and AC Cord			ve (D	C 500V	)					
ENVIRONMENT CON										
Operation Temp	0~40°C									
Storage Temp	-10~70									
Operating Humidity	≦80%									
Storage Humidity	≦70%	RH								
OTHER										
Power Source	AC100	V/120\	//220\	V±10%	; 230V(	+10%~	-6%);	50/601	Hz	
Dimensions & Weight	AC100V/120V/220V±10%; 230V(+10%~-6%); 50/60Hz 210(W)x 155(H) x 306(D) mm; Approx. 7kg									

## ORDERING INFORMATION

GPE-1326	Single Channel, 192W Linear DC Power Supply
GPE-2323	2 Channels, 192W Linear DC Power Supply
GPE-3323	3 Channels, 217W Linear DC Power Supply
GPE-4323	4 Channels, 212W Linear DC Power Supply
ACCESSOR	IES :
Power Cord	c1
GPE-1326	Test Lead GTL-104A x 1; GTL-105A x 1; or European GTL-204A x 1, GTL-203A x 1
GPE-2323	Test Lead GTL-104Ax 2; or European GTL-204A x 2
GPE-3323	Test Lead GTL-104Ax 3 : or European GTL-204A x 3

Test Lead GTL-104A x 2; GTL-105A x 2 or European GTL-204A x 2, GTL-203A x 2

Note: (\*1) For a higher resolution (10mV/1mA), please follow the setting procedure of the user manual on p35.

When using a higher resolution, the current or voltage adjustment may be limited by the knob sensibility.

# **Multiple Output Linear DC Power Supply**



The GPS Series linear power supplies have 2-4 independent output channels, 180W to 200W output, overload and reverse polarity protection as well as an output ON/OFF switch for safety. The tracking mode switches allow voltage/current to be output in parallel or series and the intelligent fan reduces noise. The GPS-Series is an entry level general purpose power supply recognized for their affordability in education, laboratories and industry.

## GPS-2303/3303/4303



## **FEATURES**

- \* 2, 3 and 4 Independent Isolated Output
- \* Four "3 Digits" LED Displays
- \* 0.01% Load and Line Regulation
- \* Low Ripple and Noise
- \* Tracking Operation and Auto Series/Parallel Operation
- \* Output ON/OFF Switch
- \* Output Voltage and Current Setting When Output Disable (Except for GPS-2303)
- \* Fan Speed Control Circuit to Minimize Fan Noise
- \* Over Load and Reverse Polarity Protection
- \* Optional European Jack Type Terminal

## **European Type Jack Terminal**



## GPS-001 Voltage/Current protection Knob



## Rear Panel



GPS-3303

SPECIFICATIONS											
		GPS-4303		GPS-	3303	GPS-2303					
OUTPUT MODE											
	CH1 CH2	CH3	CH4	CH1 CH2	CH3	CH1 CH2					
Voltage	0 ~ 30V	2.2 ~ 5.2V	8 ~ 15V	0 ~ 30V	5V Fixed	0 ~ 30V					
Current	0 ~ 3A	1A Max.	1A Max.	0 ~ 3A	3A Max.	0 ~ 3A					
Tracking Series Voltage	0 ~ 60V	0 ~ 60V 0 ~ 60V 0 ~ 0									
Tracking Parallel Current	0 ~ 6A										
CONSTANT VOLTAGE	OPERATION (	PERATION (CH1, CH2)									
Line Regulation	≤ 0.01% + 3	mV									
Load Regulation		$\leq$ 0.01% + 3mV (rating current $\leq$ 3A) $\leq$ 0.02% + 5mV (rating current > 3A)									
Ripple & Noise		≤ 1mVrms , 5Hz ~ 1MHz									
Recovery Time	≤ 100 µS (50	% Load chang	ge, Minimum I	oad 0.5A)							
CONSTANT CURRENT	OPERATION	(CH1, CH2)									
Line Regulation	≤ 0.2% + 3m	nΑ									
Load Regulation	≤ 0.2% + 3m	ıΑ									
Ripple & Noise	≤ 3mArms										
TRACKING OPERATIO											
Tracking Error	≤ 0.5% + 10										
Series Regulation Load Regulation	≤ 0.01% + 5 < 300mV	mv									
Ripple & Noise		5Hz ~ 1MHz									
CH3 OPERATION (for	r GPS-3303/4	303)									
CH3 Voltage	GPS-4303 : 2	2.2V ~ 5.2V , C	PS-3303 : 5V	Fix							
Line Regulation	<u>&lt;</u> 5mV										
Load Regulation	≤ 15mV										
Ripple & Noise		Hz ~ 1MHz									
Current Output		A, GPS-3303	: 3A								
CH4 OPERATION (fo											
CH4 VOLTAGE Line Regulation	8V ~ 15V < 5mV										
Load Regulation	< 10mV										
Ripple & Noise		Hz~1MHz									
Current Output	1A										
METER											
Digital	3 digits 0.5" LED display GPS-4303/3303 Out ON Accuracy ± (0.5% of rdg + 2 digits) GPS-4303/3303 Out OFF Accuracy ± (0.5% of rdg + 8 digits)										
	GPS-2303 A	ccuracy <u>+</u> (0.5	% of rdg + 2 d	ligits)							
INSULATION											
Chassis and Terminal Chassis and AC Cord											
POWER SOURCE											
AC 100V/120V/220V±10	0%, 230V(+109	%~-6%), 50/6	OHz								
DIMENSIONS & WEIGH	нт										

## ORDERING INFORMATION

GPS-4303 4-channels, 200W Multiple Output Linear DC Power Supply
GPS-3303 3-channels, 195W Multiple Output Linear DC Power Supply
GPS-2303 2-channels, 180W Multiple Output Linear DC Power Supply

ACCESSORIES : Power cord x 1.

GPS-4303 : Test lead GTL-104A x 2, GTL-105A x 2 ; European test lead GTL-203A x 2, GTL-204A x 2, GTL-201 x 1 GPS-3303 : Test lead GTL-104A x 2, GTL-105A x 1 ; European test lead GTL-203A x 1, GTL-204A x 2, GTL-201 x 1 GPS-2303 : Test lead GTL-104A x 2 ; European test lead GTL-204A x 2, GTL-201A x 1

OPTIONAL ACCESSORIES

GPS-001 Voltage/Current Protection Knob

255 (W) x 145 (H) x 265 (D) mm, Approx. 7 kg

# **Triple Output Linear DC Power Supply**



GPC-3060D/6030D

The GPC-Series is a triple output, 375W, linear DC power supply. Channel 1 and 2 are fully adjustable (model dependant) and channel 3 is fixed at 5V/3A with ripple and noise at less than 2mVrms. Overload and reverse polarity protection keep GPC-Series and its loads safe from unexpected conditions. GPC features continuous or dynamic internal load selection and series or parallel tracking for application flexibility. The GPC-Series is an ideal solution for inexpensive bench-top applications requiring low noise and multiple outputs.

## **FEATURES**

- \* Triple Output
- \* Auto Tracking
- \* Auto Series and Parallel Operation
- \* Constant Voltage and Constant Current
  Operation
- \* Low Ripple and Noise
- \* Internal Select for Continuous or Dynamic Load
- \* Overload and Reverse Polarity Protection
- \* 3 1/2 Digits 0.5" LED Display
- \* 5V, 3A Fixed Output

SPECIFICATIONS	
OPERATION MODE	
Independent	Two independent outputs and 5V fixed output
	Output from 0 to rating volts and 0 to rating amperes
Series	Output from 0 to ± rating volts at rating amperes each
35 650mm	Output from 0 to double rating volts at rating amperes
Parallel	Output from 0 to double rating amperes at rating volts
CONSTANT VOLTAGE OF	ERATION
Regulation	Line regulation ≤ 0.01% + 3mV
	Load regulation ≤0.01% + 3mV (rating current≤3A)
	≤0.01% + 5mV(rating current ≤10A)
NAC 32 22 200 A	≤ 0.02% + 5mV (rating current≥10A)
Ripple & Noise	≤1mVrms 5Hz ~ 1MHz
Recovery Time	≤100µS (50% Load change, Minimum load 0.5A)
CONSTANT CURRENT OF	PERATION
Regulation	Line regulation≤0.2% + 3mA
4.40	Load regulation≤0.2% + 5mA
Ripple Current	≤3mArms
5V FIXED OUTPUT	
Regulation	Line regulation ≤5mV
1779 Address 10 - 1870 - 18	Load regulation ≤10mV
Ripple & Noise	≤2mVrms
Voltage Accuracy	5V±0.25V
Output Current	3A
TRACKING OPERATION	
Tracking Error	$\leq$ 0.5% + 10mV of the master
Series Regulation	≤300mV
METER	
Digital	3½ digits 0.5" LED display
	Accuracy±(0.5% of rdg + 2 digits)
INSULATION	
Chassis and Terminal	100M $\Omega$ or above (DC 1000V)
Chassis and AC Cord	100MΩ or above (DC 1000V)
POWER SOURCE	
AC 100V/120V/220V/240V	±10%, 50/60Hz
DIMENSIONS	
255(W) x 145(H) x 420(D) r	mm

	ORDERING INFORMATION							
	Model	Independent	Series	Parallel	Weight (kg)			
GPC-6030D	375W DC Power Supply	$(0\sim60V/0\sim3A)\times2$ , (5V/3A MAX) $\times1$	120V 3A	60V 6A	18.5			
GPC-3060D	375W DC Power Supply	$(0\sim30V/0\sim6A)~x~2$ , (5V/3A MAX) x 1	60V 6A	30V 12A	18.5			
ACCESSORIES : User manual x 1 , Power cord x 1 Test lead GTL-105A x 1 ( $\leq$ 3A ) or GTL-104A x 2 ( $\leq$ 10A )								
OPTIONAL ACCESSORIES								
GRA-401	Rack Mount Kit							



## **GPR-H Series**



## **FEATURES**

- \* 0.01% High Regulation
- \* Constant Voltage and Constant Current Operation
- \* Internal Select for Continuous or Dynamic Load
- \* Low Ripple and Noise
- \* Overload and Reverse Polarity Protection
- \* 3 1/2 Digit 0.5" LED Display
- \* Internal Select for Continuous or Dynamic Load (for GPR-3510HD/GPR-6060D/ GPR-7550D)

## Rear Panel



The GPR-H Series consists of single output linear DC power supplies with voltage outputs rating from 8V to 300V. The series includes overload and reversed polarity protection to protect devices under test from being damaged due to impropriate operation. The internal select for dynamic loads is often used for amplifier testing. It can support high pulse current derived from dynamic processes as well as support low noise and noise, which make it suitable for high-end bench-top applications requiring precision. Its rear panel supports output wiring. These features combined into one assembly allow the GPR-H Series to predominate in applications requiring high voltage or high current.

SPECIFICATIONS	
CONSTANT VOLTAGE OPER	RATION
Regulation	Line regulation ≤0.01% + 3mV
	Load regulation $\leq 0.01\% + 5$ mV ( $<10$ A) $\leq 0.02\% + 5$ mV ( $>10$ A)
Ripple & Noise	
Recovery Time	≤100 μS (50% load change, minimum load 0.5A)
Output Range	0 to rating voltage continuously adjustable
CONSTANT CURRENT OPE	RATION
Regulation	Line regulation≤0.2% + 3mA
	Load regulation ≤ 0.2% + 5mA
Ripple Current	≤5mArms (≤20A),≤10mArms (≤30A)
Output Range	
	o to rating current continuously adjustable
METER	
Туре	3 1/2 Digit 0.5" LED display
Accuracy	$\pm$ (0.5% of rdg + 2 digits)
INSULATION	
Chassis and Terminal	100M $\Omega$ or above ( DC 1000V )
Chassis and AC Cord	100M $\Omega$ or above ( DC 1000V )
POWER SOURCE	<u> </u>
AC 100V/120V/220V/240V ±1	0%, 50/60Hz
DIMENSIONS	
254(W) x 152(H) x 456(D) mr	n

	ORDERING INFORMATION							
Model		Output Volts (V)	Output Amps (A)	Weight (kg)				
GPR-0830HD	240W DC Power Supply	0 ~ 8	0 ~ 30	18.5				
GPR-1820HD	360W DC Power Supply	0 ~ 18	0 ~ 20	18.5				
GPR-3510HD	350W DC Power Supply	0 ~ 35	0~10	18.5				
GPR-6060D	360W DC Power Supply	0 ~ 60	0 ~ 6	18.5				
GPR-7550D	375W DC Power Supply	0 ~ 75	0~5	18.5				
GPR-11H30D	330W DC Power Supply	0 ~ 110	0 ~ 3	13.5				
GPR-30H10D	300W DC Power Supply	0 ~ 300	0~1	13.5				
ACCESSORIES:  Power cord $x$ 1  Test lead GTL-105A $x$ 1 ( $\le$ 3A) or GTL-104A $x$ 1 ( $\le$ 10A) or Not Available (>10A)								
OPTIONAL AC	CESSORIES							
GTL-122	Test Lead, U-type to Alligator T	est Lead, Max. Curren	t 40A, 1200mm					

Note: C€ Approved Only for GPR-1820HD, GPR-3510HD, GPR-7550D, GPR-11H30D Rear-Panel Output Only for GPR-0830HD, GPR-1820HD

# **Linear DC Power Supply**



The GPR-M Series is a single output, 180W, linear DC power supply which featuring all the same functions as the GPR-H Series but for lower power demands. Like the GPR-H Series, the GPR-M Series is suitable for high-end precision bench top applications. Low load and line regulation for both constant voltage and constant current mode ensure reliable, predictable output. Overload and reverse polarity protection as well as internal selection for dynamic or constant load are standard.

## **GPR-M Series**



#### **FEATURES**

- \* 0.01% High Regulation
- \* Constant Voltage and Constant Current Operation
- \* Internal Select for Continuous or Dynamic Load
- \* Low Ripple and Noise
- \* Overload and Reverse Polarity protection
- \* 3 1/2 Digit 0.5" LED Display

SPECIFICATIONS				
CONSTANT VOLTAGE OPE	RATION			
Regulation Line regulation ≤0.01% + 3mV				
250.25	Load regulation ≤ 0.01% + 5mV (<10A)			
	Load regulation ≤ 0.02% + 5mV (≥10A)			
Ripple & Noise	≤1mVrms 5Hz ~ 1MHz			
Recovery Time Output Range	≤100 μS (50% load change, minimum load 0.5A) 0 to rating voltage continuously adjustable			
CONSTANT CURRENT OPE	ERATION			
Regulation	Line regulation≤0.2% + 3mA			
-	Load regulation≤0.2% + 3mA			
Ripple Current	≤3mArms			
Output Range	0 to rating current continuoulsy adjustable			
METER				
Digital	3 1/2 Digits 0.5" LED display			
8.7%	Accuracy ± (0.5% of rdg + 2 digits)			
INSULATION				
Chassis and Terminal	20M $Ω$ or above ( DC 500V )			
Chassis and AC Cord	$30$ Μ $\Omega$ or above ( DC 500V )			
POWER SOURCE				
AC 100V/120V/220V/240V ±10%, 50/60Hz				
DIMENSIONS				
254(W) x 152(H) x 349(D) mm				

ORDERING INFORMATION								
Model		Output Volts (V)	Output Amps (A)	Weight (kg)				
GPR-1810HD	180W DC Power Supply	0 ~ 18	0 ~ 10	11.5				
GPR-3060D	180W DC Power Supply	0 ~ 30	0 ~ 6	11.5				
GPR-6030D	180W DC Power Supply	0 ~ 60	0 ~ 3	11.5				
ACCESSORIES: Power cord x 1 Test lead GTL-105A x 1 (GPR-6030D) GTL-104A x 1 (GPR-1810HD/3060D)								
OPTIONAL AC	OPTIONAL ACCESSORIES							
GRA-401 Rack A	Adapter Panel (19" , 4U)							



The GPS-Series is a single output, 54W to 90W, linear DC power supply. The GPS-Series has digital display meters with varying power outputs. The GPS-Series features overload and reverse polarity protection as well as high regulation and low ripple/noise that are maintained at 0.01% and < 1mVrms, respectively. Continuous or dynamic internal load selection accommodates applications such as pulsed current. Remote control terminals offer programming and operation from an external device.

## GPS-1830D/1850D/3030D





## **GPS-3030DD**



## **FEATURES**

- \* Light and Compact Design
- \* 0.01% High Regulation
- \* Constant Voltage and Constant Current Operation
- \* Remote Control for External Programmability
- \* Internal Select for Continuous or Dynamic Load
- \* Low Ripple and Noise
- \* Overload and Reverse Polarity Protection
- \* Series or Parallel Operation
- \* Optional European Type Jack Terminal for GPS-3030D/GPS-3030DD

## **European Type Jack Terminal**



CDECIFICATIONS.							
SPECIFICATIONS	CONSTANT VOLTAGE OPERATION						
Regulation	Line regulation ≤ 0.01% + 3mV Load regulation ≤ 0.01% + 3mV (rating current ≤ 3A) ≤ 0.01% + 5mV (rating current > 3A)						
Ripple & Noise	≤0.5mVrms 5Hz ~ 1MHz (rating current≤3A) ≤1mVrms 5Hz ~ 1MHz (rating current>3A)						
Recovery Time	≤ 100 µS (50% load change, minimum load 0.5A)						
Temp. Coefficient	≤300 ppm /°C						
Output Range	0 to rating voltage continuously adjustable						
CONSTANT CURRENT O	PERATION						
Regulation	Line regulation ≤0.2% + 3mA Load regulation ≤0.2% + 3mA						
Ripple Current	≤3mArms						
Output Range	0 to rating current continuously adjustable (Hi/Lo range switchable)						
METER							
Digital	3½ digits 0.5" LED display (GPS-1830D/1850D/3030D) 3½ digits 0.39" LED display (GPS-3030DD) Accuracy ±(0.5% of rdg + 2 digits)						
INSULATION							
Chassis and Terminal	20M $\Omega$ or above (DC 500V)						
Chassis and AC Cord	$30M\Omega$ or above (DC 500V)						
POWER SOURCE							
AC 100V/120V/220V/240V±10%, 50/60Hz							
DIMENSIONS							
128(W) x 145(H) x 285(D) mm							

ORDERING INFORMATION								
	Model	Output Volts(V)	Output Amps(A)	Weight (kg)				
GPS-1830D	54W DC Power Supply	0 ~ 18	0 ~ 3	4				
GPS-1850D	90W DC Power Supply	0 ~ 18	0 ~ 5	5				
GPS-3030D	90W DC Power Supply	0 ~ 30	0 ~ 3	5				
GPS-3030DD	90W DC Power Supply	0 ~ 30	0 ~ 3	5				

## ACCESSORIES:

Power cord x 1

Test lead GTL-105A x 1 ( $\leq$ 3A) or GTL-104A x 1 ( $\leq$ 10A)

European test lead GTL-203A x 1 (  $\leq$  3A )or GTL-204A x 1 ( $\leq$  10A )



## AC/DC POWER SOURCES

GW Instek offers three types of AC Power Sources: Programmable AC/DC Power Source, Programmable Linear AC Power Source, and Linear AC Power Source.

The ASR-3000/ASR-2000 Series serves as both a precision AC/DC power source and a powerful analyzer. It supports AC, DC, and AC+DC outputs, and measures Vrms, Vavg, Vpeak, Irms, IpkH, Iavg, Ipeak, P, S, Q, PF, CF, and harmonics up to the 40th order. It provides four signal sources (INT, EXT, ADD, SYNC) and features a sequence function for arbitrary waveform generation. The series also includes 16 waveform storage slots and 10 panel setting memory slots.

The ASR-6000 Series is GW Instek's first unit supporting AC single/three-phase input/output and rated DC power output. It uses silicon carbide (SiC) technology to offer a high power density of 6kVA in a 4U form factor.

The APS-7000 Series is a programmable linear AC power source with a 2U height and a frequency range of 45-500Hz. Output capacities are 500VA (APS-7050), 1000VA (APS-7100), 2000VA (APS-7200), and 3000VA (APS-7300). It offers nine measurement functions, a user interface similar to an AC power meter, and is ideal for applications requiring high accuracy and low ripple/noise. The APS-7000E Series is a non-programmable option with high precision and THD below 0.5%.

## PRODUCTS

- High-performance AC/DC Power Supply
- Programmable AC/DC Power Source
- Programmable AC Power Source
- AC Power Source

# **AC POWER SOURCES**

## 4.5~24kVA HIGH-PERFORMANCE AC/DC POWER SUPPLY

Model	Output Capacity	Output Freq.	Output Voltage	Max. Current	Display Type	Weight(kg)	Page
ASR-6450	AC 4.5kVA DC 4.5kW	1~2000Hz	Phase Voltage Range 0.0V-175.0V/0.0V-350.0V Line Voltage Range 1P3W: 0.00V-350.0V/0.00V-700.0V 3P4W: 0.00V-303.1V/0.00V-606.2V Setting Resolution 0.01V/0.1V DC Voltage Range -250V-+250V/-500V-+500V	45A/22.5A	LCD	40	
ASR-6450-09	AC 9kVA DC 9kW	1~1000Hz	Phase Voltage Range 0.0V-175.0V/0.0V-350.0V Line Voltage Range 1P3W: 0.00V-350.0V/0.00V-700.0V 3P4W: 0.00V-303.1V/0.00V-606.2V Setting Resolution 0.01V/0.1V DC Voltage Range -250V-+250V/-500V-+500V	90A/45A	LCD	155	
ASR-6450-13.5	AC 13.5kVA DC 13.5kW	1~1000Hz	Phase Voltage Range 0.0V-175.0V/0.0V-350.0V Line Voltage Range 1P3W: 0.00V-350.0V/0.00V-700.0V 3P4W: 0.00V-303.1V/0.00V-606.2V Setting Resolution 0.01V/0.1V DC Voltage Range -250V-+250V/-500V-+500V	135A/67.5A	LCD	200	
ASR-6600	AC 6kVA DC 6kW	1~2000Hz	Phase Voltage Range 0.0V-175.0V/0.0V-350.0V Line Voltage Range 1P3W: 0.00V-350.0V/0.00V-700.0V 3P4W: 0.00V-303.1V/0.00V-606.2V Setting Resolution 0.01V/0.1V DC Voltage Range -250V-+250V/-500V-+500V	60A/30A	LCD	40	D76-85
ASR-6600-12	AC 12kVA DC 12kW	1~1000Hz	Phase Voltage Range 0.0V~175.0V/0.0V~350.0V Line Voltage Range 1P3W: 0.00V~350.0V/0.00V~700.0V 3P4W: 0.00V~303.1V/0.00V~606.2V Setting Resolution 0.01V/0.1V DC Voltage Range -250V~+250V/-500V~+500V	120A/60A	LCD	155	
ASR-6600-18	AC 18kVA DC 18kW	1~1000Hz	Phase Voltage Range 0.0V-175.0V/0.0V-350.0V Line Voltage Range 1P3W: 0.00V-350.0V/0.00V-700.0V 3P4W: 0.00V-303.1V/0.00V-606.2V Setting Resolution 0.01V/0.1V DC Voltage Range -250V-+250V/-500V-+500V	180A/90A	LCD	200	
ASR-6600-24	AC 24kVA DC 24kW	1~550Hz	Phase Voltage Range 0.0V-175.0V/0.0V-350.0V Line Voltage Range 1P3W: 0.00V-350.0V/0.00V-700.0V 3P4W: 0.00V-303.1V/0.00V-606.2V Setting Resolution 0.01V/0.1V DC Voltage Range -250V-+250V/-500V-+500V	240A/120A	LCD	200	

## 2k-4kVA PROGRAMMABLE SWITCHING AC/DC POWER SOURCE

Model	Output Capacity	Output Freq.	Output Voltage	Max. Current	Display Type	Weight(kg)	Page
ASR-3200	2kVA	1~999.9Hz	AC 100V Range 0.0V~200.0V DC 100V Range -285V~+285V AC 200V Range 0.0V~400.0V DC 200V Range -570V~+570V	AC 100V Range 20A DC 100V Range 20A AC 200V Range 10A DC 200V Range 10A	LCD	25	
ASR-3300	3kVA	1~999.9Hz	AC 100V Range 0.0V~200.0V DC 100V Range -285V~+285V AC 200V Range 0.0V~400.0V DC 200V Range -570V~+570V	AC 100V Range 30A DC 100V Range 30A AC 200V Range 15A DC 200V Range 15A	LCD	25	D86-90
ASR-3400	4kVA	1~999.9Hz	AC 100V Range 0.0V~200.0V DC 100V Range -285V~+285V AC 200V Range 0.0V~400.0V DC 200V Range -570V~+570V	AC 100V Range 40A DC 100V Range 40A AC 200V Range 20A DC 200V Range 20A	LCD	25	D86-90
ASR-3400HF	4kVA	1~5000Hz	AC 100V Range 0.0V~200.0V DC 100V Range -285V~+285V AC 200V Range 0.0V~400.0V DC 200V Range -570V~+570V	AC 100V Range 40A DC 100V Range 40A AC 200V Range 20A DC 200V Range 20A	LCD	25	

## PROGRAMMABLE SWITCHING AC/DC POWER SOURCE

Model	Output Capacity	Output Freq.	Output Voltage	Max. Current	Display Type	Weight(kg)	Page
ASR-2050/ ASR-2050R	500VA	1~999.9Hz	AC 100V Range 0.0V-175.0V AC 200V Range 0.0V-350.0V DC 100V Range -250.0V-+250.0V DC 200V Range -500.0V-+500.0V	AC 100V Range 5A AC 200V Range 2.5A DC 100V Range 5A DC 200V Range 2.5A	LCD	11.5 (ASR-2000 Series) 10.5 (ASR-2000R Series)	
ASR-2100/ ASR-2100R	1000VA	1~999.9Hz	AC 100V Range 0.0V-175.0V AC 200V Range 0.0V-350.0V DC 100V Range -250.0V-+250.0V DC 200V Range -500.0V-+500.0V	AC 100V Range 10A AC 200V Range 5A DC 100V Range 10A DC 200V Range 5A	LCD	11.5 (ASR-2000 Series) 10.5 (ASR-2000R Series)	D91-92

## PROGRAMMABLE LINEAR AC POWER SOURCE

Model	Output Capacity	Output Freq.	Output Voltage	Max. Current	Display Type	Weight(kg)	Page
APS-7050	500VA	45~500Hz Option: 45~999.9Hz	0-310V, 0-155V Option: 0-600V	2.1A, 4.2A	LCD	24	
APS-7100	1000VA	45~500Hz Option: 45~999.9Hz	0-310V, 0-155V Option: 0-600V	4.2A, 8.4A	LCD	38	D93-96
APS-7200	2000VA	45-500Hz Option: 45-999.9Hz	0-310V, 0-155V Option: 0-600V	8.4A, 16.8A	LCD	90	D93-96
APS-7300	3000VA	45~500Hz Option: 45~999.9Hz	0-310V, 0-155V Option: 0-600V	12.6A, 25.2A	LCD	128	

## LINEAR AC POWER SOURCE

Model	Output Capacity	Output Freq.	Output Voltage	Max. Current	Display Type	Weight(kg)	Page
APS-7050E	500VA	45~500Hz	0~310V, 0~155V	2.1A, 4.2A	LCD	24	D97-98
APS-7100E	1kVA	45~500Hz	0~310V, 0~155V	4.2A, 8.4A	LCD	38	D97-98

# 4.5/6/9/12/13.5/18/24 kVA High-Performance AC/DC Power Supply



## ASR-6000 Series



**FEATURES** 

- \* Adopts Third-generation Semiconductor Silicon Carbide (SiC) Technology to Create a 4U 6kVA High-performance AC/DC Power Source with High Power Density
- \* AC Input Supports Single-phase and Threephase, Phase Voltage 200V to 240V±10% (Delta or Y Connection) \*1
- \* 10 output Modes: Including External Input Signal Frequency and Mains Synchronization (SYNC), External Voltage Controlled Internal Amplifier Output (VCA)
- \* Multi-channel Output Function
- \* Supports AC 1P2W, 1P3W, 3P4W Output
- \* AC Maximum Output Phase Voltage: 350Vrms Line Voltage: 700Vrms
- AC Balanced and Unbalanced Three-phase,
   Phase Failure Output Functions
- \* Programmable Output Impedance Adjustment
- Dual-channel Voltage/Current Output Monitoring Function
- \* Voltage Output Rise Time Can be Adjusted in Three Ranges<sup>1</sup>
- \* Supports Sequence Editing and Emulation Output Mode
- \* Powerful Arbitrary Waveform Editing and Output Function, Built-in Over 253 Types of Arbitrary Waveform Outputs
- \* Advanced Web Server Control to Support Data Acquisition and Data Logger Both Functions
- \* 100th Order Harmonic Measurement Function
- \* Support Parallel Connection Type Up to 24kVA Maximum
- \* Interfaces: RS-232C, USB, LAN; Opt: CAN BUS, DeviceNet, GPIB

Note: "1 Stand-alone models only.

## GRA-451-J Rack Mount Adapter(JIS)



#### GRA-451-E Rack Mount Adapter(EIA)



From the very moment Alpha Go defeated the human chess champion with its ultra-high-speed computing capability, artificial intelligence technology (AI) has developed rapidly around the world. Today, servers with advanced AI functions process tremendous amounts of data under the high-speed computing architecture of 2 CPUs + 8 GPUs. servers require a huge amount of power to maintain high-speed computing! In order to meet this demand, the power, density and efficiency of server power supplies have been greatly improved. High-power server power modules require high-efficiency conversion and saving of power consumption. AC single-phase input, HVDC 400V input or increased DC voltage output designs can be utilized to achieve this purpose. In order to ensure power stability when high-power servers are operating, power modules with hot-swappable redundant power supply specifications (such as CRPS) have been widely applied in server racks. Power modules with redundant functions require testing of multiple power modules at a time to ensure that all modules can maintain normal operation during high power output. Due to the rapid changes in the development of server power supplies GW Instek developed the brand new flagship model ASR-6000 series to meet customer needs. ASR-6000 series series has two models - ASR-6450 AC/DC 4.5kVA and ASR-6600 series AC/DC 6kVA.

ASR-6000 series is the first stand-alone unit from GW Instek that supports AC single/three-phase input and output, and has rated DC power output. The series employs third-generation semiconductor silicon carbide (SiC) technology to create a 4U 6kVA high power density and high-performance AC/DC power source ASR-6000 series has the ability to emulate more diverse power environment changes, such as balanced three-phase and unbalanced three-phase, phase failure, and features multi-channel output function in three-phase output mode, programmable output impedance adjustment, and up to tens of thousands of arbitrary waveform outputs. The invincible launch of GW Instek flagship model ASR-6000 series demonstrates that GW Instek can provide a complete test solution for high-power AC sources. ASR-6000 series is the MVP of GW Instek power sources.

ASR-6450-13.5/6600-18 (Three units)

## ASR-6450-24 (Four units)

## ASR-6450-09/6600-12 (Two units)







## ORDERING INFORMATION

ASR-6450 4.5kVA High-Performance AC/DC Power Supply

ASR-6450-09
ASR-6450-13.5
ASR-6600
ASR-6600-12
ASR-6600-18
ASR-6600-24
ASR-6450-09
ASR-6400-09
ASR-640

#### ACCESSORIES :

Input terminal cover, Output terminal cover, Copper plate for delta connection input(Mark 1),

Copper plate for single phase and Y connection input (Mark 2), Copper plate for delta connection input (Mark 3), Copper plate for 1P output (Mark 4)

GRA-451-E Rack mount adapter(EIA) (Stand-alone models only), GTL-246 USB cable (USB 2.0 Type A - Type B cable, approx. 1.2M)

## OPTIONAL ACCESSORIES

ASR-003 **GPIB** Interface Card ASR-004 DeviceNet Interface Card ASR-005 CAN BUS Interface Card ASR-C003 Modbus TCP feature GTL-232 RS-232C Cable, approx. 2M GTL-248 GPIB Cable, approx. 2M For ASR-6450/ASR-6600 use only: **GET-006** Universal Extension ASR-006 External Parallel Cable GRA-451-E Rack mount adapter(EIA) GRA-451-J Rack mount adapter (JIS)

**GPW-008** 6RV3 Power Cord; 10AWG/3C, 3m Max Length, , RV5-5\*3P, RV5-5\*3P UL Type

GPW-012 6RVV5 VDE Power Cord; 2.5mm2/5C, 3m Max Length, RVS3-5\*5P, RVS3-5\*5P VDE Type GPW-013 6RVT5 PSE Power Cord; 2.0mm2/5C, 3m Max Length, RVS2-5\*5P, RVS2-5\*5P PSE Type

GPW-014 6RV4 UL Power Cord; 10AWG/4C, 3m, RV5-5\*4P,RV5-5\*4P UL TYPE

GPW-015 6RVV4 VDE Power Cord; 2.5mm2/4C, 3m Max Length, RVS3-5\*4P, RVS3-5\*4P VDE Type

# 4.5/6/9/12/13.5/18/24 kVA High-Performance AC/DC Power Supply

SPECIFICATIONS						
Model		ASR-6450			ASR-6600	
Input Ratings		, , ,	0430		1311-0000	
		Single-phase ; Three-phase, Delta or Y connection selectable				
Power type		200 Vac to 240 Vac ±10 % phase				
Voltage range Trequency range		47 Hz to 63 Hz	voltage (Delta: L-L, T: L-N)			
Power factor <sup>2</sup>		0.95 or higher (typ.)				
Efficiency <sup>2</sup>		80 % or higher				
Maximum power consumption		6 kVA or lower		8 kVA or lower		
		6 KVA OF IOWER		8 KVA OF IOWER		
AC Output						
Multi-phase output		Single-phase output	Polyphase output	Single-phase output	Polyphase output	
Output capacity		4.5 kVA	1P3W: 3 kVA ; 3P4W: 4.5 kVA	6 kVA	1P3W: 4 kVA ; 3P4W: 6 kVA	
Mode *3		1P2W	1P3W; 3P4W (Y-connection)	1P2W	1P3W; 3P4W (Y-connection)	
Setting mode <sup>"3</sup>		0.001/ 175 01/ / 0.01/ 250 0	Independ, Balanced	-1-1	Independ, Balanced	
nt t	Setting Range <sup>°4</sup>		V (sine and square wave), Setting Re		10.314	
Phase voltage			to 1000 Vpp (triangle and arbitrary w	ave), Setting Resolution: 0.01	Vpp / 0.1 Vpp / 1 Vpp	
	Accuracy <sup>3</sup>	±(0.3 % of set + 0.5 V / 1 V)				
Line voltage setting range <sup>*6</sup>			1P3W: 0.00 V to 350.0 V / 0.00 V to 700.0 V 3P4W: 0.00 V to 303.1 V / 0.00 V to 606.2 V (sine and square wave) Setting Resolution: 0.01 V / 0.1 V		1P3W: 0.00 V to 350.0 V / 0.00 V to 700.0 V 3P4W: 0.00 V to 303.1 V / 0.00 V to 606.2 V (sine and square wave) Setting Resolution: 0.01 V / 0.1 V	
		-	1P3W: 0.00 Vpp to 1000 Vpp / 0.00 Vpp to 2000 Vpp 3P4W: 0.00 Vpp to 866.0 Vpp / 0.00 Vpp to 1732 Vpp (triangle and arbitrary wave) Setting Resolution: 0.01 Vpp / 0.1 Vpp / 1 Vpp		1P3W: 0.00 Vpp to 1000 Vpp / 0.00 Vpp to 2000 Vpp 3P4W: 0.00 Vpp to 866.0 Vpp / 0.00 Vpp to 1732 Vpp (triangle and arbitrary wave) Setting Resolution: 0.01 Vpp / 0.1 Vpp / 1 Vpp	
Maximum current <sup>°7</sup>		45 A / 22.5 A	15 A / 7.5 A	60 A / 30 A	20 A / 10 A	
Maximum peak current <sup>18</sup>		Four times of the maximum RMS	Scurrent			
Load power factor 9		0 to 1 (leading phase or lagging phase, 45 Hz to 65Hz)				
-	Setting range	AC Mode: 15.00 Hz to 2000.0 Hz	, AC+DC Mode: 1.00 Hz to 2000.0 Hz	, Setting resolution: 0.01 Hz /	0.1 Hz	
Frequency	Accuracy	± 0.01% of set				
	Stability 10	± 0.005%				
Output on phase setting range 11	,	0.0° to 359.9° variable (Free / Fix selectable), 0.1° (1 Hz to 500 Hz), 1° (500 Hz to 2000 Hz)				
Output off phase setting range 11		0.0° to 359.9° variable (Free / Fix	selectable), 0.1° (1 Hz to 500 Hz), 1°	(500 Hz to 2000 Hz)		
Setting range of the phase angle *12			3P4W: L2 phase: 0° to 359.9° L3 phase: 0° to 359.9° Setting Resolution: 0.1°		3P4W: L2 phase: 0° to 359.9° L3 phase: 0° to 359.9° Setting Resolution: 0.1°	
Phase angle accuracy *13		***	45 Hz to 65 Hz: ±1.0° 15 Hz to 2000 Hz: ±2.0°	***	45 Hz to 65 Hz: ±1.0° 15 Hz to 2000 Hz: ±2.0°	
DC offset <sup>°14</sup>		± 20 mV (typ.)				
DC Output (Only Single Phase Output	rt)					
Output capacity	-4	41	5 kW		6 kW	
Mode		Floating output, the N terminal of			0.10	
	Setting Range		+500.0 V, Setting Resolution: 0.01 V	/01V		
Voltage	Accuracy °15	±( 0.3 % of set  + 0.3 V / 0.6 V)	7 7 7 7 7 7 1 Setting Resolution: 0.01 V	J V.1. T		
Maximum current °16		45 A / 22.5 A		60 A / 30 A		
		45 A / 22.5 A 60 A / 30 A Four times of the maximum current				
Maximum peak current 17						
Output Stability, Total Harmonic Distortion, Output Vo		AND THE PROPERTY OF THE PROPER				
Line regulation		±0.1% or less (Phase voltage)  ±0.1 V / ±0.2 V, @DC (only single-phase output)  ±0.1 V / ±0.2 V, @45 Hz to 65 Hz (phase voltage, 0 to 100%, via output terminal)  ±0.5 V / ±1.0 V, @all other frequencies (phase voltage, 0 to 100%, via output terminal)				
Distortion of Output 019		<0.3 % @1Hz to 100Hz, <0.5 %	@100.1 Hz to 500 Hz, <1 % @500.1	Hz to 2000 Hz		
Output voltage response time 20		Fast: 50 µs (typ.); Middle:100µs (typ.); Slow: 300 µs (typ.)				
Ripple noise 21		0.5 Vrms / 1 Vrms (TYP)				

- 8. O.5 Vrms / 1 Vrms (TYP)

  \*1 Y connection is three-phase, five-wire, Delta connection is three-phase, four-wire, (Accessories will be provided)

  \*2. In the case of AC-INT mode, the rate output voltage, resistance load at maximum output current, 45 Hz to 65 Hz and sine wave output only.

  \*3. Can be only set in polyphase mode.

  \*4. For phase voltage setting in polyphase output. In balance mode all phase are collectively set and in unbalance mode each phase are individually set.

  \*5. For an output voltage of 10 V to 175 V / 20 V to 350 V, sine wave, an output frequency of 45 Hz to 65 Hz, no load, DC voltage setting 0V (AC+DC mode) and 23°C ± 5°C. For phase voltage setting in the polyphase output.

  \*6. Line voltage only can be set in balance mode.

  \*7. If the output voltage is higher than rated value, this is limited to satisfy the power capacity. If there is the DC superimmpositions, the active current of AC+DC satisfies the maximum current. In the case of 40 Hz or lower or 400 Hz or higher, and that the ambient temperature is 40 degree or higher, the maximum current may decrease.

  \*8. With respect to the capacitor-input rectifying load. Limited by the maximum current.

  \*9. External power injection or regeneration which is over short reverse power flow capacity is not available.

  \*16. If the output voltage is higher than rated value, this is limited to satisfy the power capacity. If there is the AC superimmpositions , the active current of AC+DC satisfies the maximum current. And the ambient temperature is 40 degree or higher, the maximum unrent may decrease.

  \*17. Instantaneous within 3 ms , limited by the maximum current at rated output voltage.

  \*18. For an output voltage of 75 V to 175 V / 150 V to 350 V, a load power factor of 1, stepwise change from an output current of 0 A to maximum current (or its reverse), using the output terminal on the rear panel.

  \*19. 50 % or higher of the rated output voltage, the maximum current or work, AC and AC-DC modes, THD+N. For the polyphase it is a specification for phas

Measured Value Display (All accuracy of the measurement function is indicated for 23 °C±5 °C.)						
		Single-phase output	Polyphase output 16			
	Resolution	0.01 V / 0.1 V				
'oltage <sup>°1°2</sup>	RMS value accuracy	45 Hz to 65 Hz and DC: ± (0.5 % of rdg + 0.5 V / 1 V) 15 Hz to 2000 Hz: ± (0.7 % of rdg + 1 V / 2 V)	45 Hz to 65 Hz: ± (0.5 % of rdg + 0.5 V / 1 V) 15 Hz to 2000 Hz: ± (0.7 % of rdg + 1 V / 2 V)			
	AVG value accuracy	DC: ± ( 0.5 % of rdg  + 0.5 V / 1 V)	DC: ± ( 0.5 % of rdg  + 0.5 V / 1 V)			
	PEAK value accuracy <sup>23</sup>	45 Hz to 65 Hz and DC: ±( 2 % of rdg  + 1 V / 2 V)	45 Hz to 65 Hz: ±( 2 % of rdg  + 1 V / 2 V)			
	Resolution	0.01 A / 0.1 A				
Current <sup>°4</sup>	RMS value accuracy	45 Hz to 65 Hz and DC: ±(0.5 % of rdg + 0.1 A / 0.05 A) 15 Hz to 2000 Hz: ±(0.7 % of rdg + 0.2 A / 0.1 A)	45 Hz to 65 Hz: ±(0.5 % of rdg + 0.05 A / 0.03 A) 15 Hz to 2000 Hz: ±(0.7 % of rdg + 0.1 A / 0.05 A)			
	AVG value accuracy	DC: ± ( 0.5 % of rdg  + 0.2 A / 0.1 A)	DC: ± ( 0.5 % of rdg  + 0.1 A / 0.05 A)			
	PEAK value accuracy*5	45 Hz to 65 Hz and DC: ±( 2 % of rde  + 1 A / 0.5 A)	45 Hz to 65 Hz: ±( 2 % of rde  + 0.5 A / 0.25 A)			

SPECIFICATIONS					
Model			ASR-6450	ASR-6600	
	Active (W)	Resolution	0.1 W /1 W		
	Active (w)	Accuracy*9	±(1 % of rdg + 3 W)	±(1 % of rdg + 1 W)	
Power*7*8	Apparent (VA)	Resolution	0.1 VA / 1 VA		
Power	Apparent (VA)	Accuracy	±(2 % of rdg + 6 VA)	±(2 % of rdg + 2 VA)	
	Reactive (VAR)	Resolution	0.1 VAR / 1 VAR		
	neactive (van)	Accuracy 10	±(2 % of rdg + 6 VAR)	±(2 % of rdg + 2 VAR)	
Power factor	Pan		0.000 to 1.000		
rower ractor		Resolution	0.001		
Harmonic voltage Effectiv		Range	Up to 100th order of the fundamental wave		
value (rms) Percent (%)	•	Full Scale	200 V / 400 V, 100%		
(AC-INT and 50/60 Hz on	M°11	Resolution	0.01 V /0.1 V, 0.1%		
(Ne litt and so/oo tiz on	711	Accuracy 12	Up to 20th: ±(0.2 % of rdg + 0.5 V / 1 V) ; 20th to 100th: ±(0.3 % of rdg	(+ 0.5 V / 1 V)	
Harmonic current		Range Full Scale	Up to 100th order of the fundamental wave		
	Effective value (rms)		63 A / 31.5 A, 100%	21 A / 10.5 A, 100%	
Percent (%)			0.01 A / 0.1 A, 0.1%		
		Accuracy <sup>°13</sup>	Up to 20th: ±(1 % of rdg + 1.5 A / 0.75 A) 20th to 100th: ±(1.5 % of rdg + 1.5 A / 0.75 A)	Up to 20th: ±(1 % of rdg + 0.5 A / 0.25 A) 20th to 100th: ±(1.5 % of rdg + 0.5 A / 0.25 A)	

- \*1. In the polyphase output, the specification is for phase voltage, and the DC average value display cannot be selected.

  \*2. Accuracy values are in the case that the output voltage is within voltage setting range.

  \*3. The accuracy is for output waveform DC or sine wave only.

  \*4. Accuracy values are in the case that the output current is 5% to 100% of the maximum current.

  \*5. The accuracy is for output waveform DC or sine wave only.

  \*6. In the polyphase output, these are the specifications for each phase.

  \*7. For an output voltage of 50 V or greater, an output current in the range of 10 % to 100 % of the maximum current, DC or an output frequency of 45 Hz to 65 Hz.

- \*8. The apparent and reactive powers are not displayed in the DC mode.

  \*9. For the load with the power factor 0.5 or higher.

  \*10. For the load with the power factor 0.5 or lower.

  \*11. The measurement does not conform to the IEC or other standard. Phase Voltage and Phase Current.

  \*12. For an output voltage of 10 V to 175 V / 20 V to 350 V.

  \*13. An output current in the range of 5 % to 100 % of the maximum current.

Others					
Protections			UVP, OVP, OCP, OTP, OPP, Fan Fail, Peak and RMS Current Limit		
Parallel function			Up to 3 units		
Display			TFT-LCD, 7 inch		
Memory function					
memory function	Number of m		Store and recall settings, Basic settings: 10		
	Number of memories		253 (nonvolatile)		
Arbitrary Wave	Waveform length		4096 words		
	Amplitude resolution		16 bits		
General Specificatio	ns				
		USB	Type A: Host, Type B: Slave, Speed: 1.1/2.0, USB-CDC / USB-TMC		
	Standard.	LAN	MAC Address, DNS IP Address, User Password, Gateway IP Address, Instrument IP Address, Subnet Mask		
	Standard	External	External Signal Input; External Control I/O; V/I Monitor Output		
Interface		RS-232C	Complies with the EIA-RS-232 specifications		
	Optional 1	GPIB	SCPI-1993, IEEE 488.2 compliant interface		
	Optional 2	CAN Bus	Complies with CAN 2.0A or 2.0B based protocol		
	Optional 3	DeviceNet	Complies with CAN 2.0A or 2.0B based protocol		
Insulation resistance			DC 500 V, 30 MΩ or more		
Withstand voltage	Between input and chassis, output and chassis, input and output		AC 1500 V or DC 2130 V , 1 minute		
ЕМС			EN 61326-1 (Class A) EN 61326-2-1/-2-2 (Class A) EN 61000-3-2/-3-12 (Class A, Group 1) EN 61000-3-3/-3-11 (Class A, Group 1) EN 61000-4-2/-4-3/-4-4/-4-5/-4-6/-4-8/-4-11/-4-34 (Class A, Group 1) EN 55011 (Class A, Group 1)		
Safety			EN 61010-1		
Vibration, Shock and 1	ransportation Inte	egrity	ISTA 2A Test Procedure		
Environment	Operating environment		Indoor use, Overvoltage Category II		
	Operating temperature range		0 °C to 40 °C		
	Storage temperature range		-10 °C to 70 °C		
	Operating humidity range		20 %rh to 80 % RH (no condensation)		
	Storage humidity range		90 % RH or less (no condensation)		
	Altitude		Up to 2000 m		
	Altitude				
Dimensions (mm)	Altitude		430(W)×176(H)×590(D) (not including protrusions)		

A value with the accuracy is the guaranteed value of the specification. However, an accuracy noted as reference value shows the supplemental data for reference when the product is used, and is not under the guarantee. A value without the accuracy is the nominal value or representative value (shown as typ.). Product specifications are subject to change without notice.



# 4.5/6/9/12/13.5/18/24 kVA High-Performance AC/DC Power Supply

CRECIPICATIONS.							
SPECIFICATIONS		150 5150 00		ACD ((00.30			
Model		ASR-6450-09 ASR-6600-12		6600-12			
Input Ratings							
Power type		Three-phase Three-wire Delta con Three-phase Four-wire Y connection					
Voltage range <sup>*1</sup>		200 Vac to 240 Vac (Phase Voltage) 380 Vac to 460 Vac (Line Voltage)					
Frequency range		47 Hz to 63 Hz					
Power factor *2		0.95 or higher (typ.)					
Efficiency <sup>2</sup>		80 % or higher					
Maximum power consumption		12 kVA or lower		16 kVA or lower			
AC output							
Multi-phase output		Single-phase output	Polyphase output	Single-phase output	Polyphase output		
Output capacity		9 kVA	1P3W: 6 kVA 3P4W: 9 kVA	12 kVA	1P3W: 8 kVA 3P4W: 12 kVA		
Mode		1P2W	1P3W 3P4W (Y-connection)	1P2W	1P3W 3P4W (Y-connection)		
Setting mode <sup>3</sup>			Unbalance, Balanced	,000	Unbalance, Balanced		
	Catting Dance 14		V (sine and square wave), Setting Resoluti				
Phase voltage	Setting Range <sup>*4</sup>		to 1000 Vpp (triangle and arbitrary wave),	Setting Resolution: 0.01 Vpp / 0.1 Vpp /	1 Vpp		
	Accuracy <sup>05</sup>	±(0.3 % of set + 0.5 V / 1 V)					
	,		1P3W: 0.00 V to 350.0 V / 0.00 V to 700.0 V and 700.0 V and 700.0 V to 303.1 V / 0.00 V to 606.2 V (sine and square wave)  Setting Resolution: 0.01 V / 0.1 V		1P3W: 0.00 V to 350.0 V / 0.00 V to 700.0 V 3P4W: 0.00 V to 303.1 V / 0.00 V to 606.2 V (sine and square wave) Setting Resolution: 0.01 V / 0.1 V		
Line voltage setting range <sup>46</sup>		-	1P3W: 0.00 Vpp to 1000 Vpp / 0.00 Vpp to 2000 Vpp 3P4W: 0.00 Vpp to 866.0 Vpp / 0.00 Vpp to 1732 Vpp (triangle and arbitrary wave) Setting Resolution: 0.01 Vpp / 0.1 Vpp / 1 Vpp	-	1P3W: 0.00 Vpp to 1000 Vpp / 0.00 Vpp to 2000 Vpp 3P4W: 0.00 Vpp to 866.0 Vpp / 0.00 Vpp to 1732 Vpp (triangle and arbitrary wave) Setting Resolution: 0.01 Vpp / 0.1 Vpp / 1 Vpp		
Maximum current <sup>°7</sup>		90 A / 45 A	30 A / 15 A	120 A / 60 A	40 A / 20 A		
Maximum peak current <sup>®</sup>		Four times of the maximum RMS current					
Load power factor*9	Ta	0 to 1 (leading phase or lagging phase, 45 Hz to 65Hz)					
	Setting range	AC Mode: 15.00 Hz to 1000.0 Hz, AC+DC Mode: 1.00 Hz to 1000.0 Hz, Setting resolution: 0.01 Hz / 0.1 Hz					
Frequency	Accuracy	± 0.01% of set ± 0.005%					
Output on phase setting range 111	Stability 10	± 0.005%  0.0° to 359.9° variable (Free / Fix selectable), 0.1° (1 Hz to 500 Hz), 1° (500 Hz to 1000 Hz)					
Output of phase setting range "11		0.0° to 359.9° variable (Free / Fix selectable), 0.1° (1 Hz to 500 Hz), 1° (500 Hz to 1000 Hz)					
Setting range of the phase angle 112			3P4W: L2 phase: 0" to 359.9" L3 phase: 0" to 359.9" Setting Resolution: 0.1" 45 Hz to 65 Hz: ±1.0"		3P4W: L2 phase: 0" to 359.9" L3 phase: 0" to 359.9" Setting Resolution: 0.1" 45 Hz to 65 Hz: ±1.0"		
Phase angle accuracy <sup>*13</sup>			45 Hz to 65 Hz: ±1.0° 15 Hz to 1000 Hz: ±2.0°		45 Hz to 65 Hz: ±1.0° 15 Hz to 1000 Hz: ±2.0°		
DC offset*14		± 20 mV (typ.)					
	DC output (only single phase output)						
Output capacity		9 kW 12 kW			kW		
Mode		Floating output, the N terminal can be grounded					
Voltage	Setting Range	-250.0 V to +250.0 V / -500.0 V to +500.0 V, Setting Resolution: 0.01 V / 0.1 V					
Accuracy 13		±( 0.3 % of set  + 0.3 V / 0.6 V) 90 A / 45 A 120 A / 60 A					
Maximum current <sup>v16</sup>							
Maximum peak current 17	Output voltage data		Four times of the maximum current				
Output Stability, Total Harmonic Distortion, Output voltage risin Line regulation		g time and Ripple noise  ±0.1% or less (Phase voltage)					
		±0.5 V / ±1.0 V (phase voltage)					
Load regulation "18 Distortion of Output" 13		±0.5 V / ±1.0 V (phase voltage, 0 to 100%, via output terminal) <0.3 % @1Hz to 100Hz, <0.5 % @100.1 Hz to 500 Hz, <1 % @500.1 Hz to 1000 Hz					
Output voltage response time 20		Middle: 100 µs (typ.); Slow: 300 µs					
Ripple noise <sup>221</sup>		0.5 Vms / 1 Vms / 1 Vms / 1 Vms					

- \*1 Y connection is three-phase, five-wire, Delta connection is three-phase, four-wire. (Accessories will be pro
- \*2. In the case of AC-INT mode, the rate output voltage, resistance load at maximum output current,45 Hz to 65 Hz and sine wave output only.

  \*3. Can be only set in polyphase mode.

- \*4. For phase voltage setting in polyphase output. In balance mode all phase are collectively set and in unbalance mode each phase are individually set.

  \*5. For an output voltage of 10 V to 175 V / 20 V to 350 V, sine wave, an output frequency of 45 Hz to 65 Hz, no load, DC voltage setting 0V (AC+DC mode) and 23 °C ± 5 °C. For phase voltage setting in the polyphase output.
- \*6. Line voltage only can be set in balance mode.
- \*6. Line voltage only can be set in basince mode.

  \*7. If the output voltage is higher than rated value, this is limited to satisfy the power capacity. If there is the DC superimmpositions, the active current of AC+DC satisfies the maximum current. In the case of 40 Hz or lower or 400 Hz or higher, and that the ambient temperature is 40 degree or higher, the maximum current may decrease.

  \*8. With respect to the capacitor-input rectifying load. Limited by the maximum current.

  \*9. External power injection or regeneration which is over short reverse power flow capacity is not available.

  \*16. If the output voltage is higher than rated value, this is limited to satisfy the power capacity. If there is the AC superimmpositions, the active current of AC+DC satisfies the maximum current. And the ambient

- temperature is 40 degree or higher, the maximum current may decrease. \*17. Instantaneous within 3 ms , limited by the maximum current at rated out
- um current at rated output voltage.
- \*18. For an output voltage of 75 V to 175 V f 150 V to 350 V, a load power factor of 1, stepwise change from an output current of 0 A to maximum current (or its reverse), using the output terminal on the rear panel.

  \*19. 50 % or higher of the rated output voltage, the maximum current or lower, AC and AC+DC modes, THD+N. For the polyphase it is a specification for phase voltage setting.

  \*20. For an output voltage of 100 V / 200 V, a load power factor of 1, with respect to stepwise change from an output current of 0 A to the maximum current (or its reverse). 10% 90% of output voltage.

  \*21. For 5 Hz to 1 MHz components in DC mode using the output terminal on the rear panel.

Measured value display (All accuracy of the measurement function is indicated for 23 °C±5 °
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		Single-phase output	Polyphase output <sup>6</sup>	
	Resolution	0.01 V / 0.1 V		
Voltage <sup>e1+2</sup>	RMS value accuracy	45 Hz to 65 Hz and DC: ± (0.5 % of rdg + 0.5 V / 1 V) 15 Hz to 1000 Hz: ± (0.7 % of rdg + 1 V / 2 V)	45 Hz to 65 Hz: ± (0.5 % of rdg + 0.5 V / 1 V) 15 Hz to 1000 Hz: ± (0.7 % of rdg + 1 V / 2 V)	
	AVG value accuracy	DC: ± ( 0.5 % of rdg  + 0.5 V / 1 V)	DC: ± ( 0.5 % of rdg  + 0.5 V / 1 V)	
	PEAK value accuracy <sup>3</sup>	45 Hz to 65 Hz and DC: ±( 2 % of rdg  + 1 V / 2 V)	45 Hz to 65 Hz: ±( 2 % of rdg  + 1 V / 2 V)	
Current*4	Resolution	0.01 A / 0.1 A		
	RMS value accuracy	45 Hz to 65 Hz and DC: ±(0.5 % of rdg + 0.2 A / 0.1 A) 15 Hz to 1000 Hz: ±(0.7 % of rdg + 0.4 A / 0.2 A)	45 Hz to 65 Hz: ±(0.5 % of rdg + 0.1 A / 0.05 A) 15 Hz to 1000 Hz: ±(0.7 % of rdg + 0.2 A / 0.1 A)	
	AVG value accuracy	DC: ± ( 0.5 % of rdg  + 0.4 A / 0.2 A)	DC: ± ( 0.5 % of rdg  + 0.2 A / 0.1 A)	
	PEAK value accuracy 5	45 Hz to 65 Hz and DC: ±( 2 % of rdg  + 2 A / 1 A)	45 Hz to 65 Hz: ±( 2 % of rdg  + 1 A / 0.5 A)	

SPECIFICATIONS						
Model			ASR-6450-09	ASR-6600-12		
Power*7*8	Active (W)	Resolution	0.1 W / 1 W / 10 W			
	Active (w)	Accuracy 9	±(2 % of rdg + 6 W)	±(2 % of rdg + 2 W)		
	Apparent (VA)	Resolution	0.1 VA / 1 VA / 10VA			
ower	Apparent (VA)	Accuracy	±(2 % of rdg + 9 VA)	±(2 % of rdg + 3 VA)		
	Reactive (VAR)	Resolution	0.1 VAR / 1 VAR / 10VAR			
	wearnie (Awa)	Accuracy 10	±(2 % of rdg + 9 VAR)	±(2 % of rdg + 3 VAR)		
Power factor Ran		Range	0.000 to 1.000			
		Resolution	0.001			
farmonic voltage		Range	Up to 100th order of the fundamental wave			
iffective value (rms)		Full Scale	200 V / 400 V, 100%			
Percent (%)		Resolution	0.01 V /0.1 V, 0.1%			
		Accuracy <sup>*12</sup>	Up to 20th: ±(0.2 % of rdg + 0.5 V / 1 V) 21th to 100th: ±(0.3 % of rdg + 0.5 V / 1 V)			
Harmonic current		Range	Up to 100th order of the fundamental wave			
farmonic current (ffective value (rms)		Full Scale	126 A / 63 A, 100% 42 A / 21 A, 100%			
Percent (%) (AC-INT and 50/60 Hz only)*11		Resolution	0.01 A / 0.1 A, 0.1%			
		Accuracy*13	Up to 20th: ±(1 % of rdg + 3 A / 1.5 A) 21th to 100th: ±(1.5 % of rdg + 3 A / 1.5 A)	Up to 20th: ±(1 % of rdg + 1 A / 0.5 A) 21th to 100th: ±(1.5 % of rdg + 1 A / 0.5 A)		

- a1. In the polyphase output, the specification is for phase voltage, and the DC average value display cannot be selected.
  a2. Accuracy values are in the case that the output voltage is within voltage setting range.
  a3. The accuracy is for output waveform DC or sine wave only.
  a4. Accuracy values are in the case that the output current is 5% to 100% of the maximum current.
  55. The accuracy is for output waveform DC or sine wave only.
  a6. In the polyphase output, these are the specifications for each phase.
  77. For an output voltage of 50 V or greater, an output current in the range of 10 % to 100 % of the maximum current, DC or an output frequency of 4S Hz to 65 Hz.

- \*8. The apparent and reactive powers are not displayed in the DC mode.

  \*9. For the load with the power factor 0.5 or higher.

  \*10. For the load with the power factor 0.5 or lower.

  \*11. The measurement does not conform to the IEC or other standard.

  Phase Voltage and Phase Current.

  \*12. For an output voltage of 10 V to 175 V / 20 V to 350 V.

  \*13. An output current in the range of 5 % to 100 % of the maximum current.

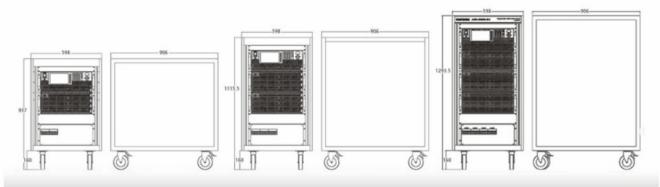
Others						
Protections			UVP, OVP, OCP, OTP, OPP, Fan Fail, Peak and RMS Current Limit			
Display			TFT-LCD, 7 inch			
Memory function			Store and recall settings, Basic settings: 10			
	Number of me	mories	253 (nonvolatile)			
Arbitrary Wave	Waveform length		4096 words			
	Amplitude rese	olution	16 bits			
General Specification	ıs					
		USB	Type A: Host, Type B: Slave, Speed: 2.0, USB-CDC / USB-TMC			
		LAN	MAC Address, DNS IP Address, User Password, Cateway IP Address, Instrument IP Address, Subnet Mask			
	Standard	External	External Signal Input; External Control I/O; V/I Monitor Output			
Interface		RS-232C	Complies with the EIA-RS-232 specifications			
	Optional 1	GPIB	SCPI-1993, IEEE 488.2 compliant interface			
	Optional 2	CAN Bus	Complies with CAN 2.0A or 2.0B based protocol			
	Optional 3	Device Net	Complies with CAN 2.0A or 2.0B based protocol			
Insulation resistance			DC 500 V, 30 MΩ or more			
Withstand voltage	Between input and chassis, output and chassis, input and output		AC 1500 V or DC 2130 V , 1 minute			
EMC			EN 61326-1 (Class A) EN 61326-2-1/-2-2 (Class A) EN 61300-3-2 (Class A, Group 1) EN 61000-3-3 (Class A, Group 1) EN 61000-4-2/-4-3/-4-6/-4-5/-4-6/-4-8/-4-11 (Class A, Group 1) EN 61000-4-2/-4-3/-4-6/-4-5/-4-6/-4-8/-4-11 (Class A, Group 1)			
Safety			EN 61010-1			
Environment	Operating env	ironment	Indoor use, Overvoltage Category II			
	Operating tem	perature range	0 °C to 40 °C			
	Storage temperature range		-10 °C to 70 °C			
	Operating humidity range		20 %rh to 80 % RH (no condensation)			
	Storage humidity range		90 % RH or less (no condensation)			
	Altitude		Up to 2000 m			
Dimensions (mm)			598(W)×937(H)×906(D) (not including protrusions)			
Weight			Approx. 155 kg			

A value without the accuracy is the nominal value or representative value (shown as typ.). Product specifications are subject to change without notice.

#### ASR-6450-09/ASR-6600-12 Dimensions (mm)

#### ASR-6450-13.5/ASR-6600-18 Dimensions (mm)

#### ASR-6600-24 Dimensions (mm)



# 4.5/6/9/12/13.5/18/24 kVA High-Performance AC/DC Power Supply

SPECIFICATIONS							
Model	Model		ASR-6450-13.5		ASR-6600-18		
Input Ratings	Input Ratings						
Power type		Three-phase Three-wire Do Three-phase Four-wire Y o					
Voltage range*1	Voltage range*1		200 Vac to 240 Vac (Phase Voltage) 380 Vac to 460 Vac (Line Voltage)				
Frequency range		47 Hz to 63 Hz					
Power factor <sup>2</sup>		0.95 or higher (typ.)					
Efficiency <sup>52</sup>		80 % or higher		24 13/4 1			
Maximum power consumption		18 kVA or lower 24 kVA or lower					
AC Output							
Multi-phase output		Single-phase output	Polyphase output	Single-phase output	Polyphase output		
Output capacity	-	13.5 kVA	1P3W: 9 kVA 3P4W: 13.5 kVA	18 kVA	1P3W: 12 kVA 3P4W: 18 kVA		
Mode		1P2W	1P3W 3P4W (Y-connection)	1P2W	1P3W 3P4W (Y-connection)		
Setting mode "3		***	Unbalance, Balanced		Unbalance, Balanced		
	Setting Second	0.00 V to 175.0 V / 0.0 V to	350.0 V (sine and square wave), Setting	Resolution: 0.01 V / 0.1 V			
Phase voltage	Setting Range <sup>*4</sup>	0.00 Vpp to 500.0 Vpp / 0.	00 Vpp to 1000 Vpp (triangle and arbitrar		Vpp / 0.1 Vpp / 1 Vpp		
	Accuracy <sup>5</sup>	±(0.3 % of set + 0.5 V / 1	/)				
Line voltage setting range <sup>*6</sup>			1P3W: 0.00 V to 350.0 V / 0.00 V to 700.0 V 3P4W: 0.00 V to 303.1 V / 0.00 V to 606.2 V (sine and square wave) Setting Resolution: 0.01 V / 0.1 V		1P3W: 0.00 V to 350.0 V / 0.00 V to 700.0 V 3P4W: 0.00 V to 303.1 V / 0.00 V to 606.2 V (sine and square wave) Setting Resolution: 0.01 V / 0.1 V		
			1P3W: 0.00 Vpp to 1000 Vpp / 0.00 Vpp to 2000 Vpp 3P4W: 0.00 Vpp to 366.0 Vpp / 0.00 Vpp to 1732 Vpp (triangle and arbitrary wave) Setting Resolution: 0.01 Vpp / 0.1 Vpp / 1 Vpp		1P3W: 0.00 Vpp to 1000 Vpp / 0.00 Vpp to 2000 Vpp 3P4W: 0.00 Vpp to 866.0 Vpp / 0.00 Vpp to 1732 Vpp (triangle and arbitrary wave) Setting Resolution: 0.01 Vpp / 0.1 Vpp / 1 Vpp		
Maximum current*7		135 A / 67.5 A	45 A / 22.5 A	180 A / 90 A	60 A / 30 A		
Maximum peak current <sup>°8</sup>		Four times of the maximu					
Load power factor <sup>*9</sup>		0 to 1 (leading phase or lagging phase, 45 Hz to 65Hz)					
	Setting range	AC Mode: 15.00 Hz to 1000.0 Hz, AC+DC Mode: 1.00 Hz to 1000.0 Hz, Setting resolution: 0.01 Hz / 0.1 Hz			0.1 Hz		
Frequency	Accuracy	± 0.01% of set					
0.1-1	Stability*10	± 0.005%  0.0° to 350.0° veriable /Free / Fix colortable) 0.3° /3 Hz to 500 Hz) 3° /500 Hz to 3000 Hz)					
Output on phase setting range *11 Output off phase setting range *11		0.0° to 359.9° variable (Free / Fix selectable), 0.1° (1 Hz to 500 Hz), 1° (500 Hz to 1000 Hz)  0.0° to 359.9° variable (Free / Fix selectable), 0.1° (1 Hz to 500 Hz), 1° (500 Hz to 1000 Hz)					
			3P4W: L2 phase: 0° to 359.9°		3P4W: L2 phase: 0° to 359.9°		
Setting range of the phase angle*12		***	L3 phase: 0° to 359.9° Setting Resolution: 0.1°	***	L3 phase: 0" to 359.9" Setting Resolution: 0.1"		
Phase angle accuracy*13			45 Hz to 65 Hz: ±1.0° 15 Hz to 1000 Hz: ±2.0°		45 Hz to 65 Hz: ±1.0° 15 Hz to 1000 Hz: ±2.0°		
DC Offset <sup>"14</sup>		± 20 mV (typ.)					
DC output (only single phase output)							
Output Capacity		13.5 kW 18 kW		18 kW			
Mode		Floating output, the N ten					
Voltage	Setting Range		0.0 V to +500.0 V, Setting Resolution: 0.01	V / 0.1 V			
Accuracy		±( 0.3 % of set  + 0.3 V / 0.6 V)  135 A / 67.5 A 180 A / 90 A					
Maximum current <sup>*16</sup> Maximum peak current <sup>*17</sup>		135 A / 67.5 A 180 A / 90 A Four times of the maximum current					
	ion Output volto						
Output Stability, Total Harmonic Distortion, Output voltage rising time and Ripple noise							
Line regulation		±0.1% or less (Phase voltage)					
Load regulation of Output 119		±0.5 V / ±1.0 V (phase voltage, 0 to 100%, via output terminal)  <0.3 % @1Hz to 100Hz, <0.5 % @100.1 Hz to 500 Hz, <1 % @500.1 Hz to 1000 Hz					
Distortion of Output 138 Output voltage response time 29		Middle: 100 µs (typ.); Slow: 300 µs (typ.)					
Ripple noise *21		0.5 Vrms / 1 Vrms (TYP)					
ruppine mones							

- P1 Y connection is three-phase, five-wire, Delta connection is three-phase, four-wire. (Accessories will be provided)
  2. In the case of AC-INT mode, the rate output voltage, resistance load at maximum output current,45 Hz to 65 Hz and sine wave output only.
- \*3. Can be only set in polyphase mode.
   \*4. For phase voltage setting in polyphase output. In balance mode all phase are collectively set and in unbalance mode each phase are individually set.
- \*5. For an output voltage of 10 V to 175 V / 20 V to 350 V, sine wave, an output frequency of 45 Hz to 65 Hz, no load, DC voltage setting 0V (AC+DC mode) and 23 °C ± 5 °C. For phase voltage setting in the polyphase output.
- \*6. Line voltage only can be set in balance mode.

  \*7. If the output voltage is higher than rated value, this is limited to satisfy the power capacity. If there is the DC superimmpositions, the active current of AC+DC satisfies the maximum current. In the case of 40 Hz or higher, and that the ambient temperature is 40 degree or higher, the maximum current may decrease.

  \*8. With respect to the capacitor-input rectifying load. Limited by the maximum current.

  \*9. External power injection or regeneration which is over short reverse power flow capacity is not available.

  \*16. If the output voltage is higher than rated value, this is limited to satisfy the power capacity. If there is the AC superimmpositions, the active current of AC+DC satisfies the maximum current. And the ambient temperature is 40 degrees or higher than rated value, this is limited to satisfy the power capacity. If there is the AC superimmpositions are current of AC+DC satisfies the maximum current.
- temperature is 40 degree or higher, the maximum current may decrease, †17. Instantaneous within 3 ms , limited by the maximum current at rated output voltage.
- \*18. For an output voltage of 75 V to 175 V / 150 V to 350 V, a load power factor of 1, stepwise change from an output current of 0 A to maximum current (or its reverse), using the output terminal on the rear panel. \*19. 50 % or higher of the rated output voltage, the maximum current or lower, AC and AC+DC modes, THD+N. For the polyphase it is a specification for phase voltage setting. \*20. For an output voltage of 100 V / 200 V, a load power factor of 1, with respect to stepwise change from an output current of 0 A to the maximum current (or its reverse). 10% 90% of output voltage. \*21. For 5 Hz to 1 MHz components in DC mode using the output terminal on the rear panel.

Model			ASR-6450-13.5	ASR-6600-18	
Measured value dis	play (All accuracy o	f the measureme	ent function is indicated for 23 °C±5 °C.)		
measured value dis	pia) (riii accaiac) o	Tine measureme	Single-phase output	Polyphase output*6	
	Resolution		0.01 V / 0.1 V	r oryphase output	
Voltage*1°2	RMS value accur	асу	45 Hz to 65 Hz and DC: ± (0.5 % of rdg + 0.5 V / 1 V) 15 Hz to 1000 Hz: ± (0.7 % of rdg + 1 V / 2 V)	45 Hz to 65 Hz: ± (0.5 % of rdg + 0.5 V / 1 V) 15 Hz to 1000 Hz: ± (0.7 % of rdg + 1 V / 2 V)	
	AVG value accur	acy	DC: ± ( 0.5 % of rdg  + 0.5 V / 1 V)	DC: ± ([0.5 % of rdg] + 0.5 V / 1 V)	
	PEAK value accu	racy <sup>°3</sup>	45 Hz to 65 Hz and DC: ±( 2 % of rdg  + 1 V / 2 V)	45 Hz to 65 Hz: ±( 2 % of rdg  + 1 V / 2 V)	
	Resolution		0.01 A / 0.1 A		
Current <sup>°4</sup>	RMS value accur	асу	45 Hz to 65 Hz and DC: ±(0.5 % of rdg + 0.3 A / 0.15 A) 15 Hz to 1000 Hz: ±(0.7 % of rdg + 0.6 A / 0.4 A)	45 Hz to 65 Hz: ±(0.5 % of rdg + 0.15 A / 0.08 A) 15 Hz to 1000 Hz: ±(0.7 % of rdg + 0.3 A / 0.15 A)	
	AVG value accur	acy	DC: ± ( 0.5 % of rdg  + 0.6 A / 0.4 A)	DC: ± ([0.5 % of rdg] + 0.3 A / 0.15 A)	
	PEAK value accu	racy <sup>5</sup>	45 Hz to 65 Hz and DC: ±( 2 % of rdg  + 3 A / 1.5 A)	45 Hz to 65 Hz: ±( 2 % of rdg  + 1.5 A / 0.75 A)	
	Active (W)	Resolution	0.1 W / 1 W / 10 W	•	
	Active (w)	Accuracy 19	±(2 % of rdg + 6 W)	±(2 % of rdg + 2 W)	
Power*7*8	Apparent (VA)	Resolution	0.1 VA / 1 VA / 10VA	No. 1990 Personal Property Co.	
Power	Apparent (VA)	Accuracy	±(2 % of rdg + 9 VA)	±(2 % of rdg + 3 VA)	
	Reactive (VAR)	Resolution	0.1 VAR / 1 VAR / 10VAR	A CONTRACTOR OF THE PROPERTY O	
	Reactive (VAR)	Accuracy *10	±(2 % of rdg + 9 VAR)	±(2 % of rdg + 3 VAR)	
Power factor		Range	0.000 to 1.000		
ower mesor		Resolution	0.001		
Harmonic voltage		Range	Up to 100th order of the fundamental wave		
Effective value (rms)		Full Scale	200 V / 400 V, 100%		
Percent (%)		Resolution	0.01 V /0.1 V, 0.1%		
(AC-INT and 50/60 Hz only)*11 Accuracy*12		Accuracy <sup>°12</sup>	Up to 20th: ±(0.2 % of rdg + 0.5 V / 1 V) 21th to 100th: ±(0.3 % of rdg + 0.5 V / 1 V)		
		Range	Up to 100th order of the fundamental wave		
Harmonic current		Full Scale	189 A / 94.5 A, 100%	63 A / 31.5 A, 100%	
Effective value (rms) Percent (%)		Resolution	0.01 A / 0.1 A, 0.1%		
(AC-INT and 50/60 Ha	c only)*11	Accuracy*13	Up to 20th: ±(1 % of rdg + 3 A / 1.5 A) 21th to 100th: ±(1.5 % of rdg + 3 A / 1.5 A)	Up to 20th: ±(1 % of rdg + 1 A / 0.5 A) 21th to 100th: ±(1.5 % of rdg + 1 A / 0.5 A)	

- \*1. In the polyphase output, the specification is for phase voltage, and the DC average value display cannot be selected.

- \*1. In the polyphase output, the specification is for phase voltage, and the DC average value display cannot be selected \$2. Accuracy values are in the case that the output voltage is within voltage setting range.
  \*3. The accuracy is for output waveform DC or sine wave only.
  \*4. Accuracy values are in the case that the output current is 5% to 100% of the maximum current.
  \*5. The accuracy is for output waveform DC or sine wave only.
  \*6. In the polyphase output, these are the specifications for each phase.
  \*7. For an output voltage of 50 V or greater, an output current in the range of 10 % to 100 % of the maximum current, DC or an output frequency of 45 Hz to 65 Hz.

- \*8. The apparent and reactive powers are not displayed in the DC mode.

  \*9. For the load with the power factor 0.5 or higher.

  \*10. For the load with the power factor 0.5 or lower.

  \*11. The measurement does not conform to the IEC or other standard.

  Phase Voltage and Phase Current.

  \*12. For an output voltage of 10 V to 175 V / 20 V to 350 V.

  \*13. An output current in the range of 5 % to 100 % of the maximum current.

Others				
Protections			UVP, OVP, OCP, OTP, OPP, Fan Fail, Peak and RMS Current Limit	
Display			TFT-LCD, 7 inch	
Memory function			Store and recall settings, Basic settings: 10	
Number of memories		mories	253 (nonvolatile)	
Arbitrary Wave	Waveform length		4096 words	
	Amplitude reso	lution	16 bits	
<b>General Specification</b>	is			
		USB	Type A: Host, Type B: Slave, Speed: 2.0, USB-CDC / USB-TMC	
	Standard		MAC Address, DNS IP Address, User Password, Gateway IP Address, Instrument IP Address, Subnet Mask	
8-A-38-97	Standard	External	External Signal Input; External Control I/O; V/I Monitor Output	
Interface		RS-232C	Complies with the EIA-RS-232 specifications	
	Optional 1	GPIB	SCPI-1993, IEEE 488.2 compliant interface	
	Optional 2	CAN Bus	Complies with CAN 2.0A or 2.0B based protocol	
	Optional 3	Device Net	Complies with CAN 2.0A or 2.0B based protocol	
Insulation resistance	Between input and chassis, in	and chassis, output put and output	DC 500 V, 30 MΩ or more	
Withstand voltage	Between input and chassis, in	and chassis, output put and output	AC 1500 V or DC 2130 V , 1 minute	
EMC			EN 61326-1 (Class A) EN 61326-2-1/-2-2 (Class A) EN 61000-3-2 (Class A, Group 1) EN 61000-3-3 (Class A, Group 1) EN 61000-4-2/-4-3/-4-45/-4-6/-4-8/-4-11 (Class A, Group 1) EN 55011 (Class A, Group1)	
Safety			EN 61010-1	
Environment	Operating envi	ronment	Indoor use, Overvoltage Category II	
	Operating temp	perature range	0 °C to 40 °C	
	Storage temperature range -10 °C to 70 °C		-10 °C to 70 °C	
	Operating hum	nidity range	20 %rh to 80 % RH (no condensation)	
	Storage humidi	ity range	90 % RH or less (no condensation)	
	Altitude		Up to 2000 m	
Dimensions (mm)			598(W)×1116(H)×906(D) (not including protrusions)	
Weight			Approx. 200 kg	

A value with the accuracy is the guaranteed value of the specification. However, an accuracy noted as reference value shows the supplemental data for reference when the product is used, and is not under the guarantee. A value without the accuracy is the nominal value or representative value (shown as typ.). Product specifications are subject to change without notice.

# 4.5/6/9/12/13.5/18/24 kVA High-Performance AC/DC Power Supply

SPECIFICATIONS				
Model		ASR-6	600-24	
Input Ratings				
Power type		Three-phase Three-wire Delta connection Three-phase Four-wire Y connection		
Voltage range <sup>*1</sup>		200 Vac to 240 Vac (Phase Voltage) 380 Vac to 460 Vac (Line Voltage)		
Frequency range		47 Hz to 63 Hz		
Power factor*2		0.95 or higher (typ.)		
Efficiency*2		80 % or higher		
Maximum power consumption		32 kVA or lower		
AC Output				
Multi-phase output		Single-phase output	Polyphase output	
Output capacity		24 kVA	1P3W: 18 kVA 3P4W: 24 kVA	
Mode		1P2W	1P3W 3P4W (Y-connection)	
Setting mode <sup>+3</sup>		***	Unbalance, Balanced	
	Setting Range*4	0.00 V to 175.0 V / 0.0 V to 350.0 V (sine and square wave), Setting		
Phase voltage	Setting Kange	0.00 Vpp to 500.0 Vpp / 0.00 Vpp to 1000 Vpp (triangle and arbitrary wave), Setting Resolution: 0.01 Vpp / 0.1 Vpp / 1 Vpp		
	Accuracy <sup>15</sup>	±(0.3 % of set + 0.5 V / 1 V)		
Line voltage setting range*6		ins	1P3W: 0.00 V to 350.0 V / 0.00 V to 700.0 V 3P4W: 0.00 V to 303.1 V / 0.00 V to 606.2 V (sine wave only) Setting Resolution: 0.01 V / 0.1 V	
Maximum current <sup>*7</sup>		240 A / 120 A	80 A / 40 A	
Maximum peak current <sup>18</sup>		Four times of the maximum RMS current		
Load power factor*9		0 to 1 (leading phase or lagging phase, 45 Hz to 65Hz)		
	Setting range	AC Mode: 15.00 Hz to 550.0 Hz, AC+DC Mode: 1.00 Hz to 550.0 Hz, Setting resolution: 0.01 Hz / 0.1 Hz		
Frequency	Accuracy	± 0.01% of set		
0.10.10.10.10.10.10.10.10.10.10.10.10.10	Stability*10	± 0.005%	1° (500 H= to 550 H=)	
Output on phase setting range 111 Output off phase setting range 111		0.0° to 359.9° variable (Free / Fix selectable), 0.1° (1 Hz to 500 Hz), 1° (500 Hz to 550 Hz)  0.0° to 359.9° variable (Free / Fix selectable), 0.1° (1 Hz to 500 Hz), 1° (500 Hz to 550 Hz)		
Setting range of the phase angle *12			3P4W: L2 phase: 0* to 359.9* L3 phase: 0* to 359.9* Setting Resolution: 0.1*	
Phase angle accuracy*13		ne.	45 Hz to 65 Hz: ±1.0° 15 Hz to 550 Hz: ±2.0°	
DC offset <sup>*14</sup>		± 20 mV (typ.)		
DC output (only single phase output)				
Output Capacity		24	kW	
Mode		Floating output, the N terminal can be grounded		
Voltage Setting Range		-250.0 V to +250.0 V / -500.0 V to +500.0 V, Setting Resolution: 0.01 V / 0.1 V		
Maximum current <sup>e16</sup>	Accuracy*15	±( 0.3 % of set  + 0.3 V / 0.6 V) 240 A / 120 A		
Maximum current Maximum peak current 17		Four times of the maximum current		
Output Stability, Total Harmonic Distort	ion. Output volta			
Line regulation	ion, output voita	±0.1% or less (Phase voltage)		
Load regulation*18		±1 V / ±2 V (phase voltage, 0 to 100%, via output terminal)		
Distortion of Output <sup>*19</sup>		<0.3 % @1Hz to 100Hz, <0.5 % @100.1 Hz to 550 Hz		
Output voltage response time*20		Medium: 100 μs (typ.) ; Slow: 300 μs (typ.)		
Ripple noise*21		0.5 Vrms / 1 Vrms (TYP)		

- \*1 Y connection is three-phase, five-wire, Delta connection is three-phase, four-wire. (Accessories will be provided)
  \*2. In the case of AC-INT mode, the rate output voltage, resistance load at maximum output current,45 Hz to 65 Hz and sine wave output only.

- \*3. Can be only set in polyphase mode.

  \*4. For phase voltage setting in polyphase output. In balance mode all phase are collectively set and in unbalance mode each phase are individually set.

  \*5. For an output voltage of 10 V to 175 V / 20 V to 350 V, sine wave, an output frequency of 45 Hz to 65 Hz, no load, DC voltage setting 0V (AC+DC mode) and 23°C ± 5°C. For phase voltage setting in the
- 6. Line voltage only can be set in balance mode.
- \*6. Line voltage only can be set in balance mode.

  \*7. If the output voltage is higher than rated value, this is limited to satisfy the power capacity. If there is the DC superimmpositions, the active current of AC+DC satisfies the maximum current. In the case of 40 Hz or lower or 400 Hz or higher, and that the ambient temperature is 40 degree or higher, the maximum current may decrease.

  \*8. With respect to the capacitor-input rectifying load. Limited by the maximum current.

  \*9. External power injection or regeneration which is over short reverse power flow capacity is not available.

  \*16. If the output voltage is higher than rated value, this is limited to satisfy the power capacity. If there is the AC superimmpositions, the active current of AC+DC satisfies the maximum current. And the ambient temperature is 40 degree or higher, the maximum current may decrease.

  \*17. Instantaneous within 3 ms, limited by the maximum current at rated output voltage.

  \*18. For an output voltage of 75 V to 175 V / 150 V to 350 V, a load power factor of 1, stepwise change from an output current of 0 A to maximum current (or its reverse), using the output terminal on the rear panel.

  \*19. 50 % or higher of the rated output voltage, the maximum current or lower, AC and AC+DC modes, THD+N. For the polyphase it is a specification for phase voltage setting.

  \*20. For an output voltage of 100 V / 200 V, a load power factor of 1, with respect to stepwise change from an output current of 0 A to the maximum current (or its reverse). 10% 90% of output voltage.

Measured value display (All accuracy of the measurement function is indicated for 23 °C±5 °C.)				
		Single-phase output	Polyphase output	
	Resolution	0.01 V / 0.1 V	' '	
Voltage*1+2	RMS value accuracy	45 Hz to 65 Hz and DC: ± (0.5 % of rdg + 0.5 V / 1 V) 15 Hz to 550 Hz: ± (0.7 % of rdg + 1 V / 2 V)	45 Hz to 65 Hz: ± (0.5 % of rdg + 0.5 V / 1 V) 15 Hz to 550 Hz: ± (0.7 % of rdg + 1 V / 2 V)	
	AVG value accuracy	DC: ± ( 0.5 % of rdg  + 0.5 V / 1 V)	DC: ± ( 0.5 % of rdg  + 0.5 V / 1 V)	
	PEAK value accuracy <sup>63</sup>	45 Hz to 65 Hz and DC: ±([2 % of rdg] + 1 V / 2 V)	45 Hz to 65 Hz: ±( 2 % of rdg  + 1 V / 2 V)	
	Resolution	0.01 A / 0.1 A		
Current*4	RMS value accuracy	45 Hz to 65 Hz and DC: ±(0.5 % of rdg + 0.3 A / 0.15 A) 15 Hz to 550 Hz: ±(0.7 % of rdg + 0.6 A / 0.4 A)	45 Hz to 65 Hz: ±(0.5 % of rdg + 0.15 A / 0.08 A) 15 Hz to 550 Hz: ±(0.7 % of rdg + 0.3 A / 0.15 A)	
	AVG value accuracy	DC: ± ( 0.5 % of rdg  + 0.6 A / 0.4 A)	DC: ± ( 0.5 % of rdg  + 0.3 A / 0.15 A)	
	PEAK value accuracy*5	45 Hz to 65 Hz and DC: +(12 % of rdal + 3 A / 1.5 A)	45 Hz to 65 Hz: +/12 % of rdel + 1.5 A / 0.75 A)	

SPECIFICATION	NS				
Model			ASR-6600-24		
Active (W)		Resolution	0.1 W / 1 W / 10 W		
	Accuracy*9	±(2 % of rdg + 9 W)	±(2 % of rdg + 3 W)		
	Apparent (VA)	Resolution	0.1 VA / 1 VA / 10VA		
rower	Apparent (VA)	Accuracy	±(2 % of rdg + 18 VA)	±(2 % of rdg + 6 VA)	
	Reactive (VAR)	Resolution	0.1 VAR / 1 VAR / 10VAR		
	reactive (VAR)	Accuracy <sup>*10</sup>	±(2 % of rdg + 18 VAR)	±(2 % of rdg + 6 VAR)	
Power factor Range		Range	0.000 to 1.000		
ower factor		Resolution	0.001		
		Range	Up to 100th order of the fundamental wave		
Harmonic voltage		Full Scale	200 V / 400 V, 100%		
Effective value (rms) Percent (%)		Resolution	0.01 V /0.1 V, 0.1%		
AC-INT and 50/60 Hz	only)*11	Accuracy*12	Up to 20th: ±(0.2 % of rdg + 0.5 V / 1 V) 21th to 100th: ±(0.3 % of rdg + 0.5 V / 1 V)		
		Range	Up to 100th order of the fundamental wave		
Harmonic current		Full Scale	252 A / 126 A, 100%	84 A / 42 A, 100%	
ffective value (rms)		Resolution	0.01 A / 0.1 A / 1 A, 0.1%	04 N / 42 N, 100/0	
Percent (%)		Kesolution			
(AC-INT and 50/60 Hz	only)*11	Accuracy*13	Up to 20th: ±(1 % of rdg + 3 A / 1.5 A) 21th to 100th: ±(1.5 % of rdg + 3 A / 1.5 A)	Up to 20th: ±(1 % of rdg + 1 A / 0.5 A) 21th to 100th: ±(1.5 % of rdg + 1 A / 0.5 A)	

- \*1. In the polyphase output, the specification is for phase voltage, and the DC average value display cannot be selected.

  \*2. Accuracy values are in the case that the output voltage is within voltage setting range.

  \*3. The accuracy is for output waveform DC or sine wave only.

  \*4. Accuracy values are in the case that the output current is 5% to 100% of the maximum current.

  \*5. The accuracy is for output waveform DC or sine wave only.

  \*6. In the polyphase output, these are the specifications for each phase.

- \*7. For an output voltage of 50 V or greater, an output current in the range of 10 % to 100 % of the maximum current, DC or an output frequency of 45 Hz to 65 Hz.

- \*8. The apparent and reactive powers are not displayed in the DC mode.

  \*9. For the load with the power factor 0.5 or higher.

  \*10. For the load with the power factor 0.5 or lower.

  \*11. The measurement does not conform to the IEC or other standard.

  Phase Voltage and Phase Current.

  \*12. For an output voltage of 10 V to 175 V / 20 V to 350 V.

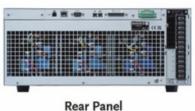
  \*13. An output current in the range of 5 % to 100 % of the maximum current.

Others				
Protections			UVP, OVP, OCP, OTP, OPP, Fan Fail, Peak and RMS Current Limit	
Display			TFT-LCD, 7 inch	
Memory function			Store and recall settings, Basic settings: 10	
Number of memories		mories	253 (nonvolatile)	
Arbitrary Wave Waveform length		gth	4096 words	
	Amplitude rese	olution	16 bits	
General Specification	s			
		USB	Type A: Host, Type B: Slave, Speed: 2.0, USB-CDC / USB-TMC	
		LAN	MAC Address, DNS IP Address, User Password, Gateway IP Address, Instrument IP Address, Subnet Mask	
Standard Interface		External	External Signal Input External Control I/O V/I Monitor Output	
		RS-232C	Complies with the EIA-RS-232 specifications	
	Optional 1	GPIB	SCPI-1993, IEEE 488.2 compliant interface	
	Optional 2	CAN Bus	Complies with CAN 2.0A or 2.0B based protocol	
	Optional 3	Device Net	Complies with CAN 2.0A or 2.0B based protocol	
Insulation resistance		and chassis, output iput and output	DC 500 V, 30 MΩ or more	
Withstand voltage		and chassis, output iput and output	AC 1500 V or DC 2130 V , 1 minute	
EMC			EN 61326-1 (Class A) EN 61326-2-1/-2-2 (Class A) EN 61000-3-2 (Class A, Group 1) EN 61000-3-3 (Class A, Group 1) EN 61000-4-2/-4-3/-4-4/-4-5/-4-6/-4-8/-4-11 (Class A, Group 1) EN 55011 (Class A, Group1)	
Safety			EN 61010-1	
Environment	Operating envi	ironment	Indoor use, Overvoltage Category II	
	Operating tem	perature range	0 °C to 40 °C	
	Storage tempe	rature range	-10 °C to 70 °C	
	Operating hun	nidity range	20 %rh to 80 % RH (no condensation)	
	Storage humid	lity range	90 % RH or less (no condensation)	
	Altitude		Up to 2000 m	
Dimensions (mm) (not	including protrusio	ons)	598(W)×1294(H)×906(D)	
Weight			Approx. 250 kg	

A value with the accuracy is the guaranteed value of the specification. However, an accuracy noted as reference value shows the supplemental data for reference when the product is used, and is not under the guarantee. A value without the accuracy is the nominal value or representative value (shown as typ.). Product specifications are subject to change without notice.

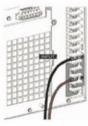
# 4.5/6/9/12/13.5/18/24 kVA High-Performance AC/DC Power Supply







#### SINGLE UNIT PROVIDES AC SINGLE/THREE-PHASE INPUT FUNCTION









ASR-6000 AC Three-phase Input (Delta Connection)



ASR-6000 AC Three-phase Input (Y Connection)

The ASR-6000 series is GW Instek's first programmable AC/DC power source that supports AC single/three-phase input.

AC three-phase input supports delta (Delta) and star (Y) wiring methods

a .ASR-6000 can use mains in most countries around the world (ex. Mainland China, Southeast. Asia, India, Europe...) AC single-phase 220V input can help test software development engineers work with the ASR-6000 on mains in the office. No additional three-phase power source is required.

b. ASR-6000 can be used immediately in various regions around the world and is not affected by differences in power grids in different countries.

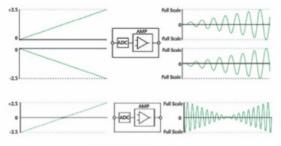
Note: 1. The AC input three-phase Y connection method must be connected to the N wire, otherwise the ASR-6000 cannot be turned on.

2. ASR-6000 AC voltage input range AC 200V ~ AC240V.

#### 10 OUTPUT MODES



### ASR-6000 Has 10 Output Modes



**AC-VCA Output Mode** 

Output Phase	Output Mode			Signal Source		
		INT	EXT	ADD	Sync.	VCA
1P	AC+DC	AC+DC-INT	AC+DC-EXT	AC+DC-ADD	AC+DC-Sync.	N/A
	AC	AC-INT	AC-EXT	AC-ADD	AC-Sync.	AC-VCA
	DC	DC-INT	N/A	N/A	N/A	N/A
193W	AC+DC	AC+DC-INT	AC+DC-EXT	AC+DC-ADD	AC+DC-Sync.	N/A
	AC	AC-INT	AC-EXT	AC-ADD	AC-Sync.	AC-VCA
	DC	DC-INT	N/A	N/A	N/A	N/A
3P	AC+DC	AC+DC-INT	AC+DC-EXT	AC+DC-ADD	AC+DC-Sync.	N/A
	AC	AC-INT	AC-EXT	AC-ADD	AC-Sync.	AC-VCA
	DC	DC-INT	N/A	N/A	N/A	N/A

- AC+DC-INT AC & DC Internal output
- AC-INT AC Internal output
- DC-INT DC Internal output
- AC+DC-EXT AC & DC External output
- AC-EXT AC External output
- AC+DC-ADD AC & DC Additional output
- AC-ADD AC Additional output
- AC+DC-Sync AC & DC Synchronal output
- AC-Sync AC Synchronal output
- AC-VCA AC Voltage Control Amplifier output

A high-performance AC power source = amplifier + signal source It has: internal output + external input signal to control internal output + amplify external input signal. and output, and other diversified output functions. ASR-6000 has up to 10 output modes, including:

- 1.Internal output (INT)
- 2. External input controls internal output (EXT)
- 3.Sum output of external and internal signal sources (ADD)
- 4. Mains frequency synchronous output (SYNC)
- 5. External DC signal controls internal AC amplitude (VCA)

#### AC SINGLE/THREE-PHASE OUTPUT + MULTI-CHANNEL OUTPUT FUNCTION

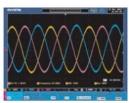


The ASR-6000 series has diverse output functions, including three modes: 1P2W, 1P3W and 3P4W. The maximum output for phase voltage is 350Vrms and the maximum output for line voltage is 700Vrms.

In AC three-phase output (3P4W) mode, each phase supports independent output settings. Taking ASR-6600 as an example, The maximum output of each phase reaches 2kVA, supporting power supply testing of up to three DUTs to meet the needs of server power modules, Testing requirements for high-power AC power products such as electric vehicle chargers and uninterruptible power supply systems.independent output settings. Taking ASR-6600 as an example, The maximum output of each phase reaches 2kVA, supporting power supply testing of up to three DUTs to meet the needs of server power modules, Testing requirements for high-power AC power products such as electric vehicle chargers and uninterruptible power supply systems.

#### D. AC BALANCED/UNBALANCED THREE-PHASE OUTPUT MODES









AC Balanced Three-phase

The ASR-6000 series has unbalanced and balanced three-phase output modes. In the AC three-phase output mode, users can set the phase angles of L1, L2 and L3 for control.

#### AC Unbalanced Three-phase

Main applications: Three-phase input power supply products, when emulating unbalanced three-phase input and phase loss, the ability of three-phase power input products to restore balanced three-phase.

#### E. OUTPUT IMPEDANCE ADJUSTMENT FUNCTION

ASR-6000 has an output impedance adjustment function, which is mainly used to change the output inductance value and output impedance value of each phase to emulate the output voltage drop of each phase due to line loss.

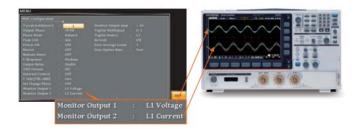
The adjustable range of the output impedance of ASR-6000 is as follows:

L1, L2, L3 Output Inductance	<b>0.0 ~ 2000</b> μH
L1, L2, L3 Output Resistance	0.0 ~ 1Ω

Note: This function only supports stand-alone applications.

This function is automatically turned off in external parallel connection.

#### **VOLTAGE AND CURRENT OUTPUT MONITORING FUNCTIONS**



ASR-6000 provides dual-channel voltage and current monitoring, allowing instant output of voltage and current signals of each phase to an oscilloscope for measurement.

#### G. OUTPUT VOLTAGE RISE TIME IS ADJUSTABLE



In order to meet the test requirements of different DUT output voltages, it is necessary to adjust the rise time of different output voltages. The ASR-6000 offers users up to three adjustable settings: typical values are fast (50 microseconds), medium (100 microseconds) and slow (300 microseconds). ASR-6000 is initially set to medium speed.

Note: When using 1P2W output, impedance adjustment or external parallel connection, the fast range setting will be automatically turned off. Application: It can output high-speed arbitrary waveforms to emulate various changes in the power system caused by transient high-speed rising voltage, etc.

#### ADVANCED WEB SERVER CONTROL FEATURES





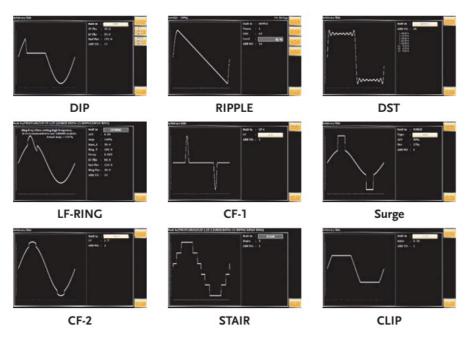


ASR-6000 provides a full range of web control functions, including:

- \* View system and information, and network configuration
- \* Monitor measurements
- \* Set/Operate ASR-6000

- \* Sequence Function/Simulate Function/Edit Waveform
- \* Data logger function

#### **DIVERSE WAVEFORM OUTPUT FUNCTION**



ASR-6000 provides more than 40 built-in waveforms, including: TRI, STAIR, CLIP, CF-1, CF-2, SURGE, DST01-22, RIPPLE, DIP, LF-RING. Each waveform also provides a change setting function, which can modulate thousands of combined waveforms and quickly emulate different AC output environments.

Users can adjust the required waveform type through the panel (the screen is displayed simultaneously), then load it into the ARB 1~16 waveform register through the access step, and return to the main menu output mode to perform ARB Waveform output. Users can also edit waveform through ASR-6000 software and then import it into ASR-6000 for execution.

# Programmable AC/DC Power Source



#### ASR-3000 Series



#### **FEATURES**

- \* Output Rating: AC 0 ~ 400 Vrms, DC 0 ~ ± 570 V
- \* Output Frequency up to 999.9 Hz (5kHz for ASR-3400HF only)
- \* DC Output (100% of Rated Power)
- \* Measurement Items: Vrms, Vavg, Vpeak, Irms, IpkH, lavg, Ipeak, P, S, Q, PF, CF
- \* Voltage and Current Harmonic Analysis (THDv, THDi)
- \* Remote Sensing Capability
- \* OCP, OPP, OTP, AC Fail Detection and Fan Fail Alarm
- \* Support Arbitrary Waveform Function
- \* Output Capacity: 2kVA/3kVA/4kVA
- \* Customized Phase Angle for Output On/Off
- \* Sequence and Simulation Function
- \* Interface(std): USB, LAN, RS-232, GPIB
- \* Built-in External Control I/O and External Signal Input
- \* Built-in Output Relay Control
- \* Memory Function (up to 10 sets)
- \* Built-in Web Server

The ASR-3000 Series is an AC+DC power source, featuring high-speed DC voltage rising and falling time (≤100us). There are four models of the series: ASR-3200(2kVA), ASR-3300(3kVA) and ASR-3400/3400HF (4kVA). The series can provide rated power output during AC output and DC output. Ten ASR-3000 Series output modes are available, including 1) AC power output mode (AC-INT Mode), 2) DC power output mode (DC-INT Mode), 3) AC/DC power output mode (AC+DC-INT Mode), 4) External AC signal source mode (AC-EXT Mode), 5) External AC/DC signal source mode (AC+DC-EXT Mode), 6) External AC signal superimposition mode (AC-ADD Mode), 7) External AC/DC signal superimposition mode (AC+DC-ADD Mode), 8) External AC signal synchronization mode (AC-SYNC Mode), 9) External AC/DC signal synchronization mode (AC+DC-SYNC Mode)10) External DC voltage control of AC output mode (AC-VCA).

ASR-3000 Series is ideal for the development of On-board Chargers, Server Powers, LED modules, AC Motors, AC Fans, UPS and various electronic components, as well as for testing applications of automotive electrical equipment and home appliances.

The ASR-3000 Series provides users with waveform output capabilities including 1) Sequence mode generates waveform fallings, surges, sags, changes and other abnormal power line conditions; 2) Arbitrary waveform function allows users to store/upload user-defined waveforms; and 3) Simulate mode simulates power outage, voltage rise, voltage fall, and frequency variations. When the ASR-3000 Series power source outputs, it can also measure Vrms, Vavg, Vpeak, Irms, Iavg, Ipeak, IpkH, P, S, Q, PF, CF, 100th-order Voltage Harmonic and Current Harmonic. In addition, the remote sensing function ensures accurate voltage output, and the Customized Phase Angle for Output On/Off function can set the start and end angles of the voltage output according to the test requirements. The protection limits of V-Limit, Ipeak-Limit and F-Limit can be set according to user requirements. Over voltage limit, OCP, OPP will protect the DUT during the output process. The Fan Fail Alarm function and the AC fail alarm function are also designed in the ASR-3000 Series.

The front panel of the ASR-3000 Series provides a universal socket or a European socket, which allows users to plug and use so as to save wiring time. Since the power socket specification has a maximum current of 15A, the rear panel of ASR-3000 Series is designed with a current circuit breaker. When the socket current is greater than 15A, it will automatically open the circuit to protect users. The ASR-3000 Series supports I/O interface and is standardly equipped with USB, LAN, External I/O, RS-232C and

ASR-002 External three phase control unit



- \* Basis Requirement of ASR-002 to ASR-Series
- 1. Must be the three same models of ASR-Ser
- 2. To ASR-2000 Series, the Opt01: RS-232+GPIB interface is required
- Functions of ASR-Series are limited when conducts to ASR-002
- No DC Output
   Measurement Items: only current(A), power(W) and PF for each phase
- 3. No Voltage and Current Harmonic Analysis
- No Remote Sensing Capability
   No Arbitrary Waveform Function
   No Sequence and Simulation Function
- 7 Not supported External Control I/O
- No memory Function
   Only support USB, no LAN port for communication

#### GRA-442-J Rack Mount Adapter(JIS)



GRA-442-E Rack Mount Adapter(EIA)



#### GTL-137 Output power wire

APS-008 Air inlet filter

GET-006 Universal extension (AC signel phase 250V/13Amps)







GPW-005 Power cord

GPW-006 Power cord (ASR-3200, ASR-3300 Ues Only)



GPW-007 Power cord



# Programmable AC/DC Power Source

		ASR-3200	ASR-3300	ASR-3400	ASR-3400HF	
INPUT RATING (AC	)		33.55.55.55.55.55			
NOMINAL INPUT V			200 Vac to 240 Vac			
NPUT VOLTAGE R	ZANGE		180 Vac to 264 Vac Single phase, Two-wire			
NOMINAL INPUT F	FREOUENCY		50 Hz to 60 Hz			
NPUT FREQUENCY			47 Hz to 63 Hz			
MAX. POWER CON:			2500 VA or less	3750 VA or less	5000 VA or less	5000 VA or less
POWER FACTOR "1 200Vac MAX. INPUT CURRENT 200Vac		0.95 (TYP)	22.5.4	30 A	30 A	
	EN I 100 V / 200 V (100V / 200V range), r		15 A over factor of 1.	22.5 A	30 A	30 A
	RATINGS (AC rms)					
VOLTAGE Setting Range *1		0.0 V to 200.0 V / 0.0 V to 400.0 V				
		Setting Resolution	0.1 V			
OUTPUT PHASE		Accuracy 12	±(1 % of set + 1 V / 2 V) Single phase, Two-wire			
MAXIMUM CURRE	NT *3	100 V	20 A	30 A	40 A	40 A
	9736 	200 V	10 A	15 A	20 A	20 A
MAXIMUM PEAK C	URRENT *4	100 V 200 V	120 A	180 A	240 A	160 A
LOAD POWER FACT	TOR	200 V	60 A 0 to 1 (leading phase or lagging phas	90 A	120 A	80 A
POWER CAPACITY			2000 VA	3000 VA	4000 VA	4000 VA
FREQUENCY		Setting Range	AC Mode: 40.0 Hz to 999.9 Hz,		VA0-340.	AC Mode: 40.0 Hz to 5000 I
			AC+DC Mode: 1 Hz to 999.9 Hz			AC+DC Mode: 1 Hz to 5000
		Setting Resolution	0.01 Hz (1.00 to 99.99 Hz), 0.1 Hz (100.0 to 999.9 Hz)			0.01 Hz (1.00 to 99.99 Hz), 0.1 Hz (100.0 to 999.9 Hz)
			0.1112 (100.0 to 355.5112)			1 Hz (1000 to 5000 Hz)
		Accuracy	0.02% of set (23 °C ± 5 °C)			,
		Stability *5	± 0.005%	3.01		
OUTPUT ON PHAS	E		0° to 359° variable (setting resolution Within ± 20 mV (TYP)	17)		
*1. 100 V / 200 V range.			WIGHT E 20 HIV (TTP)			
	20 V to 200 V / 40 V to 400 V, an out					
If there is the DC superin	mposition, the current of AC+DC mod	de satisfies the maximum currer	output voltage is 100 V to 200 V / 200 V to 400 V. it. In the case of lower than 40 Hz, and the power rating	emperature, the maximum current will be decrease.		
4. With respect to the capa	citor-input rectifying load. Limited by	the maximum current.	m current, and the operating temperature.			
6. In the case of the AC mo		resistance load for the maximu	m current, and the operating temperature.			
OUTPUT RATING F	OR DC MODE					
VOLTAGE		Setting Range	-285 V to +285 V / -570 V to +570 V 0.1 V			
		Setting Resolution Accuracy *2	±(1 % of set + 1 V / 2 V)			
MAXIMUM CURRE	NT "	100 V	20 A	30 A	40 A	40 A
		200 V	10 A	15 A	20 A	20 A
		200 ¥	10 A	13 /1	20 /1	20 A
MAXIMUM PEAK C	URRENT *4	100 V	120 A	180 A	240 A	160 A
	URRENT <sup>4</sup>		120 A 60 A	180 A 90 A	240 A 120 A	160 A 80 A
POWER CAPACITY	URRENT <sup>4</sup>	100 V	120 A	180 A	240 A	160 A
POWER CAPACITY  *1. 100 V / 200 V range.  *2. For an output voltage of	7-285 V to -28.5 V, +28.5 V to +285 V	100 V 200 V / -570 V to -57 V, +57 V to +570	120 A 60 A 2000 W V, no load, and 23 °C ± 5°C.	180 A 90 A	240 A 120 A	160 A 80 A
POWER CAPACITY  *1. 100 V / 200 V range.  *2. For an output voltage of  *3. For an output voltage of	7-285 V to -28.5 V, +28.5 V to +285 V 11.4 V to 100 V / 2.8 V to 200 V. Limi	100 V 200 V / -570 V to -57 V, +57 V to +570	120 A 60 A 2000 W	180 A 90 A	240 A 120 A	160 A 80 A
POWER CAPACITY  *1. 100 V / 200 V range.  *2. For an output voltage of  *3. For an output voltage of  *4. Limited by the maximum	7-285 V to -28.5 V, +28.5 V to +285 V 71.4 V to 100 V / 2.8 V to 200 V. Limi n current.	100 V 200 V / -570 V to -57 V, +57 V to +570	120 A 60 A 2000 W V, no load, and 23 °C ± 5°C.	180 A 90 A	240 A 120 A	160 A 80 A
POWER CAPACITY  1. 100 V / 200 V range.  2. For an output voltage of  3. For an output voltage of  4. Limited by the maximum  OUTPUT VOLTAGE  LINE REGULATION	7-285 V to -28.5 V, +28.5 V to +285 V 71.4 V to 100 V / 2.8 V to 200 V. Limi n current. STABILITY	100 V 200 V / -570 V to -57 V, +57 V to +570	120 A 60 A 2000 W V, no load, and 23 ℃ ± 5℃. the output voltage is 100 V to 250 V / 200 V to 500 V.  0.296 or less	180 A 90 A 3000 W	240 A 120 A	160 A 80 A
POWER CAPACITY  *1.100 V / 200 V range.  *2. For an output voltage of  *3. For an output voltage of  *4. Limited by the maximum  OUTPUT VOLTAGE  LINE REGULATION  LOAD REGULATION	7-285 V to -28.5 V, +28.5 V to +285 V 71.4 V to 100 V / 2.8 V to 200 V. Limi n current. STABILITY	100 V 200 V / -570 V to -57 V, +57 V to +570	120 A 60 A 2000 W V, no load, and 23 °C ± 5°C. the output voltage is 100 V to 250 V / 200 V to 500 V.  0.2% or less 0.5% or less (0 to 100%, via output vi	180 A 90 A 3000 W	240 A 120 A	160 A 80 A
POWER CAPACITY  *1.100 / 200 V range. *2. For an output voltage of *3. For an output voltage of *4. Limited by the maximum OUTPUT VOLTAGE LINE REGULATION LOAD REGULATION RIPPLE NOISE *9	7-285 V to -28.5 V, +28.5 V to +285 V -2.4 V to 100 V / 2.8 V to 200 V. Limi current. STABILITY	100 V 200 V / 370 V to -57 V, +57 V to +570 to to 1570 tet by the power capacity when	120 A 60 A 2000 W V, no load, and 23 ℃ ± 5℃. the output voltage is 100 V to 250 V / 200 V to 500 V.  0.296 or less	180 A 90 A 3000 W	240 A 120 A	160 A 80 A
POWER CAPACITY  1. 100 V J 200 V range.  12. For an output voltage of  14. United by the maximum  OUTPUT VOLTAGE  LINE REGULATION  RIPPLE NOISE  19. Power source input voltage  17. Power source input voltage  27. For an output voltage of	7-285 V to -28.5 V, +28.5 V to +28.5 V 73.4 V to 100 V / 2.8 V to 200 V. Limi courrent. STABILITY 1 1 1 100 V to 200 V / 200 V, or 240 V, no load 1:00 V to 200 V / 200 V to 4:00 V, a lo	100 V 200 V  ( .370 V to .37 V, +57 V to +570 to to 570 W the power capacity when when the power capacity when the power factor of 1, stepwise c	120 A 60 A 2000 W V, no load, and 23 °C ± 5°C. the output voltage is 100 V to 250 V / 200 V to 500 V.  0.2% or less 0.5% or less (0 to 100%, via output vi	180 A 90 A 3000 W	240 A 120 A 4000 W	160 A 80 A
POWER CAPACITY  *1. 100 V J 200 V range.  *2. For an output voltage of  *3. For an output voltage of  *3. For an output voltage of  *4. Limited by the maximum  OUTPUT VOLTAGE  LINE REGULATION  REPULATION  RIPPLE NOISE  *1. Power source input voltage  *1. For S Hz to 1 MHz com;  *3. For 5 Hz to 1 MHz com;	7-285 V to -28.5 V, +28.5 V to +285 V 7-1.4 V to 100 V / 2.8 V to 200 V. Limi current. STABILITY 91 N 92 age is 200 V, 220 V, or 240 V, no load 100 V to 200 V / 200 V to 400 V, a lo ponents in DC mode using the outpe	100 V 200 V  / 370 V to -57 V , +57 V to +570 to +570 to to +570 to to by the power capacity when the power capacity when the power factor of 1, stepwise c at terminal on the rear panel.	120 A 60 A 2000 W  V, no load, and 23 °C ± 5°C. the output voltage is 100 V to 250 V / 200 V to 500 V.  0.2% or less 0.5% or less (0 to 100%, via output t 1 Vrms / 2 Vrms (TYP)	180 A 90 A 3000 W	240 A 120 A 4000 W	160 A 80 A
POWER CAPACITY  *1.100 V / 200 V range.  *2. For an output voltage of  *3. For an output voltage of  *3. For an output voltage of  *4. Limited by the maximum  OUTPUT VOLTAGE  LINE REGULATION  LOAD REGULATION  LOAD REGULATION  RPPLE NOISE  *1. Power source input voltage  *2. For an output voltage of  *3. For 5H to 1 MHz comp  OUTPUT VOLTAGE	F-285 V to -28.5 V, +28.5 V to +285 V 1.4 V to 100 V / 2.8 V to 200 V. Limi CUTTEN COURTER  STABILITY  1  1  10  10  10  10  10  10  10  10	100 V 200 V  / 370 V to -57 V , +57 V to +570 to +570 to to +570 to to by the power capacity when the power capacity when the power factor of 1, stepwise c at terminal on the rear panel.	120 A 60 A 2000 W V, no load, and 23 °C ± 5°C. the output voltage is 100 V to 250 V / 200 V to 500 V.  0.296 or less 0.5% or less (0 to 100%, via output t 1 Vrms / 2 Vrms (TYP) hange from an output current of 0 A to maximum current LTAGE RESPONSE TIME, EFFICIENCY	180 A 90 A 3000 W	240 A 120 A 4000 W	160 A 80 A 4000 W
POWER CAPACITY  *1. 100 V / 200 V range.  *2. For an output voltage of  *3. For an output voltage of  *3. For an output voltage of  *4. Limited by the maximum  OUTPUT VOLTAGE  LINE REGULATION  LOAD REGULATION  LOAD REGULATION  RIPPLE NOISE  *1. Power source input voltage  *2. For an output voltage of  *3. For 5 Hz to 1 MHz comp  OUTPUT VOLTAGE	7-285 V to -28.5 V, +28.5 V to +285 V 7-1.4 V to 100 V / 2.8 V to 200 V. Limi current. STABILITY 91 N 92 age is 200 V, 220 V, or 240 V, no load 100 V to 200 V / 200 V to 400 V, a lo ponents in DC mode using the outpe	100 V 200 V  / 370 V to -57 V , +57 V to +570 to +570 to to +570 to to by the power capacity when the power capacity when the power factor of 1, stepwise c at terminal on the rear panel.	120 A 60 A 2000 W  V, no load, and 23 °C ± 5°C. the output voltage is 100 V to 250 V / 200 V to 500 V.  0.2% or less 0.5% or less (0 to 100%, via output t 1 Vrms / 2 Vrms (TYP)	180 A 90 A 3000 W	240 A 120 A 4000 W	160 A 80 A
POWER CAPACITY  *1. 100 V / 200 V range.  *2. For an output voltage of  *3. For an output voltage of  *3. For an output voltage of  *4. Limited by the maximum  OUTPUT VOLTAGE  LINE REGULATION  LOAD REGULATION  LOAD REGULATION  RIPPLE NOISE  *1. Power source input voltage  *2. For an output voltage of  *3. For 5 Hz to 1 MHz comp  OUTPUT VOLTAGE	F-285 V to -28.5 V, +28.5 V to +285 V 1.4 V to 100 V / 2.8 V to 200 V. Limi CUTTEN COURTER  STABILITY  1  1  10  10  10  10  10  10  10  10	100 V 200 V  / 370 V to -57 V , +57 V to +570 to +570 to to +570 to to by the power capacity when the power capacity when the power factor of 1, stepwise c at terminal on the rear panel.	120 A 60 A 2000 W V, no load, and 23 °C ± 5°C. the output voltage is 100 V to 250 V / 200 V to 500 V.  0.2% or less 0.5% or less (0 to 100%, via output to 1 Vrms / 2 Vrms (TVP) hange from an output current of 0 A to maximum current LTAGE RESPONSE TIME, EFFICIENCY < 0.2% @50/60Hz	180 A 90 A 3000 W	240 A 120 A 4000 W	160 A 80 A 4000 W <0.2% @50/60Hz <0.5% @<500Hz <1.0% @500.1Hz-2000Hz
POWER CAPACITY  1. 100 V J 200 V range.  12. For an output voltage of  3. For an output voltage of  4. Limited by the maximum  OUTPUT VOLTAGE  LINE REGULATION  LOAD REGULATION  RIPPLE NOISE  1. Power source input voltage of  3. For 3 Hz to 1 MHz comp  OUTPUT VOLTAGE  TOTAL HARMONIC	T-285 V to -28.5 V, +28.5 V to +285 V T1.4 V to 100 V / 2.8 V to 200 V. Limi in current.  STABILITY  19 10 10 10 10 10 10 10 10 10 10 10 10 10	100 V 200 V  / 370 V to -57 V , +57 V to +570 to +570 to to +570 to to by the power capacity when the power capacity when the power factor of 1, stepwise c at terminal on the rear panel.	120 A 60 A 2000 W V, no load, and 23 ℃ ± 5℃. the output voltage is 100 V to 250 V / 200 V to 500 V.  0.296 or less 0.596 or less (0 to 10096, via output to 1 V rms / 2 V rms (TVP)  hange from an output current of 0 A to maximum current LTAGE RESPONSE TIME, EFFICIENCY < 0.2% @50/60Hz < 0.3% @<500Hz < 0.5% @500.1Hz~999.9Hz	180 A 90 A 3000 W	240 A 120 A 4000 W	160 A 80 A 4000 W <0.2% @50/60Hz <0.5% @<500Hz
POWER CAPACITY  1. 100 V J 200 V range.  12. For an output voltage of  14. Limited by the maximum  OUTPUT VOLTAGE  LINE REGULATION  RIPPLE NOISE  11. Power source input voltage  12. For an output voltage of  13. For 5 Hz to 1 MHz comp  OUTPUT VOLTAGE  OUTPUT VOLTAGE  OUTPUT VOLTAGE	F-285 V to -28.5 V, +28.5 V to +285 V 1.4 V to 100 V / 2.8 V to 200 V. Limi CUTTEN COURTER  STABILITY  1  1  10  10  10  10  10  10  10  10	100 V 200 V  / 370 V to -57 V , +57 V to +570 to +570 to to +570 to to by the power capacity when the power capacity when the power factor of 1, stepwise c at terminal on the rear panel.	120 A 60 A 2000 W V, no load, and 23 °C ± 5°C. the output voltage is 100 V to 250 V / 200 V to 500 V.  0.2% or less 0.5% or less (0 to 100%, via output to 1 Vrms / 2 Vrms (TYP) hange from an output current of 0 A to maximum current LTAGE RESPONSE TIME, EFFICIENCY < 0.2% @50/60Hz < 0.3% @<500Hz < 0.5% @500.1Hz~999.9Hz 100 µs (TYP)	180 A 90 A 3000 W	240 A 120 A 4000 W	160 A 80 A 4000 W <0.2% @50/60Hz <0.5% @<500Hz <1.0% @500.1Hz-2000Hz
POWER CAPACITY  *1.100 V J 200 V range.  *2. For an output voltage of  *3. For an output voltage of  *3. For an output voltage of  *3. For an output voltage of  *4. Limited by the maximum  OUTPUT VOLTAGE  LINE REGULATION  RIPPLE NOISE  *3  *1. Power source input voltage  *3. For 5 Hz to 1 MHz comp  OUTPUT VOLTAGE  TOTAL HARMONIC  OUTPUT VOLTAGE  EFFICIENCY  *3  **  OUTPUT VOLTAGE  EFFICIENCY  **  **  **  **  **  **  **  **  **	17-285 V to -28.5 V, +28.5 V to +285	100 V 200 V  , 370 V to 37 V, 457 V to 4570 to	120 A 60 A 2000 W V, no load, and 23 °C ± 5°C. the output voltage is 100 V to 250 V / 200 V to 500 V.  0.2%6 or less 0.5%6 or less (0 to 100%, via output t 1 Vrms / 2 Vrms (TYP)  1 Vrms / 2 Vrms (TYP)  2 0.2% @50/60Hz < 0.3% @500Hz < 0.5% @5000Hz < 0.5% @5000Hz 100 µs (TYP) 80 %6 or more	180 A 90 A 3000 W	240 A 120 A 4000 W	160 A 80 A 4000 W <0.2% @50/60Hz <0.5% @<500Hz <1.0% @500.1Hz-2000Hz
POWER CAPACITY  *1.100 V J 200 V range.  *2. For an output voltage of  *3. For an output voltage of  *4. End an output voltage of  *4. End an output voltage of  *4. Limited by the maximum  OUTPUT VOLTAGE  LINE REGULATION  RIPPLE NOISE  *5. For an output voltage of  *3. For 5 Hz to 1 MHz comp  OUTPUT VOLTAGE  TOTAL HARMONIC  OUTPUT VOLTAGE  EFFICIENCY  *1. At an output voltage of 5  *2. For an output voltage of 5  *3. For an output voltage of 5  *4. For an output voltage of	7-285 V to -28.5 V, +28.5 V to +28.5 V 13.4 V to 100 V / 2.8 V to 200 V. Limi courrent.  STABILITY  1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	100 V 200 V  , 370 V to 37 V, 457 V to 4570 ted by the power capacity when ted by the power capacity when a power factor of 1, stepwise c terminal on the rear panel.  N RATIO, OUTPUT VO	120 A 60 A 2000 W V, no load, and 23 °C ± 5°C. the output voltage is 100 V to 250 V / 200 V to 500 V.  0.2% or less 0.5% or less (0 to 100%, via output t 1 Vrms / 2 Vrms (TYP) hange from an output current of 0 A to maximum current LTAGE RESPONSE TIME, EFFICIENCY < 0.2% ⊚500/Hz < 0.3% ⊚-500Hz < 0.5% ⊚500.1Hz~999.9Hz  100 µs (TYP) 80 % or more det. desge from an output current of 0 A to the maximum current ded.	180 A 90 A 3000 W  erminal)  (or its reverse), using the output terminal on the rear p	240 A 120 A 4000 W	160 A 80 A 4000 W <0.2% @50/60Hz <0.5% @<500Hz <1.0% @500.1Hz-2000Hz
POWER CAPACITY  1. 100 V J 200 V range.  12. For an output voltage of  14. Limited by the maximum  OUTPUT VOLTAGE  LINE REGULATION  LOAD REGUL	7-285 V to -28.5 V, +28.5 V to +285 V 71 At V to 100 V / 2.8 V to 200 V. Lim in current.  STABILITY  19  19  10  10  10  10  10  10  10  10	100 V 200 V  , 370 V to 37 V, 457 V to 4570 ted by the power capacity when ted by the power capacity when the power factor of 1, stepwise c terminal on the rear panel.  N RATIO, OUTPUT VO	120 A 60 A 2000 W V, no load, and 23 °C ± 5°C. the output voltage is 100 V to 250 V / 200 V to 500 V.  0.2% or less 0.5% or less (0 to 100%, via output t 1 Vrms / 2 Vrms (TYP) hange from an output current of 0 A to maximum current LTAGE RESPONSE TIME, EFFICIENCY < 0.2% ⊚500/Hz < 0.3% ⊚-500Hz < 0.5% ⊚500.1Hz~999.9Hz  100 µs (TYP) 80 % or more det. desge from an output current of 0 A to the maximum current ded.	180 A 90 A 3000 W  erminal)  (or its reverse), using the output terminal on the rear p	240 A 120 A 4000 W	160 A 80 A 4000 W <0.2% @50/60Hz <0.5% @<500Hz <1.0% @500.1Hz-2000Hz
POWER CAPACITY  1. 100 V J 200 V range.  12. For an output voltage of  14. Limited by the maximum  OUTPUT VOLTAGE  LINE REGULATION  LOAD REGULATION  LOAD REGULATION  LOAD REGULATION  12. For an output voltage of  13. For 36 Hz to 1 MHz comp  OUTPUT VOLTAGE  TOTAL HARMONIC  OUTPUT VOLTAGE  EFFICIENCY  19. It am output voltage of  19. For AC mode, at an outp  MEASURED VALUE  MEASURED VALUE  MEASURED VALUE  MEASURED VALUE  15. For AC mode, at an outp  MEASURED VALUE  15. For AC mode, at an outp  MEASURED VALUE  MEASURED VAL	7-285 V to -28.5 V, +28.5 V to +285 V 73.4 V to 100 V / 2.8 V to 200 V. Limi nourrent.  STABILITY  19  N **2  age is 200 V, 220 V, or 240 V, no load 100 V to 200 V, 200 V to 400 V, a lo ponents in DC mode using the output (EWAVEFORM DISTORTIO) C DISTORTION(THD)  10 V to 200 V / 100 V to 400 V, a load 1100 V / 200 V, a load power factor o pot voltage of 100 V / 200 V, maximu  DISPLAY  DISPLAY	100 V 200 V  ( .370 V to .37 V, +57 V to +570 ted by the power capacity when the power capacity when the power factor of 1, stepwise contemporary to terminal on the rear parel.  N RATIO, OUTPUT VO  power factor of 1, and in AC m. f1, with respect to stepwise cham current, and load power factor m. current, and load power factor m. current, and load power factor m. current, and load power factor of 1, and load power fact	120 A 60 A 2000 W V, no load, and 23 °C ± 5°C. the output voltage is 100 V to 250 V / 200 V to 500 V.  0.2% or less 0.5% or less (0 to 100%, via output t 1 Vrms / 2 Vrms (TYP) hange from an output current of 0 A to maximum current LTAGE RESPONSE TIME, EFFICIENCY < 0.2% ⊚500/Hz < 0.3% ⊚-500Hz < 0.5% ⊚500.1Hz~999.9Hz  100 µs (TYP) 80 % or more det. desge from an output current of 0 A to the maximum current ded.	180 A 90 A 3000 W  erminal)  (or its reverse), using the output terminal on the rear p	240 A 120 A 4000 W	160 A 80 A 4000 W <0.2% @50/60Hz <0.5% @<500Hz <1.0% @500.1Hz-2000Hz
POWER CAPACITY  1. 100 V J 200 V range.  12. For an output voltage of  14. Limited by the maximum  OUTPUT VOLTAGE  LINE REGULATION  LOAD REGULATION  LOAD REGULATION  LOAD REGULATION  12. For an output voltage of  13. For 36 Hz to 1 MHz comp  OUTPUT VOLTAGE  TOTAL HARMONIC  OUTPUT VOLTAGE  EFFICIENCY  19. It am output voltage of  19. For AC mode, at an outp  MEASURED VALUE  MEASURED VALUE  MEASURED VALUE  MEASURED VALUE  15. For AC mode, at an outp  MEASURED VALUE  15. For AC mode, at an outp  MEASURED VALUE  MEASURED VAL	7-285 V to -28.5 V, +28.5 V to +285 V 71 At V to 100 V / 2.8 V to 200 V. Lim in current.  STABILITY  19  19  10  10  10  10  10  10  10  10	100 V 200 V  , 370 V to 37 V, +57 V to +570 to	120 A 60 A 2000 W V, no load, and 23 °C ± 5°C. the output voltage is 100 V to 250 V / 200 V to 500 V.  0.2% or less 0.5% or less (0 to 100%, via output t 1 Vrms / 2 Vrms (TYP)  hange from an output current of 0 A to maximum current LTAGE RESPONSE TIME, EFFICIENCY  < 0.2% @50/60Hz < 0.3% @<500.1Hz~999.9Hz  100 µs (TYP) 30 % or more  ode. nge from an output current of 0 A to the maximum current of 1.  0.1 V For 45 Hz to 65 Hz and DC: ±{0.5%	180 A 90 A 3000 W  erminal)  (or its reverse), using the output terminal on the rear p  tt (or its reverse).	240 A 120 A 4000 W	160 A 80 A 4000 W <0.2% @50/60Hz <0.5% @<500Hz <1.0% @500.1Hz-2000Hz
POWER CAPACITY  1. 100 V J 200 V range.  12. For an output voltage of  14. Limited by the maximum  OUTPUT VOLTAGE  LINE REGULATION  LOAD REGULATION  LOAD REGULATION  LOAD REGULATION  12. For an output voltage of  13. For 36 Hz to 1 MHz comp  OUTPUT VOLTAGE  TOTAL HARMONIC  OUTPUT VOLTAGE  EFFICIENCY  19. It am output voltage of  19. For AC mode, at an outp  MEASURED VALUE  MEASURED VALUE  MEASURED VALUE  MEASURED VALUE  15. For AC mode, at an outp  MEASURED VALUE  15. For AC mode, at an outp  MEASURED VALUE  MEASURED VAL	7-285 V to -28.5 V, +28.5 V to +285 V 73.4 V to 100 V / 2.8 V to 200 V. Limi in current.  STABILITY  19  N **2  age is 200 V, 220 V, or 240 V, no load 1:00 V to 200 V, 200 V to 400 V, a lo ponents in DC mode using the output 1: WAVEFORM DISTORTIO C DISTORTION(THD)  1: RESPONSE TIME  20  1: 00 V / 200 V / 100 V to 400 V, a load 1:00 V / 200 V, a load power factor o and voltage of 1:00 V / 200 V, maximu  DISPLAY  RMS, AYG Value  91	100 V 200 V 200 V  (-370 V to -37 V, +57 V to +570 to	120 A 60 A 2000 W V, no load, and 23 °C±5°C. the output voltage is 100 V to 250 V / 200 V to 500 V.  0.296 or less 0.596 or less (0 to 10096, via output to 1 V rms / 2 V rms (TYP)  hange from an output current of 0 A to maximum current V = (0.2% ⊕50/60Hz < 0.3% ⊕5000Hz < 0.3% ⊕5000Hz < 0.5% ⊕500.1Hz~999.9Hz  100 µs (TYP) 80 % or more december of 0 A to the maximum current of 1.  0.1 V For 45 Hz to 65 Hz and DC: ±(0.5 % For all other frequencies: ±(0.7 % of For all other frequencies:	180 A 90 A 3000 W  erminal)  (or its reverse), using the output terminal on the rear p  tt (or its reverse).	240 A 120 A 4000 W	160 A 80 A 4000 W <0.2% @50/60Hz <0.5% @<500Hz <1.0% @500.1Hz-2000Hz
POWER CAPACITY  1. 100 V J 200 V range.  12. For an output voltage of  14. Limited by the maximum  OUTPUT VOLTAGE  LINE REGULATION  LOAD REGULATION  LOAD REGULATION  LOAD REGULATION  12. For an output voltage of  13. For 36 Hz to 1 MHz comp  OUTPUT VOLTAGE  TOTAL HARMONIC  OUTPUT VOLTAGE  EFFICIENCY  19. It am output voltage of  19. For AC mode, at an outp  MEASURED VALUE  MEASURED VALUE  MEASURED VALUE  MEASURED VALUE  15. For AC mode, at an outp  MEASURED VALUE  15. For AC mode, at an outp  MEASURED VALUE  MEASURED VAL	7-285 V to -28.5 V, +28.5 V to +285 V 73.4 V to 100 V / 2.8 V to 200 V. Limi nourrent.  STABILITY  19  N **2  age is 200 V, 220 V, or 240 V, no load 100 V to 200 V, 200 V to 400 V, a lo ponents in DC mode using the output (EWAVEFORM DISTORTIO) C DISTORTION(THD)  10 V to 200 V / 100 V to 400 V, a load 1100 V / 200 V, a load power factor o pot voltage of 100 V / 200 V, maximu  DISPLAY  DISPLAY	100 V 200 V 200 V  , 370 V to 37 V, 457 V to 4570  ted by the power capacity when  , rated output.  ad power factor of 1, stepwise c to terminal on the rear panel.  N RATIO, OUTPUT VO  power factor of 1, and in AC m Current, and load power factor  Resolution  Accuracy **2*  Resolution	120 A 60 A 2000 W V, no load, and 23 °C ± 5°C. the output voltage is 100 V to 250 V / 200 V to 500 V.  0.296 or less 0.5% or less (0 to 100%, via output t 1 Vrms / 2 Vrms (TYP) hange from an output current of 0 A to maximum current LTAGE RESPONSE TIME, EFFICIENCY < 0.2% @50/60Hz < 0.3% @500Hz < 0.5% @500.1Hz-999.9Hz  100 µs (TYP) 80 % or more dol. 0.1 V For 45 Hz to 65 Hz and DC: ±(0.5 % For all other frequencies: ±(0.7 % of 0.1 V)	180 A 90 A 3000 W  erminal)  (or its reverse), using the output terminal on the rear p  at (or its reverse).	240 A 120 A 4000 W	160 A 80 A 4000 W <0.2% @50/60Hz <0.5% @<500Hz <1.0% @500.1Hz-2000Hz
POWER CAPACITY  1-1.00 V J 200 V range.  12. For an output voltage of  14. Limited by the maximum  OUTPUT VOLTAGE  LINE REGULATION  LOAD REGULATION  LOAD REGULATION  LOAD REGULATION  LOAD REGULATION  LOAD REGULATION  17. Power source input voltage of  17. For S Hz to 1 MHz company  OUTPUT VOLTAGE  TOTAL HARMONIC  OUTPUT VOLTAGE  EFFICIENCY  12. For a noutput voltage of 5  12. For a Medical at an output woltage of 5  14. For A Composit, at an output woltage of 5  MEASURED VALUE  VOLTAGE	17-285 Y to -28.5 V, +28.5 V to +285 V 17.4 V to 100 V / 2.8 V to 200 V. Limi in current.  STABILITY 19 19 19 10 10 10 10 10 10 10 10 10 10 10 10 10	100 V 200 V 200 V  , 370 V to 37 V, +57 V to +570 to +	120 A 60 A 2000 W V, no load, and 23 ℃ ± 5℃. the output voltage is 100 V to 250 V / 200 V to 500 V.  0.2% or less 0.5% or less (0 to 100%, via output t 1 Vrms / 2 Vrms (TYP)  hange from an output current of 0 A to maximum current LTAGE RESPONSE TIME, EFFICIENCY < 0.2% @50/60Hz < 0.3% @<500Hz < 0.5% @500.1Hz~999.9Hz  100 µs (TYP) 30 % or more dde. uge from an output current of 0 A to the maximum current of 1.  0.1 V For 45 Hz to 65 Hz and DC: ±(0.5 % For all other frequencies: ±(0.7 % of 0.1 V For 45 Hz to 65 Hz and DC: ±(0.5 % For 45 Hz to 65 Hz and DC: ±(0.5 % For 45 Hz to 65 Hz and DC: ±(0.5 % For 45 Hz to 65 Hz and DC: ±(0.5 % For 45 Hz to 65 Hz and DC: ±(0.5 % For 45 Hz to 65 Hz and DC: ±(0.5 % For 45 Hz to 65 Hz and DC: ±(0.5 % For 45 Hz to 65 Hz and DC: ±(0.5 % For 45 Hz to 65 Hz and DC: ±(0.5 % For 45 Hz to 65 Hz and DC: ±(0.5 % For 45 Hz to 65 Hz and DC: ±(0.5 % For 45 Hz to 65 Hz and DC: ±(0.5 % For 45 Hz to 65 Hz and DC: ±(0.5 % For 45 Hz to 65 Hz and DC: ±(0.5 %	180 A 90 A 3000 W  erminal)  (or its reverse), using the output terminal on the rear p  at (or its reverse).	240 A 120 A 4000 W	160 A 80 A 4000 W <0.2% @50/60Hz <0.5% @<500Hz <1.0% @500.1Hz-2000Hz
POWER CAPACITY  1-1.00 V J 200 V range.  12. For an output voltage of  14. Limited by the maximum  OUTPUT VOLTAGE  LINE REGULATION  LOAD REGULATION  LOAD REGULATION  LOAD REGULATION  LOAD REGULATION  LOAD REGULATION  17. Power source input voltage of  17. For S Hz to 1 MHz company  OUTPUT VOLTAGE  TOTAL HARMONIC  OUTPUT VOLTAGE  EFFICIENCY  12. For a noutput voltage of 5  12. For a Medical at an output woltage of 5  14. For A Composit, at an output woltage of 5  MEASURED VALUE  VOLTAGE	7-285 V to -28.5 V, +28.5 V to +285 V 73.4 V to 100 V / 2.8 V to 200 V. Limi in current.  STABILITY  19  N **2  age is 200 V, 220 V, or 240 V, no load 1:00 V to 200 V, 200 V to 400 V, a lo ponents in DC mode using the output 1: WAVEFORM DISTORTIO C DISTORTION(THD)  1: RESPONSE TIME  20  1: 00 V / 200 V / 100 V to 400 V, a load 1:00 V / 200 V, a load power factor o and voltage of 1:00 V / 200 V, maximu  DISPLAY  RMS, AYG Value  91	100 V 200 V 200 V  , 370 V to 37 V, 457 V to 4570  ted by the power capacity when  , rated output.  ad power factor of 1, stepwise c to terminal on the rear panel.  N RATIO, OUTPUT VO  power factor of 1, and in AC m Current, and load power factor  Resolution  Accuracy **2*  Resolution	120 A 60 A 2000 W V, no load, and 23 °C ± 5°C. the output voltage is 100 V to 250 V / 200 V to 500 V.  0.296 or less 0.5% or less (0 to 100%, via output t 1 Vrms / 2 Vrms (TYP) hange from an output current of 0 A to maximum current LTAGE RESPONSE TIME, EFFICIENCY < 0.2% @50/60Hz < 0.3% @500Hz < 0.5% @500.1Hz-999.9Hz  100 µs (TYP) 80 % or more dol. 0.1 V For 45 Hz to 65 Hz and DC: ±(0.5 % For all other frequencies: ±(0.7 % of 0.1 V)	180 A 90 A 3000 W  erminal)  (or its reverse), using the output terminal on the rear p  at (or its reverse).	240 A 120 A 4000 W	160 A 80 A 4000 W <0.2% @50/60Hz <0.5% @<500Hz <1.0% @500.1Hz-2000Hz
POWER CAPACITY  1-1.00 V J 200 V range.  12. For an output voltage of  14. Limited by the maximum  OUTPUT VOLTAGE  LINE REGULATION  LOAD REGULATION  LOAD REGULATION  LOAD REGULATION  LOAD REGULATION  LOAD REGULATION  17. Power source input voltage of  17. For S Hz to 1 MHz company  OUTPUT VOLTAGE  TOTAL HARMONIC  OUTPUT VOLTAGE  EFFICIENCY  12. For a noutput voltage of 5  12. For a Medical at an output woltage of 5  14. For A Composit, at an output woltage of 5  MEASURED VALUE  VOLTAGE	17-285 Y to -28.5 V, +28.5 V to +285 V 17.4 V to 100 V / 2.8 V to 200 V. Limi in current.  STABILITY 19 19 19 10 10 10 10 10 10 10 10 10 10 10 10 10	100 V 200 V 200 V 200 V 200 V 200 V 4.370 V to .37V, .457 V to .4570 ted by the power capacity when 4. rated output. 4. ad power factor of 1, stepwise of 4. reminal on the rear panel. 6. N RATIO, OUTPUT VO 4. power factor of 1, and in AC mr 7. with respect to stepwise cha 6. m current, and load power factor 6. Resolution 6. Accuracy 6. Resolution 7. Resolution	120 A 60 A 2000 W V, no load, and 23 °C ± 5°C. the output voltage is 100 V to 250 V / 200 V to 500 V.  0.296 or less 0.5% or less (0 to 100%, via output t 1 Vrms / 2 Vrms (TYP)  1 Vrms / 2 Vrms (TYP)  2 Vo.2% @50/60Hz < 0.3% @-500Hz < 0.3% @-500Hz < 0.3% @500.1Hz~999.9Hz  100 μs (TYP) 80 % or more deb. 7 or all other frequencies: ± (0.7 % of 0.1 V For 45 Hz to 65 Hz and DC: ± (0.5 % For all other frequencies: ± (0.7 % of 0.0.1 V For 45 Hz to 65 Hz and DC: ± (0.5 % For 45 Hz to 65 Hz and DC: ± (0.5 % For 45 Hz to 65 Hz and DC: ± (0.5 % For 45 Hz to 65 Hz and DC: ± (0.5 % of reading+0.1 A/0.05 A)	180 A 90 A 3000 W  erminal)  (or its reverse), using the output terminal on the rear p  it (or its reverse).  of reading + 0.5 V / 1 V) reading + 1 V / 2 V)  For 45 Hz to 65 Hz and DC: ±(0.5 % of reading+0.15 A/0.08 A)	240 A 120 A 4000 W 4000 W  For 45 Hz to 65 Hz and DC: ±(0.5 % of reading+0.2 A/0.1 A	160 A 80 A 4000 W <0.2% @50/60Hz <0.5% @<500Hz <1.0% @500.1Hz-2000Hz <2.0% @2100Hz-5000Hz
POWER CAPACITY  1-1.00 V J 200 V range.  12. For an output voltage of  14. Limited by the maximum  OUTPUT VOLTAGE  LINE REGULATION  LOAD REGULATION  LOAD REGULATION  LOAD REGULATION  LOAD REGULATION  LOAD REGULATION  17. Power source input voltage of  17. For S Hz to 1 MHz company  OUTPUT VOLTAGE  TOTAL HARMONIC  OUTPUT VOLTAGE  EFFICIENCY  12. For a noutput voltage of 5  12. For a Medical at an output woltage of 5  14. For A Composit, at an output woltage of 5  MEASURED VALUE  VOLTAGE	17-285 Y to -28.5 V, +28.5 V to +285 V 17.4 V to 100 V / 2.8 V to 200 V. Limi in current.  STABILITY 19 19 19 10 10 10 10 10 10 10 10 10 10 10 10 10	100 V 200 V 200 V 200 V 200 V 200 V 4.370 V to .37V, .457 V to .4570 ted by the power capacity when 4. rated output. 4. ad power factor of 1, stepwise of 4. reminal on the rear panel. 6. N RATIO, OUTPUT VO 4. power factor of 1, and in AC mr 7. with respect to stepwise cha 6. m current, and load power factor 6. Resolution 6. Accuracy 6. Resolution 7. Resolution	120 A 60 A 2000 W V, no load, and 23 °C ± 5°C. the output voltage is 100 V to 250 V / 200 V to 500 V.  0.2% or less 0.5% or less (0 to 100%, via output t 1 Vrms / 2 Vrms (TYP)  hange from an output current of 0 A to maximum current LTAGE RESPONSE TIME, EFFICIENCY < 0.2% @50/60Hz < 0.3% @<500.1Hz~999.9Hz 100 µs (TYP) 30 % or more de. ge from an output current of 0 A to the maximum current of 1.  0.1 V For 45 Hz to 65 Hz and DC: ±(0.5 % For all other frequencies: ±(0.7 % of 0.1 V For 45 Hz to 65 Hz and DC: ±(0.5 % of 45 Hz to 65 Hz and DC: ±(0.5 % of reading+0.1 A)(0.05 A) For 45 Hz to 65 Hz and DC: ±(0.5 % of reading+0.1 A)(0.05 A) For all other frequencies:	180 A 90 A 3000 W  erminal)  (or its reverse), using the output terminal on the rear p  tt (or its reverse).  of reading + 0.5 V / 1 V) reading + 1 V / 2 V)  For 45 Hz to 65 Hz and DC: ±(0.5 % of reading+0.15 A/0.08 A) For all other frequencies:	240 A 120 A 4000 W 4000 W For 45 Hz to 65 Hz and DC: ±(0.5 % of reading+0.2 A/0.1 A For all other frequencies:	160 A 80 A 4000 W 
POWER CAPACITY  1-1.00 V J 200 V range.  12. For an output voltage of  14. Limited by the maximum  OUTPUT VOLTAGE  LINE REGULATION  LOAD REGULATION  LOAD REGULATION  LOAD REGULATION  LOAD REGULATION  LOAD REGULATION  17. Power source input voltage of  17. For S Hz to 1 MHz company  OUTPUT VOLTAGE  TOTAL HARMONIC  OUTPUT VOLTAGE  EFFICIENCY  12. For a noutput voltage of 5  12. For a Medical at an output woltage of 5  14. For A Composit, at an output woltage of 5  MEASURED VALUE  VOLTAGE	7-285 V to -28.5 V, +28.5 V to +285 V 73.4 V to 100 V / 2.8 V to 200 V. Limi ocurrent.  STABILITY  1 N ***  age is 200 V, 220 V, or 240 V, no load 1100 V to 200 V   200 V to 400 V, a load 1100 V to 200 V   200 V to 400 V, a load 1100 V to 200 V   200 V to 400 V, a load 1100 V / 200 V, a load power factor o tot voltage of 100 V / 200 V, a load 1100 V / 200 V, a load power factor o tot voltage of 100 V / 200 V, a load 1100 V / 200 V / 200 V, a load 1100 V / 200 V / 2	100 V 200 V 200 V 200 V 200 V 200 V  , 370 V to 37 V, +57 V to +570  ted by the power capacity when the power factor of 1, stepwise of the rear panel.  N RATIO, OUTPUT VO  Power factor of 1, and in AC m 17, with respect to stepwise chain current, and load power factor of m current, and load power factor of 200 Million Accuracy Resolution Accuracy Resolution Accuracy Resolution Accuracy Resolution Accuracy Resolution	120 A 60 A 2000 W V, no load, and 23 °C ± 5°C. the output voltage is 100 V to 250 V / 200 V to 500 V.  0.2% or less 0.5% or less (0 to 100%, via output t 1 Vrms / 2 Vrms (TYP) hange from an output current of 0 A to maximum current LTAGE RESPONSE TIME, EFFICIENCY < 0.2% @50.0Hz < 0.3% @-500Hz < 0.3% @-500Hz < 0.5% @-500.1Hz-999.9Hz  100 µs (TYP) 80 % or more  ode. gage from an output current of 0 A to the maximum current of 1.  0.1 V For 45 Hz to 65 Hz and DC: ±(0.5 % For all other frequencies: ± (0.7 % of 0.1 V For 45 Hz to 65 Hz and DC: ±(0.5 % of 50.0 Hz of 50.0	180 A 90 A 3000 W  erminal)  (or its reverse), using the output terminal on the rear p  it (or its reverse).  of reading + 0.5 V / 1 V) reading + 1 V / 2 V)  For 45 Hz to 65 Hz and DC: ±(0.5 % of reading+0.15 A/0.08 A)	240 A 120 A 4000 W 4000 W  For 45 Hz to 65 Hz and DC: ±(0.5 % of reading+0.2 A/0.1 A	160 A 80 A 4000 W 
POWER CAPACITY  1-1.00 V J 200 V range.  12. For an output voltage of  14. Limited by the maximum  OUTPUT VOLTAGE  LINE REGULATION  LOAD REGULATION  LOAD REGULATION  LOAD REGULATION  LOAD REGULATION  LOAD REGULATION  17. Power source input voltage of  17. For S Hz to 1 MHz company  OUTPUT VOLTAGE  TOTAL HARMONIC  OUTPUT VOLTAGE  EFFICIENCY  12. For a noutput voltage of 5  12. For a Medical at an output woltage of 5  14. For A Composit, at an output woltage of 5  MEASURED VALUE  VOLTAGE	17-285 Y to -28.5 V, +28.5 V to +285 V 17.4 V to 100 V / 2.8 V to 200 V. Limi in current.  STABILITY 19 19 19 10 10 10 10 10 10 10 10 10 10 10 10 10	100 V 200 V 200 V 200 V 200 V  , 370 V to 37 V, +57 V to +370 to +370 to +570	120 A 60 A 2000 W V, no load, and 23 °C ± 5°C. the output voltage is 100 V to 250 V / 200 V to 500 V.  0.2% or less 0.5% or less (0 to 100%, via output t 1 Vrms / 2 Vrms (TYP)  hange from an output current of 0 A to maximum current LTAGE RESPONSE TIME, EFFICIENCY < 0.2% @50/60Hz < 0.3% @<500.1Hz~999.9Hz 100 µs (TYP) 30 % or more de. ge from an output current of 0 A to the maximum current of 1.  0.1 V For 45 Hz to 65 Hz and DC: ±(0.5 % For all other frequencies: ±(0.7 % of 0.1 V For 45 Hz to 65 Hz and DC: ±(0.5 % of 45 Hz to 65 Hz and DC: ±(0.5 % of reading+0.1 A)(0.05 A) For 45 Hz to 65 Hz and DC: ±(0.5 % of reading+0.1 A)(0.05 A) For all other frequencies:	180 A 90 A 3000 W  erminal)  (or its reverse), using the output terminal on the rear p  tt (or its reverse).  of reading + 0.5 V / 1 V) reading + 1 V / 2 V)  For 45 Hz to 65 Hz and DC: ±(0.5 % of reading+0.15 A/0.08 A) For all other frequencies:	240 A 120 A 4000 W 4000 W For 45 Hz to 65 Hz and DC: ±(0.5 % of reading+0.2 A/0.1 A For all other frequencies:	160 A 80 A 4000 W 
POWER CAPACITY  1-1.00 V J 200 V range.  12. For an output voltage of  14. Limited by the maximum  OUTPUT VOLTAGE  LINE REGULATION  LOAD REGULATION  LOAD REGULATION  LOAD REGULATION  LOAD REGULATION  LOAD REGULATION  17. Power source input voltage of  17. For S Hz to 1 MHz company  OUTPUT VOLTAGE  TOTAL HARMONIC  OUTPUT VOLTAGE  EFFICIENCY  12. For a noutput voltage of 5  12. For a Medical at an output woltage of 5  14. For A Composit, at an output woltage of 5  MEASURED VALUE  VOLTAGE	7-285 V to -28.5 V, +28.5 V to +285 V 73.4 V to 100 V / 2.8 V to 200 V. Limi ocurrent.  STABILITY  1 N ***  age is 200 V, 220 V, or 240 V, no load 1100 V to 200 V   200 V to 400 V, a load 1100 V to 200 V   200 V to 400 V, a load 1100 V to 200 V   200 V to 400 V, a load 1100 V / 200 V, a load power factor o tot voltage of 100 V / 200 V, a load 1100 V / 200 V, a load power factor o tot voltage of 100 V / 200 V, a load 1100 V / 200 V / 200 V, a load 1100 V / 200 V / 2	100 V 200 V 200 V 200 V 200 V 200 V  , 370 V to 37 V, +57 V to +570  ted by the power capacity when the power factor of 1, stepwise of the rear panel.  N RATIO, OUTPUT VO  Power factor of 1, and in AC m 17, with respect to stepwise chain current, and load power factor of m current, and load power factor of 200 Million Accuracy Resolution Accuracy Resolution Accuracy Resolution Accuracy Resolution Accuracy Resolution	120 A 60 A 2000 W V, no load, and 23 °C ± 5°C. the output voltage is 100 V to 250 V / 200 V to 500 V.  0.296 or less 0.5% or less (0 to 100%, via output t 1 Vrms / 2 Vrms (TYP)  1 Vrms / 2 Vrms (TYP)  2 Vo.2% @50/60Hz < 0.3% @500Hz < 0.3% @500Hz < 0.3% @500Hz < 0.5% @500Hz < 0.5% @500Hz  100 μs (TYP) 80 % or more de. 70 for all other frequencies: ± (0.7 % of For all other frequencies: ± (0.7 % of For 45 Hz to 65 Hz and DC: ± (0.5 % For 45 Hz to 65 Hz and DC: ± (0.5 % of reading+0.1 A/0.05 A)  For 45 Hz to 65 Hz and DC: ± (0.7 % of or all other frequencies: ± (0.7 % of reading+0.1 A/0.05 A)  For 41 Hz to 65 Hz and DC: ± (0.5 % of reading+0.1 A/0.05 A)  For 41 Hz to 65 Hz and DC: ± (0.5 % of reading+0.2 A/0.1 A)  0.1 A	180 A 90 A 3000 W  erminal)  (or its reverse), using the output terminal on the rear p  tit (or its reverse).  of reading + 0.5 V / 1 V) reading + 1 V / 2 V)  For 45 Hz to 65 Hz and DC: ±(0.5 % of reading+0.15 A/0.08 A) For all other frequencies: ±(0.7 % of reading+0.3 A/0.15 A)	240 A 120 A 4000 W 4000 W  For 45 Hz to 65 Hz and DC: ±(0.5 % of reading+0.2 A/0.1 A For all other frequencies: ±(0.7 % of reading+0.4 A/0.2 A	160 A   80 A   4000 W
POWER CAPACITY  **1.100 V J 200 V range.  **2. For an output voltage of  **4. Limited by the maximum  OUTPUT VOLTAGE  LINE REGULATION  LOAD REGULATION  LOAD REGULATION  LOAD REGULATION  I Power source input voltage  **3. For 3 Hz to 1 MHz comp  OUTPUT VOLTAGE  TOTAL HARMONIC  OUTPUT VOLTAGE  EFFICIENCY  **3  **1. At an output voltage of 5  **2. For AC mode, at an outp  MEASURED VALUE  VOLTAGE  CURRENT	7-285 V to -28.5 V, +28.5 V to +285 V 73.4 V to 100 V / 2.8 V to 200 V. Limi ocurrent.  STABILITY  1 N ***  age is 200 V, 220 V, or 240 V, no load 1100 V to 200 V   200 V to 400 V, a load 1100 V to 200 V   200 V to 400 V, a load 1100 V to 200 V   200 V to 400 V, a load 1100 V / 200 V, a load power factor o tot voltage of 100 V / 200 V, a load 1100 V / 200 V, a load power factor o tot voltage of 100 V / 200 V, a load 1100 V / 200 V / 200 V, a load 1100 V / 200 V / 2	100 V 200 V	120 A 60 A 2000 W V, no load, and 23 °C ± 5°C. the output voltage is 100 V to 250 V / 200 V to 500 V.  0.2% or less 0.5% or less (0 to 100%, via output t 1 Vrms / 2 Vrms (TYP)  1 Vrms / 2 Vrms (TYP)  2 Vrms (PS)  1 Vrms / 2 Vrms (FYP)  30 % or more  de. 40.3% @500.1 Hz ~999.9 Hz  100 µs (TYP) 30 % or more  de. 7 Or 10 V  For 45 Hz to 65 Hz and DC: ±(0.5 % For all other frequencies: ±(0.7 % of 0.0 1 V  For 45 Hz to 65 Hz and DC: ±(2.8 % of 0.0 1 V  For 45 Hz to 65 Hz and DC: ±(0.5 % For all other frequencies: ±0.7 % of 0.1 V  For 45 Hz to 65 Hz and DC: ±(0.5 % of 0.0 1 V  For 45 Hz to 65 Hz and DC: ±(0.7 % of 0.0 1 V  For 45 Hz to 65 Hz and DC: ±(0.7 % of 0.0 1 V  For 45 Hz to 65 Hz and DC: ±(0.7 % of 0.0 1 V  For 45 Hz to 65 Hz and DC: ±(0.7 % of 0.0 1 V  For 45 Hz to 65 Hz and DC: ±(0.7 % of reading+0.1 A/0.05 A) For 45 Hz to 65 Hz and DC: ±(0.7 % of reading+0.2 A/0.1 A) 0.1 A  For 45 Hz to 65 Hz and DC: ±(0.7 % of reading+0.2 A/0.1 A) 0.1 A	180 A 90 A 3000 W  erminal)  (or its reverse), using the output terminal on the rear p  of reading + 0.5 V / 1 V) reading + 1 V / 2 V)  For 45 Hz to 65 Hz and DC: ±(0.5 % of reading+0.15 A/0.08 A) For all other frequencies: ±(0.7 % of reading+0.3 A/0.15 A)  For 45 Hz to 65 Hz and DC: ±( 2 % of reading +0.8 A/0.4 A)	240 A 120 A 4000 W  For 45 Hz to 65 Hz and DC: ±(0.5 % of reading+0.2 A/0.1 A For all other frequencies: ±(0.7 % of reading+0.4 A/0.2 A For 45 Hz to 65 Hz and DC: ±( 2 % of reading  + 1 A/0.5 A)	160 A   80 A   4000 W
POWER CAPACITY  **1.100 V J 200 V range.  **2. For an output voltage of  **4. Limited by the maximum  OUTPUT VOLTAGE  LINE REGULATION  LOAD REGULATION  LOAD REGULATION  LOAD REGULATION  I Power source input voltage  **3. For 3 Hz to 1 MHz comp  OUTPUT VOLTAGE  TOTAL HARMONIC  OUTPUT VOLTAGE  EFFICIENCY  **3  **1. At an output voltage of 5  **2. For AC mode, at an outp  MEASURED VALUE  VOLTAGE  CURRENT	17-285 V to -28.5 V to +28.5 V to 17.4 V to 100 V / 2.8 V to 200 V . Limi is current.  18 TABILITY  19 1  10 10 10 10 10 10 10 10 10 10 10 10 10 1	100 V 200 V	120 A 60 A 2000 W V, no load, and 23 °C ± 5°C. the output voltage is 100 V to 250 V / 200 V to 500 V.  0.2% or less 0.5% or less (0 to 100%, via output t 1 Vrms / 2 Vrms (TYP)  hange from an output current of 0 A to maximum current LTAGE RESPONSE TIME, EFFICIENCY < 0.2% @50/60Hz < 0.3% @<500Hz < 0.5% @500.1 Hz~999.9 Hz  100 µs (TYP) 30 % or more  dols, nge from an output current of 0 A to the maximum current of 1.  0.1 V For 45 Hz to 65 Hz and DC: ± (0.5 % For all other frequencies: ± (0.7 % of 0.0.1 V For 45 Hz to 65 Hz and DC: ± (0.5 % of reading+0.1 A/0.05 A) For all other frequencies: ± (0.7 % of feading+0.2 A/0.1 A) 0.1 A For 45 Hz to 65 Hz and DC: ± (12 % of reading+0.2 A/0.1 A) 0.1 A For 45 Hz to 65 Hz and DC: ± (12 % of reading+0.2 A/0.1 A) 0.1 A For 45 Hz to 65 Hz and DC: ± (12 % of reading+0.2 A/0.1 A) 1 W ± (2 % of reading+0.2 A/0.25 A)	180 A 90 A 3000 W  erminal)  (or its reverse), using the output terminal on the rear p  tt (or its reverse).  of reading + 0.5 V / 1 V) reading + 1 V / 2 V)  For 45 Hz to 65 Hz and DC: ±(0.5 % of reading+0.15 A/0.08 A) For all other frequencies: ±(0.7 % of reading+0.3 A/0.15 A)  For 45 Hz to 65 Hz and DC:	240 A 120 A 4000 W 4000 W  For 45 Hz to 65 Hz and DC: ±(0.5 % of reading+0.2 A/0.1 A For all other frequencies: ±(0.7 % of reading+0.4 A/0.2 A For 45 Hz to 65 Hz and DC:	160 A   80 A   4000 W
POWER CAPACITY  **1.100 V J 200 V range.  **2. For an output voltage of  **4. Limited by the maximum  OUTPUT VOLTAGE  LINE REGULATION  LOAD REGULATION  LOAD REGULATION  LOAD REGULATION  I Power source input voltage  **3. For 3 Hz to 1 MHz comp  OUTPUT VOLTAGE  TOTAL HARMONIC  OUTPUT VOLTAGE  EFFICIENCY  **3  **1. At an output voltage of 5  **2. For AC mode, at an outp  MEASURED VALUE  VOLTAGE  CURRENT	7-285 V to -28.5 V, +28.5 V to +285 V 73.4 V to 100 V / 2.8 V to 200 V. Limi nourrent.  STABILITY  1 N 12  age is 200 V, 220 V, or 240 V, no load 100 V to 200 V, 200 V to 400 V, a lo poments in DC mode using the output 12 WAVEFORM DISTORTIO 12 DISTORTION(THD) 13  14  15  17  17  18  18  19  19  19  19  19  19  19  19	100 V 200 V	120 A 60 A 2000 W V, no load, and 23 °C ± 5°C. the output voltage is 100 V to 250 V / 200 V to 500 V.  0.2% or less 0.5% or less (0 to 100%, via output to 1 V rms / 2 V rms (TYP)  1 V rms / 2 V rms (TYP)  2 0.2% ⊕50/60Hz < 0.2% ⊕50/60Hz < 0.3% ⊕500.1Hz~999.9Hz  100 µs (TYP) 80 % or more  does not not suppose the maximum current of 0 A to the maximum current of 0.1 V For 45 Hz to 65 Hz and DC: ±(0.5 % For all other frequencies: ±(0.7 % of 0.1 V For 45 Hz to 65 Hz and DC: ±(2.5 % 0.0 A V for all other frequencies: ±(0.7 % of 0.1 V For 45 Hz to 65 Hz and DC: ±(0.5 % 0.0 A V for all other frequencies: ±(0.7 % of 5 A V for 45 Hz to 65 Hz and DC: ±(0.5 % of 5 A V for all other frequencies: ±(0.7 % of 5 A V for 45 Hz to 65 Hz and DC: ±(0.5 % of reading+0.1 A/0.05 A) For 45 Hz to 65 Hz and DC: ±(0.5 % of reading+0.2 A/0.1 A) 0.1 A For 45 Hz to 65 Hz and DC: ±(0.5 % of reading+0.2 A/0.1 A) 0.1 A For 45 Hz to 65 Hz and DC: ±(0.5 % of reading+0.2 A/0.25 A) 1 W ±(2 % of reading+0.5 A/0.25 A)	180 A 90 A 3000 W  erminal)  (or its reverse), using the output terminal on the rear p  tt (or its reverse).  of reading + 0.5 V / 1 V) reading + 1 V / 2 V)  For 45 Hz to 65 Hz and DC: ±(0.5 % of reading+0.15 A/0.08 A) For 45 Hz to 65 Hz and DC: ±(0.7 % of reading+0.3 A/0.15 A)  For 45 Hz to 65 Hz and DC: ±(1.2 % of reading+0.3 A/0.4 A)	240 A 120 A 4000 W  For 45 Hz to 65 Hz and DC: ±(0.5 % of reading+0.2 A/0.1 A For 45 Hz to 65 Hz and DC: ±(0.7 % of reading+0.4 A/0.2 A For 45 Hz to 65 Hz and DC: ±( 2 % of reading  + 1 A/0.5 A)	160 A   80 A   4000 W
POWER CAPACITY  **1.100 V J 200 V range.  **2. For an output voltage of  **4. Limited by the maximum  OUTPUT VOLTAGE  LINE REGULATION  LOAD REGULATION  LOAD REGULATION  LOAD REGULATION  I Power source input voltage  **3. For 3 Hz to 1 MHz comp  OUTPUT VOLTAGE  TOTAL HARMONIC  OUTPUT VOLTAGE  EFFICIENCY  **3  **1. At an output voltage of 5  **2. For AC mode, at an outp  MEASURED VALUE  VOLTAGE  CURRENT	F-225 Y to -225 V, +225 V to +225 V T-3.4 V to 100 V / 2.8 V to 200 V. Lim no current.  STABILITY T T T T T T T T T T T T T T T T T T	100 V 200 V	120 A 60 A 2000 W V, no load, and 23 °C ± 5°C. the output voltage is 100 V to 250 V / 200 V to 500 V.  0.2% or less 0.5% or less (0 to 100%, via output t 1 Vrms / 2 Vrms (TYP)  1 Vrms / 2 Vrms (TYP)  2 Vrms (PTP) 80 % of TYP) 80 % of TYP) 80 % of TYP) 80 % of TYP 80 %	180 A 90 A 3000 W  erminal)  (or its reverse), using the output terminal on the rear p  of reading + 0.5 V / 1 V) reading + 1 V / 2 V)  For 45 Hz to 65 Hz and DC: ±(0.5 % of reading+0.15 A/0.08 A) For all other frequencies: ±(0.7 % of reading+0.3 A/0.15 A)  For 45 Hz to 65 Hz and DC: ±( 2 % of reading +0.8 A/0.4 A)	240 A 120 A 4000 W  For 45 Hz to 65 Hz and DC: ±(0.5 % of reading+0.2 A/0.1 A For all other frequencies: ±(0.7 % of reading+0.4 A/0.2 A For 45 Hz to 65 Hz and DC: ±( 2 % of reading  + 1 A/0.5 A)	160 A   80 A   4000 W
POWER CAPACITY  **1.100 V J 200 V range.  **2. For an output voltage of  **4. Limited by the maximum  OUTPUT VOLTAGE  LINE REGULATION  LOAD REGULATION  LOAD REGULATION  LOAD REGULATION  I Power source input voltage  **3. For 3 Hz to 1 MHz comp  OUTPUT VOLTAGE  TOTAL HARMONIC  OUTPUT VOLTAGE  EFFICIENCY  **3  **1. At an output voltage of 5  **2. For AC mode, at an outp  MEASURED VALUE  VOLTAGE  CURRENT	17-285 V to -28.5 V to +28.5 V to 17.4 V to 100 V / 2.8 V to 200 V . Limi is current.  18 TABILITY  19 1  10 10 10 10 10 10 10 10 10 10 10 10 10 1	100 V 200 V	120 A 60 A 2000 W V, no load, and 23 °C ± 5°C. the output voltage is 100 V to 250 V / 200 V to 500 V.  0.2% or less 0.5% or less (0 to 100%, via output to 1 V rms / 2 V rms (TYP)  1 V rms / 2 V rms (TYP)  2 0.2% ⊕50/60Hz < 0.2% ⊕50/60Hz < 0.3% ⊕500.1Hz~999.9Hz  100 µs (TYP) 80 % or more  does not not suppose the maximum current of 0 A to the maximum current of 0.1 V For 45 Hz to 65 Hz and DC: ±(0.5 % For all other frequencies: ±(0.7 % of 0.1 V For 45 Hz to 65 Hz and DC: ±(2.5 % 0.0 A V for all other frequencies: ±(0.7 % of 0.1 V For 45 Hz to 65 Hz and DC: ±(0.5 % 0.0 A V for all other frequencies: ±(0.7 % of 5 A V for 45 Hz to 65 Hz and DC: ±(0.5 % of 5 A V for all other frequencies: ±(0.7 % of 5 A V for 45 Hz to 65 Hz and DC: ±(0.5 % of reading+0.1 A/0.05 A) For 45 Hz to 65 Hz and DC: ±(0.5 % of reading+0.2 A/0.1 A) 0.1 A For 45 Hz to 65 Hz and DC: ±(0.5 % of reading+0.2 A/0.1 A) 0.1 A For 45 Hz to 65 Hz and DC: ±(0.5 % of reading+0.2 A/0.25 A) 1 W ±(2 % of reading+0.5 A/0.25 A)	180 A 90 A 3000 W  erminal)  (or its reverse), using the output terminal on the rear p  tt (or its reverse).  of reading + 0.5 V / 1 V) reading + 1 V / 2 V)  For 45 Hz to 65 Hz and DC: ±(0.5 % of reading+0.15 A/0.08 A) For 45 Hz to 65 Hz and DC: ±(0.7 % of reading+0.3 A/0.15 A)  For 45 Hz to 65 Hz and DC: ±(1.2 % of reading+0.3 A/0.4 A)	240 A 120 A 4000 W  For 45 Hz to 65 Hz and DC: ±(0.5 % of reading+0.2 A/0.1 A For 45 Hz to 65 Hz and DC: ±(0.7 % of reading+0.4 A/0.2 A For 45 Hz to 65 Hz and DC: ±( 2 % of reading  + 1 A/0.5 A)	160 A   80 A   4000 W
POWER CAPACITY  1-1.100 V J 200 V range.  12. For an output voltage of  14. Limited by the maximum  OUTPUT VOLTAGE  LINE REGULATION  LOAD REGULATION  LOAD REGULATION  12. For an output voltage of  13. For share to the total output voltage of  14. Total Armonic  OUTPUT VOLTAGE  FOR an output voltage of  15. For Share to The total output voltage of  16. For Share to The total output voltage of  17. For Share to The total output voltage of  18. For AC model at an output voltage of  18. For AC model at an output voltage of  18. For AC model at an output voltage of  18. For AC model at an output voltage of  18. For AC model at an output voltage of  18. For AC model at an output voltage of  CURRENT  POWER	7-285 V to -28.5 V, +28.5 V to -28.5 V 73.4 V to 100 V / 2.8 V to 200 V. Lim in current.  STABILITY  19  N **2  ange is 200 V, 220 V, or 240 V, no load 1:00 V to 200 V, 200 V to 400 V, a lo poments in DC mode using the output (EWAVEFORM DISTORTIO)  C DISTORTION(THD)  RESPONSE TIME  2  100 V to 200 V / 100 V to 400 V, a load 1:00 V / 200 V, a load power factor of 1:00 V / 200 V, a load power factor of 1:00 V / 200 V, a load power factor of 1:00 V / 200 V, a load power factor of 1:00 V / 200 V, a load power factor of 1:00 V / 200 V, a load power factor of 1:00 V / 200 V, a load power factor of 1:00 V / 200 V, a load power factor of 1:00 V / 200 V, a load power factor of 1:00 V / 200 V, a load power factor of 1:00 V / 200 V, a load power factor of 1:00 V / 200 V, a load 1:00 V / 200 V / 200 V, a load 1:00 V / 200 V, a load 1:00 V / 200 V, a load 1:00 V / 200 V / 200 V, a load 1:00 V / 200 V / 200 V / 200 V, a load 1:00 V / 200 V / 200 V / 200 V, a load 1:00 V / 200 V	100 V 200 V	120 A 60 A 2000 W V, no load, and 23 °C ± 5°C. the output voltage is 100 V to 250 V / 200 V to 500 V.  0.2% or less 0.5% or less (0 to 100%, via output t 1 Vrms / 2 Vrms (TYP)  hange from an output current of 0 A to maximum current LTAGE RESPONSE TIME, EFFICIENCY < 0.2% @50/60Hz < 0.3% @500Hz < 0.3% @500.1Hz~999.9Hz  100 µs (TYP) 80 % or more de. gage from an output current of 0 A to the maximum current of 1.  0.1 V For 45 Hz to 65 Hz and DC: ±(0.5 % For all other frequencies: ±(0.7 % of 0.1 V For 45 Hz to 65 Hz and DC: ±(0.5 % of 1 Hz to 65 Hz and DC: ±(0.5 % of 1 Hz to 65 Hz and DC: ±(0.5 % of 1 Hz to 65 Hz and DC: ±(0.5 % of 65 Hz to 65 Hz and DC: ±(0.5 % of 65 Hz to 65 Hz and DC: ±(0.5 % of 65 Hz to 65 Hz and DC: ±(0.5 % of 65 Hz a	180 A 90 A 3000 W  erminal)  (or its reverse), using the output terminal on the rear p  tt (or its reverse).  of reading + 0.5 V / 1 V) reading + 1 V / 2 V)  for adding + 1 V / 2 V)  For 45 Hz to 65 Hz and DC: ±(0.5 % of reading+0.15 A/0.08 A) For all other frequencies: ±(0.7 % of reading+0.3 A/0.15 A)  For 45 Hz to 65 Hz and DC: ±(12 % of reading+0.8 A/0.4 A)  ±(2 % of reading+3 W) ±(2 % of reading+3 VA)	240 A 120 A 4000 W  For 45 Hz to 65 Hz and DC: ±(0.5 % of reading+0.2 A/0.1 A For all other frequencies: ±(0.7 % of reading+0.4 A/0.2 A For 45 Hz to 65 Hz and DC: ±(12 % of reading+0.4 A/0.4 A) ±(2 % of reading+4 W) ±(2 % of reading+4 VA)	160 A   80 A   4000 W
POWER CAPACITY  1-1.100 V J 200 V range.  12. For an output voltage of 14. Limited by the maximum OUTPUT VOLTAGE UNE REGULATION LOAD REGULATION LOAD REGULATION PIPPLE NOISE 19. Power source input voltage of 2. For an output voltage of 2. For an output voltage of 19. For S Hz to 1 MHz comp OUTPUT VOLTAGE TOTAL HARMONIC  OUTPUT VOLTAGE FEICHENCY 19. Power source in output voltage of 2. For an output voltage of 5. Power source, and output voltage of	T-285 V to -28.5 V to +28.5 V to 10.0 V / 2.8 V to 200 V / Limi is current.  STABILITY  19  19  19  19  19  10  10  10  10  10	100 V 200 V	120 A 60 A 2000 W V, no load, and 23 °C ± 5°C. the output voltage is 100 V to 250 V / 200 V to 500 V.  0.2% or less 0.5% or less (0 to 100%, via output t 1 Vrms / 2 Vrms (TYP)  1 Vrms / 2 Vrms (TYP)  2 Voys (50 foOHz < 0.3% @>S00.1 Hz~999.9 Hz  100 μs (TYP) 30 % or more des. the food of the frequencies: ± (0.7 % of on all other frequencies: ± (0.7 % of on 1) V For 45 Hz to 65 Hz and DC: ± (0.5 % for all other frequencies: ± (0.7 % of on 1) V For 45 Hz to 65 Hz and DC: ± (0.5 % of reading +0.1 A / 0.05 A) For all other frequencies: ± (0.7 % of on 1) V For 45 Hz to 65 Hz and DC: ± (12 % of one of one of	180 A 90 A 3000 W  erminal)  (or its reverse), using the output terminal on the rear p  tt (or its reverse).  of reading + 0.5 V / 1 V) reading + 1 V / 2 V)  for adding + 1 V / 2 V)  For 45 Hz to 65 Hz and DC: ±(0.5 % of reading+0.15 A/0.08 A) For all other frequencies: ±(0.7 % of reading+0.3 A/0.15 A)  For 45 Hz to 65 Hz and DC: ±(12 % of reading+0.8 A/0.4 A)  ±(2 % of reading+3 W) ±(2 % of reading+3 VA)	240 A 120 A 4000 W  For 45 Hz to 65 Hz and DC: ±(0.5 % of reading+0.2 A/0.1 A For all other frequencies: ±(0.7 % of reading+0.4 A/0.2 A For 45 Hz to 65 Hz and DC: ±(12 % of reading+0.4 A/0.4 A) ±(2 % of reading+4 W) ±(2 % of reading+4 VA)	160 A   80 A   4000 W
POWER CAPACITY  *1.100 V J 200 V range.  *2. For an output voltage of  *3. For an output voltage of  *4. Limited by the maximum  OUTPUT VOLTAGE  LINE REGULATION  LOAD REGULATION  LOAD REGULATION  *2. For an output voltage of  *3. For 5 Hz to 1 MHz comp  OUTPUT VOLTAGE  TOTAL HARMONIC  OUTPUT VOLTAGE  EFFICIENCY  *3. For 5 m output voltage of  *5. For an output voltage of  *5. For an output voltage of  *5. For A model, an output voltage of  *5. For A model, an output voltage of  *5. For A model, an output voltage of  *5. For A Complex, an output voltage of  *5. For A Complex, an output voltage of  *5. For A Complex, an output voltage  CURRENT  POWER  LOAD POWER FACTION  LOAD POW	T-285 V to -28.5 V to +28.5 V to 10.0 V / 2.8 V to 200 V / Limi is current.  STABILITY  19  19  19  19  19  10  10  10  10  10	100 V 200 V	120 A 60 A 2000 W V, no load, and 23 °C ± 5°C. the output voltage is 100 V to 250 V / 200 V to 500 V.  0.2% or less 0.5% or less (0 to 100%, via output t 1 Vrms / 2 Vrms (TYP)  hange from an output current of 0 A to maximum current LTAGE RESPONSE TIME, EFFICIENCY  < 0.2% ⊕50/60Hz < 0.3% ⊕500.1Hz~999.9Hz  100 µs (TYP) 80 % or more  de. ger from an output current of 0 A to the maximum current of 1.  0.1 V For 45 Hz to 65 Hz and DC: ±(0.5 % For all other frequencies: ±(0.7 % of 0.1 V For 45 Hz to 65 Hz and DC: ±(0.5 % For 45 Hz to 65 Hz and DC: ±(0.5 % for 45 Hz to 65 Hz and DC: ±(0.5 % of reading+0.1 A/0.05 A) For 45 Hz to 65 Hz and DC: ±(0.5 % of reading+0.1 A/0.05 A) For 45 Hz to 65 Hz and DC: ±(0.7 % of reading+0.1 A/0.05 A) For 45 Hz to 65 Hz and DC: ±(0.7 % of reading+0.1 A/0.05 A)  For 45 Hz to 65 Hz and DC: ±(0.2 % of reading+0.2 A/0.1 A) 0.1 A For 45 Hz to 65 Hz and DC: ±(2 % of reading+0.2 A/0.1 A) 0.1 A For 45 Hz to 65 Hz and DC: ±(2 % of reading+2 VA) 1 VA ±(2 % of reading+2 VA) 1 VA ±(2 % of reading+2 VAR) 0.000 to 1.000 0.001 0.00 to 50.00	180 A 90 A 3000 W  erminal)  (or its reverse), using the output terminal on the rear p  tt (or its reverse).  of reading + 0.5 V / 1 V) reading + 1 V / 2 V)  for adding + 1 V / 2 V)  For 45 Hz to 65 Hz and DC: ±(0.5 % of reading+0.15 A/0.08 A) For all other frequencies: ±(0.7 % of reading+0.3 A/0.15 A)  For 45 Hz to 65 Hz and DC: ±(12 % of reading+0.8 A/0.4 A)  ±(2 % of reading+3 W) ±(2 % of reading+3 VA)	240 A 120 A 4000 W  For 45 Hz to 65 Hz and DC: ±(0.5 % of reading+0.2 A/0.1 A For all other frequencies: ±(0.7 % of reading+0.4 A/0.2 A For 45 Hz to 65 Hz and DC: ±(12 % of reading+0.4 A/0.4 A) ±(2 % of reading+4 W) ±(2 % of reading+4 VA)	160 A   80 A   4000 W
POWER CAPACITY  1-100 V J 200 V range.  12- For an output voltage of 24- Limited by the maximum OUTPUT VOLTAGE  LINE REGULATION  LOAD REGULATION  LOAD REGULATION  LOAD REGULATION  LOAD REGULATION  LOAD REGULATION  1- Power source input voltage of 3- For 5- Hz to 1 MHz comp  OUTPUT VOLTAGE  EFFICIENCY  1- At an output voltage of 5- 2- For a	F225 Y to -28.5 V, +28.5 V to +285 V 13.4 V to 100 V / 2.8 V to 200 V. Lim no current.  STABILITY  To age is 200 V, 220 V, or 240 V, no load 1100 V to 200 V, 220 V, or 240 V, no load 1100 V to 200 V / 200 V to 400 V, a load 1100 V to 200 V / 200 V to 400 V, a load 1100 V to 200 V / 100 V to 400 V, a load 1100 V / 200 V, no load power factor of out voltage of 100 V / 200 V, maximu  DISPLAY  RMS, AVG Value  PEAK Value  PEAK Value  Active (W)  Apparent (VA)  Reactive (VAR)  TOR	100 V 200 V	120 A 60 A 2000 W V, no load, and 23 °C ± 5°C. the output voltage is 100 V to 250 V / 200 V to 500 V.  0.2% or less 0.5% or less (0 to 100%, via output t 1 Vrms / 2 Vrms (TYP)  hange from an output current of 0 A to maximum current LTAGE RESPONSE TIME, EFFICIENCY < 0.2% @50/60Hz < 0.3% @500.Hz > 999.9Hz  100 µs (TYP) 80 % or more  de. gref from an output current of 0 A to the maximum current of 1.  0.1 V For 45 Hz to 65 Hz and DC: ±{0.7 % of 0.1 V} For 45 Hz to 65 Hz and DC: ±{0.7 % of 0.1 N} For 45 Hz to 65 Hz and DC: ±{0.7 % of 0.1 N} For 45 Hz to 65 Hz and DC: ±{0.7 % of 0.1 N} For 45 Hz to 65 Hz and DC: ±{0.7 % of 0.1 N} For 45 Hz to 65 Hz and DC: ±{0.7 % of 0.1 N} For 45 Hz to 65 Hz and DC: ±{0.7 % of 0.1 N} For 45 Hz to 65 Hz and DC: ±{0.7 % of 0.1 N} For 45 Hz to 65 Hz and DC: ±{0.7 % of 0.1 N} For 45 Hz to 65 Hz and DC: ±{0.7 % of 0.1 N} For 45 Hz to 65 Hz and DC: ±{0.7 % of 0.1 N} For 45 Hz to 65 Hz and DC: ±{0.7 % of 0.1 N} For 45 Hz to 65 Hz and DC: ±{0.7 % of 0.1 N} For 45 Hz to 65 H	180 A 90 A 3000 W  erminal)  (or its reverse), using the output terminal on the rear p  of reading + 0.5 V / 1 V) reading + 1 V / 2 V)  For 45 Hz to 65 Hz and DC: ±(0.5 % of reading+0.15 A/0.08 A) For all other frequencies: ±(0.7 % of reading+0.3 A/0.15 A)  For 45 Hz to 65 Hz and DC: ±(12 % of reading+0.3 A/0.4 A)  ±(2 % of reading+3 W) ±(2 % of reading+3 VA)	240 A 120 A 4000 W  For 45 Hz to 65 Hz and DC: ±(0.5 % of reading+0.2 A/0.1 A For all other frequencies: ±(0.7 % of reading+0.4 A/0.2 A For 45 Hz to 65 Hz and DC: ±(12 % of reading+0.4 A/0.4 A) ±(2 % of reading+4 W) ±(2 % of reading+4 VA)	160 A   80 A   4000 W
POWER CAPACITY  *1.100 V J 200 V range.  *2. For an output voltage of  *3. For an output voltage of  *4. Limited by the maximum  OUTPUT VOLTAGE  LINE REGULATION  LOAD REGULATION  RIPPLE NOISE  *3. For an output voltage of  *3. For she to 1 MHz comp  OUTPUT VOLTAGE  TOTAL HARMONIC  OUTPUT VOLTAGE  FFICIENCY  *3. For she to 1 MHz comp  *4. For an output voltage of 5  *5. For she to 1 MHz comp  OUTPUT VOLTAGE  CURRENT  **CONTROL TAPE  CURRENT  POWER  LOAD POWER FACT  LOAD POWER FACT  LOAD CREST FACTO  HARMONIC VOLTA	T-285 V to -28.5 V to +28.5 V to 10.0 V / 2.8 V to 200 V / Limi is current.  STABILITY  19  19  10  10  10  10  10  10  10  10	100 V 200 V	120 A 60 A 2000 W V, no load, and 23 °C ± 5°C. the output voltage is 100 V to 250 V / 200 V to 500 V.  0.2% or less 0.5% or less (0 to 100%, via output t 1 Vrms / 2 Vrms (TYP)  hange from an output current of 0 A to maximum current LTAGE RESPONSE TIME, EFFICIENCY  < 0.2% ⊕50/60Hz < 0.3% ⊕500.1Hz~999.9Hz  100 µs (TYP) 80 % or more  de. ger from an output current of 0 A to the maximum current of 1.  0.1 V For 45 Hz to 65 Hz and DC: ±(0.5 % For all other frequencies: ±(0.7 % of 0.1 V For 45 Hz to 65 Hz and DC: ±(0.5 % For 45 Hz to 65 Hz and DC: ±(0.5 % for 45 Hz to 65 Hz and DC: ±(0.5 % of reading+0.1 A/0.05 A) For 45 Hz to 65 Hz and DC: ±(0.5 % of reading+0.1 A/0.05 A) For 45 Hz to 65 Hz and DC: ±(0.7 % of reading+0.1 A/0.05 A) For 45 Hz to 65 Hz and DC: ±(0.7 % of reading+0.1 A/0.05 A)  For 45 Hz to 65 Hz and DC: ±(0.2 % of reading+0.2 A/0.1 A) 0.1 A For 45 Hz to 65 Hz and DC: ±(2 % of reading+0.2 A/0.1 A) 0.1 A For 45 Hz to 65 Hz and DC: ±(2 % of reading+2 VA) 1 VA ±(2 % of reading+2 VA) 1 VA ±(2 % of reading+2 VAR) 0.000 to 1.000 0.001 0.00 to 50.00	180 A 90 A 3000 W  erminal)  (or its reverse), using the output terminal on the rear p  of reading + 0.5 V / 1 V) reading + 1 V / 2 V)  For 45 Hz to 65 Hz and DC: ±(0.5 % of reading+0.15 A/0.08 A) For all other frequencies: ±(0.7 % of reading+0.3 A/0.15 A)  For 45 Hz to 65 Hz and DC: ±(12 % of reading+0.3 A/0.4 A)  ±(2 % of reading+3 W) ±(2 % of reading+3 VA)	240 A 120 A 4000 W  For 45 Hz to 65 Hz and DC: ±(0.5 % of reading+0.2 A/0.1 A For all other frequencies: ±(0.7 % of reading+0.4 A/0.2 A For 45 Hz to 65 Hz and DC: ±(12 % of reading+0.4 A/0.4 A) ±(2 % of reading+4 W) ±(2 % of reading+4 VA)	160 A   80 A   4000 W
POWER CAPACITY  **1.100 V / 200 V range.  **2. For an output voltage of st. Emitted by the maximum OUTPUT VOLTAGE LINE REGULATION LOAD REGULATION RIPPLE NOISE **  **1. Power source input voltage of st. For an output voltage of st. For AC mode, at an output voltage of	17-285 V to -28.5 V, +28.5 V to +285 V 17.4 V to 100 V / 2.8 V to 200 V. Limi no current.  18 TABILITY 19 10 N **2  age is 200 V, 220 V, or 240 V, no lead 100 V to 200 V 1000 V to 400 V, a lo poments in DC mode using the output 10 WAVEFORM DISTORTIO 10 DISTORTION(THD) 10 V to 200 V / 100 V to 400 V, a lo 1100 V / 200 V, a load power factor or 1100 V / 200 V /	100 V 200 V	120 A 60 A 2000 W V, no load, and 23 °C ± 5°C. the output voltage is 100 V to 250 V / 200 V to 500 V.  0.2% or less 0.5% or less (0 to 100%, via output t 1 Vrms / 2 Vrms (TYP)  1 Vrms / 2 Vrms (TYP)  2 Voys (50 / 60 Hz < 0.3% (60 × 500 Hz < 0.3% (60 × 50	180 A 90 A 3000 W  erminal)  (or its reverse), using the output terminal on the rear p  of reading + 0.5 V / 1 V) reading + 1 V / 2 V)  For 45 Hz to 65 Hz and DC: ±(0.5 % of reading+0.15 A/0.08 A) For all other frequencies: ±(0.7 % of reading+0.3 A/0.15 A)  For 45 Hz to 65 Hz and DC: ±(12 % of reading+0.3 A/0.4 A)  ±(2 % of reading+3 W) ±(2 % of reading+3 VA)	240 A 120 A 4000 W  For 45 Hz to 65 Hz and DC: ±(0.5 % of reading+0.2 A/0.1 A For all other frequencies: ±(0.7 % of reading+0.4 A/0.2 A For 45 Hz to 65 Hz and DC: ±(12 % of reading+0.4 A/0.4 A) ±(2 % of reading+4 W) ±(2 % of reading+4 VA)	160 A   80 A   4000 W
POWER CAPACITY  *1.100 V J 200 V range.  *2. For an output voltage of  *3. For an output voltage of  *4. Limited by the maximum  OUTPUT VOLTAGE  LINE REGULATION  LOAD REGULATION  RIPPLE NOISE  *1. For an output voltage of  *3. For \$3 Hz to 1 MHz comp  OUTPUT VOLTAGE  TOTAL HARMONIC  OUTPUT VOLTAGE  **TOTAL HARM	17-285 V to -28.5 V, +28.5 V to +285 V 17.4 V to 100 V / 2.8 V to 200 V. Limi no current.  18 TABILITY 19 10 N **2  age is 200 V, 220 V, or 240 V, no lead 100 V to 200 V 1000 V to 400 V, a lo poments in DC mode using the output 10 WAVEFORM DISTORTIO 10 DISTORTION(THD) 10 V to 200 V / 100 V to 400 V, a lo 1100 V / 200 V, a load power factor or 1100 V / 200 V /	100 V 200 V	120 A 60 A 2000 W V, no load, and 23 ℃ ± 5℃. the output voltage is 100 V to 250 V / 200 V to 500 V.  0.2% or less 0.5% or less (0 to 100%, via output t 1 Vrms / 2 Vrms (TYP)  hange from an output current of 0 A to maximum current LTAGE RESPONSE TIME, EFFICIENCY < 0.2% @ 50 / 60 Hz < 0.3% @ <500.1 Hz~999.9 Hz  100 µs (TYP) 30 % or more  de. nge from an output current of 0 A to the maximum current of 0.1 V For 45 Hz to 65 Hz and DC: ± (0.5 % For all other frequencies: ± (0.7 % of 0.1 V For 45 Hz to 65 Hz and DC: ± (0.5 % of reading +0.1 A/0.05 A) For 45 Hz to 65 Hz and DC: ± (0.5 % of reading +0.1 A/0.05 A) For 45 Hz to 65 Hz and DC: ± (0.5 % of reading +0.1 A/0.05 A) For 45 Hz to 65 Hz and DC: ± (0.7 % of reading +0.1 A/0.05 A) For 45 Hz to 65 Hz and DC: ± (2.6 % of reading +0.1 A/0.05 A)  For 45 Hz to 65 Hz and DC: ± (2.7 % of reading +0.1 A/0.05 A) For 45 Hz to 65 Hz and DC: ± (2.7 % of reading +0.1 A/0.05 A)  For 45 Hz to 65 Hz and DC: ± (2.7 % of reading +0.1 A/0.05 A)  For 45 Hz to 65 Hz and DC: ± (2.7 % of reading +0.1 A/0.05 A)  1 W ± (2.7 % of reading +0.2 A/0.1 A) 0.1 A For 45 Hz to 65 Hz and DC: ± (2.8 % of reading +2 VA) 1 VA ± (2.8 % of reading +2 VA) 1 VA ± (2.9 % of reading +2 VAR) 0.000 to 1.000 0.001 Up to 100th order of the fundamental 200 V / 400 V, 100%	180 A 90 A 3000 W  erminal)  (or its reverse), using the output terminal on the rear p  tit (or its reverse).  of reading + 0.5 V / 1 V) reading + 1 V / 2 V)  For 45 Hz to 65 Hz and DC: ±(0.5 % of reading+0.15 A/0.08 A) For all other frequencies: ±(0.7 % of reading+0.3 A/0.15 A)  For 45 Hz to 65 Hz and DC: ±( 2 % of reading+0.3 A/0.4 A) ±(2 % of reading+3 W)  ±(2 % of reading+3 VA)  ±(2 % of reading+3 VA)	240 A 120 A 4000 W  For 45 Hz to 65 Hz and DC: ±(0.5 % of reading+0.2 A/0.1 A For all other frequencies: ±(0.7 % of reading+0.4 A/0.2 A For 45 Hz to 65 Hz and DC: ±(12 % of reading+0.4 A/0.4 A) ±(2 % of reading+4 W) ±(2 % of reading+4 VA)	160 A   80 A   4000 W





#### Rear Panel



### **ASR-3000 Series**

			ASR-3200	ASR-3300	ASR-3400	ASR-3400HF				
HARMONIC CURREN	-	B	7.5.1.0.200	1.0.1.0000	7.51.5100	rwit-5400111				
EFFECTIVE VALUE (RI		Range Full Scale	Up to 100th order of the fundaments 20 A / 10 A, 100%	30 A / 15 A, 100%	40 A / 20 A, 100%					
	мэ)		0.01 A. 0.1%	30 A / 15 A, 100%	40 A / 20 A, 100%					
PERCENT (%) Resolution (AC-INT and 50/60 Hz only) Accuracy *9										
		Accuracy "	Up to 20th ±(1 % of reading+0.4 A/0.2 A) 20th to 100th ±(1.5 % of reading+0.4 A/0.2 A)	Up to 20th ±(1 % of reading+0.6 A/0.3 A) 20th to 100th ±(1.5 % of reading+0.6 A/0.3 A)	Up to 20th ±(1 % of reading+0.8 A/0.4 A) 20th to 100th ±(1.5 % of reading+0.8 A/0.4 A)					
<ol> <li>An output current in the rar</li> <li>An output current in the rar</li> <li>For an output voltage of 50</li> <li>The apparent and reactive p</li> <li>The reactive power is for th</li> <li>An output voltage in the rar</li> </ol>	Itage of 20 V to 200 V / 40 V nge of 5 % to 100 % of the r nge of 5 % to 100 % of the r V or greater, an output cun sowers are not displayed in e load with the power factor	V to 400 V and 23 °C ± 5 °C. DC mo maximum current, and 23 °C ± 5 °C maximum peak current in AC modi rent in the range of 10 % to 100 % the DC mode. r 0.5 or lower.	de: For an output voltage of 28.5 V to 285 V / 57 V to 570 V , an output current in the range of 5 % to 100 % of the max of the maximum current, DC or an output frequency of 45 H	imum instantaneous current in DC mode, and 23 °C ±	5 °C. The accuracy of the peak value is for a waveform	of DC or sine wave.				
THERS										
ROTECTIONS			UVP, OCP, OTP, OPP, Fan Fail							
HSPLAY			TFT-LCD, 4.3 inch							
MEMORY FUNCTION			Store and recall settings, Basic settings: 10 (0-9 numeric keys)							
RBITRARY WAVE	Number of Mer		16 (nonvolatile)							
	Waveform Leng	th	4096 words							
ITERFACE	Standard	USB	Type A: Host, Type B: Slave, Speed: 1.1/2.0, USB-CDC, USB-TMC							
	20004-03-47-46	LAN	MAC Address, DNS IP Address, User Password, Gateway IP Address, Instrument IP Address, Subnet Mask							
		RS-232C	Complies with the EIA-RS-232 specifi							
		EXT Control	External Signal Input; External Control I/O							
2000, CODE, C. 100, M. C. Asto. 100	960 000	GPIB	SCPI-1993, IEEE 488.2 compliant interface							
NSULATION RESISTA			500 Vdc, 30 MΩ or more							
etween input and chassis		nput and output	1.4 TE W							
VITHSTAND VOLTAG	(T) 1		1500 Vac, 1 minute							
etween input and chassis	, output and chassis, ir	nput and output								
EMC			EN 61326-1, EN 61326-2-1, EN 61000-3-2, EN 61000-3-3, EN 61000-3-11, EN 61000-3-12							
			EN 61000-4-2/-4-3/-4-4/-4-5/-4-6/-4-8/-4-11/-4-34, EN 55011 (Class A), EN 55032							
SAFETY			EN 61010-1							
NVIRONMENT	Operating Envir		Indoor use, Overvoltage Category II							
	Operating Tem		0 °C to 40 °C		·					
	Storage Temper		-10 °C to 70 °C							
	Operating Hum		20 % to 80 % RH (no condensation	)						
	Storage Humid	ity Range	90 % RH or less (no condensation)							
	Altitude		Up to 2000 m	·	·					
DIMENSIONS & WEIG	SHT		430(W)×176(H)×530(D) mm (not in	cluding protrusions); Approx. 25kg		430(W)x176(H)x530(D) mm (not including protrusions); Approx. 25kg				

#### ORDERING INFORMATION

ASR-3200	2kVA Programmable AC/DC Power Source
ASR-3300	3kVA Programmable AC/DC Power Source
ASR-3400	4kVA Programmable AC/DC Power Source
ASR-3400HF	4kVA Programmable AC/DC Power Source

#### ACCESSORIES :

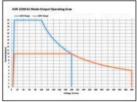
Safety guide, Input Terminal Cover, Output terminal cover include remote sensing, GRA-442-E Rack mount adapter (EIA), GTL-246 USB Cable

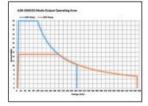
#### OPTIONAL ACCESSORIES

GPW-005	Power cord, 3m, 105°C, UL/CSA type	GTL-232	RS232C Cable, approx. 2m
GPW-006	Power cord, 3m, 105°C, VDE type	GTL-248	GPIB Cable, approx. 2m
	(ASR-3200, ASR-3300 Ues Only)	GTL-137	Output power wire(load wire_10AWG:50A, 600V/sense wire_16AWG:20A, 600V)
GPW-007	Power cord, 3m, 105°C, PSE type	ASR-002	External three phase control unit for IP2W, IP3W, 3P4W output
GRA-442-J	Rack mount adapter(JIS)	APS-008	Air inlet filter
GRA-442-E	Rack mount adapter (EIA)	GET-006	Universal Extension
		ASR-C003	Modbus TCP feature
* European	output outlet(factory installed)		

# Programmable AC/DC Power Source

#### **OPERATING AREA FOR ASR-3000 SERIES**





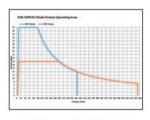
AC Output for ASR-3200

DC Output for ASR-3200

AC Output for ASR-3300

DC Output for ASR-3300

ш			
		4	



Model Name	Power Rating	Max. Output Current	Max. Output Voltage
ASR-3200	2k VA	20 / 10 A	400 Vrms / ±570 Vdc
ASR-3300	3k VA	30 / 15 A	400 Vrms / ±570 Vdc
ASR-3400	4k VA	40 / 20 A	400 Vrms / ±570 Vdc

AC Output for ASR-3400

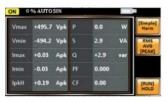
DC Output for ASR-3400

The ASR-3000 series is an AC + DC power source that provides not only rated power output for AC output, but also rated power output for DC output.

#### **MEASUREMENT ITEMS FOR ASR-3000 SERIES**







**RMS Meas Display** 

**AVG Meas Display** 

Peak Meas Display

ON	ON ON 94 % 200V (50U)							
Harr Harr		larr Harn Harn		Harmonic Voltage Measure THDv = 42.2 % Sie				
31th	21th	11th	1st	179.9 Vrms	90.7 %	[Harm		
32th	22th	12th	2nd	0.0 Vrms	0.0%			
33th	29th	13th	3rd	59.8 Vrms	30.2 %	[THDV		
34th	24th	14th	4th	0.0 Vrms	0.0%	THO		
35th	25th	15th	Sth	35.8 Vrms	18.0 %			
36th	26th	16th	6th	0.0 Vrms	0.0 %			
37th	27th	17th	7th	25.5 Vrms	12.9 %			
30th	28th	18th	Bth	0.0 Vrms	0.0%			
39th	29th	19th	9th	19.8 Vrms	10.0 %	Page		
40th	30th	20th	10th	0.0 Vrms	0.0 %	Down		



Voltage Harmonic

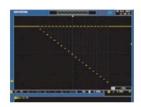
**Current Harmonic** 

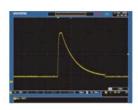
The ASR-3000 Series provides users with measurement capabilities including Vrms, Vavg, Vpeak, Irms, Iavg, Ipeak, IpkH, P, S, Q, PF, CF, 100th-order Voltage Harmonic and Current Harmonic. During the power output, the measurement

parameters including Vrms/Irms, Vavg/Iavg and Vmax/Vmin/Imax/ Imin can be switched by users at any time to display the instantaneous calculation reading.

#### SEQUENCE MODE AND BUILT-IN ISO-16750-2 WAVEFORMS







SEQ6: Momentary Drop in **Supply Voltage** 

SEQ7: Reset Behavior at Voltage Drop with 12V System

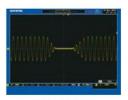
The sequence mode provides editable 10 sets of SEQ0~SEQ9, each set has 0~999 steps, each step time setting range is 0.0001~999.9999 seconds. Users can combine multiple sets of steps to generate the required waveforms, including waveform falling, surges, sags and other abnormal power line conditions to meet the needs of the test applications.

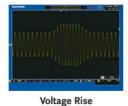
SEQ8: Starting Profile Waveform

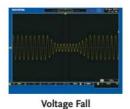
SEQ9: Load Dump with Tr\_10ms, Td\_40ms

In addition, ASR-3000 Series also built in common ISO-16750-2 test waveforms in the Sequence Mode preset waveforms, including Momentary Drop in Supply Voltage built in at SEQ6, Reset Behavior at Voltage Drop with 12V system built in at SEQ7, Starting Profile Waveform built in at SEQ8 and Load Dump with Tr\_10ms, and Td\_40ms built in at SEQ9.

#### D. SIMULATE MODE







Simulate Mode can quickly simulate different transient waveforms, such as power outage, voltage rise, voltage fall, etc., for engineers to evaluate the impact of transient phenomena on the DUT.

Ex: Capacitance durability test.

**Power Outage** 

#### FUNCTION WAVEFORM (ARBITRARY EDIT) MODE



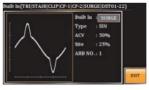




TRI Waveform ST

STAIR Waveform

**CLIP Waveform** 





**SURGE Waveform** 

Fourier Series Synthesized Waveform

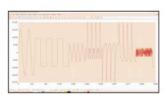
ASR-3000 Series provides more than 20,000 waveform combinations in seven categories, allowing users to quickly simulate different AC voltage waveforms. Adjust the desired waveform type directly through the panel (displayed synchronously on the screen), then the waveform is loaded into the ARB 1~16 waveform register through the access procedures, and return to the main menu output mode to perform ARB Waveform output.

#### F. PC SOFTWARE





Sequence Mode





Basic Controller

ARB Waveform Edit

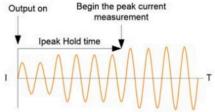
The Waveform is Observed with DSO

The ASR-3000 Series software includes basic settings, the Simulate Mode, the Sequence Mode, Data Log and the arbitrary waveform editing function. Users can directly set output voltage, frequency, start/stop phase on ASR-3000 Series through the software. The Simulate Mode can quickly simulate different transient waveforms such as power outage, voltage rise, voltage fall... etc.

The Sequence Mode can edit the editing parameters read back from ASR-3000 Series, or directly edit the parameters and control ASR-3000 Series to output waveforms according to the set sequence.

The arbitrary waveform editing function not only combines various waveforms, including sine waves, square waves, triangle waves, and noise waveforms, but also allows uses to draw arbitrary waveforms and output them.

#### G. T, IPK HOLD & IPK, HOLD FUNCTIONS



T, Ipk Measurement

T, lpk Hold is used to set the delay time after the output (1ms  $\sim$  60,000ms) to capture the Ipeak value and keep the maximum value. The update only functions when the measurement value is greater than the original value. The T, lpk Hold delay time setting can be used to measure surge current at the power on process of the DUT.

lpk Hold can be used to measure the transient surge current of the DUT at power on without using an oscilloscope and a current probe.

### SLEW RATE MODE



#### Time Mode

Slope Mode

The ASR-3000 Series can set the Slew Rate Mode to determine the rise time of the voltage according to the test requirements of the DUT. Slew Rate Mode provides "Time" and "Slope" modes. When setting "Time" mode, ASR-3000 Series can increase output to  $10{\sim}90\%$  of the set voltage within  $100\mu s$ ; and when selecting "Slope" mode, ASR-3000 Series increases output voltage by a fixed rising slope of  $1.5V/\mu s$  until reaching the set voltage value.

In addition, if users decide to self-define the rise time of the output voltage, users can flexibly set the rise time of the ASR-3000 Series voltage by editing the Sequence mode.

# Compact Programmable AC/DC Power Source



#### ASR-2050/2100 Series



### ASR-2050R/2100R Series



#### **FEATURES**

- \* Output Rating: AC 0 ~ 350 Vrms, DC 0 ~ + 500 V
- \* Output Frequency up to 999.9 Hz
- \* DC Output (100% of Rated Power)
- \* Output Capacity: 500VA/1000VA
- \* Measurement Items: Vrms, Vavg, Vpeak, Irms, IpkH, Iavg, Ipeak, P, S, Q, PF, CF
- \* Voltage and Current Harmonic Analysis (THDv, THDi)
- \* Customized Phase Angle for Output On/Off
- \* Remote Sensing Capability
- \* OVP, OCP, OPP, OTP, AC Fail Detection and Fan Fail Alarm
- \* Interface: USB,LAN,RS-232(std.); GPIB(opt.)
- \* Built-in External Control I/O and External Signal Input
- \* Built-in Output Relay Control
- \* Memory Function (up to 10 sets)
- \* Sequence and Simulation Function (up to 10 sets)
- \* Support Arbitrary Waveform Function
- \* Built-in Web Server

#### **GET-003** Universal Extended Terminal Box **GET-004** Euro Extended Terminal Box

(ASR-2000R only)



#### **GET-006** Universal extension

(AC signel phase 250V/13Amps)



The ASR-2000 series, an AC+DC power source aiming for system integration or desktop applications, provides both rated power output for AC output and rated power output for DC output. Ten ASR-2000 output modes are available, including 1) AC power output mode (AC-INT Mode), 2) DC power output mode (DC-INT Mode), 3) AC/DC power output mode (AC+DC-INT Mode), 4) External AC signal source mode (AC-EXT Mode), 5) External AC/DC signal source mode (AC-EXT Mode), 6) External AC/DC signal superimposition mode (AC-ADD Mode), 7) External AC/DC signal superimposition mode (AC+DC-ADD Mode), 8) External AC signal synchronization mode (AC-SYNC Mode), 9) External AC/DC signal synchronization mode (AC-DC-SYNC Mode), 10) External DC voltage control of AC output mode (AC-DC-SYNC Mode), 10) VCA).

The ASR-2000 series provides users with waveform output capabilities to meet the test requirements of different electronic component development, automotive electrical devices and home appliance, including 1) Sequence mode generates waveform fallings, surges, sags, changes and other abnormal power line conditions; 2) Arbitrary waveform function allows users to store/upload user-defined waveforms; and 3) Simulate mode simulates power outage, voltage rise, voltage fall, and frequency variations. When the ASR-2000 series power source outputs, it can also measure Vrms, Vavg, Vpeak, Irms, Iavg, Ipeak, IpkH, P, S, Q, PF, CF, 100th-order Voltage Harmonic and Current Harmonic. In addition, the Remote sense function ensures accurate voltage output. The Customized Phase Angle for Output On/Off function can set the starting angle and ending angle of the voltage output according to the test requirements. V-Limit, Ipeak-Limit, F-Limit, OVP, OCP, OPP function settings can protect the DUT during the measurement process. In addition to OTP, OCP, and OPP protection, the ASR-2000 series also incorporates the Fan fail alarm function and AC fail alarm

The front panel of the ASR-2050/2100 provides a universal socket or a European socket, which allows users to plug and use so as to save wiring time. The ASR-2050R/2100R is 3U height and 1/2 Rack width design, which is compatible with ATS assembly. The ASR-2000 series supports I/O interface and is equipped with USB, LAN, PS-232C External I/O and

		ASR-2050/ASR-2050R	ASR-2100/ASR-2100R
INPUT RATING (AC)		•	
NOMINAL INPUT VOLTAC INPUT VOLTAGE RANGE PHASE INPUT FREQUENCY RANG MAX. POWER CONSUMPT POWER FACTOR" MAX. INPUT CURRENT	ie .	100 Vac to 240 Vac 90 Vac to 264 Vac Single phase, Two-wire 47 Hz to 63 Hz 800 VA or less 0.95 (typ.) 0.90 (typ.) 8 A 4 A	100 Vac to 240 Vac 90 Vac to 264 Vac Single phase, Two-wire 47 Hz to 63 Hz 1500 VA or less 0.95 (typ.) 0.90 (typ.) 15 A 7.5 A
*1, For an output voltage of 100	V/200 V (100V/200V rang	ge), maximum current, and a load power fac	tor of 1.
AC MODE OUTPUT RATIN	IGS (AC rms)		
VOLTAGE OUTPUT PHASE	Setting Range Setting Resolution Accuracy 2	0.0 V to 175.0 V / 0.0 V to 350.0 V 0.1 V ±(0.5 % of set + 0.6 V / 1.2 V) Single phase, Two-wire	
MAXIMUM CURRENT'3	100 V	5 A	10 A

OUTPUT PHASE		Single phase, two wife	
MAXIMUM CURRENT <sup>13</sup>	100 V	5 A	10 A
78 78143 243	200 V	2.5 A	5 A
MAXIMUM PEAK CURRENT*	100 V	20 A	40 A
	200 V	10 A	20 A
POWER CAPACITY		500 VA	1000 VA
FREQUENCY	Setting Range	AC Mode: 40.00 Hz to 999.9 Hz, AC+I	OC Mode: 1.00 Hz to 999.9 Hz
	Setting Resolution	0.01 Hz (1.00 to 99.99 Hz), 0.1 Hz (10	00.0 to 999.9 Hz)
	Accuracy	For 45 Hz to 65 Hz: 0.01% of set, For	40 Hz to 999.9 Hz: 0.02% of set
	Stability*5	± 0.005%	
OUTPUT ON PHASE	70.70.80700 <b>*</b>	0.0° to 359.9° variable (setting resoluti	ion 0.1°)
DC OFFSET <sup>16</sup>		Within ± 20 mV (TYP)	

- \*1.100 V / 200 V range
  \*2. For an output voltage of 17.5 V to 175 V / 35 V to 350 V, sine wave, an output frequency of 45 Hz to 65 Hz, no load, DC voltage setting 0V (AC+DC mode) and 23°C ± 5°C
  \*3. For an output voltage of 1 V to 100 V / 2 V to 200 V, Limited by the power capacity when the output voltage is 100 V to 175 V / 200 V to 350 V.
  \*4. With respect to the capacitor-input rectifying load. Limited by the maximum current.
  \*5. For 45 Hz to 55 Hz, the rated output voltage, no load and the resistance load for the maximum current, and the operating temperature.
  \*6. In the case of the AC mode and output voltage setting to 0 V.

OUTPUT RATING FOR DC M	IODE		
VOLTAGE	Setting Range <sup>11</sup> Setting Resolution Accuracy <sup>12</sup>	-250 V to +250 V / -500 V to +500 0.1 V ±( 0.5 % of set  + 0.6 V / 1.2 V)	V
MAXIMUM CURRENT <sup>13</sup>	100 V	5 A	10 A
	200 V	2.5 A	5 A
MAXIMUM PEAK CURRENT*	100 V	20 A	40 A
	200 V	10 A	20 A
POWER CAPACITY		500 W	1000 W

- 100 V / 200 V range
  For an output voltage of -250 V to -25 V, +25 V to +250 V / -500 V to -50 V, +50 V to +500 V, no load, AC volatge setting 0V (AC+DC mode) and 23°C ± 5°C
  For an output voltage of 1.4 V to 100 V / 2.8 V to 200 V, Limited by the power capacity when the output voltage is 100 V to 250 V / 200 V to 500 V.
  Within 5 ms, Limited by the maximum current.

OUTPUT VOLTAGE STABILITY

LINE REGULATION"	±0.2% or less
LOAD REGULATION <sup>12</sup>	$\pm 0.15\% @45\text{-}65\text{Hz}; \pm 0.5\% @DC, all other frequencies (0–100\%, via output terminal)$
RIPPLE NOISE"	0.7 Vrms / 1.4 Vrms (TYP)

- \*1. Power source input voltage is 100 V, 120 V, or 230 V, no load, rated output.

  \*2. For an output voltage of 75 V to 175V/150V to 350V, a load power factor of 1, stepwise change from an output current of 0 A to maximum current (or its reverse), using the output terminal on the rear panel.

  \*3. For 5 Hz to 1 MHz components in DC mode using the output terminal on the rear panel.

OUTPUT VOLTAGE WAVEFORM DISTORTION RATIO, OUTPUT VOLTAGE RESPONSE TIME, EFFICIENCY					
TOTAL HARMONIC DISTORTION(THD)	≤ 0.2% @50/60Hz, ≤ 0.3% @<500Hz, ≤ 0.5% @500.1Hz~999.9Hz				
OUTPUT VOLTAGE RESPONSE TIME <sup>12</sup>	100 μs (TYP)				
EFFICIENCY'3	70 % or more				
5 to 5 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1					

- \*1. At an output voltage of 50 V to 175 V / 100 V to 350 V, a load power factor of 1, and in AC and AC+DC mode.
  \*2. For an output voltage of 100 V / 200 V, a load power factor of 1, with respect to stepwise change from an output current of 0 A to the maximum current (or its reverse); 10% 90% of output voltage \*3. For AC mode, at an output voltage of 100 V / 200 V, maximum current, and load power factor of 1 and sine wave only.

MEASURE	D VALUE DISPLAY						
VOLTAGE	RMS, AVG Value"	Resolution Accuracy 2	0.1 V For 45 Hz to 65 Hz and DC: ±(0.5 % 999.9 Hz: ±(0.7 % of reading + 0.9 V/				
	PEAK Value	Resolution Accuracy	0.1 V For 45 Hz to 65 Hz and DC: ±( 2 % of reading  + 1 V / 2 V)				
CURRENT	RMS, AVG Value	Resolution Accuracy <sup>3</sup>	0.01 A For 45 Hz to 65 Hz and DC: ±(0.5 % of reading+0.02 A/0.02 A); For 40 Hz to 999.9 Hz: ±(0.7 % of reading + 0.04 A / 0.04 A)	0.01 A For 45 Hz to 65 Hz and DC: ±(0.5 % of reading+0.04 A/0.02 A); For 40 Hz to 999.9 Hz: ±(0.7 % of reading + 0.08 A / 0.04 A)			





#### **ASR-2000 Series**

PEAK Value	Resolution Accuracy **	0.01 A	
		For 45 Hz to 65 Hz and DC:	0.01 A For 45 Hz to 65 Hz and DC:
		±( 2 % of reading +0.2 A/0.1 A)	±( 2 % of reading +0.2 A/0.1 A)
Active (W)	Resolution	0.1 / 1 W	0.1 / 1 W
	Accuracy"	±(2 % of reading + 0.5 W)	±(2 % of reading + 1 W)
Apparent (VA)		The state of the s	0.1 / 1 VA
Reactive (VAR)			±(2 % of reading + 1 VA) 0.1 / 1 VAR
, ,			±(2 % of reading + 1 VAR)
VER FACTOR	Range	0.000 to 1.000	0.000 to 1.000
	Resolution	0.001	0.001
ST FACTOR	Range	0.00 to 50.00	0.00 to 50.00
	Resolution	0.01	0.01
C VOLTAGE	Range		Up to 100th order of the fundamental wave
			175 V / 350 V, 100%
,			0.1 V, 0.1%
50/60 Hz only)	Accuracy *		Up to 20th±(0.2% of reading + 0.5V/1V); 20th to 100th±(0.3% of reading + 0.5V/1V)
C CURRENT	Range	1 100	Up to 100th order of the fundamental wave
VALUE (RMS)	Full Scale	5 A / 2.5 A, 100%	10 A / 5 A, 100%
%)	Resolution	0.01 A, 0.1%	0.01 A, 0.1%
50/60 Hz only)	Accuracy <sup>13</sup>	Up to 20th±(1% of reading + 0.1A/0.05 A);	Up to 20th±(1% of reading + 0.2A/0.1A); 20th to 100th±(1.5% of reading + 0.2A/0.1A)
	ST FACTOR  C VOLTAGE VALUE (RMS) %) 50/60 Hz only)  C CURRENT VALUE (RMS) %) 50/60 Hz only)	Apparent (VA) Resolution Accuracy **** Resolution Accuracy **** VER FACTOR Range Resolution ST FACTOR Range Resolution C VOLTAGE VALUE (RMS) ** ** ** ** ** ** ** ** ** ** ** ** **	Apparent (VA)   Resolution   Accuracy***   Eactive (VAR)   Resolution   Accuracy***   Eactive (VAR)   Resolution   Accuracy***   Eactive (VAR)   Resolution   Accuracy***   Eactive (VAR)   Eactive (VAR)

- \*1. The voltage display is set to RMS in AC/AC+DC mode and AVG in DC mode.

  \*2. AC mode: For an output voltage of 17.5V to 175V/35V to 350V and 23 °C±5 °C. DC mode: For an output voltage of 25V to 250V/50V to 500V and 23 °C±5 °C.

  \*3. An output current in the range of 5 % to 100 % of the maximum current, and 23 °C±5 °C.

  \*4. An output current in DC mode, and 23 °C±5 °C. The accuracy of the peak value is for a waveform of DC or sine wave.

  \*5. For an output voltage of 50V or greater, an output current in AC maximum peak output current in AC mode, and 23 °C±5 °C.

  \*6. The apparent and reactive powers are not displayed in the DC mode. \*7. The reactive power is for the load with the power factor 0.5 or lower.

  \*6. The apparent and reactive powers are not displayed in the DC mode. \*7. The reactive power is for the load with the power factor 0.5 or lower.

  \*6. THERS

#### OTHERS

PROTECTIONS DISPLAY MEMORY FUNCTION

ARBITRARY WAVE Number of Memories Waveform Length Standard USB INTERFACE

LAN RS-232C

EXT Control Optional CPIR INSULATION RESISTANCE

WITHSTAND VOLTAGE

EMC

Safety

Operating Environment Environment Operating Temperature Range Storage Temperature Range Operating Humidity Range

Storage Humidity Range

**DIMENSIONS & WEIGHT** 

OCP, OTP, OPP, FAN Fail

TFT-LCD, 4.3 inch

10 sets for Store and Recall settings

16 (nonvolatile) 4096 words

Type A: Host, Type B: Slave, Speed: 1.1/2.0, USB-CDC MAC Address, DNS IP Address, User Password, Gateway IP Address,

Instrument IP Address, Subnet Mask Complies with the EIA-RS-232 specifications External Signal Input; External Control I/O SCPI-1993, IEEE 488.2 compliant interface

500 Vdc, 30 MΩ or more

1500 Vac, 1 minute

EN 61326-1 (Class A);EN 61326-2-1/-2-2 (Class A);EN 61000-3-2 (Class A, Group 1);EN 61000-3-3 (Class A, Group 1);EN 61000-4-2/-4-3/-4-4/-4-5/-4-6/-4-8/-4-11 (Class A, Group 1);EN 55011 (Class A, Group1);EN 61010-1 Indoor use, Overvoltage Category II

0 °C to 40 °C

-10 °C to 70 °C

20 % RH to 80 % RH (no condensation)

90 % RH or less (no condensation)

Up to 2000 m

ASR-2000 : 285 (W)×124 (H)×480 (D) (not including protrusions); Approx. 11.5 kg ASR-2000R : 213 (W)×124 (H)×480 (D) (not including protrusions); Approx. 10.5 kg

#### ORDERING INFORMATION

ASR-2050 500VA Programmable AC/DC Power Source
1000VA Programmable AC/DC Power Source
1000VA Programmable AC/DC Power Source
1000VA Programmable AC/DC Power Source for 3U 1/2 Rack Mount
1000VA Programmable AC/DC Power Source for 3U 1/2 Rack Mount

ACCESSORIES:

Safety Guide, Power Cord, Mains Terminal Cover Set, Remote Sense Terminal Cover Set, GTL-123 Test Lead, GTL-246 USB Cable

#### OPTIONAL ACCESSORIES

ASR-GPIB-2K Optional GPIB Interface for ASR-2000 (Factory installed) European Output Outlet only for ASR-2000 (Factory installed) Extended Universal Power Socket(ASR-2000R only) ASR-EU-2K **GET-003** GET-004 ASR-001 ASR-002

Extended European Power Socket (ASR-2000R only)
Air inlet filter
External three phase control unit for IP2W, IP3W, 3P4W output ASR-C003

GRA-439-E Rack Mount Kit (EIA) GRA-439-J Rack Mount Kit (JIS) GTL-232 RS-232C Cable, approx. 2M GPIB Cable, approx. 2M, including 25 pins Micro-D connector GTL-258 GET-006 Universal Extension

#### FREE DOWNLOAD

USB Driver

Note : GET-003/GET-004 are not C€ approved.

#### ASR-2050/2100 Rear Panel



#### ASR-2050R/2100R Rear Panel



#### GRA-439-J/E Rack Mount Kit(JIS/EIA)

For: ASR-2000 Series





#### GTL-258 GPIB Cable, 2000mm



#### ASR-001 Air Inlet Filter



#### ASR-002 External three phase control unit

- Basis Requirement of ASR-002 to ASR-Series
- Must be the three same models of ASR-Series
   To ASR-2000 Series, the ASR-GPIB-2K: GPIB interface is required
- \* Functions of ASR-Series are limited when conducts to ASR-002
- 1. No DC Output
- 2. Measurement Items: only current(A), power(W) and PF for each phase
  3. No Voltage and Current Harmonic Analysis

- No Remote Sensing Capability
   No Arbitrary Waveform Function
   No Sequence and Simulation Function
   Not supported External Control I/O

- No memory Function
   Only support USB, no LAN port for communication



# 500/1000/2000/3000 VA Programmable Linear AC Power Source



#### APS-7050



#### APS-7100



#### **FEATURES**

- \* 4.3-inch TFT-LCD
- \* Output Capacity: APS-7050(500VA,310Vrms,4.2Arms); APS-7100(1000VA,310Vrms,8.4Arms); APS-7200(2000VA, 310Vrms,16.8Arms); APS-7300(3000VA,310Vrms,25.2Arms) Output Augmentation by Options(0-600Vrms/45-999.9Hz)
- \* Low Ripple & Noise
- \* Measurement and Test Functions Include VOLT, CURR, PWR, SVA, IPK, IPKH, FREQ, PF, CF
- \* Support a Small AC Current Measurement 2mA ~35A, Min. Rresolution 0.01mA(APS-7050&APS-7100)
- \* Reverse Current Alarm Function
- \* 10 sets of Sequence Function to Edit Output Waveforms/10 sets of Simulate Mode to Rapidly Simulate Transient Power Supply/10 sets of Program Mode to Define Measurement Sequence/10 sets of Panel Memory Function
- \* Automatic Execution of Sequence, Simulate, Program mode and Output Function when the Power is on
- \* Standard Interfaces: USB Host, LAN. USB Device(APS-7200 & APS-7300 only)
- \* Optional Interfaces:GPIB(APS-001),RS-232/USB CDC(APS-002 for APS-7050 & APS-7100 only), RS-232 (APS-007 for APS-7200 & APS-7300 only)

#### APS-001/APS-002 Interface Card



**APS-003** 

APS-004 Output Frequency Capacity



#### APS-007 RS-232 Interface Card

For: APS-7200 Series, APS-7300 Series



GWInstek introduces APS-7000 series programmable AC power sources, which consists of 500VA of APS-7050, 1000VA of APS-7100, 2000VA of APS-7200 and 3000VA of APS-7300. APS-7000 series features power characteristics from its linear structure design including low noise, low THD, and highly stabilized power output that are ideal for the product development and verification of input power with low noise requirement or stereo, video and audio device applications, etc. The maximum rated voltage is 0~310Vrms, 25.2Arms, 100.8A peak current and the output frequency range is 45~500.0Hz. Users can conveniently augment the output voltage from 0Vrms to 600Vrms and output frequency from 45Hz to 999.9Hz by purchasing options without sending equipment back to GW Instek

One of the popular alternative energy solutions in the market is to utilize inverter to convert DC to AC and the converted AC is then sent to power grid or products require electricity. For instance, AC produced by PV inverter is sent to power grid or equipment requires electricity. While simulating power grid to verify inverter connecting with power grid, general AC power sources cannot withstand DUT's feedback energy, hence, additional power consumption resistors are needed to prevent AC power source from being damaged. On the contrary, APS-7000 series has the characteristic of absorbing reverse current so that additional power consumption resistors are not required. The input terminal of APS-7000 series is designed to isolate from the simulated AC power grid output terminal, therefore, users do not need an additional isolation device to protect DUT. APS-7000 series is suitable for simulating power grid and conducting inverter output characteristic tests, including synchronized phase and frequency. Reverse current and power detected by APS-7000 series will be displayed in red readings to facilitate user's test observation. APS-7000 series utilizes Simulate mode and Sequence mode to provide a single step or consecutive power changes; and to simulate power grid's Voltage Abnormality Test and Frequency Abnormality Test.

APS-7000 series comprises nine measurement and test functions (Vrms, Irms, F, Ipk, W, VA, PF, Ipk hold, CF), and provides user interface similar to that of AC Power Meter. APS-7000 series is ideal for the LED industry and standby mode power consumption test. Under the ARB mode, APS-7000 series provides waveforms in seven categories including Sine waveform, Triangle waveform, Staircase waveform(Square wave), Clipped Sinewave, Crest factor waveform, Surge waveform, and Fourier series and 20,000 waveform combinations so as to meet the requirements of simulating abnormal input power waveform test of various industries. Ten Preset settings allow users to store ten sets of data; Power ON Output setting allows Sequence, Simulate, and Program to automatically execute output after the equipment power is on.

To meet the test criteria of line voltage fluctuation often seen in consumer electronics, APS-7000 series features five methods to cope with special purpose or abnormal voltage, frequency, and phase; ten sets of the Simulate mode simulate power outage, voltage rise, and voltage fall; ten sets of the Sequence mode allow users to define parameters and produce sine wave by editing steps; ten sets of the Program mode can edit AC waveform output and define the ceiling and floor level of measurement items for different DUTs; Ramp Control allows users to set the variation speed for output voltage rise and fall; Surge/Dip Control simulates DUT's input power producing a Surge or Dip voltage overlapping with output voltage waveform at a specific time. For larger current output applications, voltage drop across the output cables should be avoided. APS-7200/7300 also provide the remote sense function, which senses DUT's voltage and sends the information back to APS-7200/7300 for program controlled voltage compensation. Therefore, APS-7200/7300 can avoid the voltage drop of the cable to affect output voltage.

Ethernet Port, on the rear panel, can be used for remote program control; Sync Output Socket provides external 10V sync output; Signal Output Connector provides monitor of Program execution results. APS-7000 series also provides users with Trigger In/Out and Output on/off remote control functions from J1 connector on the rear panel.

Model		APS-7050	APS-7100	APS-7200	APS-7300
AC OUTPUT					
Power Rating Output Voltage		500VA 0 ~ 155Vrms, 0 ~ 310Vrms	1000VA 0 ~ 155Vrms, 0 ~ 310Vrms	2000VA 0 ~ 155Vrms, 0 ~ 310Vrms	3000VA 0 ~ 155Vrms, 0 ~ 310Vrms
Output Frequency Maximum Current(r.m.s) *7	0~155Vrms 0~310Vrms	45.00 ~ 500.0 Hz 4.2A 2.1A	45.00 ~ 500.0 Hz 8.4A 4.2A	45.00 ~ 500.0 Hz 16.8A 8.4A	45.00 ~ 500.0 Hz 25.2A 12.6A
Current(peak) OPT. APS-003(rms) OPT. APS-003(peak)		16.8A 8.4A 1.05A 4.2A	33.6A 16.8A 2.1A 8.4A	67.2A 33.6A 4.2A 16.8A	100.8A 50.4A 6.3A 25.2A
Total Harmonic Disto Crest Factor Line Regulation Load Regulation Response Time Reverse Current	rtion (THD)*2	≤4 0.1% (% of full sca 0.3% (% of full sca <100μs 30% of Maximum 6			f Maximum
SETTING			11 12 0		
Voltage	Range Resolution Accuracy	0~155Vrms, 0~310Vrms, Auto 0.01V at 0.00 ~ 99.99Vrms; 0.1V at 100.0 ~ 310.0Vrms ±(0.5% of setting+2 counts)			
Frequency	Range Resolution Accuracy	45 ~ 500Hz	99.99Hz; 0.1Hz at 100	0.0 ~ 500.0Hz	
OPT. APS-004	Range Resolution	45~999.9Hz 0.01Hz at 45.00 ~ 9	99.99Hz; 0.1Hz at 100	).0 ~ 999.9Hz	
Power On/Off Phase Angle	Range Resolution Accuracy	0 ~ 359° 1° ±1°(45 ~ 65Hz)			
MEASUREMENT:	÷3				
Voltage(RMS)	Range	0.20~38.75Vrms;38.777.51~155.0Vrms;15	5.1~310.0Vrms	0.20~38.75Vrms;38 77.51~155.0Vrms;1	55.1~310.0Vrms
Frequency	Resolution Accuracy*4	0.01V at 0.00 ~ 99. 0.1V at 100.0 ~ 310 ±(0.5% of reading	0.0Vrms	0.01V at 0.00 ~ 99 0.1V at 100.0 ~ 31 ±(0.5% of reading	0.0Vrms
,,	Range Resolution	45 ~ 500Hz 0.01Hz at 45Hz~99 0.1Hz at 100Hz~50	9.99Hz;	45 ~ 500Hz 0.01Hz at 45Hz~9 0.1Hz at 100Hz~9	99.99Hz;
Current(RMS)	Accuracy Range Resolution	±0.1Hz 2.00 ~ 70.00mA;60 0.300 ~ 3.500A;3.0 0.01mA, 0.1mA, 0.	0 ~ 17.5A	±0.1Hz 0.200 ~ 3.500A;3.0 0.001A;0.01A	00~35.00A
	Accuracy	±(0.6% of reading+5 ±(0.5% of reading+5	counts),2.00~350.0mA; counts),0.300~3.500A; counts),3.000~17.50A	±(0.5% of reading+	5 counts),0.200~3.500A -3 counts),3.00~35.00A





**APS-7200** 

**APS-7300** 

SPECIFICA Model		ADC 7050	ADC 7100	ADC 7200	ADC 7200	
wodei		APS-7050	APS-7100	APS-7200	APS-7300	
Current(Peak)	Range	0.0 ~ 70.0A		0.0 ~ 140.0A		
	Resolution	0.1A		0.1A		
	Accuracy	±(1% of reading+1	count)	± 1% of reading+1 of	count)	
Power(W)	Resolution	0.01W, 0.1W, 1W		0.1W, 1W		
	Accuracy	±(0.6% of reading+5	counts),0.20~99.99W;	±(0.6% of reading+	5counts),0.2~999.9V	
		±(0.6% of reading+5 counts),100.0~999.9W;		±(0.6% of reading+2counts),1000~9999		
A	n 1		2 counts),1000~9999W			
Apparent(VA)	Resolution Accuracy	0.01VA, 0.1VA, 1VA		0.1VA, 1VA	ta\ 0.3. 000 0\//	
	Accuracy	,	ounts),0.20~99.99VA; ounts),100.0~999.9VA;		counts),0.2~999.9VA	
			counts),1000~9999VA		counts),1000~9999\	
Power Factor	Resolution	0.001	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	0.001		
i onei racioi	Accuracy	±(2% of reading +	2 counts)	±(2% of reading+2	counts)	
GENERAL		-(				
Remote output	signal	Dace Fail Test in D	rocess, Trigger in, Trig	rger out OUT ON /OF	E	
Sync output sig		Output Signal 10 V		ger out, our onlyon		
Number of Pre		10 (0~9 numeric ke				
Protection		OCP, OPP, OTP an				
Trigger Out		Maximum low level output = 0.8V; Minimum high level output = 2V; Maximum source current = 8mA				
Trigger In		Maximum low level input voltage = 0.8V; Minimum high level input voltage = 2.0V;				
98		Maximum sink current = 8mA				
SEQUENCE/	SIMULATIO	N FUNCTION				
Number of Me	mories	10 (0 ~ 9 Numeric	keys)			
Number of Step	os	255 max. (For 1 sec				
Step Time Setti		0.01 ~ 999.99s Constant, Keep, Linear Sweep				
Operation With Parameters	iin Step			ne wave only): On Ph	ase Off Phase Term	
Tarameters		Output Range, Frequency, Waveform (sine wave only); On Phase, Off Phase, Term Jump Count (0 ~ 255) jump-to, Branch 1, Branch 2, Trigger Output				
Sequence Cont	rol		Continue, Branch 1, Br		1	
AC INPUT						
Phase		Single Phase	Single Phase	Single Phase	Single Phase	
Input Voltage		115/230Vac±15%	115/230Vac±15%	230Vac±15%	230Vac±15%	
Input Frequenc	у	50/60Hz	50/60Hz	50/60Hz	50/60Hz	
Max. Current		16A/8A	32A/16A	32A	50A	
Power Factor		0.7Typ.	0.7Тур.	0.7Typ.	0.7Тур.	
Power Consum	•	1.8kVA or less	3.6kVA or less	7.2kVA or less	10.8kVA or less	
ENVIRONME	NT CONDIT					
Operating Temp						
Storage Tempe Operating Hun		-10 ~ +70°C				
Storage Humid		20 ~ 80% RH (No Condensation) 80% RH or less (No Condensation)				
INTERFACE	ni, nange	00701111011033(110	Condensation			
Standard		USB Host, LAN		USB Host, USB CD	CLAN	
Optional		GPIB (APS-001)		GPIB (APS-001)	C, LAIV	
- Prioriti		RS232 / USB CDC	(APS-002)	RS232 (APS-007)		
DIMENSION	S & WEICHT		,		v. –	
		430(W) x 88(H) x	430(W) x 88(H) x	430(W) x 312(H) x	430(W) x 400(H) :	
		400(D) mm;	560(D) mm;	650(D) mm;	650(D) mm;	
		Approx. 24kg	Approx. 38kg	Approx. 90kg	Approx. 128kg	

#### ORDERING INFORMATION

Approx. 38kg

APS-7050 500VA Programmable AC Power Source APS-7100 1000VA Programmable AC Power Source ACCESSORIES:

Approx. 24kg

APS-7200 2000VA Programmable AC Power Source APS-7300 3000VA Programmable AC Power Source

Approx. 128kg

Approx. 90kg

Power Cord(Region Dependent), GTL-123 Test Lead
OPTIONAL ASSESSORIES

#### APS-7300 Rear Panel



#### APS-7200 Rear Panel



#### APS-7100 Rear Panel



#### APS-7050 Rear Panel



#### APS-7000 Series **Europe Type Output Outlet**



The Specifications are not suit for ARB mode.

- \*1. Maximum output current at working voltage 120Vrms, 240Vrms
- \*2. 45~500Hz, 10% or higher of the rated output voltage, the maximum current or lower
- \*3. All of measurement accuracy is at 23±5°C
- \*4. In the case of 15~155V, 30~310V, sine wave, no load

#### Mains Terminal Cover Set

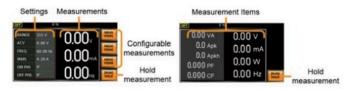


Note: 1. APS-7200/APS-7300 are not **C €** approved.

2. The minimum time settings of sequence mode or simulate mode must be greater than 1 cycle of the waveform itself.

# 500/1000/2000/3000 VA Programmable Linear AC Power Source

#### CONTROL PANEL CHARACTERISTICS



#### Standard Mode

#### Simple Mode

There are two control panel modes: Standard mode and Simple mode. Both modes are shown on the above. Standard mode combines settings and AC Power Meter measurement window display. Users apply Function key (F1~F3) to select required measurement items. There are nine items for selection. Simple mode shows all measurement items on the display.

#### REVERSE CURRENT DISPLAY





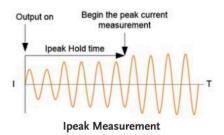
#### Standard Mode

#### Simple Mode

When output terminal detects 180 degree phase difference between voltage and current (reverse current), the front panel of APS-7000 Series will remind users the power and power factor measurement results in red numerical display. This feature can be applied to show the power and power factor measurement while testing inverter for feedback power grid. As shown on the above :

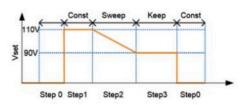
APS-7000 Series can withstand reverse current: 30% of the maximum effective current or maximum current output within three minutes.

#### T IPEAK, HOLD FUNCTION



T, Ipk Hold sets delay time (1ms~60 seconds) for measurement after the output of Ipeak value and the maximum value will be retrieved. Update will be proceeded only if measured value is greater than the original value. Ipk Hold is for measuring transient inrush current as soon as the equipment power is on that is usually done by oscilloscope and current probe. T, Ipk Hold delay time setting can be applied to measure inrush current of sequentially activated DUT.

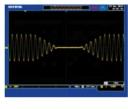
#### **SEQUENCE MODE**

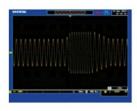


#### Sequence Mode

There are ten sets of Sequence mode and each set has 0~255 steps. The time setting range for each step is 0.01 ~ 999.99 seconds. Combining many sets of steps to edit required waveforms can satisfy users' requirement of highly complicated waveforms.

#### SIMULATE MODE







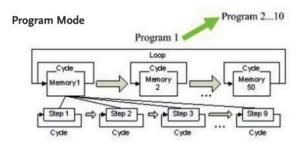
input transient waveforms such as power outage; voltage rise and voltage fall etc. for engineers to evaluate the impact on DUT posed by the transient phenomena. For instance, capacitor endurance

This mode can rapidly produce different simulated

**Power Outage** Voltage Rise

Voltage Fall

#### PROGRAM MODE

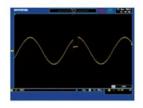


This mode allows users to set ceiling and floor specifications to produce PASS/FAIL result after the measurement is done. It can also show test results for each test procedure or only show the last result.

There are ten sets of Program mode and each set has 50 sets of memory. Each memory comprises 9 steps. Each Program will operate according to memory sequence, self-defined loops or designated steps to stop.

#### G SURGE/DIP CONTROL





Overlapping a Surge/Dip voltage on a normal voltage as the input power for DUT allows users to simulate Surge/Dip situation and evaluate DUT characteristics.

Surge

Dip

#### H. FUNCTION WAVEFORM (ARB) MODE

Provide waveforms in seven categories and 20,000 waveform combinations so as to rapidly simulate distorted AC voltage waveforms.



Sine Waveform Standard AC Waveform



Triangle Waveform

Power Harmonic Output Simulation
Is Triangle Waveform



Staircase Waveform Simulate Square Waveform And Staircase Waveform For Commercial Ups



Clipped Sinewave Simulate Grid Power Supply Heavy Load Waveform



Crest Factor Waveform Simulate Rectified Filter Current Waveform By Capacitor Input



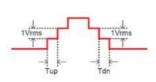
Surge Waveform Simulate Grid Power Supply's Peak Over-voltage

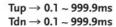


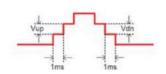
#### Fourier Series Synthesized Waveform

Simulate real output power waveform. Distorted power waveform is produced due to output impedance and non-linear effect such as inductance, capacitance, and parasitic capacitance effect. For example: motors.

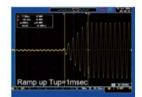
#### RAMP CONTROL



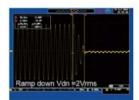




 $Vup \rightarrow 0.01 \sim 99.99 \text{ Vrms}$  $Vdn \rightarrow 0.01 \sim 99.99 \text{ Vrms}$ 



Mode=Time, Tup=1msec, VAC=100V, Freq=50Hz, Ramp output=on.



Mode=Voltage, Vdn=2Vrms, VAC=100V, Freq=50Hz, Ramp output=off.

Ramp control allows users to set output voltage rise or fall speed which is based on time (1ms) or voltage (1Vrms) unit.



#### **APS-7050E**



#### **APS-7100E**



#### **FEATURES**

- \* 4.3" large LCD Display
- \* Output Capacity: APS-7050E (500VA, 310Vrms, 4.2/2.1Arms) APS-7100E (1000VA, 310Vrms, 8.4/4.2Arms)
- \* Measurement Function : Voltage, Current, Power, Frequency, Power Factor, Ipeak
- \* Reverse Current Alarm Function
- \* 10 Sets of The Test Mode Simulate Power Transient Output
- \* 10 Sets of Preset Allow Users to Store Ten Settings
- \* OCP/OPP/OTP Protection
- \* Variable Voltage, Frequency and Current
- \* Universal Power Inlet

GW Instek launches the APS-7000E series the economy version of the APS-7000 programmable AC power source. With the height of 2U, the maximum rated output for APS-7050E is 500VA, 310Vrms, 4.2Arms and APS-7100E is 1000VA, 310Vrms, 8.4Arms. The output frequency range of the series is 45~500Hz. The series is ideal for the test and development of DC power supply devices, consumer electronics, automotive electronics and electronic components.

The APS-7000E series comprises six measurement and test functions (Vrms, Irms, F, Ipk, W, PF), and provides user interface similar to that of AC Power Meter. The APS-7000E series, via switching many sets of current levels to increase small current measurement resolution, is ideal for the LED industry and standby mode power consumption test. Ten sets of Preset allow users to store ten settings.

To meet the test criteria of line voltage fluctuation often seen in consumer electronics, the APS-7000E series not only provides a stable AC power source but also features the Test mode to satisfy special or abnormal voltage and frequency variation demands. Ten sets of the Test mode simulate power outage, voltage rise, and voltage fall. The APS-7000E series that simulates waveforms of city power grid's transient changes is suitable for verifying electronics products operated under abnormal power source.

The APS-7000E series is the economy version of the APS-7000 series. If communications interface and larger voltage/frequency are required, please refer to the APS-7000 series.

	APS-7050E	APS-7100E				
1	500VA	1000VA				
		0 ~ 155Vrms/0 ~ 310.0 Vrms				
		45.00 ~ 500.0 Hz				
0.3551/	10 at 2 at 2 at 5 at 2 at 2 at 2 at 2 at 2	43.00 ~ 300.0 HZ 8.4A				
		8.4A 4.2A				
0 510111115	2	1,2,1				
		33.6A				
0~310Vrms	8.4A	16.8A				
oration (THD)	≤0.5% at 45 ~ 500Hz (Resistive Load)					
	≤4					
	0.1% (% of full scale)					
	0.3% (% of full scale)					
	<100us					
		(Continue): 100% of Maximum				
		<u></u>				
Pango	0 155\/rms/0 210\/rms/Auto					
		0 310 01/				
	그 일반 회사 시간 시간 한 전체 시간	0 ~ 310.0vrms				
0	0.01Hz at 45.00 ~ 99.99Hz/0.1Hz at 100.0 ~ 500.0Hz					
Accuracy	10.0270 of Setting					
-	0.20~38.75Vrms/38.76~77.50 Vrms/77.51~155.0Vrms/155.1~310.0Vrms					
		.0 ~ 310.0vrms				
110001411011		00Hz~500.0Hz)				
	2.00 ~ 70.00mA/60.0 ~ 350.0mA/0.300 ~ 3.500A/3.00 ~ 17.5A					
Accuracy		, ,				
	, ,	nts);3.500~17.50A				
Range						
Resolution	0.1A					
Accuracy	±(1% of reading+1 count)					
Resolution	0.01W, 0.1W, 1W					
Accuracy	±(0.6% of reading+5 counts); 0.20~99.9	9W; ±(0.6% of reading+5 counts);				
33	100.0~999.9W ±(0.6% of reading+2 counts); 1000~9999W					
Resolution	0.001					
Accuracy	±(2% of reading + 2 counts)					
	10(0~9 Numeric keys)					
	Range Resolution Accuracy Resolution Accuracy Resolution Accuracy Resolution	SOOVA   0 ~ 155Vrms/0 ~ 310.0 Vrms   45.00 ~ 500.0 Hz   42.A   2.1A   16.8A   0-310Vrms   8.4A   0-310Vrms   8.4A   0-310Vrms   8.4A   0.1% (% of full scale)   0.3% (% of full scale)   0.1% (% of full scale)   0.10µs   30% of Maximum Output RMS Current Output RMS Current (Within 3 minutes   45 ~ 500Hz   6.5% of setting+2 counts)   45 ~ 500Hz   6.5% of setting+2 counts   45 ~ 500Hz   6.6% of setting+5 counts   45 ~ 500Hz   45 ~ 500Hz   6.6% of setting+5 counts   6				



### **APS-7050E**



### APS-7100E Rear Panel

APS-7050E Rear Panel



# APS-7100E

Model	APS-7100E	
<b>ENVIRONMENT CONDI</b>	TIONS	
Operation Temperature	0~+40℃	
Storage Temperature	-10 ~ +70°C	
Operating Temperature	20 ~ 80% RH (No Condensation)	
Storage Humidity	80% RH or less (No Condensation)	
AC INPUT		
Input Power Source	1Φ AC 115/230Vac ±15%	
<b>DIMENSIONS &amp; WEICH</b>		
	430(W) x 88(H) x 400(D) mm; Approx. 24kg	430(W) x 88(H) x 560(D) mm; Approx. 38kg

#### ORDERING INFORMATION

APS-7050E 500VA AC Power Source APS-7100E 1000VA AC Power Source

#### ACCESSORIES :

Power Cord (Region Dependent), Mains Terminal Cover Set,

GTL-123 Test Lead

#### OPTIONAL ASSESSORIES

GRA-423 Rack Mount Kit (APS-7000E Series)

#### **Mains Terminal Cover Set**



#### APS-7000E Series Europe Type Output Outlet





### **ELECTRONIC LOADS**

GW Instek provides DC electronic loads, AC/DC electronic loads, which allow users to flexibly test various batteries, energy storage systems, and power supply devices. DC electronic load can simulate load characteristics, including static, dynamic, constant current, constant resistance, constant voltage, constant power and short circuit. AC/DC electronic load can simulate sine wave current load in the CC mode, non-sine wave current load in the linear CC mode, and AC rectified load in the rectifier mode.

Electronic loads can be simply divided into multi-channel electronic loads and single-channel electronic loads according to application requirements. The multi-channel electronic load can test and measure multiple sets of low-power and different specifications of power output devices at the same time; and the single-channel electronic load can, based on the characteristics of a single load, choose high power, high voltage, high precision, high resolution or fast dynamic response to conduct test and measurement.

Electric vehicles, solar energy, energy storage systems, server power supplies, and power electronics, etc., can use the built-in dedicated test modes of GW Instek electronic loads to simplify user's operating procedures and shorten the test time. For example: using the CC+CV, CP+CV, CC+UVP, CP+UVP battery discharge modes to discharge electric vehicle battery can avoid over-discharge and protect the battery at the same time. The MPPT mode can quickly obtain the maximum power point of the solar panel.

#### **PRODUCTS**

- Multi-channel Electronic Loads
- High Power DC Electronic Load
- DC Electronic Load
- . AC & DC Electronic Load

# DC ELECTRONIC LOADS

#### MULTI-CHANNEL DC ELECTRONIC LOAD MODULES

Model	Operation Voltage	Operation Current	Power	Channel	Weight(kg)	Page
PEL-2020A(B)	0 ~ 80V	20A	100/100W	2	3.8	
PEL-2030A(B)	0 ~ 80V	5/40A	30/250W	2	3.8	D115-118
PEL-2040A(B)	0 ~ 80V	70A	350W	1	3.8	D113-110
PEL-2041A(B)	0 ~ 500V	10A	350W	1	3.8	

#### DC ELECTRONIC LOADS

Model	Operation Voltage	Operation Current	Power	Channel	Weight(kg)	Page
PEL-503-80-50	0 ~ 80V	50A	250W	1	5.3	
PEL-504-80-70	0 ~ 80V	70A	350W	1	5.3	D127-128
PEL-507-80-140	0 ~ 80V	140A	700W	1	10.3	
PEL-3021	0 ~ 150V	35A	175W	1	6	D101-108
PEL-3031AE	0 ~ 150V	60A	300W	1	7.5	D109-114
PEL-3041	0 ~ 150V	70A	350W	1	7	
PEL-3111	0 ~ 150V	210A	1050W	1	17	D103-108
PEL-3211	0 ~ 150V	420A	2100W	1	23	
PEL-3032AE	0 ~ 500V	15A	300W	1	7.5	D109-114
PEL-504-500-15	0 ~ 500V	15A	350W	1	5.3	D107.100
PEL-507-500-30	0 ~ 500V	30A	700W	1	10.3	D127-128
PEL-3021H	0 ~ 800V	8.75A	175W	1	6	
PEL-3041H	0 ~ 800V	17.5A	350W	1	7	
PEL-3111H	0 ~ 800V	52.5A	1050W	1	17	D103-108
PEL-3211H	0 ~ 800V	105A	2100W	1	23	1

#### HIGH POWER DC ELECTRONIC LOADS

Model	Operation Voltage	Operation Current	Power	Channel	Weight(kg)	Page
PEL-5008C-150-800	150V	800A	8kW	1	77.5	
PEL-5010C-150-1000	150V	1000A	10kW	1	84.8	
PEL-5012C-150-1200	150V	1200A	12kW	1	92	
PEL-5015C-150-1500	150V	1500A	15kW	1	116.5	
PEL-5018C-150-1800	150V	1800A	18kW	1	124	
PEL-5020C-150-2000	150V	2000A	20kW	1	140.5	
PEL-5024C-150-2000	150V	2000A	24kW	1	155	
PEL-5008C-600-560	600V	560A	8kW	1	77.5	
PEL-5010C-600-700	600V	700A	10kW	1	84.8	1
PEL-5012C-600-840	600V	840A	12kW	1	92	D110 100
PEL-5015C-600-1050	600V	1050A	15kW	1	116.5	D119-126
PEL-5018C-600-1260	600V	1260A	18kW	1	124	
PEL-5020C-600-1400	600V	1400A	20kW	1	140.5	1
PEL-5024C-600-1680	600V	1680A	24kW	1	155	
PEL-5008C-1200-320	1200V	320A	8kW	1	77.5	1
PEL-5010C-1200-400	1200V	400A	10kW	1	84.8	1
PEL-5012C-1200-480	1200V	480A	12kW	1	92	
PEL-5015C-1200-600	1200V	600A	15kW	1	116.5	
PEL-5018C-1200-720	1200V	720A	18kW	1	124	
PEL-5020C-1200-800	1200V	800A	20kW	1	140.5	
PEL-5024C-1200-960	1200V	960A	24kW	1	155	
PEL-5004G-150-400	150V	400A	4kW	1	28	
PEL-5005G-150-500	150V	500A	5kW	1	28	
PEL-5006G-150-600	150V	600A	6kW	1	28	
PEL-5004G-600-280	600V	280A	4kW	1	29	
PEL-5005G-600-350	600V	350A	5kW	1	29	D135-138
PEL-5006G-600-420	600V	420A	6kW	1	29	
PEL-5004G-1200-160	1200V	160A	4kW	1	29	
PEL-5005G-1200-200	1200V	200A	5kW	1	29	
PEL-5006G-1200-240	1200V	240A	6kW	1	29	

# DC ELECTRONIC LOADS

# AC/DC ELECTRONIC LOADS

Model	Operation Voltage	Operation Current	Power	Channel	Weight(kg)	Page
AEL-5002-350-18.75	350V	18.75A	1875W	1	21.5	
AEL-5003-350-28	350V	28A	2800W	1	27.5	
AEL-5004-350-37.5	350V	37.5A	3750W	1	33.5	
AEL-5006-350-56	350V	56A	5600W	1	58	
AEL-5008-350-75	350V	75A	7500W	1	70	
AEL-5012-350-112.5	350V	112.5A	11250W	1	105	
AEL-5015-350-112.5	350V	112.5A	15000W	1	140	
AEL-5019-350-112.5	350V	112.5A	18750W	1	260	
AEL-5023-350-112.5	350V	112.5A	22500W	1	295	
AEL-5002-425-18.75	425V	18.75A	1875W	1	21.5	D129-134
AEL-5003-425-28	425V	28A	2800W	1	27.5	
AEL-5004-425-37.5	425V	37.5A	3750W	1	33.5	
AEL-5006-425-56	425V	56A	5600W	1	58	
AEL-5008-425-75	425V	75A	7500W	1	70	
AEL-5012-425-112.5	425V	112.5A	11250W	1	105	
AEL-5015-425-112.5	425V	112.5A	15000W	1	140	
AEL-5019-425-112.5	425V	112.5A	18750W	1	260	
AEL-5023-425-112.5	425V	112.5A	22500W	1	295	
AEL-5003-480-18.75	480V	18.75A	2800W	1	27.5	
AEL-5004-480-28	480V	28A	3750W	1	33.5	



### PEL-3111/3111H



### PEL-3041/3041H/3021/3021H



#### **FEATURES**

- \* Operating Voltage (DC): 0~150V(PEL-3000)/ 0~800V(PEL-3000H)
- \* Operating Mode: C.C/C.V/C.R/C.P/C.C+C.V/ C.R+C.V/C.P+C.V
- \* Parallel Connection of Inputs for Higher Capacity (Max: 9,450W)
- \* Support of High Slew Rate: Max 16A/µs (PEL-3000)/0.84A/µs (PEL-3000H)
- \* Run Program Function (Go/NoGo Test)
- \* Sequence Function for High Efficient Load
- \* Dynamic (Switching) Function: 0.0166Hz~ 20kHz
- \* Soft Start Function: Off/On (1~200ms, Res. 1ms)
- \* Adjustable OCP/OVP/OPP/UVP Setting
- \* Short Circuit Function
- \* Timer Function: Elapsed Time of Load on
- \* Cut Off Time (Auto Load Off Timer): 1s to 999h 59min 59s or Off
- \* External Channel Control/Monitoring Via **Analog Control Connector**
- \* Setup Memories: 100 sets
- \* 3.5 Inch TFT LCD Display
- \* Multi Interface : USB, RS-232 (Std.)/ GPIB, LAN (Opt.)

The PEL-3000 Series, a single-channel, programmable D.C. electronic load with 0.01mA current resolution and 16A/  $\mu$  s current Slew Rate, is very ideal for testing server power supply and SPS (Switching Power Supply) for commercial and industrial computers. For a heavy-duty device like cloud ecosystem running 24-hour nonstop operations, a stable and high-power power supply, ranging from 350W to 1500W, is required to maintain the normal operation of server, Hub, and the equipment of data storage and internet communications. Owing to the increasing demand of data transmission and large scale data storage of telecommunications systems, the infrastructure of internet communications is in the pace of rapid expansion. This has greatly boosted the market demand of telecommunications equipment powered by power supply of 2000W and above. The flexible power combination of PEL-3000 Series meets the test requirements of present high-power power supply. The PEL-3000H Series programmable DC Electronic load, which not only inherited functions and features from the PEL-3000 Series but providing three current ranges for all PEL-3000H Series and adding voltage monitor BNC terminals on the front panel. The PEL-3000H Series, a singlechannel, programmable D.C. electronic load with 800V and 0.84A/  $\mu$  s current Slew Rate, is ideal for the test of the high voltage devices such as the EV & HEV in-vehicle chargers, DC/DC converters or high-voltage batteries. With respect to battery testing applications such as rechargeable battery for electrical tools, battery module and automobile battery, PEL-3000(H) Series has three stand-alone models to offer including 175W, 350W, 1050W and Booster. By connecting Booster 2100W units with master units, the maximum load capacity of the whole system can reach 9,450W. Hence, the PEL-3000(H) Series fulfills various power testing requirements including medium to low power or highpower power supply.

The PEL-3000(H) Series has seven operating modes and three operating functions. Among the seven operating modes, four of them are basic operating modes, including constant current, constant voltage, constant resistance, and constant power, and the other three are advanced operating modes including constant current + constant voltage, constant resistance + constant voltage, and constant power + constant voltage. Users must first select operating mode and then operating function based upon the test requirements. Static, Dynamic and Sequence operating functions can be applied to different testing conditions including a fixed load level, switching between two levels or switching among more than two levels. Sequence function is divided into Fast Sequence and Normal Sequence according to the test time of each step. Both Dynamic and Sequence are to assist users to simulate the genuine load change. For instance, PEL-3000(H) Series can simulate HEV current consumption to make sure that automobile battery can supply HEV with sufficient power need on the road. By so doing, manufacturers can elevate product quality and reliability.

The Soft Start function of the PEL-3000(H) Series can set current rise time for the moment PEL-3000(H) Series is turned on to reduce the abnormal situation of the voltage drop of power supply under test. The adjustable Under Voltage Protection (UVP), GO/NO GO voltage input monitoring function, current monitoring function and Timer Function to control load activation time can be jointly applied to the characteristic tests of battery bleeding to avoid battery damage during bleeding operation. Based upon the functionalities described above, the PEL-3000(H) Series can test a vast variety of power supply ranging from the fundamental static sink current to complex dynamic load simulations so as to enhance product quality and reliability.

#### The single unit D.C Electronic Load of PEL-3000(H) Series

The PEL-3000(H) Series is a high speed, single channel and programmable D.C. electronic load and its power, functionality, parallel combination and size are listed on the following chart:

MODEL	PEL-3021/3021H	PEL-3041/3041H	PEL-3111/3111H	PEL-3211/3211H	
Power	175W	350W	1,050W	2,100W Booster	
Function	Full-function Single Unit	Full-function Single Unit	Full-function Single Unit	No control panel, can not be operated alone	
Parallel	Parallel with same	Parallel with same	Parallel with same model, 5 units the maximum	Parallel with	
Combination	model, 5 units the maximum	model, 5 units the maximum	Parallel with the maximum of four PEL-3211 (H)s	PEL-3111(H)	
Size	Half Rack	Half Rack	Full Rack	Full Rack	

SPECIFICATIONS						
Model			PEL-3021	PEL-3041	PEL-3111	PEL-3211
Voltage			0V~150V	0V~150V	0V~150V	0V~150V
Current Power			35A 175W	70A 350W	210A 1050W	420A 2100W
Input Resistance			500 kΩ	500 kΩ	500 kΩ	500 kΩ
Min. Operating			0.75V@17.5A	0.75V@35A	0.75V@105A	0.75V@210A
Voltage(DC)(Typ.)  CONSTANT CURRENT MOD	E		1.5V@35A	1.5V@70A	1.5V@210A	1.5V@420A
Operating Range	H,M,	L	0~35A 0~3.5A 0~0.35A	0~70A 0~7A 0~0.7A	0~210A 0~21A 0~2.1A	420A
Accuracy of Setting	Н,М		±(0.2 % of set + 0.1 % of f.s*1	) + Vin*2/500 kΩ		±(1.2% of set+1.1% of f.s)
Accuracy of Setting	L		±(0.2 % of set + 0.1 % of f.s*1		- 10	N/A
Accuracy of Setting(Parallel)			±(1.2% of set +1.1% of f.s.*3)		57 - 57 - 57	±(1.2% of set+1.1% of f.s)
Resolution	Н,М,	L	1mA 0.1mA 0.01mA	2mA 0.2mA 0.02mA	10mA 1mA 0.1mA	N/A
CR MODE						
Operating Range		н	23.3336S~400μS (42.857mΩ~2.5kΩ)	46.6672S~800μS (21.428mΩ~1.25kΩ)	140.0016S~2.4mS (7.1427mΩ~416.6667Ω)	280.0032S~4.8mS (3.5714mΩ~208.3334Ω)
		597.5	2.33336S~40µS	4.6667S~80μS	14.0001S~242.4µS	28.0032S~484.8µS
	Range	М	(428.566mΩ~25kΩ)	4.00073~80μ3 (214.28mΩ~12.5kΩ)	(71.427mΩ~4.16667kΩ)	(35.7135mΩ~2.083334Ω)
		2020	0.233336S~4µS	0.46667S~8µS	1.40001S~24.24µS	
		L	(4.28566Ω~250kΩ)	(2.1428Ω~125kΩ)	$(714.27 \text{m}\Omega \sim 41.6667 \text{k}\Omega)$	N/A
Accuracy of Setting	Н,М		±(0.5 % of set*6 + 0.5 % of f.s	1) + Vin <sup>3</sup> /500kΩ		±(1.2% of set" +1.1% of f.s")
Accuracy of Setting	L		±(0.5 % of set*6 + 0.5 % of f.s	1) + Vin <sup>13</sup> /500kΩ		N/A
Parallel			±(1.2 % of set + 1.1 % of f.s*3)	10 30 V 10 10		±(1.2% of set +1.1% of f.s*3)
Resolution	Н,М,	L	400μS 40μS 4μS	800μS 80μS 8μS	2.4mS 240μS 24μS	N/A
CONSTANT VOLTAGE MOD	E			3 2 2 2		
Operating Range	Range	Н	1.5V~150V			1.5V~150V
- P Manage	gc	L	1.5V~15V			1.5V~15V
Accuracy of Setting	H,L		±(0.1 % of set + 0.1 % of f.s)			AL/A
Resolution	H,L		10mV/1mV			N/A
CONSTANT POWER MODE						
Operating Range	No.	Н	17.5W~175W	35W~350W	105W~1050W	210W~2100W
	Range	М	1.75W~17.5W	3.5W~35W	10.5W~105W	21W~210W N/A
		L	0.175W~1.75W	0.35W~3.5W	1.05W~10.5W	19/5
Accuracy of Setting	H,M,L			set $^{3}$ + 1.4 % of f.s $^{3}$ ) + Vin $^{3}$ /500kΩ		N/A
Resolution PARALLEL Mode	Н,М,		10mW 1mW 0.1mW	10mW 1mW 0.1mW	100mW 10mW 1mW	
Capacity			875W	1750W	5250W	PEL-3111 with 4 booster
			1000000	1750W	3230 W	units : Max 9.45kW
SLEW RATE						
Operation Mode		н	CC, CR	CC, CR	CC, CR	N/A
Setting Range	Range		2.5 x N <sup>*10</sup> mA/µs~2.5A/µs 250 x N <sup>*10</sup> µA/µs~250mA/µs	5 x N*10 mA/μs~5A/μs 500 x N*10 μ4/μs~500m4/μs	16 x N*11 mA/μs~16A/μs	N/A
Setting Range (CC mode)	Range	M	250 x N <sup>*10</sup> µA/µs~250mA/µs	500 x N <sup>*10</sup> μA/μs~500mA/μs	1.6 x N*11mA/μs~1.6A/μs	N/A
(CC mode)	Range	М	250 x N <sup>*10</sup> µA/µs~250mA/µs 25 x N <sup>*10</sup> µA/µs~25mA/µs 250 x N <sup>*10</sup> µA/µs~250mA/µs			N/A
	Range	L H M	250 x N <sup>*10</sup> μA/μs~250mA/μs 25 x N <sup>*10</sup> μA/μs~25mA/μs 250 x N <sup>*10</sup> μA/μs~250mA/μs 25 x N <sup>*10</sup> μA/μs~25mA/μs	500 x N <sup>*10</sup> μA/μs~500mA/μs 50 x N <sup>*10</sup> μA/μs~50mA/μs 500 x N <sup>*10</sup> μA/μs~500mA/μs 500 x N <sup>*10</sup> μA/μs~50mA/μs	1.6 x N <sup>*11</sup> mA/µs~1.6A/µs 160 x N <sup>*11</sup> µA/µs~160mA/µs 1.6 x N <sup>*11</sup> mA/µs~1.6A/µs 160 x N <sup>*11</sup> µA/µs~160mA/µs	N/A N/A
(CC mode)  Setting Range (CR Mode)	Range	H M L	250 x N <sup>+10</sup> µA/µs~250mA/µs 25 x N <sup>+10</sup> µA/µs~25mA/µs 250 x N <sup>+10</sup> µA/µs~250mA/µs 25 x N <sup>+10</sup> µA/µs~25mA/µs 2.5 x N <sup>+10</sup> µA/µs~2.5mA/µs	500 x N <sup>*10</sup> μA/μs~500mA/μs 50 x N <sup>*10</sup> μA/μs~50mA/μs 500 x N <sup>*10</sup> μA/μs~500mA/μs	1.6 x N*11 mA/µs~1.6A/µs 160 x N*11 µA/µs~160mA/µs 1.6 x N*11 mA/µs~1.6A/µs	N/A
(CC mode)  Setting Range (CR Mode)  Accuracy of Setting		H M L	250 x N <sup>-10</sup> $\mu$ A/ $\mu$ s~250mA/ $\mu$ s 25 x N <sup>-10</sup> $\mu$ A/ $\mu$ s~25mA/ $\mu$ s 250 x N <sup>-10</sup> $\mu$ A/ $\mu$ s~25mA/ $\mu$ s 250 x N <sup>-10</sup> $\mu$ A/ $\mu$ s~25mA/ $\mu$ s 2.5 x N <sup>-10</sup> $\mu$ A/ $\mu$ s~2.5mA/ $\mu$ s ±(10 % of set" + 5 $\mu$ s)	500 x N <sup>-10</sup> μA/μs~50mA/μs 50 x N <sup>-10</sup> μA/μs~50mA/μs 500 x N <sup>-10</sup> μA/μs~50mA/μs 50 x N <sup>-10</sup> μA/μs~50mA/μs 5 x N <sup>-10</sup> μA/μs~5mA/μs	1.6 x N <sup>-11</sup> mA/μs~1.6A/μs 160 x N <sup>-11</sup> μA/μs~160mA/μs 1.6 x N <sup>-11</sup> mA/μs~1.6A/μs 160 x N <sup>-11</sup> μA/μs~160mA/μs 16 x N <sup>-11</sup> μA/μs~16mA/μs	
(CC mode)  Setting Range (CR Mode)  Accuracy of Setting Resolution	Range	H M L	250 x N <sup>-10</sup> $\mu$ A/ $\mu$ s250 mA/ $\mu$ s 25 x N <sup>-10</sup> $\mu$ A/ $\mu$ s25 mA/ $\mu$ s 250 x N <sup>-10</sup> $\mu$ A/ $\mu$ s25 mA/ $\mu$ s 25 x N <sup>-10</sup> $\mu$ A/ $\mu$ s25 mA/ $\mu$ s 2.5 x N <sup>-10</sup> $\mu$ A/ $\mu$ s2.5 mA/ $\mu$ s $\pm$ (10 % of set" + 5 $\mu$ s) 1 x N <sup>-10</sup> mA 250 x N <sup>-10</sup> mA/ $\mu$ s2.5 A/ $\mu$ s	500 x N <sup>-10</sup> μA/μs~500mA/μs 50 x N <sup>-10</sup> μA/μs~50mA/μs 50 x N <sup>-10</sup> μA/μs~500mA/μs 50 x N <sup>-10</sup> μA/μs~50mA/μs 5 x N <sup>-10</sup> μA/μs~5mA/μs 2 x N <sup>-10</sup> mA/μs~5mA/μs	1.6 x N <sup>-11</sup> mA/μs~1.6A/μs 160 x N <sup>-11</sup> μA/μs~160mA/μs 1.6 x N <sup>-11</sup> mA/μs~1.60mA/μs 160 x N <sup>-11</sup> μA/μs~160mA/μs 16 x N <sup>-11</sup> μA/μs~16mA/μs 6 x N <sup>-11</sup> μA/μs~16A/μs	N/A
(CC mode)  Setting Range (CR Mode)  Accuracy of Setting	Range	H M L	250 x N <sup>+10</sup> $\mu$ A/ $\mu$ s~250mA/ $\mu$ s 25 x N <sup>+10</sup> $\mu$ A/ $\mu$ s~25mA/ $\mu$ s 250 x N <sup>+10</sup> $\mu$ A/ $\mu$ s~25mA/ $\mu$ s 250 x N <sup>+10</sup> $\mu$ A/ $\mu$ s~25mA/ $\mu$ s 2.5 x N <sup>+10</sup> $\mu$ A/ $\mu$ s~2.5mA/ $\mu$ s $\pm$ (10 % of set <sup>*0</sup> + 5 $\mu$ s) 1 x N <sup>+10</sup> mA 250 x N <sup>+10</sup> mA/ $\mu$ s~2.5A/ $\mu$ s 100 x N <sup>+10</sup> mA	500 x N <sup>-10</sup> μA/μs~500mA/μs 50 x N <sup>-10</sup> μA/μs~50mA/μs 500 x N <sup>-10</sup> μA/μs~500mA/μs 50 x N <sup>-10</sup> μA/μs~50mA/μs 5 x N <sup>-10</sup> μA/μs~5mA/μs 2 x N <sup>-10</sup> mA/μs~5mA/μs	1.6 x N <sup>-11</sup> mA/μs~1.6A/μs 160 x N <sup>-11</sup> μA/μs~160mA/μs 1.6 x N <sup>-11</sup> μA/μs~1.6A/μs 160 x N <sup>-11</sup> μA/μs~160mA/μs 16 x N <sup>-11</sup> μA/μs~16mA/μs 6 x N <sup>-11</sup> μA/μs~16A/μs 600 x N <sup>-11</sup> μA	N/A
(CC mode)  Setting Range (CR Mode)  Accuracy of Setting Resolution	Range	H M L	250 x N <sup>-10</sup> μA/μs~250mA/μs 25 x N <sup>-10</sup> μA/μs~25mA/μs 250 x N <sup>-10</sup> μA/μs~25mA/μs 25 x N <sup>-10</sup> μA/μs~25mA/μs 2.5 x N <sup>-10</sup> μA/μs~2.5mA/μs ±(10 % of set <sup>-9</sup> + 5μs) 1 x N <sup>-10</sup> mA 250 x N <sup>-10</sup> μA/μs~2.5A/μs 100 x N <sup>-10</sup> μA 25 x N <sup>-10</sup> mA/μs~250 x N <sup>-10</sup> mA/μs 10 x N <sup>-10</sup> μA	500 x N <sup>-10</sup> μA/μs~500mA/μs 50 x N <sup>-10</sup> μA/μs~50mA/μs 50 x N <sup>-10</sup> μA/μs~50mA/μs 50 x N <sup>-10</sup> μA/μs~50mA/μs 5 x N <sup>-10</sup> μA/μs~5mA/μs 2 x N <sup>-10</sup> mA 200 x N <sup>-10</sup> mA/μs~5A/μs 200 x N <sup>-10</sup> μA/μs~500 x N <sup>-10</sup> mA/μs 20 x N <sup>-10</sup> μA	1.6 x N <sup>-11</sup> mA/μs~1.6A/μs 160 x N <sup>-11</sup> μA/μs~160mA/μs 1.6 x N <sup>-11</sup> mA/μs~1.60mA/μs 160 x N <sup>-11</sup> μA/μs~160mA/μs 16 x N <sup>-11</sup> μA/μs~16mA/μs 6 x N <sup>-11</sup> μA 60 x N <sup>-11</sup> μA 160 x N <sup>-11</sup> μA 160 x N <sup>-11</sup> μA	N/A N/A
(CC mode)  Setting Range (CR Mode)  Accuracy of Setting Resolution	Range	H M L	250 x N <sup>-10</sup> μA/μs250mA/μs 25 x N <sup>-10</sup> μA/μs25mA/μs 250 x N <sup>-10</sup> μA/μs25mA/μs 25 x N <sup>-10</sup> μA/μs25mA/μs 2.5 x N <sup>-10</sup> μA/μs2.5mA/μs ±(10 % of set" + 5μs) 1 x N <sup>-10</sup> mA 250 x N <sup>-10</sup> μA/μs2.5A/μs 100 x N <sup>-10</sup> μA 25 x N <sup>-10</sup> mA/μs250 x N <sup>-10</sup> mA/μs 10 x N <sup>-10</sup> μA 2.5 x N <sup>-10</sup> mA/μs250 x N <sup>-10</sup> mA/μs 1.5 x N <sup>-10</sup> mA/μs25 x N <sup>-10</sup> mA/μs	500 x N <sup>-10</sup> μA/μs~500mA/μs 50 x N <sup>-10</sup> μA/μs~50mA/μs 500 x N <sup>-10</sup> μA/μs~500mA/μs 50 x N <sup>-10</sup> μA/μs~50mA/μs 5 x N <sup>-10</sup> μA/μs~5mA/μs 2 x N <sup>-10</sup> mA/μs~5mA/μs 20 x N <sup>-10</sup> mA/μs~50 x N <sup>-10</sup> mA/μs 50 x N <sup>-10</sup> mA/μs~50 x N <sup>-10</sup> mA/μs 50 x N <sup>-10</sup> mA/μs~50 x N <sup>-10</sup> mA/μs 50 x N <sup>-10</sup> mA/μs~50 x N <sup>-10</sup> mA/μs	1.6 x N <sup>-11</sup> mA/μs~1.6A/μs 160 x N <sup>-11</sup> μA/μs~1.60mA/μs 1.6 x N <sup>-11</sup> mA/μs~1.6A/μs 160 x N <sup>-11</sup> μA/μs~160mA/μs 16 x N <sup>-11</sup> μA/μs~16mA/μs 6 x N <sup>-11</sup> μA/μs~16mA/μs 6 x N <sup>-11</sup> μα 1.6 x N <sup>-11</sup> μs~16A/μs 600 x N <sup>-11</sup> μα 160 x N <sup>-11</sup> μA/μs~1.6 x N <sup>-11</sup> A/μs 60 x N <sup>-11</sup> μA/μs~1.6 x N <sup>-11</sup> A/μs 16 x N <sup>-11</sup> μA/μs~1.60 x N <sup>-11</sup> A/μs	N/A
(CC mode)  Setting Range (CR Mode)  Accuracy of Setting Resolution	Range	H M L	250 x N <sup>-10</sup> μA/μs250mA/μs 25 x N <sup>-10</sup> μA/μs25mA/μs 250 x N <sup>-10</sup> μA/μs25mA/μs 25 x N <sup>-10</sup> μA/μs25mA/μs 2.5 x N <sup>-10</sup> μA/μs2.5mA/μs ±(10 % of set" + 5μs) 1 x N <sup>-10</sup> mA 250 x N <sup>-10</sup> μA/μs2.5A/μs 100 x N <sup>-10</sup> μA 25 x N <sup>-10</sup> mA/μs250 x N <sup>-10</sup> mA/μs 10 x N <sup>-10</sup> μA 2.5 x N <sup>-10</sup> mA/μs250 x N <sup>-10</sup> mA/μs 1.5 x N <sup>-10</sup> mA/μs25 x N <sup>-10</sup> mA/μs	500 x N <sup>-10</sup> μA/μs~500mA/μs 50 x N <sup>-10</sup> μA/μs~50mA/μs 50 x N <sup>-10</sup> μA/μs~50mA/μs 50 x N <sup>-10</sup> μA/μs~50mA/μs 5 x N <sup>-10</sup> μA/μs~5mA/μs 2 x N <sup>-10</sup> μA/μs~5mA/μs 2 x N <sup>-10</sup> μα 500 x N <sup>-10</sup> μα/μs~50 x N <sup>-10</sup> μα/μs 50 x N <sup>-10</sup> μα/μs~500 x N <sup>-10</sup> μα/μs 5 x N <sup>-10</sup> μα/μs~50 x N <sup>-10</sup> μα/μs	1.6 x N <sup>-11</sup> mA/μs~1.6A/μs 160 x N <sup>-11</sup> μA/μs~1.60mA/μs 1.6 x N <sup>-11</sup> mA/μs~1.6A/μs 160 x N <sup>-11</sup> μA/μs~160mA/μs 16 x N <sup>-11</sup> μA/μs~16mA/μs 6 x N <sup>-11</sup> μA/μs~16mA/μs 6 x N <sup>-11</sup> μα 1.6 x N <sup>-11</sup> μs~16A/μs 600 x N <sup>-11</sup> μα 160 x N <sup>-11</sup> μA/μs~1.6 x N <sup>-11</sup> A/μs 60 x N <sup>-11</sup> μA/μs~1.6 x N <sup>-11</sup> A/μs 16 x N <sup>-11</sup> μA/μs~1.60 x N <sup>-11</sup> A/μs	N/A N/A
(CC mode)  Setting Range (CR Mode)  Accuracy of Setting Resolution	Range	H M L	250 x N <sup>-10</sup> μA/μs~250mA/μs 25 x N <sup>-10</sup> μA/μs~25mA/μs 250 x N <sup>-10</sup> μA/μs~25mA/μs 25 x N <sup>-10</sup> μA/μs~25mA/μs 2.5 x N <sup>-10</sup> μA/μs~2.5mA/μs ±(10 % of set" + 5μs) 1 x N <sup>-10</sup> mA 250 x N <sup>-10</sup> mA/μs~2.5A/μs 100 x N <sup>-10</sup> mA/μs~250 x N <sup>-10</sup> mA/μs 12 x N <sup>-10</sup> mA/μs~250 x N <sup>-10</sup> mA/μs 1 x N <sup>-10</sup> mA/μs~25 x N <sup>-10</sup> mA/μs 25 x N <sup>-10</sup> mA/μs~25 x N <sup>-10</sup> mA/μs 25 x N <sup>-10</sup> mA/μs~25 x N <sup>-10</sup> mA/μs 25 x N <sup>-10</sup> mA/μs~250 x N <sup>-10</sup> mA/μs	500 x N <sup>-10</sup> μA/μs~500mA/μs 50 x N <sup>-10</sup> μA/μs~50mA/μs 50 x N <sup>-10</sup> μA/μs~50mA/μs 50 x N <sup>-10</sup> μA/μs~50mA/μs 5 x N <sup>-10</sup> μA/μs~5mA/μs 2 x N <sup>-10</sup> μA/μs~5mA/μs 200 x N <sup>-10</sup> μA 500 x N <sup>-10</sup> μA 500 x N <sup>-10</sup> μA 50 x N <sup>-10</sup> μA 5 x N <sup>-10</sup> μA/μs~500 x N <sup>-10</sup> mA/μs 20 x N <sup>-10</sup> μA 5 x N <sup>-10</sup> μA/μs~50 x N <sup>-10</sup> mA/μs 200 x N <sup>-10</sup> μA/μs~50 x N <sup>-10</sup> mA/μs 500 x N <sup>-10</sup> μA/μs~50 x N <sup>-10</sup> mA/μs 500 x N <sup>-10</sup> μA/μs~50 x N <sup>-10</sup> mA/μs	1.6 x N <sup>-11</sup> mA/μs~1.6A/μs 160 x N <sup>-11</sup> μA/μs~160mA/μs 1.6 x N <sup>-11</sup> μA/μs~160mA/μs 160 x N <sup>-11</sup> μA/μs~160mA/μs 16 x N <sup>-11</sup> μA/μs~16mA/μs 6 x N <sup>-11</sup> μA/μs~16mA/μs 600 x N <sup>-11</sup> μA/μs~16 x N <sup>-11</sup> A/μs 60 x N <sup>-11</sup> μA 160 x N <sup>-11</sup> μA 16 x N <sup>-11</sup> mA/μs~16 x N <sup>-11</sup> mA/μs 6 x N <sup>-11</sup> μA 1.6 x N <sup>-11</sup> mA/μs~16 x N <sup>-11</sup> mA/μs 60 x N <sup>-11</sup> μA 1.6 x N <sup>-11</sup> mA/μs~16 x N <sup>-11</sup> mA/μs 600 x N <sup>-11</sup> μA	N/A N/A
(CC mode)  Setting Range (CR Mode)  Accuracy of Setting Resolution	Range	H M L	250 x N <sup>110</sup> µA/µs~250mA/µs 25 x N <sup>110</sup> µA/µs~25mA/µs 250 x N <sup>110</sup> µA/µs~25mA/µs 25 x N <sup>110</sup> µA/µs~25mA/µs 2.5 x N <sup>110</sup> µA/µs~25mA/µs ±(10 % of set" + 5µs) 1 x N <sup>110</sup> mA 250 x N <sup>110</sup> mA/µs~2.5A/µs 100 x N <sup>110</sup> mA 25 x N <sup>110</sup> mA/µs~250 x N <sup>110</sup> mA/µs 10 x N <sup>110</sup> mA/µs~25 x N <sup>110</sup> mA/µs 1 x N <sup>110</sup> µA 25 x N <sup>110</sup> mA/µs~25 x N <sup>110</sup> mA/µs 1 x N <sup>110</sup> µA 25 x N <sup>110</sup> µA/µs~25 x N <sup>110</sup> mA/µs 100 x N <sup>110</sup> mA 25 x N <sup>110</sup> µA/µs~25 x N <sup>110</sup> µA/µs 100 x N <sup>110</sup> mA	500 x N <sup>-10</sup> μA/μs~500mA/μs 50 x N <sup>-10</sup> μA/μs~50mA/μs 50 x N <sup>-10</sup> μA/μs~50mA/μs 50 x N <sup>-10</sup> μA/μs~50mA/μs 50 x N <sup>-10</sup> μA/μs~5mA/μs 2 x N <sup>-10</sup> μA/μs~5mA/μs 20 x N <sup>-10</sup> μA 500 x N <sup>-10</sup> μA/μs~50 x N <sup>-10</sup> mA/μs 20 x N <sup>-10</sup> μA 50 x N <sup>-10</sup> μA/μs~50 x N <sup>-10</sup> mA/μs 2 x N <sup>-10</sup> μA/μs~50 x N <sup>-10</sup> mA/μs 2 x N <sup>-10</sup> μA/μs~50 x N <sup>-10</sup> mA/μs 20 x N <sup>-10</sup> μA/μs~50 x N <sup>-10</sup> mA/μs 20 x N <sup>-10</sup> μA/μs~500 x N <sup>-10</sup> μA/μs 20 x N <sup>-10</sup> μA/μs~500 x N <sup>-10</sup> μA/μs	1.6 x N <sup>-11</sup> mA/μs~1.6A/μs 160 x N <sup>-11</sup> μA/μs~1.60mA/μs 1.6 x N <sup>-11</sup> μA/μs~1.60mA/μs 160 x N <sup>-11</sup> μA/μs~1.60mA/μs 16 x N <sup>-11</sup> μA/μs~16mA/μs 6 x N <sup>-11</sup> μA 1.6 x N <sup>-11</sup> μA 160 x N <sup>-11</sup> μA 160 x N <sup>-11</sup> μA 160 x N <sup>-11</sup> μA 160 x N <sup>-11</sup> mA/μs~1.6 x N <sup>-11</sup> A/μs 60 x N <sup>-11</sup> μA 1.6 x N <sup>-11</sup> mA/μs~1.6 x N <sup>-11</sup> mA/μs 6 x N <sup>-11</sup> μA 1.6 x N <sup>-11</sup> mA/μs~1.6 x N <sup>-11</sup> mA/μs 6 x N <sup>-11</sup> μA/μs~1.6 x N <sup>-11</sup> mA/μs 6 x N <sup>-11</sup> μA/μs~1.6 x N <sup>-11</sup> μA/μs 6 x N <sup>-11</sup> μA/μs~1.6 x N <sup>-11</sup> μA/μs	N/A N/A
(CC mode)  Setting Range (CR Mode)  Accuracy of Setting Resolution	Range	H M L	250 x N <sup>-10</sup> μA/μs~250mA/μs 25 x N <sup>-10</sup> μA/μs~25mA/μs 250 x N <sup>-10</sup> μA/μs~25mA/μs 25 x N <sup>-10</sup> μA/μs~25mA/μs 2.5 x N <sup>-10</sup> μA/μs~2.5mA/μs ±(10 % of set" + 5μs) 1 x N <sup>-10</sup> mA 250 x N <sup>-10</sup> mA/μs~2.5A/μs 100 x N <sup>-10</sup> mA/μs~250 x N <sup>-10</sup> mA/μs 12 x N <sup>-10</sup> mA/μs~250 x N <sup>-10</sup> mA/μs 1 x N <sup>-10</sup> mA/μs~25 x N <sup>-10</sup> mA/μs 25 x N <sup>-10</sup> mA/μs~25 x N <sup>-10</sup> mA/μs 25 x N <sup>-10</sup> mA/μs~25 x N <sup>-10</sup> mA/μs 25 x N <sup>-10</sup> mA/μs~250 x N <sup>-10</sup> mA/μs	500 x N <sup>-10</sup> μA/μs~500mA/μs 50 x N <sup>-10</sup> μA/μs~50mA/μs 50 x N <sup>-10</sup> μA/μs~50mA/μs 50 x N <sup>-10</sup> μA/μs~50mA/μs 5 x N <sup>-10</sup> μA/μs~5mA/μs 2 x N <sup>-10</sup> μA/μs~5mA/μs 200 x N <sup>-10</sup> μA 500 x N <sup>-10</sup> μA 500 x N <sup>-10</sup> μA 50 x N <sup>-10</sup> μA 5 x N <sup>-10</sup> μA/μs~500 x N <sup>-10</sup> mA/μs 20 x N <sup>-10</sup> μA 5 x N <sup>-10</sup> μA/μs~50 x N <sup>-10</sup> mA/μs 200 x N <sup>-10</sup> μA/μs~50 x N <sup>-10</sup> mA/μs 500 x N <sup>-10</sup> μA/μs~50 x N <sup>-10</sup> mA/μs 500 x N <sup>-10</sup> μA/μs~50 x N <sup>-10</sup> mA/μs	1.6 x N <sup>-11</sup> mA/μs~1.6A/μs 160 x N <sup>-11</sup> μA/μs~160mA/μs 1.6 x N <sup>-11</sup> μA/μs~160mA/μs 160 x N <sup>-11</sup> μA/μs~160mA/μs 16 x N <sup>-11</sup> μA/μs~16mA/μs 6 x N <sup>-11</sup> μA/μs~16mA/μs 600 x N <sup>-11</sup> μA/μs~16 x N <sup>-11</sup> A/μs 60 x N <sup>-11</sup> μA 160 x N <sup>-11</sup> μA 16 x N <sup>-11</sup> mA/μs~16 x N <sup>-11</sup> mA/μs 6 x N <sup>-11</sup> μA 1.6 x N <sup>-11</sup> mA/μs~16 x N <sup>-11</sup> mA/μs 60 x N <sup>-11</sup> μA 1.6 x N <sup>-11</sup> mA/μs~16 x N <sup>-11</sup> mA/μs 600 x N <sup>-11</sup> μA	N/A N/A
(CC mode)  Setting Range (CR Mode)  Accuracy of Setting Resolution (Setting Range)  METER  Voltmeter	Range H, M,	M L H M L	$ \begin{array}{c} 250 \times N^{+10}  \mu A / \mu s - 250 m A / \mu s \\ 25 \times N^{+10}  \mu A / \mu s - 250 m A / \mu s \\ 250 \times N^{+10}  \mu A / \mu s - 250 m A / \mu s \\ 250 \times N^{+10}  \mu A / \mu s - 250 m A / \mu s \\ 2.5 \times N^{+10}  \mu A / \mu s - 2.5 m A / \mu s \\ \frac{1}{2} \times N^{+10}  \mu A / \mu s - 2.5 m A / \mu s \\ \frac{1}{2} \times N^{+10}  \mu A / \mu s - 2.5 m A / \mu s \\ 250 \times N^{+10}  \mu A / \mu s - 2.5 A / \mu s \\ 100 \times N^{+10}  \mu A / \mu s - 2.5 \times N^{+10}  m A / \mu s \\ 25 \times N^{+10}  m A / \mu s - 250 \times N^{+10}  m A / \mu s \\ 12 \times N^{+10}  \mu A / \mu s - 25 \times N^{+10}  m A / \mu s \\ 25 \times N^{+10}  m A / \mu s - 25 \times N^{+10}  m A / \mu s \\ 25 \times N^{+10}  \mu A / \mu s - 25 \times N^{+10}  \mu A / \mu s \\ 25 \times N^{+10}  \mu A / \mu s - 25 \times N^{+10}  \mu A / \mu s \\ 25 \times N^{+10}  \mu A / \mu s - 25 \times N^{+10}  \mu A / \mu s \\ 10 \times N^{+10}  \mu A / \mu s - 25 \times N^{+10}  \mu A / \mu s \\ 10 \times N^{+10}  \mu A / \mu s - 25 \times N^{+10}  \mu A / \mu s \\ 10 \times N^{+10}  \mu A / \mu s - 25 \times N^{+10}  \mu A / \mu s \\ 10 \times N^{+10}  \mu A / \mu s - 25 \times N^{+10}  \mu A / \mu s \\ 10 \times N^{+10}  \mu A / \mu s - 25 \times N^{+10}  \mu A / \mu s \\ 10 \times N^{+10}  \mu A / \mu s - 25 \times N^{+10}  \mu A / \mu s \\ 10 \times N^{+10}  \mu A / \mu s - 25 \times N^{+10}  \mu A / \mu s \\ 10 \times N^{+10}  \mu A / \mu s - 25 \times N^{+10}  \mu A / \mu s \\ 10 \times N^{+10}  \mu A / \mu s - 25 \times N^{+10}  \mu A / \mu s \\ 10 \times N^{+10}  \mu A / \mu s - 25 \times N^{+10}  \mu A / \mu s \\ 10 \times N^{+10}  \mu A / \mu s - 25 \times N^{+10}  \mu A / \mu s \\ 10 \times N^{+10}  \mu A / \mu s - 25 \times N^{+10}  \mu A / \mu s \\ 10 \times N^{+10}  \mu A / \mu s - 25 \times N^{+10}  \mu A / \mu s \\ 10 \times N^{+10}  \mu A / \mu s - 25 \times N^{+10}  \mu A / \mu s \\ 10 \times N^{+10}  \mu A / \mu s - 25 \times N^{+10}  \mu A / \mu s \\ 10 \times N^{+10}  \mu A / \mu s - 25 \times N^{+10}  \mu A / \mu s \\ 10 \times N^{+10}  \mu A / \mu s - 25 \times N^{+10}  \mu A / \mu s \\ 10 \times N^{+10}  \mu A / \mu s - 25 \times N^{+10}  \mu A / \mu s \\ 10 \times N^{+10}  \mu A / \mu s - 25 \times N^{+10}  \mu A / \mu s \\ 10 \times N^{+10}  \mu A / \mu s - 25 \times N^{+10}  \mu A / \mu s \\ 10 \times N^{+10}  \mu A / \mu s - 25 \times N^{+10}  \mu A / \mu s \\ 10 \times N^{+10}  \mu A / \mu$	500 x N <sup>-10</sup> μA/μs~500mA/μs 50 x N <sup>-10</sup> μA/μs~50mA/μs 50 x N <sup>-10</sup> μA/μs~50mA/μs 50 x N <sup>-10</sup> μA/μs~50mA/μs 5 x N <sup>-10</sup> μA/μs~5mA/μs 2 x N <sup>-10</sup> μA/μs~5A/μs 200 x N <sup>-10</sup> μA 500 x N <sup>-10</sup> μA 500 x N <sup>-10</sup> μA 50 x N <sup>-10</sup> μA/μs~500 x N <sup>-10</sup> mA/μs 20 x N <sup>-10</sup> μA 5 x N <sup>-10</sup> μA/μs~50 x N <sup>-10</sup> mA/μs 200 x N <sup>-10</sup> μA/μs~50 x N <sup>-10</sup> mA/μs 50 x N <sup>-10</sup> μA/μs~50 x N <sup>-10</sup> μA/μs 50 x N <sup>-10</sup> μA/μs~50 x N <sup>-10</sup> μA/μs 20 x N <sup>-10</sup> μA/μs~50 x N <sup>-10</sup> μA/μs	1.6 x N <sup>-11</sup> mA/μs~1.6A/μs 160 x N <sup>-11</sup> μA/μs~1.60mA/μs 1.6 x N <sup>-11</sup> μA/μs~1.60mA/μs 160 x N <sup>-11</sup> μA/μs~1.60mA/μs 16 x N <sup>-11</sup> μA/μs~16mA/μs 6 x N <sup>-11</sup> μA 1.6 x N <sup>-11</sup> μA 160 x N <sup>-11</sup> mA/μs~1.6 x N <sup>-11</sup> A/μs 6 x N <sup>-11</sup> μA 1.6 x N <sup>-11</sup> mA/μs~16 x N <sup>-11</sup> mA/μs 6 x N <sup>-11</sup> μA 1.6 x N <sup>-11</sup> mA/μs~16 x N <sup>-11</sup> mA/μs 6 x N <sup>-11</sup> μA/μs~16 x N <sup>-11</sup> mA/μs 6 x N <sup>-11</sup> μA/μs~16 x N <sup>-11</sup> μA/μs 6 x N <sup>-11</sup> μA/μs~1.6 x N <sup>-11</sup> μA/μs	N/A N/A N/A
(CC mode)  Setting Range (CR Mode)  Accuracy of Setting Resolution (Setting Range)  METER  Voltmeter Ammeter	Range H, M,	M L H M L	250 x N <sup>-10</sup> $\mu$ A/ $\mu$ s250 mA/ $\mu$ s 25 x N <sup>-10</sup> $\mu$ A/ $\mu$ s25 mA/ $\mu$ s 250 x N <sup>-10</sup> $\mu$ A/ $\mu$ s25 mA/ $\mu$ s 25 x N <sup>-10</sup> $\mu$ A/ $\mu$ s25 mA/ $\mu$ s 2.5 x N <sup>-10</sup> $\mu$ A/ $\mu$ s2.5 mA/ $\mu$ s ±(10 % of set" + 5 $\mu$ s) 1 x N <sup>-10</sup> $\mu$ A 250 x N <sup>-10</sup> $\mu$ A/ $\mu$ s2.5 A/ $\mu$ s 100 x N <sup>-10</sup> $\mu$ A 25 x N <sup>-10</sup> $\mu$ A/ $\mu$ s250 x N <sup>-10</sup> $\mu$ A/ $\mu$ s 10 x N <sup>-10</sup> $\mu$ A 2.5 x N <sup>-10</sup> $\mu$ A/ $\mu$ s25 x N <sup>-10</sup> $\mu$ A/ $\mu$ s 10 x N <sup>-10</sup> $\mu$ A 2.5 x N <sup>-10</sup> $\mu$ A/ $\mu$ s25 x N <sup>-10</sup> $\mu$ A/ $\mu$ s 10 x N <sup>-10</sup> $\mu$ A/ $\mu$ s25 x N <sup>-10</sup> $\mu$ A/ $\mu$ s 25 x N <sup>-10</sup> $\mu$ A/ $\mu$ s25 x N <sup>-10</sup> $\mu$ A/ $\mu$ s 10 x N <sup>-10</sup> $\mu$ A/ $\mu$ s25 x N <sup>-10</sup> $\mu$ A/ $\mu$ s 25 x N <sup>-10</sup> $\mu$ A/ $\mu$ s25 x N <sup>-10</sup> $\mu$ A/ $\mu$ s 10 x N <sup>-10</sup> $\mu$ A/ $\mu$ s25 x N <sup>-10</sup> $\mu$ A/ $\mu$ s	500 x N <sup>-10</sup> μA/μs~500mA/μs 50 x N <sup>-10</sup> μA/μs~50mA/μs 50 x N <sup>-10</sup> μA/μs~50mA/μs 50 x N <sup>-10</sup> μA/μs~50mA/μs 5 x N <sup>-10</sup> μA/μs~5mA/μs 2 x N <sup>-10</sup> μA/μs~5A/μs 200 x N <sup>-10</sup> μA 500 x N <sup>-10</sup> μA 500 x N <sup>-10</sup> μA 50 x N <sup>-10</sup> μA/μs~500 x N <sup>-10</sup> mA/μs 20 x N <sup>-10</sup> μA 5 x N <sup>-10</sup> μA/μs~50 x N <sup>-10</sup> mA/μs 200 x N <sup>-10</sup> μA/μs~50 x N <sup>-10</sup> mA/μs 50 x N <sup>-10</sup> μA/μs~50 x N <sup>-10</sup> μA/μs 50 x N <sup>-10</sup> μA/μs~50 x N <sup>-10</sup> μA/μs 20 x N <sup>-10</sup> μA/μs~50 x N <sup>-10</sup> μA/μs	1.6 x N <sup>-11</sup> mA/μs~1.6A/μs 160 x N <sup>-11</sup> μA/μs~1.60mA/μs 1.6 x N <sup>-11</sup> μA/μs~1.60mA/μs 160 x N <sup>-11</sup> μA/μs~1.60mA/μs 16 x N <sup>-11</sup> μA/μs~16mA/μs 6 x N <sup>-11</sup> μA 1.6 x N <sup>-11</sup> μA 160 x N <sup>-11</sup> mA/μs~1.6 x N <sup>-11</sup> A/μs 6 x N <sup>-11</sup> μA 1.6 x N <sup>-11</sup> mA/μs~16 x N <sup>-11</sup> mA/μs 6 x N <sup>-11</sup> μA 1.6 x N <sup>-11</sup> mA/μs~16 x N <sup>-11</sup> mA/μs 6 x N <sup>-11</sup> μA/μs~16 x N <sup>-11</sup> mA/μs 6 x N <sup>-11</sup> μA/μs~16 x N <sup>-11</sup> μA/μs 6 x N <sup>-11</sup> μA/μs~1.6 x N <sup>-11</sup> μA/μs	N/A N/A
(CC mode)  Setting Range (CR Mode)  Accuracy of Setting Resolution (Setting Range)  METER  Voltmeter Ammeter Ammeter(Parallel Operation)	Range H, M,	M L H M L	$ \begin{array}{c} 250 \times N^{+10}  \mu A / \mu s - 250 m A / \mu s \\ 25 \times N^{+10}  \mu A / \mu s - 250 m A / \mu s \\ 250 \times N^{+10}  \mu A / \mu s - 250 m A / \mu s \\ 250 \times N^{+10}  \mu A / \mu s - 250 m A / \mu s \\ 2.5 \times N^{+10}  \mu A / \mu s - 2.5 m A / \mu s \\ \frac{1}{2} \times N^{+10}  \mu A / \mu s - 2.5 m A / \mu s \\ \frac{1}{2} \times N^{+10}  \mu A / \mu s - 2.5 m A / \mu s \\ 250 \times N^{+10}  \mu A / \mu s - 2.5 A / \mu s \\ 100 \times N^{+10}  \mu A / \mu s - 2.5 \times N^{+10}  m A / \mu s \\ 25 \times N^{+10}  m A / \mu s - 250 \times N^{+10}  m A / \mu s \\ 12 \times N^{+10}  \mu A / \mu s - 25 \times N^{+10}  m A / \mu s \\ 25 \times N^{+10}  m A / \mu s - 25 \times N^{+10}  m A / \mu s \\ 25 \times N^{+10}  \mu A / \mu s - 25 \times N^{+10}  \mu A / \mu s \\ 25 \times N^{+10}  \mu A / \mu s - 25 \times N^{+10}  \mu A / \mu s \\ 25 \times N^{+10}  \mu A / \mu s - 25 \times N^{+10}  \mu A / \mu s \\ 10 \times N^{+10}  \mu A / \mu s - 25 \times N^{+10}  \mu A / \mu s \\ 10 \times N^{+10}  \mu A / \mu s - 25 \times N^{+10}  \mu A / \mu s \\ 10 \times N^{+10}  \mu A / \mu s - 25 \times N^{+10}  \mu A / \mu s \\ 10 \times N^{+10}  \mu A / \mu s - 25 \times N^{+10}  \mu A / \mu s \\ 10 \times N^{+10}  \mu A / \mu s - 25 \times N^{+10}  \mu A / \mu s \\ 10 \times N^{+10}  \mu A / \mu s - 25 \times N^{+10}  \mu A / \mu s \\ 10 \times N^{+10}  \mu A / \mu s - 25 \times N^{+10}  \mu A / \mu s \\ 10 \times N^{+10}  \mu A / \mu s - 25 \times N^{+10}  \mu A / \mu s \\ 10 \times N^{+10}  \mu A / \mu s - 25 \times N^{+10}  \mu A / \mu s \\ 10 \times N^{+10}  \mu A / \mu s - 25 \times N^{+10}  \mu A / \mu s \\ 10 \times N^{+10}  \mu A / \mu s - 25 \times N^{+10}  \mu A / \mu s \\ 10 \times N^{+10}  \mu A / \mu s - 25 \times N^{+10}  \mu A / \mu s \\ 10 \times N^{+10}  \mu A / \mu s - 25 \times N^{+10}  \mu A / \mu s \\ 10 \times N^{+10}  \mu A / \mu s - 25 \times N^{+10}  \mu A / \mu s \\ 10 \times N^{+10}  \mu A / \mu s - 25 \times N^{+10}  \mu A / \mu s \\ 10 \times N^{+10}  \mu A / \mu s - 25 \times N^{+10}  \mu A / \mu s \\ 10 \times N^{+10}  \mu A / \mu s - 25 \times N^{+10}  \mu A / \mu s \\ 10 \times N^{+10}  \mu A / \mu s - 25 \times N^{+10}  \mu A / \mu s \\ 10 \times N^{+10}  \mu A / \mu s - 25 \times N^{+10}  \mu A / \mu s \\ 10 \times N^{+10}  \mu A / \mu s - 25 \times N^{+10}  \mu A / \mu s \\ 10 \times N^{+10}  \mu A / \mu s - 25 \times N^{+10}  \mu A / \mu s \\ 10 \times N^{+10}  \mu A / \mu$	500 x N <sup>-10</sup> μA/μs~500mA/μs 50 x N <sup>-10</sup> μA/μs~50mA/μs 50 x N <sup>-10</sup> μA/μs~50mA/μs 50 x N <sup>-10</sup> μA/μs~50mA/μs 5 x N <sup>-10</sup> μA/μs~5mA/μs 2 x N <sup>-10</sup> μA/μs~5A/μs 200 x N <sup>-10</sup> μA 500 x N <sup>-10</sup> μA 500 x N <sup>-10</sup> μA 50 x N <sup>-10</sup> μA/μs~500 x N <sup>-10</sup> mA/μs 20 x N <sup>-10</sup> μA 5 x N <sup>-10</sup> μA/μs~50 x N <sup>-10</sup> mA/μs 200 x N <sup>-10</sup> μA/μs~50 x N <sup>-10</sup> mA/μs 50 x N <sup>-10</sup> μA/μs~50 x N <sup>-10</sup> μA/μs 50 x N <sup>-10</sup> μA/μs~50 x N <sup>-10</sup> μA/μs 20 x N <sup>-10</sup> μA/μs~50 x N <sup>-10</sup> μA/μs	1.6 x N <sup>-11</sup> mA/μs~1.6A/μs 160 x N <sup>-11</sup> μA/μs~1.60mA/μs 1.6 x N <sup>-11</sup> μA/μs~1.60mA/μs 160 x N <sup>-11</sup> μA/μs~1.60mA/μs 16 x N <sup>-11</sup> μA/μs~16mA/μs 6 x N <sup>-11</sup> μA 1.6 x N <sup>-11</sup> μA 160 x N <sup>-11</sup> mA/μs~1.6 x N <sup>-11</sup> A/μs 6 x N <sup>-11</sup> μA 1.6 x N <sup>-11</sup> mA/μs~16 x N <sup>-11</sup> mA/μs 6 x N <sup>-11</sup> μA 1.6 x N <sup>-11</sup> mA/μs~16 x N <sup>-11</sup> mA/μs 6 x N <sup>-11</sup> μA/μs~16 x N <sup>-11</sup> mA/μs 6 x N <sup>-11</sup> μA/μs~16 x N <sup>-11</sup> μA/μs 6 x N <sup>-11</sup> μA/μs~1.6 x N <sup>-11</sup> μA/μs	N/A N/A N/A
(CC mode)  Setting Range (CR Mode)  Accuracy of Setting Resolution (Setting Range)  METER  Voltmeter Ammeter Ammeter(Parallel Operation) DYNAMIC MODE	Range H, M,	M L H M L	$ \begin{array}{c} 250 \times N^{*10}  \mu A / \mu s - 250 m A / \mu s \\ 25 \times N^{*10}  \mu A / \mu s - 250 m A / \mu s \\ 250 \times N^{*10}  \mu A / \mu s - 250 m A / \mu s \\ 25 \times N^{*10}  \mu A / \mu s - 250 m A / \mu s \\ 25 \times N^{*10}  \mu A / \mu s - 25 m A / \mu s \\ 2.5 \times N^{*10}  \mu A / \mu s - 2.5 m A / \mu s \\ 2.5 \times N^{*10}  \mu A / \mu s - 2.5 m A / \mu s \\ 250 \times N^{*10}  m A / \mu s - 2.5 A / \mu s \\ 100 \times N^{*10}  \mu A \\ 25 \times N^{*10}  m A / \mu s - 250 \times N^{*10}  m A / \mu s \\ 10 \times N^{*10}  \mu A \\ 2.5 \times N^{*10}  m A / \mu s - 250 \times N^{*10}  m A / \mu s \\ 10 \times N^{*10}  \mu A / \mu s - 25 \times N^{*10}  m A / \mu s \\ 10 \times N^{*10}  \mu A / \mu s - 2.5 \times N^{*10}  m A / \mu s \\ 25 \times N^{*10}  \mu A / \mu s - 25 \times N^{*10}  m A / \mu s \\ 25 \times N^{*10}  \mu A / \mu s - 25 \times N^{*10}  m A / \mu s \\ 25 \times N^{*10}  \mu A / \mu s - 25 \times N^{*10}  \mu A / \mu s \\ 25 \times N^{*10}  \mu A / \mu s - 25 \times N^{*10}  \mu A / \mu s \\ 25 \times N^{*10}  \mu A / \mu s - 25 \times N^{*10}  \mu A / \mu s \\ 25 \times N^{*10}  \mu A / \mu s - 25 \times N^{*10}  \mu A / \mu s \\ 25 \times N^{*10}  \mu A / \mu s - 25 \times N^{*10}  \mu A / \mu s \\ 25 \times N^{*10}  \mu A / \mu s - 25 \times N^{*10}  \mu A / \mu s \\ 25 \times N^{*10}  \mu A / \mu s - 25 \times N^{*10}  \mu A / \mu s \\ 25 \times N^{*10}  \mu A / \mu s - 25 \times N^{*10}  \mu A / \mu s \\ 25 \times N^{*10}  \mu A / \mu s - 25 \times N^{*10}  \mu A / \mu s \\ 25 \times N^{*10}  \mu A / \mu s - 25 \times N^{*10}  \mu A / \mu s \\ 25 \times N^{*10}  \mu A / \mu s - 25 \times N^{*10}  \mu A / \mu s \\ 25 \times N^{*10}  \mu A / \mu s - 25 \times N^{*10}  \mu A / \mu s \\ 25 \times N^{*10}  \mu A / \mu s - 25 \times N^{*10}  \mu A / \mu s \\ 25 \times N^{*10}  \mu A / \mu s - 25 \times N^{*10}  \mu A / \mu s \\ 25 \times N^{*10}  \mu A / \mu s - 25 \times N^{*10}  \mu A / \mu s \\ 25 \times N^{*10}  \mu A / \mu s - 25 \times N^{*10}  \mu A / \mu s \\ 25 \times N^{*10}  \mu A / \mu s - 25 \times N^{*10}  \mu A / \mu s \\ 25 \times N^{*10}  \mu A / \mu s - 25 \times N^{*10}  \mu A / \mu s \\ 25 \times N^{*10}  \mu A / \mu s - 25 \times N^{*10}  \mu A / \mu s \\ 25 \times N^{*10}  \mu A / \mu s - 25 \times N^{*10}  \mu A / \mu s \\ 25 \times N^{*10}  \mu A / \mu s - 25 \times N^{*10}  \mu A / \mu s \\ 25 \times N^{*10}  \mu A / \mu s - 25 \times N^{*10}  \mu A / \mu s \\ 25 \times N^{*10}  \mu A / \mu s - 25 \times N^{*10}  \mu A / \mu s \\ 25 \times N^{*10}  \mu A / \mu s - 25 \times N^{*10}  \mu A / \mu s \\ 25 \times N^{*10}  \mu A / \mu s $	500 x N <sup>-10</sup> μA/μs~500mA/μs 50 x N <sup>-10</sup> μA/μs~50mA/μs 50 x N <sup>-10</sup> μA/μs~50mA/μs 50 x N <sup>-10</sup> μA/μs~50mA/μs 5 x N <sup>-10</sup> μA/μs~5mA/μs 2 x N <sup>-10</sup> μA/μs~5A/μs 200 x N <sup>-10</sup> μA 500 x N <sup>-10</sup> μA 500 x N <sup>-10</sup> μA 50 x N <sup>-10</sup> μA/μs~500 x N <sup>-10</sup> mA/μs 20 x N <sup>-10</sup> μA 5 x N <sup>-10</sup> μA/μs~50 x N <sup>-10</sup> mA/μs 200 x N <sup>-10</sup> μA/μs~50 x N <sup>-10</sup> mA/μs 50 x N <sup>-10</sup> μA/μs~50 x N <sup>-10</sup> μA/μs 50 x N <sup>-10</sup> μA/μs~50 x N <sup>-10</sup> μA/μs 20 x N <sup>-10</sup> μA/μs~50 x N <sup>-10</sup> μA/μs	1.6 x N <sup>-11</sup> mA/μs~1.6A/μs 160 x N <sup>-11</sup> μA/μs~1.60mA/μs 1.6 x N <sup>-11</sup> μA/μs~1.60mA/μs 160 x N <sup>-11</sup> μA/μs~1.60mA/μs 16 x N <sup>-11</sup> μA/μs~16mA/μs 6 x N <sup>-11</sup> μA 1.6 x N <sup>-11</sup> μA 160 x N <sup>-11</sup> mA/μs~1.6 x N <sup>-11</sup> A/μs 6 x N <sup>-11</sup> μA 1.6 x N <sup>-11</sup> mA/μs~16 x N <sup>-11</sup> mA/μs 6 x N <sup>-11</sup> μA 1.6 x N <sup>-11</sup> mA/μs~16 x N <sup>-11</sup> mA/μs 6 x N <sup>-11</sup> μA/μs~16 x N <sup>-11</sup> mA/μs 6 x N <sup>-11</sup> μA/μs~16 x N <sup>-11</sup> μA/μs 6 x N <sup>-11</sup> μA/μs~1.6 x N <sup>-11</sup> μA/μs	N/A N/A N/A
(CC mode)  Setting Range (CR Mode)  Accuracy of Setting Resolution (Setting Range)  METER  Voltmeter Ammeter Ammeter(Parallel Operation) DYNAMIC MODE Operation Mode T1 & T2	Range H, M,	M L H M L	250 x N <sup>-10</sup> µA/µs~250mA/µs 25 x N <sup>-10</sup> µA/µs~25mA/µs 250 x N <sup>-10</sup> µA/µs~25mA/µs 25 x N <sup>-10</sup> µA/µs~25mA/µs 2.5 x N <sup>-10</sup> µA/µs~2.5mA/µs ±(10 % of set" + 5µs) 1 x N <sup>-10</sup> mA 250 x N <sup>-10</sup> mA/µs~2.5A/µs 100 x N <sup>-10</sup> mA/µs~2.50 x N <sup>-10</sup> mA/µs 25 x N <sup>-10</sup> mA/µs~250 x N <sup>-10</sup> mA/µs 10 x N <sup>-10</sup> µA 2.5 x N <sup>-10</sup> mA/µs~25 x N <sup>-10</sup> mA/µs 10 x N <sup>-10</sup> µA 2.5 x N <sup>-10</sup> mA/µs~25 x N <sup>-10</sup> mA/µs 10 x N <sup>-10</sup> µA 2.5 x N <sup>-10</sup> mA/µs~25 x N <sup>-10</sup> mA/µs 10 x N <sup>-10</sup> nA 2.5 x N <sup>-10</sup> mA/µs~25 x N <sup>-10</sup> mA/µs 10 x N <sup>-10</sup> nA 2.5 x N <sup>-10</sup> mA/µs~25 x N <sup>-10</sup> mA/µs 10 x N <sup>-10</sup> nA 2.5 x N <sup>-10</sup> mA/µs~25 x N <sup>-10</sup> mA/µs 10 x N <sup>-10</sup> nA 2.5 x N <sup>-10</sup> mA/µs~25 x N <sup>-10</sup> mA/µs 10 x N <sup>-10</sup> nA 2.5 x N <sup>-10</sup> mA/µs~25 x N <sup>-10</sup> mA/µs	500 x N <sup>-10</sup> μA/μs~50mA/μs 50 x N <sup>-10</sup> μA/μs~50mA/μs 50 x N <sup>-10</sup> μA/μs~50mA/μs 50 x N <sup>-10</sup> μA/μs~50mA/μs 5 x N <sup>-10</sup> μA/μs~50mA/μs 2 x N <sup>-10</sup> μA/μs~5A/μs 200 x N <sup>-10</sup> μA 500 x N <sup>-10</sup> μA 500 x N <sup>-10</sup> μA 50 x N <sup>-10</sup> μA 50 x N <sup>-10</sup> μA 5 x N <sup>-10</sup> μA/μs~50 x N <sup>-10</sup> mA/μs 2 x N <sup>-10</sup> μA 5 x N <sup>-10</sup> μA/μs~5 x N <sup>-10</sup> mA/μs 200 x N <sup>-10</sup> μA 50 x N <sup>-10</sup> μA/μs~50 x N <sup>-10</sup> μA/μs 20 x N <sup>-10</sup> μA/μs~50 x N <sup>-10</sup> μA/μs 20 x N <sup>-10</sup> μA/μs~50 x N <sup>-10</sup> μA/μs	1.6 x N <sup>-11</sup> mA/μs~1.6A/μs 160 x N <sup>-11</sup> μA/μs~1.60mA/μs 1.6 x N <sup>-11</sup> μA/μs~1.60mA/μs 160 x N <sup>-11</sup> μA/μs~1.60mA/μs 16 x N <sup>-11</sup> μA/μs~16mA/μs 6 x N <sup>-11</sup> μA 1.6 x N <sup>-11</sup> μA 160 x N <sup>-11</sup> mA/μs~1.6 x N <sup>-11</sup> A/μs 6 x N <sup>-11</sup> μA 1.6 x N <sup>-11</sup> mA/μs~16 x N <sup>-11</sup> mA/μs 6 x N <sup>-11</sup> μA 1.6 x N <sup>-11</sup> mA/μs~16 x N <sup>-11</sup> mA/μs 6 x N <sup>-11</sup> μA/μs~16 x N <sup>-11</sup> mA/μs 6 x N <sup>-11</sup> μA/μs~16 x N <sup>-11</sup> μA/μs 6 x N <sup>-11</sup> μA/μs~1.6 x N <sup>-11</sup> μA/μs	N/A N/A N/A
(CC mode)  Setting Range (CR Mode)  Accuracy of Setting Resolution (Setting Range)  METER  Voltmeter Ammeter(Parallel Operation) DYNAMIC MODE Operation Mode T1 & T2 Accuracy	Range H, M,	M L H M L	250 x N <sup>-10</sup> µA/µs~250mA/µs 25 x N <sup>-10</sup> µA/µs~25mA/µs 250 x N <sup>-10</sup> µA/µs~25mA/µs 25 x N <sup>-10</sup> µA/µs~25mA/µs 2.5 x N <sup>-10</sup> µA/µs~2.5mA/µs ±(10 % of set" + 5µs) 1 x N <sup>-10</sup> mA 250 x N <sup>-10</sup> mA/µs~2.5A/µs 100 x N <sup>-10</sup> mA/µs~2.5A ys 100 x N <sup>-10</sup> mA/µs~2.50 x N <sup>-10</sup> mA/µs 25 x N <sup>-10</sup> mA/µs~250 x N <sup>-10</sup> mA/µs 1 x N <sup>-10</sup> µA 2.5 x N <sup>-10</sup> mA/µs~25 x N <sup>-10</sup> mA/µs 100 x N <sup>-10</sup> mA 2.5 x N <sup>-10</sup> mA/µs~25 x N <sup>-10</sup> mA/µs 100 x N <sup>-10</sup> mA 2.5 x N <sup>-10</sup> mA/µs~250 x N <sup>-10</sup> mA/µs 100 x N <sup>-10</sup> mA 2.5 x N <sup>-10</sup> mA/µs~250 x N <sup>-10</sup> mA/µs 100 x N <sup>-10</sup> mA 2.5 x N <sup>-10</sup> mA/µs~250 x N <sup>-10</sup> mA/µs 100 x N <sup>-10</sup> mA 2.5 x N <sup>-10</sup> mA/µs~250 x N <sup>-10</sup> mA/µs 100 x N <sup>-10</sup> mA 2.5 x N <sup>-10</sup> mA/µs~250 x N <sup>-10</sup> mA/µs 100 x N <sup>-10</sup> mA 2.5 x N <sup>-10</sup> mA/µs~250 x N <sup>-10</sup> mA/µs 100 x N <sup>-10</sup> mA 2.5 x N <sup>-10</sup> mA/µs~250 x N <sup>-10</sup> mA/µs 100 x N <sup>-10</sup> mA 2.5 x N <sup>-10</sup> mA/µs~250 x N <sup>-10</sup> mA/µs 100 x N <sup>-10</sup> mA 2.5 x N <sup>-10</sup> mA/µs~250 x N <sup>-10</sup> mA/µs 100 x N <sup>-10</sup> mA/µs~250 x N <sup>-10</sup>	500 x N <sup>-10</sup> μA/μs~50mA/μs 50 x N <sup>-10</sup> μA/μs~50mA/μs 50 x N <sup>-10</sup> μA/μs~50mA/μs 50 x N <sup>-10</sup> μA/μs~50mA/μs 5 x N <sup>-10</sup> μA/μs~50mA/μs 2 x N <sup>-10</sup> μA/μs~5πA/μs 20 x N <sup>-10</sup> μA/μs~50 x N <sup>-10</sup> mA/μs 20 x N <sup>-10</sup> μA 50 x N <sup>-10</sup> μA/μs~50 x N <sup>-10</sup> mA/μs 20 x N <sup>-10</sup> μA/μs~50 x N <sup>-10</sup> mA/μs 2 x N <sup>-10</sup> μA/μs~50 x N <sup>-10</sup> mA/μs 20 x N <sup>-10</sup> μA/μs~50 x N <sup>-10</sup> μA/μs 20 x N <sup>-10</sup> μA/μs~50 x N <sup>-10</sup> μA/μs 20 x N <sup>-10</sup> μA/μs~50 x N <sup>-10</sup> μA/μs	1.6 x N <sup>-11</sup> mA/μs~1.6A/μs 160 x N <sup>-11</sup> μA/μs~160mA/μs 1.6 x N <sup>-11</sup> μA/μs~160mA/μs 160 x N <sup>-11</sup> μA/μs~160mA/μs 16 x N <sup>-11</sup> μA/μs~16mA/μs 6 x N <sup>-11</sup> μA/μs~16mA/μs 6 x N <sup>-11</sup> μA/μs~16 x N <sup>-11</sup> μA/μs~16 x N <sup>-11</sup> μA/μs~16 x N <sup>-11</sup> μA/μs 600 x N <sup>-11</sup> μA/μs~16 x N <sup>-11</sup>	N/A N/A N/A
(CC mode)  Setting Range (CR Mode)  Accuracy of Setting Resolution (Setting Range)  METER  Voltmeter Ammeter Ammeter(Parallel Operation) DYNAMIC MODE  Operation Mode T1 & T2 Accuracy Slew Rate	Accuracy Accuracy	M L H M L	250 x N <sup>-10</sup> μA/μs~250mA/μs 25 x N <sup>-10</sup> μA/μs~25mA/μs 250 x N <sup>-10</sup> μA/μs~25mA/μs 250 x N <sup>-10</sup> μA/μs~25mA/μs 2.5 x N <sup>-10</sup> μA/μs~2.5mA/μs ±(10 % of set° + 5μs) 1 x N <sup>-10</sup> mA/μs~2.5A/μs 100 x N <sup>-10</sup> mA/μs~2.5A/μs 100 x N <sup>-10</sup> mA/μs~2.5A/μs 100 x N <sup>-10</sup> mA/μs~2.50 x N <sup>-10</sup> mA/μs 2.5 x N <sup>-10</sup> mA/μs~2.5 x N <sup>-10</sup> mA/μs 1 x N <sup>-10</sup> μA 2.5 x N <sup>-10</sup> mA/μs~2.5 x N <sup>-10</sup> mA/μs 1 x N <sup>-10</sup> μA 2.5 x N <sup>-10</sup> μA/μs~2.5 x N <sup>-10</sup> mA/μs 10 x N <sup>-10</sup> nA 2.5 x N <sup>-10</sup> μA/μs~250 x N <sup>-10</sup> μA/μs 10 x N <sup>-10</sup> nA 2.5 x N <sup>-10</sup> μA/μs~25 x N <sup>-10</sup> μA/μs 10 x N <sup>-10</sup> nA 2.5 x N <sup>-10</sup> μA/μs~25 x N <sup>-10</sup> μA/μs 10 x N <sup>-10</sup> nA 2.5 x N <sup>-10</sup> μA/μs~25 x N <sup>-10</sup> μA/μs 10 x N <sup>-10</sup> nA 2.5 x N <sup>-10</sup> μA/μs~25 x N <sup>-10</sup> μA/μs 10 x N <sup>-10</sup> nA 2.5 x N <sup>-10</sup> μA/μs~25 x N <sup>-10</sup> μA/μs 10 x N <sup>-10</sup> nA 2.5 x N <sup>-10</sup> μA/μs~25 x N <sup>-10</sup> μA/μs 10 x N <sup>-10</sup> nA 2.5 x N <sup>-10</sup> μA/μs~25 x N <sup>-10</sup> μA/μs 10 x N <sup>-10</sup> nA 2.5 x N <sup>-10</sup> μA/μs~25 x N <sup>-10</sup> μA/μs 10 x N <sup>-10</sup> nA 2.5 x N <sup>-10</sup> μA/μs~25 x N <sup>-10</sup> μA/μs 10 x N <sup>-10</sup> nA 2.5 x N <sup>-10</sup> μA/μs~25 x N <sup>-10</sup> μA/μs 10 x N <sup>-10</sup> nA 2.5 x N <sup>-10</sup> μA/μs~25 x N <sup>-10</sup> μA/μs 10 x N <sup>-10</sup> nA 2.5 x N <sup>-10</sup> μA/μs~25 x N <sup>-10</sup> μA/μs 10 x N <sup>-10</sup> nA/μs~25 x N <sup>-10</sup> μA/μs 2.5 x N <sup>-10</sup> μA/μs~25 x N <sup>-10</sup> μA/μs 2.5 x N <sup>-10</sup> μA/μs~25 x N <sup>-10</sup> μA/μs	500 x N <sup>-10</sup> μΑ/μs~50mA/μs 50 x N <sup>-10</sup> μΑ/μs~50mA/μs 500 x N <sup>-10</sup> μΑ/μs~50mA/μs 500 x N <sup>-10</sup> μΑ/μs~50mA/μs 5 x N <sup>-10</sup> μΑ/μs~50mA/μs 5 x N <sup>-10</sup> μΑ/μs~5mA/μs 20 x N <sup>-10</sup> μΑ/μs~5πA/μs 200 x N <sup>-10</sup> μΑ 500 x N <sup>-10</sup> μΑ 50 x N <sup>-10</sup> μΑ/μs~500 x N <sup>-10</sup> mA/μs 20 x N <sup>-10</sup> μΑ 50 x N <sup>-10</sup> μΑ/μs~50 x N <sup>-10</sup> mA/μs 50 x N <sup>-10</sup> μΑ/μs~50 x N <sup>-10</sup> μΑ/μs 50 x N <sup>-10</sup> μΑ/μs~50 x N <sup>-10</sup> μΑ/μs 50 x N <sup>-10</sup> μΑ/μs~50 x N <sup>-10</sup> μΑ/μs 50 x N <sup>-10</sup> μΑ/μs~50 x N <sup>-10</sup> μΑ/μs 50 x N <sup>-10</sup> μΑ/μs~50 x N <sup>-10</sup> μΑ/μs 50 x N <sup>-10</sup> μΑ/μs~50 x N <sup>-10</sup> μΑ/μs	1.6 x N <sup>-11</sup> mA/μs~1.6A/μs 160 x N <sup>-11</sup> μΔ/μs~160mA/μs 1.6 x N <sup>-11</sup> μΔ/μs~160mA/μs 160 x N <sup>-11</sup> μΔ/μs~160mA/μs 16 x N <sup>-11</sup> μΔ/μs~160mA/μs 6 x N <sup>-11</sup> μΔ/μs~16mA/μs 6 x N <sup>-11</sup> μΔ/μs~16A/μs 600 x N <sup>-11</sup> μΔ 16 x N <sup>-11</sup> μΔ/μs~16 x N <sup>-11</sup> μΔ/μs 600 x N <sup>-11</sup> μΔ 16 x N <sup>-11</sup> μΔ/μs~16 x N <sup>-11</sup> μΔ/μs 60 x N <sup>-11</sup> μΔ/μs~16 x N <sup>-11</sup> μΔ/μs 61 x N <sup>-11</sup> μΔ/μs~16 x N <sup>-11</sup> μΔ/μs 61 x N <sup>-11</sup> μΔ/μs~16 x N <sup>-11</sup> μΔ/μs	N/A N/A N/A
(CC mode)  Setting Range (CR Mode)  Accuracy of Setting Resolution (Setting Range)  METER  Voltmeter Ammeter(Parallel Operation) DYNAMIC MODE Operation Mode T1 & T2 Accuracy	Range H, M,	M L H M L L	$ \begin{array}{c} 250 \times N^{10} \ \mu A / \mu s - 250 m A / \mu s \\ 25 \times N^{10} \ \mu A / \mu s - 250 m A / \mu s \\ 250 \times N^{10} \ \mu A / \mu s - 250 m A / \mu s \\ 250 \times N^{10} \ \mu A / \mu s - 250 m A / \mu s \\ 25 \times N^{10} \ \mu A / \mu s - 25m A / \mu s \\ 2.5 \times N^{10} \ \mu A / \mu s - 2.5m A / \mu s \\ 2.5 \times N^{10} \ \mu A / \mu s - 2.5m A / \mu s \\ 250 \times N^{10} \ m A / \mu s - 2.5 A / \mu s \\ 100 \times N^{10} \ \mu A \\ 25 \times N^{10} \ m A / \mu s - 250 \times N^{10} \ m A / \mu s \\ 100 \times N^{10} \ \mu A \\ 2.5 \times N^{10} \ m A / \mu s - 250 \times N^{10} \ m A / \mu s \\ 100 \times N^{10} \ \mu A / \mu s - 25 \times N^{10} \ m A / \mu s \\ 100 \times N^{10} \ \mu A / \mu s - 25 \times N^{10} \ m A / \mu s \\ 250 \times N^{10} \ \mu A / \mu s - 25 \times N^{10} \ m A / \mu s \\ 25 \times N^{10} \ \mu A / \mu s - 25 \times N^{10} \ \mu A / \mu s \\ 25 \times N^{10} \ \mu A / \mu s - 25 \times N^{10} \ \mu A / \mu s \\ 25 \times N^{10} \ \mu A / \mu s - 25 \times N^{10} \ \mu A / \mu s \\ 10 \times N^{10} \ \mu A / \mu s - 25 \times N^{10} \ \mu A / \mu s \\ 10 \times N^{10} \ \mu A / \mu s - 25 \times N^{10} \ \mu A / \mu s \\ 10 \times N^{10} \ \mu A / \mu s - 25 \times N^{10} \ \mu A / \mu s \\ 10 \times N^{10} \ \mu A / \mu s - 25 \times N^{10} \ \mu A / \mu s \\ 10 \times N^{10} \ \mu A / \mu s - 25 \times N^{10} \ \mu A / \mu s \\ 10 \times N^{10} \ \mu A / \mu s - 25 \times N^{10} \ \mu A / \mu s \\ 10 \times N^{10} \ \mu A / \mu s - 25 \times N^{10} \ \mu A / \mu s \\ 10 \times N^{10} \ \mu A / \mu s - 25 \times N^{10} \ \mu A / \mu s \\ 10 \times N^{10} \ \mu A / \mu s - 25 \times N^{10} \ \mu A / \mu s \\ 10 \times N^{10} \ \mu A / \mu s - 25 \times N^{10} \ \mu A / \mu s \\ 10 \times N^{10} \ \mu A / \mu s - 25 \times N^{10} \ \mu A / \mu s \\ 10 \times N^{10} \ \mu A / \mu s - 25 \times N^{10} \ \mu A / \mu s \\ 10 \times N^{10} \ \mu A / \mu s - 25 \times N^{10} \ \mu A / \mu s \\ 10 \times N^{10} \ \mu A / \mu s - 25 \times N^{10} \ \mu A / \mu s \\ 10 \times N^{10} \ \mu A / \mu s - 25 \times N^{10} \ \mu A / \mu s \\ 10 \times N^{10} \ \mu A / \mu s - 25 \times N^{10} \ \mu A / \mu s \\ 10 \times N^{10} \ \mu A / \mu s - 25 \times N^{10} \ \mu A / \mu s \\ 10 \times N^{10} \ \mu A / \mu s - 25 \times N^{10} \ \mu A / \mu s \\ 10 \times N^{10} \ \mu A / \mu s - 25 \times N^{10} \ \mu A / \mu s \\ 10 \times N^{10} \ \mu A / \mu s - 25 \times N^{10} \ \mu A / \mu s \\ 10 \times N^{10} \ \mu A / \mu s - 25 \times N^{10} \ \mu A / \mu s \\ 10 \times N^{10} \ \mu A / \mu s - 25 \times N^{10} \ \mu A / \mu s \\ 10 \times N^{10} \ \mu A / \mu s - 25 \times N^{10} \ \mu A / \mu s \\ 10 \times N^{10} \ \mu A / \mu s - 25 \times N^{10} \ \mu $	500 x N <sup>-10</sup> μΑ/μs~50mA/μs 50 x N <sup>-10</sup> μΑ/μs~50mA/μs 500 x N <sup>-10</sup> μΑ/μs~50mA/μs 50 x N <sup>-10</sup> μΑ/μs~50mA/μs 5 x N <sup>-10</sup> μΑ/μs~5mA/μs 5 x N <sup>-10</sup> μΑ/μs~5mA/μs 2 x N <sup>-10</sup> μΑ/μs~5πA/μs 200 x N <sup>-10</sup> μΑ/μs~500 x N <sup>-10</sup> mA/μs 200 x N <sup>-10</sup> μΑ 500 x N <sup>-10</sup> μΑ 500 x N <sup>-10</sup> μΑ 50 x N <sup>-10</sup> μΑ/μs~500 x N <sup>-10</sup> mA/μs 2 x N <sup>-10</sup> μΑ 5 x N <sup>-10</sup> μΑ/μs~5 x N <sup>-10</sup> mA/μs 5 x N <sup>-10</sup> μΑ/μs~50 x N <sup>-10</sup> μΑ/μs 5 x N <sup>-10</sup> μΑ/μs~5 x N <sup>-10</sup> μΑ/μs 5 x N <sup>-10</sup> μΑ/μs~5 x N <sup>-10</sup> μΑ/μs 5 x N <sup>-10</sup> μΑ/μs~500 x N <sup>-10</sup> μΑ/μs 5 x N <sup>-10</sup> μΑ/μs~500 x N <sup>-10</sup> μΑ/μs 5 x N <sup>-10</sup> μΑ/μs~50 x N <sup>-10</sup> μΑ/μs 5 x N <sup>-10</sup> μΑ/μs~50 x N <sup>-10</sup> μΑ/μs 5 x N <sup>-10</sup> μΑ/μs~50 x N <sup>-10</sup> μΑ/μs 5 x N <sup>-10</sup> μΑ/μs~50 x N <sup>-10</sup> μΑ/μs	1.6 x N <sup>-11</sup> mA/μs~1.6A/μs 160 x N <sup>-11</sup> μA/μs~160mA/μs 1.6 x N <sup>-11</sup> μA/μs~160mA/μs 160 x N <sup>-11</sup> μA/μs~160mA/μs 16 x N <sup>-11</sup> μA/μs~160mA/μs 16 x N <sup>-11</sup> μA/μs~160mA/μs 60 x N <sup>-11</sup> μA/μs~16A/μs 600 x N <sup>-11</sup> μA 16 x N <sup>-11</sup> μA/μs~16 x N <sup>-11</sup> A/μs 60 x N <sup>-11</sup> μA 16 x N <sup>-11</sup> μA/μs~16 x N <sup>-11</sup> M/μs 60 x N <sup>-11</sup> μA 1.6 x N <sup>-11</sup> μA/μs~16 x N <sup>-11</sup> μA/μs 60 x N <sup>-11</sup> μA/μs~16 x N <sup>-11</sup> μA/μs 60 x N <sup>-11</sup> μA/μs~16 x N <sup>-11</sup> μA/μs 16 x N <sup>-11</sup> μA/μs~16 x N <sup>-11</sup> μA/μs 16 x N <sup>-11</sup> μA/μs~16 x N <sup>-11</sup> μA/μs 16 x N <sup>-11</sup> μA/μs~16 x N <sup>-11</sup> μA/μs 16 x N <sup>-11</sup> μA/μs~16 x N <sup>-11</sup> μA/μs	N/A N/A N/A
(CC mode)  Setting Range (CR Mode)  Accuracy of Setting Resolution (Setting Range)  METER  Voltmeter Ammeter Ammeter (Parallel Operation) DYNAMIC MODE  Operation Mode T1 & T2 Accuracy Slew Rate (CC Mode)	Accuracy Accuracy	M L H M L L	250 x N <sup>-10</sup> μA/μs-250mA/μs 25 x N <sup>-10</sup> μA/μs-25mA/μs 25 x N <sup>-10</sup> μA/μs-25mA/μs 250 x N <sup>-10</sup> μA/μs-25mA/μs 2.5 x N <sup>-10</sup> μA/μs-25mA/μs 2.5 x N <sup>-10</sup> μA/μs-2.5mA/μs ±(10 % of set" + 5μs) 1 x N <sup>-10</sup> μA 250 x N <sup>-10</sup> μA/μs-2.5A/μs 100 x N <sup>-10</sup> μA 25 x N <sup>-10</sup> μA/μs-25 x N <sup>-10</sup> mA/μs 100 x N <sup>-10</sup> μA 25 x N <sup>-10</sup> μA/μs-25 x N <sup>-10</sup> mA/μs 10 x N <sup>-10</sup> μA 2.5 x N <sup>-10</sup> μA/μs-25 x N <sup>-10</sup> mA/μs 10 x N <sup>-10</sup> μA/μs-25 x N <sup>-10</sup> μA/μs 25 x N <sup>-10</sup> μA/μs-25 x N <sup>-10</sup> μA/μs 25 x N <sup>-10</sup> μA/μs-25 x N <sup>-10</sup> μA/μs 25 x N <sup>-10</sup> μA/μs-25 x N <sup>-10</sup> μA/μs 25 x N <sup>-10</sup> μA/μs-25 x N <sup>-10</sup> μA/μs 25 x N <sup>-10</sup> μA/μs-25 x N <sup>-10</sup> μA/μs 25 x N <sup>-10</sup> μA/μs-25 x N <sup>-10</sup> μA/μs 25 x N <sup>-10</sup> μA/μs-25 x N <sup>-10</sup> μA/μs 25 x N <sup>-10</sup> μA/μs-25 x N <sup>-10</sup> μA/μs 25 x N <sup>-10</sup> μA/μs-25 x N <sup>-10</sup> μA/μs 25 x N <sup>-10</sup> μA/μs-25 x N <sup>-10</sup> μA/μs 25 x N <sup>-10</sup> μA/μs-25 x N <sup>-10</sup> μA/μs 25 x N <sup>-10</sup> μA/μs-25 x N <sup>-10</sup> μA/μs 25 x N <sup>-10</sup> μA/μs-25 x N <sup>-10</sup> μA/μs 25 x N <sup>-10</sup> μA/μs-25 x N <sup>-10</sup> μA/μs 25 x N <sup>-10</sup> μA/μs-25 x N <sup>-10</sup> μA/μs 25 x N <sup>-10</sup> μA/μs-25 x N <sup>-10</sup> μA/μs 25 x N <sup>-10</sup> μA/μs-25 x N <sup>-10</sup> μA/μs 25 x N <sup>-10</sup> μA/μs-25 x N <sup>-10</sup> μA/μs 25 x N <sup>-10</sup> μA/μs-25 x N <sup>-10</sup> μA/μs 25 x N <sup>-10</sup> μA/μs-25 x N <sup>-10</sup> μA/μs γ y y y y y y y y y y y y y y y y y y	500 x N <sup>-10</sup> μΑ/μs~50mA/μs 50 x N <sup>-10</sup> μΑ/μs~50mA/μs 50 x N <sup>-10</sup> μΑ/μs~50mA/μs 50 x N <sup>-10</sup> μΑ/μs~50mA/μs 5 x N <sup>-10</sup> μΑ/μs~5mA/μs 5 x N <sup>-10</sup> μΑ/μs~5mA/μs 2 x N <sup>-10</sup> μΑ/μs~5πΑ/μs 20 x N <sup>-10</sup> μΑ/μs~5α/μs 200 x N <sup>-10</sup> μΑ 200 x N <sup>-10</sup> μΑ 50 x N <sup>-10</sup> μΑ/μs~50 x N <sup>-10</sup> mA/μs 5 x N <sup>-10</sup> μΑ/μs~50 x N <sup>-10</sup> μΑ/μs 5 x N <sup>-10</sup> μΑ/μs~5 x N <sup>-10</sup> μΑ/μs 50 x N <sup>-10</sup> μΑ/μs~5 x N <sup>-10</sup> μΑ/μs 50 x N <sup>-10</sup> μΑ/μs~50 x N <sup>-10</sup> μΑ/μs 50 x N <sup>-10</sup> μΑ/μs~50 x N <sup>-10</sup> μΑ/μs 50 x N <sup>-10</sup> μΑ/μs~50 x N <sup>-10</sup> μΑ/μs 50 x N <sup>-10</sup> μΑ/μs~50 x N <sup>-10</sup> μΑ/μs 50 x N <sup>-10</sup> μΑ/μs~50 x N <sup>-10</sup> μΑ/μs 50 x N <sup>-10</sup> μΑ/μs~50 x N <sup>-10</sup> μΑ/μs	1.6 x N <sup>-11</sup> mA/μs~1.6A/μs 160 x N <sup>-11</sup> μA/μs~160mA/μs 1.6 x N <sup>-11</sup> μA/μs~160mA/μs 160 x N <sup>-11</sup> μA/μs~160mA/μs 16 x N <sup>-11</sup> μA/μs~160mA/μs 16 x N <sup>-11</sup> μA/μs~160mA/μs 60 x N <sup>-11</sup> μA/μs~16A/μs 600 x N <sup>-11</sup> μA 16 x N <sup>-11</sup> μA/μs~16 x N <sup>-11</sup> A/μs 60 x N <sup>-11</sup> μA 16 x N <sup>-11</sup> μA/μs~16 x N <sup>-11</sup> mA/μs 60 x N <sup>-11</sup> μA 1.6 x N <sup>-11</sup> μA/μs~16 x N <sup>-11</sup> mA/μs 60 x N <sup>-11</sup> μA/μs~16 x N <sup>-11</sup> μA/μs 11.6 x N <sup>-11</sup> μA/μs~16 x N <sup>-11</sup> μA/μs 11.6 x N <sup>-11</sup> μA/μs~16 x N <sup>-11</sup> μA/μs 11.6 x N <sup>-11</sup> μA/μs~16 x N <sup>-11</sup> μA/μs 11.6 x N <sup>-11</sup> μA/μs~16 x N <sup>-11</sup> μA/μs 11.6 x N <sup>-11</sup> μA/μs~160 x N <sup>-11</sup> μA/μs	N/A N/A N/A
(CC mode)  Setting Range (CR Mode)  Accuracy of Setting Resolution (Setting Range)  METER  Woltmeter Ammeter Ammeter (Parallel Operation)  DYNAMIC MODE  Operation Mode T1 & T2 Accuracy Slew Rate (CC Mode)	Accuracy Accuracy Range	M L H M L L	250 x N <sup>-10</sup> μA/μs250mA/μs 25 x N <sup>-10</sup> μA/μs25mA/μs 250 x N <sup>-10</sup> μA/μs25mA/μs 250 x N <sup>-10</sup> μA/μs25mA/μs 2.5 x N <sup>-10</sup> μA/μs25mA/μs 2.5 x N <sup>-10</sup> μA/μs2.5mA/μs ±(10 % of set" + 5μs) 1 x N <sup>-10</sup> μA 250 x N <sup>-10</sup> μA/μs2.5A/μs 100 x N <sup>-10</sup> μA 25 x N <sup>-10</sup> μA/μs250 x N <sup>-10</sup> mA/μs 10 x N <sup>-10</sup> μA 2.5 x N <sup>-10</sup> μA/μs250 x N <sup>-10</sup> mA/μs 10 x N <sup>-10</sup> μA 2.5 x N <sup>-10</sup> μA/μs250 x N <sup>-10</sup> mA/μs 2.5 x N <sup>-10</sup> μA/μs250 x N <sup>-10</sup> mA/μs 2.5 x N <sup>-10</sup> μA/μs250 x N <sup>-10</sup> μA/μs 2.5 x N <sup>-10</sup> μA/μs250 x N <sup>-10</sup> μA/μs 2.5 x N <sup>-10</sup> μA/μs250 x N <sup>-10</sup> μA/μs 2.5 x N <sup>-10</sup> μA/μs250 x N <sup>-10</sup> μA/μs 2.5 x N <sup>-10</sup> μA/μs250 x N <sup>-10</sup> μA/μs 2.5 x N <sup>-10</sup> μA/μs250 x N <sup>-10</sup> μA/μs 2.5 x N <sup>-10</sup> μA/μs250 x N <sup>-10</sup> μA/μs 2.5 x N <sup>-10</sup> μA/μs250 x N <sup>-10</sup> μA/μs ±(0.1 % of rdg + 0.1 % of f.s.)  CC , CR and CP 0.025 ms10 ms/Res : 1 μs ; 1 r ±100 ppm of setting 2.5 mA/μs2.5 A/μs 250 μA/μs250 mA/μs 250 μA/μs250 mA/μs	500 x N <sup>-10</sup> μA/μs~500mA/μs 50 x N <sup>-10</sup> μA/μs~50mA/μs 50 x N <sup>-10</sup> μA/μs~50mA/μs 50 x N <sup>-10</sup> μA/μs~50mA/μs 5 x N <sup>-10</sup> μA/μs~50mA/μs 5 x N <sup>-10</sup> μA/μs~5mA/μs 5 x N <sup>-10</sup> μA/μs~5mA/μs 20 x N <sup>-10</sup> μA/μs~500 x N <sup>-10</sup> mA/μs 200 x N <sup>-10</sup> μA 500 x N <sup>-10</sup> μA 50 x N <sup>-10</sup> μA 50 x N <sup>-10</sup> μA/μs~500 x N <sup>-10</sup> mA/μs 20 x N <sup>-10</sup> μA 5 x N <sup>-10</sup> μA/μs~50 x N <sup>-10</sup> mA/μs 5 x N <sup>-10</sup> μA/μs~50 x N <sup>-10</sup> μA/μs 50 x N <sup>-10</sup> μA/μs~5 x N <sup>-10</sup> μA/μs 50 x N <sup>-10</sup> μA/μs~50 x N <sup>-10</sup> μA/μs 50 x N <sup>-10</sup> μA/μs~500 x N <sup>-10</sup> μA/μs 5 x N <sup>-10</sup> μA/μs~500 x N <sup>-10</sup> μA/μs 5 x N <sup>-10</sup> μA/μs~50 x N <sup>-10</sup> μA/μs 5 x N <sup>-10</sup> μA/μs~50 x N <sup>-10</sup> μA/μs 5 x N <sup>-10</sup> μA/μs~50 x N <sup>-10</sup> μA/μs 5 x N <sup>-10</sup> μA/μs~50 x N <sup>-10</sup> μA/μs 5 x N <sup>-10</sup> μA/μs~50 x N <sup>-10</sup> μA/μs 5 x N <sup>-10</sup> μA/μs~50 x N <sup>-10</sup> μA/μs 5 x N <sup>-10</sup> μA/μs~50 x N <sup>-10</sup> μA/μs 5 x N <sup>-10</sup> μA/μs~50 x N <sup>-10</sup> μA/μs	1.6 x N <sup>-11</sup> mA/μs~1.6A/μs 160 x N <sup>-11</sup> μA/μs~160mA/μs 1.6 x N <sup>-11</sup> μA/μs~160mA/μs 1.6 x N <sup>-11</sup> μA/μs~160mA/μs 160 x N <sup>-11</sup> μA/μs~160mA/μs 16 x N <sup>-11</sup> μA/μs~160mA/μs 60 x N <sup>-11</sup> μA/μs~16α A/μs 600 x N <sup>-11</sup> μA 160 x N <sup>-11</sup> μA/μs~1.6 x N <sup>-11</sup> A/μs 600 x N <sup>-11</sup> μA 16 x N <sup>-11</sup> mA/μs~1.6 x N <sup>-11</sup> M/μs 16 x N <sup>-11</sup> mA/μs~16 x N <sup>-11</sup> mA/μs 60 x N <sup>-11</sup> μA/μs~16 x N <sup>-11</sup> μA/μs 60 x N <sup>-11</sup> μA/μs~16 x N <sup>-11</sup> μA/μs 60 x N <sup>-11</sup> μA/μs~16 x N <sup>-11</sup> μA/μs 1.6 x N <sup>-11</sup> μA/μs~16 x N <sup>-11</sup> μA/μs 1.6 x N <sup>-11</sup> μA/μs~16 x N <sup>-11</sup> μA/μs 1.6 x N <sup>-11</sup> μA/μs~16 x N <sup>-11</sup> μA/μs 1.6 x N <sup>-11</sup> μA/μs~160 x N <sup>-11</sup> μA/μs 1.6 mA/μs~1.6 A/μs 1.6 mA/μs~1.6 A/μs 1.6 mA/μs~1.6 A/μs 1.6 mA/μs~1.6 A/μs	N/A N/A N/A
(CC mode)  Setting Range (CR Mode)  Accuracy of Setting Resolution (Setting Range)  METER  Voltmeter Ammeter Ammeter(Parallel Operation) DYNAMIC MODE  Operation Mode T1 & T2 Accuracy Slew Rate (CC Mode)	Accuracy Accuracy	H H M L L	250 x N <sup>-10</sup> μA/μs~250mA/μs 25 x N <sup>-10</sup> μA/μs~250mA/μs 250 x N <sup>-10</sup> μA/μs~250mA/μs 25 x N <sup>-10</sup> μA/μs~25mA/μs 2.5 x N <sup>-10</sup> μA/μs~2.5mA/μs ± (10 % of set" + 5μs) 1 x N <sup>-10</sup> μA 25 x N <sup>-10</sup> μA/μs~2.5A/μs 100 x N <sup>-10</sup> μA 25 x N <sup>-10</sup> μA/μs~2.5 x N <sup>-10</sup> mA/μs 100 x N <sup>-10</sup> μA 2.5 x N <sup>-10</sup> μA/μs~250 x N <sup>-10</sup> mA/μs 100 x N <sup>-10</sup> μA 2.5 x N <sup>-10</sup> μA/μs~250 x N <sup>-10</sup> mA/μs 100 x N <sup>-10</sup> μA/μs~250 x N <sup>-10</sup> mA/μs 2.5 x N <sup>-10</sup> μA/μs~250 x N <sup>-10</sup> mA/μs 10 x N <sup>-10</sup> μA/μs~250 x N <sup>-10</sup> μA/μs 10 x N <sup>-10</sup> μA/μs~250 x N <sup>-10</sup> μA/μs 2.5 x N <sup>-10</sup> μA/μs~25 x N <sup>-10</sup> μA/μs ± (0.1 % of rdg + 0.1 % of f.s.) ± (0.2 % of rdg + 0.3 % of f.s.) ± (1.2% of rdg + 1.1% of f.s.) CC , CR and CP 0.025 ms~10 ms/Res : 1 μs ; 1 r ± 100 ppm of setting 2.5 mA/μs~2.5 A/μs 250 μA/μs~25 mA/μs 250 μA/μs~25 mA/μs 250 μA/μs~25 mA/μs	500 x N <sup>-10</sup> μA/μs~500mA/μs 50 x N <sup>-10</sup> μA/μs~50mA/μs 50 x N <sup>-10</sup> μA/μs~50mA/μs 50 x N <sup>-10</sup> μA/μs~50mA/μs 5 x N <sup>-10</sup> μA/μs~50mA/μs 5 x N <sup>-10</sup> μA/μs~5mA/μs 2 x N <sup>-10</sup> μA/μs~5πA/μs 2 x N <sup>-10</sup> μA/μs~5α/μs 2 x N <sup>-10</sup> μA/μs~500 x N <sup>-10</sup> mA/μs 2 x N <sup>-10</sup> μA/μs~500 x N <sup>-10</sup> mA/μs 2 x N <sup>-10</sup> μA/μs~500 x N <sup>-10</sup> mA/μs 5 x N <sup>-10</sup> μA/μs~50 x N <sup>-10</sup> mA/μs 5 x N <sup>-10</sup> μA/μs~50 x N <sup>-10</sup> μA/μs 5 x N <sup>-10</sup> μA/μs~5 x N <sup>-10</sup> μA/μs 5 x N <sup>-10</sup> μA/μs~5 x N <sup>-10</sup> μA/μs 5 x N <sup>-10</sup> μA/μs~500 x N <sup>-10</sup> μA/μs 5 x N <sup>-10</sup> μA/μs~500 x N <sup>-10</sup> μA/μs 5 x N <sup>-10</sup> μA/μs~500 x N <sup>-10</sup> μA/μs 5 x N <sup>-10</sup> μA/μs~500 x N <sup>-10</sup> μA/μs 5 x N <sup>-10</sup> μA/μs~500 x N <sup>-10</sup> μA/μs 5 x N <sup>-10</sup> μA/μs~500 x N <sup>-10</sup> μA/μs 5 x N <sup>-10</sup> μA/μs~500 x N <sup>-10</sup> μA/μs 5 x N <sup>-10</sup> μA/μs~500 x N <sup>-10</sup> μA/μs 5 x N <sup>-10</sup> μA/μs~500 x N <sup>-10</sup> μA/μs 5 x X x x x x x x x x x x x x x x x x x	1.6 x N <sup>-11</sup> mA/μs~1.6A/μs 160 x N <sup>-11</sup> μA/μs~160mA/μs 1.6 x N <sup>-11</sup> μA/μs~160mA/μs 1.6 x N <sup>-11</sup> μA/μs~160mA/μs 16 x N <sup>-11</sup> μA/μs~160mA/μs 16 x N <sup>-11</sup> μA/μs~16mA/μs 60 x N <sup>-11</sup> μA/μs~16α/μs 600 x N <sup>-11</sup> μA 16 x N <sup>-11</sup> μA/μs~16 x N <sup>-11</sup> A/μs 60 x N <sup>-11</sup> μA 16 x N <sup>-11</sup> μA 16 x N <sup>-11</sup> μA 16 x N <sup>-11</sup> μA/μs~16 x N <sup>-11</sup> mA/μs 60 x N <sup>-11</sup> μA 16 x N <sup>-11</sup> μA/μs~16 x N <sup>-11</sup> μA/μs 60 x N <sup>-11</sup> μA/μs~16 x N <sup>-11</sup> μA/μs 61 x N <sup>-11</sup> μA/μs~16 x N <sup>-11</sup> μA/μs 61 x N <sup>-11</sup> μA/μs~16 x N <sup>-11</sup> μA/μs 61 x N <sup>-11</sup> μA/μs~16 x N <sup>-11</sup> μA/μs 61 x N <sup>-11</sup> μA/μs~16 x N <sup>-11</sup> μA/μs 61 x N <sup>-11</sup> μA/μs~16 x N <sup>-11</sup> μA/μs 61 x N <sup>-11</sup> μA/μs~160 x N <sup>-11</sup> μA/μs 61 x N <sup>-11</sup> μA/μs~160 x N <sup>-11</sup> μA/μs 61 x N <sup>-11</sup> μA/μs~160 x N <sup>-11</sup> μA/μs 61 x N <sup>-11</sup> μA/μs~160 x N <sup>-11</sup> μA/μs 61 x N <sup>-11</sup> μA/μs~160 x N <sup>-11</sup> μA/μs 61 x N <sup>-11</sup> μA/μs~160 x N <sup>-11</sup> μA/μs	N/A N/A N/A
CCC mode)  Setting Range (CR Mode)  Accuracy of Setting Resolution (Setting Range)  METER  Voltmeter Ammeter Ammeter (Parallel Operation)  DYNAMIC MODE  Operation Mode T1 & T2 Accuracy Slew Rate (CC Mode)  Slew Rate (CR Mode)	Accuracy Accuracy Range	M L H M L L	250 x N <sup>-10</sup> μA/μs~250mA/μs 25 x N <sup>-10</sup> μA/μs~250mA/μs 250 x N <sup>-10</sup> μA/μs~250mA/μs 25 x N <sup>-10</sup> μA/μs~250mA/μs 2.5 x N <sup>-10</sup> μA/μs~2.5mA/μs ± (10 % of set" + 5μs) 1 x N <sup>-10</sup> μA 25 x N <sup>-10</sup> μA/μs~2.5A/μs 100 x N <sup>-10</sup> μA 25 x N <sup>-10</sup> μA/μs~2.5A/μs 100 x N <sup>-10</sup> μA 25 x N <sup>-10</sup> μA/μs~2.5 x N <sup>-10</sup> mA/μs 100 x N <sup>-10</sup> μA 2.5 x N <sup>-10</sup> μA/μs~2.5 x N <sup>-10</sup> mA/μs 100 x N <sup>-10</sup> μA 2.5 x N <sup>-10</sup> μA/μs~2.5 x N <sup>-10</sup> μA/μs 10 x N <sup>-10</sup> μA 2.5 x N <sup>-10</sup> μA/μs~2.5 x N <sup>-10</sup> μA/μs 10 x N <sup>-10</sup> μA/μs~2.5 x N <sup>-10</sup> μA/μs 2.5 x N <sup>-10</sup> μA/μs~2.5 x N <sup>-10</sup> μA/μs ± (0.1 % of rdg + 0.1 % of f.s.) ± (1.2% of rdg + 1.1% of f.s.) CC , CR and CP 0.025 ms~10 ms/Res : 1 μs ; 1 r ±100 ppm of setting 2.5 mA/μs~2.5 A/μs 2.5 μA/μs~2.5 mA/μs 2.5 μA/μs~2.5 mA/μs 2.5 μA/μs~2.5 mA/μs 2.5 μA/μs~2.5 mA/μs	500 x N <sup>-10</sup> μA/μs~500mA/μs 50 x N <sup>-10</sup> μA/μs~50mA/μs 50 x N <sup>-10</sup> μA/μs~50mA/μs 50 x N <sup>-10</sup> μA/μs~50mA/μs 5 x N <sup>-10</sup> μA/μs~50mA/μs 5 x N <sup>-10</sup> μA/μs~5mA/μs 2 x N <sup>-10</sup> μA/μs~5πA/μs 2 x N <sup>-10</sup> μA/μs~50 x N <sup>-10</sup> mA/μs 200 x N <sup>-10</sup> μA 500 x N <sup>-10</sup> μA 5 x N <sup>-10</sup> μA	1.6 x N <sup>-11</sup> mA/μs~1.6A/μs 160 x N <sup>-11</sup> μΔ/μs~160mA/μs 1.6 x N <sup>-11</sup> μΔ/μs~160mA/μs 16 x N <sup>-11</sup> μΔ/μs~160mA/μs 16 x N <sup>-11</sup> μΔ/μs~160mA/μs 16 x N <sup>-11</sup> μΔ/μs~16mA/μs 60 x N <sup>-11</sup> μΔ/μs~16mA/μs 60 x N <sup>-11</sup> μΔ/μs~16 x N <sup>-11</sup> Δ/μs 600 x N <sup>-11</sup> μΔ/μs~1.6 x N <sup>-11</sup> Δ/μs 60 x N <sup>-11</sup> μΔ/μs~1.6 x N <sup>-11</sup> M/μs 16 x N <sup>-11</sup> μΔ/μs~16 x N <sup>-11</sup> mA/μs 60 x N <sup>-11</sup> μΔ/μs~1.6 x N <sup>-11</sup> μΔ/μs 60 x N <sup>-11</sup> μΔ/μs~1.6 x N <sup>-11</sup> μΔ/μs 60 x N <sup>-11</sup> μΔ/μs~1.6 x N <sup>-11</sup> μΔ/μs 60 x N <sup>-11</sup> μΔ/μs~1.6 x N <sup>-11</sup> μΔ/μs 16 x N <sup>-11</sup> μΔ/μs~160 x N <sup>-11</sup> μΔ/μs 16 x N <sup>-11</sup> μΔ/μs~160 x N <sup>-11</sup> μΔ/μs 16 mΔ/μs~160 x Δ/μs 1.6mA/μs~160mA/μs 1.6mA/μs~160mA/μs 1.6mA/μs~160mA/μs 160μΔ/μs~160mA/μs	N/A N/A N/A N/A
(CC mode)  Setting Range (CR Mode)  Accuracy of Setting Resolution (Setting Range)  METER  Voltmeter Ammeter Ammeter (Parallel Operation)  DYNAMIC MODE  Operation Mode T1 & T2 Accuracy Slew Rate (CC Mode)  Slew Rate (CC Mode)  Current Accuracy	Accuracy Accuracy Range	H H M L L	250 x N <sup>-10</sup> μA/μs~250mA/μs 25 x N <sup>-10</sup> μA/μs~250mA/μs 250 x N <sup>-10</sup> μA/μs~250mA/μs 25 x N <sup>-10</sup> μA/μs~25mA/μs 2.5 x N <sup>-10</sup> μA/μs~2.5mA/μs ± (10 % of set" + 5μs) 1 x N <sup>-10</sup> μA 25 x N <sup>-10</sup> μA/μs~2.5A/μs 100 x N <sup>-10</sup> μA 25 x N <sup>-10</sup> μA/μs~2.5 x N <sup>-10</sup> mA/μs 100 x N <sup>-10</sup> μA 2.5 x N <sup>-10</sup> μA/μs~250 x N <sup>-10</sup> mA/μs 100 x N <sup>-10</sup> μA 2.5 x N <sup>-10</sup> μA/μs~250 x N <sup>-10</sup> mA/μs 100 x N <sup>-10</sup> μA/μs~250 x N <sup>-10</sup> mA/μs 2.5 x N <sup>-10</sup> μA/μs~250 x N <sup>-10</sup> mA/μs 10 x N <sup>-10</sup> μA/μs~250 x N <sup>-10</sup> μA/μs 10 x N <sup>-10</sup> μA/μs~250 x N <sup>-10</sup> μA/μs 2.5 x N <sup>-10</sup> μA/μs~25 x N <sup>-10</sup> μA/μs ± (0.1 % of rdg + 0.1 % of f.s.) ± (0.2 % of rdg + 0.3 % of f.s.) ± (1.2% of rdg + 1.1% of f.s.) CC , CR and CP 0.025 ms~10 ms/Res : 1 μs ; 1 r ± 100 ppm of setting 2.5 mA/μs~2.5 A/μs 250 μA/μs~25 mA/μs 250 μA/μs~25 mA/μs 250 μA/μs~25 mA/μs	500 x N <sup>-10</sup> μA/μs~500mA/μs 50 x N <sup>-10</sup> μA/μs~50mA/μs 50 x N <sup>-10</sup> μA/μs~50mA/μs 50 x N <sup>-10</sup> μA/μs~50mA/μs 5 x N <sup>-10</sup> μA/μs~50mA/μs 5 x N <sup>-10</sup> μA/μs~5mA/μs 2 x N <sup>-10</sup> μA/μs~5πA/μs 2 x N <sup>-10</sup> μA/μs~5α/μs 2 x N <sup>-10</sup> μA/μs~500 x N <sup>-10</sup> mA/μs 2 x N <sup>-10</sup> μA/μs~500 x N <sup>-10</sup> mA/μs 2 x N <sup>-10</sup> μA/μs~500 x N <sup>-10</sup> mA/μs 5 x N <sup>-10</sup> μA/μs~50 x N <sup>-10</sup> mA/μs 5 x N <sup>-10</sup> μA/μs~50 x N <sup>-10</sup> μA/μs 5 x N <sup>-10</sup> μA/μs~5 x N <sup>-10</sup> μA/μs 5 x N <sup>-10</sup> μA/μs~5 x N <sup>-10</sup> μA/μs 5 x N <sup>-10</sup> μA/μs~500 x N <sup>-10</sup> μA/μs 5 x N <sup>-10</sup> μA/μs~500 x N <sup>-10</sup> μA/μs 5 x N <sup>-10</sup> μA/μs~500 x N <sup>-10</sup> μA/μs 5 x N <sup>-10</sup> μA/μs~500 x N <sup>-10</sup> μA/μs 5 x N <sup>-10</sup> μA/μs~500 x N <sup>-10</sup> μA/μs 5 x N <sup>-10</sup> μA/μs~500 x N <sup>-10</sup> μA/μs 5 x N <sup>-10</sup> μA/μs~500 x N <sup>-10</sup> μA/μs 5 x N <sup>-10</sup> μA/μs~500 x N <sup>-10</sup> μA/μs 5 x N <sup>-10</sup> μA/μs~500 x N <sup>-10</sup> μA/μs 5 x X x x x x x x x x x x x x x x x x x	1.6 x N <sup>-11</sup> mA/μs~1.6A/μs 160 x N <sup>-11</sup> μA/μs~160mA/μs 1.6 x N <sup>-11</sup> μA/μs~160mA/μs 1.6 x N <sup>-11</sup> μA/μs~160mA/μs 16 x N <sup>-11</sup> μA/μs~160mA/μs 16 x N <sup>-11</sup> μA/μs~16mA/μs 60 x N <sup>-11</sup> μA/μs~16α/μs 600 x N <sup>-11</sup> μA 16 x N <sup>-11</sup> μA/μs~16 x N <sup>-11</sup> A/μs 60 x N <sup>-11</sup> μA 16 x N <sup>-11</sup> μA 16 x N <sup>-11</sup> μA 16 x N <sup>-11</sup> μA/μs~16 x N <sup>-11</sup> mA/μs 60 x N <sup>-11</sup> μA 16 x N <sup>-11</sup> μA/μs~16 x N <sup>-11</sup> μA/μs 60 x N <sup>-11</sup> μA/μs~16 x N <sup>-11</sup> μA/μs 61 x N <sup>-11</sup> μA/μs~16 x N <sup>-11</sup> μA/μs 61 x N <sup>-11</sup> μA/μs~16 x N <sup>-11</sup> μA/μs 61 x N <sup>-11</sup> μA/μs~16 x N <sup>-11</sup> μA/μs 61 x N <sup>-11</sup> μA/μs~16 x N <sup>-11</sup> μA/μs 61 x N <sup>-11</sup> μA/μs~16 x N <sup>-11</sup> μA/μs 61 x N <sup>-11</sup> μA/μs~160 x N <sup>-11</sup> μA/μs 61 x N <sup>-11</sup> μA/μs~160 x N <sup>-11</sup> μA/μs 61 x N <sup>-11</sup> μA/μs~160 x N <sup>-11</sup> μA/μs 61 x N <sup>-11</sup> μA/μs~160 x N <sup>-11</sup> μA/μs 61 x N <sup>-11</sup> μA/μs~160 x N <sup>-11</sup> μA/μs 61 x N <sup>-11</sup> μA/μs~160 x N <sup>-11</sup> μA/μs	N/A N/A N/A
CCC mode)  Setting Range (CR Mode)  Accuracy of Setting Resolution (Setting Range)  METER  Voltmeter Ammeter Ammeter(Parallel Operation) DYNAMIC MODE  Operation Mode T1 & T2 Accuracy Slew Rate (CC Mode)  Slew Rate (CC Mode)  Current Accuracy PROTECTION FUNCTION	Accuracy Accuracy Range	H H M L L	250 x N <sup>-10</sup> μA/μs~250mA/μs 25 x N <sup>-10</sup> μA/μs~250mA/μs 250 x N <sup>-10</sup> μA/μs~250mA/μs 25 x N <sup>-10</sup> μA/μs~25mA/μs 2.5 x N <sup>-10</sup> μA/μs~2.5mA/μs ±(10 % of set" + 5μs) 1 x N <sup>-10</sup> μA 250 x N <sup>-10</sup> μA/μs~2.5A/μs 100 x N <sup>-10</sup> μA 25 x N <sup>-10</sup> mA/μs~25 x N <sup>-10</sup> mA/μs 15 x N <sup>-10</sup> μA 2.5 x N <sup>-10</sup> mA/μs~25 x N <sup>-10</sup> mA/μs 10 x N <sup>-10</sup> μA 2.5 x N <sup>-10</sup> μA/μs~25 x N <sup>-10</sup> mA/μs 10 x N <sup>-10</sup> μA 2.5 x N <sup>-10</sup> μA/μs~25 x N <sup>-10</sup> mA/μs 10 x N <sup>-10</sup> μA 2.5 x N <sup>-10</sup> μA/μs~25 x N <sup>-10</sup> μA/μs 10 x N <sup>-10</sup> μA 10 x N <sup>-10</sup> μA 10 x N <sup>-10</sup> μA 10 x N <sup>-10</sup> μA/μs~25 x N <sup>-10</sup> μA/μs 10 x N <sup>-10</sup> μA/μs~25 x N <sup>-10</sup> μA/μs 2.5 x N <sup>-10</sup> μA/μs~25 x N <sup>-10</sup> μA/μs ±(0.1 % of rdg + 0.1 % of f.s.) ±(0.2 % of rdg + 0.3 % of f.s.) ±(1.2% of rdg + 1.1% of f.s.) CC , CR and CP 0.025 ms~10 ms/Res : 1μs ; 1π ±100 ppm of setting 2.5 mA/μs~2.5 μA/μs 250 μA/μs~250 mA/μs 25μA/μs~250 mA/μs 25μA/μs~25 mA/μs 25μA/μs~25 mA/μs 25μA/μs~25 mA/μs ±0.4%F.S.	500 x N <sup>-10</sup> μA/μs~500mA/μs 50 x N <sup>-10</sup> μA/μs~50mA/μs 50 x N <sup>-10</sup> μA/μs~50mA/μs 50 x N <sup>-10</sup> μA/μs~50mA/μs 5 x N <sup>-10</sup> μA/μs~50mA/μs 5 x N <sup>-10</sup> μA/μs~5mA/μs 2 x N <sup>-10</sup> μA/μs~5mA/μs 2 x N <sup>-10</sup> μA/μs~50 x N <sup>-10</sup> mA/μs 200 x N <sup>-10</sup> μA 500 x N <sup>-10</sup> μA 5 x N <sup>-10</sup> μA/μs~50 x N <sup>-10</sup> mA/μs 20 x N <sup>-10</sup> μA 5 x N <sup>-10</sup> μA/μs~5 x N <sup>-10</sup> mA/μs 20 x N <sup>-10</sup> μA 5 x N <sup>-10</sup> μA/μs~5 x N <sup>-10</sup> μA/μs 50 x N <sup>-10</sup> μA/μs~500 x N <sup>-10</sup> μA/μs 20 x N <sup>-10</sup> μA/μs~500 x N <sup>-10</sup> μA/μs 5 x N <sup>-10</sup> μA/μs~500 x N <sup>-10</sup> μA/μs 5 x N <sup>-10</sup> μA/μs~500 x N <sup>-10</sup> μA/μs 5 x N <sup>-10</sup> μA/μs~500 x N <sup>-10</sup> μA/μs 5 x N <sup>-10</sup> μA/μs~500 x N <sup>-10</sup> μA/μs 5 x N <sup>-10</sup> μA/μs~500 x N <sup>-10</sup> μA/μs 5 x N <sup>-10</sup> μA/μs~500 x N <sup>-10</sup> μA/μs 5 y μA/μs~50 x N <sup>-10</sup> μA/μs 5 y μA/μs~50 x N <sup>-10</sup> μA/μs	1.6 x N <sup>-11</sup> mA/μs~1.6A/μs 160 x N <sup>-11</sup> μA/μs~160mA/μs 1.6 x N <sup>-11</sup> μA/μs~160mA/μs 160 x N <sup>-11</sup> μA/μs~160mA/μs 160 x N <sup>-11</sup> μA/μs~160mA/μs 16 x N <sup>-11</sup> μA/μs~16mA/μs 60 x N <sup>-11</sup> μA/μs~16A/μs 600 x N <sup>-11</sup> μA/μs~1.6 x N <sup>-11</sup> A/μs 600 x N <sup>-11</sup> μA/μs~1.6 x N <sup>-11</sup> A/μs 60 x N <sup>-11</sup> μA/μs~1.6 x N <sup>-11</sup> M/μs 60 x N <sup>-11</sup> μA/μs~1.6 x N <sup>-11</sup> mA/μs 60 x N <sup>-11</sup> μA/μs~1.6 x N <sup>-11</sup> μA/μs 60 x N <sup>-11</sup> μA/μs~1.6 x N <sup>-11</sup> μA/μs 60 x N <sup>-11</sup> μA/μs~1.6 x N <sup>-11</sup> μA/μs 60 x N <sup>-11</sup> μA/μs~1.6 x N <sup>-11</sup> μA/μs 60 x N <sup>-11</sup> μA/μs~1.6 x N <sup>-11</sup> μA/μs 60 x N <sup>-11</sup> μA/μs~1.6 x N <sup>-11</sup> μA/μs 10 x N <sup>-11</sup> μA/μs~1.6 x N <sup>-11</sup> μA/μs 11 x N <sup>-11</sup> μA/μs~1.6 x N <sup>-11</sup> μA/μs 11 x N <sup>-11</sup> μA/μs~1.6 x N <sup>-11</sup> μA/μs 11 x N <sup>-11</sup> μA/μs~1.6 x N <sup>-11</sup> μA/μs 11 x N <sup>-11</sup> μA/μs~1.6 x N <sup>-11</sup> μA/μs 11 x N <sup>-11</sup> μA/μs~1.6 x N <sup>-11</sup> μA/μs 11 x N <sup>-11</sup> μA/μs~1.6 x N <sup>-11</sup> μA/μs 11 x N <sup>-11</sup> μA/μs~1.6 x N <sup>-11</sup> μA/μs 11 x N <sup>-11</sup> μA/μs~1.6 x N <sup>-11</sup> μA/μs 11 x N <sup>-11</sup> μA/μs~1.6 x N <sup>-11</sup> μA/μs 11 x N <sup>-11</sup> μA/μs~1.6 x N <sup>-11</sup> μA/μs 11 x N <sup>-11</sup> μA/μs~1.6 x N <sup>-11</sup> μA/μs 11 x N <sup>-11</sup> μA/μs~1.6 x N <sup>-11</sup> μA/μs 11 x N <sup>-11</sup> μA/μs~1.6 x N <sup>-11</sup> μA/μs 11 x N <sup>-11</sup> μA/μs~1.6 x N <sup>-11</sup> μA/μs 11 x N <sup>-11</sup> μA/μs~1.6 x N <sup>-11</sup> μA/μs 11 x N <sup>-11</sup> μA/μs~1.6 x N <sup>-11</sup> μA/μs 11 x N <sup>-11</sup> μA/μs~1.6 x N <sup>-11</sup> μA/μs 11 x N <sup>-11</sup> μA/μs~1.6 x N <sup>-11</sup> μA/μs 11 x N <sup>-11</sup> μA/μs~1.6 x N <sup>-11</sup> μA/μs	N/A  N/A  N/A  N/A  N/A  1.2%of set+1.1% of F.S.)
(CC mode)  Setting Range (CR Mode)  Accuracy of Setting Resolution (Setting Range)  METER  Voltmeter Ammeter Ammeter (Parallel Operation)  DYNAMIC MODE  Operation Mode T1 & T2 Accuracy Slew Rate (CC Mode)  Slew Rate (CC Mode)  Current Accuracy	Accuracy Accuracy Range	H H M L L	250 x N <sup>-10</sup> μA/μs-250mA/μs 25 x N <sup>-10</sup> μA/μs-25mA/μs 250 x N <sup>-10</sup> μA/μs-25mA/μs 250 x N <sup>-10</sup> μA/μs-25mA/μs 2.5 x N <sup>-10</sup> μA/μs-25mA/μs 2.5 x N <sup>-10</sup> μA/μs-2.5mA/μs 2.5 x N <sup>-10</sup> μA/μs-2.5mA/μs 2.5 x N <sup>-10</sup> μA/μs-2.5A/μs 100 x N <sup>-10</sup> μA 25 x N <sup>-10</sup> μA/μs-2.5A/μs 100 x N <sup>-10</sup> μA 25 x N <sup>-10</sup> μA/μs-250 x N <sup>-10</sup> mA/μs 10 x N <sup>-10</sup> μA 25 x N <sup>-10</sup> μA/μs-25 x N <sup>-10</sup> mA/μs 10 x N <sup>-10</sup> μA/μs-25 x N <sup>-10</sup> mA/μs 2.5 x N <sup>-10</sup> μA/μs-2.5 x N <sup>-10</sup> μA/μs 2.5 x N <sup>-10</sup> μA/μs-2.5 x N <sup>-10</sup> μA/μs 25 x N <sup>-10</sup> 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<sup>-10</sup> μΑ/μs~5 x N <sup>-10</sup> μΑ/μs 5 x N <sup>-10</sup> μΑ/μs~5 x N <sup>-10</sup> μΑ/μs 5 x N <sup>-10</sup> μΑ/μs~50 x N <sup>-10</sup> μΑ/μs 5 x N <sup>-10</sup> μΑ/μs~50 x N <sup>-10</sup> μΑ/μs 5 x N <sup>-10</sup> μΑ/μs~50 x N <sup>-10</sup> μΑ/μs 5 x N <sup>-10</sup> μΑ/μs~50 x N <sup>-10</sup> μΑ/μs 5 x N <sup>-10</sup> μΑ/μs~50 x N <sup>-10</sup> μΑ/μs 5 x N <sup>-10</sup> μΑ/μs~50 x N <sup>-10</sup> μΑ/μs 5 x N <sup>-10</sup> μΑ/μs~50 x N <sup>-10</sup> μΑ/μs 5 x N <sup>-10</sup> μΑ/μs~50 x N <sup>-10</sup> μΑ/μs 5 x N <sup>-10</sup> μΑ/μs~50 x N <sup>-10</sup> μΑ/μs 5 x N <sup>-10</sup> μΑ/μs~50 x N <sup>-10</sup> μΑ/μs 5 x N <sup>-10</sup> μΑ/μs~50 x N <sup>-10</sup> μΑ/μs 5 x N <sup>-10</sup> μΑ/μs~50 x N <sup>-10</sup> μΑ/μs 5 x N <sup>-10</sup> μΑ/μs~50 x N <sup>-10</sup> μΑ/μs 5 x N <sup>-10</sup> μΑ/μs~50 x N <sup>-10</sup> μΑ/μs 5 x N <sup>-10</sup> μΑ/μs~50 x N <sup>-10</sup> μΑ/μs 5 x N <sup>-10</sup> μΑ/μs~50 x N <sup>-10</sup> μΑ/μs 5 x N 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<sup>-10</sup> μΑ/μs~50 x N <sup>-10</sup> μΑ/μs 5 x N <sup>-10</sup> μΑ/μs~50 x N <sup>-10</sup> μΑ/μs 5 x N <sup>-10</sup> μΑ/μs~50 x N <sup>-10</sup> μΑ/μs 5 x N <sup>-10</sup> μΑ/μs~50 x N <sup>-10</sup> μΑ/μs 5 x N <sup>-10</sup> μΑ/μs~50 x N <sup>-10</sup> μΑ/μs 5 x N <sup>-10</sup> μΑ/μs x N <sup>-10</sup> μΑ/μs 5 x N <sup>-10</sup> μΑ/μs x N <sup>-10</sup> μΑ/μs 5 x N <sup>-10</sup> μΑ/μs x N <sup>-10</sup> μΑ/μs 5 x N <sup>-10</sup> μΑ/μs x N <sup>-10</sup> μΑ/μs 5 x N <sup>-10</sup> μΑ/μs x N <sup>-10</sup> μΑ/μs 5 x N <sup>-10</sup> μΑ/μs x N <sup>-10</sup> μΑ/μs 5 x	1.6 x N <sup>-11</sup> mA/μs~1.6A/μs 160 x N <sup>-11</sup> μA/μs~160mA/μs 1.6 x N <sup>-11</sup> μA/μs~160mA/μs 1.6 x N <sup>-11</sup> μA/μs~1.60mA/μs 160 x N <sup>-11</sup> μA/μs~160mA/μs 16 x N <sup>-11</sup> μA/μs~160mA/μs 60 x N <sup>-11</sup> μA/μs~16A/μs 600 x N <sup>-11</sup> μA 1.6 x N <sup>-11</sup> μA/μs~1.6 x N <sup>-11</sup> A/μs 60 x N <sup>-11</sup> μA 1.6 x N <sup>-11</sup> μA/μs~1.6 x N <sup>-11</sup> A/μs 60 x N <sup>-11</sup> μA/μs~1.6 x N <sup>-11</sup> μA/μs 60 x N <sup>-11</sup> μA/μs~1.6 x N <sup>-11</sup> μA/μs 1.6 x N <sup>-11</sup> μA/μs~1.6 x N <sup>-11</sup> μA/μs 60 x N <sup>-11</sup> μA/μs~1.6 x N <sup>-11</sup> μA/μs 1.6 x N <sup>-11</sup> μA/μs~1.6 x N <sup>-11</sup> μA/μs 1.6 x N <sup>-11</sup> μA/μs~1.6 x N <sup>-11</sup> μA/μs 1.6 x N <sup>-11</sup> μA/μs~1.6 x N <sup>-11</sup> μA/μs 1.6 x N <sup>-11</sup> μA/μs~1.6 x N <sup>-11</sup> μA/μs 1.6 x N <sup>-11</sup> μA/μs~1.6 x N <sup>-11</sup> μA/μs 1.6 mA/μs~1.6 A/μs 1.6 μA/μs~1.6 A/μs	N/A N/A N/A N/A  N/A  1.2%of set+1.1% of F.S.)
CCC mode)  Setting Range (CR Mode)  Accuracy of Setting Resolution (Setting Range)  METER  Voltmeter Ammeter Ammeter(Parallel Operation) DYNAMIC MODE  Operation Mode T1 & T2 Accuracy Slew Rate (CC Mode)  Slew Rate (CC Mode)  Current Accuracy PROTECTION FUNCTION	Accuracy Accuracy Range	H H M L L	250 x N <sup>-10</sup> μA/μs-250mA/μs 25 x N <sup>-10</sup> μA/μs-25mA/μs 250 x N <sup>-10</sup> μA/μs-25mA/μs 250 x N <sup>-10</sup> μA/μs-25mA/μs 2.5 x N <sup>-10</sup> μA/μs-25mA/μs 2.5 x N <sup>-10</sup> μA/μs-2.5mA/μs 2.5 x N <sup>-10</sup> μA/μs-2.5mA/μs 2.5 x N <sup>-10</sup> μA/μs-2.5A/μs 100 x N <sup>-10</sup> μA 25 x N <sup>-10</sup> μA/μs-2.5A/μs 100 x N <sup>-10</sup> μA 25 x N <sup>-10</sup> μA/μs-250 x N <sup>-10</sup> mA/μs 10 x N <sup>-10</sup> μA 25 x N <sup>-10</sup> μA/μs-25 x N <sup>-10</sup> mA/μs 10 x N <sup>-10</sup> μA/μs-25 x N <sup>-10</sup> mA/μs 2.5 x N <sup>-10</sup> μA/μs-2.5 x N <sup>-10</sup> μA/μs 2.5 x N <sup>-10</sup> μA/μs-2.5 x N <sup>-10</sup> μA/μs 25 x N <sup>-10</sup> μA/μs-25 x N <sup>-10</sup> μA/μs 25 x N <sup>-10</sup> μA/μs-25 x N <sup>-10</sup> μA/μs 25 x N <sup>-10</sup> μA/μs-25 x N <sup>-10</sup> μA/μs 25 x N <sup>-10</sup> μA/μs-25 x N <sup>-10</sup> μA/μs 25 x N <sup>-10</sup> μA/μs-25 x N <sup>-10</sup> μA/μs 25 x N <sup>-10</sup> μA/μs-25 x N <sup>-10</sup> μA/μs 25 x N <sup>-10</sup> μA/μs-25 x N <sup>-10</sup> μA/μs 25 x N <sup>-10</sup> μA/μs-25 x N <sup>-10</sup> μA/μs 25 x N <sup>-10</sup> μA/μs-250mA/μs 25 y N <sup>-10</sup> μA/μs-25 y N <sup>-10</sup> μA/μs 25 y N <sup>-10</sup> μA/μs-25 y N <sup>-10</sup> μA/μs 25 y N <sup>-10</sup> μA/μs-25 y N <sup>-10</sup> μA/μs 25 y N <sup>-10</sup> μA/μs-25 y N <sup>-10</sup> μA/μs 25 y N <sup>-10</sup> μA/μs-25 y N <sup>-10</sup> μA/μs 25 y N <sup>-10</sup> μA/μs-25 y N <sup>-10</sup> μA/μs 25 y N <sup>-10</sup> μA/μs-25 y N <sup>-10</sup> μA/μs 25 y N <sup>-10</sup> μA/μs-25 y N <sup>-10</sup> μA/μs 25 y N <sup>-10</sup> μA/μs-25 y N <sup>-10</sup> μA/μs 25 y N <sup>-10</sup> μA/μs-25 y N <sup>-10</sup> μA/μs 25 y N <sup>-10</sup> μA/μs-25 y N <sup>-10</sup> μA/μs 25 y N <sup>-10</sup> μA/μs-25 y N <sup>-10</sup> μA/μs 25 y N <sup>-10</sup> μA/μs-25 y N <sup>-10</sup> μA/μs 25 y N <sup>-10</sup> μA/μs-25 y N <sup>-10</sup> μA/μs 25 y N <sup>-10</sup> μA/μs-25 y N <sup>-10</sup> μA/μs 25 y N <sup>-10</sup> μA/μs-25 y N <sup>-10</sup> μA/μs 25 y N <sup>-10</sup> μA/μs-25 y N <sup>-10</sup> μA/μs 25 y N <sup>-10</sup> μA/μs-25 y N <sup>-10</sup> μA/μs 25 y N <sup>-10</sup> μA/μs-25 y N <sup>-10</sup> μA/μs 25 y N <sup>-10</sup> μA/μs-25 y N <sup>-10</sup> μA/μs 25 y N <sup>-10</sup> μA/μs-25 y N <sup>-10</sup> μA/μs 25 y N <sup>-10</sup> μA/μs-25 y N <sup>-10</sup> μA/μs 25 y N <sup>-10</sup> μA/μs-25 y N <sup>-10</sup> μA/μs 25 y N <sup>-10</sup> μA/μs-25 y N <sup>-10</sup> μA/μs 25 y N <sup>-10</sup> μA/μs-25 y N <sup>-10</sup> μA/μs 25 y N <sup>-10</sup> μA/μs-25 y N <sup>-10</sup> μA/μs 25 y N <sup>-10</sup> μA/μs-25 y N <sup>-10</sup> μA/μs 25 y N <sup>-10</sup> μA/μs y N <sup>-10</sup> μA/μs 25 y N <sup>-10</sup> μA/μs y N <sup>-10</sup> μA/μs 25 y N <sup>-10</sup> μA/μs y N <sup>-10</sup> μA/μs 25 y N <sup>-10</sup> μA/μs y N <sup>-10</sup> μA/μs 25 y N <sup>-10</sup> μA/μs y N <sup>-10</sup> μA/μs 25 y N <sup>-10</sup> μA/μs y N <sup>-10</sup> μA/μs 25 y N <sup>-10</sup> μA/μs y N <sup>-10</sup> μA/μs 25 y N <sup>-10</sup> μA/μs y N <sup>-10</sup> μA/μS y N <sup>-10</sup> μA/μs 25 y N <sup>-10</sup> μA/μs y N	500 x N <sup>-10</sup> μA/μs~500mA/μs 50 x N <sup>-10</sup> μA/μs~50mA/μs 50 x N <sup>-10</sup> μA/μs~50mA/μs 50 x N <sup>-10</sup> μA/μs~50mA/μs 5 x N <sup>-10</sup> μA/μs~50mA/μs 5 x N <sup>-10</sup> μA/μs~5mA/μs 2 x N <sup>-10</sup> μA/μs~5mA/μs 2 x N <sup>-10</sup> μA/μs~50 x N <sup>-10</sup> mA/μs 200 x N <sup>-10</sup> μA 500 x N <sup>-10</sup> μA 5 x N <sup>-10</sup> μA/μs~50 x N <sup>-10</sup> mA/μs 20 x N <sup>-10</sup> μA 5 x N <sup>-10</sup> μA/μs~5 x N <sup>-10</sup> mA/μs 20 x N <sup>-10</sup> μA 5 x N <sup>-10</sup> μA/μs~5 x N <sup>-10</sup> μA/μs 50 x N <sup>-10</sup> μA/μs~500 x N <sup>-10</sup> μA/μs 20 x N <sup>-10</sup> μA/μs~500 x N <sup>-10</sup> μA/μs 5 x N <sup>-10</sup> μA/μs~500 x N <sup>-10</sup> μA/μs 5 x N <sup>-10</sup> μA/μs~500 x N <sup>-10</sup> μA/μs 5 x N <sup>-10</sup> μA/μs~500 x N <sup>-10</sup> μA/μs 5 x N <sup>-10</sup> μA/μs~500 x N <sup>-10</sup> μA/μs 5 x N <sup>-10</sup> μA/μs~500 x N <sup>-10</sup> μA/μs 5 x N <sup>-10</sup> μA/μs~500 x N <sup>-10</sup> μA/μs 5 y μA/μs~50 x N <sup>-10</sup> μA/μs 5 y μA/μs~50 x N <sup>-10</sup> μA/μs	1.6 x N <sup>-11</sup> mA/μs~1.6A/μs 160 x N <sup>-11</sup> μA/μs~160mA/μs 1.6 x N <sup>-11</sup> μA/μs~160mA/μs 1.6 x N <sup>-11</sup> μA/μs~1.60mA/μs 160 x N <sup>-11</sup> μA/μs~160mA/μs 16 x N <sup>-11</sup> μA/μs~160mA/μs 60 x N <sup>-11</sup> μA/μs~16A/μs 600 x N <sup>-11</sup> μA 1.6 x N <sup>-11</sup> μA/μs~1.6 x N <sup>-11</sup> A/μs 60 x N <sup>-11</sup> μA 1.6 x N <sup>-11</sup> μA/μs~1.6 x N <sup>-11</sup> A/μs 60 x N <sup>-11</sup> μA/μs~1.6 x N <sup>-11</sup> μA/μs 60 x N <sup>-11</sup> μA/μs~1.6 x N <sup>-11</sup> μA/μs 1.6 x N <sup>-11</sup> μA/μs~1.6 x N <sup>-11</sup> μA/μs 60 x N <sup>-11</sup> μA/μs~1.6 x N <sup>-11</sup> μA/μs 1.6 x N <sup>-11</sup> μA/μs~1.6 x N <sup>-11</sup> μA/μs 1.6 x N <sup>-11</sup> μA/μs~1.6 x N <sup>-11</sup> μA/μs 1.6 x N <sup>-11</sup> μA/μs~1.6 x N <sup>-11</sup> μA/μs 1.6 x N <sup>-11</sup> μA/μs~1.6 x N <sup>-11</sup> μA/μs 1.6 x N <sup>-11</sup> μA/μs~1.6 x N <sup>-11</sup> μA/μs 1.6 mA/μs~1.6 A/μs 1.6 μA/μs~1.6 A/μs	N/A  N/A  N/A  N/A  N/A  1.2%of set+1.1% of F.S.)
CCC mode)  Setting Range (CR Mode)  Accuracy of Setting  Resolution (Setting Range)  METER  Voltmeter Ammeter Ammeter(Parallel Operation)  DYNAMIC MODE  Operation Mode T1 & T2  Accuracy  Slew Rate (CC Mode)  Slew Rate (CR Mode)  Current Accuracy  PROTECTION FUNCTION Functions	Accuracy Accuracy Range	H H M L L	250 x N <sup>-10</sup> μA/μs~250mA/μs 25 x N <sup>-10</sup> μA/μs~25mA/μs 250 x N <sup>-10</sup> μA/μs~25mA/μs 25 x N <sup>-10</sup> μA/μs~25mA/μs 2.5 x N <sup>-10</sup> μA/μs~2.5mA/μs ± (10 % of set" + 5μs) 1 x N <sup>-10</sup> μA 250 x N <sup>-20</sup> μA/μs~2.5A/μs 100 x N <sup>-20</sup> μA 25 x N <sup>-10</sup> μA/μs~2.5 x N <sup>-10</sup> mA/μs 10 x N <sup>-10</sup> μA 2.5 x N <sup>-10</sup> μA/μs~2.5 x N <sup>-10</sup> mA/μs 10 x N <sup>-10</sup> μA 2.5 x N <sup>-10</sup> μA/μs~2.5 x N <sup>-10</sup> mA/μs 10 x N <sup>-10</sup> μA 2.5 x N <sup>-10</sup> μA/μs~2.5 x N <sup>-10</sup> μA/μs 2.5 x N <sup>-10</sup> μA/μs~2.5 x N <sup>-10</sup> μA/μs 10 x N <sup>-10</sup> μA 2.5 x N <sup>-10</sup> μA/μs~2.5 x N <sup>-10</sup> μA/μs 10 x N <sup>-10</sup> μA/μs~2.5 x N <sup>-10</sup> μA/μs 10 x N <sup>-10</sup> μA/μs~2.5 x N <sup>-10</sup> μA/μs 10 x N <sup>-10</sup> μA/μs~2.5 x N <sup>-10</sup> μA/μs 2.5 x N <sup>-10</sup> μA/μs~2.5 x N <sup>-10</sup> μA/μs 2.5 x N <sup>-10</sup> μA/μs~2.5 x N <sup>-10</sup> μA/μs ± (0.1 % of rdg + 0.1 % of f.s) ± (1.2% of rdg + 1.1% of f.s.) CC , CR and CP 0.025 ms~10 ms/Res : 1 μs ; 1 r ±100 ppm of setting 2.5 mA/μs~2.5 A/μs 25 μA/μs~2.5 mA/μs 25 μA/μs~2.5 mA/μs 25 μA/μs~2.5 mA/μs 2.5 μA/μs~2.5 mA/μs ± 0.4%F.S. Overvoltage protection (OVP) Undervoltage protection (UVP)	500 x N <sup>-10</sup> μA/μs~50mA/μs 50 x N <sup>-10</sup> μA/μs~50mA/μs 50 x N <sup>-10</sup> μA/μs~50mA/μs 50 x N <sup>-10</sup> μA/μs~50mA/μs 5 x N <sup>-10</sup> μA/μs~50mA/μs 5 x N <sup>-10</sup> μA/μs~5mA/μs 5 x N <sup>-10</sup> μA/μs~5mA/μs 2 x N <sup>-10</sup> μA/μs~5α/μs 200 x N <sup>-10</sup> μA/μs~500 x N <sup>-10</sup> mA/μs 200 x N <sup>-10</sup> μA 5 x N <sup>-10</sup> μA/μs~500 x N <sup>-10</sup> mA/μs 2 x N <sup>-10</sup> μA 5 x N <sup>-10</sup> μA/μs~50 x N <sup>-10</sup> mA/μs 200 x N <sup>-10</sup> μA 5 x N <sup>-10</sup> μA/μs~50 x N <sup>-10</sup> μA/μs 5 x N <sup>-10</sup> μA/μs~50 x N <sup>-10</sup> μA/μs 5 x N <sup>-10</sup> μA/μs~50 x N <sup>-10</sup> μA/μs 200 x N <sup>-10</sup> μA/μs~50 x N <sup>-10</sup> μA/μs 5 x N <sup>-10</sup> μA/μs~50 x N <sup>-10</sup> μA/μs 5 x N <sup>-10</sup> μA/μs~50 x N <sup>-10</sup> μA/μs 5 x N <sup>-10</sup> μA/μs~50 x N <sup>-10</sup> μA/μs 5 x N <sup>-10</sup> μA/μs~50 x N <sup>-10</sup> μA/μs 5 x N <sup>-10</sup> μA/μs~50 x N <sup>-10</sup> μA/μs 5 x N <sup>-10</sup> μA/μs~50 x N <sup>-10</sup> μA/μs 5 x N <sup>-10</sup> μA/μs~50 x N <sup>-10</sup> μA/μs 5 x N <sup>-10</sup> μA/μs~50 x N <sup>-10</sup> μA/μs 5 x N <sup>-10</sup> μA/μs~50 x N <sup>-10</sup> μA/μs 5 x N <sup>-10</sup> μA/μs~50 x N <sup>-10</sup> μA/μs 5 x N <sup>-10</sup> μA/μs~50 x N <sup>-10</sup> μA/μs 5 x N <sup>-10</sup> μA/μs~50 x N <sup>-10</sup> μA/μs 5 x N <sup>-10</sup> μA/μs~50 x N <sup>-10</sup> μA/μs 5 x N <sup>-10</sup> μA/μs~50 x N <sup>-10</sup> μA/μs 5 x N <sup>-10</sup> μA/μs~50 x N <sup>-10</sup> μA/μs 5 x N <sup>-10</sup> μA/μs~50 x N <sup>-10</sup> μA/μs 5 x N <sup>-10</sup> μA/μs~50 x N <sup>-10</sup> μA/μs 5 x N <sup>-10</sup> μA/μs~50 x N <sup>-10</sup> μA/μs 5 x N <sup>-10</sup> μA/μs~50 x N <sup>-10</sup> μA/μs 5 x N <sup>-10</sup> μA/μs~50 x N <sup>-10</sup> μA/μs 5 x N <sup>-10</sup> μA/μs~50 x N <sup>-10</sup> μA/μs 5 x N <sup>-10</sup> μA/μs~50 x N <sup>-10</sup> μA/μs 5 x N <sup>-10</sup> μA/μs~50 x N <sup>-10</sup> μA/μs 5 x N <sup>-10</sup> μA/μs~50 x N <sup>-10</sup> μA/μs 5 x N <sup>-10</sup> μA/μs~50 x N <sup>-10</sup> μA/μs 5 x N <sup>-10</sup> μA/μs~50 x N <sup>-10</sup> μA/μs 5 x N <sup>-10</sup> μA/μs~50 x N <sup>-10</sup> μA/μs 5 x N <sup>-10</sup> μA/μs~50 x N <sup>-10</sup> μA/μs 5 x N <sup>-10</sup> μA/μs~50 x N <sup>-10</sup> μA/μs 5 x N <sup>-10</sup> μA/μs~50 x N <sup>-10</sup> μA/μs 5 x N <sup>-10</sup> μA/μs x N <sup>-10</sup> μA/μs 5 x N <sup>-10</sup> μA/μs x N <sup>-10</sup> μA/μs 5 x N <sup>-10</sup> μA/μs x N <sup>-10</sup> μA/μs 5 x N <sup>-10</sup> μA/μs x N <sup>-10</sup> μA/μs 5 x N <sup>-10</sup> μA/μs x N <sup>-10</sup> μA/μs 5 x N <sup>-10</sup> μA/μs x N <sup>-10</sup> μA/μs 5 x N <sup>-10</sup> μA/μs x N <sup>-10</sup> μA/μs 5 x N <sup>-10</sup> μA/μs x N <sup>-10</sup> μA/μs 5 x N <sup>-10</sup> μA/μs 5 x N <sup>-10</sup> μA/μs x N <sup>-10</sup> μA/μs 5 x N	1.6 x N <sup>-11</sup> mA/μs~1.6A/μs 160 x N <sup>-11</sup> μΔ/μs~160mA/μs 1.6 x N <sup>-11</sup> μΔ/μs~160mA/μs 1.6 x N <sup>-11</sup> μΔ/μs~160mA/μs 16 x N <sup>-11</sup> μΔ/μs~160mA/μs 16 x N <sup>-11</sup> μΔ/μs~160mA/μs 60 x N <sup>-11</sup> μΔ/μs~16A/μs 600 x N <sup>-11</sup> μΔ/μs~1.6 x N <sup>-11</sup> Δ/μs 600 x N <sup>-11</sup> μΔ/μs~1.6 x N <sup>-11</sup> mA/μs 16 x N <sup>-11</sup> μΔ/μs~1.6 x N <sup>-11</sup> mA/μs 16 x N <sup>-11</sup> μΔ/μs~1.6 x N <sup>-11</sup> μΔ/μs 60 x N <sup>-11</sup> μΔ/μs~1.6 x N <sup>-11</sup> μΔ/μs 60 x N <sup>-11</sup> μΔ/μs~1.6 x N <sup>-11</sup> μΔ/μs 61 x N <sup>-11</sup> μΔ/μs~1.6 x N <sup>-11</sup> μΔ/μs 16 x N <sup>-11</sup> μΔ/μs~1.6 x N <sup>-11</sup> μΔ/μs 11 x N <sup>-11</sup> μΔ/μs~1.6 x N <sup>-11</sup> μΔ/μs 11 x N <sup>-11</sup> μΔ/μs~1.6 x N <sup>-11</sup> μΔ/μs 11 x N <sup>-11</sup> μΔ/μs~160 x N <sup>-11</sup> μΔ/μs 11 x N <sup>-11</sup> μΔ/μs~160mA/μs 11 x x x x x x x x x x x x x x x x x x	N/A N/A N/A N/A N/A  N/A  1(1.2%of set+1.1% of F.S.)
CCC mode)  Setting Range (CR Mode)  Accuracy of Setting Resolution (Setting Range)  METER  Voltmeter Ammeter Ammeter (Parallel Operation)  DYNAMIC MODE  Operation Mode T1 & T2 Accuracy Slew Rate (CC Mode)  Slew Rate (CC Mode)  Current Accuracy PROTECTION FUNCTION Functions  GENERAL Input Range Power(Max.)	Accuracy Accuracy Range	H H M L L	250 x N <sup>-10</sup> μA/μs~250mA/μs 25 x N <sup>-10</sup> μA/μs~250mA/μs 250 x N <sup>-10</sup> μA/μs~250mA/μs 25 x N <sup>-10</sup> μA/μs~25mA/μs 2.5 x N <sup>-10</sup> μA/μs~2.5mA/μs ± (10 % of set" + 5μs) 1 x N <sup>-10</sup> μA 250 x N <sup>-10</sup> μA/μs~2.5A/μs 100 x N <sup>-10</sup> μA 25 x N <sup>-10</sup> mA/μs~2.5 x N <sup>-10</sup> mA/μs 15 x N <sup>-10</sup> μA 2.5 x N <sup>-10</sup> mA/μs~25 x N <sup>-10</sup> mA/μs 10 x N <sup>-10</sup> μA 2.5 x N <sup>-10</sup> μA/μs~25 x N <sup>-10</sup> mA/μs 10 x N <sup>-10</sup> μA 2.5 x N <sup>-10</sup> μA/μs~25 x N <sup>-10</sup> mA/μs 10 x N <sup>-10</sup> μA 2.5 x N <sup>-10</sup> μA/μs~25 x N <sup>-10</sup> mA/μs 10 x N <sup>-10</sup> μA 2.5 x N <sup>-10</sup> μA/μs~25 x N <sup>-10</sup> μA/μs 10 x N <sup>-10</sup> μA 10 x N <sup>-10</sup> μA 10 x N <sup>-10</sup> μA 2.5 x N <sup>-10</sup> μA/μs~25 x N <sup>-10</sup> μA/μs 10 x N <sup>-10</sup> μA 10 x N <sup>-10</sup> μA 10 x N <sup>-10</sup> μA 10 x N <sup>-10</sup> μA 10 x N <sup>-10</sup> μA/μs~25 x N <sup>-10</sup> μA/μs 10 x N <sup>-10</sup> μA/μs~25 x N <sup>-10</sup> μA/μs ± (0.1 % of rdg + 0.1 % of f.s.) ± (0.2 % of rdg + 0.3 % of f.s.) ± (1.2% of rdg + 1.1% of f.s.) CC , CR and CP 0.025 ms~10 ms/Res : 1μs ; 1π ±100 ppm of setting 2.5 mA/μs~2.5 μA/μs 250 μA/μs~250 mA/μs 25μA/μs~250 mA/μs 25μA/μs~25 mA/μs ±0.4%F.S. Overvoltage protection (OVP) Undervoltage protection (UVP) 90VAC~132VAC/180VAC~250VAC 90VA	500 x N <sup>-10</sup> μA/μs~50mA/μs 50 x N <sup>-10</sup> μA/μs~50mA/μs 50 x N <sup>-10</sup> μA/μs~50mA/μs 50 x N <sup>-10</sup> μA/μs~50mA/μs 5 x N <sup>-10</sup> μA/μs~50mA/μs 5 x N <sup>-10</sup> μA/μs~5mA/μs 2 x N <sup>-10</sup> μA/μs~5mA/μs 2 x N <sup>-10</sup> μA/μs~50 x N <sup>-10</sup> mA/μs 200 x N <sup>-10</sup> μA 500 x N <sup>-10</sup> μA 5 x N <sup>-10</sup> μA/μs~50 x N <sup>-10</sup> mA/μs 200 x N <sup>-10</sup> μA 5 x N <sup>-10</sup> μA/μs~5 x N <sup>-10</sup> mA/μs 200 x N <sup>-10</sup> μA 5 x N <sup>-10</sup> μA/μs~500 x N <sup>-10</sup> μA/μs 50 x N <sup>-10</sup> μA/μs~500 x N <sup>-10</sup> μA/μs 20 x N <sup>-10</sup> μA/μs~500 x N <sup>-10</sup> μA/μs 5 x N <sup>-10</sup> μA/μs~500 x N <sup>-10</sup> μA/μs 5 x N <sup>-10</sup> μA/μs~500 x N <sup>-10</sup> μA/μs 5 x N <sup>-10</sup> μA/μs~500 x N <sup>-10</sup> μA/μs 5 x N <sup>-10</sup> μA/μs~500 x N <sup>-10</sup> μA/μs 5 x N <sup>-10</sup> μA/μs~500 mA/μs 5 y μA/μs~50mA/μs 5 y μA/μs~5mA/μs	1.6 x N <sup>-11</sup> mA/μs~1.6A/μs 160 x N <sup>-11</sup> μA/μs~160mA/μs 1.6 x N <sup>-11</sup> μA/μs~160mA/μs 1.6 x N <sup>-11</sup> μA/μs~1.60mA/μs 160 x N <sup>-11</sup> μA/μs~160mA/μs 16 x N <sup>-11</sup> μA/μs~160mA/μs 60 x N <sup>-11</sup> μA/μs~16A/μs 600 x N <sup>-11</sup> μA 1.6 x N <sup>-11</sup> μA/μs~1.6 x N <sup>-11</sup> A/μs 60 x N <sup>-11</sup> μA 1.6 x N <sup>-11</sup> μA/μs~1.6 x N <sup>-11</sup> A/μs 60 x N <sup>-11</sup> μA/μs~1.6 x N <sup>-11</sup> μA/μs 60 x N <sup>-11</sup> μA/μs~1.6 x N <sup>-11</sup> μA/μs 1.6 x N <sup>-11</sup> μA/μs~1.6 x N <sup>-11</sup> μA/μs 60 x N <sup>-11</sup> μA/μs~1.6 x N <sup>-11</sup> μA/μs 1.6 x N <sup>-11</sup> μA/μs~1.6 x N <sup>-11</sup> μA/μs 1.6 x N <sup>-11</sup> μA/μs~1.6 x N <sup>-11</sup> μA/μs 1.6 x N <sup>-11</sup> μA/μs~1.6 x N <sup>-11</sup> μA/μs 1.6 x N <sup>-11</sup> μA/μs~1.6 x N <sup>-11</sup> μA/μs 1.6 x N <sup>-11</sup> μA/μs~1.6 x N <sup>-11</sup> μA/μs 1.6 mA/μs~1.6 A/μs 1.6 μA/μs~1.6 A/μs	N/A  N/A  N/A  N/A  N/A  1.2%of set+1.1% of F.S.)
CCC mode)  Setting Range (CR Mode)  Accuracy of Setting Resolution (Setting Range)  METER  Voltmeter Ammeter Ammeter(Parallel Operation) DYNAMIC MODE  Operation Mode T1 & T2 Accuracy Slew Rate (CC Mode)  Slew Rate (CR Mode)  Current Accuracy PROTECTION FUNCTION Functions  GENERAL Input Range Power(Max.) Interface	Accuracy Accuracy Range	H H M L L	250 x N <sup>-10</sup> μA/μs-250mA/μs 25 x N <sup>-10</sup> μA/μs-250mA/μs 250 x N <sup>-10</sup> μA/μs-250mA/μs 250 x N <sup>-10</sup> μA/μs-250mA/μs 25 x N <sup>-10</sup> μA/μs-25mA/μs 2.5 x N <sup>-10</sup> μA/μs-2.5mA/μs 2.5 x N <sup>-10</sup> μA/μs-2.5mA/μs 1 x N <sup>-10</sup> μA/μs-2.5A/μs 100 x N <sup>-10</sup> μA 25 x N <sup>-10</sup> μA/μs-2.5A/μs 100 x N <sup>-10</sup> μA 25 x N <sup>-10</sup> μA/μs-250 x N <sup>-10</sup> mA/μs 10 x N <sup>-10</sup> μA 25 x N <sup>-10</sup> μA/μs-25 x N <sup>-10</sup> mA/μs 25 x N <sup>-10</sup> μA/μs-25 x N <sup>-10</sup> mA/μs 25 x N <sup>-10</sup> μA/μs-25 x N <sup>-10</sup> μA/μs 25 x N <sup>-10</sup> μA/μs-25 x N <sup>-10</sup> μA/μs 25 x N <sup>-10</sup> μA/μs-25 x N <sup>-10</sup> μA/μs 25 x N <sup>-10</sup> μA/μs-25 x N <sup>-10</sup> μA/μs 25 x N <sup>-10</sup> μA/μs-25 x N <sup>-10</sup> μA/μs 25 x N <sup>-10</sup> μA/μs-25 x N <sup>-10</sup> μA/μs 25 x N <sup>-10</sup> μA/μs-25 x N <sup>-10</sup> μA/μs 25 x N <sup>-10</sup> μA/μs-25 x N <sup>-10</sup> μA/μs 25 x N <sup>-10</sup> μA/μs-25 x N <sup>-10</sup> μA/μs 25 x N <sup>-10</sup> μA/μs-25 x N <sup>-10</sup> μA/μs 25 μA/μs-25 x N <sup>-10</sup> μA/μs 25 μA/μs-250 mA/μs 25 μA/μs-250 mA/μs 25 μA/μs-25 mA/μs	500 x N <sup>-10</sup> μΑ/μs~50mA/μs 50 x N <sup>-10</sup> μΑ/μs~50mA/μs 50 x N <sup>-10</sup> μΑ/μs~50mA/μs 50 x N <sup>-10</sup> μΑ/μs~50mA/μs 5 x N <sup>-10</sup> μΑ/μs~50mA/μs 5 x N <sup>-10</sup> μΑ/μs~5mA/μs 2 x N <sup>-10</sup> μΑ/μs~5mA/μs 20 x N <sup>-10</sup> μΑ/μs~500 x N <sup>-10</sup> mA/μs 200 x N <sup>-10</sup> μΑ 50 x N <sup>-10</sup> μΑ/μs~500 x N <sup>-10</sup> mA/μs 20 x N <sup>-10</sup> μΑ 50 x N <sup>-10</sup> μΑ/μs~50 x N <sup>-10</sup> mA/μs 20 x N <sup>-10</sup> μΑ/μs~5 x N <sup>-10</sup> mA/μs 5 x N <sup>-10</sup> μΑ/μs~5 x N <sup>-10</sup> μΑ/μs 5 x N <sup>-10</sup> μΑ/μs~5 x N <sup>-10</sup> μΑ/μs 5 x N <sup>-10</sup> μΑ/μs~5 x N <sup>-10</sup> μΑ/μs 5 x N <sup>-10</sup> μΑ/μs~50 x N <sup>-10</sup> μΑ/μs 5 x N <sup>-10</sup> μΑ/μs~50 x N <sup>-10</sup> μΑ/μs 5 x N <sup>-10</sup> μΑ/μs~50 x N <sup>-10</sup> μΑ/μs 5 x N <sup>-10</sup> μΑ/μs~50 x N <sup>-10</sup> μΑ/μs 5 x N <sup>-10</sup> μΑ/μs~50 x N <sup>-10</sup> μΑ/μs 5 x N <sup>-10</sup> μΑ/μs~50 x N <sup>-10</sup> μΑ/μs 5 x N <sup>-10</sup> μΑ/μs~50 x N <sup>-10</sup> μΑ/μs 5 x N <sup>-10</sup> μΑ/μs~50 x N <sup>-10</sup> μΑ/μs 5 x N <sup>-10</sup> μΑ/μs~50 x N <sup>-10</sup> μΑ/μs 5 x N <sup>-10</sup> μΑ/μs~50 x N <sup>-10</sup> μΑ/μs 5 x N <sup>-10</sup> μΑ/μs~50 x N <sup>-10</sup> μΑ/μs 5 x N <sup>-10</sup> μΑ/μs~50 x N <sup>-10</sup> μΑ/μs 5 x N <sup>-10</sup> μΑ/μs~50 x N <sup>-10</sup> μΑ/μs 5 x N <sup>-10</sup> μΑ/μs~50 x N <sup>-10</sup> μΑ/μs 5 x N <sup>-10</sup> μΑ/μs~50 x N <sup>-10</sup> μΑ/μs 5 x N <sup>-10</sup> μΑ/μs~50 x N <sup>-10</sup> μΑ/μs 5 x N <sup>-10</sup> μΑ/μs~50 x N <sup>-10</sup> μΑ/μs 5 x N <sup>-10</sup> μΑ/μs~50 x N <sup>-10</sup> μΑ/μs 5 x N <sup>-10</sup> μΑ/μs~50 x N <sup>-10</sup> μΑ/μs 5 x N <sup>-10</sup> μΑ/μs~50 x N <sup>-10</sup> μΑ/μs 5 x N <sup>-10</sup> μΑ/μs~50 x N <sup>-10</sup> μΑ/μs 5 x N <sup>-10</sup> μΑ/μs~50 x N <sup>-10</sup> μΑ/μs 5 x N <sup>-10</sup> μΑ/μs~50 x N <sup>-10</sup> μΑ/μs 5 x N <sup>-10</sup> μΑ/μs~50 x N <sup>-10</sup> μΑ/μs 5 x N <sup>-10</sup> μΑ/μs~50 x N <sup>-10</sup> μΑ/μs 5 x N <sup>-10</sup> μΑ/μs~50 x N <sup>-10</sup> μΑ/μs 5 x N <sup>-10</sup> μΑ/μs~50 x N <sup>-10</sup> μΑ/μs 5 x N <sup>-10</sup> μΑ/μs~50 x N <sup>-10</sup> μΑ/μs 5 x N <sup>-10</sup> μΑ/μs~50 x N <sup>-10</sup> μΑ/μs 5 x N <sup>-10</sup> μΑ/μs~50 x N <sup>-10</sup> μΑ/μs 5 x N <sup>-10</sup> μΑ/μs~50 x N <sup>-10</sup> μΑ/μs 5 x N <sup>-10</sup> μΑ/μs~50 x N <sup>-10</sup> μΑ/μs 5 x N <sup>-10</sup> μΑ/μs~50 x N <sup>-10</sup> μΑ/μs 5 x N <sup>-10</sup> μΑ/μs~50 x N <sup>-10</sup> μΑ/μs 5 x N <sup>-10</sup> μΑ/μs~50 x N <sup>-10</sup> μΑ/μs 5 x N <sup>-10</sup> μΑ/μs~50 x N <sup>-10</sup> μΑ/μs 5 x N <sup>-10</sup> μΑ/μs x N <sup>-10</sup> μΑ/μs 5 x N <sup>-10</sup> μΑ/μs x N <sup>-10</sup> μΑ/μs 5 x N <sup>-10</sup> μΑ/μs x N <sup>-10</sup> μΑ/μs 5 x N <sup>-10</sup> μΑ/μs x x x x x x x x x x x x x x x x x x x	1.6 x N <sup>-11</sup> mA/μs~1.6A/μs 160 x N <sup>-11</sup> μΔ/μs~160mA/μs 1.6 x N <sup>-11</sup> μΔ/μs~160mA/μs 1.6 x N <sup>-11</sup> μΔ/μs~160mA/μs 160 x N <sup>-11</sup> μΔ/μs~160mA/μs 16 x N <sup>-11</sup> μΔ/μs~160mA/μs 60 x N <sup>-11</sup> μΔ/μs~160mA/μs 60 x N <sup>-11</sup> μΔ/μs~164 μs 600 x N <sup>-11</sup> μΔ 16 x N <sup>-11</sup> μΔ/μs~16 x N <sup>-11</sup> μΔ/μs 60 x N <sup>-11</sup> μΔ/μs~16 x N <sup>-11</sup> μΔ/μs 60 x N <sup>-11</sup> μΔ/μs~16 x N <sup>-11</sup> μΔ/μs 60 x N <sup>-11</sup> μΔ/μs~16 x N <sup>-11</sup> μΔ/μs 16 x N <sup>-11</sup> μΔ/μs~16 x N <sup>-11</sup> μΔ/μs 160 x N <sup>-11</sup> μΔ/μs~16 x N <sup>-11</sup> μΔ/μs 160 x N <sup>-11</sup> μΔ/μs~160 x N <sup>-11</sup> μΔ/μs 16 mΔ/μs~16 λ/μs 16 mΔ/μs~16 λ/μs 1.6 mΔ/μs~16 λ/μs 1.6 mΔ/μs~16 λ/μs 1.6 μΔ/μs~16 μς 1.6 μΔ/μs~16 μς 1.6 μΔ/μs~16 μς 1.6 μσ/μs~16 μς 1.6 μς 1	N/A  N/A  N/A  N/A  N/A  1(1.2%of set+1.1% of F.S.)
CCC mode)  Setting Range (CR Mode)  Accuracy of Setting Resolution (Setting Range)  METER  Voltmeter Ammeter Ammeter (Parallel Operation)  DYNAMIC MODE  Operation Mode T1 & T2 Accuracy Slew Rate (CC Mode)  Slew Rate (CC Mode)  Current Accuracy PROTECTION FUNCTION Functions  GENERAL Input Range Power(Max.)	Accuracy Accuracy Range	H H M L L	250 x N <sup>-10</sup> μA/μs~250mA/μs 25 x N <sup>-10</sup> μA/μs~250mA/μs 250 x N <sup>-10</sup> μA/μs~250mA/μs 25 x N <sup>-10</sup> μA/μs~25mA/μs 2.5 x N <sup>-10</sup> μA/μs~2.5mA/μs ± (10 % of set" + 5μs) 1 x N <sup>-10</sup> μA 250 x N <sup>-10</sup> μA/μs~2.5A/μs 100 x N <sup>-10</sup> μA 25 x N <sup>-10</sup> mA/μs~2.5 x N <sup>-10</sup> mA/μs 15 x N <sup>-10</sup> μA 2.5 x N <sup>-10</sup> mA/μs~25 x N <sup>-10</sup> mA/μs 10 x N <sup>-10</sup> μA 2.5 x N <sup>-10</sup> μA/μs~25 x N <sup>-10</sup> mA/μs 10 x N <sup>-10</sup> μA 2.5 x N <sup>-10</sup> μA/μs~25 x N <sup>-10</sup> mA/μs 10 x N <sup>-10</sup> μA 2.5 x N <sup>-10</sup> μA/μs~25 x N <sup>-10</sup> mA/μs 10 x N <sup>-10</sup> μA 2.5 x N <sup>-10</sup> μA/μs~25 x N <sup>-10</sup> μA/μs 10 x N <sup>-10</sup> μA 10 x N <sup>-10</sup> μA 10 x N <sup>-10</sup> μA 2.5 x N <sup>-10</sup> μA/μs~25 x N <sup>-10</sup> μA/μs 10 x N <sup>-10</sup> μA 10 x N <sup>-10</sup> μA 10 x N <sup>-10</sup> μA 10 x N <sup>-10</sup> μA 10 x N <sup>-10</sup> μA/μs~25 x N <sup>-10</sup> μA/μs 10 x N <sup>-10</sup> μA/μs~25 x N <sup>-10</sup> μA/μs ± (0.1 % of rdg + 0.1 % of f.s.) ± (0.2 % of rdg + 0.3 % of f.s.) ± (1.2% of rdg + 1.1% of f.s.) CC , CR and CP 0.025 ms~10 ms/Res : 1μs ; 1π ±100 ppm of setting 2.5 mA/μs~2.5 μA/μs 250 μA/μs~250 mA/μs 25μA/μs~250 mA/μs 25μA/μs~25 mA/μs ±0.4%F.S. Overvoltage protection (OVP) Undervoltage protection (UVP) 90VAC~132VAC/180VAC~250VAC 90VA	500 x N <sup>-10</sup> μA/μs~50mA/μs 50 x N <sup>-10</sup> μA/μs~50mA/μs 50 x N <sup>-10</sup> μA/μs~50mA/μs 50 x N <sup>-10</sup> μA/μs~50mA/μs 5 x N <sup>-10</sup> μA/μs~50mA/μs 5 x N <sup>-10</sup> μA/μs~5mA/μs 2 x N <sup>-10</sup> μA/μs~5mA/μs 2 x N <sup>-10</sup> μA/μs~50 x N <sup>-10</sup> mA/μs 200 x N <sup>-10</sup> μA 500 x N <sup>-10</sup> μA 5 x N <sup>-10</sup> μA/μs~50 x N <sup>-10</sup> mA/μs 200 x N <sup>-10</sup> μA 5 x N <sup>-10</sup> μA/μs~5 x N <sup>-10</sup> mA/μs 200 x N <sup>-10</sup> μA 5 x N <sup>-10</sup> μA/μs~500 x N <sup>-10</sup> μA/μs 50 x N <sup>-10</sup> μA/μs~500 x N <sup>-10</sup> μA/μs 20 x N <sup>-10</sup> μA/μs~500 x N <sup>-10</sup> μA/μs 5 x N <sup>-10</sup> μA/μs~500 x N <sup>-10</sup> μA/μs 5 x N <sup>-10</sup> μA/μs~500 x N <sup>-10</sup> μA/μs 5 x N <sup>-10</sup> μA/μs~500 x N <sup>-10</sup> μA/μs 5 x N <sup>-10</sup> μA/μs~500 x N <sup>-10</sup> μA/μs 5 x N <sup>-10</sup> μA/μs~500 mA/μs 5 y μA/μs~50mA/μs 5 y μA/μs~5mA/μs	1.6 x N <sup>-11</sup> mA/μs~1.6A/μs 160 x N <sup>-11</sup> μΔ/μs~160mA/μs 1.6 x N <sup>-11</sup> μΔ/μs~160mA/μs 1.6 x N <sup>-11</sup> μΔ/μs~160mA/μs 16 x N <sup>-11</sup> μΔ/μs~160mA/μs 16 x N <sup>-11</sup> μΔ/μs~160mA/μs 60 x N <sup>-11</sup> μΔ/μs~16A/μs 600 x N <sup>-11</sup> μΔ/μs~1.6 x N <sup>-11</sup> Δ/μs 600 x N <sup>-11</sup> μΔ/μs~1.6 x N <sup>-11</sup> mA/μs 16 x N <sup>-11</sup> μΔ/μs~1.6 x N <sup>-11</sup> mA/μs 16 x N <sup>-11</sup> μΔ/μs~1.6 x N <sup>-11</sup> μΔ/μs 60 x N <sup>-11</sup> μΔ/μs~1.6 x N <sup>-11</sup> μΔ/μs 60 x N <sup>-11</sup> μΔ/μs~1.6 x N <sup>-11</sup> μΔ/μs 61 x N <sup>-11</sup> μΔ/μs~1.6 x N <sup>-11</sup> μΔ/μs 16 x N <sup>-11</sup> μΔ/μs~1.6 x N <sup>-11</sup> μΔ/μs 11 x N <sup>-11</sup> μΔ/μs~1.6 x N <sup>-11</sup> μΔ/μs 11 x N <sup>-11</sup> μΔ/μs~1.6 x N <sup>-11</sup> μΔ/μs 11 x N <sup>-11</sup> μΔ/μs~160 x N <sup>-11</sup> μΔ/μs 11 x N <sup>-11</sup> μΔ/μs~160mA/μs 11 x x x x x x x x x x x x x x x x x x	N/A N/A N/A N/A N/A  N/A  N/A  1(1.2% of set+1.1% of F.S.)

Model			PEL-3021H	PEL-3041H	PEL-3111H	PEL-3211H		
Voltage			0V~800V	0V~800V	0V~800V	0V~800V		
Current Power			8.75A 175W	17,5A 350W	52,5A 1050W	105A 2100W		
Input Resistance			3.24ΜΩ	3.24ΜΩ	3.24ΜΩ	3.24ΜΩ		
Min. Operating			5V@8.75A	5V@17.5A	5V@52.5A	5V@105A		
Voltage(DC)(Typ.)	\r		2.5V@4,375A	2.5V@8,75A	2.5V@26,25A	2.5V@52,5A		
Operating Range	H,M,		0-8 754 0-875m4 0-87 5m4	0-1754 0-1754 0-175mA	0~52.5A 0~5.25A 0~525mA	0~105A 0~10.5A 0~1.05A		
Accuracy of Setting H, M			±(0.2 % of set + 0.1 % of f.s <sup>*1</sup>		0~32.3A 0~3.23A 0~323IIIA	±(1.2% of set+1.1% of f.s		
Accuracy of Setting	L		±(0.2 % of set + 0.1 % of f.s"	, , ,		N/A		
Accuracy of Setting(Parallel)	-		±(1.2% of set +1.1% of f.s. <sup>13</sup> )	) + VIII /3.241VIS2		N/A		
Resolution	Н,М,	1	300μA 30μA 3μA	0.6mA 60µА 6µА	2mA 200μA 20μA	4mA 400µA 40µ		
CR MODE	11,101,	_	σούμα σούμα σύμα	O.OHA OHA OHA	200μΑ 20μΑ	411ΙΑ   400μΑ   40μ		
Operating Range		н	1.75S~30μS (571mΩ~33.3kΩ)	3.5S~60μS (285mΩ~16.6kΩ)	10.5S~180μS (95.2mΩ~5.55kΩ)	21S~360μS (47.6mΩ~2.777kΩ)		
	Range	М	175mS~3μS (5.71Ω~333kΩ)	350mS~6μS (2.85Ω~166kΩ)	1.05S~18μS (952mΩ~55.5kΩ)	2.1S~36μS (476mΩ~27.77kΩ)		
		L	17.5mS~0.3μS (57.1Ω~3.33MΩ)	35mS~0.6μS (28.5Ω~1.66MΩ)	105mS~1.8μS (9.52Ω~555kΩ)	210mS~3.6μS (4.762Ω~277.7kΩ)		
Accuracy of Setting	Н,М	55	±(0.5% set + 0.5% f.S*1) + Vir	1 <sup>*2</sup> /3.24MΩ		±(1.2% of set +1.1% of f.s)TY		
Accuracy of Setting	L		±(0.5% set + 0.5% f.S*1) + Vir	1 <sup>*2</sup> /3.24MΩ		N/A		
Parallel	à.		±(1.2 % of set + 1.1 % of f.s <sup>3</sup> )			N/A		
Resolution	Н,М,	L	30μS 3μS 0.3μS	60μS 6μS 0.6μS	180μS 18μS 1.8μS	N/A		
CONSTANT VOLTAGE MOD	E							
Oncrating Page	Denre	н	5V~800V			5V~800V		
Operating Range	Range	L	5V~80V			5V~80V		
Accuracy of Setting	Range	H,L	±(0.2% of set + 0.2% of f.s)			±(0.2% of set + 0.2% of f.s		
• • • • • • • • • • • • • • • • • • • •	Parallel	TYP	±(0.2% of set + 0.2% of f.s)			±(0.2% of set + 0.2% of f.s		
Resolution	Range	H,L	20mV/2mV			N/A		
CONSTANT POWER MODE								
Operating Range	Denr	Н	17.5W~175W	35W~350W	105W~1050W	210W~2100W		
	Range	L	1.75W~17.5W 0.175W~1.75W	3.5W~35W 0.35W~3.5W	10.5W~105W 1.05W~10.5W	21W~210W 2.1W~21W		
Accuracy of Setting	н,м		±(0.6 % of set + 1.4 % of f.s)			±(5 % of f.s)TYP		
Resolution	н.м.	1	10mW 1mW 0.1mW	10mW 1mW 0.1mW	100mW 10mW 1mW	N/A		
PARALLEL Mode	П, М,	_	Tomw Timw O.Timw	TOTTW TITTW O.THIW	TOOM TOMW TIME	IN/A		
Capacity			875W	1750W	5250W	PEL-3111H with 4 booste		
Capacity			0.30	173011	3230W	units : Max 9.45kW		
SLEW RATE								
Operation Mode	2	_	CC, CR	CC, CR	CC, CR	N/A		
Setting Range (CC mode)	Range	M L	0.14 x N <sup>*10</sup> mA/μs~140mA/μs 0.014 x N <sup>*10</sup> mA/μs~14mA/μs 1.4 x N <sup>*10</sup> μA/μs~1400μA/μs	0.280 x N <sup>*10</sup> mA/µs~280.0mA/µs 0.0280 x N <sup>*10</sup> mA/µs~28.00mA/µs 2.80 x N <sup>*10</sup> µA/µs~2800µA/µs	0.840 x N <sup>*11</sup> mA/µs~840mA/µs 0.0840 x N <sup>*11</sup> mA/µs~84.00mA/µs 0.00840 x N <sup>*11</sup> mA/µs~8.400mA/µs	N/A		
Setting Range	3	н	0.014 x N*10 mA/μs~14mA/μs	0.0280 x N <sup>110</sup> mA/μs~28.00mA/μs	0.0840 x N <sup>"11</sup> mA/μs~84.00mA/μs			
(CR Mode)	Range	М	0.0014 x N <sup>*10</sup> mA/μs~1.4mA/μs	0.00280 x N <sup>*10</sup> mA/μs~2.800mA/μs	0.00840 x N <sup>*11</sup> mA/μs~8.400mA/μs	N/A		
,		L	0.14 x N <sup>*10</sup> μΑ/μs~140μΑ/μs	0.280 x N <sup>*10</sup> μA/μs~280.0μA/μs	0.000840 x N°11mA/μs~0.8400mA/μs			
Accuracy of Setting	Н,М,		±(10 % of set + 25μs)	6	32 A.C.	N/A		
Resolution (Setting Range)	H,M,L		.,,,,,2		50 x N*10 μA 14 x N*10 mA/μs~140mA/μs 5 x N*10 μA	100 x N <sup>*10</sup> μA 28 x N <sup>*10</sup> mA/μs~280mA/μs 10 x N <sup>*10</sup> μA	300 x N <sup>*11</sup> μA 84 x N <sup>*11</sup> mA/μs~840mA/μs 30 x N <sup>*11</sup> μA	
			1.4 x N <sup>150</sup> mA/μs-14 x N <sup>110</sup> mA/μs 0.5 x N <sup>151</sup> μA 140 x N <sup>151</sup> μΔ/μs-1.4 x N <sup>110</sup> mA/μs 50 x N <sup>110</sup> nA 14 x N <sup>151</sup> μΔ/μs-140 x N <sup>110</sup> μΔ/μs 5 x N <sup>110</sup> nA 1.4 x N <sup>110</sup> μΔ/μs-14 x N <sup>110</sup> μΔ/μs 0.5 x N <sup>110</sup> nA 0.5 x N <sup>110</sup> μΔ/μs-1.4 x N <sup>110</sup> μΔ/μs 0.14 x N <sup>110</sup> μΔ/μs-1.4 x N <sup>110</sup> μΔ/μs	2.8 x N <sup>*10</sup> mA/μs~28 x N <sup>*10</sup> mA/μs 1 x N <sup>*10</sup> μA	8.4 x N <sup>-11</sup> mA/µs-84 x N <sup>-11</sup> mA/µs 3 x N <sup>-11</sup> µA 840 x N <sup>-11</sup> µA/µs-8.4 x N <sup>-11</sup> mA/µs 0.3 x N <sup>-11</sup> µA 84 x N <sup>-11</sup> µA/µs-840 x N <sup>-11</sup> µA/µs 30 x N <sup>-11</sup> nA 8.4 x N <sup>-11</sup> µA/µs-84 x N <sup>-11</sup> µA/µs 3 x N <sup>-11</sup> µA/µs-84 x N <sup>-11</sup> µA/µs	N/A		
METER			0.5 x N <sup>-11</sup> μA 140 x N <sup>+12</sup> μA/μs~1.4 x N <sup>+10</sup> mA/μs 50 x N <sup>-10</sup> nA 14 x N <sup>+10</sup> μA/μs~140 x N <sup>+10</sup> μA/μs 5 x N <sup>+10</sup> μA/μs~14 x N <sup>+10</sup> μA/μs 1.4 x N <sup>+10</sup> μA/μs~14 x N <sup>+10</sup> μA/μs 0.5 x N <sup>+10</sup> nA	2.8 x N <sup>-10</sup> mA/μs-28 x N <sup>-10</sup> mA/μs 1 x N <sup>-10</sup> μA 280 x N <sup>-10</sup> μA/μs-2.8 x N <sup>-10</sup> mA/μs 0.1 x N <sup>-10</sup> μA 28 x N <sup>-10</sup> μA/μs-280 x N <sup>-10</sup> μA/μs 10 x N <sup>-10</sup> μA/μs-28 x N <sup>-10</sup> μA/μs 1.8 x N <sup>-10</sup> μA/μs-28 x N <sup>-10</sup> μA/μs 1 x N <sup>-10</sup> μA	8.4 x N <sup>-11</sup> mA/µs-84 x N <sup>-11</sup> mA/µs 3 x N <sup>-11</sup> µA 840 x N <sup>-11</sup> µA/µs-8.4 x N <sup>-11</sup> mA/µs 0.3 x N <sup>-11</sup> µA 84 x N <sup>-11</sup> µA/µs-840 x N <sup>-11</sup> µA/µs 30 x N <sup>-11</sup> nA 8.4 x N <sup>-11</sup> µA/µs-84 x N <sup>-11</sup> µA/µs 3 x N <sup>-11</sup> µA/µs-84 x N <sup>-11</sup> µA/µs	N/A		
Voltmeter	Accuracy		0.5 x N <sup>-11</sup> $\mu$ A 140 x N <sup>-13</sup> $\mu$ A/ $\mu$ s - 1.4 x N <sup>-10</sup> $\mu$ A/ $\mu$ s 50 x N <sup>-10</sup> $\mu$ A 14 x N <sup>-13</sup> $\mu$ A/ $\mu$ s - 140 x N <sup>-10</sup> $\mu$ A/ $\mu$ s 5 x N <sup>-10</sup> $\mu$ A 1.4 x N <sup>-13</sup> $\mu$ A/ $\mu$ s - 14 x N <sup>-10</sup> $\mu$ A/ $\mu$ s 0.5 x N <sup>-10</sup> $\mu$ A 0.14 x N <sup>-13</sup> $\mu$ A/ $\mu$ s - 1.4 x N <sup>-10</sup> $\mu$ A/ $\mu$ s $\frac{1}{2}(0.1\% \text{ of } \text{rdg} + 0.1\% \text{ of } \text{f.s})$	2.8 x N <sup>-10</sup> mA/μs-28 x N <sup>-10</sup> mA/μs 1 x N <sup>-10</sup> μA 280 x N <sup>-10</sup> μA/μs-2.8 x N <sup>-10</sup> mA/μs 0.1 x N <sup>-10</sup> μA 28 x N <sup>-10</sup> μA/μs-280 x N <sup>-10</sup> μA/μs 10 x N <sup>-10</sup> μA 2.8 x N <sup>-10</sup> μA/μs-28 x N <sup>-10</sup> μA/μs 1 x N <sup>-10</sup> pA 0.28 x N <sup>-10</sup> μA/μs-2.8 x N <sup>-10</sup> μA/μs	8.4 x N <sup>-11</sup> mA/µs-84 x N <sup>-11</sup> mA/µs 3 x N <sup>-11</sup> µA 840 x N <sup>-11</sup> µA/µs-8.4 x N <sup>-11</sup> mA/µs 0.3 x N <sup>-11</sup> µA 84 x N <sup>-11</sup> µA/µs-840 x N <sup>-11</sup> µA/µs 30 x N <sup>-11</sup> nA 8.4 x N <sup>-11</sup> µA/µs-84 x N <sup>-11</sup> µA/µs 3 x N <sup>-11</sup> µA/µs-84 x N <sup>-11</sup> µA/µs	±(0.1 % of rdg + 0.1 % of f.s)T		
Voltmeter Ammeter	Accuracy		0.5 x N <sup></sup> μA 140 x N <sup></sup> βμΔμμs-1.4 x N <sup></sup> θ mA/μs 50 x N <sup></sup> βηΑ 14 x N <sup></sup> βμΛμs-140 x N <sup></sup> θμΛμs 5 x N πηΛ 1.4 x N <sup></sup> βμΛμs-14 x N <sup></sup> θμΛμs 0.5 x N <sup></sup> ηΛ 0.14 x N <sup></sup> βμΛμs-1.4 x N <sup></sup> θμΛμs ±(0.1 % of rdg + 0.1 % of f.s) ±(0.2 % of rdg + 0.3 % of f.s)	2.8 x N <sup>-10</sup> mA/μs-28 x N <sup>-10</sup> mA/μs 1 x N <sup>-10</sup> μA 280 x N <sup>-10</sup> μA/μs-2.8 x N <sup>-10</sup> mA/μs 0.1 x N <sup>-10</sup> μA 28 x N <sup>-10</sup> μA/μs-280 x N <sup>-10</sup> μA/μs 10 x N <sup>-10</sup> μA 2.8 x N <sup>-10</sup> μA/μs-28 x N <sup>-10</sup> μA/μs 1 x N <sup>-10</sup> pA 0.28 x N <sup>-10</sup> μA/μs-2.8 x N <sup>-10</sup> μA/μs	8.4 x N <sup>-11</sup> mA/µs-84 x N <sup>-11</sup> mA/µs 3 x N <sup>-11</sup> µA 840 x N <sup>-11</sup> µA/µs-8.4 x N <sup>-11</sup> mA/µs 0.3 x N <sup>-11</sup> µA 84 x N <sup>-11</sup> µA/µs-840 x N <sup>-11</sup> µA/µs 30 x N <sup>-11</sup> nA 8.4 x N <sup>-11</sup> µA/µs-84 x N <sup>-11</sup> µA/µs 3 x N <sup>-11</sup> µA/µs-84 x N <sup>-11</sup> µA/µs	±(0.1 % of rdg + 0.1 % of f.s)T N/A		
Voltmeter Ammeter Ammeter(Parallel Operation)			0.5 x N <sup>-11</sup> $\mu$ A 140 x N <sup>-13</sup> $\mu$ A/ $\mu$ s - 1.4 x N <sup>-10</sup> $\mu$ A/ $\mu$ s 50 x N <sup>-10</sup> $\mu$ A 14 x N <sup>-13</sup> $\mu$ A/ $\mu$ s - 140 x N <sup>-10</sup> $\mu$ A/ $\mu$ s 5 x N <sup>-10</sup> $\mu$ A 1.4 x N <sup>-13</sup> $\mu$ A/ $\mu$ s - 14 x N <sup>-10</sup> $\mu$ A/ $\mu$ s 0.5 x N <sup>-10</sup> $\mu$ A 0.14 x N <sup>-13</sup> $\mu$ A/ $\mu$ s - 1.4 x N <sup>-10</sup> $\mu$ A/ $\mu$ s $\frac{1}{2}(0.1\% \text{ of } \text{rdg} + 0.1\% \text{ of } \text{f.s})$	2.8 x N <sup>-10</sup> mA/μs-28 x N <sup>-10</sup> mA/μs 1 x N <sup>-10</sup> μA 280 x N <sup>-10</sup> μA/μs-2.8 x N <sup>-10</sup> mA/μs 0.1 x N <sup>-10</sup> μA 28 x N <sup>-10</sup> μA/μs-280 x N <sup>-10</sup> μA/μs 10 x N <sup>-10</sup> μA 2.8 x N <sup>-10</sup> μA/μs-28 x N <sup>-10</sup> μA/μs 1 x N <sup>-10</sup> pA 0.28 x N <sup>-10</sup> μA/μs-2.8 x N <sup>-10</sup> μA/μs	8.4 x N <sup>-11</sup> mA/µs-84 x N <sup>-11</sup> mA/µs 3 x N <sup>-11</sup> µA 840 x N <sup>-11</sup> µA/µs-8.4 x N <sup>-11</sup> mA/µs 0.3 x N <sup>-11</sup> µA 84 x N <sup>-11</sup> µA/µs-840 x N <sup>-11</sup> µA/µs 30 x N <sup>-11</sup> nA 8.4 x N <sup>-11</sup> µA/µs-84 x N <sup>-11</sup> µA/µs 3 x N <sup>-11</sup> µA/µs-84 x N <sup>-11</sup> µA/µs	±(0.1 % of rdg + 0.1 % of f.s)Ti		
Voltmeter Ammeter Ammeter(Parallel Operation) DYNAMIC MODE	Accuracy		$\begin{array}{l} 0.5 \times N^{-1} \mu A \\ 140 \times N^{-1} \mu A \\ 140 \times N^{-1} \mu A \\ 140 \times N^{-1} \mu A \\ 141 \times N^{-1} \mu A \\ 141 \times N^{-1} \mu A \\ 142 \times N^{-1} \mu A \\ 143 \times N^{-1} \mu A \\ 143 \times N^{-1} \mu A \\ 143 \times N^{-1} \mu A \\ 144 \times $	2.8 x N <sup>-10</sup> mA/μs-28 x N <sup>-10</sup> mA/μs 1 x N <sup>-10</sup> μA 280 x N <sup>-10</sup> μA/μs-2.8 x N <sup>-10</sup> mA/μs 0.1 x N <sup>-10</sup> μA 28 x N <sup>-10</sup> μA/μs-280 x N <sup>-10</sup> μA/μs 10 x N <sup>-10</sup> μA 2.8 x N <sup>-10</sup> μA/μs-28 x N <sup>-10</sup> μA/μs 1 x N <sup>-10</sup> pA 0.28 x N <sup>-10</sup> μA/μs-2.8 x N <sup>-10</sup> μA/μs	8.4 x N <sup>-11</sup> mA/µs-84 x N <sup>-11</sup> mA/µs 3 x N <sup>-11</sup> µA 840 x N <sup>-11</sup> µA/µs-8.4 x N <sup>-11</sup> mA/µs 0.3 x N <sup>-11</sup> µA 84 x N <sup>-11</sup> µA/µs-840 x N <sup>-11</sup> µA/µs 30 x N <sup>-11</sup> nA 8.4 x N <sup>-11</sup> µA/µs-84 x N <sup>-11</sup> µA/µs 3 x N <sup>-11</sup> µA/µs-84 x N <sup>-11</sup> µA/µs	±(0.1 % of rdg + 0.1 % of f.s)T\ N/A ±(1.2% of rdg +1.1% of f.s.)T\		
Voltmeter Ammeter Ammeter(Parallel Operation)	Accuracy		0.5 x N <sup></sup> μA 140 x N <sup></sup> βμΔμμs-1.4 x N <sup></sup> θ mA/μs 50 x N <sup></sup> βηΑ 14 x N <sup></sup> βμΛμs-140 x N <sup></sup> θμΛμs 5 x N πηΛ 1.4 x N <sup></sup> βμΛμs-14 x N <sup></sup> θμΛμs 0.5 x N <sup></sup> ηΛ 0.14 x N <sup></sup> βμΛμs-1.4 x N <sup></sup> θμΛμs ±(0.1 % of rdg + 0.1 % of f.s) ±(0.2 % of rdg + 0.3 % of f.s)	2.8 x N <sup>-10</sup> mA/μs-28 x N <sup>-10</sup> mA/μs 1 x N <sup>-10</sup> μA 280 x N <sup>-10</sup> μA/μs-2.8 x N <sup>-10</sup> mA/μs 0.1 x N <sup>-10</sup> μA 28 x N <sup>-10</sup> μA/μs-280 x N <sup>-10</sup> μA/μs 10 x N <sup>-10</sup> μA 2.8 x N <sup>-10</sup> μA/μs-28 x N <sup>-10</sup> μA/μs 1 x N <sup>-10</sup> pA 0.28 x N <sup>-10</sup> μA/μs-2.8 x N <sup>-10</sup> μA/μs	8.4 x N <sup>-11</sup> mA/µs-84 x N <sup>-11</sup> mA/µs 3 x N <sup>-11</sup> µA 840 x N <sup>-11</sup> µA/µs-8.4 x N <sup>-11</sup> mA/µs 0.3 x N <sup>-11</sup> µA 84 x N <sup>-11</sup> µA/µs-840 x N <sup>-11</sup> µA/µs 30 x N <sup>-11</sup> nA 8.4 x N <sup>-11</sup> µA/µs-84 x N <sup>-11</sup> µA/µs 3 x N <sup>-11</sup> µA/µs-84 x N <sup>-11</sup> µA/µs	±(0.1 % of rdg + 0.1 % of f.s)Ti		
Voltmeter Ammeter Ammeter(Parallel Operation) DYNAMIC MODE Operation Mode T1 & T2	Accuracy		0.5 x N <sup>-1</sup> μA 140 x N <sup>-1</sup> μAμμs-1.4 x N <sup>-10</sup> mA/μs 50 x N <sup>-10</sup> nA 14 x N <sup>-10</sup> μA/μs-140 x N <sup>-10</sup> μA/μs 5 x N <sup>-10</sup> nA 1.4 x N <sup>-10</sup> μA/μs-14 x N <sup>-10</sup> μA/μs 0.5 x N <sup>-10</sup> nA 0.14 x N <sup>-10</sup> μA/μs-1.4 x N <sup>-10</sup> μA/μs ±(0.1 % of rdg + 0.1 % of f.s) ±(0.2 % of rdg + 0.3 % of f.s) ±(1.2% of rdg + 1.1% of f.s.) CC, CR, CP 0.025 ms~10ms/Res: 1 μs; 10	2.8 x N <sup>-10</sup> mA/μs-28 x N <sup>-10</sup> mA/μs 1 x N <sup>-10</sup> μA 280 x N <sup>-10</sup> μA/μs-2.8 x N <sup>-10</sup> mA/μs 0.1 x N <sup>-10</sup> μA 28 x N <sup>-10</sup> μA/μs-280 x N <sup>-10</sup> μA/μs 10 x N <sup>-10</sup> μA 2.8 x N <sup>-10</sup> μA/μs-28 x N <sup>-10</sup> μA/μs 1 x N <sup>-10</sup> pA 0.28 x N <sup>-10</sup> μA/μs-2.8 x N <sup>-10</sup> μA/μs	8.4 x N <sup>-11</sup> mA/µs-84 x N <sup>-11</sup> mA/µs 3 x N <sup>-11</sup> µA 840 x N <sup>-11</sup> µA/µs-8.4 x N <sup>-11</sup> mA/µs 0.3 x N <sup>-11</sup> µA 84 x N <sup>-11</sup> µA/µs-840 x N <sup>-11</sup> µA/µs 30 x N <sup>-11</sup> nA 8.4 x N <sup>-11</sup> µA/µs-84 x N <sup>-11</sup> µA/µs 3 x N <sup>-11</sup> µA/µs-84 x N <sup>-11</sup> µA/µs	±(0.1 % of rdg + 0.1 % of f.s)T N/A ±(1.2% of rdg +1.1% of f.s.)TN N/A N/A		
Voltmeter Ammeter Ammeter(Parallel Operation) DYNAMIC MODE Operation Mode T1 & T2 Accuracy Slew Rate	Accuracy	н	0.5 x N $^{10}\mu$ A 140 x N $^{10}\mu$ A μps -1.4 x N $^{10}\mu$ A μps 50 x N $^{10}\mu$ A μps -1.4 x N $^{10}\mu$ A μps 50 x N $^{10}\mu$ A μps -1.4 x N	2.8 x N <sup>-10</sup> mA/μs-28 x N <sup>-10</sup> mA/μs 1 x N <sup>-10</sup> μA 280 x N <sup>-10</sup> μA/μs-2.8 x N <sup>-10</sup> mA/μs 0.1 x N <sup>-10</sup> μA 28 x N <sup>-10</sup> μA/μs-280 x N <sup>-10</sup> μA/μs 10 x N <sup>-10</sup> μA/μs-280 x N <sup>-10</sup> μA/μs 10 x N <sup>-10</sup> μA/μs-28 x N <sup>-10</sup> μA/μs 2.8 x N <sup>-10</sup> μA/μs-2.8 x N <sup>-10</sup> μA/μs 0.28 x N <sup>-10</sup> μA/μs-2.8 x N <sup>-10</sup> μA/μs 0.28 x N <sup>-10</sup> μA/μs-2.8 x N <sup>-10</sup> μA/μs 0.28 x N <sup>-10</sup> μA/μs-2.8 x N <sup>-10</sup> μA/μs 0.28 x N <sup>-10</sup> μA/μs-2.8 x N <sup>-10</sup> μA/μs	8.4 x N <sup>-11</sup> mA/μs-84 x N <sup>-11</sup> mA/μs 3 x N <sup>-11</sup> μA 480 x N <sup>-11</sup> μA/μs-8.4 x N <sup>-11</sup> mA/μs 0.3 x N <sup>-11</sup> μA 84 x N <sup>-11</sup> μA/μs-840 x N <sup>-11</sup> μA/μs 30 x N <sup>-11</sup> nA 8.4 x N <sup>-11</sup> μA/μs-84 x N <sup>-11</sup> μA/μs 3 x N <sup>-11</sup> nA 0.84 x N <sup>-11</sup> μA/μs-84 x N <sup>-11</sup> μA/μs	±(0.1 % of rdg + 0.1 % of f.s)T N/A ±(1.2% of rdg +1.1% of f.s.)TO N/A N/A ± 100ppm of setting		
Voltmeter Ammeter Ammeter(Parallel Operation) DYNAMIC MODE Operation Mode T1 & T2 Accuracy Slew Rate	Accuracy	Н	0.5 x N <sup>-1</sup> μA 140 x N <sup>-1</sup> μAμμs-1.4 x N <sup>-10</sup> mA/μs 50 x N <sup>-10</sup> nA 14 x N <sup>-10</sup> μA/μs-140 x N <sup>-10</sup> μA/μs 5.5 x N <sup>-10</sup> nA 1.4 x N <sup>-10</sup> μA/μs-14 x N <sup>-10</sup> μA/μs 0.5 x N <sup>-10</sup> nA 0.14 x N <sup>-10</sup> μA/μs-1.4 x N <sup>-10</sup> μA/μs  ±(0.1 % of rdg + 0.1 % of f.s) ±(0.2 % of rdg + 0.3 % of f.s) ±(1.2% of rdg + 1.1% of f.s.)  CC, CR, CP 0.025 ms-10 ms/Res: 1 μs; 10 ± 100 ppm of setting 0.140 mA/μs~14.00 mA/μs 0.014 mA/μs~14.00 mA/μs	2.8 x N <sup>-10</sup> mA/μs-28 x N <sup>-10</sup> mA/μs 1 x N <sup>-10</sup> μA 280 x N <sup>-10</sup> μA/μs-2.8 x N <sup>-10</sup> mA/μs 0.1 x N <sup>-10</sup> μA 28 x N <sup>-10</sup> μA/μs-280 x N <sup>-10</sup> μA/μs 10 x N <sup>-10</sup> μA/μs-280 x N <sup>-10</sup> μA/μs 10 x N <sup>-10</sup> μA/μs-28 x N <sup>-10</sup> μA/μs 10 x N <sup>-10</sup> μA 0.28 x N <sup>-10</sup> μA/μs-2.8 x N <sup>-10</sup> μA/μs 0.28 x N <sup>-10</sup> μA/μs-2.8 x N <sup>-10</sup> μA/μs 0.28 x N <sup>-10</sup> μA/μs-2.8 x N <sup>-10</sup> μA/μs 0.28 x N <sup>-10</sup> μA/μs-2.8 x N <sup>-10</sup> μA/μs 0.28 mA/μs-28.00mA/μs 0.028mA/μs-28.00mA/μs	8.4 x N <sup>*1</sup> mA/μs-84 x N <sup>*1</sup> mA/μs 3 x N <sup>*1</sup> μA 480 x N <sup>*1</sup> μA/μs-8.4 x N <sup>*1</sup> mA/μs 0.3 x N <sup>*1</sup> μA 84 x N <sup>*1</sup> μA/μs-840 x N <sup>*1</sup> μA/μs 30 x N <sup>*1</sup> nA 8.4 x N <sup>*1</sup> μA/μs-84 x N <sup>*1</sup> μA/μs 3 x N <sup>*1</sup> nA 0.84 x N <sup>*1</sup> μA/μs-84 x N <sup>*1</sup> μA/μs	±(0.1 % of rdg + 0.1 % of f.s)T N/A ±(1.2% of rdg +1.1% of f.s.)T N/A N/A ± 100ppm of setting		
Voltmeter Ammeter Ammeter(Parallel Operation) DYNAMIC MODE Operation Mode T1 & T2 Accuracy Slew Rate (CC Mode)	Accuracy	H M L	0.5 x N <sup>-1</sup> μA 140 x N <sup>-1</sup> μA μs-1.4 x N <sup>-10</sup> mA/μs 50 x N <sup>-10</sup> nA 14 x N <sup>-10</sup> μA/μs-140 x N <sup>-10</sup> μA/μs 5 x N nA 1.4 x N <sup>-10</sup> μA/μs-14 x N <sup>-10</sup> μA/μs 0.5 x N <sup>-10</sup> nA 0.14 x N <sup>-10</sup> μA/μs-1.4 x N <sup>-10</sup> μA/μs  ±(0.1 % of rdg + 0.1 % of f.s) ±(0.2 % of rdg + 0.3 % of f.s) ±(1.2% of rdg + 1.1% of f.s.)  CC, CR, CP 0.025 ms-10 ms/Res : 1 μs ; 10 ± 100 ppm of setting 0.140 mA/μs~14.00 mA/μs 0.014 mA/μs~140.00 μA/μs 1.400 μA/μs~1400.0 μA/μs	2.8 x N <sup>-10</sup> mA/μs-28 x N <sup>-10</sup> mA/μs 1 x N <sup>-10</sup> μA 280 x N <sup>-10</sup> μA/μs-2.8 x N <sup>-10</sup> mA/μs 0.1 x N <sup>-10</sup> μA 28 x N <sup>-10</sup> μA/μs-280 x N <sup>-10</sup> μA/μs 10 x N <sup>-10</sup> μA/μs-280 x N <sup>-10</sup> μA/μs 10 x N <sup>-10</sup> μA/μs-28 x N <sup>-10</sup> μA/μs 2.8 x N <sup>-10</sup> μA/μs-2.8 x N <sup>-10</sup> μA/μs 0.28 x N <sup>-10</sup> μA/μs-2.8 x N <sup>-10</sup> μA/μs 0.28 x N <sup>-10</sup> μA/μs-2.8 x N <sup>-10</sup> μA/μs 0.28 x N <sup>-10</sup> μA/μs-2.8 x N <sup>-10</sup> μA/μs 0.28 mA/μs-28.00mA/μs 0.028mA/μs-28.00mA/μs 2.800μA/μs-2800μA/μs	8.4 x N <sup>*1</sup> mA/μs-84 x N <sup>*1</sup> mA/μs 3 x N <sup>*1</sup> μA 480 x N <sup>*1</sup> μA/μs-8.4 x N <sup>*1</sup> mA/μs 0.3 x N <sup>*1</sup> μA 84 x N <sup>*1</sup> μA/μs-840 x N <sup>*1</sup> μA/μs 30 x N <sup>*1</sup> nA 8.4 x N <sup>*1</sup> μA/μs-84 x N <sup>*1</sup> μA/μs 3 x N <sup>*1</sup> nA 0.84 x N <sup>*1</sup> μA/μs-8.4 x N <sup>*1</sup> μA/μs 0.84 x N <sup>*1</sup> μA/μs-8.4 x N <sup>*1</sup> μA/μs 0.84 x N <sup>*1</sup> μA/μs-8.4 x N <sup>*1</sup> μA/μs	±(0.1 % of rdg + 0.1 % of f.s)T N/A ±(1.2% of rdg +1.1% of f.s.)TO N/A N/A ± 100ppm of setting		
Voltmeter Ammeter Ammeter(Parallel Operation) DYNAMIC MODE Operation Mode T1 & T2 Accuracy Slew Rate (CC Mode)	Accuracy Accuracy	H M L	0.5 x N <sup></sup> μA 140 x N <sup></sup> βμΔμμs-1.4 x N <sup></sup> θ mA/μs 50 x N <sup></sup> θ nA 14 x N <sup></sup> βμΔμμs-140 x N <sup></sup> θμΔμμs 5. x N <sup></sup> θ nA 1.4 x N <sup></sup> βμΔμμs-14 x N <sup></sup> θμΔμμs 0.5 x N <sup></sup> θ nA 0.14 x N <sup></sup> θμΔμμs-1.4 x N <sup></sup> θμΔμμs ±(0.1 % of rdg + 0.1 % of f.s.) ±(0.2 % of rdg + 0.3 % of f.s.) ±(1.2% of rdg + 1.1% of f.s.) CC, CR, CP 0.025 ms~10 ms/Res: 1 μs; 10 ± 100 ppm of setting 0.14 mmA/μs~14.00 mA/μs 0.014 mA/μs~140.0 mA/μs 1.400 μA/μs~140.0 mA/μs	2.8 x N <sup>-10</sup> mA/μs-28 x N <sup>-10</sup> mA/μs 1 x N <sup>-10</sup> μA 280 x N <sup>-10</sup> μA/μs-2.8 x N <sup>-10</sup> mA/μs 0.1 x N <sup>-10</sup> μA 280 x N <sup>-10</sup> μA/μs-280 x N <sup>-10</sup> μA/μs 10 x N <sup>-10</sup> μA 10 x N <sup>-10</sup> μA 2.8 x N <sup>-10</sup> μA/μs-28 x N <sup>-10</sup> μA/μs 1 x N <sup>-10</sup> ρA 0.28 x N <sup>-10</sup> μA/μs-2.8 x N <sup>-10</sup> μA/μs 0.28 x N <sup>-10</sup> μA/μs-2.8 x N <sup>-10</sup> μA/μs 0.28 x N <sup>-10</sup> μA/μs-2.8 x N <sup>-10</sup> μA/μs 0.28 x N <sup>-10</sup> μA/μs-2.8 x N <sup>-10</sup> μA/μs 0.28 x N <sup>-10</sup> μA/μs-2.8 x N <sup>-10</sup> μA/μs 0.28 x N <sup>-10</sup> μA/μs-2.8 x N <sup>-10</sup> μA/μs 0.28 x N <sup>-10</sup> μA/μs-2.8 x N <sup>-10</sup> μA/μs 0.028 mA/μs-28.00mA/μs 0.028 mA/μs-28.00mA/μs 0.028 mA/μs-28.00mA/μs	8.4 x N <sup>-1</sup> mA/μs –84 x N <sup>-1</sup> mA/μs 3 x N <sup>-1</sup> μA 840 x N <sup>-1</sup> μA/μs –8.4 x N <sup>-1</sup> mA/μs 0.3 x N <sup>-1</sup> μA/μs –8.4 x N <sup>-1</sup> μA/μs 30 x N <sup>-1</sup> μA/μs –840 x N <sup>-1</sup> μA/μs 30 x N <sup>-1</sup> μA/μs –84 x N <sup>-1</sup> μA/μs 3 x N <sup>-1</sup> μA/μs –8.4 x N <sup>-1</sup> μA/μs 3 x N <sup>-1</sup> μA/μs –8.4 x N <sup>-1</sup> μA/μs 0.84 x N <sup>-1</sup> μA/μs –8.4 x N <sup>-1</sup> μA/μs 0.84 x N <sup>-1</sup> μA/μs –8.4 x N <sup>-1</sup> μA/μs 0.084mA/μs –8.400mA/μs 0.084mA/μs –8.400mA/μs 0.084mA/μs –8.400mA/μs	±(0.1 % of rdg + 0.1 % of f.s)T N/A ±(1.2% of rdg +1.1% of f.s.)T N/A N/A ± 100ppm of setting N/A		
Voltmeter Ammeter Ammeter(Parallel Operation) DYNAMIC MODE Operation Mode T1 & T2 Accuracy Slew Rate (CC Mode)	Accuracy Accuracy	H M L H	0.5 x N <sup></sup> μA 140 x N <sup></sup> πA <sup>-</sup> μAμs-1.4 x N <sup></sup> πα/μs 50 x N <sup></sup> πA <sup>-</sup> πA <sup>-</sup> μs-140 x N <sup></sup> μμ/μs 50 x N <sup></sup> πA <sup>-</sup> πα 140 x N <sup></sup> μμ/μs 1.4 x N <sup></sup> πμ μμs-14 x N <sup></sup> μμ/μs 0.5 x N <sup></sup> πA 0.14 x N <sup></sup> πμ μ/μs-1.4 x N <sup></sup> μμ/μs ± (0.1 % of rdg + 0.1 % of f.s) ± (0.2 % of rdg + 0.3 % of f.s) ± (1.2% of rdg + 1.1% of f.s.) CC, CR, CP 0.025 ms~10 ms/Res : 1 μs ; 10 ± 100 ppm of setting 0.14 mA/μs~14.00 mA/μs 0.014 mA/μs~140.0 mA/μs 0.014 mA/μs~140.0 mA/μs 0.014 mA/μs~14.00 mA/μs	2.8 x N <sup>-10</sup> mA/μs-28 x N <sup>-10</sup> mA/μs 1 x N <sup>-10</sup> μA 280 x N <sup>-10</sup> μA/μs-2.8 x N <sup>-10</sup> mA/μs 0.1 x N <sup>-10</sup> μA 280 x N <sup>-10</sup> μA/μs-280 x N <sup>-10</sup> μA/μs 10 x N <sup>-10</sup> μA 28 x N <sup>-10</sup> μA/μs-28 x N <sup>-10</sup> μA/μs 1 x N <sup>-10</sup> pA 0.28 x N <sup>-10</sup> μA/μs-28 x N <sup>-10</sup> μA/μs 1 x N <sup>-10</sup> pA 0.28 x N <sup>-10</sup> μA/μs-2.8 x N <sup>-10</sup> μA/μs 0.28 x N <sup>-10</sup> μA/μs-2.8 x N <sup>-10</sup> μA/μs 0.28 x N <sup>-10</sup> μA/μs-2.8 x N <sup>-10</sup> μA/μs 0.28 x N <sup>-10</sup> μA/μs-2.8 x N <sup>-10</sup> μA/μs 0.28 x N <sup>-10</sup> μA/μs-2.8 x N <sup>-10</sup> μA/μs 0.28 x N <sup>-10</sup> μA/μs-2.8 x N <sup>-10</sup> μA/μs 0.28 x N <sup>-10</sup> μA/μs-2.8 x N <sup>-10</sup> μA/μs 2.80μA/μs-28.00mA/μs 2.80μA/μs-28.00mA/μs 2.8μA/μs-2.800mA/μs	8.4 x N <sup>-1</sup> mA/μs –84 x N <sup>-1</sup> mA/μs 3 x N <sup>-1</sup> μA 840 x N <sup>-1</sup> μA/μs –8.4 x N <sup>-1</sup> mA/μs 0.3 x N <sup>-1</sup> μA 84 x N <sup>-1</sup> μA/μs –840 x N <sup>-1</sup> μA/μs 30 x N <sup>-1</sup> μA/μs –84 x N <sup>-1</sup> μA/μs 3 x N <sup>-1</sup> μA/μs –8.4 x N <sup>-1</sup> μA/μs 3 x N <sup>-1</sup> μA/μs –8.4 x N <sup>-1</sup> μA/μs 0.84 x N <sup>-1</sup> μA/μs –8.4 x N <sup>-1</sup> μA/μs 0.84 x N <sup>-1</sup> μA/μs –8.4 x N <sup>-1</sup> μA/μs 0.084 mA/μs –8.400 mA/μs 0.084 mA/μs –8.400 mA/μs 0.084 mA/μs –8.400 mA/μs 0.0084 mA/μs –8.400 mA/μs	±(0.1 % of rdg + 0.1 % of f.s)T N/A ±(1.2% of rdg + 1.1% of f.s.)T N/A N/A ± 100ppm of setting N/A		
Voltmeter Ammeter Ammeter(Parallel Operation) DYNAMIC MODE Operation Mode T1 & T2 Accuracy Slew Rate (CC Mode)	Accuracy Accuracy	H M L H	0.5 × N <sup></sup> μA 140 × N <sup></sup> μA μs-1.4 × N <sup></sup> 0mA/μs 50 × N <sup></sup> ηA 14 × N <sup></sup> ηΔ/μs-140 × N <sup></sup> 0μA/μs 50 × N <sup></sup> ηA 14 × N <sup></sup> ηΔ/μs-14 × N <sup></sup> 0μA/μs 5.5 × N <sup></sup> ηA 1.4 × N <sup></sup> ημΑ/μs-14 × N <sup></sup> 0μA/μs 0.5 × N <sup></sup> ηA 0.14 × N <sup></sup> 0μA/μs-1.4 × N <sup></sup> 0μA/μs ±(0.1 % of rdg + 0.1 % of f.s.) ±(0.2 % of rdg + 0.3 % of f.s) ±(0.2 % of rdg + 1.1% of f.s.)  CC, CR, CP 0.025ms-10ms/Res: 1μs; 10 ± 100ppm of setting 0.140mA/μs~140.0mA/μs 0.014mA/μs~140.0mA/μs 1.400μA/μs~1400.0μA/μs 0.014mA/μs~14000mA/μs 0.0014mA/μs~1.4000mA/μs 0.1400μA/μs~14000mA/μs 0.1400μA/μs~14000mA/μs 0.1400μA/μs~14000mA/μs 0.1400μA/μs~14000mA/μs 0.1400μA/μs~14000mA/μs	2.8 x N <sup>-10</sup> mA/μs-28 x N <sup>-10</sup> mA/μs 1 x N <sup>-10</sup> μA 280 x N <sup>-10</sup> μA/μs-2.8 x N <sup>-10</sup> mA/μs 0.1 x N <sup>-10</sup> μA 28 x N <sup>-10</sup> μA/μs-280 x N <sup>-10</sup> μA/μs 10 x N <sup>-10</sup> μA/μs-280 x N <sup>-10</sup> μA/μs 10 x N <sup>-10</sup> μA/μs-28 x N <sup>-10</sup> μA/μs 10 x N <sup>-10</sup> μA/μs-2.8 x N <sup>-10</sup> μA/μs 2.8 x N <sup>-10</sup> μA/μs-2.8 x N <sup>-10</sup> μA/μs 0.28 x N <sup>-10</sup> μA/μs-2.8 x N <sup>-10</sup> μA/μs 0.28 x N <sup>-10</sup> μA/μs-2.8 x N <sup>-10</sup> μA/μs 0.28 mA/μs-2.8 0.0 mA/μs 0.28 mA/μs-2.8 0.0 mA/μs 0.28 mA/μs-2.8 0.0 mA/μs 0.28 mA/μs-2.8 0.0 mA/μs 0.28 μA/μs-2.8 0.0 mA/μs 0.28 μA/μs-2.8 0.0 mA/μs 0.28 μA/μs-2.8 0.0 mA/μs 0.28 μA/μs-2.8 0.0 μA/μs	8.4 x N <sup>-1</sup> mA/μs~84 x N <sup>-1</sup> mA/μs 3 x N <sup>-1</sup> μA 40 x N <sup>-1</sup> μA/μs~8.4 x N <sup>-1</sup> mA/μs 0.3 x N <sup>-1</sup> μA/μs~8.40 x N <sup>-1</sup> μA/μs 30 x N <sup>-1</sup> nA 8.4 x N <sup>-1</sup> μA/μs~840 x N <sup>-1</sup> μA/μs 30 x N <sup>-1</sup> nA 8.4 x N <sup>-1</sup> μA/μs~84 x N <sup>-1</sup> μA/μs 3 x N <sup>-1</sup> nA 0.84 x N <sup>-1</sup> μA/μs~8.4 x N <sup>-1</sup> μA/μs 0.84 x N <sup>-1</sup> μA/μs~8.4 x N <sup>-1</sup> μA/μs 0.084 mA/μs~8.4.00mA/μs 0.0084 mA/μs~8.4.00mA/μs 0.0084 mA/μs~8.4.00mA/μs 0.0084 mA/μs~8.400mA/μs 0.0084 mA/μs~8.400mA/μs 0.0084 mA/μs~8.800mA/μs 0.0084 mA/μs~8.800mA/μs 0.0084 mA/μs~8.800mA/μs	±(0.1 % of rdg + 0.1 % of f.s)T N/A ±(1.2% of rdg +1.1% of f.s.)T N/A N/A ± 100ppm of setting N/A N/A N/A +0.4%F.S.		
Voltmeter Ammeter Ammeter(Parallel Operation) DYNAMIC MODE Operation Mode T1 & T2 Accuracy Slew Rate (CC Mode) Slew Rate (CR Mode)  Current Accuracy PROTECTION FUNCTION Functions GENERAL	Accuracy Accuracy	H M L H	0.5 × N <sup></sup> μA 140 × N <sup></sup> μA μs-1.4 × N <sup></sup> πα/μs 50 × N <sup></sup> πα 14 × N <sup></sup> πα/μs-140 × N <sup></sup> πμ/μs 50 × N <sup></sup> πα 14 × N <sup></sup> πα/μs-14 × N <sup></sup> πμ/μs 1.4 × N <sup></sup> πα/μs-14 × N <sup></sup> πμ/μs 0.5 × N <sup></sup> πα 0.14 × N <sup></sup> πα/μs-14 × N <sup></sup> πμ/μs ±(0.1 % of rdg + 0.1 % of f.s) ±(0.2 % of rdg + 0.3 % of f.s) ±(1.2% of rdg + 1.1% of f.s.)  CC, CR, CP 0.025 ms-10 ms/Res : 1 μs ; 10 ± 100 ppm of setting 0.140 mA/μs-14.00 mA/μs 0.014 mA/μs-14.00 mA/μs 1.400 μA/μs-140.00 μA/μs 0.014 mA/μs-140.00 mA/μs 0.014 mA/μs-140.00 mA/μs 0.1400 μA/μs-140.00 mA/μs 0.1400 μA/μs-140.00 μA/μs ±0.4%F.S.  Overvoltage protection (OVP) Undervoltage protection (UVF	2.8 x N <sup>-10</sup> mA/μs-28 x N <sup>-10</sup> mA/μs 1 x N <sup>-10</sup> μA 280 x N <sup>-10</sup> μA/μs-2.8 x N <sup>-10</sup> mA/μs 0.1 x N <sup>-10</sup> μA 280 x N <sup>-10</sup> μA/μs-280 x N <sup>-10</sup> μA/μs 10 x N <sup>-10</sup> μA 10 x N <sup>-10</sup> μA 2.8 x N <sup>-10</sup> μA/μs-28 x N <sup>-10</sup> μA/μs 1 x N <sup>-10</sup> ρA 0.28 x N <sup>-10</sup> μA/μs-28 x N <sup>-10</sup> μA/μs 1 x N <sup>-10</sup> ρA 0.28 x N <sup>-10</sup> μA/μs-2.8 x N <sup>-10</sup> μA/μs 0.28 x N <sup>-10</sup> μA/μs-2.8 x N <sup>-10</sup> μA/μs 0.28 x N <sup>-10</sup> μA/μs-2.8 x N <sup>-10</sup> μA/μs 0.28 mA/μs-28.00mA/μs 2.800μA/μs-28.00mA/μs 2.800μA/μs-28.00mA/μs 0.280μA/μs-28.00mA/μs 1.8μA/μs-2.800μA/μs 1.90.28 mA/μs-28.00mA/μs 1.90.28 mA/μs-28	8.4 x N <sup>-1</sup> mA/μs~84 x N <sup>-1</sup> mA/μs 3 x N <sup>-1</sup> μA 40 x N <sup>-1</sup> μA/μs~8.4 x N <sup>-1</sup> mA/μs 0.3 x N <sup>-1</sup> μA/μs~8.40 x N <sup>-1</sup> μA/μs 30 x N <sup>-1</sup> nA 8.4 x N <sup>-1</sup> μA/μs~840 x N <sup>-1</sup> μA/μs 30 x N <sup>-1</sup> nA 8.4 x N <sup>-1</sup> μA/μs~84 x N <sup>-1</sup> μA/μs 3 x N <sup>-1</sup> nA 0.84 x N <sup>-1</sup> μA/μs~8.4 x N <sup>-1</sup> μA/μs 0.84 x N <sup>-1</sup> μA/μs~8.4 x N <sup>-1</sup> μA/μs 0.084 mA/μs~8.4.00mA/μs 0.0084 mA/μs~8.4.00mA/μs 0.0084 mA/μs~8.4.00mA/μs 0.0084 mA/μs~8.400mA/μs 0.0084 mA/μs~8.400mA/μs 0.0084 mA/μs~8.800mA/μs 0.0084 mA/μs~8.800mA/μs 0.0084 mA/μs~8.800mA/μs	±(0.1 % of rdg + 0.1 % of f.s)T N/A ±(1.2% of rdg + 1.1% of f.s.)T N/A N/A ± 100ppm of setting N/A N/A N/A +0.4%F.S.		
Voltmeter Ammeter Ammeter(Parallel Operation) DYNAMIC MODE  Operation Mode T1 & T2 Accuracy Slew Rate (CC Mode)  Slew Rate (CR Mode)  Current Accuracy PROTECTION FUNCTION Functions  GENERAL Input Range	Accuracy Accuracy	H M L H	0.5 × N <sup></sup> μA 140 × N <sup></sup> μA 140 × N <sup></sup> μA 140 × N <sup></sup> μA 50 × N <sup></sup> πA 14 × N <sup></sup> μA/μs -140 × N <sup></sup> μA/μs 50 × N <sup></sup> πA 1.4 × N <sup></sup> μA/μs -14 × N <sup></sup> μA/μs 0.14 × N <sup></sup> μA/μs -1.4 × N <sup></sup> μA/μs 0.14 × N <sup></sup> μA/μs -1.4 × N <sup></sup> μA/μs ±(0.1 % of rdg + 0.1 % of f.s.) ±(0.2 % of rdg + 0.3 % of f.s.) ±(0.2 % of rdg + 1.1% of f.s.) CC, CR, CP 0.025ms~10ms/Res: 1 μs; 10 ± 100ppm of setting 0.140mA/μs-14.00mA/μs 0.014mA/μs~140.00μA/μs 0.014mA/μs~140.00mA/μs 0.014mA/μs~1.4000mA/μs 0.1400μA/μs~1.4000mA/μs 0.1400μA/μs~1.4000mA/μs 0.1400μA/μs~1.4000mA/μs 0.1400μA/μs~1.4000mA/μs 0.1400μA/μs~1.4000mA/μs 0.1400μA/μs~1.4000mA/μs	2.8 x N <sup>-10</sup> mA/μs-28 x N <sup>-10</sup> mA/μs 1 x N <sup>-10</sup> μA 2.80 x N <sup>-10</sup> μA/μs-2.8 x N <sup>-10</sup> mA/μs 0.1 x N <sup>-10</sup> μA 2.8 x N <sup>-10</sup> μA/μs-280 x N <sup>-10</sup> μA/μs 10 x N <sup>-10</sup> μA 10 x N <sup>-10</sup> μA 2.8 x N <sup>-10</sup> μA/μs-28 x N <sup>-10</sup> μA/μs 1 x N <sup>-10</sup> ρA 0.28 x N <sup>-10</sup> μA/μs-28 x N <sup>-10</sup> μA/μs 0.28 x N <sup>-10</sup> μA/μs-2.8 x N <sup>-10</sup> μA/μs 0.28 x N <sup>-10</sup> μA/μs-2.8 x N <sup>-10</sup> μA/μs 0.28 x N <sup>-10</sup> μA/μs-2.8 x N <sup>-10</sup> μA/μs 0.28 mA/μs-28.00mA/μs 0.028mA/μs-28.00mA/μs 2.80μA/μs-28.00mA/μs 2.8μA/μs-2.800mA/μs 0.280μA/μs-28.00mA/μs 0.280μA/μs-28.00mA/μs 0.70, Reverse connection (OCP), (10), Reverse connection protection (CS), Reverse connection protection (CS), Reverse connection protection (CS), Reverse connection protection (CS), Reverse connection protection (CS)	8.4 x N <sup>-1</sup> mA/μs-84 x N <sup>-1</sup> mA/μs 3 x N <sup>-1</sup> μA 40 x N <sup>-1</sup> μA 410 x N <sup>-1</sup> μA/μs-8.4 x N <sup>-1</sup> mA/μs 0.3 x N <sup>-1</sup> μA 41 x N <sup>-1</sup> μA/μs-8.40 x N <sup>-1</sup> μA/μs 30 x N <sup>-1</sup> μA 50 x N <sup>-1</sup> μA 50 x N <sup>-1</sup> μA/μs-84 x N <sup>-1</sup> μA/μs 30 x N <sup>-1</sup> μA 0.84 x N <sup>-1</sup> μA/μs-8.4 x N <sup>-1</sup> μA/μs 0.84 x N <sup>-1</sup> μA/μs-8.4 x N <sup>-1</sup> μA/μs 0.84 x N <sup>-1</sup> μA/μs-8.4 x N <sup>-1</sup> μA/μs 0.084 mA/μs-8.4.00mA/μs 0.084 mA/μs-8.400mA/μs 0.0084 mA/μs-8.400mA/μs 0.0084 mA/μs-8.400mA/μs 0.0084 mA/μs-0.8400 mA/μs	±(0.1 % of rdg + 0.1 % of f.s)T  N/A  ±(1.2% of rdg + 1.1% of f.s.)T  N/A  N/A  ±100ppm of setting  N/A  N/A  +0.4%F.S.		
Voltmeter Ammeter Ammeter (Parallel Operation) DYNAMIC MODE Operation Mode T1 & T2 Accuracy Slew Rate (CC Mode)  Slew Rate (CR Mode)  Current Accuracy PROTECTION FUNCTION Functions  GENERAL Input Range Power(Max.)	Accuracy Accuracy	H M L H	0.5 x N <sup></sup> μA 140 x N <sup></sup> 1μAμμs-1.4 x N <sup></sup> 0mA/μs 50 x N <sup></sup> 0pA 14 x N <sup></sup> 1μA/μs-140 x N <sup></sup> 0μA/μs 5 x N <sup></sup> 10A 1.4 x N <sup></sup> 10A/μs-14 x N <sup></sup> 0μA/μs 0.5 x N <sup></sup> 10A 0.14 x N <sup></sup> 1μA/μs-1.4 x N <sup></sup> 0μA/μs ±(0.1 % of rdg + 0.1 % of f.s.) ±(0.2 % of rdg + 0.3 % of f.s.) ±(0.2 % of rdg + 1.1% of f.s.) CC, CR, CP 0.025ms~10ms/Res: 1 μs; 10 ± 100ppm of setting 0.140mA/μs~14.00mA/μs 0.014mA/μs~14.00mA/μs 0.014mA/μs~140.0mA/μs 0.014mA/μs~140.0mA/μs 0.014mA/μs~14000mA/μs 0.014mA/μs~14000mA/μs 0.1400μA/μs~14000mA/μs 0.1400μA/μs~14000mA/μs 0.1400μA/μs~14000mA/μs 0.1400μA/μs~14000mA/μs 0.1400μA/μs~14000mA/μs 0.1400μA/μs~14000mA/μs 0.1400μA/μs~14000mA/μs 0.1400μA/μs~14000mA/μs	2.8 x N <sup>-10</sup> mA/μs-28 x N <sup>-10</sup> mA/μs 1 x N <sup>-10</sup> μA 280 x N <sup>-10</sup> μA 10 x N <sup>-10</sup> μA/μs-28 x N <sup>-10</sup> μA/μs 10 x N <sup>-10</sup> μA/μs-28 x N <sup>-10</sup> μA/μs 10 x N <sup>-10</sup> μA/μs-28 x N <sup>-10</sup> μA/μs 10 x N <sup>-10</sup> μA/μs-28 x N <sup>-10</sup> μA/μs 10 x N <sup>-10</sup> μA/μs-28 x N <sup>-10</sup> μA/μs 10 x N <sup>-10</sup> μA/μs-28 x N <sup>-10</sup> μA/μs 10 x N <sup>-10</sup> μA/μs-28 x N <sup>-10</sup> μA/μs 10 x N <sup>-10</sup> μA/μs-28 x N <sup>-10</sup> μA/μs 10 x N <sup>-10</sup> μA/μs-28 x N <sup>-10</sup> μA/μs 10 x N <sup>-10</sup> μA/μs-28 x N <sup>-10</sup> μA/μs 10 x N <sup>-10</sup> μA/μs-28 x N <sup>-10</sup> μA/μs 10 x N <sup>-10</sup> μA/μs-28 x N <sup>-10</sup> μA/μs 10 x N <sup>-10</sup> μA/μs-28 x N <sup>-10</sup> μA/μs 10 x N <sup>-10</sup> μA/μs-28 x N <sup>-10</sup> μA/μs 10 x N <sup>-10</sup> μA/μs-28 x N <sup>-10</sup> μA/μs 10 x N <sup>-10</sup> μA/μs-28 x N <sup>-10</sup> μA/μs 10 x N <sup>-10</sup> μA/μs-28 x N <sup>-10</sup> μA/μs 10 x N <sup>-10</sup> μA/μs-28 x N <sup>-10</sup> μA/μs 10 x N <sup>-10</sup> μA/μs-28 x N <sup>-10</sup> μA/μs 10 x N <sup>-10</sup> μA/μs-28 x N <sup>-10</sup> μA/μs 10 x N <sup>-10</sup> μA/μs-28 x N <sup>-10</sup> μA/μs 10 x N <sup>-10</sup> μA/μs-28 x N <sup>-10</sup> μA/μs 10 x N <sup>-10</sup> μA/μs-28 x N <sup>-10</sup> μA/μs 10 x	8.4 x N <sup>-1</sup> mA/μs~84 x N <sup>-1</sup> mA/μs 3 x N <sup>-1</sup> μA 40 x N <sup>-1</sup> μA/μs~8.4 x N <sup>-1</sup> mA/μs 0.3 x N <sup>-1</sup> μA/μs~8.40 x N <sup>-1</sup> μA/μs 30 x N <sup>-1</sup> nA 8.4 x N <sup>-1</sup> μA/μs~840 x N <sup>-1</sup> μA/μs 30 x N <sup>-1</sup> nA 8.4 x N <sup>-1</sup> μA/μs~84 x N <sup>-1</sup> μA/μs 3 x N <sup>-1</sup> nA 0.84 x N <sup>-1</sup> μA/μs~8.4 x N <sup>-1</sup> μA/μs 0.84 x N <sup>-1</sup> μA/μs~8.4 x N <sup>-1</sup> μA/μs 0.084 mA/μs~8.4.00mA/μs 0.0084 mA/μs~8.4.00mA/μs 0.0084 mA/μs~8.4.00mA/μs 0.0084 mA/μs~8.400mA/μs 0.0084 mA/μs~8.400mA/μs 0.0084 mA/μs~8.800mA/μs 0.0084 mA/μs~8.800mA/μs 0.0084 mA/μs~8.800mA/μs	±(0.1 % of rdg + 0.1 % of f.s)T N/A ±(1.2% of rdg +1.1% of f.s.)T N/A N/A ± 100ppm of setting N/A N/A N/A +0.4%F.S.		
Voltmeter Ammeter Ammeter(Parallel Operation) DYNAMIC MODE  Operation Mode T1 & T2 Accuracy  Slew Rate (CC Mode)  Slew Rate (CR Mode)  Current Accuracy PROTECTION FUNCTION Functions  GENERAL Input Range	Accuracy Accuracy	H M L H	0.5 × N <sup></sup> μA 140 × N <sup></sup> μA 140 × N <sup></sup> μA 140 × N <sup></sup> μA 50 × N <sup></sup> πA 14 × N <sup></sup> μA/μs -140 × N <sup></sup> μA/μs 50 × N <sup></sup> πA 1.4 × N <sup></sup> μA/μs -14 × N <sup></sup> μA/μs 0.14 × N <sup></sup> μA/μs -1.4 × N <sup></sup> μA/μs 0.14 × N <sup></sup> μA/μs -1.4 × N <sup></sup> μA/μs ±(0.1 % of rdg + 0.1 % of f.s.) ±(0.2 % of rdg + 0.3 % of f.s.) ±(0.2 % of rdg + 1.1% of f.s.) CC, CR, CP 0.025ms~10ms/Res: 1 μs; 10 ± 100ppm of setting 0.140mA/μs-14.00mA/μs 0.014mA/μs~140.00μA/μs 0.014mA/μs~140.00mA/μs 0.014mA/μs~1.4000mA/μs 0.1400μA/μs~1.4000mA/μs 0.1400μA/μs~1.4000mA/μs 0.1400μA/μs~1.4000mA/μs 0.1400μA/μs~1.4000mA/μs 0.1400μA/μs~1.4000mA/μs 0.1400μA/μs~1.4000mA/μs	2.8 x N <sup>-10</sup> mA/μs-28 x N <sup>-10</sup> mA/μs 1 x N <sup>-10</sup> μA 280 x N <sup>-10</sup> μA/μs-2.8 x N <sup>-10</sup> mA/μs 0.1 x N <sup>-10</sup> μA 280 x N <sup>-10</sup> μA/μs-280 x N <sup>-10</sup> μA/μs 10 x N <sup>-10</sup> μA 10 x N <sup>-10</sup> μA/μs-28 x N <sup>-10</sup> μA/μs 1 x N <sup>-10</sup> μA 10 x N <sup>-10</sup> μA/μs-28 x N <sup>-10</sup> μA/μs 1 x N <sup>-10</sup> μA/μs-2.8 x N <sup>-10</sup> μA/μs 2.8 x N <sup>-10</sup> μA/μs-2.8 x N <sup>-10</sup> μA/μs 0.28 x N <sup>-10</sup> μA/μs-2.8 x N <sup>-10</sup> μA/μs 0.028 mA/μs-28.00 mA/μs 2.800 μA/μs-28.00 mA/μs 2.800 μA/μs-28.00 mA/μs 2.8μA/μs-2.800 mA/μs 0.028 mA/μs-28.00 mA/μs 10.028 mA/μs-28.00 mA/μs 2.8μA/μs-2.800 mA/μs 2.8μA/μs-2.800 mA/μs 0.28 mA/μs-28.00 mA/μs 0.28 mA/μs-28 mA/μs 0.02 mA/μs 0.	8.4 x N <sup>-1</sup> mA/μs-84 x N <sup>-1</sup> mA/μs 3 x N <sup>-1</sup> μA 40 x N <sup>-1</sup> μA 410 x N <sup>-1</sup> μA/μs-8.4 x N <sup>-1</sup> mA/μs 0.3 x N <sup>-1</sup> μA 41 x N <sup>-1</sup> μA/μs-8.40 x N <sup>-1</sup> μA/μs 30 x N <sup>-1</sup> μA 50 x N <sup>-1</sup> μA 50 x N <sup>-1</sup> μA/μs-84 x N <sup>-1</sup> μA/μs 30 x N <sup>-1</sup> μA 0.84 x N <sup>-1</sup> μA/μs-8.4 x N <sup>-1</sup> μA/μs 0.84 x N <sup>-1</sup> μA/μs-8.4 x N <sup>-1</sup> μA/μs 0.84 x N <sup>-1</sup> μA/μs-8.4 x N <sup>-1</sup> μA/μs 0.084 mA/μs-8.4.00mA/μs 0.084 mA/μs-8.400mA/μs 0.0084 mA/μs-8.400mA/μs 0.0084 mA/μs-8.400mA/μs 0.0084 mA/μs-0.8400 mA/μs	±(0.1 % of rdg + 0.1 % of f.s)T  N/A  ±(1.2% of rdg + 1.1% of f.s.)T  N/A  N/A  ±100ppm of setting  N/A  N/A  ±0.4%F.S.		

Victor   V	SPECIFICATION	ONS									
Current		ONS		PEL-3212H	PEL-3323H	PEL-3424H	PEL-3535H	PEL-3322H	PEL-3533H	PEL-3744H	PEL-3955H
Operating Ranger   M.H.J.	Voltage Current Power Input Resistance Min. Operating Voltage(DC)(Typ.)			0V~800V 0~105A 2100W 1.62MΩ 5V@105A	0V~800V 0~157.5A 3150W 1.08MΩ 5V@157.5A	0V~800V 0~210A 4200W 0.81MΩ 5V@210A	0V~800V 0~262.5A 5250W 0.648MΩ 5V@262.5A	0V~800V 0~157.5A 3150W 3.24MΩ 5V@157.5A	0V~800V 0~262.5A 5250W 3.24MΩ 5V@262.5A	0V~800V 0~367.5A 7350W 3.24MΩ 5V@367.5A	0V~800V 0~472.5A 9450W 3.24MΩ 5V@472.5A
Recursion   M.M.			$\neg$	0.1054 0.1054 0.1054	0. 157 54 0. 15 754 0. 1 5754	0.2104   0.214   0.214	0. 262 54 0. 26 254 0. 2 6254	0. 157 50 0. 15 750 0. 1 5750	0. 262 54 0. 26254 0. 2 6254	0. 367 54 0. 36 754 0. 3 6754	0. 472 50 0. 47 250 0. 4 705
March   Composition   March   Composition   Service   Composition   Service   Composition   Service   Se		-	-				U-262.5A   U-26.25A   U-2.625A	U-15/.5A  U-15/.5A U-1.5/5A	U-262.3A  U-26.23A U-2.623A	U-36/.5A U-36./5A U-3.6/5A	U-4/2.5A   U-4/.25A   0-4,725
Heap   12 / 26 / 26 / 27 / 27 / 27 / 27 / 27 / 2	Resolution	-	_		1 1		10mA 1mA 0.1mA	6mA 0.6mA 0.06mA	10mA 1mA 0.1mA	14mA   1.4mA   0.14mA	18mA 1.8mA 0.18m
Barge   M	Operating Range <sup>*4</sup>		н	(47.619mΩ~		(23.8095mΩ~	(19.0476mΩ~		(19.0476mΩ~	(13.6054mΩ~	(10.582mΩ~
Control   Cont		Range	м	(476.19mΩ~ 27.778kΩ)	(317.46mΩ~ 18.5185kΩ)	(238.095mΩ~ 13.8889kΩ)	(190.476mΩ~ 11.1111kΩ)	(317.46mΩ~ 18.5185kΩ)	(190.476mΩ~ 11.1111kΩ)	(136.054mΩ~ 7.93651kΩ)	(105.82mΩ~ 6.17284kΩ)
Reader   March   Supple   Su			L	(4.7619Ω~	(3.1746Ω~	(2.38095Ω~	(1.90476Ω~	(3.1746Ω~	(1.90476Ω~	(1.36054Ω~	(1.0582Ω~
Constant Voltace Mode	, ,	H,M	_		, ,,			22.55			
Poperating Range   Range   II   20-02 % of set + 0.2 % of fs	111777	CE MOS	-	360μS   36μS   3.6μS	540μS   54μS   5.4μS	720μS   72μS   7.2μS	900μS  90μS  9μS	540μS   54μS   5.4μS	900μS   90μS   9μS	1.26mS  126μS   12.6μS	1.62mS   162µS   16.2µ
Accuracy of Setting   Range   14, 1, 20 × 6 cs + 0.2 % of f.s			н	7.1							
Range   Rang		_									
Constant Provers Mode	, 8	-	-		6 of f.s)						
Comparison Range	157.447.04			z0mV/2mV							
Recolation   Resolution   Resolution   200mw    20mw    20mw    30mw    30mw			Н	21W~210W	31.5W~315W	42W~420W	52.5W~525W	31.5W~315W	52.5W~525W	73.5W~735W	94.5W~945W
Resolution			_	- Ch					5.25W~52.5W	7.35W~73.5W	9.45W~94.5W
PARALLEL Mode	, ,	н,м	_	<u> </u>					F00-14/ F0-14/ F-14/	700-14/ 70-14/ 7-14/	000-14/100-14/10-14
SEEW RATE				200mW 20mW 2mW	300mW 30mW 3mW	400mW   40mW   4mW	500mW 50mW 5mW	300mW   30mW   3mW	S00mW S0mW SmW	/00mW   /0mW   /mW	900mW   90mW   9mW
CC	Capacity			-	-	-	-	-	-	-	-
		-		CC, CR	CC, CR	CC, CR	CC, CR	CC, CR	CC, CR	CC, CR	CC, CR
Setting Range (CR Mode)   Range   H   168 jk / jus-8 4 m / jus   252 jk / jus-8 3 3 7 m / jus   3 36 jk / jus-8 4 m / jus   420 jk / jus-8 4 m / jus   252 jk / jus-8 3 3 7 m / jus   252 jk / jus-8 4 0 m / jus   25		Range	М	168μA/μs~84mA/μs	252μA/μs~83.97mA/μs	336μA/μs~84mA/μs	420μA/μs~84mA/μs	252μA/μs~83.97mA/μs	420μA/μs~84mA/μs	588μA/μs~84mA/μs	7.56mA/µs~839.7mA/µ: 756µA/µs~83.97mA/µs
CR Mode   Range   M   16.8 µA   µs - 8.4 mA   µs   25.2 µA   µs - 8.4 mA		3	_	1 11							
Carrety of Setting   H.M.   \( \frac{1}{2} \)   \( \frac{1}{2} \		Range	-								200,000
Control (Setting Range)	(		L	1.68μΑ/μς~840μΑ/μς			- CT- 1700000000 - 10000				7.56µA/µs~839.7µA/µs
186mA/µs=840mA/µs   60µA   120µA   130mA/µs=840mA/µs   120µA	Accuracy of Setting"	H,M	,L	±(10 % of set + 25μs)							
Signar   1.68mA/µs - 1.68mA/µs - 2.52mA/µs - 2.52mA/				168mA/μs840mA/μs 60μA	252mA/μs842.4mA/μs 90μA	336mA/μs-840mA/μs 120μA	420mA/μs-840mA/μs 150μA	252mA/μs-842.4mA/μs 90μA	420mA/μs-840mA/μs 150μA	588mA/μs-840mA/μs 210μA	756mA/μs-842.4mA/μs 270uA
O.0168mA/μs0.168mA/μs   O.0252mA/μs0.252mA/μs   O.0356mA/μs0.356mA/μs   O.0356mA/μs0.252mA/μs   O.0252mA/μs0.252mA/μs   O.0252mA/μs0.252mA/μs   O.0252mA/μs0.0252mA/μs   O.0058mA/μs0.0366mA/μs   O.0366mA/μs0.0366mA/μs   O.0036mA/μs0.0366mA/μs   O.0036mA/μs0.0366mA/μs   O.0036mA/μs0.0366mA/μs   O.0036mA/μs0.0356mA/μs   O.0036mA/μs				1.68mA/μs—16.8mA/μs 600nA 0.168mA/μs—1.68mA/μs	2.52mA/μs-25.2mA/μs 900nA 0.252mA/μs-2.52mA/μs	3.36mA/µs-33.6mA/µs 1.2µA 0.336A/µs-3.36mA/µs	4.2mA/μs-42mA/μs 1.5μA 0.42mA/μs-4.2mA/μs	2.52mA/μs-25.2mA/μs 900nA 0.252mA/μs-2.52mA/μs	4.2mA/μs—42mA/μs 1.5μA 0.42mA/μs—4.2mA/μs	5.88mA/μs-58.8mA/μs 2.1μA 0.588mA/μs-5.88mA/μs	7.56mA/μs-75.6mA/μs 2.7μA 0.756mA/μs-7.56mA/μ
Meter   Accuracy   ± (0.1 % of rdg + 0.1 % of f.s)				0.0168mA/μs-0.168mA/μs 6nA	0.0252mA/μs~0.252mA/μs 9nA	0.0336mA/μs-0.336mA/μs 12nA	0.042mA/μs0.42mA/μs 15nA	0.0252mA/μs~0.252mA/μs 9nA	0.042mA/μs0.42mA/μs 15nA	0.0588mA/μs~0.588mA/μs 21nA	0.0756mA/μs0.756mA/μ 27nA
Operation Mode   T1 & T2   CC and CR   0.025ms-10ms/Res : 1μs ; 10ms-30s/Res : 1ms   1μs/1ms ± 100ppm   1.68μA/μs-840mA/μs   2.52μA/μs-839.7mA/μs   3.36μA/μs-840mA/μs   4.2mA/μs-840mA/μs   2.52μA/μs-83.97mA/μs   4.2mA/μs-840mA/μs   4.2mA/μs-83.97mA/μs   4.2mA/μs-840mA/μs   4.2mA/μs-83.97mA/μs   4.2mA/μs-840mA/μs   4.2mA/μs-83.97mA/μs   4.2mA/μs-840mA/μs   4.2mA/μs-83.97mA/μs   4.2mA/μs-840mA/μs   4.2mA/μs-83.97mA/μs   4.2mA/μs-840mA/μs   4.2mA/μs-83.97mA/μs   4.2mA/μs-83.97mA/μs   4.2mA/μs-840mA/μs   4.2mA/μs-83.97mA/μs   4.2mA/μs-840mA/μs   4.2mA/μs-840μA/μs   4.2mA/μs-840μA	METER										
Operation Mode   T1 & T2   CC and CR   0.025ms-10ms/Res : 1μs ; 10ms-30s/Res : 1ms   1μs/1ms ± 100ppm   1.68μA/μs-840mA/μs   2.52μA/μs-839.7mA/μs   3.36μA/μs-840mA/μs   4.2mA/μs-840mA/μs   2.52μA/μs-83.97mA/μs   4.2mA/μs-840mA/μs   4.2mA/μs-83.97mA/μs   4.2mA/μs-840mA/μs   4.2mA/μs-83.97mA/μs   4.2mA/μs-840mA/μs   4.2mA/μs-83.97mA/μs   4.2mA/μs-840mA/μs   4.2mA/μs-83.97mA/μs   4.2mA/μs-840mA/μs   4.2mA/μs-83.97mA/μs   4.2mA/μs-840mA/μs   4.2mA/μs-83.97mA/μs   4.2mA/μs-83.97mA/μs   4.2mA/μs-840mA/μs   4.2mA/μs-83.97mA/μs   4.2mA/μs-840mA/μs   4.2mA/μs-840μA/μs   4.2mA/μs-840μA				±(0.1 % of rdg + 0.1 9	% of f.s)						
1		, .ccura	-/	<u> </u>	, o on 1.3]						
H   1.68mA/μs-840mA/μs   252mA/μs-839.7mA/μs   3.36mA/μs-840mA/μs   4.2mA/μs-840mA/μs   252μA/μs-839.7mA/μs   3.36mA/μs-840mA/μs   4.2mA/μs-840mA/μs   252μA/μs-83.97mA/μs   4.2mA/μs-840mA/μs   252μA/μs-83.97mA/μs   4.2mA/μs-84mA/μs   252μA/μs-83.97mA/μs   4.2mA/μs-84mA/μs   252μA/μs-83.97mA/μs   4.2mA/μs-84mA/μs   4.2mA/μs-84mA/μs   4.2mA/μs-84mA/μs   4.2mA/μs-84mA/μs   4.2mA/μs-84mA/μs   5.88mA/μs-84mA/μs   5.88mA/μs-84mA/μs   7.56mA/μs-83.97mA/μs   4.2mA/μs-84mA/μs   4.2mA/μs-8.3.97mA/μs   4.2mA/μs-8.4mA/μs   4.2mA/μs-8.3.97mA/μs   4.2mA/μs-8.3.97mA/μs   4.2mA/μs-8.4mA/μs   4.2mA/μs-8.3.97mA/μs   4.2mA/μs-8.3.97mA/μs   4.2mA/μs-8.3.97mA/μs   4.2mA/μs-8.3.97mA/μs   4.2mA/μs-8.3.97mA/μs   4.2mA/μs-8.3.97mA/μs   4.2mA/μs-8.4mA/μs   4.2mA/μs-8.3.97mA/μs   4.2mA/μs-8.4mA/μs   4.2mA/μs-8.4mA/μs   4.2mA/μs-8.4mA/μs   4.2mA/μs-8.3.97mA/μs   4.2mA/μs-8.4mA/μs   4.2mA/μs-8.4mA/μs   4.2mA/μs-8.3.97mA/μs   4.2mA/μs-8.4mA/μs   4.2mA/μs-8.4mA/μs   4.2mA/μs-8.3.97mA/μs   4.2mA/μs-8.4mA/μs   4.2mA/μs-8.4mA/μs   4.2mA/μs-8.3.97mA/μs   4.2mA/μs-8.4mA/μs   4.2mA/μs-8.3.97mA/μs   4.2mA/μs-8.4mA/μs   4.2mA/μs-8.4mA/μs   4.2mA/μs-8.3.97mA/μs   4.2mA/μs-8.4mA/μs   4.2mA/μs-8.4mA/μs   4.2mA/μs-8.4mA/μs   4.2mA/μs-8.3.97mA/μs   4.2mA/μs-8.4mA/μs   4.2mA/μs-8.4mA/μs   4.2mA/μs-8.4mA/μs   4.2mA/μs-8.4mA/μs   4.2mA/μs-8.4mA/μs   4.2mA/μs-8.4mA/μs   4.2mA/μs-8.4mA/μs   4.2mA/μs-8.3.97mA/μs   4.2mA/μs-8.4mA/μs   4.2mA/μs-8.4mA/μs   4.2mA/μs-8.4mA/μs   4.2mA/μs-8.4mA/μs	T1 & T2			0.025ms~10ms/Res :	1μs ; 10ms~30s/Res	: 1ms					
CC Mode   Range   M   168μA/μs-84mA/μs   252μA/μs-83.97mA/μs   336μA/μs-84mA/μs   420μA/μs-84mA/μs   252μA/μs-8.3.97mA/μs   420μA/μs-8.4mA/μs   252μA/μs-8.3.97mA/μs   420μA/μs-8.4mA/μs   252μA/μs-8.3.97mA/μs   420μA/μs-8.4mA/μs   252μA/μs-8.3.97mA/μs   420μA/μs-8.4mA/μs   252μA/μs-8.3.97mA/μs   42μA/μs-8.4mA/μs   258μA/μs-8.4mA/μs   258μA/μs-8.4mA/μ	•		н		2.52mA/µs~839.7mA/µs	3.36mA/μs~840mA/μs	4.2mA/μs~840mA/μs	2.52mA/µs~839.7mA/µs	4.2mA/μs~840mA/μs	5.88mA/μs~840mA/μs	7.56mA/µs~839.7mA/µ
H   168μΑ/μs-8.4mA/μs   252μΑ/μs-8.397mA/μs   336μΑ/μs-8.4mA/μs   420μΑ/μs-8.4mA/μs   252μΑ/μs-8.397mA/μs   420μΑ/μs-8.4mA/μs   252μΑ/μs-8.397mA/μs   420μΑ/μs-8.4mA/μs   252μΑ/μs-8.397mA/μs   420μΑ/μs-8.4mA/μs   252μΑ/μs-8.397mA/μs   420μΑ/μs-8.4mA/μs   252μΑ/μs-8.397mA/μs   42μΑ/μs-8.4mA/μs   252μΑ/μs-8.4mA/μs   252μΑ/μs-8.397mA/μs   42μΑ/μs-8.4mA/μs   252μΑ/μs-8.4mA/μs   252μΑ/μs-8.4mA/μs   252μΑ/μs-8.4mA/μs   252μΑ/μs-8.397mA/μs   42μΑ/μs-8.4mA/μs   252μΑ/μs-8.4mA/μs		Range			252μA/μs~83.97mA/μs	336μA/μs~84mA/μs	420μA/μs~84mA/μs	252μA/μs~83.97mA/μs	420μA/μs~84mA/μs		756μA/μs~83.97mA/μs
CR Mode   Range   M   16.8μλ/μs - 8.4mλ/μs   25.2μλ/μs - 8.397mλ/μs   33.6μλ/μs - 8.4mλ/μs   42.μλ/μs - 8.4mλ/μs   25.2μλ/μs - 8.397mλ/μs   42.μλ/μs - 8.4mλ/μs   25.2μλ/μs - 8.397mλ/μs   42.μλ/μs - 8.4mλ/μs   25.2μλ/μs - 8.397mλ/μs   42.μλ/μs - 8.40μλ/μs   5.88μλ/μs - 8.40μλ/μs   7.56μλ/μs - 8.397mλ/μ   7.56μλ/μs - 8.397mλ/μs   42.μλ/μs - 8.40μλ/μs   42.μλ	cl p	S .							70.0000 4000 1000		
Current Accuracy ±0.4%F.S.		Range	-				10.71				75.6µA/µs~83.97mA/µ 75.6µA/µs~8.397mA/µ
PROTECTION FUNCTION  Functions  Overvoltage protection(OVP), Overcurrent protection(OCP), Overpower protection(OPP), Overheat protection(OHP),	\$2	83	L	1.68μΑ/μς~840μΑ/μς	2.52μΑ/μς~839.7μΑ/μς	3.36μΑ/μς~840μΑ/μς	4.2μΑ/μς~840μΑ/μς	2.52μΑ/μς~839.7μΑ/μς	4.2μΑ/μς~840μΑ/μς	5.88μΑ/μς~840μΑ/μς	7.56μΑ/μς~839.7μΑ/μς
Functions Overvoltage protection(OVP), Overcurrent protection(OCP), Overpower protection(OPP), Overheat protection(OHP),		2		±0.4%F.S.	±0.4%F.S.	±0.4%F.S.	±0.4%F.S.	±0.4%F.S.	±0.4%F.S.	±0.4%F.S.	±0.4%F.S.
		CTION		0	H (O) (D) C		CD) O			OLID)	
1995 ACM SECTION AND ACCOUNT OF A STATE OF A	*01.895.7354.95 W							otection(OPP), Ov	erheat protection(	OHP),	
GENERAL    1901/4				90VAC, 122VAC/180V	/AC_250\/AC Single =	hase: 47U= 62U=					
Input Range	Power(Max.)			380VA	570VA	760VA	950VA	420VA	650VA	880VA	1110VA
Dimensions & Weight		rht	1	79-31 H1 79 9-3-11 11	75000	F 10 20 10 10 10 10 10 10 10 10 10 10 10 10 10	598(W)x877(H)x	598(W)x877(H)x	598(W)x877(H)x	598(W)x877(H)x	598(W)x877(H)x

#### Note:

- \*1. Full scale of H range
- \*2. Vin: input terminal voltage of electronic load
- \*3. M range applies to the full scale of H range
- \*4. Siemens[S] = Input current[A] / Input voltage[V] =  $1/\text{resistance}[\Omega]$
- \*5. Converted value at the input current. At the input current. It is not applied for the condition of the parallel operation.
- \*6. set = Vin/Rset
- \*7. At the sensing point during remote sensing under the operating range of the input voltage. It is also applied for the condition of the parallel operation.
  \*8. It is not applied for the condition of the parallel operation.
- \*9. Time to reach from 10 % to 90 % when the current is varied from 2 % to 100 % (20 % to 100 % in M range) of the rated current.
  \*10. N = Number of units in parallel (same model)
- \*11. N = Number of units in parallel (same model) or N = 1 + 2 x (Number of units in parallel [PEL-3211])

. 11434 - 1455 <u>- 114</u>		,								
1	ORDERING INF	ORMATION								
PEL-3021	(150V/35A/175W) Single-Channel Programmable DC Electronic Load									
PEL-3041	, , , , , ,	(150V/70A/350W) Single-Channel Programmable DC Electronic Load								
PEL-3111		(150V/210A/1050W) Single-Channel Programmable DC Electronic Load								
PEL-3211 PEL-3021F		(150V/420A/2100W) 2100W Booster for PEL-3111 only								
PEL-30211		(800V/8.75A/175W) Single-Channel Programmable DC Electronic Load								
PEL-30411	(out 1) the state of the state									
PEL-3111F										
. 22-32111	(0001/103A/2100W) 2100W BOOSTEI IOI PEL-3111H Olly									
ACCESSORIE	S:									
•	Guide, CD(User Manual/Programming Manual), Power Cord		e Link Cable 300mm							
	ad Input Terminal Cover PEL-012 Terminal Fittings Kits PEL-014 J1/J2 Protection Plug	Front Terminal	Washers							
OPTIONAL	ACCESSORIES									
CR123A	3V Lithium Battery for Clock.	PEL-004	GPIB Option							
GRA-413	Rack Mount Bracket for Booster PEL-3211 (H) (EIA+JIS)	PEL-005								
GRA-414-E		PEL-006	connect cu i lute							
GRA-414-J	Rack Mount Frame for PEL-3021 (H), PEL-3041 (H), PEL-3111 (H)/JIS		Connect Cu Plate							
GTL-120 GTL-248	Test Lead (Max. 40A) GPIB Cable, 2.0m	PEL-008	Connect Cu Plate Connect Cu Plate							
GTL-248	USB Cable Type A- Type B		LAN Card							
PEL-010	Dust Filter		Diff Card							
FREE DOW	NLOAD									
Driver	LabView Driver									







PEL-3111H



PEL-3211H



PEL-3041H

#### **Rear Panel**





GRA-413 Rack Mount Kit (EIA+JIS)

For : PEL-3211 (H)



GRA-414-J Rack Mount Kit (JIS)

For: PEL-3021/3021H/3041/3041H/3111/3111H



GRA-414-E Rack Mount Kit (EIA)

For: PEL-3021/3021H/3041/3041H/3111/3111H





#### PEL-3031AE



#### PEL-3032AE



#### **FEATURES**

- \* 0~150V(PEL-3031AE)Min. Operating Voltage(dc): 1V at 60A, 0.5V at 30A 0~500V(PEL-3032AE)Min. Operating Voltage(dc): 2.5V at 15A, 1.25V at 7.5A
- \* 7 Operating Modes : CC, CV, CR, CP, CC+CV, CR+CV, CP+CV
- \* Normal Sequence Function: Max Steps: 1000 steps/Step Time:1ms~999h 59min 59s(3599940 sec)Fast Sequence Function: Max Steps:1000 steps/Step Time:25us~600ms
- \* Soft Start
- \* BATT Test Automation:Max Test Time:999h: 59min 59s(3599940 sec):Max Test AH:9999.99Ah
- \* OCP, OPP Test Automation
- \* Max. Slew Rate: 2.5A/µs
- \* Dynamic Mode
- \* Protection: OVP, OCP, OPP, OTP, RVP, UVP
- \* Remote Sense
- \* Integrate Voltage, Current and Power Measurement Functions
- \* External Voltage or Resistance Control
- \* Rear Panel BNC, Trigger IN/OUT
- \* Analog External Control
- \* Interfaces: LAN/USB/RS-232 & RS-485(Std.), GPIB(Opt.)

GW Instek launches new PEL-3000AE Series programmable single-channel electronic load. In the series, PEL-3031AE provides 300W (1V~150V/60A) and PEL-3032AE provides 300W (2.5V~500V/15A) current sink capability. Inherited from the PEL-3000A Series, PEL-3000AE has an easy-to-read LCD panel and user-friendly interface. This model features high speed and accurate measurement capability for electronic component, battery, portable charger and power products that require low to medium power consumption.

The PEL-3000AE Series is designed for current sink operation starting from 60mA and aims at measurement applications, including charger, adapter, various power supply equipment, and portable charger.

The PEL-3000AE Series has seven operating modes. Among them, four basic operating modes are constant current, constant voltage, constant resistance, and constant power. Three other combined operating modes are constant current + constant voltage, constant resistance + constant voltage, constant power + constant voltage. Users can select operating modes based upon products' test requirements. For C.C. mode, electronic load will sink a constant current according to the set current value; for C.V. mode, electronic load will attempt to sink sufficient current to control the source voltage to the programmed value; for C.R. mode, electronic load will sink a current linearly proportional to input voltage according to the set resistance value; for C.P. mode, electronic load will initiate load power sinking operation (load voltage x load current) in accordance with the programmed

To meet the requirements of different test conditions, the Static function is to sink a constant current; the Dynamic function is to periodically switch between two sink conditions, and the Sequence function is to provide tests for more than two sink conditions. The sequence function can be divided into Normal Sequence and Fast Sequence. Normal Sequence is the most flexible mean of generating complex sequences that can facilitate users to establish a set of changing current sink conditions based upon different sinking conditions (CC, CR, CV or CP mode) and time(adjustable range: 1ms to 999h 59min 59s). Fast sequence allows time resolution of 25us to be set for the smallest step. Setting parameters for multiple steps can simulate consecutive current changes of various real load conditions. For instance, while using an electronic load to test a power-driven tool's power supply, we can first obtain waveforms by an oscilloscope and a current probe from the tool, and subsequently, use the obtained waveforms to edit simulated current waveforms, via electronic load's sequence function, to test the power-driven tool and to analyze its operational status. The Soft Start function allows users to determine the rise time of current sink that is to decide the required time to reach electronic load's set current, resistance or power value. Setting a proper rise time for Soft Start is effective to counter output voltage

by DUT's (power supply) transient output current. It is worth noting, General DC loads do not have the soft start function. When conducting high speed current sink operation, the inductance effect on the cable connecting electronic load and DUT will lead to transient voltage drop on electronic load's input terminal, therefore, that will result in Voltage Non-monotonic increase. PEL-3000AE's soft start function not only allows output voltage to be Monotonic increase, but also prevents inrush current and surge voltage from happening on DUT. For instance, tests using a power supply, LED and a DC load (activate the soft start function) can prevent inrush current and surge voltage from causing damages on LED.

The built-in BATT Test Automation of PEL-3000AE Series provides battery discharge applications with more flexible discharge stop setting as well as rise and fall Slew Rate for discharge current settings. OCP, OPP test Automation for DUT (ex. Power Supply), provide users with high resolution measurement values to verify DUT's activation point. Provide users with measurement results so as to help them determine whether DUT's actual over protection activation point meets the regulations. Other than that, PEL-3000AE provides users with analog control terminal to control PEL-3000AE Series from external voltage, external resistance and switch. Analog control terminal can also monitor electronic load's status and display protective alarms.

Model	PEL-3031AE		PEL-3032AE		
Power	300W	300W	300W	300W	
Range	Low	High	Low	High	
Voltage	0 ~ 150V	0 ~ 150V	0 ~ 500V	0 ~ 500V	
Current	0 ~ 6A	0 ~ 60A	0 ~ 1.5A	0 ~ 15A	
Min. Operating Voltage(dc)	1V ~ 6A	1V ~ 60A	2.5V ~ 1.5A	2.5V ~ 15A	
STATIC MODE					
Constant Current Mode				8.	
Range	0 ~ 6A	0 ~ 60A	0~1.5A	0 ~ 15A	
Setting Range	0 ~ 6.12A	0 ~ 61.2A	0~1.53A	0 ~ 15.3A	
Resolution	0.2mA	2mA	0.05mA	0.5mA	
Accuracy	(T*1)±(0.1% of set	$(T^{*1})\pm(0.1\% \text{ of set}$	(T*1)±(0.1% of set	$(T^{*1})\pm(0.1\% \text{ of set}$	
	+0.1% of FS)+	+0.2% of FS)+	+0.1% of FS)+	+0.2% of FS)+	
	Vin/500kΩ	Vin/500kΩ	Vin/500kΩ	Vin/500kΩ	
	(Full scale of High range)	(Full scale of High range)	(Full scale of High range)	(Full scale of High rang	
Constant Resistance Mode					
Range	60S~0.002S(0.01666Ω~500Ω) (300W/15V)		6S~0.0002S(0.16666Ω~5kΩ)(300W/50V)		
Mark Control	6S~0.0002S(0.1666Ω~5kΩ) (300W/150V)		0.65~0.00002S(1.6666Ω~0kΩ)(300W/500V		
Setting Range	60S~0.002S (0.01666Ω~50ÓΩ) (30ÓW/15V)		6S~0.0002S(0.16666Ω~5kΩ)(300W/50V)		
	6S~0.0002S(0.1666Ω		0.65~0.000025(1.6666		
Resolution (30000 Steps)	0.002S(15V); 0.0002S(150V)		0.0002S(50V); 0.00002S(500V)		
Accuracy	$(T^{*1})\pm(0.3\% \text{ of set } +$	0.6S) + 0.002mS	$(T^{*1})\pm(0.3\% \text{ of set} + 0.06S) + 0.002r$		
Constant Voltage Mode			7.		
Range	1 ~ 15V	1 ~ 150V	2.5 ~ 50V	2.5 ~ 500V	
Setting Range	0 ~ 15.3V	0 ~ 153V	0 ~ 51V	0 ~ 510V	
Resolution	0.5mV	5mV	1mV	10mV	
Accuracy	$(T^{*1})\pm(0.1\% \text{ of set+}$	$(T^{*1})\pm(0.1\% \text{ of set}+$	$(T^{*1})\pm(0.1\% \text{ of set+}$	$(T^{*1})\pm(0.1\% \text{ of set+}$	
	0.1% of FS)	0.1% of FS)	0.1% of FS)	0.1% of FS)	
Constant Power Mode	(Full scale of High range)	(Full scale of High range)	(Full scale of High range)	(Full scale of High rang	
constant romer mode	0\\\ 20\\\\6\\	011/ 2001///6041	OVY 20VY/7 FAV	017/ 20017/7541	
Range	0W ~ 30W(6A) 0W ~ 30.6W	0W ~ 300W(60A) 0W ~ 306W	0W ~ 30W(1.5A) 0W ~ 30.6W	0W ~ 300W(15A) 0W ~ 306W	
Setting Range Resolution	0W ~ 30.6W 1mW	0W ~ 306W 10mW	0W ~ 30.6W	0W ~ 306W 10mW	
Resolution	IIIIW	TOTTIW	IIIIW	TOTAW	



### PEL-3032AE

SPECIFICATIONS					
Model	PEL-3031AE		PEL-3032AE		
DYNAMIC MODE					
General T1& T2	0.05ms~30ms/Res:1µs;30ms~30s/Res:1ms		0.05ms~30ms/Res:1µs;30ms~30s/Res:1m		
Accuracy Slew Rate(Accuracy 10%) Slew Rate Resolution Slew Rate Accuracy of Setting	1μs/1ms±200ppm 0.001 ~ 0.25A/μs 0.001A/μs ±(10% + 15μs) *1T	1μs/1ms±200ppm 0.01 ~ 2.5A/μs 0.01A/μs ime to reach from 10 % to % to 100 % in L range) of	1μs/1ms±200ppm 0.25 ~ 62.5mA/μs 0.25mA/μs 90 % when the current is v	1μs/1ms±200ppm 2.5 ~ 625mA/μs 2.5mA/μs aried from 2 % to 100 %	
Constant Current Mode Current Setting Range Current Resolution Current Accuracy	0 ~ 6A 0 ~ 6.12A 0.2mA ±0.8% FS	0 ~ 60A 0 ~ 61.2A 2mA ±0.8% FS	0 ~ 1.5A 0 ~ 1.53A 0.05mA ±0.8% FS	0 ~ 15A 0 ~ 15.3A 0.5mA ±0.8% FS	
Constant Resistance Mode Range Setting Range	60S~0.002S(0.01666Ω~500Ω)(300W/15V) 6S~0.0002S(0.1666Ω~5kΩ)(300W/150V) 60S~0.0002S(0.01666Ω~5kΩ)(300W/15V) 60S~0.0002S(0.01666Ω~500Ω)(300W/15V) 6S~0.0002S(0.16666Ω~5kΩ)(300W/15V)			Ω~50kΩ) (300W/500V) 2~5kΩ) (300W/50V)	
Resistance Resolution Resistance Accuracy	30000 steps (T*1)±(1%set + 0.6S	0.65 $-0.00002$ $(0.666$ $-0.0000$ $(0.65$ $-0.0000$ $(0.666$ $-0.000$ $-0.000$ $(0.666$ $-0.00$			
MEASUREMENT	( ) ( )		, , ,	,	
Voltage Readback Range Resolution Accuracy	0 ~ 15V 0.5mV (T*1)±(0.1% of rdg +0.1% of FS) (Full scale of Low range)	0 ~ 150V 5mV (T*1)±(0.1% of rdg +0.1% of FS) (Full scale of High range)	0 ~ 50V 2mV (T*1)±(0.1% of rdg +0.1% of FS) (Full scale of Low range)	$0 \sim 500V$ 20mV $(T^{+1})\pm(0.1\% \text{ of rdg}$ +0.1%  of FS) (Full scale of High range)	
Current Readback Range Resolution Accuracy	0 ~ 6A 0.2mA (T*1)±(0.1% of rdg+ 0.1% of FS) (Full scale of High range)	$0 \sim 60A$ 2mA $(T^*1)\pm(0.1\% \text{ of rdg}+$ 0.2%  of FS) (Full scale of High range)	$0 \sim 1.5A$ 0.05mA $(T^{*1})\pm(0.1\% \text{ of rdg}+$ 0.1%  of FS) (Full scale of High range)	0 ~ 15A 0.5mA (T*1)±(0.1% of rdg+ 0.2% of FS) (Full scale of High range)	
Power Read back H&L Range CP Mode L Range	0 ~ 300W 0 ~ 30W	0 ~ 300W 0 ~ 30W	0 ~ 300W 0 ~ 30W	0 ~ 300W 0 ~ 30W	
FUNCTION					
Sequence(Normal/Fast)	Normal sequence function: Max steps: 1000 steps/Step time: 1ms ~ 999h 59min 59s (3599940 sec) Fast sequence function: Max steps: 1000 steps/Step time: 25us ~ 600ms				
BATT Test Automation Test Function Soft Start In/Out Terminal Preset Data Protection	Max test time: 999h: 59m: 59s(3599940sec); Max test AH: 9999.99Ah OCP Autotest function, OPP Autotest Function Yes Analog External Control, Current Monitor Output, Trigger In/Out Terminal (BNC) 10 Sets OCP, OPP, UVP, OVP, OTP, RVP				
OTHER					
Power Source Interface Dimensions & Weight		240VAC, 47 ~ 63Hz RS-485(Std.), GPIB(Op x 400.5(D)mm, Approx			

Note : \*1 - If the ambient temperature is over 30 °C or below 20 °C, then T =  $\pm$  | t - 25 °C | x 100ppm/°C x Set If the ambient temperature is in the range of 20°C-30°C, then T = 0 (t is the ambient temperature)

#### ORDERING INFORMATION

PEL-3031AE PEL-3032AE 150V/60A/300W Programmable Single-channel DC Electronic Load SOOV/15A/300W Programmable Single-channel DC Electronic Load ACCESSORIES :

Power Cord (Region dependent), Front Terminal Washers-spring Washer (M6) x 2, GTL-105A Remote Sense Cables (Red x 1, Black x 1)

#### OPTIONAL ACCESSORIES

USB cable, Type A – Type B	GTL-262	RS-485 Slave cable
GPIB cable, 2.0m	GRA-414-J	Rack Mount Kit(JIS)
RS-232 Cable with Db9 connector to RJ45		Rack Mount Kit(EIA)
RS-485 Cable with DB9 connector to RJ45	PEL-010	Dust Filter
Serial Master Cable+Terminator, 0.5M	PEL-004	GPIB option

#### **Rear Panel**



#### PEL-010 Dust Filter



PEL-004 GPIB Option



GRA-414-J Rack Mount Kit (JIS)



GRA-414-E Rack Mount Kit (EIA)



GTL-259 GTL-260



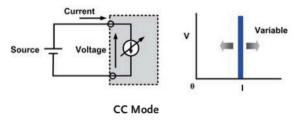


GTL-261 GTL-262

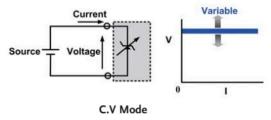


#### A. OPERATING MODE

The PEL-3000AE series provides four fundamental operating modes and three add-on modes of CC, CR and CP separately combining with CV. Users can set different load condition under different operating modes such as setting operating range for load level, Current Slew Rate, input voltage and load current. The input voltage

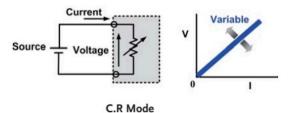


Under constant current mode, electronic load will sink the amount of current users has set. Different current settings via CC mode allow users to test the voltage changes of DC power supply which is called load regulation rate test.

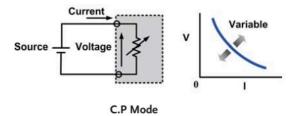


Under constant voltage mode, electronic load will sink sufficient current to regulate the voltage source to the set value. This mode allows users not only to test current limit function of power supply, but also to simulate battery operation in testing battery chargers.

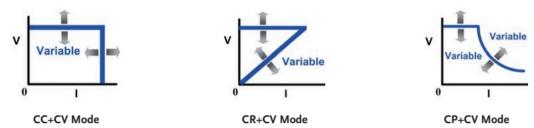
range has two levels - high and low. The load current operating range has two levels - high and low current levels which possess different resolution to meet test requirements of different power product specifications.



Under constant resistance mode, electronic load will sink load current, which is linearly direct proportion to input voltage. This mode can be utilized in testing voltage or the activation and current limit of power supply.



Under constant power mode, electronic load will sink load current, which is indirect proportion to input voltage to reach preset constant power requirement. Hence, the changes of input voltage will have indirect proportion effect on current sinking so as to reach constant power control.



+CV mode can be selected under CC, CR or CP mode. When +CV mode function is turned on and electronic load sinks more current than the maximum current of power supply under test, electronic load will automatically switch to CV mode. It is because that the current sunk is the maximum current of power device. Therefore,

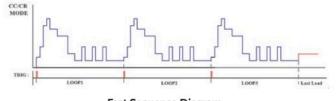
power supply will switch to CC mode and PEL-3000AE will switch to CV mode to limit electronic load from sinking the total current of power supply so as to prevent power supply under test from damaging. Electronic load will cease operation once the voltage of DUT is lower than the set voltage under + CV mode.

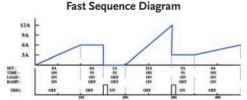
#### B. STATIC/DYNAMIC/SEQUENCE MODE

Operation	a	Dynamic	Sequence			
Function	Static Dynamic		Fast	Normal		
Operating Condition Selection	Single fixed condition	Selection between two conditions	Selection from more than two conditions	Selection from more than two conditions		
Operating Modes	All modes	Two conditions using same mode     Support CC or CR mode	Each condition must use same mode     Support CC or CR mode	Each condition is able to be used in different mode     All modes		
Adjustable Condition Setting	Value A/ Value B Slew Rate	Level 1/Level 2     Timer 1/Timer 2     Slew Rate 1/Slew Rate 2	Level	Level		
Sequence Step Combination	N/A	N/A	• 1 Sequence • 25µs/step • 1,000 steps	• 10 Sequence • 1ms/step • 1,000 steps		
Other Functions	N/A	Trigger Out function	Trigger Out function	Trigger Out function     Ramp function		

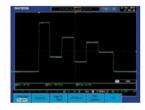
The PEL-3000AE Series, according to different test conditions, step or continuous changes, test speeds, and selectable modes, has three operating functions: Static, Dynamic and Sequence.

#### C. FAST SEQUENCE & NORMAL SEQUENCE





Normal Sequence Diagram



When operating the Sequence Function, PEL-3000AE Series follows the time and load settings of step1, step2, step3, etc. so as to realize different load current variation.



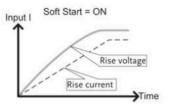
**Power-driven Tools Simulation Test** 

Set a complete sequence editing function to obtain following waveforms. Users can save development cost and time without using a PC to control electronic load and writing programs.

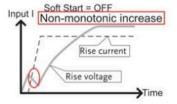


Ramp function of PEL-3000AE Series is able to set the current transition. When turned on, the current takes on a slope form; when turned off, the current takes on a step form.

#### D. SOFT START

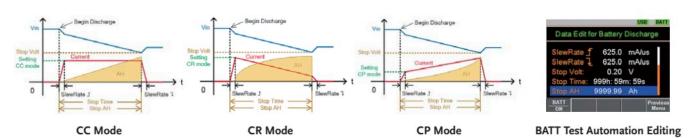


The Soft Start function of PEL-3000AE Series allows users to determine the rise time of current sink that is to decide how much time is required to reach electronic load's set current, resistance or power value. PEL-3000AE's soft start function prevents inrush current and surge voltage from happening on DUT.



For instance, test applications using a power supply, LED and a DC load (activate the soft start function) can prevent inrush current and surge voltage from causing damages on LED.

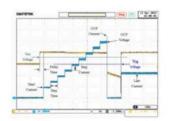
#### E. BATT TEST AUTOMATION



The built-in BATT Test Automation of PEL-3000AE provides battery discharge applications with more flexible discharge stop time setting as well as rise and fall Slew Rate for discharge current settings. Under CP, CC or CR mode, the conditions for stop discharge can be set respectively.

For instance, set the input voltage for stop discharge current, the execution time for discharge current or total discharge current\*time (AH) to satisfy the verification of battery capability.

#### F. OCP TEST AUTOMATION



OCP test Automation for DUT (Power Supply), Provide users with high resolution OCP measurement values to verify DUT's OCP activation point. Provide users with measurement results so as to help them determine whether DUT's actual OCP activation point meets the regulations. Test the value of OCP by setting load current increment from start current to stop current. OCP's activation point can be accurately measured.

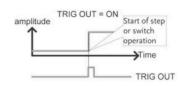
#### G. OPP TEST AUTOMATION

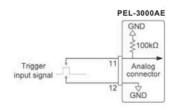


OPP test Automation for DUT (Power Supply), Provide users with high resolution OPP measurement values to verify DUT's OPP activation point. Provide users with measurement results so as to help them determine whether DUT's actual OPP activation point meets the regulations. Test the value of OPP by setting power increment from start power to stop power. OPP's activation point can be accurately measured.

#### H. TRIGGER IN/OUT BNC







Trigger In/Out function could be turned on or off by CONFIGURE setting of PEL-3000AE Series. The Trigger Input can be set the delay time while the Trigger Out Pulse Width can be set as well.

The trigger output signal is generated every time a switching operation is performed such as Dynamic mode or Fast/Normal sequence is executed when the trig out parameter is enabled.

The trigger output signal from TRIG OUT BNC is a 4.5V pulse of at least 2us with an impedance of 500ohm. The common

potential is connected to the chassis potential. The signal threshold level is TTL.

The TRIG IN BNC on the rear panel is used to resume a sequence after a pause. This action is useful to synchronize the execution of a sequence with another device. To resume a pause sequence, apply a high signal for 10us or more. The TRIG IN BNC is pulled down to earth internally using a 100Kohm resistor.

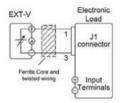
#### I. PROTECTION MODES

Protection Function	ОСР	OVP	ОРР	ОТР	UVP
Adjustable Thresholds	✓	✓	✓	N/A	✓
Load Off	✓	✓	✓	Fixed	✓
Limit Function	✓	N/A	✓	N/A	N/A

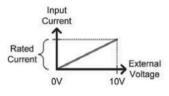
The PEL-3000AE Series provides many protective functions including over current protection (OCP), over voltage protection (OVP), over power protection (OPP), over temperature protection (OTP) and under voltage protection (UVP). Except for OTP, all thresholds

of protective functions are adjustable. When protective function is activated, electronic load will send out warning signal and terminate operation. Other than protective functions, Limit function can also

#### ANALOG EXTERNAL CONTROL

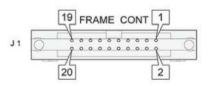


**External Voltage Control** 

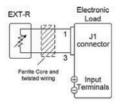


CC Mode

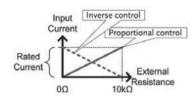
Input current = rated current x (external voltage/10)



J1 Connector



**External Resistance Control** 



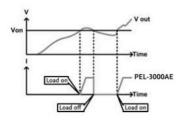
CC Mode

Proportional Control:Input current = rated current x (external resistance/10K ohm)

Inverse Control:Input current = rated current x (1- external resistance/10k ohm)

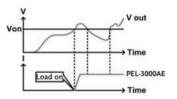
The PEL-3000AE Series provides the external analog channel control function, which allows users to connect J1 connectors on the rear panel to input voltage or to connect resistance to control electronic load operation. Users can integrate this function into test system and utilize signals generated from the test system to control PEL-3000AE Series.

#### K. VonN VOLTAGE AND Von LATCH FUNCTION



Von Latch = OFF

Von Voltage is the threshold voltage for electronic load to activate or terminate sinking current. When Von Latch is set to off, electronic load operation will be activated if input voltage is higher than Von Voltage and electronic load operation will be terminated if input voltage is lower than Von Voltage. When Von Latch is set to on, electronic load operation



Von Latch = ON

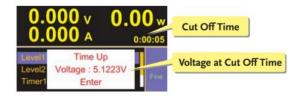
will be activated if input voltage is higher than Von Voltage and will continue operation even input voltage is lower than Von Voltage. Von Voltage function can test the transient maximum current capability provided by power supply.

#### L. TIMER FUNCTIONS



#### **Elapsed Time**

The PEL-3000AE series provides count time and cut off time functions. The display screen will show present activation time when electronic load is activated. When electronic load operation is terminated count time will stop and the total operation time will be shown on the display screen. The activation time of cut off time can be set to the maximum length of 999h 59min 59s. When electronic load is activated



#### Voltage at Cut Off Time

this function will start counting time. Electronic load will cease operation (load off) and show the final input voltage on the screen when preset time is reached. Timer function can provides information and application related to time. Users can obtain the total time of limiting electronic load operation to increase the agility of electronic load tests.



#### PEL-2004A



#### PEL-2002A



#### **FEATURES**

- \* Sequence Function to do High Speed Load Simulations
- \* Flexible Configuration with Mainframes and Plug-in Modules
- \* Multiple Independent Load Inputs up to 8 Channels in a Mainframe
- \* Parallel Connection of Inputs for Higher **Load Capacity**
- \* Program Mode to Create Work Routines for
- \* OPP/OCP/OVP/OTP/RVP/UVP Protections
- \* External Channel Control/Monitoring via **Analog Control Connector**
- \* Multiple-Interface USB Device/Host, RS-232C, and GPIB/LAN (Optional)

The PEL-2004A and PEL-2002A are multiple channel, programmable DC electronic loads with a modularized structure. The PEL-2000A Series is designed to meet the continuing shift toward high speed operation in today's semiconductor market. As the power supply units, DC-DC converters, and batteries that drive semiconductor circuits need to follow this shift, power supply design, quality inspection and characteristic certification using highspeed performance loads have become necessary. The PEL-2000A Series includes two types of mainframes and 4 types of load modules to accommodate users' requirements in a flexible manner. Any load module combination can be used with a mainframe to tailor a test system based on the number of channels, and the maximum load power, voltage and current of each channel. Multiple loads can be connected in parallel to provide a higher-power load to test higher power supply outputs. This flexibility significantly reduces the investment needed for future projects that have differed power requirements.

PEL-2004A is a 4-slot mainframe with a master control unit to hold 4 load modules, while PEL-2002A is a 2-slot mainframe with master control unit to hold 2 load modules. When PEL-2004A is configured with 4 load modules rated at 350W each, the PEL-2000A Series is able to sink up to 1.4kVA of power.

For higher load capacities, mainframes can be linked together in parallel with standard MIL 20-pin connectors. A maximum of 5 mainframes, including one master and 4 slaves can be chained together to create a total load capacity of 7kW for high current and high power applications. Using 4 dual channel load modules, PEL-2004A is able to test 8 power supply outputs simultaneously.

The Sequence function allows each channel to change its load sink according to a predefined sequence at a rate of up to  $100\mu s$  per step. Each sequence is able to run concurrently, under the control of one clock. This is one of the most powerful features of the PEL-2000A Series as it is able to realistically simulate a multi-output power supply load. Under Dynamic mode, the load current or load resistance pulses between two preset levels at a pre-defined speed up to 25µs per step. This is often used as the standard test procedure to verify the response of a power supply to quick load changes. Most remarkably, multiple load channels can be connected in parallel to run Dynamic tests synchronously under a single clock. This Parallel Dynamic functionality gives the flexibility to perform dynamic tests for a high-power power supply without the need of another high-power load.

The PEL-2000A Series includes a number of protection modes: Over Current Protection (OCP), Over Voltage Protection (OVP), Over Power Protection (OPP), Reverse Voltage Protection (RVP), and Under Voltage Protection(UVP). The protection modes are useful to protect both the load modules and the DUT(s).

A buzzer can be set for when a protection setting has been tripped. When a protection mode has been tripped, the load unit will display an alarm and stop sinking current/voltage. When a load unit is operating in CR or CV mode, the unit may need Over Current Protection to prevent excessive current being sunk. Over Current Protection stops the load from sinking more current than its recommended limit and prevents the load from burn-out damage. Over Voltage Protection is used to limit the amount of voltage sunk. If the OVP trips, the PEL-Series load will stop sinking voltage. Over Power Protection is used when the input power exceeds the specifications of the load. When OPP is tripped, the power will cease to be sunk. Reverse Voltage Protection prevents reverse voltage damage to the PEL-2000A Series up to the specified rating. When Reverse Voltage Protection has been tripped, an alarm tone will sound until the reverse voltage is removed. Under Voltage Protection will turn off the load when the voltage drops

The Go/NoGo function is available to monitor test results all the time. When a test result goes beyond a preset limit range, a "No Go" indication will be shown on the display and a "No Go" signal can be sent out through the D-SUB interface for external device control. This Go/NoGo function is available for CC mode, CV mode and CR mode. Under "Program" mode, 12 programs each containing 10 panel-setup memories, can be edited to create work routines for repetitive tests. After a program has been executed, the results of all test steps, along with the Go/NoGo judgments, will be shown on the screen. For external control and system configuration, the PEL-Series has USB and RS-232 interfaces as standard and LAN as well as GPIB as an option. The LabView driver and Data Logging PC software are both supported for all the available interfaces. Each channel has an analog control/monitoring connector on the rear panel to externally turn a load on/off and to externally monitor load input current and voltage.

#### PEL-001 GPIB Card

#### PEL-002 Rack Mount Kit

#### PFI -003 Panel Cover

PEL-016 LAN Card

(for PEL-2000A Main Frame)









GTL-249 Frame Link Cable



GTL-120 Test Lead



GTL-121 Sense Lead



SPECIFICATIONS	PEL-20 PEL-20	63 D 36 70		L-2030A/ L-2030B		PEL-20 PEL-20	(1) (1) (1)	PEL-20 PEL-20	
CHANNEL RANGE POWER CURRENT VOLTAGE MIN.OPERATING VOLTAGE (DC)(Typ.)	L/R Low 100W 0~2A 0~80V 0.4V at 2A 0.2V at 1A	L/R High 100W 0~20A 0~80V 0.8V at 20A 0.4V at 10A	Left N/A 30W 0-5A 0-80V 0.8V at 5A 0.4V at 2.5A	Right Low 250W 0-4A 0-80V 0.4V at 4A 0.2V at 2A	Right High 250W 0-40A 0-80V 0.8V at 40A 0.4V at 20A	One channel Low 350W 0~7A 0~80V 0.4V at 7A 0.2V at 3.5A	One channel High 350W 0~70A 0~80V 0.8V at 70A 0.4V at 35A	One channel Low 350W 0~1A 0~500V 0.4V at 1A 0.2V at 0.5A	One channel High 350W 0~10A 0~500V 0.8V at 10A 0.4V at 5A
STATIC MODE									
CONSTANT CURRENT MODE Operating Range Setting Range Resolution Accuracy	0-2A 0-2.04A 0.1mA ±(0.1%set + 0.1%F.S.)	0~20A 0~20.4A 1mA ±(0.1%set + 0.2%F.S.)	0-5A 0-5.1A 0.125mA ±(0.1%set + 0.1%F.S.)	0-4A 0-4.08A 0.1mA ±(0.1%set + 0.1%F.S.)	0~40A 0~40.8A 1mA ±(0.1%set + 0.2%F.S.)	0~7A 0~7.14A 0.2mA ±(0.1%set + 0.1%F.S.)	0~70A 0~71.4A 2mA ±(0.1%set+ 0.2%F.S.)	0~1A 0~1.02A 0.05mA ±(0.1%set+ 0.1%F.S.)	0~10A 0~10.2A 0.5mA ±(0.1%set+ 0.2%F.S.)
CONSTANT RESISTANCE MODE Operating Range	0.075Ω~300Ω 3.75Ω~15K(1	00W/80V)	0.3Ω~1.2KΩ(30W/16V) 15Ω~60K(30W/80V)	0.0375Ω~150Ω 1.875Ω~7.5K(25	*	0.025Ω~100Ω(3 1.25Ω~5K(350W		1.25Ω~5KΩ(3 50Ω~200K(35	
Setting Range		1	0.3Ω~1.2KΩ(30W/16V) 15Ω~60K(30W/80V)	0.0375Ω~150Ω 1.875Ω~7.5K(25		0.025Ω~100Ω(3 1.25Ω~5K(350W		1.25Ω~5Ω(35	1
Resolution Accuracy	3.75Ω~15K(100W/80V) 0.333mS(100W/16V) 6.667μS(100W/80V) 3.00Ω: ±(0.2%set+0.1S) 1.2KΩ:±(0.2%set+0.1S)			0.666mS (250W) 13.333μS (250W)	/16V) //80V)	1mS(350W/16V) 20μS(350W/80V) 100Ω: ±(0.2%se	) )	50Ω~200K(35 20μS(350W/1 0.5μS(350W/5 5KΩ:±(0.2%s	25V) 500V)
(with≥2.5V at input)	15KΩ: ±(0.19	1	60KΩ:±(0.1%set+0.01S)	150Ω:±(0.2%se 7.5KΩ:±(0.1%set		5KΩ: ±(0.1%set-		200KΩ:±(0.1%s	
CONSTANT VOLTAGE+ CONSTANT CURRENT MODE Operating Range Setting Range Resolution Accuracy	1~80V 0~81.6V 2mV ±(0.05%set +	- 0.1%F.S.)	1–80V 0–81.6V 2mV ±(0.05%set + 0.1%F.S.)				2.5~500V 0~510V 10mV ±(0.05%set + 0.1%F.S.)		
Current Setting Range Resolution	0~20A 1mA		0~5A 0.125mA	0~40A 1mA		0~70A 2mA		0~10A 0.5mA	
Accuracy	±(0.1%set +	0.2%F.S)		22		ZIIIA	,	U.JIIIA	
CONSTANT POWER MODE Operating Range* Setting Range Resolution Accuracy	1~10W 0~10.2W 1mW ±(0.5%set + 0.5%F.S)	1~100W 0~102W 10mW ±(0.5%set + 0.5%F.S)	1-30W 0-30.6W 1mW ±(0.5%set + 0.5%F.S)	1~25W 0~25.5W 1mW ±(0.5%set + 0.5%F.S)	1~250W 0~255W 10mW ±(0.5%set + 0.5%F.S)	1~35W 0~35.7W 1mW ±(0.5%set+ 0.5%F.S)	1~350W 0~357W 10mW ±(0.5%set+ 0.5%F.S)	1~35W 0~35.7W 1mW ±(0.5%set+ 0.2%F.S)	1~350W 0~357W 10mW ±(0.5%set+ 0.5%F.S)
DYNAMIC MODE	l l						- 12		25 72
T1&T2 Accuracy	0.025mS~10r 10mS~30S/R 1μS/1mS ± 1	les:1mS	0.025mS~10mS/Res: 10mS~30S/Res:1mS 1μS/1mS ± 100ppm	μS		0.025mS~10mS/Res:1µS 10mS~30S/Res:1mS 1µS/1mS±100ppm		0.025mS~10mS/Res:1μS 10mS~30S/Res:1mS 1μS/1mS±100ppm	
CONSTANT CURRENT MODE Slew Rate (±10%set+15µS) Slew Rate Resolution Slew Rate Accuracy of Setting Current Settong Range Current Resolution Current Accuracy	0.32mA/μS		0.8~200mA/μS 0.8mA/μS ±(10%+15μs) 0~5A 0.125mA ±0.4%F.S.	0.64~160mA/μS 0.64mA/μS ±(10%+15μs) 0~4A 0.1mA ±0.4%F.S.	6.4~1600mA/μS 6.4mA/ μS ±(10%+15μs) 0~40A 1mA ±0.4%F.S.	0.001~0.28A/μS 0.001A/μS ±(10%+15μs) 0~7A 0.2mA ±0.4% F.S.	0.01~2.8A/μS 0.01A/μS ±(10%+15μs) 0~70A 2mA ±0.4% F.S.	0.16~40mA/μS 0.16mA/μS ±(10%+15μs) 0~1A 0.05mA ±0.4%F.S.	1.6mA/µS
CONSTANT RESISTANCE MODE Slew Rate Slew Rate Resolution Slew Rate Accuracy of setting	0.32mA/μS	3.2~800mA/µS 3.2mA/µS ±(10%+15µs)	0.8~200mA/μS 0.8mA/μS ±(10%+15μs)	0.64–160mA/μS 0.64mA/μS ±(10%+15μs)	6.4~1600mA/μS 6.4mA/μS ±(10%+15μs)	0.001~0.28A/μS 0.001A/μS ±(10%+15μs)	0.01~2.8A/μS 0.01A/μS ±(10%+15μs)	0.16mA/µS	1.6~400mA/μS 1.6mA/μS ±(10%+15μs)
Resistance Setting Range	3.75Ω~15K(1		15Ω~60K(30W/80V)	0.0375Ω~150KΩ 1.875Ω~7.5K(2	50W/80V)	0.025Ω~100Ω(3 1.25Ω~5K(350W	/80V)	1.25Ω~5KΩ(3 50Ω~200K(35	0W/500V)
Resistance Resolution  Resistance Resolution	0.333mS(100 6.667μS(100\ 300Ω:±(0.5%	W/80V)	83.333μS(30W/16V) 1.666μS(30W/80V) 1.2KΩ:±(0.5%set+0.1S)	0.666mS(250W) 13.333μS(250W) 150Ω:±(0.5%se	//80V)	1mS(350W/16V) 20μS(350W/80V) 100Ω:±(0.5%set	)	20μS(350W/1 0.5μS(350W/! 5KΩ:±(0.5%s	500V)
Resistance Accuracy  MEASUREMENT	15KΩ:±(0.5%		60KΩ:±(0.5%set+0.01S)	7.5KΩ:±(0.5%s	7 1/55 135 7 T 15 16	5KΩ:±(0.5%set			6set + 0.005S)
VOLTAGE READBACK	Sr.			10		- A - A - A - A - A - A - A - A - A - A		138	CE SEE
Range Resolution	0~16V 0.32mV	0~80V 1.6mV	0~16V,0~80V 0.32mV,1.6mV	0~16V 0.32mV	0~80V 1.6mV	0~16V 0.32mV	0~80V 1.6mV	0~125V 2.5mV	0~500V 10mV
Accuracy	±(0.025%set	+ 0.025%F.S.)		4					
CURRENT READBACK Range Resolution	0~2A 0.04mA	0~20A 0.4mA	0~5A 0.1mA	0~4A 0.08mA	0~40A 0.8mA	0~7A 0.14mA	0~70A 1.4mA	0~1A 0.02mA	0~10A 0.2mA
Accuracy	±(0.05%set +			5.00.101	5.6	211 1101		e.vellirs	J. 2.1173
POWER READBACK Range	0~10W	0~100W	0~30W	0~25W	0~250W	0~35W	0~350W	0~35W	0~350W
Accuracy	±(0.1%set +	0.10/EC*1		O) 0			±1 ⋅ Do	ver F.S.=Vrange F.	27



#### PEL-2004A Rear Panel



#### PEL-2020A Rear Panel



## PEL-2000A(B) Series

SPECIFICATIONS									
	PEL-2	020A/ 020B		PEL-2030A/ PEL-2030B		6000000	2040A/ 2040B	PEL-20 PEL-20	
PROTECTION									
OVER POWER PROTECTION Range Resolution Accuracy OVER CURRENT PROTECTION Range Resolution Accuracy OVER VOLTAGE PROTECTION Range Resolution Accuracy Over Temperature Protection RATED POWER PROTECTION Value	1-102W 0.5W ±(2%set+0.25 0-20.4A 0.05A ±(2%set+0.25 1-81.6V 0.2V ±(2%set+0.25 = 85°C	%F.S.)	1~30.6W 0.15W ±(2%set+0.25%F.S.) 0~5.1A 0.0125A ±(2%set+0.25%F.S.) 1~81.6V 0.2V ±(2%set+0.25%F.S.) = 85°C 33W	1~255W 1.25W ±(2%set+0.25 0~40.8A 0.1A ±(2%set+0.25 1~81.6V 0.2V ±(2%set+0.25 = 85°C	%F.S.)	1-357W 1.75W ±(2%set+0.25%F.S.) 0-71.4A 0.175A ±(2%set+0.25%F.S.) 1-81.6V 0.2V ±(2%set+0.25%F.S.) = 85°C 385W ±(2%set)		1-357W 1.75W ±(2%set+0.25%F.S.) 0-10.2A 0.025A ±(2%set+0.25%F.S.) 1-510V 1.25V ±(2%set+0.25%F.S.) = 85°C 385W	
Accuracy GENERAL	±(2%set)		±(2%set)	±(2%set)		±(2705et)		±(2%set)	
SHORT CIRCUIT Current(CC) Voltage(CV) Resistance(CR)	⇒ 2.2/2A 0V ⇒ 3.75Ω	≒22/20A 0V ≒0.075Ω	⇒ 5.5/5A 0V ⇒ 15Ω , ⇒ 0.3Ω	= 4.4/4A 0V = 1.875Ω	≒44/40A 0V ≒0.0375Ω	≒7.7/7A 0V ≒1.25Ω	≒77/70A 0V ≒0.025Ω	≒1.1/1A 0V ≒15Ω,≒50Ω	≒11/10A 0V ≒1.25Ω
INPUT RESISTANCE(LOAD OFF	5)								
	500KΩ(Typic	al)							
POWER SOURCE	AC100V ~ 23	OV ± 10%; 50	Hz / 60Hz ± 2Hz						
WEIGHT	Approx. 3.8	3 kg							
DIMENSIONS & WEIGHT (PEL-2002A)	272(W) x 2	00(H) x 581	(D) mm ; Approx.	17.1kg(full mo	dules)				
DIMENSIONS & WEIGHT (PEL-2004A)	435 (W) x 2	00(H) x 581	(D) mm ; Approx.	28.4kg(full mo	dules)				

## ORDERING INFORMATION

PEL-2020A/2020B Dual Channel Module, (0~80V, 0~20A, 100W) x 2

PEL-2030A/2030B Dual Channel Module, (1~80V, 0~5A, 30W)+(1~80V, 0~40A, 250W)

PEL-2040A/2040B Single Channel Module, (0–80V, 0~70A, 350W)
PEL-2041A/2041B Single Channel Module, (0–500V, 0~10A, 350W)
PEL-2004A 4-Slot Programmable DC Electronic Load Mainframe
PEL-2002A 2-Slot Programmable DC Electronic Load Mainframe

Note: Load module cannot be used without a mainframe

ACCESSORIES :

PEL-2002A/2004A Power Cord x1

PEL-2020A/2020B/2030A/2030B/2040A/2040B/2041A/2041B GTL-120 Test Lead x 1, GTL-121 Sense Lead x 1

\* PEL-003 x 3 (PEL-2004A); PEL-003 x 1 (PEL-2002A)

OPTIONAL ACCESSORIES

 PEL-001
 GPIB Card
 GTL-248
 GPIB Cable (2m)

 PEL-002
 PEL-2000A(B) Series Rack Mount Kit
 GTL-249
 Frame Link Cable

PEL-003 Panel Cover GTL-246 USB Cable, USB 2.0 A-B TYPE CABLE, 4P

PEL-016 LAN Card (for PEL-2000A(B) Main Frame) GTL-232 RS-232C Cable, 9-pin, F-F Type, null modem, 2000mm

#### MODULARIZED STRUCTURE/PROGRAM & INTERFACE

#### Modularized Structure

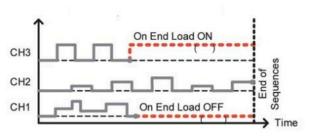
PEL-2004A is a 4-slot mainframe with a master control unit made to hold 4 load modules, and PEL-2002A is a 2-slot mainframe with a master control unit made to hold 2 load modules. The modularized structure of the PEL-2000A Series allows any combination of mainframe and load module (PEL-2020A, PEL-2030A, PEL-2040A, PEL-2041A) to be integrated into a custom-tailored system.

Multiple loads within the same mainframe can be connected in parallel to perform both static and dynamic tests. This flexibility makes the PEL-2000A Series a very cost-effective instrument for testing a broad range of power supply outputs.

#### Program & Interface

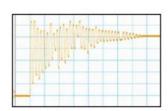
The PEL-2000A Series supports a total of 12 different programs and 10 sequences to each program. With a total of up to 120 different configurations. For external control and system configuration, the PEL-Series has USB and RS-232 interfaces as standard and GPIB as an option. The LabView driver and Data Logging PC software are supported for all the interfaces available. Each channel has an analog control/monitoring connector to externally turn a load on/off and to externally monitor load input current and voltage.

#### B. AUTOMATICALLY SEQUENCE FUNCTION



Sequence - On End Load

The Sequence function allows each channel to change its load sink according to a predefined sequence at a rate of up to  $100\,\mu s$  per step. Each sequence is able to run concurrently, under the control of one clock. This is one of the most powerful features of the PEL-2000A Series as it is able to realistically simulate a multi-output power supply load. Under Dynamic mode, the load current or load resistance pulses between two preset levels at a pre-defined speed up to  $25\,\mu s$  per step. This is often used as the standard test procedure to verify the response of a power supply to quick load changes.

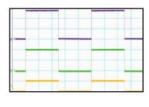


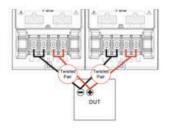
The figure above shows the current waveform of a simulation using the sequence function.

The picture above is an example of a sequence used as a load profile for a single output switching power supply. A load profile is programmed to simulate the current drawn of a power supply load.

By using a current probe to acquire a current waveform, PEL-2000A Series is able to evaluate the performance of a power supply based on the load sequence that is programmed. An oscilloscope is then used to display the result.

#### C. PARALLEL DYNAMIC LOADING



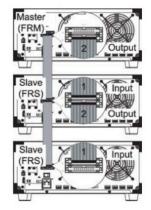


**Dynamic Test** 

Wire Connection

All the load channels in a PEL-2000A Series mainframe can be connected in parallel to perform any combination of static or dynamic loading. Under Dynamic mode, the load current or load resistance pulses between two preset levels at a predefined speed of up to  $25\,\mu s$  per step. When the channels are connected in parallel, dynamic tests are synchronously clocked. The ability to perform parallel dynamic loading gives you the flexibility to perform dynamic tests to high-power power supplies without the need for a dedicated high power electronic load.

#### D. FRAMELINK



The PEL-2000A Series allows multiple mainframes to be linked together with standard MIL 20-pin connectors to provide higher power load capacity. A maximum of 5 mainframes, including one master and 4 slaves, can be chained together to give a 7kW load capacity for high current and high power applications.



#### PEL-5000C Series



#### **FEATURES**

- \* Maximum Power up to 192kW
- \* Up to 8 units of Master/Slave Parallel Control
- \* 5-digit Digital Voltage, Current and Power Meter
- \* Large LCD Display
- \* Display Voltage Value, Current Value, Watt Value at the Same Time
- \* Suitable for Power Factor Regulator (PFC) Testing (600V, 1200V Models)
- \* Automatically Perform OCP, OPP Test
- \* The Power-on State Value Can be Set
- \* Constant Current, Constant Resistance, Constant Voltage, Constant Power, Constant Current + Constant Voltage, Constant Power + Constant Voltage, Dynamic and Short Circuit Modes
- \* Short Circuit Time Can be Set During Short Circuit Test
- \* Over Current, Over Power, Over Temperature Protection and Over Voltage Warning
- \* Voltage Polarity Display Can be Set to Positive Value ("+") or Negative Value ("-")
- \* Support Solar Panel MPPT Test
- \* Optional Interface: GPIB, RS232, USB, LAN

#### Rear Panel



GW Instek PEL-5000C series single-channel electronic load provides 150V/ 600V/ 1200V models with a power range of 8kW~24kW. PEL-5000C has a total of 24 models featuring different combinations of power, voltage, and current. It can test and verify the specifications of batteries, electric vehicle chargers/charging stations, electric vehicle batteries and solar panels. PEL-5000C supports parallel connection for same voltage specification and different power models. PEL-5000C can support up to 8 units connected in parallel to provide a maximum power of 192kW.

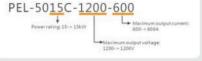
For the scenario of battery testing, PEL-5000C specifically provides four battery discharge modes, namely CC+CV battery discharge test mode, CP+CV battery discharge test mode, CC+ UVP battery discharge test mode, and CP+ UVP battery discharge test mode. Users can choose a suitable test mode according to the test requirements. In addition to the four battery discharge modes, PEL-5000C also provides Time period discharge, Pulse discharge, and RAMP discharge modes. Users can set the discharge time, or discharge in the pulse current mode, or even set the rising/falling slew rate of the discharge current. These functions can be very flexible in the simulation of the battery discharge current waveform when an electric vehicle is running.

In order to meet the verification requirements of different DUTs, PEL-5000C provides a variety of test functions, including inrush current test mode, solar panel MPPT test mode, automated OCP, OPP test functions and 150 sets of parameter storage function. The 1200V model of PEL-5000C not only provides full power output at 1000V, but also provides 60% power output at 1200V output, which is higher than the 50% power output of other manufacturers of similar electronic loads. High-voltage batteries or chargers directly connected to the electronic load may cause damage to the electronic load. PEL-5000C has a built-in slow starter, which not only protects the DC load, but also saves the user's installation cost and setting time for measurement.

The communication interfaces supported by PEL-5000C include GPIB, RS232, USB, and LAN. The power, voltage and current of each model are shown in the following table:

#### ORDERING INFORMATION

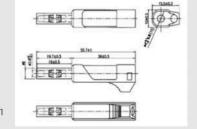
PEL-5008C-150-800	150V/800A/8kW	High Power DC Electronic Load
PEL-5010C-150-1000	150V/1000A/10kW	High Power DC Electronic Load
PEL-5012C-150-1200	150V/1200A/12kW	High Power DC Electronic Load
PEL-5015C-150-1500	150V/1500A/15kW	High Power DC Electronic Load
PEL-5018C-150-1800	150V/1800A/18kW	High Power DC Electronic Load
PEL-5020C-150-2000	150V/2000A/20kW	High Power DC Electronic Load
PEL-5024C-150-2000	150V/2000A/24kW	High Power DC Electronic Load
PEL-5008C-600-560	600V/560A/8LW	High Power DC Electronic Load
PEL-5010C-600-700	600V/700A/10kW	High Power DC Electronic Load
PEL-5012C-600-840	600V/840A/12kW	High Power DC Electronic Load
PEL-5015C-600-1050	600V/1050A/15kW	High Power DC Electronic Load
PEL-5018C-600-1260	600V/1260A/18kW	High Power DC Electronic Load
PEL-5020C-600-1400	600V/1400A/20kW	High Power DC Electronic Load
PEL-5024C-600-1680	600V/1680A/24kW	High Power DC Electronic Load
PEL-5008C-1200-320	1200W/320A/RkW	High Power DC Electronic Load
PEL-5010C-1200-400	1200V/400A/10kW	High Power DC Electronic Load
PEL-5012C-1200-480	1200V/480A/12kW	High Power DC Electronic Load
PEL-5015C-1200-600	1200V/600A/15kW	High Power DC Electronic Load
PEL-5018C-1200-720	1200V/720A/18kW	High Power DC Electronic Load
PEL-5020C-1200-800	1200V/800A/20kW	High Power DC Electronic Load
PEL-5024C-1200-960	1200V/960A/24kW	High Power DC Electronic Load



PEL-027-3 Rack Mount Kit For PEL-5015C, PEL-5018C
PEL-027-4 Rack Mount Kit For PEL-5020C, PEL-5024C
PEL-028 HANDLES, U-shaped Handle(fixed to the bracket)

#### STANDARD ACCESSORIES

PEL-5000C Series operation manual
BANANA PLUGS: Please refer to Fig.1 x 1
BNC – BNC CABLE: BNC to BNC CABLE, 1m x 1
HD-DSUB: 15PIN Parallel wire Parallel Wire x 1



#### **OPTIONAL ACCESSORIES**

PEL-022	GPIB Card	PEL-030	GPIB+RS-232 Card
PEL-023	RS-232 Card	GTL-246	USB Cable, USB 2.0, A-B Type, 1200mm
PEL-024	LAN Card	GTL-248	GPIB Cable, Double Shielded, 2000mm
PEL-025	USB Card	GTL-250	GPIB Cable, Double Shielded, 600mm
PEL-026	Hook Ring x 4		
PEL-027-1	Rack Mount Kit For PEL-5006C		
PEL-027-2	Rack Mount Kit For PEL-5008C, PEL-5010C, F	EL-5012C	

Note: \* Regarding the product delivery date, please contact your regional sales representative.

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PEL-5008C-150-800 PEL-5008C-600-560 PEL-5008C-1200-320



PEL-5010C-150-1000 PEL-5010C-600-700 PEL-5010C-1200-400



PEL-5012C-150-1200 PEL-5012C-600-840 PEL-5012C-1200-480



PEL-5015C-150-1500 PEL-5015C-600-1050 PEL-5015C-1200-600



PEL-5018C-150-1800 PEL-5018C-600-1260 PEL-5018C-1200-720



PEL-5020C-150-2000 PEL-5020C-600-1400 PEL-5020C-1200-800



PEL-5024C-150-2000 PEL-5024C-600-1680 PEL-5024C-1200-960

Power / Voltage	150V	600V	1200V
8kW	PEL-5008C-150-800 (800A)	PEL-5008C-600-560 (560A)	PEL-5008C-1200-320 (320A)
10kW	PEL-5010C-150-1000 (1000A)	PEL-5010C-600-700 (700A)	PEL-5010C-1200-400 (400A)
12kW	PEL-5012C-150-1200 (1200A)	PEL-5012C-600-840 (840A)	PEL-5012C-1200-480 (480A)
15kW	PEL-5015C-150-1500 (1500A)	PEL-5015C-600-1050 (1050A)	PEL-5015C-1200-600 (600A)
18kW	PEL-5018C-150-1800 (1800A)	PEL-5018C-600-1260 (1260A)	PEL-5018C-1200-720 (720A)
20kW	PEL-5020C-150-2000 (2000A)	PEL-5020C-600-1400 (1400A)	PEL-5020C-1200-800 (800A)
24kW	PEL-5024C-150-2000 (2000A)	PEL-5024C-600-1680 (1680A)	PEL-5024C-1200-960 (960A)

PEL-022 GPIB Card

PEL-023 RS-232 Card

PEL-024 LAN Card

PEL-025 USB Card



PEL-026 Hook Ring



PEL-027-1~4 Rack Mount Kit



PEL-028 Handles









SPECIFICATIONS						
MODEL	PEL-5008	C-150-800	PEL-50100	C-150-1000	PEL-50120	C-150-1200
Power <sup>2</sup> 1	81	¢W	10	k W	121	kW
Current	0 ~ 80A	0 ~ 800A	0 ~ 100A	0 ~ 1000A	0 ~ 120A	0 ~ 1200A
Voltage Min. Operating Voltage	0.7V @	0 ~ 1		1000A	0.7V @	1200A
Protections	0.71	00011	0.77	100011	0.71	120071
Over Power Protection (OPP)		105				
Over Current Protection (OCP) Over Voltage Protection (OVP)		104				
Over Temp Protection (OTP)	1	90°C				
Constant Current Mode		,,,,				1
Range <sup>e2</sup>	80A	800A	100A	1000A	120A	1200A
Resolution Accuracy <sup>23</sup>	1.28mA	12.8mA ± 0.05% of (Se	1.6mA	16mA	1.92mA	19.2mA
Constant Resistance Mode		± 0.03% 01 (3e	ttilig + Kalige)			
Range	11250Ω~0.1875Ω	0.1875Ω~0.0009Ω	9000Ω~0.15Ω	0.15Ω~0.0007Ω	7500Ω~0.125Ω	0.125Ω~0.0006Ω
Resolution	88.888µS	3.125μΩ	111.111µS	2.5μΩ	133.333µS	2.084μΩ
Accuracy Constant Voltage Mode		±0.2% of (Set	ting + Kange)			
Range		15	0V			
Resolution		2.5				
Accuracy Constant Power Mode		± 0.05% of (Se	tting + Kange)			
Range	800W	8000W	1000W	10000W	1200W	12000W
Resolution	12.8mW	128mW	16mW	160mW	19.2mW	192mW
Accuracy	± 0.1% of	± 0.1% of	± 0.1% of	± 0.1% of (Setting+Range)	± 0.1% of	± 0.1% of
Constant Voltage Mode + Constant Current Mode	(Setting+Range)	(Setting+Range)	(Setting+Range)	(Setting+Range)	(Setting+Range)	(Setting+Range)
Range	150V	800A	150V	1000A	150V	1200A
Resolution	2.5mV	12.8mA	2.5mV	3.2mA	2.5mV	19.2mA
Accuracy Constant Voltage Mode + Constant Power Mode		± 1.0% of (Set	ting + Range)			
Range	150V	8000W	150V	10000W	150V	12000W
Resolution	2.5mV	128mW	2.5mV	160mW	2.5mV	192mW
Accuracy		± 1.0% of (Set	ting + Range)			
Surge Test Surge & Normal current	Ι ο	-800A	0.10	000A	0~12	2004
Surge time		1000ms		000M 000ms	10~10	
Surge step	2-	1~	-5			
MPPT Mode						
MPPT Mode	T	nº	0			
Algorithm		P&				
Algorithm Load mode P&O interval	1	P& C 000ms~60000ms ;	V	15		
Algorithm Load mode P&O interval Dynamic Mode	1	C	V	15		
Algorithm Load mode P&O interval Dynamic Mode Timing		C 000ms~60000ms ;	V resolution 1000m			
Algorithm Load mode P&O interval Dynamic Mode		C 000ms~60000ms ; 0.010~9.999 / 99.9	V resolution 1000m			
Algorithm Load mode P&O interval Dynamic Mode Timing Thigh & Tlow Resolution Accuracy		C 000ms~60000ms ; 0.010~9.999 / 99.9 0.001 / 0.01 1µs / 10µs / 100µ	V resolution 1000m 9 / 999.9 / 9999m / 0.1 / 1ms us / 1ms + 50ppm	s		
Algorithm Load mode P&O interval Dynamic Mode Timing Thigh & Tlow Resolution Accuracy Slew Rate	0.0192A~1.2A/μs	0.00ms~60000ms; 0.010~9.999 / 99.9 0.001 / 0.01 1µs / 10µs / 100µ 0.192A~12A/µs	V resolution 1000m 9 / 999.9 / 9999m / 0.1 / 1ms us / 1ms + 50ppm 0.024A~1.5A/µs	s 0.24A~15A/μs	0.0288A~1.8A/µs	0.288A~18A/µs
Algorithm Load mode P&O interval Dynamic Mode Timing Thigh & Tlow Resolution Accuracy Slew Rate Resolution		0.010~9.999 / 99.9 0.001 / 0.01 1µs / 10µs / 100µ 0.192A~12A/µs 0.048A/µs	V resolution 1000m 9 / 999.9 / 9999m / 0.1 / 1ms us / 1ms + 50ppm 0.024A~1.5A/µs 0.006A/µs	s	0.0288A~1.8A/µs 0.0072A/µs	0.288A~18A/μs 0.072A/μs
Algorithm Load mode P&O interval Dynamic Mode Timing Thigh & Tlow Resolution Accuracy Slew Rate	0.0192A~1.2A/μs	0.00ms~60000ms; 0.010~9.999 / 99.9 0.001 / 0.01 1µs / 10µs / 100µ 0.192A~12A/µs	V resolution 1000m 9 / 999.9 / 9999m / 0.1 / 1ms us / 1ms + 50ppm 0.024A-1.5A/µs 0.006A/µs typical)	s 0.24A~15A/μs	0.0072A/μs	
Algorithm Load mode P&O interval Dynamic Mode Timing Thigh & Tlow Resolution Accuracy Slew Rate Resolution Min. Rise Time Current Range	0.0192A~1.2A/µs 0.0048A/µs	C000ms-60000ms; 0.010~9.999 / 99.9 0.001 / 0.01 1µs / 10µs / 100µ 0.192A-12A/µs 0.048A/µs 66.7µs( 80~800A	V resolution 1000m 9 / 999.9 / 9999m / 0.1 / 1 / 1ms s: / 1ms + 50ppm 0.024A-1.5A/µs 0.006A/µs typical) 0-100A	s 0.24A~15A/μs 0.06A/μs 100~1000A	0.0072A/μs 0~120A	0.072A/μs 120~1200A
Algorithm Load mode P&O interval Dynamic Mode Timing Thigh & Tlow Resolution Accuracy Slew Rate Resolution Min. Rise Time Current Range Resolution	0.0192A~1.2A/µs 0.0048A/µs	C 000ms-60000ms; 0.010-9.999 / 99.9 0.001 / 0.01 1µs / 10µs / 100µ 0.192A-12A/µs 0.048A/µs 66.7µs(	V resolution 1000m 9 / 999.9 / 9999m / 0.1 / 1ms us / 1ms + 50ppm 0.024A-1.5A/µs 0.006A/µs typical)	s 0.24Α~15Α/μs 0.06Α/μs	0.0072A/μs	0.072A/µs
Algorithm Load mode P&O interval Dynamic Mode Timing Thigh & Tlow Resolution Accuracy Slew Rate Resolution Min. Rise Time Current Range	0.0192A~1.2A/µs 0.0048A/µs	C000ms-60000ms; 0.010~9.999 / 99.9 0.001 / 0.01 1µs / 10µs / 100µ 0.192A-12A/µs 0.048A/µs 66.7µs( 80~800A	V resolution 1000m 9 / 999.9 / 9999m / 0.1 / 1 / 1ms s: / 1ms + 50ppm 0.024A-1.5A/µs 0.006A/µs typical) 0-100A	s 0.24A~15A/μs 0.06A/μs 100~1000A	0.0072A/μs 0~120A	0.072A/μs 120~1200A
Algorithm Load mode P&O interval  Dynamic Mode Timing Thigh & Tlow Resolution Accuracy Slew Rate Resolution Min. Rise Time Current Range Resolution Measurement Voltage Read Back Range (5 Digital)	0.0192A-1.2A/µs 0.0048A/µs 0~80A 1.28mA	C000ms-60000ms; 0.010~9.999 / 99.9 0.001 / 0.01 1µs / 10µs / 100µ 0.192A-12A/µs 0.048A/µs 66.7µs( 80~800A 12.8mA	V resolution 1000m 9 / 999.9 / 9999m / 0.1 / 1 ms ss / 1ms + 50ppm 0.024A-1.5A/µs 0.006A/µs typical)  0~100A 1.6mA	S 0.24A~15A/μs 0.06A/μs 100~1000A 16mA	0.0072A/µs  0~120A 1.92mA	0.072A/µs 120~1200A 19.2mA
Algorithm Load mode P&O interval Dynamic Mode Timing Thigh & Tlow Resolution Accuracy Slew Rate Resolution Min. Rise Time Current Range Resolution Measurement Voltage Read Back Range (5 Digital) Resolution	0.0192A~1.2A/µs 0.0048A/µs 0~80A 1.28mA	C 000ms-60000ms; 0.010-9.999 / 99.9 0.001 / 0.01 1µs / 10µs / 100µ 0.192A-12A/µs 0.048A/µs 66.7µs( 80~800A 12.8mA	V resolution 1000m 9 / 999.9 / 9999m / 0.1 / 1ms ss / 1ms + 50ppm 0.024A-1.5A/µs 0.006A/µs typical) 0-100A 1.6mA	0.24A~15A/μs 0.06A/μs 100~1000A 16mA	0.0072A/µs 0~120A 1.92mA	0.072A/µs 120~1200A 19.2mA
Algorithm Load mode P&O interval Dynamic Mode Timing Thigh & Tlow Resolution Accuracy Slew Rate Resolution Min. Rise Time Current Range Resolution Measurement Voltage Read Back Range (5 Digital) Resolution Accuracy	0.0192A-1.2A/µs 0.0048A/µs 0~80A 1.28mA	C 000ms-60000ms; 0.010-9.999 / 99.9 0.001 / 0.01 1µs / 10µs / 100µ 0.192A-12A/µs 0.048A/µs 66.7µs( 80~800A 12.8mA	V resolution 1000m 9 / 999.9 / 9999m / 0.1 / 1 ms ss / 1ms + 50ppm 0.024A-1.5A/µs 0.006A/µs typical)  0~100A 1.6mA	S 0.24A~15A/μs 0.06A/μs 100~1000A 16mA	0.0072A/µs  0~120A 1.92mA	0.072A/µs  120~1200A 19.2mA
Algorithm Load mode P&O interval  Dynamic Mode Timing Thigh & Tlow Resolution Accuracy Slew Rate Resolution Min. Rise Time Current Range Resolution Measurement Voltage Read Back Range (5 Digital) Resolution Accuracy	0.0192A~1.2A/µs 0.0048A/µs 0~80A 1.28mA	C0000ms-60000ms; 0.010-9.999 / 99.9 0.001 / 0.01 1	V resolution 1000m 9 / 999.9 / 9999m / 0.1 / 1ms sis / 1ms + 50ppm 0.024A-1.5A/µs 0.006A/µs typical)  0~100A 1.6mA  0~15V 0.25mV eading + Range)	0.24A~15A/μs 0.06A/μs  100~1000A 16mA  15~150V 2.5mV	0.0072A/μs  0120A 1.92mA  015V 0.25mV	0.072A/µs  120~1200A  19.2mA  15~150V  2.5mV
Algorithm Load mode P&O interval Dynamic Mode Timing Thigh & Tlow Resolution Accuracy Slew Rate Resolution Min. Rise Time Current Range Resolution Measurement Voltage Read Back Range (5 Digital) Resolution Accuracy Current Read Back Range (5 Digital) Resolution Resolution Resolution Accuracy Current Read Back Range (5 Digital) Resolution	0.0192A~1.2A/µs 0.0048A/µs 0~80A 1.28mA	C000ms-60000ms; 0.010-9.999 / 99.9 0.001 / 0.01 1µs / 10µs / 100µ 0.192A-12A/µs 0.048A/µs 66.7µs( 80~800A 12.8mA  15-150V 2.5mV ±0.025% of (Re 80~800A 12.8mA	V resolution 1000m 9 / 999.9 / 9999m / 0.1 / 1ms is / 1ms + 50ppm 0.024A-1.5A/µs 0.006A/µs typical) 0~100A 1.6mA  0~15V 0.25 mV eading + Range) 0~100A 1.6mA	0.24A~15A/μs 0.06A/μs 100~1000A 16mA 15~150V 2.5mV	0.0072A/μs  0~120A 1.92mA  0~15V 0.25mV	0.072A/μs  120~1200A  19.2mA  15~150V  2.5mV
Algorithm Load mode P&O interval  Dynamic Mode Timing Thigh & Tlow Resolution Accuracy Slew Rate Resolution Min. Rise Time Current Range Resolution Measurement Voltage Read Back Range (5 Digital) Resolution Accuracy	0.0192A~1.2A/µs 0.0048A/µs 0~80A 1.28mA	C000ms-60000ms; 0.010-9.999 / 99.9 0.001 / 0.01 1µs / 10µs / 100µ 0.192A-12A/µs 0.048A/µs 66.7µs( 80~800A 12.8mA  15-150V 2.5mV ±0.025% of (Re 80~800A 12.8mA	V resolution 1000m 9 / 999.9 / 9999m / 0.1 / 1ms sis / 1ms + 50ppm 0.024A-1.5A/µs 0.006A/µs typical)  0~100A 1.6mA  0~15V 0.25mV eading + Range)	0.24A~15A/μs 0.06A/μs  100~1000A 16mA  15~150V 2.5mV	0.0072A/μs  0120A 1.92mA  015V 0.25mV	0.072A/μs  120~1200A  19.2mA  15~150V  2.5mV
Algorithm Load mode P&O interval Dynamic Mode Timing Thigh & Tlow Resolution Accuracy Slew Rate Resolution Min. Rise Time Current Range Resolution Measurement Voltage Read Back Range (5 Digital) Resolution Accuracy	0.0192A~1.2A/µs 0.0048A/µs 0~80A 1.28mA 0~15V 0.25mV	C000ms-60000ms; 0.010-9.999 / 99.9 0.001 / 0.01 1µs / 10µs / 100µ 0.192A-12A/µs 0.048A/µs 66.7µs( 80~800A 12.8mA  15-150V 2.5mV ±0.025% of (Re 80~800A 12.8mA	V resolution 1000m 9 / 999.9 / 9999m / 0.1 / 1 / 1ms s: / 1ms + 50ppm 0.024A-1.5A/µs 0.006A/µs typical)  0-100A 1.6mA  0-15V 0.25mV vading + Range)  0-100A 1.6mA  ading + Range)	0.24A~15A/μs 0.06A/μs  100~1000A 16mA  15~150V 2.5mV	0.0072A/µs  0.0072A/µs  0.0072A/µs  0.0072A/µs  0.0072A/µs  0.0072A/µs  0.0072A/µs	0.072A/µs  120~1200A  19.2mA  15~150V  2.5mV
Algorithm Load mode P&O interval Dynamic Mode Timing Thigh & Tlow Resolution Accuracy Slew Rate Resolution Min. Rise Time Current Range Resolution Measurement Voltage Read Back Range (5 Digital) Resolution Accuracy Current Read Back Range (5 Digital) Resolution Accuracy Current Read Back Range (5 Digital) Resolution Accuracy Current Read Back Range (5 Digital) Resolution Accuracy Power Read Back Range (5 Digital) Resolution Accuracy Power Read Back Range (5 Digital) Accuracy	0.0192A~1.2A/µs 0.0048A/µs 0~80A 1.28mA 0~15V 0.25mV	C000ms-60000ms; 0.010-9.999 / 99.9 0.001 / 0.01 1µs / 10µs / 100µ 0.192A-12A/µs 0.048A/µs 66.7µs( 80~800A 12.8mA  15-150V 2.5mV ±0.025% of (Re 80~800A 12.8mA	V resolution 1000m 9 / 999.9 / 9999m / 0.1 / 1 / 1ms s: / 1ms + 50ppm 0.024A-1.5A/µs 0.006A/µs typical)  0-100A 1.6mA  0-15V 0.25mV vading + Range)  0-100A 1.6mA  ading + Range)	5 0.24A~15A/μs 0.06A/μs 100~1000A 16mA 15~150V 2.5mV	0.0072A/µs  0.0072A/µs  0.0072A/µs  0.0072A/µs  0.0072A/µs  0.0072A/µs  0.0072A/µs	0.072A/μs  120~1200A  19.2mA  15~150V  2.5mV  120~1200A  19.2mA
Algorithm Load mode P&O interval Dynamic Mode Timing Thigh & Tlow Resolution Accuracy Slew Rate Resolution Min. Rise Time Current Range Resolution Measurement Voltage Read Back Range (5 Digital) Resolution Accuracy Current Read Back Range (5 Digital) Resolution Accuracy Current Read Back Range (5 Digital) Resolution Accuracy Current Read Back Range (5 Digital) Resolution Accuracy Power Read Back Range (5 Digital) Accuracy Power Read Back Range (5 Digital) Accuracy Ceneral	0.0192A-1.2A/µs 0.0048A/µs 0~80A 1.28mA 0~15V 0.25mV	C000ms-60000ms; 0.010-9.999 / 99.9 0.001 / 0.01 1ps / 10ps / 100p 0.192A-12A/µs 0.048A/µs 66.7µs(  80~800A 12.8mA  15~150V 2.5mV ±0.025% of (Re: 80~800A 12.8mA ±0.05% of (Re:	V resolution 1000m 9 / 999.9 / 9999m / 0.1 / 1ms ss / 1ms + 50ppm 0.024A-1.5A/µs 0.006A/µs typical)  0~100A 1.6mA  0~15V 0.25mV ading + Range)  0~100A	S 0.24A~15A/μs 0.06A/μs 0.06A/μs 100~1000A 16mA 15~150V 2.5mV 100~1000A 16mA	0.0072A/µs  0.0072A/µs  0.120A 1.92mA  0.15V 0.25mV  0.120A 1.92mA	0.072A/μs  120~1200A  19.2mA  15~150V  2.5mV  120~1200A  19.2mA
Algorithm Load mode P&O interval Dynamic Mode Timing Thigh & Tlow Resolution Accuracy Slew Rate Resolution Min. Rise Time Current Range Resolution Measurement Voltage Read Back Range (5 Digital) Resolution Accuracy Current Read Back Range (5 Digital) Resolution Accuracy Power Read Back Range (5 Digital) Accuracy	0.0192A~1.2A/µs 0.0048A/µs 0.0048A/µs 0~80A 1.28mA  0~15V 0.25mV  0~80A 1.28mA	C000ms-60000ms; 0.010-9.999 / 99.9 0.001 / 0.01 1µs / 10µs / 100µ 0.192A-12A/µs 0.048A/µs 66.7µs( 80~800A 12.8mA  15-150V 2.5mV ±0.025% of (Re 80~800A 12.8mA	V resolution 1000m 9 / 999.9 / 9999m / 0.1 / 1 ms sis / 1ms + 50ppm 0.024A-1.5A/µs 0.006A/µs typical)  0-100A 1.6mA  0-15V 0.25mV vading + Range)  0-100A 1.6mA  1.6mA  1.6mA	5 0.24A~15A/μs 0.06A/μs 100~1000A 16mA 15~150V 2.5mV 100~1000A 16mA	0.0072A/μs  0120A 1.92mA  015V 0.25mV  0120A 1.92mA	0.072A/μs  120~1200A  19.2mA  15~150V  2.5mV  120~1200A  19.2mA
Algorithm Load mode P&O interval Dynamic Mode Timing Thigh & Tlow Resolution Accuracy Slew Rate Resolution Min. Rise Time Current Range Resolution Measurement Voltage Read Back Range (5 Digital) Resolution Accuracy Current Read Back Range (5 Digital) Resolution Accuracy Courrent Read Back Range (5 Digital) Resolution Accuracy Courrent Read Back Range (5 Digital) Resolution Accuracy Courrect Couracy Couracy Couracy Courrect Couracy C	0.0192A~1.2A/µs 0.0048A/µs 0.0048A/µs 0~80A 1.28mA  0~15V 0.25mV  0~80A 1.28mA	C000ms-60000ms; 0.010-9.999 / 99.9 0.001 / 0.01 1μs / 10μs / 100μ 0.192A-12A/μs 0.048A/μs 66.7μs(  80~800A 12.8mA  15~150V 2.5mV ±0.025% of (Re: 80~800A 12.8mA ±0.05% of (Re: 000W ± 0.06% of (Re: 000Q 00A 0.25 ~	V resolution 1000m 9 / 999.9 / 9999m / 0.1 / 1ms ss / 1ms + 50ppm 0.024A-1.5A/µs 0.006A/µs typical)  0~100A 1.6mA  0~15V 0.25mV eading + Range)  0~100A 1.6mA ading + Range)	0.24A~15A/μs 0.06A/μs  100~1000A 16mA  15~150V 2.5mV  100~1000A 16mA	0.0072A/μs  0120A 1.92mA  015V 0.25mV  0120A 1.92mA	0.072A/μs  120~1200A 19.2mA  15~150V 2.5mV  120~1200A 19.2mA
Algorithm Load mode P&O interval Dynamic Mode Timing Thigh & Tlow Resolution Accuracy Slew Rate Resolution Min. Rise Time Current Range Resolution Measurement Voltage Read Back Range (5 Digital) Resolution Accuracy Current Read Back Range (5 Digital) Resolution Accuracy Power Read Back Range (5 Digital) Resolution Accuracy Current Read Back Range (5 Digital) Resolution Accuracy Power Read Back Range (5 Digital) Resolution Accuracy Power Read Back Range (5 Digital) Resolution Accuracy Power Read Back Range (5 Digital)	0.0192A~1.2A/µs 0.0048A/µs 0~80A 1.28mA 0~15V 0.25mV 0.80A 1.28mA	C0000ms-60000ms; 0.010~9.999 / 99.9 0.001 / 0.001 / 0.001 1 μs / 10μs / 100μ 0.192A-12A/μs 66.7μs( 80~800A 12.8mA  15~150V 2.5mV ±0.025% of (Rei 80~800A 12.8mA ±0.05% of (Rei 009Ω 00A 0.25~	V resolution 1000m 9 / 999.9 / 9999m / 0.1 / 1 / 1ms ss / 1ms + 50ppm 0.024A-1.5A/µs 0.006A/µs typical)  0~100A 1.6mA  0~15V 0.25mV ading + Range)  0~100A 1.6mA  1.6mA  1.6mA	0.24A~15A/μs 0.06A/μs  100~1000A 16mA  15~150V 2.5mV  100~1000A 16mA	0.0072A/µs  0120A 1.92mA  015V 0.25mV  0120A 1.92mA	0.072A/μs  120~1200A 19.2mA  15~150V 2.5mV  120~1200A 19.2mA
Algorithm Load mode P&O interval Dynamic Mode Timing Thigh & Tlow Resolution Accuracy Slew Rate Resolution Min. Rise Time Current Range Resolution Measurement Voltage Read Back Range (5 Digital) Resolution Accuracy Current Read Back Range (5 Digital) Resolution Accuracy Dower Read Back Range (5 Digital) Accuracy Ceneral Typical Short Resistance Maximum Short Current Load ON Voltage Load OFF Voltage Power Consumption	0.0192A~1.2A/µs 0.0048A/µs 0.0048A/µs 0~80A 1.28mA  0~80A 1.28mA  800  800  920	C000ms-60000ms; 0.010-9.999 / 99.9 0.001 / 0.01 1μs / 10μs / 100μs 0.092A-12A/μs 0.048A/μs 66.7μs( 80~800A 12.8mA  15-150V ±0.025% of (Res 2.5mV ±0.05% of (Res 000W 00A 0.25 ~ 0 ~ 6 00VA	V resolution 1000m 9 / 999.9 / 9999m / 0.1 / 1ms ss / 1ms + 50ppm 0.024A-1.5A/µs 0.006A/µs typical) 0~100A 1.6mA  0~15V 0.25mV rading + Range)  0-100A 1.6mA  1.6mA  100 62.5V 52.5V 920	0.24A~15A/μs 0.06A/μs  100~1000A 16mA  15~150V 2.5mV  100~1000A 16mA	0.0072A/µs  0120A 1.92mA  015V 0.25mV  0120A 1.92mA	0.072A/μs  120~1200A 19.2mA  15~150V 2.5mV  120~1200A 19.2mA
Algorithm Load mode P&O interval Dynamic Mode Timing Thigh & Tlow Resolution Accuracy Slew Rate Resolution Min. Rise Time Current Range Resolution Measurement Voltage Read Back Range (5 Digital) Resolution Accuracy Current Read Back Range (5 Digital) Resolution Accuracy Power Read Back Range (5 Digital) Resolution Accuracy Current Read Back Range (5 Digital) Resolution Accuracy Power Read Back Range (5 Digital) Resolution Accuracy Power Read Back Range (5 Digital) Resolution Accuracy Power Read Back Range (5 Digital)	0.0192A~1.2A/µs 0.0048A/µs 0.0048A/µs 0~80A 1.28mA 0~80A 1.28mA 800 800 921 571.6x481	C0000ms-60000ms; 0.010~9.999 / 99.9 0.001 / 0.001 / 0.001 1 μs / 10μs / 100μ 0.192A-12A/μs 66.7μs( 80~800A 12.8mA  15~150V 2.5mV ±0.025% of (Rei 80~800A 12.8mA ±0.05% of (Rei 009Ω 00A 0.25~	V resolution 1000m  9 / 999.9 / 9999m  / 0.1 / 1ms  ss / 1ms + 50ppm  0.024A-1.5A/µs 0.006A/µs typical)  0-100A 1.6mA  0-15V 0.25mV eading + Range)  0-100A 1.6mA  ading + Range)  100 ading + Range)  0-25V 22.5V 920 571.6x481	0.24A~15A/μs 0.06A/μs  100~1000A 16mA  15~150V 2.5mV  100~1000A 16mA	0.0072A/µs  0-120A 1.92mA  0-15V 0.25mV  0-120A 1.92mA  1.92mA	0.072A/μs  120~1200A 19.2mA  15~150V 2.5mV  120~1200A 19.2mA
Algorithm Load mode P&O interval Dynamic Mode Timing Thigh & Tlow Resolution Accuracy Slew Rate Resolution Min. Rise Time Current Range Resolution Measurement Voltage Read Back Range (5 Digital) Resolution Accuracy Current Read Back Range (5 Digital) Resolution Accuracy Current Read Back Range (5 Digital) Resolution Accuracy Current Read Back Range (5 Digital) Resolution Accuracy Dower Read Back Range (5 Digital) Current Read Back Range (5 Digital) Resolution Accuracy Dower Read Back Range (5 Digital) Resolution	0.0192A-1.2A/µs 0.0048A/µs 0.0048A/µs 0~80A 1.28mA 0~15V 0.25mV 0~80A 1.28mA 800 800 920 571.6x445.	C 000ms-60000ms; 0.010-9.999 / 99.9 0.001 / 0.01 1μs / 10μs / 100μ 0.192A-12A/μs 0.048A/μs 66.7μs( 80~800A 12.8mA  15–150V 2.5mV ±0.025% of (Rec 80~800A 12.8mA  ±0.05% of (Rec 00W ±0.06% of (Rec 00W 2.5mC 0 ~ 6 00VA 2.757.3mm 5 kg	V resolution 1000m  9 / 999.9 / 9999m / 0.1 / 1ms ss / 1ms + 50ppm 0.024A-1.5A/µs 0.006A/µs typical)  0-100A 1.6mA  0-15V 0.25mV ading + Range)  0-100A 1.6mA  1.6mA  20-15V 0.25mV ading + Range)  0-100A 1.6mA 4ding + Range)  100 62.5V 571.6x481 467.6x445.	0.24A~15A/μs 0.06A/μs 100~1000A 16mA  15~150V 2.5mV  100~1000A 16mA  000W	0.0072A/µs  0.0072A/µs  0.120A 1.92mA  0.15V 0.25mV  0.25mV  1.92mA  1.92mA	0.072A/μs  120~1200A 19.2mA  15~150V 2.5mV  120~1200A 19.2mA
Algorithm Load mode P&O interval Dynamic Mode Timing Thigh & Tlow Resolution Accuracy Slew Rate Resolution Min. Rise Time Current Range Resolution Measurement Voltage Read Back Range (5 Digital) Resolution Accuracy Current Read Back Range (5 Digital) Resolution Accuracy Dower Read Back Range (5 Digital) Resolution Accuracy Louracy Dower Read Back Range (5 Digital) Accuracy Locat On Voltage Load OFF Voltage Dower Consumption Dimension (HxWxD) HxWxD Non Induded Back Maunt KLubeds  Dower Consumption Dimension (HxWxD) HxWxD Non Induded Back Maunt KLubeds	0.0192A-1.2A/µs 0.0048A/µs 0.0048A/µs 0~80A 1.28mA 0~15V 0.25mV 0~80A 1.28mA 800 800 920 571.6x445.	C0000ms-60000ms; 0.010-9.999 / 99.9 0.001 / 0.01 1μs / 10μs / 100μ 0.192A-12A/μs 0.048A/μs 66.7μs( 80~800A 12.8mA  15~150V 2.5mV ±0.025% of (Rei 200W ±0.05% of (Rei 200W 00A 0.25 ~ 0 ~ 6 0VA x757.3mm 2x757.3mm 5 kg	V resolution 1000m  9 / 999.9 / 9999m / 0.1 / 1ms ss / 1ms + 50ppm 0.024A-1.5A/µs 0.006A/µs typical)  0~100A 1.6mA  0~15V 0.25mV ading + Range)  0~100A 1.6mA  1.6mA  1.6mA	0.24A~15A/µs   0.06A/µs   0.06A/µs   100~1000A   16mA   15~150V   2.5mV   100~1000A   16mA   16mA   000W   007Ω   000A   000A	0.0072A/µs  0.0072A/µs  0.120A 1.92mA  0.15V 0.25mV  0.25mV  1.92mA  1.92mA	0.072A/µs  120~1200A 19.2mA  15~150V 2.5mV  120~1200A 19.2mA  000W

#### Cooling: Advanced Fan Cooled

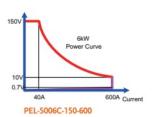
Input AC Power: 100~240 Vac ±10%, 50/60Hz, Single-phase

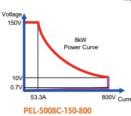
Note \*1 : The power rating specifications at ambient temperature – 25°C

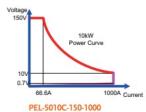
Note \*2 : The range is automatically or forcing to range II only in CC Mode

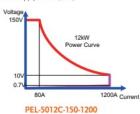
Note \*3 : If the operating current is below range 0.1%, the accuracy specification is 0.1% F.S.

Note \*4 : Operating temperature range is 0–40°C \* all specifications apply for 25°C±5°C









SPECIFICATIONS	DEL FATEC	750 7500	DEI 50300	150 1000	DEL 50200	750 2000	DEL 50246	750 2000
MODEL Power <sup>®</sup>	PEL-5015C		PEL-5018C		PEL-5020C		PEL-50240	
Current	0 ~ 150A	0 ~ 1500A	0 ~ 180A	0 ~ 1800A	0 ~ 200A	0 ~ 2000A	0 ~ 200A	kW 0 ~ 2000A
Voltage					150V			200011
Min. Operating Voltage	0.7V @	1500A	0.7V @	1800A	0.7V @	2000A	0.7V @	2000A
Protections					9.00			
Over Power Protection (OPP) Over Current Protection (OCP)					05% 04%			
Over Voltage Protection (OVP)					05%			
Over Temp Protection (OTP)					C±5°C			
Constant Current Mode								
Range <sup>©2</sup> Resolution	150A	1500A	180A	1800A	200A	2000A	200A	2000A
Accuracy <sup>†3</sup>	2.4mA	24mA	2.88mA	28.8mA ± 0.05% of (Set	3.2mA	32mA	3.2mA	32mA
Constant Resistance Mode				1 0.0370 01 (36)	tillig + Kallge)			
Range	6000Ω~0.1Ω	0.1Ω~0.0005Ω	5000Ω~0.0833Ω	0.0833Ω~0.0004Ω	4500Ω~0.075Ω	0.075Ω~0.0004Ω	4500Ω~0.075Ω	0.075Ω~0.0004Ω
Resolution	166.666µS	1.667μΩ	200µS	1.389μΩ	222.22µS	1.25μΩ	222.22µS	1.25μΩ
Accuracy Constant Voltage Mode				±0.2% of (Set	tting + Range)			
Range				15	50V			
Resolution					mV			
Accuracy				± 0.05% of (S	etting + Range)			
Constant Power Mode Range	1500W	15000W	1800W	18000W	2000W	20000W	2400W	24000W
Resolution	24mW	240mW	28.8mW	288mW	32mW	320mW	38.4mW	384mW
Accuracy	± 0.1% of	± 0.1% of	± 0.1% of	± 0.1% of	± 0.1% of	± 0.1% of	± 0.1% of	± 0.1% of
	(Setting+Range)		(Setting+Range)	(Setting+Range)	(Setting+Range)	(Setting+Range)	(Setting+Range)	(Setting+Range)
Constant Voltage Mode + Co			1500	10004	1504	20004	1501/	20004
Range Resolution	150V 2.5mV	1500A 24mA	150V 2.5mV	1800A 28.8mA	150V 2.5mV	2000A 32mA	150V 2.5mV	2000A 32mA
Accuracy	2.3	211101	2.5		tting + Range)	32.117	2.51117	3211171
Constant Voltage Mode + Co								
Range	150V	15000W	150V	18000W	150V	20000W	150V	24000W
Resolution Accuracy	2.5 mV	240mW	2.5mV	288mW + 1.0% of (Se	2.5mV tting + Range)	320mW	2.5 mV	384mW
Surge Test				11.070 01 (50	tting i kange)			
Surge & Normal current	0~15	00A	0~	1800A	0~20	A00	0~20	000A
Surge time	10~10	00ms	10~1	1000ms	10~10	00ms	10~10	00ms
Surge step MPPT Mode				1-	5			
Algorithm				P	%O			
Load mode				(	V			
P&O interval			1	000ms~60000ms	; resolution 1000m	S		
Dynamic Mode Timing								
Thigh & Tlow			(	0.010~9.999 / 99.9	9 / 999.9 / 9999ms			
Resolution				0.001 / 0.01				
Accuracy	2							
					us / 1ms + 50ppm			
Slew Rate	0.036A~2.25A/µs	0.360A~22.5A/µs	0.0432A~2.7A/µs	0.432A~27A/µs	us / 1ms + 50ppm 0.048A~3A/μs	0.48A~30A/µs	0.048A~3A/µs	0.48A~30A/µs
Resolution	0.036A~2.25A/μs 0.009A/μs	0.360A~22.5A/μs 0.09A/μs	0.0432A~2.7A/μs 0.0108A/μs	0.432A~27A/μs 0.108A/μs	us / 1ms + 50ppm 0.048A~3A/μs 0.012A/μs	0.48A~30A/μs 0.12A/μs	0.048A~3A/μs 0.012A/μs	0.48A~30A/μs 0.12A/μs
				0.432A~27A/μs 0.108A/μs	us / 1ms + 50ppm 0.048A~3A/μs			
Resolution Min. Rise Time Current Range	0.009A/μs 0~150A	0.09A/µs	0.0108A/μs 0~180A	0.432A~27A/μs 0.108A/μs 66.7μs	μs / 1ms + 50ppm 0.048Α~3Α/μs 0.012Α/μs (typical)	0.12A/μs 200~2000A	0.012A/μs 0~200A	0.12A/μs 200~2000A
Resolution Min. Rise Time Current Range Resolution	0.009A/µs	0.09A/µs	0.0108A/μs	0.432A~27A/μs 0.108A/μs 66.7μs	us / 1ms + 50ppm 0.048Α~3Α/μs 0.012Α/μs (typical)	0.12A/μs	0.012A/µs	0.12A/μs
Resolution Min. Rise Time Current Range Resolution Measurement	0.009A/μs 0~150A	0.09A/µs	0.0108A/μs 0~180A	0.432A~27A/μs 0.108A/μs 66.7μs	μs / 1ms + 50ppm 0.048Α~3Α/μs 0.012Α/μs (typical)	0.12A/μs 200~2000A	0.012A/μs 0~200A	0.12A/μs 200~2000A
Resolution Min. Rise Time Current Range Resolution	0.009A/μs 0~150A	0.09A/µs	0.0108A/μs 0~180A	0.432A~27A/μs 0.108A/μs 66.7μs	μs / 1ms + 50ppm 0.048Α~3Α/μs 0.012Α/μs (typical)	0.12A/μs 200~2000A	0.012A/μs 0~200A	0.12A/μs 200~2000A
Resolution Min. Rise Time Current Range Resolution Measurement Voltage Read Back	0.009A/μs 0~150A 2.4mA	0.09A/μs 150~1500A 24mA	0.0108A/µs 0~180A 2.88mA	0.432A-27A/µs 0.108A/µs 66.7µs 180~1800A 28.8mA 15~150V 2.5mV	us / 1ms + 50ppm 0.048A~3A/µs 0.012A/µs (typical) 0-200A 3.2mA 0-15V 0.25mV	0.12A/µs 200~2000A 32mA	0.012A/μs 0~200A 3.2mA	0.12A/µs 200~2000A 32mA
Resolution Min. Rise Time Current Range Resolution Measurement Voltage Read Back Range (5 Digital) Resolution Accuracy	0.009A/µs  0-150A 2.4mA	0.09A/μs 150~1500A 24mA	0.0108A/µs 0~180A 2.88mA	0.432A-27A/µs 0.108A/µs 66.7µs 180~1800A 28.8mA 15~150V 2.5mV	μs / 1ms + 50ppm 0.048Α-3Α/μs 0.012Α/μs (typical) 0-200Α 3.2mA	0.12A/μs 200-2000A 32mA	0.012A/µs  0~200A 3.2mA	0.12A/µs 200~2000A 32mA
Resolution Min. Rise Time Current Range Resolution Measurement Voltage Read Back Range (5 Digital) Resolution Accuracy Current Read Back	0.009A/µs  0-150A 2.4mA  0-15V 0.25mV	0.09A/µs  150~1500A 24mA  15~150V 2.5mV	0.0108A/μs  0-180A 2.88mA  0-15V 0.25mV	0.432A-27A/µs 0.108A/µs 66.7µs 180-1800A 28.8mA 15-150V 2.5mV ±0.025% of (Re	us / 1ms + 50ppm 0.048A~3A/µs 0.012A/µs (typical) 0-200A 3.2mA 0-15V 0.25mV eading + Range)	0.12A/µs  200-2000A  32mA  15-150V  2.5mV	0.012A/µs  0-200A 3.2mA  0-15V 0.25mV	0.12A/μs 200-2000A 32mA 15-150V 2.5mV
Resolution Min. Rise Time Current Range Resolution Measurement Voltage Read Back Range (5 Digital) Resolution Accuracy	0.009A/µs  0-150A 2.4mA	0.09A/μs 150~1500A 24mA	0.0108A/µs 0~180A 2.88mA	0.432A-27A/µs 0.108A/µs 66.7µs 180~1800A 28.8mA 15~150V 2.5mV	us / 1ms + 50ppm 0.048A~3A/µs 0.012A/µs (typical) 0-200A 3.2mA 0-15V 0.25mV	0.12A/μs 200-2000A 32mA	0.012A/µs  0~200A 3.2mA	0.12A/µs 200~2000A 32mA
Resolution Min. Rise Time Current Range Resolution Measurement Voltage Read Back Range (5 Digital) Resolution Accuracy Current Read Back Range (5 Digital) Resolution Accuracy	0.009A/µs  0.150A 2.4mA  0.15V 0.25mV  0.750A	0.09A/µs  150~1500A 24mA  15~150V 2.5mV	0.0108A/μs  0180A 2.88mA  015V 0.25mV	0.432A-27A/µs 0.108A/µs 66.7µs 180~1800A 28.8mA 15–150V 2.5mV ±0.025% of (Re	us / 1ms + 50ppm 0.048A~3A/µs 0.012A/µs (typical) 0~200A 3.2mA 0~15V 0.25mV eading + Range)	0.12A/µs  200-2000A  32mA  15-150V  2.5mV	0.012A/µs  0-200A 3.2mA  0-15V 0.25mV	0.12A/µs  200~2000A  32mA  15~150V  2.5mV
Resolution Min. Rise Time Current Range Resolution Measurement Voltage Read Back Range (5 Digital) Resolution Accuracy Current Read Back Range (5 Digital) Resolution Accuracy Power Read Back	0.009A/µs  0-150A 2.4mA  0-15V 0.25mV  0-150A 2.4mA	0.09A/µs  150~1500A 24mA  15–150V 2.5mV  15–1500A 24mA	0.0108A/µs  0.180A 2.88mA  0.15V 0.25mV  0.180A 2.88mA	0.432A-27A/µs 0.108A/µs 66.7µs 180-1800A 28.8mA 15-150V 2.5mV ±0.025% of (Re 180~1800A 28.8mA ± 0.05% of (Re	us / 1ms + 50ppm 0.048A~3A/µs 0.012A/µs (typical) 0-200A 3.2mA 0-15V 0.25mV eading + Range) 0-200A 3.2mA eading + Range)	0.12A/µs  200-2000A 32mA  15-150V 2.5mV  200-2000A 32mA	0.012A/µs  0-200A 3.2mA  0-15V 0.25mV  0-200A 3.2mA	0.12A/µs  200~2000A  32mA  15~150V  2.5mV  200~2000A  32mA
Resolution Min. Rise Time Current Range Resolution Measurement Voltage Read Back Range (5 Digital) Resolution Accuracy Current Read Back Range (5 Digital) Resolution Accuracy Power Read Back Range (5 Digital) Resolution	0.009A/µs  0.150A 2.4mA  0.15V 0.25mV  0.750A	0.09A/µs  150~1500A 24mA  15–150V 2.5mV  15–1500A 24mA	0.0108A/μs  0180A 2.88mA  015V 0.25mV	0.432A-27A/µs 0.108A/µs 66.7µs 180~1800A 28.8mA  15–150V 2.5mV ±0.025% of (Re 180~1800A 28.8mA	us / 1ms + 50ppm 0.048A-3A/µs 0.012A/µs (typical) 0-200A 3.2mA 0-15V 0.25mV eading + Range) 0-200A 3.2mA 2000	0.12A/µs  200-2000A 32mA  15-150V 2.5mV  200-2000A 32mA	0.012A/µs  0-200A 3.2mA  0-15V 0.25mV  0-200A 3.2mA	0.12A/µs  200~2000A  32mA  15~150V  2.5mV
Resolution Min. Rise Time Current Range Resolution Measurement Voltage Read Back Range (5 Digital) Resolution Accuracy Current Read Back Range (5 Digital) Resolution Accuracy Power Read Back	0.009A/µs  0-150A 2.4mA  0-15V 0.25mV  0-150A 2.4mA	0.09A/µs  150~1500A 24mA  15–150V 2.5mV  15–1500A 24mA	0.0108A/µs  0.180A 2.88mA  0.15V 0.25mV  0.180A 2.88mA	0.432A-27A/µs 0.108A/µs 66.7µs 180~1800A 28.8mA  15–150V 2.5mV ±0.025% of (Re 180~1800A 28.8mA	us / 1ms + 50ppm 0.048A~3A/µs 0.012A/µs (typical) 0-200A 3.2mA 0-15V 0.25mV eading + Range) 0-200A 3.2mA eading + Range)	0.12A/µs  200-2000A 32mA  15-150V 2.5mV  200-2000A 32mA	0.012A/µs  0-200A 3.2mA  0-15V 0.25mV  0-200A 3.2mA	0.12A/μs  200~2000A  32mA  15~150V  2.5mV  200~2000A  32mA
Resolution Min. Rise Time Current Range Resolution Measurement Voltage Read Back Range (5 Digital) Resolution Accuracy Current Read Back Range (5 Digital) Resolution Accuracy Power Read Back Range (5 Digital) Accuracy General	0.009A/µs  0.150A 2.4mA  0.15V 0.25mV  0.150A 2.4mA	0.09A/μs  150~1500A 24mA  15–150V 2.5mV  15~1500A 24mA	0.0108A/µs  0.0108A/µs  0.0108A 2.88mA  0.000  0.000  1800  0.000	0.432A-27A/μs 0.108A/μs 66.7μs 180-1800A 28.8mA 15-150V 2.5mV ±0.025% of (Re 180-1800A 28.8mA ± 0.05% of (Re 000W ± 0.06% of (Re	us / 1ms + 50ppm 0.048A~3A/µs 0.012A/µs (typical) 0~200A 3.2mA  0~15V 0.25mV eading + Range) 0~200A 3.2mA  200(200A) 200A 200A 200A 200A 200A 200A 200A	0.12A/μs  200-2000A 32mA  15-150V 2.5mV  200-2000A 32mA	0.012A/µs  0-200A 3.2mA  0-15V 0.25mV  0-200A 3.2mA	0.12A/μs  200~2000A 32mA  15~150V 2.5mV  200~2000A 32mA
Resolution Min. Rise Time Current Range Resolution Measurement Voltage Read Back Range (5 Digital) Resolution Accuracy Current Read Back Range (5 Digital) Resolution Accuracy Power Read Back Range (5 Digital) Accuracy General Typical Short Resistance Maximum Short Current	0.009A/µs  0.150A 2.4mA  0.15V 0.25mV  0.150A 2.4mA	0.09A/µs  150~1500A 24mA  15~150V 2.5mV  15~1500A 24mA	0.0108A/µs  0-180A 2.88mA  0-15V 0.25mV  0-180A 2.88mA	0.432A-27A/μs 0.108A/μs 66.7μs 180~1800A 28.8mA 15~150V 2.5mV ±0.025% of (Re 180~1800A 28.8mA ± 0.05% of (Re	us / 1ms + 50ppm 0.048A-3A/µs 0.012A/µs 0.012A/µs (typical) 0-200A 3.2mA  0-15V 0.25mV eading + Range)  0-200A 3.2mA  2000 eading + Range)	0.12A/μs  200-2000A 32mA  15-150V 2.5mV  200-2000A 32mA	0.012A/µs  0-200A 3.2mA  0-15V 0.25mV  0-200A 3.2mA	0.12A/µs  200~2000A 32mA  15~150V 2.5mV  200~2000A 32mA
Resolution Min. Rise Time Current Range Resolution Measurement Voltage Read Back Range (5 Digital) Resolution Accuracy Current Read Back Range (5 Digital) Resolution Accuracy Power Read Back Range (5 Digital) Accuracy Power Read Back Range (5 Digital) Accuracy General Typical Short Resistance Maximum Short Current Load ON Voltage	0.009A/µs  0.150A 2.4mA  0.15V 0.25mV  0.150A 2.4mA	0.09A/μs  150~1500A 24mA  15–150V 2.5mV  15~1500A 24mA	0.0108A/µs  0.0108A/µs  0.0108A 2.88mA  0.000  0.000  1800  0.000	0.432A-27A/μs 0.108A/μs 66.7μs 180-1800A 28.8mA 15-150V 2.5mV ±0.025% of (Re 180~1800A 28.8mA ± 0.05% of (Re 000W ± 0.06% of (Re	us / 1ms + 50ppm 0.048A-3A/µs 0.012A/µs 0.012A/µs (typical) 0-200A 3.2mA  0-15V 0.25mV eading + Range)  0-200A 3.2mA  2000 eading + Range)  0.000 eading + Range)	0.12A/μs  200-2000A 32mA  15-150V 2.5mV  200-2000A 32mA	0.012A/µs  0-200A 3.2mA  0-15V 0.25mV  0-200A 3.2mA	0.12A/μs  200~2000A 32mA  15~150V 2.5mV  200~2000A 32mA
Resolution Min. Rise Time Current Range Resolution Measurement Voltage Read Back Range (5 Digital) Resolution Accuracy Current Read Back Range (5 Digital) Resolution Accuracy Power Read Back Range (5 Digital) Accuracy Power Read Back Range (5 Digital) Accuracy Fower Read Back Range (5 Digital) Accuracy General Typical Short Resistance Maximum Short Current Load ON Voltage Load OFF Voltage	0.009A/µs  0.150A 2.4mA  0.15V 0.25mV  0.150A 2.4mA	0.09A/μs  150~1500A 24mA  15–150V 2.5mV  15–1500A 24mA	0.0108A/µs  0.180A 2.88mA  0.15V 0.25mV  0.180A 2.88mA	0.432A-27A/μs 0.108A/μs 66.7μs 180-1800A 28.8mA 15-150V 2.5mV ±0.025% of (Re 180~1800A 28.8mA ± 0.05% of (Re 00W ± 0.06% of (Re 04Ω 00A 0.25 - 0 - 0	us / 1ms + 50ppm 0.048A~3A/µs 0.012A/µs 0.012A/µs (typical) 0~200A 3.2mA  0~15V 0.25mV eading + Range)  0~200A 3.2mA  2000 eading + Range)  0.000 0.000 2000 - 62.5V 62.5V	0.12A/μs  200-2000A 32mA  15-150V 2.5mV  200-2000A 32mA	0.012A/µs  0-200A 3.2mA  0-15V 0.25mV  0-200A 3.2mA  240  0.00	0.12A/μs  200~2000A  32mA  15–150V  2.5mV  200~2000A  32mA
Resolution Min. Rise Time Current Range Resolution Measurement Voltage Read Back Range (5 Digital) Resolution Accuracy Current Read Back Range (5 Digital) Resolution Accuracy Power Read Back Range (5 Digital) Resolution Accuracy Power Read Back Range (5 Digital) Accuracy General Typical Short Resistance Maximum Short Current Load ON Voltage Load OFF Voltage Power Consumption Dimension (HxWxD)	0.009A/µs  0-150A 2.4mA  0-15V 0.25mV  0-150A 2.4mA  1500  150  10.00 150  10.00 150  10.00 150  10.00 150	0.09A/μs  150–1500A 24mA  15–150V 2.5mV  15–1500A 24mA  00W  00SΩ 00A  0VA x757.3mm	0.0108A/μs  0-180A 2.88mA  0-15V 0.25mV  0-180A 2.88mA  1800  1800  1800  1800	0.432A-27A/μs 0.108A/μs 66.7μs 180~1800A 28.8mA 15~150V 2.5mV ±0.025% of (Re 180~1800A 0.05% of (Re 000W ±0.06% of (Re 000W 0.25 - 0 - 1 00VA x757.3mm	us / 1ms + 50ppm 0.048A-3A/µs 0.012A/µs 0.012A/µs (typical) 0-200A 3.2mA  0-15V 0.25mV eading + Range)  0-200A 3.2mA  2000 ading + Range)  0.00 0.25mV eading + Range)	0.12A/μs  200-2000A 32mA  15-150V 2.5mV  200-2000A 32mA	0.012A/µs  0-200A 3.2mA  0-15V 0.25mV  0-200A 3.2mA  240  0.00 20	0.12A/μs  200~2000A 32mA  15~150V 2.5mV  200~2000A 32mA
Resolution Min. Rise Time Current Range Resolution Measurement Voltage Read Back Range (5 Digital) Resolution Accuracy Current Read Back Range (5 Digital) Resolution Accuracy Power Read Back Range (5 Digital) Resolution Accuracy Power Read Back Range (5 Digital) Accuracy General Typical Short Resistance Maximum Short Current Load ON Voltage Load OFF Voltage Power Consumption Dimension (HxWxD) HxWxD (Not Included Sack Mount Rit, wheels)	0.009A/µs  0-150A 2.4mA  0-15V 0.25mV  0-150A 2.4mA  1500  150  1000 150  132 760.6x481 656.6x445	0.09A/μs  150~1500A 24mA  15–150V 2.5mV  15–1500A 24mA  000W	0.0108A/µs  0-180A 2.88mA  0-15V 0.25mV  0-180A 2.88mA  1800  1800  1800  1800  1800  1800  1800  1800  1800  1800  1800  1800	0.432A-27A/μs 0.108A/μs 66.7μs 180-1800A 28.8mA 15-150V 2.5mV ±0.025% of (Re 180-1800A 28.8mA ± 0.05% of (Re 000W ± 0.06% of (Re 000A 0.25 - 0 - 1 00A 2x757.3mm	us / 1ms + 50ppm 0.048A-3A/µs 0.012A/µs 0.012A/µs (typical) 0-200A 3.2mA  0-15V 0.25mV eading + Range)  0-200A 3.2mA 2000 eading + Range)  0.00 200 62.5V 62.5V 62.5V 170 886.6x481 782.6x4445.	0.12A/μs  200–2000A 32mA  15–150V 2.5mV  200–2000A 32mA  00W	0.012A/µs  0-200A 3.2mA  0-15V 0.25mV  0-200A 3.2mA  240  0.00 20  170 886.6x481 782.6x4455	0.12A/μs  200~2000A  32mA  15~150V  2.5mV  200~2000A  32mA  000W
Resolution Min. Rise Time Current Range Resolution Measurement Voltage Read Back Range (5 Digital) Resolution Accuracy Current Read Back Range (5 Digital) Resolution Accuracy Power Read Back Range (5 Digital) Resolution Accuracy Power Read Back Range (5 Digital) Accuracy Power Read Back Range (5 Digital) Accuracy General Typical Short Resistance Maximum Short Current Load ON Voltage Load OFF Voltage Power Consumption Dimension (HxWxD) HxWxD) Not included Rack Mount Kit, wheele) Weight	0.009A/µs  0-150A 2.4mA  0-15V 0.25mV  0-150A 2.4mA  1500  150  1000 150  132 760.6x481 656.6x445	0.09A/μs  150–1500A 24mA  15–150V 2.5mV  15–1500A 24mA  00W  00SΩ 00A  0VA x757.3mm	0.0108A/µs  0-180A 2.88mA  0-15V 0.25mV  0-180A 2.88mA  1800  1800  1800  1800  1800  1800  1800  1800  1800  1800  1800  1800	0.432A-27A/μs 0.108A/μs 66.7μs 180~1800A 28.8mA  15–150V 2.5mV ±0.025% of (Re 180~1800A 28.8mA ± 0.05% of (Re 00W ± 0.06% of (Re 00A 0.25 - 0 - 1 0VA x757.3mm kg	us / 1ms + 50ppm 0.048A~3A/µs 0.012A/µs 0.012A/µs (typical) 0~200A 3.2mA  0~15V 0.25mV eading + Range)  0~200A 3.2mA  200(eading + Range)  0.00 200 200 405.5V 62.5V 62.5V 62.5V 170 886.6x481 782.6x445.	0.12A/μs  200–2000A 32mA  15–150V 2.5mV  200–2000A 32mA  00W	0.012A/µs  0-200A 3.2mA  0-15V 0.25mV  0-200A 3.2mA  240  0.00 20  170 886.6x481 782.6x4455	0.12A/μs  200-2000A 32mA  15-150V 2.5mV  200-2000A 32mA  000W
Resolution Min. Rise Time Current Range Resolution Measurement Voltage Read Back Range (5 Digital) Resolution Accuracy Current Read Back Range (5 Digital) Resolution Accuracy Power Read Back Range (5 Digital) Accuracy Power Read Back Range (5 Digital) Accuracy General Typical Short Resistance Maximum Short Current Load ON Voltage Load OFF Voltage Power Consumption Dimension (HxWxD) HxWxD (Net Included Rack Mount Kit,wheels) Weight Temperature*4	0.009A/µs  0-150A 2.4mA  0-15V 0.25mV  0-150A 2.4mA  1500  150  1000 150  132 760.6x481 656.6x445	0.09A/μs  150~1500A 24mA  15–150V 2.5mV  15–1500A 24mA  000W	0.0108A/µs  0-180A 2.88mA  0-15V 0.25mV  0-180A 2.88mA  1800  1800  1800  1800  1800  1800  1800  1800  1800  1800  1800  1800	0.432A-27A/μs 0.108A/μs 66.7μs 180~1800A 28.8mA 15~150V 2.5mV ±0.025% of (Re 180~1800A 28.8mA  ± 0.05% of (Re 00W ± 0.06% of (Re 00W 20.25 or 0 or 0 00A 2757.3mm 2x757.3mm kg	us / 1ms + 50ppm 0.048A-3A/µs 0.012A/µs 0.012A/µs (typical) 0-200A 3.2mA  0-15V 0.25mV eading + Range)  0-200A 3.2mA  2000 eading + Range)  0.00 200 62.5V 62.5V 62.5V 170 886.6x481 782.6x445. 140.	0.12A/μs  200–2000A 32mA  15–150V 2.5mV  200–2000A 32mA  00W	0.012A/µs  0-200A 3.2mA  0-15V 0.25mV  0-200A 3.2mA  240  0.00 20  170 886.6x481 782.6x4455	0.12A/μs  200~2000A  32mA  15~150V  2.5mV  200~2000A  32mA  000W
Resolution Min. Rise Time Current Range Resolution Measurement Voltage Read Back Range (5 Digital) Resolution Accuracy Current Read Back Range (5 Digital) Resolution Accuracy Power Read Back Range (5 Digital) Resolution Accuracy Power Read Back Range (5 Digital) Accuracy Power Read Back Range (5 Digital) Accuracy General Typical Short Resistance Maximum Short Current Load ON Voltage Load OFF Voltage Power Consumption Dimension (HxWxD) HxWxD) Not included Rack Mount Kit, wheele) Weight	0.009A/µs  0.150A 2.4mA  0.15V 0.25mV  0.150A 2.4mA  1500  150  1000 150  1100  1100  1100  1100  1100  1100	0.09A/μs  150~1500A 24mA  15–150V 2.5mV  15–1500A 24mA  000W	0.0108A/µs  0-180A 2.88mA  0-15V 0.25mV  0-180A 2.88mA  1800  1800  1800  132 760.6x481 656.6x445.	0.432A-27A/μs 0.108A/μs 66.7μs 180~1800A 28.8mA 15~150V 2.5mV ±0.025% of (Re 180~1800A 28.8mA  ± 0.05% of (Re 000W ± 0.06% of (Re 000W 20.25 - 0 - 1 00A 20.757.3mm 20.757.3mm 20.76	us / 1ms + 50ppm 0.048A~3A/µs 0.012A/µs 0.012A/µs (typical) 0~200A 3.2mA  0~15V 0.25mV eading + Range)  0~200A 3.2mA  200(eading + Range)  0.00 200 200 405.5V 62.5V 62.5V 62.5V 170 886.6x481 782.6x445.	0.12A/μs  200–2000A 32mA  15–150V 2.5mV  200–2000A 32mA  00W  04Ω 00A  0VA x757.3mm 2x757.3mm 5 kg	0.012A/µs  0-200A 3.2mA  0-15V 0.25mV  0-200A 3.2mA  240  0.00 20  170 886.6x481 782.6x445.	0.12A/μs  200~2000A  32mA  15~150V  2.5mV  200~2000A  32mA  000W

#### Cooling: Advanced Fan Cooled

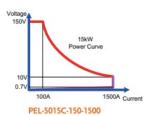
Input AC Power :  $100\sim240$  Vac  $\pm10\%$  , 50/60Hz, Single-phase

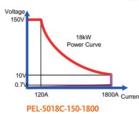
Note \*1 : The power rating specifications at ambient temperature ~ 25°C

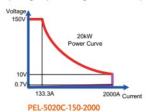
Note \*2 : The range is automatically or forcing to range II only in CC Mode

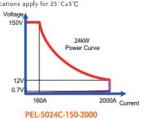
Note \*3 : If the operating current is below range 0.1%, the accuracy specification is 0.1% F.S.

Note \*4 : Operating temperature range is 0~40°C \* all specifications apply for 25°C±5°C









Simply Reliable | Good Will Instrument Co., Ltd.

SPECIFICATIONS							
MODEL	PEL-5008	C-600-560	PEL-5010	C-600-700	PEL-5012	C-600-840	
Power*1		kW	10	kW	12	kW	
Current	0 ~ 56A	0 ~ 560A	0 ~ 70A	0 ~ 700A	0 - 84A	0 - 840A	
Voltage			600V	6/1	W ··		
Min. Operating Voltage	10V @	9 560A	10V @	700A	10∨ €	9 840A	
Protections Over Power Protection (OPP)		10	F0/				
Over Power Protection (OPP) Over Current Protection (OCP)			5% 4%				
Over Voltage Protection (OVP)			5%				
Over Temp Protection (OTP)			±5°C			×	
Constant Current Mode	1	71.2					
Range*2	56A	560A	70A	700A	84A	840A	
Resolution	0.896mA	8.96mA	1.12mA	11.2mA	1.334mA	13.44mA	
Accuracy°3		± 0.05% of (Se	etting + Range)				
Constant Resistance Mode	1 414410 1 44410						
Resolution Resolution	64284Ω~1.0714Ω		51427.2Ω~0.85712Ω	0.85712Ω~0.014304Ω	42856Ω~0.714267Ω	0.714267Ω~0.01192Ω	
Accuracy	15.5559µS	17.88μΩ ±0.2% of (Set	19.4449µS	14.304μΩ	23.3339µS	11.92μΩ	
Constant Voltage Mode		10.270 01 (36)	illig + Kange)				
Range	T	60	0V				
Resolution	1		mV				
Accuracy		± 0.05% of (Se					
Constant Power Mode							
Range	800W	8000W	1000W	10000W	1200W	12000W	
Resolution	12.8mW	128mW	16mW	160mW	19.2mW	192mW	
Accuracy	± 0.2% of (Setting+Range)	± 0.1% of (Setting+Range)	± 0.2% of (Setting+Range)	± 0.1% of (Setting+Range)	± 0.2% of (Setting+Range)	± 0.1% of (Setting+Range)	
Constant Voltage Mode + Constant Current Mode	(Jetting+Range)	(Jetting+Range)	(Jetting+Kange)	(Jennigthange)	(Jetting+Kange)	(Jetting+Range)	
Range	600V	560A	600V	700A	600V	840A	
Resolution	10mV	8.96mA	10mV	11.2mA	10mV	13.44mA	
Accuracy		± 1.0% of (Se	tting + Range)				
Constant Voltage Mode + Constant Power Mode							
Range	600V	8000W	600V	10000W	600V	12000W	
Resolution	10mV	128mW	10mV	160mW	10mV	192mW	
Surge Test		± 1.0% of (Se	tting + Range)				
Surge & Normal current	0	560A	0-1	700A	0-1	340A	
Surge time		000ms		000ms		000ms	
Surge step			~5				
MPPT Mode							
Algorithm			&O				
Load mode			CV				
P&O interval Dynamic Mode		1000ms~60000ms	; resolution 1000m	15			
Timing							
Thigh & Tlow	1	0.010-9.999 / 99.9	9 / 999.9 / 9999m	s			
Resolution			1 / 0.1 / 1ms				
Accuracy			µs / 1ms + 50ppm				
Slew Rate	0.0288A-1.8A/µs		0.0336A~2.1A/µs	0.336A~21A/µs	0.0384A-2.4/µs	0.384A-24A/µs	
Resolution	0.0072A/μs	0.072A/µs	0.0084A/µs	0.084A/µs	0.0096A/µs	0.096A/µs	
Current	0.554	FC FC04	0.704	70 7004	0.044	00.0	
Range Resolution	0~56A 0.896mA	56~560A 8.96mA	0~70A 1.12mA	70~700A 11.2mA	0~84A 1.334mA	84~840A 13.34mA	
Measurement	0.030IIIA	8.30IIIA	1.121117	11.21116	1.334111A	13.34111A	
Voltage Read Back							
Range (5 Digital)	0~60V	60~600V	0~60V	60~600V	0~60V	60~600V	
Resolution	1mV	10mV	1mV	10mV	1mV	10mV	
Accuracy	2	±0.025% of (Re	ading + Range)	<u></u>	·	2	
Current Read Back				70 7001			
Range (5 Digital) Resolution	0-56A 0.896mA	56~560A 8.96mA	0~70A 1.12mA	70~700A 11.2mA	0~84A 1.334mA	84~840A 13.34mA	
Accuracy	0.090IIIA		ading + Range)	11.211114	1.334IIIA	13.34IIIA	
Power Read Back		10.0370 01 (KE	adding + natige)				
Range (5 Digital)	800	00W	100	00W	120	00W	
Accuracy	2	± 0.06% of (Re	ading + Range)				
General							
Typical Short Resistance		179Ω		43Ω		120Ω	
Maximum Short Current Load ON Voltage	56	60A	100V	0A	84	A04	
LUAU OI VUITARE			100V				
	1	J	876.575			V/A	
Load OFF Voltage	926	OVA	920VA 920VA 920VA				
		0VA x757.3mm					
Load OFF Voltage Power Consumption Dimension (HxWxD) HxWxD)Net Include Back Mount Rt.wheele)	571.6x481		920 571.6x481x 467.6x445.2	757.3mm	571.6x481x 467.6x445.2	757.3mm	
Load OFF Voltage Power Consumption Dimension (HxWxD) HxWxD Net indused Rack Majort Kit, wheels) Weight	571.6x481 467.6x445.	x757.3mm 2x757.3mm 5 kg	571.6x481x 467.6x445.2 84.	757.3mm	571.6x481x 467.6x445.2	757.3mm	
Load OFF Voltage Power Consumption Dimension (HxWxD) HxWxD)Net Include Back Mount Rt.wheele)	571.6x481 467.6x445.	x757.3mm 2x757.3mm 5 kg 0~4	571.6x481x 467.6x445.2	757.3mm x757.3mm	571.6x481x 467.6x445.2	757.3mm x757.3mm	

Cooling: Advanced Fan Cooled

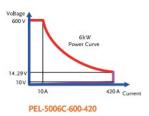
Input AC Power: 100~240 Vac ±10%, 50/60Hz, Single-phase

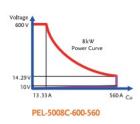
Note \*1 : The power rating specifications at ambient temperature – 25°C

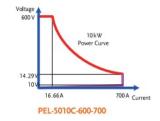
Note \*2 : The range is automatically or forcing to range II only in CC Mode

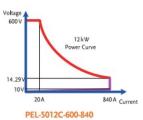
Note \*3 : If the operating current is below range 0.1%, the accuracy specification is 0.1% F.S.

Note \*4 : Operating temperature range is 0–40°C · all specifications apply for 25°C±5°C









SPECIFICATIONS								
MODEL	PEL-501	5C-600-1050	PEL-50180	C-600-1260	PEL-5020C	-600-1400	PEL-5024C-	600-1680
Power*1		kW		kW		kW	24k	
Current Voltage	0 ~ 105A	0 ~ 1050A	0 ~ 126A	0 ~ 1260A	0 ~ 140A 600V	0 ~ 1400A	0 ~ 168A	0 1680A
Min. Operating Voltage	10V @	1050A	10V @	1260A	10V @	1400A	10V @	1680A
Protections (ODD)								
Over Power Protection (OPP) Over Current Protection (OCP)					5% 4%			
Over Voltage Protection (OVP)					5%			
Over Temp Protection (OTP)				90℃	±5°C			
Constant Current Mode Range*2	105A	1050A	126A	1260A	140A	1400A	168A	1680A
Resolution	1.68mA	16.8mA	2.016mA	20.16mA	2.24mA	22.4mA	2.688mA	26.88mA
Accuracy*3				± 0.05% of (S	etting + Range)			
Constant Resistance Mo Range	de 34284.8~0.571413Ω	0.571413~0.009536Ω	28570.67~0.476178Ω	0.476178~0.007947Ω	25713.6~0.42856Ω	0.42856~0.007152Ω	21428~0.357133Ω	0.357133~0.00596Ω
Resolution	29.1674µS	9.536μΩ	35.0009µS	7.947μΩ	38.8899µS	7.152μΩ	46.6679µS	5.96μΩ
Accuracy			5: 47	±0.2% of (Se	tting + Range)	200	192	VS-V
Constant Voltage Mode Range				60	10V			
Resolution					mV			
Accuracy				± 0.05% of (Se	etting + Range)			
Constant Power Mode Range	1500W	15000W	1800W	18000W	2000W	20000W	2400W	24000W
Resolution	24mW	240mW	28.8mW	288mW	32mW	320mW	38.4mW	384mW
Accuracy	± 0.2% of (Setting+Range)	± 0.1% of	± 0.2% of	± 0.1% of (Setting+Range)	± 0.2% of	± 0.1% of	± 0.2% of	± 0.1% of
Constant Voltage Mode		(Setting+Range)	(Setting+Range)	(Setting+Range)	(Setting+Range)	(Setting+Range)	(Setting+Range)	(Setting+Range)
Range	600V	1050A	600V	1260A	600V	1400A	600V	1680A
Resolution	10mV	16.8mA	10mV	20.16mA	10mV	22.4mA	10mV	26.88mA
Accuracy Constant Voltage Mode	+ Constant Powe	er Mode		± 1.0% of (Se	tting + Range)			
Range	600V	15000W	600V	18000W	600V	20000W	600V	24000W
Resolution	10mV	240mW	10mV	288mW	10mV	320mW	10mV	384mW
Accuracy Surge Test				± 1.0% of (Se	tting + Range)			
Surge & Normal current		050A	0~12	260A	0~1	400A	0~1	680A
Surge time								
	10~10	000ms	10~10	000ms		000ms	10~10	000ms
Surge step	10~10	000ms	10~10		~5	000ms	10~10	000ms
Surge step MPPT Mode Algorithm	10~10	000ms	10~10	1 P8	~5 &O	000ms	10-10	000ms
Surge step MPPT Mode Algorithm Load mode	10~10	000ms		1 P8	~5 &O CV		10~10	000ms
Surge step MPPT Mode Algorithm	10~10	000ms		1 P8	~5 &O		10~10	000ms
Surge step MPPT Mode Algorithm Load mode P&O interval Dynamic Mode Timing	10~1(	000ms	1	1. P8 ( 000ms~60000ms	~5 &O CV ; resolution 1000m	ıs	10~10	000ms
Surge step MPPT Mode Algorithm Load mode P&O interval Dynamic Mode Timing Thigh & Tlow	10~1(	000ms	1	P8 (000ms~60000ms	~5 &O V ; resolution 1000m	ıs	10~10	000ms
Surge step MPPT Mode Algorithm Load mode P&O interval Dynamic Mode Timing	10~1	000ms	1	P8 C 0000ms~60000ms 0.010~9.999 / 99.9 0.001 / 0.01	~5 &O CV ; resolution 1000m	ıs	10-16	000ms
Surge step MPPT Mode Algorithm Load mode P&O interval Dynamic Mode Timing Thigh & Tlow Resolution Accuracy Slew Rate	0.0432A~2.7A/µs	0.432A~27A/µs	1 ( 0.048Α~3Α/μs	Pl (000ms-60000ms 0.0010-9.999 / 99.9 0.001 / 0.01 1µs / 10µs / 10µs 0.48A-30A/µs	-5 &O 'V ; resolution 1000m 19 / 999.9 / 9999m / 0.1 / 1 ms sy / 1ms + 50ppm 0.0528A-3.3A/µs	s 0.528A~33A/µs	0.0576A~3.6A/µs	0.576A~36A/µs
Surge step MPPT Mode Algorithm Load mode P&O interval Dynamic Mode Timing Thigh & Tlow Resolution Accuracy Slew Rate Resolution			1	PR (0000ms-60000ms 0.010-9.999 / 99.99 0.001 / 0.01 1 μs / 10μs / 100	~5 &O :V ; resolution 1000m 19 / 999.9 / 9999m 1 / 0.1 / 1ms us / 1ms + 50ppm	is s		
Surge step MPPT Mode Algorithm Load mode P&O interval Dynamic Mode Timing Thigh & Tlow Resolution Accuracy Slew Rate	0.0432A~2.7A/µs	0.432A~27A/µs	1 ( 0.048Α~3Α/μs	Pl (000ms-60000ms 0.0010-9.999 / 99.9 0.001 / 0.01 1µs / 10µs / 10µs 0.48A-30A/µs	-5 &O 'V ; resolution 1000m 19 / 999.9 / 9999m / 0.1 / 1 ms sy / 1ms + 50ppm 0.0528A-3.3A/µs	s 0.528A~33A/µs	0.0576A~3.6A/µs	0.576A~36A/µs
Surge step MPPT Mode Algorithm Load mode P&O interval Dynamic Mode Timing Thigh & Tlow Resolution Accuracy Slew Rate Resolution Current Range Resolution	0.0432A~2.7A/µs 0.0108A/µs	0.432A~27A/μs 0.108A/μs	0.048Α~3Α/μs 0.012Α/μs	1 PR (000ms-60000ms 0.001-9.999 / 99.9 0.001 / 0.01 1µs / 10µs / 100 0.48A-30A/µs 0.12A/µs	~5 &O EV; resolution 1000m 19 / 999.9 / 9999m 1 / 0.1 / 1ms us / 1ms + 50ppm 0.0528A~3.3A/µs 0.0132A/µs	0.528A~33A/µs 0.132A/µs	0.0576A-3.6A/μs 0.0144A/μs	0.576A~36A/μs 0.144A/μs
Surge step MPPT Mode Algorithm Load mode P&O interval Dynamic Mode Timing Thigh & Tlow Resolution Accuracy Slew Rate Resolution Current Range Resolution Measurement	0.0432A-2.7A/µs 0.0108A/µs 0-105A	0.432A-27A/µs 0.108A/µs 105-1050A	0.048A-3A/μs 0.012A/μs 0-126A	1 P2 (000ms-60000ms 0.001 / 0.01	-5 &O V; resolution 1000m 19 / 999.9 / 9999m 1 / 0.1 / 1ms 20 / 1ms + 50ppm 0.0528A-3.3A/µs 0.0132A/µs	0.528A~33A/µs 0.132A/µs 140~1400A	0.0576A-3.6A/µs 0.0144A/µs 0-168A	0.576A-36A/μs 0.144A/μs 168-1680A
Surge step MPPT Mode Algorithm Load mode P&O interval Dynamic Mode Timing Thigh & Tlow Resolution Accuracy Slew Rate Resolution Current Range Resolution	0.0432A-2.7A/µs 0.0108A/µs 0-105A	0.432A-27A/µs 0.108A/µs 105-1050A	0.048A-3A/μs 0.012A/μs 0-126A	1 P2 (000ms-60000ms 0.001 / 0.01	-5 &O V; resolution 1000m 19 / 999.9 / 9999m 1 / 0.1 / 1ms 20 / 1ms + 50ppm 0.0528A-3.3A/µs 0.0132A/µs	0.528A~33A/µs 0.132A/µs 140~1400A	0.0576A-3.6A/µs 0.0144A/µs 0-168A	0.576A-36A/μs 0.144A/μs 168-1680A
Surge step MPPT Mode Algorithm Load mode P&O interval Dynamic Mode Timing Thigh & Tlow Resolution Accuracy Slew Rate Resolution Current Range Resolution Measurement Voltage Read Back Range (5 Digital) Resolution	0.0432A~2.7A/µs 0.0108A/µs 0~105A 1.68mA	0.432A~27A/μs 0.108A/μs 105~1050A 16.8mA	0.048A~3A/μs 0.012A/μs 0.012A 0.126A 2.016mA	1000ms-60000ms 0.010-9.999 / 99.9 0.001 / 0.01 1µs / 10µs / 10µs / 10µs 0.12A/µs 126-1260A 20.16mA	-5 &O EV; resolution 1000m 19 / 999.9 / 9999m 1 / 0.1 / 1ms us / 1ms + 50ppm 0.0528A-3.3A/µs 0.0132A/µs 0.0132A/µs 0.0140A 2.24mA	0.528A~33A/µs 0.132A/µs 140~1400A 22.4mA	0.0576A-3.6A/μs 0.0144A/μs 0-168A 2.688mA	0.576A~36A/µs 0.144A/µs 168~1680A 26.88mA
Surge step MPPT Mode Algorithm Load mode P&O interval Dynamic Mode Timing Thigh & Tlow Resolution Accuracy Slew Rate Resolution Current Range Resolution Measurement Voltage Read Back Range (5 Digital) Resolution Accuracy	0.0432A~2.7A/µs 0.0108A/µs 0~105A 1.68mA	0.432A-27A/µs 0.108A/µs 105-1050A 16.8mA	0.048A~3A/µs 0.012A/µs 0.012A/µs 0-126A 2.016mA	1000ms-60000ms 0.010-9.999 / 99.9 0.001 / 0.01 1µs / 10µs / 10µs / 10µs 0.12A/µs 126-1260A 20.16mA	-5 &O -7 ; resolution 1000m 19 / 999.9 / 9999m 1 / 0.1 / 1ms 2 / 1ms + 50ppm 0.0528A-3.3A/µs 0.0132A/µs 0-140A 2.24mA	0.528A-33A/µs 0.132A/µs 140-1400A 22.4mA	0.0576A~3.6A/µs 0.0144A/µs 0~168A 2.688mA	0.576A~36A/µs 0.144A/µs 168~1680A 26.88mA
Surge step MPPT Mode Algorithm Load mode P&O interval Dynamic Mode Timing Thigh & Tlow Resolution Accuracy Slew Rate Resolution Current Range Resolution Measurement Voltage Read Back Range (5 Digital) Resolution	0.0432A~2.7A/µs 0.0108A/µs 0~105A 1.68mA	0.432A-27A/µs 0.108A/µs 105-1050A 16.8mA	0.048A~3A/µs 0.012A/µs 0.012A/µs 0-126A 2.016mA	1000ms-60000ms 0.010-9.999 / 99.9 0.001 / 0.01 1µs / 10µs / 10µs / 10µs 0.12A/µs 126-1260A 20.16mA	-5 &O EV; resolution 1000m 19 / 999.9 / 9999m 1 / 0.1 / 1ms us / 1ms + 50ppm 0.0528A-3.3A/µs 0.0132A/µs 0.0132A/µs 0.0140A 2.24mA	0.528A-33A/µs 0.132A/µs 140-1400A 22.4mA	0.0576A~3.6A/µs 0.0144A/µs 0~168A 2.688mA	0.576A~36A/µs 0.144A/µs 168~1680A 26.88mA
Surge step MPPT Mode Algorithm Load mode P&O interval Dynamic Mode Timing Thigh & Tlow Resolution Accuracy Slew Rate Resolution Current Range Resolution Measurement Voltage Read Back Range (5 Digital) Resolution Accuracy Current Read Back Range (5 Digital) Resolution	0.0432A-2.7A/µs 0.0108A/µs 0-105A 1.68mA 0-60V 1mV	0.432A-27A/µs 0.108A/µs 105-1050A 16.8mA 60-600V 10mV	0.048A~3A/µs 0.012A/µs 0.012A/µs 0-126A 2.016mA	1000ms-60000ms 0.010-9.999 / 99.9 0.001 / 0.01 1µs / 10µs / 100 0.48A-30A/µs 0.12A/µs 126-1260A 20.16mA 60-600V 10mV ±0.025% of (Re	-5 &O CV ; resolution 1000m 19 / 999.9 / 9999m 1 / 0.1 / 1ms 25 / 1ms + 50ppm 0.0528A-3.3A/µs 0.0132A/µs 0.0132A/µs 0-140A 2.24mA 0-60V 1mV eading + Range) 0-140A 2.24mA	0.528A-33A/µs 0.132A/µs 140-1400A 22.4mA 60-600V 10mV	0.0576A-3.6A/µs 0.0144A/µs 0-168A 2.688mA 0-60V 1mV	0.576A-36A/µs 0.144A/µs 168-1680A 26.88mA 60-600V 10mV
Surge step MPPT Mode Algorithm Load mode P&O interval Dynamic Mode Timing Thigh & Tlow Resolution Accuracy Slew Rate Resolution Current Range Resolution Measurement Voltage Read Back Range (5 Digital) Resolution Accuracy Current Read Back Range (5 Digital) Resolution Accuracy Current Read Back Range (5 Digital) Resolution Accuracy	0.0432A~2.7A/µs 0.0108A/µs 0~105A 1.68mA  0~60V 1mV	0.432A-27A/µs 0.108A/µs 105-1050A 16.8mA 60-600V 10mV	0.048A~3A/µs 0.012A/µs 0.012A/µs 0-126A 2.016mA 0-60V 1mV	1000ms-60000ms 0.010-9.999 / 99.9 0.001 / 0.01 1µs / 10µs / 100 0.48A-30A/µs 0.12A/µs 126-1260A 20.16mA 60-600V 10mV ±0.025% of (Re	-5 &O :V ; resolution 1000m 19 / 999.9 / 9999m 1 / 0.1 / 1ms us / 1ms + 50ppm 0.0528A-3.3A/µs 0.0132A/µs 0-140A 2.24mA 0-60V 1mV eading + Range)	0.528A-33A/µs 0.132A/µs 140-1400A 22.4mA 60-600V 10mV	0.0576A-3.6A/µs 0.0144A/µs 0-168A 2.688mA  0-60V 1mV	0.576A-36A/µs 0.144A/µs 168-1680A 26.88mA 60-600V 10mV
Surge step MPPT Mode Algorithm Load mode P&O interval Dynamic Mode Timing Thigh & Tlow Resolution Accuracy Slew Rate Resolution Current Range Resolution Measurement Voltage Read Back Range (5 Digital) Resolution Accuracy Current Read Back Range (5 Digital) Resolution Accuracy Current Read Back Range (5 Digital) Resolution Accuracy Power Read Back Range (5 Digital)	0.0432A~2.7A/µs 0.0108A/µs 0~105A 1.68mA  0~60V 1mV  0~105A 1.68mA	0.432A-27A/µs 0.108A/µs 105-1050A 16.8mA 60-600V 10mV	0.048A~3A/µs 0.012A/µs 0.012A/µs 0-126A 2.016mA 0-60V 1mV	1000ms-60000ms 0.010-9.999 / 99.9 0.001 / 0.01 1µs / 10µs / 10µs / 10µs 0.12A/µs 126-1260A 20.16mA 60-600V 10mV ±0.025% of (Re 126-1260A 20.16mA ± 0.05% of (Re	-5 &O EV; resolution 1000m 19 / 999.9 / 9999m 1 / 0.1 / 1ms us / 1ms + 50ppm 0.0528A-3.3A/µs 0.0132A/µs 0.0132A/µs 0-140A 2.24mA  0-60V 1mV eading + Range) 0-140A 2.24mA 2.24mA	0.528A-33A/µs 0.132A/µs 140-1400A 22.4mA 60-600V 10mV 140-1400A 22.4mA	0.0576A-3.6A/µs 0.0144A/µs 0-168A 2.688mA  0-60V 1mV  0-168A 2.688mA	0.576A-36A/µs 0.144A/µs 168-1680A 26.88mA 60-600V 10mV
Surge step MPPT Mode Algorithm Load mode P&O interval Dynamic Mode Timing Thigh & Tlow Resolution Accuracy Slew Rate Resolution Current Range Resolution Measurement Voltage Read Back Range (5 Digital) Resolution Accuracy Current Read Back Range (5 Digital) Resolution Accuracy Current Read Back Range (5 Digital) Accuracy Power Read Back Range (5 Digital) Accuracy	0.0432A~2.7A/µs 0.0108A/µs 0~105A 1.68mA  0~60V 1mV  0~105A 1.68mA	0.432A-27A/µs 0.108A/µs 105-1050A 16.8mA 60-600V 10mV 105-1050A 16.8mA	0.048A~3A/µs 0.012A/µs 0.012A/µs 0-126A 2.016mA 0-60V 1mV	1000ms-60000ms 0.010-9.999 / 99.9 0.001 / 0.01 1µs / 10µs / 10µs / 10µs 0.12A/µs 126-1260A 20.16mA 60-600V 10mV ±0.025% of (Re 126~1260A 20.16mA ± 0.05% of (Re	-5 &O -7 ; resolution 1000m -9 / 999.9 / 9999m -/ 0.1 / 1ms	0.528A-33A/µs 0.132A/µs 140-1400A 22.4mA 60-600V 10mV 140-1400A 22.4mA	0.0576A-3.6A/µs 0.0144A/µs 0-168A 2.688mA  0-60V 1mV  0-168A 2.688mA	0.576A-36A/µs 0.144A/µs 168-1680A 26.88mA 60-600V 10mV
Surge step MPPT Mode Algorithm Load mode P&O interval Dynamic Mode Timing Thigh & Tlow Resolution Accuracy Slew Rate Resolution Current Range Resolution Measurement Voltage Read Back Range (5 Digital) Resolution Accuracy Current Read Back Range (5 Digital) Resolution Accuracy Power Read Back Range (5 Digital) Resolution Accuracy Power Read Back Range (5 Digital) Accuracy Power Read Back Range (5 Digital) Accuracy	0.0432A~2.7A/µs 0.0108A/µs 0~105A 1.68mA  0~60V 1mV  0~105A 1.68mA	0.432A-27A/µs 0.108A/µs 105-1050A 16.8mA 60-600V 10mV 105-1050A 16.8mA	0.048A~3A/µs 0.012A/µs 0.012A/µs 0-126A 2.016mA 0-60V 1mV	1000ms-6000ms 0.010-9.999 / 99.9 0.001 / 0.01 1ps / 10ps / 100 0.48A-30A/µs 0.12A/µs 126-1260A 20.16mA 60-600V 10mV ±0.025% of (Re 126-1260A 20.16mA	-5 &O V; resolution 1000m 99 / 999.9 / 9999m / 0.1 / 1ms sy / 1ms + 50ppm 0.0528A-3.3A/µs 0.0132A/µs 0.0132A/µs  0-140A 2.24mA  0-60V 1mV eading + Range) 0-140A 2.24mA 2.24mA	0.528A-33A/µs 0.132A/µs 140-1400A 22.4mA 60-600V 10mV 140-1400A 22.4mA	0.0576A-3.6A/µs 0.0144A/µs 0-168A 2.688mA  0-60V 1mV  0-168A 2.688mA	0.576A-36A/µs 0.144A/µs 168-1680A 26.88mA 60-600V 10mV 168-1680A 26.88mA
Surge step MPPT Mode Algorithm Load mode P&O interval Dynamic Mode Timing Thigh & Tlow Resolution Accuracy Slew Rate Resolution Current Range Resolution Measurement Voltage Read Back Range (5 Digital) Resolution Accuracy Current Read Back Range (5 Digital) Resolution Accuracy Dewer Read Back Range (5 Digital) Accuracy General Typical Short Resistance Maximum Short Current	0.0432A-2.7A/µs 0.0108A/µs 0-105A 1.68mA  0-60V 1mV  0-105A 1.68mA	0.432A-27A/µs 0.108A/µs 105-1050A 16.8mA 60-600V 10mV 105-1050A 16.8mA	0.048A~3A/µs 0.012A/µs 0.012A/µs 0-126A 2.016mA 0-60V 1mV	1000ms-6000ms 0.010-9.999 / 99.9 0.001 / 0.01 1μs / 10μs / 10μs 0.12A/μs 0.12A/μs 126-1260A 20.16mA 40.025% of (Re 126-1260A 20.16mA ± 0.05% of (Re 000W ± 0.06% of (Re	2000 140 140 140 140 140 140 140 140 140	0.528A-33A/μs 0.132A/μs 140-1400A 22.4mA 60-600V 10mV 140-1400A 22.4mA	0.0576A-3.6A/µs 0.0144A/µs 0-168A 2.688mA  0-60V 1mV  0-168A 2.688mA	0.576A-36A/µs 0.144A/µs 168-1680A 26.88mA 60-600V 10mV
Surge step MPPT Mode Algorithm Load mode P&O interval Dynamic Mode Timing Thigh & Tlow Resolution Accuracy Slew Rate Resolution Current Range Resolution Measurement Voltage Read Back Range (5 Digital) Resolution Accuracy Current Read Back Range (5 Digital) Resolution Accuracy Coeneral Typical Short Resistance Maximum Short Current Load ON Voltage	0.0432A-2.7A/µs 0.0108A/µs 0-105A 1.68mA  0-60V 1mV  0-105A 1.68mA	0.432A~27A/μs 0.108A/μs 105~1050A 16.8mA 60~600V 10mV 105~1050A 16.8mA	0.048A~3A/µs 0.012A/µs 0.012A/µs 0-126A 2.016mA 0-60V 1mV	1000ms-60000ms 0.010-9.999 / 99.9 0.001 / 0.01 1ps / 10ps / 10p 0.48A-30A/µs 0.12A/µs 126-1260A 20.16mA 60-600V 10mV ±0.025% of (Re 126-1260A 20.16mA ± 0.05% of (Re 000W ± 0.06% of (Re	-5 &O V; resolution 1000m 99 / 999.9 / 9999m / 0.1 / 1ms sy / 1ms + 50ppm 0.0528A-3.3A/µs 0.0132A/µs  0-140A 2.24mA  0-60V 1mV eading + Range) 0-140A 2.24mA	0.528A-33A/μs 0.132A/μs 140-1400A 22.4mA 60-600V 10mV 140-1400A 22.4mA	0.0576A-3.6A/µs 0.0144A/µs 0-168A 2.688mA  0-60V 1mV  0-168A 2.688mA	0.576A-36A/µs 0.144A/µs 168-1680A 26.88mA 60-600V 10mV 168-1680A 26.88mA
Surge step MPPT Mode Algorithm Load mode P&O interval Dynamic Mode Timing Thigh & Tlow Resolution Accuracy Slew Rate Resolution Current Range Resolution Measurement Voltage Read Back Range (5 Digital) Resolution Accuracy Slew Rate Resolution Measurement Voltage Read Back Range (5 Digital) Resolution Accuracy Power Read Back Range (5 Digital) Resolution Accuracy Power Read Back Range (5 Digital) Accuracy Load ON Voltage Load OFF Voltage	0.0432A~2.7A/µs 0.0108A/µs 0~105A 1.68mA  0~60V 1mV  0~105A 1.68mA	0.432A~27A/μs 0.108A/μs 105—1050A 16.8mA 60~600V 10mV 105~1050A 16.8mA	0.048A~3A/µs 0.012A/µs 0.012A/µs 0-126A 2.016mA 0-60V 1mV 0-126A 2.016mA	1000ms-6000ms 0.010-9.999 / 99.9 0.001 / 0.01 1µs / 10µs / 10µs / 10µs 0.12A/µs 126-1260A 20.16mA 20.16mA 40.025% of (Re 126-1260A 20.16mA ± 0.05% of (Re 180Ω 50A 0.4 ~ 0 ~	-5 & O CV ; resolution 1000m resolution	0.528A-33A/μs 0.132A/μs 140-1400A 22.4mA 60-600V 10mV 140-1400A 22.4mA	0.0576A-3.6A/µs 0.0144A/µs 0-168A 2.688mA  0-60V 1mV  0-168A 2.688mA	0.576A-36A/µs 0.144A/µs 168-1680A 26.88mA 60-600V 10mV 168-1680A 26.88mA
Surge step MPPT Mode Algorithm Load mode P&O interval Dynamic Mode Timing Thigh & Tlow Resolution Accuracy Slew Rate Resolution Current Range Resolution Measurement Voltage Read Back Range (5 Digital) Resolution Accuracy Current Read Back Range (5 Digital) Resolution Accuracy Lourent Read Back Range (5 Digital) Resolution Accuracy Power Read Back Range (5 Digital) Accuracy Load OFF Voltage Load OFF Voltage Load OFF Voltage Power Consumption Dimension (HxWxD)	0.0432A~2.7A/µs 0.0108A/µs 0.0108A/µs 0-105A 1.68mA  0-60V 1mV  0~105A 1.68mA	0.432A~27A/μs 0.108A/μs 105~1050A 16.8mA 60~600V 10mV 105~1050A 16.8mA	0.048A-3A/µs 0.012A/µs 0.012A/µs 0-126A 2.016mA 0-60V 1mV 0-126A 2.016mA	1000ms-60000ms 0.010-9.999 / 99.9 0.001 / 0.01 1μs / 10μs / 100 0.48A-30A/μs 0.12A/μs 126-1260A 20.16mA 60-600V 10mV ±0.025% of (Re 126-1260A 20.16mA ± 0.05% of (Re 000W ± 0.06% of (Re 000W 500A 0.4 ~ 0 ~ 0 ~ 0 ~ 0 ~ 0 ~ 0 ~ 0 ~ 0 ~ 0 ~ 0	-5 &O -5 &O -7 ; resolution 1000m -9 / 999.9 / 9999m -/ 0.1 / 1ms -/ 1 / 1ms	0.528A-33A/μs 0.132A/μs 140-1400A 22.4mA 60-600V 10mV 140-1400A 22.4mA	0.0576A-3.6A/µs 0.0144A/µs 0.0144A/µs 0.0168A 2.688mA  0-60V 1mV  0-168A 2.688mA	0.576A-36A/μs 0.144A/μs 168-1680A 26.88mA 60-600V 10mV 168-1680A 26.88mA
Surge step MPPT Mode Algorithm Load mode P&O interval Dynamic Mode Timing Thigh & Tlow Resolution Accuracy Slew Rate Resolution Current Range Resolution Measurement Voltage Read Back Range (5 Digital) Resolution Accuracy Current Read Back Range (5 Digital) Resolution Accuracy Current Read Back Range (5 Digital) Resolution Accuracy Current Read Back Range (5 Digital) Resolution Accuracy Power Read Back Range (5 Digital) Resolution Accuracy Power Read Back Range (5 Digital) Resolution Accuracy Power Read Back Range (5 Digital) Accuracy Power Read Back Range (5 Digital) Accuracy Power Read Back Range (5 Digital) Accuracy General Typical Short Resistance Maximum Short Current Load ON Voltage Load OFF Voltage Power Consumption Dimension (HxWxD) HxWxD)Prot included Rob Hount Rickshool Dimension (HxWxD)	0.0432A~2.7A/µs 0.0108A/µs 0.0108A 1.68mA  0-60V 1mV  0~105A 1.68mA  150  0.00 10:  132 760.6x481 656.6x445.	0.432A-27A/μs 0.108A/μs 105-1050A 16.8mA 60-600V 10mV 105-1050A 16.8mA 000W	0.048A~3A/µs 0.012A/µs 0.012A/µs 0.0126A 2.016mA  0-60V 1mV  0-126A 2.016mA  180  0.00 120  132 760.6x481 656.6x445.	1000ms-6000ms 0.010-9.999 / 99.9 0.001 / 0.01 1ps / 10ps / 10p 0.48A-30A/µs 0.12A/µs 126-1260A 20.16mA  60-600V 10mV ±0.025% of (Re 126-1260A 20.16mA ± 0.05% of (Re 000W ± 0.06% of (Re 800 50A 0.4 ~ 0 ~	-5 &O EV; resolution 1000m 19 / 999.9 / 9999m 10.1 / 1ms 10.0528A-3.3A/µs 0.0132A/µs 0.0132A/µs 0.0140A 2.24mA 0-60V 1mV eading + Range) 0-140A 2.24mA 2.24mA 2.24mA 2.34mA 2.4mA 2.4mA 2.4mA 3.4mA 3.	0.528A-33A/µs 0.132A/µs 140-1400A 22.4mA 60-600V 10mV 140-1400A 22.4mA	0.0576A-3.6A/µs 0.0144A/µs 0.0144A/µs 0.168A 2.688mA  0-60V 1mV  0-168A 2.688mA  240  10.00 166  170 886.6x481 782.6x445	0.576A-36A/μs 0.144A/μs 168-1680A 26.88mA 60-600V 10mV 168-1680A 26.88mA
Surge step MPPT Mode Algorithm Load mode P&O interval Dynamic Mode Timing Thigh & Tlow Resolution Accuracy Slew Rate Resolution Current Range Resolution Measurement Voltage Read Back Range (5 Digital) Resolution Accuracy Slew Rate Current Range Resolution Measurement Voltage Read Back Range (5 Digital) Resolution Accuracy Current Read Back Range (5 Digital) Accuracy Current Read Back Range (5 Digital) Accuracy Courrent Load ON Voltage Load OFF Voltage Power Consumption Dimension (HxWxD) HxWxD Wai included Rusk Mount RX, whodel) Weight	0.0432A~2.7A/µs 0.0108A/µs 0.0108A 1.68mA  0-60V 1mV  0~105A 1.68mA  150  0.00 10:  132 760.6x481 656.6x445.	0.432A-27A/μs 0.108A/μs 105-1050A 16.8mA  60-600V 10mV  105-1050A 16.8mA	0.048A~3A/µs 0.012A/µs 0.012A/µs 0.0126A 2.016mA  0-60V 1mV  0-126A 2.016mA  180  0.00 120  132 760.6x481 656.6x445.	1000ms-6000ms 0.010-9.999 / 99.9 0.001 / 0.01 1µs / 10µs / 10µs / 10µs 0.12A/µs 126-1260A 20.16mA 20.16mA 40.05% of (Re 126-1260A 20.16mA ± 0.05% of (Re 126-1260A 20.16mA	0-140A 2.24mA  0-60V 1mV 2.24mA  0-140A 2.24mA 0-140A 0	0.528A-33A/μs 0.132A/μs 140-1400A 22.4mA 60-600V 10mV 140-1400A 22.4mA 00W	0.0576A-3.6A/µs 0.0144A/µs 0.0144A/µs 0.168A 2.688mA  0-60V 1mV  0-168A 2.688mA  240  10.00 166  170 886.6x481 782.6x445	0.576A-36A/μs 0.144A/μs 168-1680A 26.88mA 60-600V 10mV 168-1680A 26.88mA
Surge step MPPT Mode Algorithm Load mode P&O interval Dynamic Mode Timing Thigh & Tlow Resolution Accuracy Slew Rate Resolution Current Range Resolution Measurement Voltage Read Back Range (5 Digital) Resolution Accuracy Current Read Back Range (5 Digital) Resolution Accuracy Current Read Back Range (5 Digital) Resolution Accuracy Current Read Back Range (5 Digital) Resolution Accuracy Power Read Back Range (5 Digital) Resolution Accuracy Loure (5 Digital) Resolution Accuracy Power Read Back Range (5 Digital) Resolution Accuracy Power Read Back Range (5 Digital) Accuracy Power Read Back Range (5 Digital) Accuracy General Typical Short Resistance Maximum Short Current Load ON Voltage Load OFF Voltage Power Consumption Dimension (HxWxD) HxWxD)Prox Included Rob Hount Rickshoot  HxWxD)Prox Included Rob Hount Rickshoot  HxWxD)	0.0432A~2.7A/µs 0.0108A/µs 0.0108A 1.68mA  0-60V 1mV  0~105A 1.68mA  150  0.00 10:  132 760.6x481 656.6x445.	0.432A-27A/μs 0.108A/μs 105-1050A 16.8mA 60-600V 10mV 105-1050A 16.8mA 000W	0.048A~3A/µs 0.012A/µs 0.012A/µs 0.0126A 2.016mA  0-60V 1mV  0-126A 2.016mA  180  0.00 120  132 760.6x481 656.6x445.	1000ms-6000ms 0.010-9.999 / 99.9 0.001 / 0.01 1 μs / 10μs / 10μs 0.48A-30A/μs 0.12A/μs 126-1260A 20.16mA  ± 0.05% of (Re 126~1260A 20.16mA ± 0.05% of (Re 180Ω 0.4 ~ 0 ~ 0 ~ 0 ~ 0 ~ 0 ~ 0 ~ 0 ~ 0 ~ 0 ~ 0	-5 &O EV; resolution 1000m 19 / 999.9 / 9999m 10.1 / 1ms 10.0528A-3.3A/µs 0.0132A/µs 0.0132A/µs 0.0140A 2.24mA 0-60V 1mV eading + Range) 0-140A 2.24mA 2.24mA 2.24mA 2.34mA 2.4mA 2.4mA 2.4mA 3.4mA 3.	0.528A-33A/µs 0.132A/µs 140-1400A 22.4mA 60-600V 10mV 140-1400A 22.4mA	0.0576A-3.6A/µs 0.0144A/µs 0.0144A/µs 0.168A 2.688mA  0-60V 1mV  0-168A 2.688mA  240  10.00 166  170 886.6x481 782.6x445	0.576A-36A/μs 0.144A/μs 168-1680A 26.88mA 60-600V 10mV 168-1680A 26.88mA

### Cooling: Advanced Fan Cooled

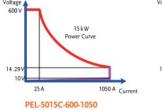
Input AC Power: 100~240 Vac ±10%, 50/60Hz, Single-phase

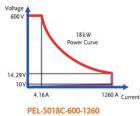
Note \*1 : The power rating specifications at ambient temperature = 25°C

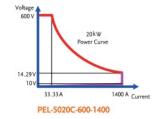
Note \*2 : The range is automatically or forcing to range II only in CC Mode

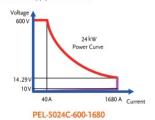
Note \*3 : If the operating current is below range 0.1%, the accuracy specification is 0.1% F.S.

Note \*4 : Operating temperature range is 0-40°C \* all specifications apply for 25°C±5°C









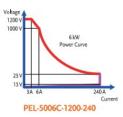
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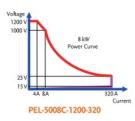
SPECIFICATIONS						
MODEL	PEL-50080	C-1200-320	PEL-50100	C-1200-400	PEL-50120	C-1200-480
Power*1	81	cW	10	kW	12	kW
Current	0 ~ 32A	0 ~ 320A	0 ~ 40A	0 ~ 400A	0 ~ 48A	0 ~ 480A
Voltage			200V			
Min. Operating Voltage Protections	15V @	320A	15V @	0 400A	150 @	9 480A
Over Power Protection (OPP)	T	10	5%			
Over Current Protection (OCP)		10-				
Over Voltage Protection (OVP)		10-	4%			
Over Temp Protection (OTP)		90℃	±5℃			
Constant Current Mode Range <sup>°2</sup>	32A	320A	40A	400A	48A	480A
Resolution	0.512mA	5.12mA	0.64mA	6.4mA	0.768mA	7.68mA
Accuracy*3	0.012	± 0.05% of (Set			0.7001111	7.001117
Constant Resistance Mode						
Range	22.5ΚΩ~3.75Ω	3.75Ω~0.0468Ω	18ΚΩ~3Ω	3Ω~0.0375Ω	15ΚΩ~2.5Ω	2.5Ω~0.0312Ω
Resolution	4.444µS	62.5μΩ ±0.2% of (Set	5.5555µS	50μΩ	6.6666µS	41.667μΩ
Accuracy Constant Voltage Mode	1/	±0.2% or (Set	ting + Kange)			
Range	T.	120	00V			
Resolution		20				
Accuracy		± 0.05% of (Se	tting + Range)			
Constant Power Mode	90011	9000111	1000184	1000011	12000	1200011
Range	800W 12.8mW	8000W 128mW	1000W 16mW	10000W 160mW	1200W 19.2mW	12000W 192mW
	± 0.1% of	± 0.1% of	± 0.1% of	± 0.1% of	± 0.1% of	± 0.1% of
Accuracy		(Setting+Range)	(Setting+Range)	(Setting+Range)	(Setting+Range)	(Setting+Range)
Constant Voltage Mode + Constant Current Mode						
Range	1200V	320A	1200V	400A	1200V	480A
Resolution Accuracy	20mV	5.12mA ± 1.0% of (Set	20mV	6.4mA	20mV	7.68mA
Constant Voltage Mode + Constant Power Mode		11.070 01 (36)	iting + Kange)			
Range	1200V	8000W	1200V	10000W	1200V	12000W
Resolution	20mV	128mW	20mV	160mW	20mV	192mW
Accuracy		± 1.0% of (Set	tting + Range)			
Surge Test Surge & Normal current	0_3	20A	I 0_4	00A	I 0.4	80A
Surge time		000ms		000ms		000ms
Surge step	2		-5			
MPPT Mode						
Algorithm Load mode		P8 C	20			
P&O interval	1		resolution 1000m	s		
Dynamic Mode						
Timing						
Thigh & Tlow			99 / 999.9 / 9999m	S		
Resolution			1 / 0.1 / 1ms µs / 1ms + 50ppm			
Slew Rate	0.0192A~1.2A/µs		0.0224A~1.4A/µs	0.224A~14A/µs	0.0256A~1.6A/µs	0.256A~16A/µs
Resolution	0.0048A/µs	0.048A/µs	0.0056A/µs	0.056A/µs	0.0064A/µs	0.064A/µs
Current						
Range	0~32A 0.512mA	32~320A 5.12mA	0~40A 0.64mA	40~400A 6.4mA	0~48A 0.768mA	48~480A 7.68mA
Measurement	0.312IIIA	3.12IIIA	0.04IIIA	0.4111A	0.700HIA	7.00IIIA
Voltage Read Back						
Range (5 Digital)	0~120V	120~1200V	0~120V	120~1200V	0~120V	120~1200V
Resolution	2mV	20mV	2mV	20mV	2mV	20mV
Accuracy Current Read Back		±0.025% of (R	eading + Range)			
Range (5 Digital)	0~32A	32~320A	0~40A	40~400A	0~48A	48~480A
Resolution	0.512mA	5.12mA	0.64mA	6.4mA	0.768mA	7.68mA
Accuracy		±0.05% of (Re	ading + Range)			
Power Read Back	1	now/	100	0011/	100	00W
Range (5 Digital)	800	± 0.06% of (Re	ading + Range)	00W	120	UUW .
General	1	_ 1.1070 or (NO	Numbel			
Typical Short Resistance		469Ω		75Ω		13Ω
Maximum Short Current	32	20A		0A	48	0A
Load ON Voltage Load OFF Voltage			- 240V 240V			
Power Consumption	92	0 ~ 0VA		OVA	926	OVA
Dimension (HxWxD)		x757.3mm		x757.3mm		x757.3mm
HxWxD(Not included Rack Mount Kit,wheels)	467.6x445.	2x757.3mm	467.6x445.	2x757.3mm	467.6x445.	2x757.3mm
Weight	77.	5 kg		8 kg	92	kg
Temperature <sup>*4</sup>			40°C E			
Safety & EMC						

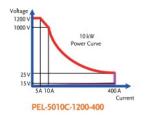
Cooling: Advanced Fan Cooled

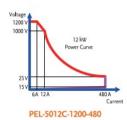
Input AC Power: 100~240 Vac ±10%, 50/60Hz, Single-phase

Note  $\pm$ 1 : The power rating specifications at ambient temperature = 25 °C Note  $\pm$ 2 : The range is automatically or forcing to range II only in CC Mode Note  $\pm$ 3 : If the operating current is below range 0.1%, the accuracy specification is 0.1% F.S. Note  $\pm$ 4 : Operating temperature range is 0–40 °C  $\pm$  all specifications apply for 25 °C $\pm$ 5 °C









SPECIFICATIONS MODEL	DEL 5015/	C-1200-600	DEL 50197	C-1200-720	DEL 50200	C-1200-800	DEL 50240	-1200-960			
Power*1	151			kW	201		24				
Current	0 ~ 60A	0 ~ 600A	0 ~ 72A	0 ~ 720A	0 ~ 80A	0 ~ 800A	0 ~ 96A	0 ~ 960A			
Voltage	351/6	0.004	351/6	0 ~ 1	2000000	2004	154.6	0604			
Min. Operating Voltage Protections	150 @	000A	150 @	720A	15V @	800A	15V @	960A			
Over Power Protection (OPP)				105							
Over Current Protection (OCP)				104							
Over Voltage Protection (OVP) Over Temp Protection (OTP)				104 90°C:							
Constant Current Mode				30 0.							
Range*2	60A	600A	72A	720A	80A	800A	96A	960A			
Resolution Accuracy <sup>23</sup>	0.96mA	9.6mA	1.152mA	11.52mA ± 0.05% of (Se	1.28mA	12.8mA	1.536mA	15.36mA			
Constant Resistance Mod	de			1 0.03/0 01 (36	ttilig + Kalige)						
Range	12Ω-2Ω	2Ω~ 0.0250Ω	10ΚΩ~1.666Ω	1.666Ω-0.0208Ω	9ΚΩ~1.5Ω	1.5Ω-0.0187Ω	7.5ΚΩ~1.25Ω	1.25Ω~0.0156Ω			
Resolution Accuracy	8.3333µS	33.334μΩ	10µS	27.778μΩ	11.111µS	25μΩ	13.333µS	20.834μΩ			
Constant Voltage Mode				±0.2% of (Set	ting + kange)						
Range				120	00V						
Resolution	20mV ± 0.05% of (Setting + Range)										
Accuracy Constant Power Mode				± 0.05% of (Se	tting + Range)						
Range	1500W	15000W	1800W	18000W	2000W	20000W	2400W	24000W			
Resolution	24mW	240mW	28.8mW	288mW	32mW	320mW	38.4mW	384mW			
Accuracy	± 0.1% of (Setting+Range)	± 0.1% of (Setting+Range)	± 0.1% of (Setting+Range)	± 0.1% of (Setting+Range)	± 0.1% of (Setting+Range)	± 0.1% of (Setting+Range)	± 0.1% of (Setting+Range)	± 0.1% of (Setting+Range)			
Constant Voltage Mode			,	,	,BaBe)	,	(Seeming Committee)	(2500 B (100 Bc)			
Range	1200V	600A	1200V	720A	1200V	800A	1200V	960A			
Resolution Accuracy	20mV	9.6mA	20mV	3.2mA ± 1.0% of (Set	20mV	3.84mA	20mV	15.36mA			
Constant Voltage Mode	+ Constant Powe	r Mode		± 1.0% or (Set	tting + Kange)						
Range	1200V	15000W	1200V	18000W	1200V	20000W	1200V	24000W			
Resolution Accuracy	20mV	240mW	20mV	288mW	20mV	320mW	20mV	384mW			
Surge Test				± 1.0% of (Set	tting + Kange)						
Surge & Normal current		00A	0~7	20A	0~8	00A	0~9	60A			
Surge time	10~10	000ms	10~10	000ms		000ms	10-10	00ms			
Surge step MPPT Mode				1-	-5						
Algorithm					20						
Load mode P&O interval					V						
Dynamic Mode			5)	000ms~60000ms ;	resolution 1000m	5					
Timing											
Thigh & Tlow			(	0.010-9.999 / 99.9	9 / 999.9 / 9999ms / 0.1 / 1ms	S					
Resolution Accuracy											
Slew Rate	0.0288A~1.8A/μs	0.288A~18A/μs	0.032A~2A/µs	1μs / 10μs / 100μ	0.0352A~2.2A/μs	0.352A~22A/µs	0.0384A~2.4A/µs	0.384A~24A/µs			
Slew Rate Resolution	0.0288A~1.8A/μs 0.0072A/μs	0.288A~18A/μs 0.072A/μs	0.032A~2A/μs 0.008A/μs	1μs / 10μs / 100μ	ıs / 1ms + 50ppm	0.352A~22A/μs 0.088A/μs	0.0384A~2.4A/μs 0.0096A/μs	0.384A~24A/μs 0.096A/μs			
Slew Rate Resolution Current	0.0072A/µs	0.072A/μs	0.008A/µs	1μs / 10μs / 100μ 0.32A~20A/μs 0.08A/μs	0.0352A~2.2A/μs 0.0088A/μs	0.088A/µs	0.0096A/μs	0.096A/µs			
Slew Rate Resolution Current Range Resolution				1μs / 10μs / 100μ 0.32A~20A/μs	us / 1ms + 50ppm 0.0352A~2.2A/μs						
Slew Rate Resolution Current Range Resolution Measurement	0.0072A/μs 0–60A	0.072A/μs 60~600A	0.008A/µs 0-72A	1μs / 10μs / 100μ 0.32A~20A/μs 0.08A/μs	0.0352A~2.2A/μs 0.0088A/μs 0.80A	0.088A/µs 80~800A	0.0096A/μs 0~96A	0.096A/μs 96~960A			
Slew Rate Resolution Current Range Resolution Measurement Voltage Read Back	0.0072A/μs 0-60A 0.96mA	0.072A/μs 60–600A 9.6mA	0.008A/µs 0-72A 1.152mA	1µs / 10µs / 100µ 0.32A~20A/µs 0.08A/µs 72~720A 11.52mA	us / 1ms + 50ppm 0.0352A-2.2A/µs 0.0088A/µs 0-80A 1.28mA	0.088A/µs 80–800A 12.8mA	0.0096A/µs 0-96A 1.536mA	0.096A/µs 96–960A 15.36mA			
Slew Rate Resolution Current Range Resolution Measurement	0.0072A/μs 0–60A	0.072A/μs 60~600A	0.008A/µs 0-72A	1μs / 10μs / 100μ 0.32A~20A/μs 0.08A/μs	0.0352A~2.2A/μs 0.0088A/μs 0.80A	0.088A/µs 80~800A	0.0096A/μs 0~96A	0.096A/μs 96~960A			
Slew Rate Resolution Current Range Resolution Measurement Voltage Read Back Range (5 Digital) Resolution Accuracy	0.0072A/µs  0-60A 0.96mA	0.072A/µs 60–600A 9.6mA	0.008A/µs  0-72A  1.152mA	1µs / 10µs / 100µ 0.32A-20A/µs 0.08A/µs 72-720A 11.52mA 120-1200V 20mV	s / 1ms + 50ppm 0.0352A-2.2A/μs 0.0088A/μs 0-80A 1.28mA	0.088A/µs 80–800A 12.8mA	0.0096A/µs 0-96A 1.536mA	0.096A/μs 96–960A 15.36mA			
Slew Rate Resolution Current Range Resolution Measurement Voltage Read Back Range (5 Digital) Resolution Accuracy Current Read Back	0.0072A/µs  0-60A  0.96mA  0-120V  2mV	0.072A/µs 60–600A 9.6mA 120–1200V 20mV	0.008A/µs  0-72A 1.152mA  0-120V 2mV	1µs / 10µs / 100µ 0.32A~20A/µs 0.08A/µs 72~720A 11.52mA 120~1200V 20mV ±0.025% of (Re	us / 1ms + 50ppm 0.0352A-2.2A/µs 0.0088A/µs 0-80A 1.28mA 0-120V 2mV eading + Range)	0.088A/µs 80–800A 12.8mA 120–1200V 20mV	0.0096A/µs  0-96A 1.536mA  0-120V 2mV	0.096A/µs 96–960A 15.36mA 120–1200V 20mV			
Slew Rate Resolution Current Range Resolution Measurement Voltage Read Back Range (5 Digital) Resolution Accuracy Current Read Back Range (5 Digital) Resolution	0.0072A/µs  0-60A 0.96mA	0.072A/µs 60–600A 9.6mA	0.008A/µs  0-72A 1.152mA  0-120V 2mV  0-72A 1.152mA	1µs / 10µs / 100; 0.32A~20A/µs 0.08A/µs 72~720A 11.52mA 120~1200V ±0.025% of (Re 72~720A 11.52mA	18 / 1ms + 50ppm 0.0352A-2.2A/µs 0.0088A/µs 0-80A 1.28mA 0-120V 2mV eading + Range) 0-80A 1.28mA	0.088A/µs 80–800A 12.8mA	0.0096A/µs 0-96A 1.536mA	0.096A/μs 96–960A 15.36mA			
Slew Rate Resolution Current Range Resolution Measurement Voltage Read Back Range (5 Digital) Resolution Accuracy Current Read Back Range (5 Digital) Resolution Accuracy	0.0072A/µs  0-60A 0.96mA  0-120V 2mV	0.072A/µs 60-600A 9.6mA 120-1200V 20mV	0.008A/µs  0-72A 1.152mA  0-120V 2mV  0-72A 1.152mA	1µs / 10µs / 100µ 0.32A-20A/µs 0.08A/µs 72-720A 11.52mA 120-1200V 20mV ±0.025% of (Re	18 / 1ms + 50ppm 0.0352A-2.2A/µs 0.0088A/µs 0-80A 1.28mA 0-120V 2mV eading + Range) 0-80A 1.28mA	0.088A/µs 80–800A 12.8mA 120–1200V 20mV	0.0096A/µs  0-96A 1.536mA  0-120V 2mV	0.096A/µs 96–960A 15.36mA 120–1200V 20mV			
Slew Rate Resolution Current Range Resolution Measurement Voltage Read Back Range (5 Digital) Resolution Accuracy Current Read Back Range (5 Digital) Resolution Accuracy Power Read Back	0.0072A/µs  0-60A 0.96mA  0-120V 2mV  0-60A 0.96mA	0.072A/µs 60–600A 9.6mA  120–1200V 20mV  60–600A 9.6mA	0.008A/µs  0-72A 1.152mA  0-120V 2mV  0-72A 1.152mA ±0	1µs / 10µs / 100µ 0.32A~20A/µs 0.08A/µs 72~720A 11.52mA 120~1200V 20mV ±0.025% of (Re 72~720A 11.52mA 05% of (Reading -	1	0.088A/µs 80–800A 12.8mA 120–1200V 20mV 80–800A 12.8mA	0.0096A/µs  0-96A 1.536mA  0-120V 2mV  0-96A 1.536mA	0.096A/µs 96–960A 15.36mA 120–1200V 20mV 96–960A 15.36mA			
Slew Rate Resolution Current Range Resolution Measurement Voltage Read Back Range (5 Digital) Resolution Accuracy Current Read Back Range (5 Digital) Resolution Accuracy Current Read Back Range (5 Digital) Accuracy Power Read Back Range (5 Digital) Accuracy	0.0072A/µs  0-60A 0.96mA  0-120V 2mV  0-60A 0.96mA	0.072A/µs 60-600A 9.6mA 120-1200V 20mV	0.008A/µs  0-72A 1.152mA  0-120V 2mV  0-72A 1.152mA ±0	1µs / 10µs / 100; 0.32A~20A/µs 0.08A/µs 72~720A 11.52mA 120~1200V ±0.025% of (Re 72~720A 11.52mA	us / 1ms + 50ppm 0.0352A-2.2A/µs 0.0088A/µs 0-80A 1.28mA 0-120V 2mV eading + Range) 0-80A 1.28mA 1.28mA	0.088A/µs 80–800A 12.8mA 120–1200V 20mV 80–800A 12.8mA	0.0096A/µs  0-96A 1.536mA  0-120V 2mV	0.096A/µs 96–960A 15.36mA 120–1200V 20mV 96–960A 15.36mA			
Slew Rate Resolution Current Range Resolution Measurement Voltage Read Back Range (5 Digital) Resolution Accuracy Current Read Back Range (5 Digital) Resolution Accuracy Power Read Back Range (5 Digital) Accuracy Power Read Back Range (5 Digital) Accuracy General	0.0072A/µs  0-60A 0.96mA  0-120V 2mV  0-60A 0.96mA	0.072A/µs 60–600A 9.6mA  120–1200V 20mV  60–600A 9.6mA	0.008A/µs  0-72A 1.152mA  0-120V 2mV  0-72A 1.152mA ±0	1µs / 10µs / 100µ 0.32A~20A/µs 0.08A/µs 72~720A 11.52mA  120~1200V ±0.025% of (Re 72~720A 11.52mA 0.5% of (Reading -	us / 1ms + 50ppm 0.0352A-2.2A/µs 0.0088A/µs 0-80A 1.28mA 0-120V 2mV 2ading + Range) 0-80A 1.28mA + Range)	0.088A/µs  80–800A 12.8mA  120–1200V 20mV  80–800A 12.8mA	0.0096A/µs  0-96A 1.536mA  0-120V 2mV  0-96A 1.536mA	0.096A/µs  96–960A 15.36mA  120–1200V 20mV  96–960A 15.36mA			
Slew Rate Resolution Current Range Resolution Measurement Voltage Read Back Range (5 Digital) Resolution Accuracy Current Read Back Range (5 Digital) Resolution Accuracy Power Read Back Range (5 Digital) Accuracy General Typical Short Resistance	0.0072A/µs  0-60A 0.96mA  0-120V 2mV  0-60A 0.96mA	0.072A/µs 60–600A 9.6mA  120–1200V 20mV  60–600A 9.6mA	0.008A/µs  0-72A 1.152mA  0-120V 2mV  0-72A 1.152mA ±0  1800	1µs / 10µs / 100µ 0.32A~20A/µs 0.08A/µs  72~720A 11.52mA  120~1200V 20mV ±0.025% of (Re 72~720A 11.52mA  05% of (Reading -	0.0352A-2.2A/μs 0.0088A/μs 0.0088A/μs 0-80A 1.28mA  0-120V 2mV eading + Range) 0-80A 1.28mA  2m8 0-80A 1.28mA  2m9 0-80A 1.28mA + Range)	0.088A/µs  80–800A 12.8mA  120–1200V 20mV  80–800A 12.8mA	0.0096A/µs  0-96A 1.536mA  0-120V 2mV  0-96A 1.536mA	0.096A/µs  96–960A 15.36mA  120–1200V 20mV  96–960A 15.36mA			
Slew Rate Resolution Current Range Resolution Measurement Voltage Read Back Range (5 Digital) Resolution Accuracy Current Read Back Range (5 Digital) Resolution Accuracy Power Read Back Range (5 Digital) Accuracy Power Read Back Range (5 Digital) Accuracy General	0.0072A/µs  0-60A 0.96mA  0-120V 2mV  0-60A 0.96mA	0.072A/µs 60–600A 9.6mA  120–1200V 20mV  60–600A 9.6mA	0.008A/µs  0-72A 1.152mA  0-120V 2mV  0-72A 1.152mA ±0  1800	1µs / 10µs / 100; 0.32A~20A/µs 0.08A/µs  72~720A 11.52mA  120—1200V ±0.025% of (Re  72~720A 11.52mA 0.55% of (Reading +	S / 1ms + 50ppm	0.088A/µs  80–800A 12.8mA  120–1200V 20mV  80–800A 12.8mA	0.0096A/µs  0-96A 1.536mA  0-120V 2mV  0-96A 1.536mA	0.096A/µs  96–960A 15.36mA  120–1200V 20mV  96–960A 15.36mA			
Slew Rate Resolution Current Range Resolution Measurement Voltage Read Back Range (5 Digital) Resolution Accuracy Current Read Back Range (5 Digital) Resolution Accuracy Power Read Back Range (5 Digital) Accuracy Power Read Back Range (5 Digital) Accuracy Fower Read Back Range (5 Digital) Accuracy General Typical Short Resistance Maximum Short Current Load ON Voltage Load OFF Voltage	0.0072A/µs  0-60A 0.96mA  0-120V 2mV  0-60A 0.96mA  0.96mA	0.072A/µs 60–600A 9.6mA  120–1200V 20mV  60–600A 9.6mA	0.008A/µs  0-72A 1.152mA  0-120V 2mV  0-72A 1.152mA ±0  1800	1µs / 10µs / 100µ 0.32A~20A/µs 0.08A/µs  72~720A 11.52mA  120~1200V 20mV ±0.025% of (Re 72~720A 11.52mA 0.5% of (Reading + 0.06% of (Re	S / 1ms + 50ppm	0.088A/µs  80–800A 12.8mA  120–1200V 20mV  80–800A 12.8mA	0.0096A/µs  0-96A 1.536mA  0-120V 2mV  0-96A 1.536mA	0.096A/μs  96–960A 15.36mA  120–1200V 20mV  96–960A 15.36mA			
Slew Rate Resolution Current Range Resolution Measurement Voltage Read Back Range (5 Digital) Resolution Accuracy Current Read Back Range (5 Digital) Resolution Accuracy Power Read Back Range (5 Digital) Accuracy General Typical Short Resistance Maximum Short Current Load ON Voltage Load OFF Voltage Power Consumption	0.0072A/µs  0-60A 0.96mA  0-120V 2mV  0-60A 0.96mA  1500  0.02 60	0.072A/µs 60–600A 9.6mA  120–1200V 20mV  60–600A 9.6mA  00W	0.008A/µs  0-72A 1.152mA  0-120V 2mV  0-72A 1.152mA ±0  1800  1801	1µs / 10µs / 100; 0.32A~20A/µs 0.08A/µs  72~720A 11.52mA  120—1200V ±0.025% of (Re 72~720A 11.52mA 0.5% of (Reading - 0.00W ± 0.06% of (Re 0.96 ~ 0.96 ~ 0.96 ~ 0.90 ~ 0.	s / 1ms + 50ppm 0.0352A-2.2A/µs 0.0088A/µs 0-80A 1.28mA  0-120V 2mV eading + Range)  0-80A 1.28mA  1.28mA  0-80A 1.28mA  0-80A 1.28mA  0-80A 1.28mA  1.28mA  1.28mA  1.28mA  1.28mA	0.088A/µs  80–800A 12.8mA  120–1200V 20mV  80–800A 12.8mA  00W	0.0096A/µs  0-96A 1.536mA  0-120V 2mV  0-96A 1.536mA  2400  0.01	0.096A/µs  96–960A 15.36mA  120–1200V 20mV  96–960A 15.36mA			
Slew Rate Resolution Current Range Resolution Measurement Voltage Read Back Range (5 Digital) Resolution Accuracy Current Read Back Range (5 Digital) Resolution Accuracy Power Read Back Range (5 Digital) Accuracy Power Read Back Range (5 Digital) Accuracy Fower Read Back Range (5 Digital) Accuracy General Typical Short Resistance Maximum Short Current Load ON Voltage Load OFF Voltage	0.0072A/µs  0-60A 0.96mA  0-120V 2mV  0-60A 0.96mA  1500  1320 760.6x481	0.072A/µs 60–600A 9.6mA  120–1200V 20mV  60–600A 9.6mA  00W	0.008A/µs  0-72A 1.152mA  0-120V 2mV  0-72A 1.152mA ±0  1800  0.022 72	1µs / 10µs / 100; 0.32A~20A/µs 0.08A/µs  72~720A 11.52mA  120~1200V ±0.025% of (Re 72~720A 11.52mA 0.55% of (Reading + 0.06% of (Re 09Ω 0A 0.96 ~ 0~ 0VA x757.3mm	18 / 1ms + 50ppm 0.0352A-2.2A/µs 0.0088A/µs 0-80A 1.28mA  0-120V 2mV eading + Range) 0-80A 1.28mA  - Range)  0-80A 0-80A 0-80A 0-80A 0-80A 0-80A 0-80A 0-80A 1.28mA - Range)  1.28mA	0.088A/µs  80–800A 12.8mA  120–1200V 20mV  80–800A 12.8mA  00W  88Ω 00A	0.0096A/µs  0-96A 1.536mA  0-120V 2mV  0-96A 1.536mA  2400  0.01 96	0.096A/µs  96–960A 15.36mA  120–1200V 20mV  96–960A 15.36mA  200W			
Slew Rate Resolution Current Range Resolution Measurement Voltage Read Back Range (5 Digital) Resolution Accuracy Current Read Back Range (5 Digital) Resolution Accuracy Power Read Back Range (5 Digital) Resolution Accuracy Power Read Back Range (5 Digital) Accuracy Power Consumption Unimension (HxWxD) HxWxD (Not included Rack Mount Rickebels) Weight	0.0072A/µs  0-60A 0.96mA  0-120V 2mV  0-60A 0.96mA  1500  1320 760.6x481.	0.072A/µs 60–600A 9.6mA  120–1200V 20mV  60–600A 9.6mA  00W	0.008A/µs  0-72A 1.152mA  0-120V 2mV  0-72A 1.152mA ±0  1800  0.02 72  132 760.6x481 656.6x445.	1µs / 10µs / 100; 0.32A~20A/µs 0.08A/µs  72~720A 11.52mA  120—1200V 20mV ±0.025% of (Re 72~720A 11.52mA  05% of (Reading + 00%) 00W ±0.06% of (Re 09Ω 0A 0.96 ~ 0~0VA x757.3mm 2x757.3mm 2x757.3mm	s / 1ms + 50ppm 0.0352A-2.2A/µs 0.0088A/µs 0-80A 1.28mA  0-120V 2mV eading + Range)  0-80A 1.28mA  1.28mA  0-80A 1.28mA  0-80A 1.28mA  1.28mA  1.28mA  780666481 782.64455 1.240V	0.088A/µs  80–800A 12.8mA  120–1200V 20mV  80–800A 12.8mA  00W	0.0096A/µs  0-96A 1.536mA  0-120V 2mV  0-96A 1.536mA  2400  0.01 96	0.096A/μs  96–960A 15.36mA  120–1200V 20mV  96–960A 15.36mA  200W  2757Ω  200A  200A			
Slew Rate Resolution Current Range Resolution Measurement Voltage Read Back Range (5 Digital) Resolution Accuracy Current Read Back Range (5 Digital) Resolution Accuracy Current Read Back Range (5 Digital) Resolution Accuracy Power Read Back Range (5 Digital) Accuracy General Typical Short Resistance Maximum Short Current Load ON Voltage Load OFF Voltage Power Consumption Dimension (HxWxD) HxWxD Not Included Rack Mount Ricurbeids Weight Temperature *4	0.0072A/µs  0-60A 0.96mA  0-120V 2mV  0-60A 0.96mA  1500  1320 760.6x481.	0.072A/µs 60–600A 9.6mA  120–1200V 20mV  60–600A 9.6mA  000W	0.008A/µs  0-72A 1.152mA  0-120V 2mV  0-72A 1.152mA ±0  1800  0.02 72  132 760.6x481 656.6x445.	1µs / 10µs / 100; 0.32A~20A/µs 0.08A/µs  72~720A 11.52mA  120~1200V ±0.025% of (Re  72~720A 11.52mA 0.5% of (Reading + 0.06% of (Re  09Ω 0A 0.96 ~ 0 ~ 0VA x757.3mm 2x757.3mm kg	S / 1ms + 50ppm	0.088A/µs  80–800A 12.8mA  120–1200V 20mV  80–800A 12.8mA  000W  88Ω 00A  0VA x757.3mm	0.0096A/µs  0-96A 1.536mA  0-120V 2mV  0-96A 1.536mA  2400  0.01 96  1700 886.6x481 782.6x4445.7	0.096A/μs  96–960A 15.36mA  120–1200V 20mV  96–960A 15.36mA  200W  2757Ω  200A  200A			
Slew Rate Resolution Current Range Resolution Measurement Voltage Read Back Range (5 Digital) Resolution Accuracy Current Read Back Range (5 Digital) Resolution Accuracy Power Read Back Range (5 Digital) Resolution Accuracy Power Read Back Range (5 Digital) Accuracy Power Consumption Mimma Short Current Load ON Voltage Power Consumption Dimension (HxWxD) HxWxD (Voli included Rack Mount Rickebook) Weight	0.0072A/µs  0-60A 0.96mA  0-120V 2mV  0-60A 0.96mA  1500  1320 760.6x481.	0.072A/µs 60–600A 9.6mA  120–1200V 20mV  60–600A 9.6mA  000W	0.008A/µs  0-72A 1.152mA  0-120V 2mV  0-72A 1.152mA ±0  1800  1800  1800  124	1µs / 10µs / 100; 0.32A~20A/µs 0.08A/µs  72~720A 11.52mA  120—1200V 20mV ±0.025% of (Re 72~720A 11.52mA  05% of (Reading + 00%) 00W ±0.06% of (Re 09Ω 0A 0.96 ~ 0~0VA x757.3mm 2x757.3mm 2x757.3mm	S / 1ms + 50ppm	0.088A/μs  80–800A 12.8mA  120–1200V 20mV  80–800A 12.8mA  00W  88Ω 00A  0VA x757.3mm 2x757.3mm 5 kg	0.0096A/µs  0-96A 1.536mA  0-120V 2mV  0-96A 1.536mA  2400  1.536mA	0.096A/μs  96–960A 15.36mA  120–1200V 20mV  96–960A 15.36mA  200W  2757Ω  200A  200A			

Cooling: Advanced Fan Cooled

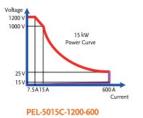
Input AC Power: 100~240 Vac ±10%, 50/60Hz, Single-phase

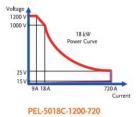
Note \*1 : The power rating specifications at ambient temperature = 25°C

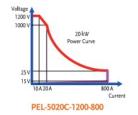
Note \*2 : The range is automatically or forcing to range II only in CC Mode

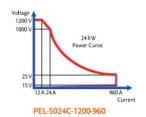
Note \*3 : If the operating current is below range 0.1%, the accuracy specification is 0.1% F.S.

Note \*4 : Operating temperature range is 0–40°C \* all specifications apply for 25°C±5°C









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#### PEL-503-80-50



#### PEL-507-80-140



#### **FEATURES**

- 5-digit Digital Voltage, Current and Power Meter
- Simultaneous Display of Voltage, Current, and Watts
- \* Short-circuit Time Can be Set During Short-circuit Test
- \* Automatic Test Function of Overcurrent Protection/Overpower Protection
- \* The Battery Discharge Test Function Can Set the Discharge Stop Voltage(Vbatt), Discharge Capacity(AH, WH) and Stop Discharge Time
- \* Surge Test Can Simulate Boot Overshoot Current and Transient Current From Hot Plugging
- \* Constant Current, Constant Resistance, Constant Voltage, Constant Power and Dynamic Mode
- \* Overvoltage, Overcurrent, Overpower, Over Temperature Protection and Reverse Polarity Detection
- \* Voltage Polarity Display Can be set to Positive Value"+" or Negative Value"-"
- \* Communications Interface: RS232, USB

The PEL-500 series single-channel electronic load has a total of 5 models and provides 0~80V/ 0~500V voltage operating ranges and 250~700W power operating range. The series can be applied to R&D, quality control, ATE system and production test, including voltage source/current source test; switching power supply transient response; constant voltage mode for current limiting test; battery simulation; and battery discharge test.

The PEL-500 series provides a 5-digit digital display of voltage, current and power. Users can monitor the measurement data of the DUT at the same time. In order to facilitate users to evaluate whether the DUT can withstand the overshoot current, the PEL-500 series provides Surge test, which can simulate the boot overshoot current and the transient current from hot plugging. The built-in battery discharge test function can determine the conditions for stopping the discharge according to the test requirements of the DUT, including setting the discharge stop voltage (Vbatt), discharge capacity (AH, WH) and stop discharge time.

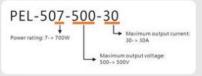
Users can set the loading voltage/unloading voltage of the PEL-500 series for testing according to the characteristics of the DUT. When the output voltage of the DUT rises to the loading voltage value, the loading starts. When the output voltage drops to the unloading voltage, the loading ends. Users can use the GO/NG function to pre-set the judgment conditions according to the function and specifications of the DUT. The PEL-500 series will automatically generate the judgment results according to the set judgment conditions during the test.

Under the safety test requirements of the power supply, the PEL-500 series not only provides the Short test function, but also provides the automatic test function of overcurrent protection/overpower protection to simplify users' complicated manual operation and verify the OCP/OPP of the DUT's action points. The generated measurement results help users confirm whether the actual operating action points of the DUT for OCP/OPP are within the measurement regulations.

In addition to the function of providing load current waveforms to the oscilloscope via the BNC output terminal of Imonitor, the PEL-500 series also provides overvoltage, overcurrent, overpower and over temperature protection, and reverse polarity detection. When any one of them generates a trigger action, The PEL-500 series will have protective or reminding measures to protect the PEL-500 from damage due to abnormal operating ranges.



PEL-503-80-50 80V/50A/250W DC Electronic Load PEL-504-80-70 80V/70A/350W DC Electronic Load PEL-504-500-15 500V/15A/350W DC Electronic Load PEL-507-80-140 80V/140A/700W DC Electronic Load PEL-507-500-30 500V/30A/700W DC Electronic Load



#### **OPTIONAL ACCESSORIES**

**GTL-238** RS-232 Cable, 9-pin, M-F Type, 1000mm USB Cable, USB 2.0, A-B Type, 1200mm

Note: \* Regarding the product delivery date, please contact your regional sales representative.





#### GTL-238 RS-232 Cable, 9-pin, M-F Type, 1000mm



#### Rear Panel





Note	Mod	lel	PEL-50	3-80-50	PEL-50	4-80-70	PEL-504	4-500-15	PEL-50	7-80-140	PEL-50	7-500-30
Martin   100											10	
Mary Norman			25/	) W	35	0 W	35	0 W	70	0 W	7	00 W
May	100000000000000000000000000000000000000		7.000	3.355				13,12	18	2000	A.5	V1-0003
Pose			80	V	8	0 V	50	0 V	8	0 V	5	00 V
Part	40 7	ge	1.0V (	@ 50A	1.2V	@ 70A	6V @	D 15A	0.9V (	@ 140A	3V	@ 30A
Part						<u> </u>					200	
Mary minimage   Mary minima	Over Power Protection	n(OPP)	80 V 80 V 500 V 80 V 1.0V 80 V 1.0V 80 V 1.0V 80 V 1.0V 80 S0A 1.2V 870A 6V 815A 0.9V 8140A 0.9V 8140A 1.2V 870A 6V 815A 0.9V 8140A 1.2V 870A 1.2V 870A 1.2V 870A 1.2V 8140A 1.2V 870A 1.2V 8140A 1.2V 870A 1.2V 8140A 1.2V 870A 1.2V 8140A 1.2V 8						35W	5	735W	
Part	Over Current Protection	on(OCP)	25,070077	N. 6750	-	274.2 37.63	≒15	i.75A	≒1	47A	1	31.5A
Profession	Over Voltage Protection	on(OVP)	≒8	34V	=	84V	≒5	25V	=	84V	=	525V
Persistentifies	Over Temp. Protection	n(OTP)	Y	ES	Y	ES	Y	ES	Y	ES		rES
March   Mar	CC Mode											
Procession   Pr	Range		0~5.04	~50.4A	0~7.02	2~70.2A	0~1.5	5~15A	0~14.04	1~140.4A	0~-	3~30A
Profess	Resolution		0.084m	A/0.84mA	0.117m/	A/1.17mA	0.025mA	A/0.25mA	0.234m/	A/2.34mA	0.05m	A/ 0.5mA
Producing	Accuracy						±0.1% of (SET)	TING + RANGE)				
Paralle	CR Mode											
Paralle	Range		$ \begin{array}{cccccccccccccccccccccccccccccccccccc$						57-34200Ω	0.2-20-	-1200000Ω	
Maintain   Maintain			26.666μΩ/0.01	0416mSiemens	19μΩ/0.014	619mSiemens	666.667μΩ/0	.416µSiemens	9.5μΩ/29.2	39µSiemens	333.334μΩ/	0.833µSiemens
Production	Accuracy	-		±0.2% of (SET  0-8.1~81V								
Production												
Pool			0~8.1	~81V	0~8.	1~81V	0~60	~500V	0~8.	1~81V	0~6	0~500V
Provincy								11.730/00	2000000	20.000		C.O. M. 1905
Process	E S COST					nue to a considera		Variable Cold	Tomas Calabase TC	3		
Registion				(Imax=r1:5A, r2:50A) (Imax=r1:7A, r2:70A) (Imax=r1:1.5A, r2:15A) (Imax=r1:14A, r2:140A)								
Contact   Con	2000000											
## Page   Page		· .										
Paymint Mode	ENGREE TON		0.417mW	//4.17mW	0.584mV	V/5.84mW		•			1.17m\	W/117mW
Product   Pro	-						±0.5% of (SET)	FING + RANGE)				
Periodic   Periodic		,										
Part   Fig.	700 7 3 7 4 7 7							1777011 777037				
Note	Resolution											
Accuracy   Section   Se	Slew rate											
Many Note   Ma		н	3.2~200	0mA/μs	4.64~25	90mA/μs			0.096	~6A/µs	20~12	50mA/μs
Mange (S Digital)         0.8.3 s							±5%:	±10µs				
Note   Pack	Measurement	Daniel (E. Dialea)	0.01	031/		3 031/	0.00	5001	0.0	1 0114	1 00	0 5001/
Marcolary												
Current Read Read Read Read Read Read Read Read	Voltage Read Back	110.194.002702	0.135mV	/1.35mV	0.135m	V/1.35mV			0.135m	V/1.35mV	Im\	/10mV
Part			0.50	70.11		. 70.01			0.140		1	
Accuracy   Accuracy	C											
Power Read Black   Resolution   0,010   0,0	Current Read Back	180000000000000	0.084m	A/0.84mA	0.11/m/	4/1.17mA	7.87.7.29.1		0.234m/	A/2.34mA	0.05m	A/ 0.5MA
Power Read Back   Resolution   0.001W   0.01W   0.001W   0.001W		7.67			1	1			22.11			
Accuracy				10000000	9,111,271							5000000
Surge Ex Normal current         O-50A         0-70A         0-15A         0-140A         0-30A           Surge time         10-1000ms         10-1000ms         10-1000ms         10-1000ms         10-1000ms           Surge step         1-5 <th>Power Read Back</th> <th>- 100 A 100 A</th> <th>0.001W</th> <th>0.01W</th> <th>0.001W</th> <th>0.01W</th> <th></th> <th>575.0277.02</th> <th>0.001W</th> <th>0.01W</th> <th>0.001W</th> <th>0.01W</th>	Power Read Back	- 100 A	0.001W	0.01W	0.001W	0.01W		575.0277.02	0.001W	0.01W	0.001W	0.01W
Surge & Normal current         0-50A         0-70A         0-15A         0-140A         0-30A           Surge time         10-1000ms         10-1000ms         10-1000ms         10-1000ms         10-1000ms           Surge step         1-5         1-5         1-5         1-5         1-5         1-5           Battery Discharge Test           UVP         0-81V         0-81V         0-500V         0-81V         0-500V           Time         1-9999 Sec         1-9999 Sec         1-99999 Sec         0-100V         0         205         0.00         0.00         0.02	S T	Accuracy					±0.1% of (REAL	DING+ RANGE)				
Surge time         10-1000ms         10-1000ms         10-1000ms         10-1000ms         10-1000ms           Surge step         1-5         1-5         1-5         1-5         1-5         1-5           Battery Discharge Test           UVP         0-81V         0-81V         0-500V         0-81V         0-500V           Time         1-99999 Sec				-04		704		154	0.1	1404		204
Surge step         1-5         1-99999 Sec         1-99999 Sec         1-99999 Sec         1-99999 Sec         1-99999 Sec         0-1-000         0.1-25V         0-1-100         0.1-25V </th <th>-</th> <th>ent</th> <th></th> <th>// 10.000</th> <th></th> <th>.,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,</th> <th></th> <th></th> <th></th> <th>- V</th> <th></th> <th></th>	-	ent		// 10.000		.,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,				- V		
Battery Discharge Test         UVP         0-81V         0-81V         0-500V         0-81V         0-500V           Time         1-99999 Sec         10-100V         0         0.1-25V         0.4-100V         0         0.4-100V         0         0         0         0         0         0         0         0         0         0         0         0 </th <th></th> <th>-</th> <th>0.70,00</th> <th>10.000</th> <th></th> <th>010 ve 070</th> <th>5000000</th> <th>C320007</th> <th></th> <th></th> <th></th> <th>7.00.000000</th>		-	0.70,00	10.000		010 ve 070	5000000	C320007				7.00.000000
UVP         0-81V         0-81V         0-50V         0-81V         0-500V           Time         1-9999 Sec         1-9999 Sec         1-9999 Sec         1-9999 Sec         1-9999 Sec           Capacity         0.1-9999 Sec         1-9999 Sec         2         3         4         0         0         4         4         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0	- 1	Test .	1-	-3		-3		-,		-,		
Time         1-9999 Sec         1-9999 Sec         1-9999 Sec         1-99999 Sec         2-25V         0         200         200         200         25V         0.4-100V         0.4-25V         0.4-100V         0.050         0-100V         0.050         0.0050		1636	0	RIV	٥.	81V	0.5	5001/	0	81V		500V
On-1-1999,9AH/0.1~1999,9WH           Others           Load ON Voltage         0.1~25V         0.4~100V         0.1~25V         0.4~100V           Accuracy         1% of (SETTING + RANGE)           Load OFF Voltage         0.25V         0.100V         0.25V         0.700V           Accuracy         Full scale: 10V           Current Monitor         Full scale: 10V           Accuracy         0.3% of (SETTING + RANGE)           Typical Short Resistance         0.018Ω         0.0169Ω         0.367Ω         0.0053Ω         0.087Ω           Max. short Current         50A         70A         115/230 Vac±10%, 50/60Hz           Interface (Standard)         USB/RS232           Power Consumption         40 VA         50 × 231 x 480mm         205 x 23	200000		4554	***	/~ /	0/4/2		AS AG	1000	NOVI V A	2772	200000
Others         Load ON Voltage         0.1~25V         0.4~100V         0.1~25V         0.4~100V           Accuracy         1% of (SETTING + RANGE)           Load OFF Voltage         0~25V         0~100V         0~25V         0~100V           Accuracy	L (0.01.0.1000)		1~399	400	1~39			33/22/83/	1~393		1~99	
Load ON Voltage         0.1~25V         0.4~100V         0.1~25V         0.4~100V           Accuracy         1% of (SETTING + RANGE)           Load OFF Voltage         0~25V         0~100V         0~25V         0~100V           Accuracy							V.1. 19993,3MI)	(*************************************				
Accuracy         1% of (SETTING + RANGE)           Load OFF Voltage         0~25V         0~100V         0~25V         0~100V           Accuracy				0.1	~25V		0.4-	100V	0.1	~25V	0.4	~100V
Load OFF Voltage         0-25V         0-100V         0-25V         0-100V           Accuracy         0.05% of (SETTING + RANGE)		3		0.1	-27				0.1		0.4	
Accuracy         0.05% of (SETTING + RANGE)           Immitor (Non-isolated)         5.04 A/V         7.02 A/V         1.5 A/V         14.04 A/V         3 A/V           Current Monitor         Full scale: 10V           Accuracy				n.	-25V			,	η.	25V	0.	100V
Immoitor (Non-isolated)         5.04 A/V         7.02 A/V         1.5 A/V         14.04 A/V         3 A/V           Current Monitor         Full scale: 10V           Accuracy	777	3		0.				(0)00	0~	<del></del>		
Current Monitor         Full scale: 10V           Accuracy         0.5% of (SETTING + RANGE)           Typical Short Resistance         0.018Ω         0.0169Ω         0.367Ω         0.0053Ω         0.087Ω           Max. short Current         50A         70A         15A         140A         30A           Power input         USB/RS232           Interface (Standard)         USB/RS232           Power Consumption         40 VA         60 VA           Dimension (HxWxD)         205 x 123 x 477mm         205 x 123 x 477mm         205 x 231 x 480mm         205 x 231 x 480mm		rd)	5.04	A/V	7.01	2 A/V		NO. 10.1	14.0	4 A/V	3	A/V
Accuracy         0.5% of (SETTING + RANGE)           Typical Short Resistance         0.018Ω         0.0169Ω         0.367Ω         0.0053Ω         0.087Ω           Max. short Current         50A         70A         15A         140A         30A           Power input         USB/RS232           Interface (Standard)         USB/RS232           Power Consumption         40 VA         50 VA         50 VA           Dimension (HxWxD)         205 x 123 x 477mm         205 x 123 x 477mm         205 x 123 x 477mm         205 x 231 x 480mm         205 x 231 x 480mm			5.04	9.	7.00	11	-		14.0	-1.		0.9.5
Typical Short Resistance         0.018Ω         0.0169Ω         0.367Ω         0.0053Ω         0.087Ω           Max. short Current         50A         70A         15A         140A         30A           Power input         115/230 Vac±10%, 50/60Hz           Interface (Standard)         USB/RS232           Power Consumption         40 VA         60 VA           Dimension (HxWxD)         205 x 123 x 477mm         205 x 123 x 477mm         205 x 231 x 480mm         205 x 231 x 480mm			-									
Max. short Current         50A         70A         15A         140A         30A           Power input         115/230 Vac±10%, 50/60Hz           Interface (Standard)         USB/RS232           Power Consumption         40 VA         60 VA           Dimension (HxWxD)         205 x 123 x 477mm         205 x 123 x 477mm         205 x 123 x 477mm         205 x 231 x 480mm         205 x 231 x 480mm		nce	0.0	180	0.0	169Ω			0.00	053O	0.0	087O
Power input				A1.4774	7.7.7.4							13.13.04F
Interface (Standard)         USB/RS232           Power Consumption         40 VA         60 VA           Dimension (HxWxD)         205 x 123 x 477mm         205 x 123 x 477mm         205 x 123 x 477mm         205 x 231 x 480mm         205 x 231 x 480mm			30						- 1			
Power Consumption         40 VA         60 VA           Dimension (HxWxD)         205 x 123 x 477mm         205 x 123 x 477mm         205 x 123 x 477mm         205 x 231 x 480mm	Power input											
Dimension (HxWxD)         205 x 123 x 477mm         205 x 123 x 477mm         205 x 123 x 477mm         205 x 231 x 480mm         205 x 231 x 480mm		-	1				USB/	NJ434				
19 SQUENCE 1 19 SQUENCE 1 19 SQUENCE 1 1 19 SQUENCE 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Interface (Standard)				- 40	N/A	,		-		. VA	
weigin 3.3kg 3.3kg 3.3kg 10.3kg 10.3kg	Interface (Standard) Power Consumption		205 222	v 477mm					205 223			1 × 480m
	Interface (Standard)  Power Consumption  Dimension (HxWxD)		707 mgg, 3100 cg 1	(0.0204,000)	205 x 123	3 x 477mm	205 x 123	3 x 477mm		1 x 480mm	205 x 23	- 1 × 2 × 1 × 1 × 1 × 1 × 1

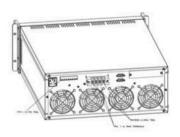


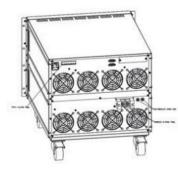
#### **AEL-5000 Series**



#### **FEATURES**

- \* Turbo Mode (Multiplier Mode) Can Withstand up to 2 Times the Rating Current and Power of the Electronic Load in a Short Period of Time
- \* Operating Mode: CC, linear CC, CR, CV, CP and AC **Rectifier Loads**
- \* Measurement Items: Voltage Value(Vrms, Vpeak, Vmax., Vmin), Current Value(Irms, Ipeak, Imax., Imin.), Watt Value, Volt-ampere Value(VA), Frequency Value, Crest Factor, Power Factor, Voltage Total Distortion(V THD, VH), Current Total Distortion (I THD, IH), Etc
- \* Eight Units Connected in Parallel up to 180kW for Single-phase and 540kW for Three-phase
- \* Support Loading and Unloading Angle Control, Loading and Unloading Angle Control Can be set at the Full Range of 0-359 Degrees
- \* Support Positive Half Cycle or Negative Half Cycle Load
- \* Support SCR/TRIAC Current Phase Modulation Waveform, 90-degree Trailing Edge and Leading Edge
- \* Support the Capacitive Load (Inrush Current) when the Power Supply is Turned on and the Transient Current (Surge Current) Test when the Load is Suddenly Connected (Hot Plug-in) During Operation
- \* Crest Factor Range: 1.414~5.0
- \* Power Factor Range: 0.1~1.0 Leading or Trailing
- \* Frequency Range: DC, 40~440Hz (AEL-5003-480-18.75/AEL-5004-480-28: DC, 40~70Hz), and 800Hz and 1kHz Need to be Customized
- \* Optional Control Interfaces: GPIB, RS-232, USB, LAN





GW Instek launches 20 models of the AEL-5000 series AC/DC electronic loads depending on the power range. The power range of a single unit is from 1875W to 22500W, and up to 8 units can be connected in parallel. The maximum power of single-phase parallel connection can reach 180kW, and the total power of 3-phase can reach 540kW, which are suitable for UPS, Inverter/Breaker, AC Power Source, Battery, Fuse/Breaker, DC Power Source and other applications.

The AEL-5000 series has built-in precision measurement circuits such as 16-bit A/D and DSP to provide accurate measurement items, which include voltage root mean square value (Vrms), current root mean square value (Arms), and watt value (Watt), volt-ampere (VA), crest factor (CF), power factor (PF), total harmonic distortion (THD), voltage total harmonic distortion (VTHD), current total harmonic distortion (ITHD), peak current (Ipeak), maximum current (Amax), minimum current (Amin), maximum voltage (Vmax), minimum voltage (Vmin), time measurement. In addition, built-in test modes include UPS Efficiency, PV Inverter Efficiency, UPS Back-up time, Battery Discharge time, UPS transfer time, Fuse/Breaker Trip/Non-Trip, short circuit simulation, OCP, OPP and other test modes.

The AEL-5000 series has the Turbo mode (ON or OFF can be selected) design, which can increase the current and power of the electronic load by 2 times in one second. For test applications that require transient high power and large current such as transient overload test of protective components or short circuit of Fuse/Breaker and AC power supply, OCP and OPP tests etc.. The Turbo mode provides the most economical solution.

The AEL-5000 series also supports the Load On startup function (pre-set Load On). When the inverter or uninterruptible power supply is turned on, the series directly loads the set load current to verify that whether startup of the inverter or uninterrupted power supply connecting to the electrical appliance is stable. At the same time, the Load On start function can also set positive half cycle or negative half load to verify whether the output voltage of the inverter or uninterruptible power supply remains stable when the actual electrical appliance only has a positive half cycle or negative half cycle load current. Control load angle and unload angle can also be set (range 0–359 degrees) to verify the stability of the transient response of the inverter or uninterruptible power supply when the appliance is plugged in and unplugged. In addition, the series also supports SCR/TRIAC current phase modulation waveform, 90 degree Trailing Edge and Leading Edge settings.

For the application of the adjustable bandwidth (BW) function, when the bandwidth of the DUT does not match the bandwidth of the AEL-5000 series, there will be oscillations. Users can reduce the BW setting value accordingly to meet the response speed of the DUT. Inrush Current verifies whether the transient response of the inverter output voltage is stable when the electrical appliance is turned on (Inrush Current) and when the electrical appliance is suddenly connected (Surge

The entire series of AEL-5000 provides over-voltage warning, over-current, over-power, and over-temperature protection. Analog Input terminal can control constant current, constant power and other working modes through external voltage. Vmonitor/Imonitor terminal is used to connect external voltage/current monitoring device. In addition, a variety of optional control interfaces are provided such as GPIB, RS-232, USB, and LAN to meet the needs of system integration.

## ORDERING INFORMATION

AEL-5002-350-18.75	350V/18.75A/1875W	AC & DC Electronic Load
AEL-5003-350-28	350V/28A/2800W	AC & DC Electronic Load
AEL-5004-350-37.5	350V/37.5A/3750W	AC & DC Electronic Load
AEL-5006-350-56	350V/56A/5600W	AC & DC Electronic Load
AEL-5008-350-75	350V/75A/7500W	AC & DC Electronic Load
AEL-5012-350-112.5	350V/112.5A/11250W	AC & DC Electronic Load
AEL-5015-350-112.5	350V/112.5A/15000W	AC & DC Electronic Load
AEL-5019-350-112.5	350V/112.5A/18750W	AC & DC Electronic Load
AEL-5023-350-112.5	350V/112.5A/22500W	AC & DC Electronic Load
AEL-5002-425-18.75	425V/18.75A/1875W	AC & DC Electronic Load
AEL-5003-425-28	425V/28A/2800W	AC & DC Electronic Load
AEL-5004-425-37.5	425V/37.5A/3750W	AC & DC Electronic Load
AEL-5006-425-56	425V/56A/5600W	AC & DC Electronic Load
AEL-5008-425-75	425V/75A/7500W	AC & DC Electronic Load
AEL-5012-425-112.5	425V/112.5A/11250W	AC & DC Electronic Load
AEL-5015-425-112.5	425V/112.5A/15000W	AC & DC Electronic Load
AEL-5019-425-112.5	425V/112.5A/18750W	AC & DC Electronic Load
AEL-5023-425-112.5	425V/112.5A/22500W	AC & DC Electronic Load
AEL-5003-480-18.75	480V/18.75A/2800W	AC & DC Electronic Load
AEL-5004-480-28	480V/28A/3750W	AC & DC Electronic Load



#### STANDARD ACCESSORIES

AEL-5000 Series operation manual HD-DSUB: 15pin MALE to MALE 150cm x 1 PTV1-12 PIN TRML: Please refer to Fig.1 x 6

#### AEL-5002-xxx-18.75/AEL-5003-xxx-28/AEL-5004-xxx-37.5

PVL 1-4 RING TERMINALS: Please refer to Fig.4 x 2 RNYBS8-4 RING TRML: Please refer to Fig.5 x 2

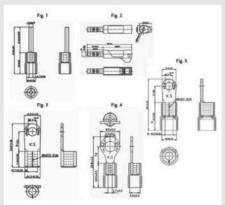
AEL-5006-xxx-56/AEL-5008-xxx-78/AEL-5012-xxx-112.5/ AEL-5015-xxx-112.5/AEL-5019-xxx-112.5/AEL-5023-xxx/112.5

SLS10B RED PLUG CONN 20A RED: Please refer to Fig.2; The terminal is used for Vsense x

SLS10B BLK PLUG CONN 20A BLK: Please refer to Fig.2;

The terminal is used for Vsense x 1

RNB S22-6 RING TRML, #4: Please refer to Fig.3 x 2



#### **OPTIONAL ACCESSORIES**

PEL-022 GPIB Card

PEL-030 GPIB+RS-232 Card GTL-246 USB Cable, USB 2.0, A-B Type, 1200mm PEL-023 RS-232 Card GTL-248 GPIB Cable, Double Shielded, 2000mm PEL-024 LAN Card PEL-025 USB Card GTL-250 GPIB Cable, Double Shielded, 600mm PEL-028 HANDLES, U-shaped handle(fixed to the bracket) (for AEL-5006/5008/5012/5015) PEL-029 HANDLES Rack Accessories (for AEL-5002/5003/5004)

Note: \* Regarding the product delivery date, please contact your regional sales representative



AEL-5002-350-18.75 AEL-5003-350-28 AEL-5004-350-37.5 AEL-5002-425-18.75 AEL-5006-350-56 AEL-5008-350-75 AEL-5006-425-56 AEL-5012-350-112.5 AEL-5015-350-112.5 AEL-5019-350-112.5 AEL-5012-425-112.5 AEL-5015-425-112.5 AEL-5019-425-112.5

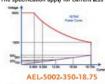
AEL-5002-425-18.75 AEL-5008-425-75 AEL-5003-425-28 AEL-5004-425-37.5 AEL-5003-480-18.75 AEL-5004-480-28

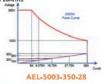
MODEL	Power (W)		Currer	nt(Ampere)	
MODEL	Turbo OFF	Turbo ON	Turbo OFF	Turbo ON	Voltage(Volt)
AEL-5002-350-18.75	1875 W	3750W (x2)*	18.75 Arms / 56.25Apeak	37.5Arms/56.25Apeak (x2)*	
AEL-5003-350-28	2800W	5600W (x2)*	28 Arms / 84Apeak	56Arms/84Apeak (x2)*	
AEL-5004-350-37.5	3750 W	7500W (x2)*	37.5 Arms / 112.5Apeak	75.0Arms/112.5Apeak (x2)*	50~350Vrms / 500Vdc
AEL-5002-425-18.75	1875 W	3750W (x2)*	18.75 Arms / 56.25Apeak	37.5Arms/56.25Apeak (x2)*	
AEL-5003-425-28	2800W	5600W (x2)*	28 Arms / 84Apeak	56Arms/84Apeak (x2)*	
AEL-5004-425-37.5	3750 W	7500W (x2)*	37.5 Arms / 112.5Apeak	75.0Arms/112.5Apeak (x2)*	50~425Vrms / 600Vdc
AEL-5006-350-56	5600 W	11200W (x2)*	56.0 Arms / 168Apeak	112.0Arms/ 168Apeak (x2)*	
AEL-5008-350-75	7500 W	15000W (x2)*	75.0 Arms / 225Apeak	150.0Arms/225Apeak (x2)*	
AEL-5012-350-112.5	11250W	22500W (x2)*	112.5 Arms / 337.5Apeak	225Arms/337.5Apeak (x2)*	
AEL-5015-350-112.5	15000W	30000W (x2)*	112.5 Arms / 337.5Apeak	225Arms/337.5Apeak (x2)*	
AEL-5019-350-112.5	18750W	37500W (x2)*	112.5 Arms / 337.5Apeak	225Arms/337.5Apeak (x2)*	
AEL-5023-350-112.5	22500W	45000W (x2)*	112.5 Arms / 337.5Apeak	225Arms/337.5Apeak (x2)*	50~350Vrms / 500Vdc
AEL-5006-425-56	5600 W	11200W (x2)*	56.0 Arms / 168Apeak	112.0Arms/ 168Apeak (x2)*	
AEL-5008-425-75	7500 W	15000W (x2)*	75.0 Arms / 225Apeak	150.0Arms/225Apeak (x2)*	
AEL-5012-425-112.5	11250W	22500W (x2)*	112.5 Arms / 337.5Apeak	225Arms/337.5Apeak (x2)*	
AEL-5015-425-112.5	15000W	30000W (x2)*	112.5 Arms / 337.5Apeak	225Arms/337.5Apeak (x2)*	
AEL-5019-425-112.5	18750W	37500W (x2)*	112.5 Arms / 337.5Apeak	225Arms/337.5Apeak (x2)*	
AEL-5023-425-112.5	22500W	45000W (x2)*	112.5 Arms / 337.5Apeak	225Arms/337.5Apeak (x2)*	50~425Vrms / 600Vdc
AEL-5003-480-18.75	2800W	5600W (x2)*	18.75 Arms / 56.25Apeak	37.5Arms/56.25Apeak (x2)*	
AEL-5004-480-28	3750 W	7500W (x2)*	28 Arms / 84Apeak	56Arms/84Apeak (x2)*	50~480Vrms / 700Vdc

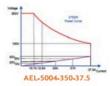
<sup>\*</sup> Power and current boost rate of Turbo ON

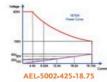
SPECIFICATI	ONS						
MODEL Power (W)		1875 W	2800W	3750 W	AEL-5002-425-18.75	2800W	3750 W
Current(Ampere) Voltage(Volt) FREQUENCY Range		18.75 Arms / 56.25Apeak	28 Arms / 84Apeak 50~350Vrms / 500Vdc 0Hz(CC,CP Mode) , DC~440Hz(LIN,CR	37.5 Arms / 112.5Apeak	18.75 Arms / 56.25Apeak	28 Arms / 84Apeak 50-425Vrms / 600Vdc Hz(CC,CP Mode) , DC-440Hz(LIN,CF	37.5 Arms / 112.5Apeak
PROTECTIONS Over Power Protection		≒ 1968.75Wrms or Programmable	≒2940Wrms or Programmable	≒ 3937.5Wrms or Programmable	≒ 1968.75Wrms or Programmable	≒2940'Wrms or Programmable	≒ 3937.5Wrms or Programmable
Over Current Protection Over Vlotage Protection		≒ 19.687 Arms or Programmable	≒ 29.4 Arms or Programmable ≒ 367.5 Vrms / 525Vdc	≒ 39.375 Arms, or Programmable	≒ 19.687 Arms or Programmable	≒ 29.4 Arms or Programmable ≒ 446.25 Vrms/630Vdc	≒ 39.375 Arms, or Programmable
Over Temp. Protection OPERATION MODE Constant Current Mode for Si			Yes			Yes	
Range Resolution	ne-Wave	0–18.75A 0.3125mA/16bits	0–28A 0.5mA/16bits	0–37.5A 0.625mA/16bits	0–18.75A 0.3125mA/16bits	0-28A 0.5mA/16bits	0-37.5A 0.625mA/16bits
Accuracy	e for Sine-Wave, Square		range ) @ 50/60Hz , ± 0.5% of ( set			ange ) @ 50/60Hz , ± 0.5% of ( setti	
Range Resolution		0~18.75A 0.3125mA/16bits	0~28A 0.5mA/16bits	0~37.5A 0.625mA/16bits	0~18.75A 0.3125mA/16bits	0~28A 0.5mA/16bits	0~37.5A 0.625mA/16bits
Constant Resistance Mode		± ( 0.1% of setting + 0.2% of			± ( 0.1% of setting + 0.2% of r		ting + range ) @ DC and 400Hz
Range Resolution*1 Accuracy		3.2 ohm – 64k ohm 0.0052083mS/16bits	2.0 ohm = 40 k ohm 0.0083333mS/16bits @ 50/60Hz , ± ( 0.5% of setting + 2	1.6 ohm = 32k ohm 0.010416mS/16bits	0.0052083mS/16bits	2.0 ohm = 40 k ohm 0.0083333mS/16bits 50/60Hz , ± ( 0.5% of setting + 2)	1.6 ohm = 32k ohm 0.010416mS/16bits
Constant Voltage Mode Range		20.2% of (Setting + Tange)	50~350Vrms / 500Vdc	250 OF range 7 80 DC and 400H2	±0.2% of (secong + range) go	50-425Vrms / 600Vdc	is of range / g/ bc and 400H2
Resolution Accuracy		10	0.01V ±(0.1% of setting + 0.1% of range)			0.1V ±(0.1% of setting + 0.1% of range)	
Constant Power Mode Range		1875W	2800W	3750W	1875W	2800W	3750W
Resolution Accuracy*4 CREST FACTOR (CC & CP M	ODE ONLY	0.1W ±0.5% of { se	0.1W tting + range ) @ 50/60Hz , =2% of ( s	0.1W etting + range )	0.1W ±0.5% of ( setti	0.1W ng + range ) @ 50/60Hz , ±2% of ( se	0.1W etting + range )
Range Resolution	ODE ONLY)		√2~5 0.1			√2~5 0.1	
Accuracy POWER FACTOR (CC & CP )	(ODE ONLY)		(0.5% / Irms) + 1%F.S.			(0.5% / Irms) + 1%F.S.	
Range Resolution	A 4637	21	0-1 Lag or Lead 0.01			0-1 Lag or Lead 0.01	
Accuracy TEST MODE			1%F.S.			1%F.S.	
Operating Frequency Current Range		0-18.75A	Non-Linear Mode Auto ; 40-440Hz 0-28A	0-37.5A	0-18.75A	Non-Linear Mode Auto ; 40–440Hz 0–28A	0-37.5A
PF Range Measuring Efficiency For PV S	Systems,	7.	0-1		- 10101	01	
Power Conditioners for THD Operating Frequency	8096	a deservation of the second	Resistive + Non-Linear Mode Auto ; 40–440Hz	9,5,44	Albania Albania	Resistive + Non-Linear Mode Auto ; 40–440Hz	
Current Range Resistive Range	N.C. C.	0–18.75A 3.2 ohm – 64k ohm	0~28A 2.0 ohm = 40k ohm	0~37.5A 1.6 ohm ~ 32k ohm	0~18.75A 3.2 ohm ~ 64k ohm	0~28A 2.0 ohm = 40 k ohm	0-37.5A 1.6 ohm ~ 32k ohm
UPS Back-Up Function(CC,LI UVP (VTH) UPS Back-Up Time	N,CR,CP)	2	50–350Vrms / 500Vdc 1~99999 Sec. (>27H)			50-425Vrms / 600Vdc 1~99999 Sec. (>27H)	
Bettery Discharge Function(C UVP (VTH)	C,LIN,CR,CP)		50–350Vrms / 500Vdc			50-425Vrms / 600Vdc	
Battery Discharge Time UPS Transfer Time			1~99999 Sec. (>27H)			1~99999 Sec. (>27H)	
Current Range UVP (VTH)		0-18.75A	0–28A 2.5V	0-37.5A	0-18.75A	0–28A 2.5V	0-37.5A
Time Range Fuse Test Mode	Turbo OFF(CC1-3)			ı			1
Max. Current	Turbo ON(CC3) Turbo ON(CC1-2)	18.75Arms 37.5Arms (x2) *3	28.0Arms 56.0Arms (x2) *3	37.5Arms 75.0Arms (x2) *5	18.75Arms 37.5Arms (x2) *3	28.0Arms 56.0Arms (x2) *3	37.5Arms 75.0Arms (x2) *3
Trip & Non-Trip Time	Turbo OFF(Time1~3) Turbo ON(Time1~2)		0.01~333.33 Sec. 0.01~0.5 Sec.			0.01~333.33 Sec. 0.01~0.5 Sec.	
OFF Time	Turbo ON(Time3)	2	0.01-600.00 Sec. 0.1-999.9 Sec.			0.01-600.00 Sec. 0.1-999.9 Sec.	
Meas. Accuracy Repeat Cycle Short/OPP/OCP Test Function	00		±0.003 Sec. 0-99999			e0.003 Sec. 0-99999	
Short Time	Turbo OFF Turbo ON		0.1–10Sec. or Cont. 0.1~1Sec.			0.1-10Sec. or Cont. 0.1~1Sec.	
OPP/OCP Step Time	Turbo OFF Turbo ON	22	100ms 100ms, up to 10 Steps			100ms 100ms, up to 10 Steps	
OCP Istop	Turbo OFF Turbo ON	18.75Arms 37.5Arms	28.0Arms 56.0Arms 2800W	37.5Arms 75.0Arms	18.75Arms 37.5Arms 1875W	28.0Arms 56.0Arms 2800W	37.5Arms 75.0Arms
OPP Pstop  Programmable Inrush Current	Turbo OFF Turbo ON	1875W 3750W	2800W 5600W	3750W 7500W	18/5W 3750W	2800W 5600W	3750W 7500W
Istart, Inrush Start Current Inrush Step Time		0~37.5A	0~56A 0.1ms~100ms	0~75A	0~37.5A	0~56A 0.1ms~100ms	0~75A
Istop, Inrush Stop Current Programmable Surge Current	: Simulation: S1/T1 - S2	0–18.75A <b>(T2 - 53/T3</b>	0-28A	0-37.5A	0-18.75A	0-28A	0-37.5A
S1 and S2 Current T1 and T2 Time	26 - No. 40 - No. 00 (12.2 NO. 1801)	0~37.5A 0~18.75A	0~56A 0.01~0.5Sec. 0~28A	0~75A 0~37.5A	0-37.5A 0-18.75A	0-56A 0.01~0.5Sec. 0-28A	0~75A 0~37.5A
S3 Current T3 Time MEASUREMENTS			0-28A 01-9.99Sec. or Cont.	0-37.3A	U-18.73A	0.01~9.99Sec. or Cont.	U-37.3A
VOLTAGE READBACK V MET Range	TER		500V			600V	1
Resolution Accuracy			0.01V ±0.05% of (reading + range) Vrms,V Max/Min,+/-Vpk			±0.05% of (reading + range) Vrms,V Max/Min,+/-Vpk	
Parameter CURRENT READBACK A MET Range	TER	9.375Arms/18.75Arms	Vrms,V Max/Min,+/-Vpk	18.75Arms/37.5Arms	9.375Arms/18.75Arms	Vrms,V Max/Min,+/-Vpk 14Arms/28Arms	18,75Arms/37.5Arms
Resolution Accuracy		0.2mA/0.4mA	0.3mA/0.6mA 0.05% of ( reading + range ) @ 50/60	0.4mA/0.8mA	0.2mA/0.4mA	0.3mA/0.6mA	0.4mA/0.8mA
Parameter WATT READBACK W METER			Irms,I Max/Min,+/-lpk			05% of ( reading + range ) @ 50/60 Irms,I Max/Min,+/-lpk	
Range Resolution		1875W 0.03125W	2800W 0.05W	3750W 0.0625W	1875W 0.03125W	2800W 0.05W	3750W 0.0625W
Accuracy®4 VA METER POWER FACTOR METER			ng + range ) @ 50/60Hz , ±2% of ( readi msxArms Correspond To Vrms and Are			ding + range ) @ 50/60Hz , ±2% of ( r msxArms Correspond To Vrms and Ar	
Range Accuracy			+/- 0.000-1.000 ±(0.002±(0.001/PF)*F)			+/- 0.000~1.000 ±(0.002±(0.001/PF)*F)	
Frequency METER(Hz) Range			DC,40~440Hz			DC,40~440Hz	
Accuracy Other Parameter METER			0.1%			0.1%	
OTHERS Start up Loading	VA	, VAR, CF_I, Ipeak, Imax., Imin. Vmax., Vn		ited un	V A	wer on loading during Immers (1995	start un
Start up Loading Load ON / OFF Angle Half Cycle and SCR/TRIAC Lo	nading	0 ~ 359 degree can be	ower on loading during Inverter / UPS s programmed for the angle of load ON Trailing edge or Leading edge curren	and load OFF loading	0 ~ 359 degree can be	ower on loading during Inverter / UPS programmed for the angle of load ON O'Trailing edge or Leading edge currer	and load OFF loading
Master/Slave (3 Phase or Par External Programming Input	allel Application)	roome or regains nan cycle, 2	Yes, 1 master and upto 7 slave units F.S / 10Vdc, Resulotion 0.1V			Yes, 1 master and upto 7 slave units F.S / 10Vdc, Resulction 0.1V	
External SYNC Input Vmonitor (Isolated)			TTL ±500V / ±10V			TTL ±600V / ±10V	
Imonitor (Isolated) Interface (OPTION)		±56.25Apk / ±10Vpk	±84Apk / ±10Vpk GPIB ; RS-232 ; LAN ; USB	±112.5Apk / ±10Vpk	±56.25Apk / ±10Vpk	±84Apk / ±10Vpk GPIB ; RS-232 ; LAN ; USB	±112.5Apk / ±10Vpk
MAX. Power Consumption Operation Temperature *2 Current of Input Impedance/	wA\@50/60U~ ·	2	150VA			150VA 0 ~ 40 °C	200000000000000000000000000000000000000
Current of Input Impedance(r @ 400Hz Dimension( H x W x D )	uwidhanlenus :	~V*0.3 ; ~V*2.2 177 x 440 x 552.6 mm	~V°0.45 ; ~V°3.3 177 × 440 × 552.6 mm	~V°0.6; ~V°4.4 177 × 440 × 552.6 mm	~V°0.3 ; ~V°2.2 177 x 440 x 552.6 mm	~V^0.45 ; ~V^3.3 177 x 440 x 552.6 mm	~V^0.6; ~V^4.4 177 x 440 x 552.6 mm
Weight		177 x 440 x 352.6 mm 21.5kg	177 x 440 x 552.6 mm 27.5 kg	177 x 440 x 552.6 mm 33.5 kg	177 x 440 x 532.6 mm 21.5kg	177 x 440 x 552.6 mm 27.5kg	177 x 440 x 552.6 mm 33.5 kg

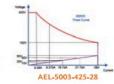
Weight 21.5kg 27.5kg 27.5kg  $^{\circ}$  1 ms (millisiemens) is the unit of conductance(G), one siemens equal to  $1/\Omega$   $^{\circ}$  2 Operating temperature range is 0-40°C, all specification apply for 25°C±5°C, except as noted  $^{\circ}$  3 Turbo mode for up to 2X Current rating & Power rating support Fuse, Short/OCP/OPP test function  $^{\circ}$  4 The specification apply for current less than 20Arms

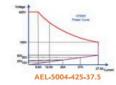










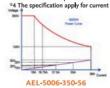


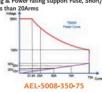
Good Will Instrument Co., Ltd. | Simply Reliable

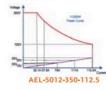
<sup>\*</sup> All specifications apply for 50/60Hz
\* All specifications subject to change without notice

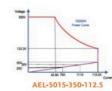
SPECIFICATION MODEL	2142	AEL-5006-350-56	AEL-5008-350-75	AEL-5012-350-112.5	AEL-5015-350-112	.5 AEL-5019-350-112.	.5 AEL-5023-350-1
ower (W) urrent(Ampere)		5600 W 56 Arms / 168Apeak	7500 W 75 Arms / 225Apeak	11250W 112.5 Arms / 337.5Apeak	15000 W 112.5 Arms / 337.5Apeak	18750W 112.5 Arms / 337.5Apeak	22500W 112.5 Arms / 337.5Apeal
iltage(Volt) EQUENCY Range		2074 may too-speak	To Petiting Assorption	50~350Vri	ms / 500Vdc , DC-440Hz(LIN,CR,CV Mode)	The second of second and	1022-11112/22/22/24
OTECTIONS						12	
er Power Protection er Current Protection		≒ 5880Wrms or Programmable ≒ 58.8 Arms, or Programmable	≒ 7875Wrms or Programmable ≒ 78.75 Arms, or Programmable	≒11812.5Wrms or Programmable ≒ 118.125 Arms or Programmable	≒ 118.125 Arms or Programmab	= 19687.5Wrms or Programmable = 118.125 Arms or Programmable	e ≒23625Wrms or Programm. le ≒ 118.125 Arms or Programs
ver Vlotage Protection ver Temp. Protection		100 200			/rms/525Vdc Yes	79 800	9.00 (96.00)
ERATION MODE enstant Current Mode for Sir	ne-Wave						
tange tesolution		0–56A 1mA/16bits	0-75A 1.25mA/16bits	0–112.5A 1.875mA/16bits	0–112.5A 1.875mA/16bits	0-112.5A 1.875mA/16bits	0–112.5A 1.875mA/16bits
ccuracy	for Sine Word Source W	ave or Quasi-Square Wave, PWM Wave	± ( 0.1% of setting	g + 0.2% of range ) @ 50/60Hz, ±0.	5% of ( setting + range ) @ DC as	nd 400Hz	normal result
lange	for sine-wave, square-w	0~56A	0~75A 1.25mA/16bits	0-112.5A	0-112.5A	0~112.5A	0~112.5A
esolution ecuracy		1mA/16bits		1.875mA/16bits + 0.2% of range > @ 50/60Hz , ± 0.5	1.875mA/16bits 5% of ( setting + range ) @ DC an	1.875mA/16bits d 400Hz	1.875mA/16bits
nstant Resistance Mode lange		1 ohm = 20 k ohm	0.8 ohm = 16k ohm	0.533 ohm = 10.666k ohm	0.533 ohm = 10.666 k ohm	0.533 ohm = 10.666k ohm	0.533 ohm = 10.666k ohr
tesolution*1 ccuracy		0.016666mS/16bits	0.020832mS/16bits ±0.2% of (settin	0.031248mS/16bits g + range) @ 50/60Hz, ± ( 0.5% of s	0.031248mS/16bits etting + 2% of range ) @ DC and	0.031248mS/16bits 400Hz	0.031248mS/16bits
nstant Voltage Mode ange				50350Vr	ms / 500Vdc		
esolution ccuracy					1.1V + range ) @ 50/60Hz		
nstant Power Mode		5600W	7500W	11250W	15000 W	18750W	22500W
esolution ccuracy *4		0.1W	0.1W	1W ±0.5% of ( setting + range ) @ 50/60Hz	1W	1W	1W
EST FACTOR (CC & CP MC	DE ONLY)			and the second of the second		7.0	75
ange esolution		1			2~5 0.1		
WER FACTOR (CC & CP M	ODE ONLY)			(0.5% / Irr	ns) + 1%F.5.		
ange esolution		7			g or Lead 0.01		
T MODE					6F.S.		
S Efficient Measurement perating Frequency					near Mode 10–440Hz		
urrent Range		0-56A	0-75A	0-112.5A	0-112.5A	0-112.5A	0-112.5A
F Range sesuring Efficiency For PV S	ystems,	2			0-1 on-Linear Mode		
wer Conditioners for THD 8 perating Frequency	0%	C 0,000,000	10,988	Auto ; 4	10-440Hz	. 10 2.0.3.4 8.9836	70 9000 1000 C
urrent Range esistive Range		0~56A 1 ohm = 20 k ohm	0~75A 0.8 ohm = 16k ohm	0~112.5A 0.533 ohm = 10.666k ohm	0~112.5A 0.533 ohm ~ 10.666k ohm	0~112.5A 0.533 ohm = 10.666k ohm	0~112.5A 0.533 ohm ~ 10.666k oh
S Back-Up Function (CC,LIN	I,CR,CP)			•	ms / 500Vdc		
PS Back-Up Time	LIN CB CB				Sec. (>27H)		
VP (VTH)	-unickich)			50–350Vri	ms / 500Vdc		
attery Discharge Time S Transfer Time					Sec. (>27H)		
urrent Range VP (VTH)		0-56A	0-75A	0-112.5A	0-112.5A	0-112.5A	0-112.5A
me range se Test Mode				0.15ms-	-999.99ms		
Max. Current	Turbo OFF(CC1-3) Turbo ON(CC3)	56Arms	75Arms	112.5Arms	112.5Arms	112.5Arms	112.5Arms
max. Current	Turbo ON(CC1-2)	112Arms (x2) *2	150Arms (x2) *3	225Arms (x2) *3	225Arms (x2) *3	225Arms (x2) *3	225Arms (x2) *3
Trip & Non-Trip Time	Turbo OFF(Time1~3) Turbo ON(Time1~2)			0.01~0	13.33 Sec. 0.50 Sec.		
PFF Time	Turbo ON(Time3)	2		0.1-99	00.00 Sec. 99.9 Sec.		
Meas. Accuracy Repeat Cycle		<u> </u>			03 Sec. 99999		
hort/OPP/OCP Test Functio	Turbo OFF			0.1~10Se	ec. or Cont.		
Short Time	Turbo ON Turbo OFF	2			-1Sec. IOms		
OPP/OCP Step Time	Turbo ON Turbo OFF	56Arms	75Arms	100ms, up	to 10 Steps 112.5Arms	112.5Arms	112.5Arms
OCP Istop	Turbo ON Turbo OFF	112Arms 5600W	150Arms 7500W	225Arms 11250W	225Arms 15000W	225Arms 18750W	225Arms 22500W
OPP Pstop	Turbo ON	11200W	15000W	22500W	30000W	37500W	45000W
ogrammable Inrush Current tart, Inrush Start Current	Simulation: Istart - Istop	0~112A	0~150A	0-225A	0~225A	0~225A	0-225A
rush Step Time op, Inrush Stop Current		0-56A	0-75A	0.1ms 0-112.5A	~100ms 0–112.5A	0-112.5A	0-112.5A
grammable Surge Current : and S2 Current	Simulation: S1/T1 - S2/T2	- <b>S3/T3</b> 0-112A	0-150A	0-225A	0-225A	0-225A	0-225A
and T2 Time Current		0~56A	0~75A	0.01~ 0~112.5A	-0.5Sec. 0-112.5A	0~112.5A	0-112.5A
Time EASUREMENTS					Sec. or Cont.		
LTAGE READBACK V MET	ER				A41.		
ange				0.	00V 01V		
				±0.05% of (re Vrms,V Ma	eading + range) ox/Min,+/-Vpk		
esolution ccuracy arameter							56.25Arms/112.5Arms
ccuracy arameter RRENT READBACK A MET	ER	28Arms/56Arms	37.5Arms/75Arms	56.25Arms/112.5Arms	56.25Arms/112.5Arms	56.25Arms/112.5Arms	
ccuracy arameter IRRENT READBACK A METI ange esolution	ER	28Arms/56Arms 0.6mA/1.2mA	37.5Arms/75Arms 0.8mA/1.6mA	1.2mA/2.4mA	56.25Arms/112.5Arms 1.2mA/2.4mA + range ) @ 50/60Hz	56.25Arms/112.5Arms 1.2mA/2.4mA	1.2mA/2.4mA
ccuracy arameter iRRENT READBACK A METI ange esolution ccuracy arameter	ER			1.2mA/2.4mA ±0.1% of ( reading			
occuracy parameter RRENT READBACK A MET ange esolution ccuracy parameter ATT READBACK W METER ange	ER	0.6mA/1.2mA 5600W	0.8mA/1.6mA 7500W	1.2mA/2.4mA ±0.1% of { reading lrms,I Ma 11250W	1.2mA/2.4mA + range ) @ 50/60Hz x/Min.+/-lpk 15000W	1.2mA/2.4mA	1.2mA/2.4mA 22500W
occuracy varanteer RRENT READBACK A METI sings solution cocuracy varanteer vity READBACK W METER sings solution cocuracy cocuracy varanteer cocuracy varanteer cocuracy varanteer solution	ER	0.6mA/1.2mA	0.8mA/1.6mA	1.2mA/2.4mA ±0.1% of { reading   Irms,  Ma 11259W 0.1875W ±0.5% of [ reading + range } @ 5	1.2mA/2.4mA + range ) @ 50/60Hz x/Min,+/-lpk 15000W 0.25W 0/60Hz , ±2% of ( reading + range )	1.2mA/2.4mA	1.2mA/2.4mA
DOCURACY PARAMETRICAD BACK A METI RENT READBACK A METI RESOLUTION DOCURACY PARAMETRICAD	ER	0.6mA/1.2mA 5600W	0.8mA/1.6mA 7500W	1.2mA/2.4mA ±0.1% of { reading Irms,I Ma 11250W 0.1875W ±0.5% of { reading + range } ⊕ 5 VrmsxArms Correspond	1.2mA/2.4mA + range ) ap 50/50Hz x/Min.+/-lpk 15000W 0.25W 0/60Hz , ±2% of (reading + range) and To Vrms and Arms	1.2mA/2.4mA	1.2mA/2.4mA 22500W
SCURIACY varianter RRENT READBACK A METI nge solution Kuriacy rarmeter TIT READBACK W METER nige solution Curiacy A. METER wer Factor METER nige	ER	0.6mA/1.2mA 5600W	0.8mA/1.6mA 7500W	1.2mh/2.4mh	1.2mA/2.4mA + range ) @ 50/60Hz x/Min,+/-lpk 15000W 0.25W 0/60Hz , ±2% of ( reading + range )	1.2mA/2.4mA	1.2mA/2.4mA 22500W
CUPREY PREMT READBACK A METI INTERPREMEMBER  REMT READBACK A METI INTERPREMEMBER  FOR THE READBACK W METER INGE  SOURTION  LUPREY 94  METER  WE FEATOR METER INGE  CUPREY 94  METER  UNDERF  LUPREY 94  METER  LUPREY 94  METE	ER	0.6mA/1.2mA 5600W	0.8mA/1.6mA 7500W	1.2mA/2.4mA a.0.1% of { reading trans,1 Me irms,1 Me 11250W 0.1875W s.0.5% of { reading + range } 0.5 VrmsvArms Corresp = (0.002a)(0.002a)	1.2mA/2.4mA + range ) @ 50/60Hz x/Min.+/-lpk   15000W	1.2mA/2.4mA	1.2mA/2.4mA 22500W
curacy rameter	ER	0.6mA/1.2mA 5600W	0.8mA/1.6mA 7500W	1.2mA/2.4mA #0.1% of { reading transl. Mas   11250W   11	1.2mA/2.4mA + range ) @ 50/60Hz x/Min.+/-lpk 15000W 0.25W 0.0/60Hz , ±2% of ( reading + range ) 000 To Virns and Arms 00-1.000	1.2mA/2.4mA	1.2mA/2.4mA 22500W
CUPIACY THE ATTENDED TO THE AT	ER	0.6mA/1.2mA 5600W	0.8mA/1.6mA 7500W 0.125W	1.2mA/2.4mA #0.1% of { reading transl. Mas   11250W   11	1.2mA/2.4mA + range) @ 50/60Hz y/Min.+/-lpk 15000W 0.25W 0.25W 0.00Hz , ±2% of ( reading + range ) and Tro Virns and Arms 00-1 000 0.001/PF/-F) 0-400Hz	1.2mA/2.4mA	1.2mA/2.4mA 22500W
CUPROY TARRENT READBACK A METI METER SOLUTION METER SOLUTION TO READ THE SOLUTION TO READ THE SOLUTION TO READ THE SOLUTION TO READ THE SOLUTION METER INGE CUPROY METER INGE METER ING	ER	0.6mA/1.2mA 5600W	0.8mA/1.6mA 7500W 0.125W VA. VAR. CF_J, Ipeak, Im	1.2mA/2.4mA a.0.1% of { reading } reading   Irms,! Ma I1250W 0.1875W a.0.5% of { reading + range } @ 5 VrmsxArms Corresp +/- 0.0 a.(0.0021x(1) DC.44  3xs., Irmin, Vrmax., Vrmin., IHD, VHD, ITH4 Yes., Power on loading ds.	1.2mA/2.4mA + range ) @ 05/60Hz x/Min.+/-lpk 15000W 0.25W 0.25W 0/60Hz, ±2% of ( reading + range ) 00-1.000 00-1.000 0.001/PF)*F) 0-440Hz 1.3% 0, VTHD pring Inverter / UPS start up	1.2mA/2.4mA 18750W 0.3125W	1.2mA/2.4mA 22500W
COURSEY azameter RREENT READBACK A METI ange sesolution coursey aramster aramsee coursey aramster aramsee ange coursey aramster A METER ange coursey METER(Hz) ange coursey her Paramster METER(Hz) ange HETER HET	uding	0.6mA/1.2mA 5600W	0.8mA/I.6mA 7500W 0.125W  VA, VAR, CF_J, Ipeak, Im	1.2mA/2.4mA a.0.136 of { reading to reading to } lims,I Ma 11250W 0.1875W 0.1875W s.0.5% of { reading + range } g) 5 Vrmsx4ms Corresp +/- 0.0 s(0.002s(t) 0.4(0.002s(t) 0.	1.2mA/2.4mA + range ) @ 50/60Hz x/Min.+/-lpk 15000W 0.25W 0.25W 0.00Hz, ±2% of ( reading + range ) 00-1.000 00-	1.2mA/2.4mA 18750W 0.3125W	1.2mA/2.4mA 22500W
COURSEY  ADMINISTRATER  ADMINISTRATION  ADMINI	uding	0.6mA/1.2mA 5600W	0.8mA/I.6mA 7500W 0.125W  VA, VAR, CF_J, Ipeak, Im	1.2mA/2.4mA a.0.1% of { reading lrms,! Ma linus,! Ma li	1.2mA/2.4mA + range ) @ 50/60Hz x Min.+/-lpk 150/60Hz 150/60Hz 0.25W 0.25W 0.01/60Hz 1.500 and Arms 00-1000 0.001/PF/-F) 0.440Hz 1.7% 0.7/THD 0.7/THD 0.7/THD 0.7/THD 0.7/THD 0.7/THD angle reveter / UPS start up the angle of load ON and load OFF load ON and load ON and load ON and load ON and load ON an	1.2mA/2.4mA 18750W 0.3125W	1.2mA/2.4mA 22500W
COURSEY TREATE READBACK A METI mings solution COURSEY TATT READBACK W METER mings TOTT READBACK W METER METER TOTT W METER TOTT	uding	0.6mA/1.2mA 5600W	0.8mA/I.6mA 7500W 0.125W  VA, VAR, CF_J, Ipeak, Im	1.2mA/2.4mA a.0.1% of { reading lrms,! Ma l 11250W	1.2mA/2.4mA + range) @ 50660Hz x/Min,+/-lpk 15060Hz 0.25W 0.25W 0.060Hz 1.52% of (reading = range) 000-1.000 000-1/P)**F)	1.2mA/2.4mA 18750W 0.3125W	1.2mA/2.4mA 22500W
COURSEY TREATER READBACK A METT Ingg Solution COURSEY TATTREADBACK A METER Ingg TATTREADBACK W METER Ingg COURSEY THE COURSE T	uding	0.6mA/1.2mA 5600W	0.8mA/I.6mA 7500W 0.125W  VA, VAR, CF_J, Ipeak, Im	1.2mA/2.4mA a.0.1% of { reading lrms,! Me li1250W 0.1875W a.0.5% of [reading + range ] @ 5 VrmsxArms Corresp +/-0.0 a(0.002a(f 0.002a(f 0.	1.2mA/2.4mA + range) @ 50/60Hz x/Min,+/-lpk 150/60Hz 150/60Hz - 1.2% of ( reading + range ) 0.25W 0.25W 0.001/P)*-F) 0.001/P)*-F) 0.001/P)*-F) 0.440Hz 1/56 0.2,VTM0 1/66 1.20	1.2mA/2.4mA 18750W 0.3125W	1.2mA/2.4mA 22500W
COURSEY REENT READBACK A METI ange solution COURSEY FATTREADBACK A METER ange TATTREADBACK W METER ange COURSEY FATTREADBACK W METER ange COURSEY FATTREADBACK W METER ange COURSEY FATTREADBACK FATTREA	uding	0.6mA/1.2mA 5600W 0.1W	O.8mA/I.6mA 7500W 0.123W  VA, VAR, CF_I, Ipeak, Im Postive or	1.2mA/2.4mA a.0.1% of { reading lrms,! Me li1250W 0.1875W a.0.5% of [reading + range ] @ 5 VrmsxArms Corresp +/-0.0 a(0.002aft 0C,46 0 axa, Imin. Vmax., Vmin., IHD, VHD, ITH! Yes. Power on loading 6, 0 - 359 degree can be programmed or r Negative half cycle, 90 "Trailing edge or Yes. I massed for the second of the second o	1.2mA/2.4mA + range) @ 50/60Hz x/Mm,+/-lpk 150/60Hz 150/6	1.2mA/2.4mA  18750W 0.3125W  ding	1.2mA/2.4mA 22500W 0.375W
ccuracy	nding Ilel Application) OPTION)	0.6mA/1.2mA 5600W 0.1W	0.8mA/J.6mA 7500W 0.125W  VA, VAE, CF_J, Ipeak, Im Postive of	1.2mA/2.4mA a.0.1% of { reading lrms,! Me li1250W 0.1875W a.0.5% of [reading + range ] @ 5 VrmsxArms Corresp +/-0.0 a(0.002aft 0C,46 0 axa, Imin. Vmax., Vmin., IHD, VHD, ITH! Yes. Power on loading 6, 0 - 359 degree can be programmed or r Negative half cycle, 90 "Trailing edge or Yes. I massed for the second of the second o	1.2mA/2.4mA + range) @ 50/60Hz x Min.+/-lpk 150/60Hz 150/	1.2mA/2.4mA  18750W 0.3123W  ding programmed  #337.5Apk / #10Vpk	1.2mA/2.4mA 22500W 0.375W 0.375W

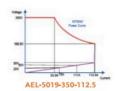
- \*7 ms (millisiemens) is the unit of conductance(C), one siemens equal to 1/Ω
  \*2 Operating temperature range is 0-40°C, all specification apply for 25°C±5°C, Except as noted
  \*3 Turbo mode for up to 2X Current rating & Power rating support Fuse, Short/OCP/OPP test function
  \*4 The specification apply for current less than 20Arms
  - \* All specifications apply for 50/60Hz
    All specifications subject to change without notice

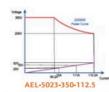








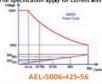


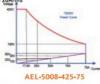


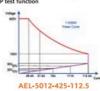
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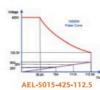
SPECIFICATI MODEL	ONS	AEL-5006-425-56		AEL-5012-425-112.5			
Power (W) Current(Ampere)		5600 W 56 Arms / 168Apeak	7500 W 75 Arms / 225Apeak	11250W 112.5 Arms / 337.5Apeak	15000 W 112.5 Arms / 337.5Apeak	18750W 112.5 Arms / 337.5Apeak	22500W 112.5 Arms / 337.5Apeak
Voltage(Volt) FREQUENCY Range			\$ \$	50-425Vrm DC,40-440Hz(CC,CP Mode),	ns / 600Vdc	<u> </u>	
ROTECTIONS Over Power Protection		≒ 5880Wrms or Programmable	≒ 7875Wrms or Programmable	≒11812.5Wrms or Programmable	≒15750Wrms or Programmable	≒19687.5Wrms or Programmable	≒23625Wrms or Programmable
Over Current Protection Over Vlotage Protection		≒ 58.8 Arms, or Programmable	≒ 78.75 Arms, or Programmable	≒ 118.125 Arms or Programmable	≒ 118.125 Arms or Programmable rms/630Vdc	≒ 118.125 Arms or Programmable	≒ 118.125 Arms or Programmab
Over Temp. Protection DPERATION MODE				Y			
Constant Current Mode for S Range	ine-Wave	0-56A	0~75A	0-112.5A	0-112.5A	0-112.5A	0-112.5A
Resolution Accuracy		1mA/16bits	1.25mA/16bits	1.875mA/16bits sing + 0.2% of range ) @ 50/60Hz , ±	1.875mA/16bits	1.875mA/16bits	1.875mA/16bits
Linear Constant Current Mod	de for Sine-Wave, Square	-Wave or Quasi-Square Wave, PWM Wav 0~56A	0~75A	0-112.5A	0-112.5A	0~112.5A	0~112.5A
Range Resolution		1mA/16bits	1.25mA/16bits	1.875mA/16bits	1.875mA/16bits	1.875mA/16bits	1.875mA/16bits
Constant Resistance Mode			± ( 0.1% of sett		0.5% of ( setting + range ) @ DC a		
Resolution*1		1 ohm – 20k ohm 0.016666mS/16bits	0.8 ohm = 16k ohm 0.020832mS/16bits	0.533 ohm = 10.666k ohm 0.031248mS/16bits	0.533 ohm = 10.666k ohm 0.031248mS/16bits	0.533 ohm – 10.666k ohm 0.031248mS/16bits	0.533 ohm = 10.666k ohm 0.031248mS/16bits
Accuracy Constant Voltage Mode			±0.2% of (se			400Hz	
Range Resolution				0.			
Accuracy Constant Power Mode					range ) @ 50/60Hz		
Range Resolution		5600W 0.1W	7500W 0.1W	11250W 1W	15000 W	18750W 1W	22500W 1W
Accuracy *4 CREST FACTOR (CC & CP M	ODE ONLY)	2		±0.5% of ( setting + range ) @ 50/60Hz	t, a2% of (setting + range)	<u> </u>	ii
Range Resolution				√2 0	-5 .1		
Accuracy POWER FACTOR (CC & CP )	MODE ONLY)			(0.5% / Irm	s) + 1%F.S.		
Range Resolution	,			0-1 Lag 0.	or Lead 01		
Accuracy EST MODE				1%			
UPS Efficient Measurement Operating Frequency		V <sub>an</sub> yan	physical d	Non-Line Auto ; 40		No. 6/2007**2.55	
Current Range PF Range		0-56A	0-75A	0-112.5A	0-112.5A	0-112.5A	0-112.5A
Measuring Efficiency For PV : Power Conditioners for THD	Systems, 80%			Resistive + No	n-Linear Mode		
Operating Frequency Current Range		0~56A	0~75A	Auto ; 46	0–440Hz	0~112.5A	0112.5A
Resistive Range UPS Back-Up Function(CC,LI	IN CR CR	1 ohm – 20 k ohm	0.8 ohm – 16 k ohm	0.533 ohm = 10.666k ohm	0.533 ohm = 10.666k ohm	0.533 ohm – 10.666k ohm	0.533 ohm = 10.666k ohm
UVP (VTH) UPS Back-Up Time	in,cn,cr)			50-425Vrm 1~99999 S			
Battery Discharge Function(C UVP (VTH)	CC,UN,CR,CP)			50-425Vrm			
Battery Discharge Time UPS Transfer Time				1-99999 S	ec. (>27H)		
Current Range		0-56A	0-75A	0-112.5A	0-112.5A	0-112.5A	0-112.5A
UVP (VTH) Time range				2. 0.15ms-			
Fuse Test Mode	Turbo OFF(CC1-3)	56Arms	75Arms	112.5Arms	112.5Arms	112.5Arms	112.5Arms
Max. Current	Turbo ON(CC3) Turbo ON(CC1-2)	112Arms (x2) *2	150Arms (x2) *3	225Arms (x2) *3	225Arms (x2) ±3	225Arms (x2) *3	225Arms (x2) *3
Trip & Non-Trip Time	Turbo OFF(Time1-3) Turbo ON(Time1-2)			0.01~33: 0.01~0.			
OFF Time	Turbo ON(Time3)			0.01-600 0.1~999			
Meas. Accuracy Repeat Cycle				±0.00	3 Sec. 9999		
Short/OPP/OCP Test Functi Short Time	Turbo OFF			0.1~10Sec	c. or Cont.		
OPP/OCP Step Time	Turbo ON Turbo OFF			0.1-			
100000000000000000000000000000000000000	Turbo ON Turbo OFF	56Arms	75Arms	100ms, up 112.5Arms	to 10 Steps 112.5Arms	112.5Arms	112.5Arms
OCP Istop	Turbo ON Turbo OFF	112Arms 5600W	150Arms 7500W	225Arms 11250W	225Arms 15000W	225Arms 18750W	225Arms 22500W
OPP Pstop Programmable Inrush Currer	Turbo ON nt Simulation: Istart - Ista	11200W	15000W	22500W	30000W	37500W	45000W
Istart, Inrush Start Current Inrush Step Time		0~112A	0~150A	0~225A	0~225A ~100ms	0~225A	0~225A
Istop, Inrush Stop Current Programmable Surge Current	t Simulation: \$1/17 - \$2	0-56A	0-75A	0-112.5A	0-112.5A	0-112.5A	0-112.5A
S1 and S2 Current T1 and T2 Time		0-112A	0-150A	0-225A	0225A 0.55ec.	0-225A	0-225A
S3 Current T3 Time		0~56A	0~75A	0~112.5A	0-112.5A Sec. or Cont.	0~112.5A	0-112.5A
MEASUREMENTS VOLTAGE READBACK V MET	TER			0.01-9.993	Victor or William		
Range Resolution				60			
Accuracy Parameter					iding + range)		
CURRENT READBACK A ME	TER	28Arms/56Arms	37.5Arms/75Arms	56.25Arms/112.5Arms	/міп,+/-vpк 56.25Arms/112.5Arms	56.25Arms/112.5Arms	56.25Arms/112.5Arms
Range Resolution		0.6mA/1.2mA	0.8mA/1.6mA	1.2mA/2.4mA	1.2mA/2.4mA	1.2mA/2.4mA	1.2mA/2.4mA
Accuracy Parameter				a0.1% of ( reading 4	range ) @ 50/60Hz /Min,+/-lpk	***	
WATT READBACK W METER Range		5600W	7500W	11250W	15000W	18750W	22500W
		0.1W	0.125W	0.1875W ±0.5% of ( reading + range ) @ 50	0.25W /60Hz , ±3% of ( reading + range )	0.3125W	0.375W
Accuracy © 4				VrmsxArms Correspo	nd To Vrms and Arms		
Accuracy © 4 VA METER Power Factor METER							
Accuracy © 4 VA METER Power Factor METER Range Accuracy				+/- 0.00 ±(0.002±(0.	0-1.000 001/PF)*F)		
Accuracy * 4 VA METER ower Factor METER Range Accuracy requency METER(Hz)				±(0.002±(0.	0-1.000 001/PF)*F) -440Hz		
Accuracy = 4 VA METER Vower Factor METER Range Accuracy requency METER(Hz) Range Accuracy				±(0.002±(0.	001/PF)*F} -440Hz		
Accuracy = 4 VA METER Power Factor METER Range Accuracy Frequency METER(Hz) Range Accuracy Other Parameter METER			VA, VAR, CF_I, Ipeak,	±(0.002±(0. DC,40-	.001/PF)*F) -440Hz 1%		
Accuracy*4 VA METER Power Factor METER Range Accuracy Frequency METER(H2) Range Accuracy Other Parameter METER DTHERS START U Loading			VA, VAR, ČF.J, I peak,	±(0.002±(0 DC,40- 0.) Imax., Imin. Vmax., Vmin., IHD, VHD, ITH Yes , Power on loading dur	001/PF)*F) -440Hz % ID, VTHD ing Inverter / UPS start up	nov.	
Accuracy *4 VA METER Power Factor METER Range Accuracy Frequency METER(Hz) Range Accuracy Other Parameter METER Start up Loading Load On / OFF Angle Load ON / OFF Angle	oading			#(0,0024)0  DC,400  DC,400  0.  Imax., Imin. Vmax., Vmin., IHD, VHD, ITH  Yes , Power on loading du  0 – 359 degree can be programmed for Ith  Negative half cycle, 90 "Trailing edge or Ith	001/PF)*F) 440Hz % 1D, VTHD ling Inverter / UPS start up e angle of load ON and load OFF loadi	ng grogrammed	
Accuracy -4 VA METER Range Accuracy Frequency METER(Hz) Range Accuracy Trequency METER(Hz) Range Accuracy There Areameter METER THERS List up Loading oad On J OFF Angle salf Cycle and SCR/TRIAC Li Master/Slave (3 Phase or Pa	rallel Application)			#(0.002-)(0  DC.40-  DC.40-  Imax., Imin. Vmax., Vmin., IHD, VHD, ITP  Yes , Power on loading du 0 - 359 degree can be programmed for It  Negative half cycle, 90 Trailing dege or 1  Yes, I master and F.5 / 10/40c, R	001/PF/FF} 440Hz 95 ID, VTHD ing Inverter / UPS start up e angle of foad ON and load OFF load assding edge current waveform can be j upto 7 slave unit seutotion 0.1V	ng programmed	
Accuracy -4 VA METER Range Accuracy Trequency METER(Hz) Range Accuracy Trequency METER(Hz) Range Accuracy THERS TH	rallel Application)		Postive a	# (0.002-)(0  DC.40-  DC.40-  Imax., Imin., Vmax., Vmin., IHD, VHO, ITP-  Yes , Power on loading du 0 - 339 degree can be programmed for least of the Vest of the Vest of Vest	001/PF/FF)  440Hz  56  ID, VTHD  ing Inverter / UPS start up e angle of foad ON and load OFF load adding edge current waveform can be j upto 7 slave unit esulotion 0.1V  TL  1 J 10V	programmed	
Accuracy - 4 VA METER Range Accuracy Trequency METER(Hz) Range Accuracy Trequency METER(Hz) Range Accuracy Dither Parameter METER THERS SILIATE SILIAT	rallel Application)	#168Apk / #10Vpk	Postive oi ±225Apk / ±10Vpk	# (0.002-(0 DC.40	001/PF/FF  440Hz % ID, VTHD ing Inverter / UPS start up e angle of foad ON and load OFF load auding edge current waveform can be j upto 7 slave unit esulotion 0.1V IL / 10/W = 3337.5Apk / =10Vpk 1; LAN ; USB	programmed ±337.5Apk / ±10Vpk	a337.5Apk / a10Vpk
Accuracy 14 VA METER Prower Factor METER Range Accuracy Frequency METER(Hz) Range Accuracy Other Parameter METER STHERS S	(OPTION)	a168Apk / a10Vpk 270VA	Postive a	# (0.002-10)  DC,400  DC,400  (0.1)  Imax., Imin. Vmax., Vmin., IHD, VHD, ITH  Yes , Power on loading du  Ves , Power on loading du  Negative half cycle, 30 Trail. Image.  F. S. / 10Vdc, R  ### 1500  ### 15	001/PE/FF) 440Hz % 1D, VTHD ing Inverter / UPS start up e angle of foad ON and load OFF load starting and sta	programmed	±337.5Apk / ±10Vpk 750VA
Resolution Accuracy 74 VA METER VA METER Range Range Range Range Range Accuracy Other Parameter METER Range Status	(OPTION)	77. 237 12 77 73	Postive oi ±225Apk / ±10Vpk	# (0.002-(0 DC,400 DC,4	001/PE/FF) 440Hz % 1D, VTHD ing Inverter / UPS start up e angle of foad ON and load OFF load starting and sta	programmed ±337.5Apk / ±10Vpk	\$6

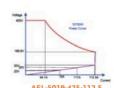
Weight 58 kg 70 kg 1 ms (millisiemens) is the unit of conductance(C), one siemens equal to  $1/\Omega$  2 Operating temperature range is 0-40°C, all specification apply for 25°C±5°C, Except as noted 23 Turbo mode for up to 2X Current rating & Power rating support Fuse, Short/OCP/OPP test function 24 The specification apply for current less than 20Arms \* All specifications apply for 50/60Hz \* All specifications subject to change without notice

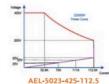










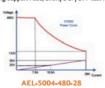


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SPECIFICATI MODEL		AEL-5003-480-18.75	AEL-5004-480-28
Power (W) Current(Ampere)		2800W 18.75 Arms / 56.25Apeak	3750 W 28 Arms / 84Apeak
/oltage(Volt) FREQUENCY Range		50-480\	/rms / 700Vdc e) , DC-70Hz(LIN,CR,CV Mode)
NOTECTIONS Over Power Protection		≒2940Wrms or Programmable	≒ 3937.5Wrms or Programmable
ver Current Protection ver Violage Protection		≒ 19.687 Arms or Programmable	≈ 29.4 Arms or Programmable frms / 735Vdc
ver Temp. Protection PERATION MODE		7 3049	Yes
onstant Current Mode for S Range	Sine-Wave	0~18.75A	0~28A
tesolution accuracy		0.3125mA/16bits ± ( 0.1% of setting + 0.2% of range ) @ 50/60	0.5mA/16bits
	de for Sine-Wave, Square-W	Vave or Quasi-Square Wave, PWM Wave  0~18.75A	0~28A
Resolution Accuracy		0.3125mA/16bits ± ( 0.1% of setting + 0.2% of range ) @ 50/60	0.5mA/16bits
onstant Resistance Mode Range		4 ohm ~ 80K ohm	2.5 ohm ~ 50K ohm
Resolution®1		0.004166mS/16bits	0.006666mS/16bits
onstant Voltage Mode			0.5% of setting + 2% of range ) @ DC and 400Hz
Range Resolution Accuracy		C	/rms / 700Vdc 0.0125V
onstant Power Mode		2800W	ng + 0.1% of range) 3750W
tange Resolution		0.1W	0.1W
ccuracy ° 4 EST FACTOR (CC & CP M	(ODE ONLY)	±0.5% of (setting + range) @	50/60Hz , ±2% of ( setting + range )
tange tesolution			√2~5 0.1
OWER FACTOR (CC & CP	MODE ONLY)		Irms) + 1% F.S.
tange tesolution			Lag or Lead 0.01
Accuracy ST MODE			1%F.S.
PS Efficient Measurement Operating Frequency		Auto	Linear Mode ; 40–70Hz
Current Range PF Range		0-18.75A	0-28A 0-1
leasuring Efficiency For PV ower Conditioners for THD	Systems, 98096		Non-Linear Mode
Operating Frequency Current Range		0~18.75A	: 40~70Hz 0~28A
Resistive Range PS Back-Up Function(CC,L	JN,CR,CP)	4 ohm ~ 80 k ohm	2.5 ohm ~ 50 k ohm
UVP (VTH) UPS Back-Up Time		50~480\\1.~9999	/rms / 700Vdc 9 Sec. (>27H)
sttery Discharge Function( UVP (VTH)	CC,LIN,CR,CP)		9 Sec. (>27H) Vrms ( 700Vdc
Battery Discharge Time			9 Sec. (>27H)
Current Range UVP (VTH)		0-18.75A	0-28A
Time range		0.15m	2.5V is=999.99ms
use Test Mode	Turbo OFF(CC1~3)	18.75Arms	28.0Arms
Max. Current	Turbo ON(CC3) Turbo ON(CC1-2)	37.5Arms (x2) *3	56.0Arms (x2) *3
Trip & Non-Trip Time	Turbo ON(Time1-2)	0.01	333.33 Sec. -0.50 Sec.
OFF Time	Turbo ON(Time3)	0.1-	600.00 Sec. 999.9 Sec.
Meas. Accuracy Repeat Cycle			.003 Sec.
hort/OPP/OCP Test Funct Short Time	Turbo OFF		
OPP/OCP Step Time	Turbo ON Turbo OFF		100ms
OCP Istop	Turbo ON Turbo OFF	18.75Arms	up to 10 Steps 28.0Arms
OPP Pstop	Turbo ON Turbo OFF	37.5Arms 2800W	56.0Arms 3750W
	Turbo ON nt Simulation: Istart - Istop	5600W	7500W
start, Inrush Start Current nrush Step Time		0-37.5k	0–56A k
stop, Inrush Stop Current rogrammable Surge Curren	nt Simulation: \$1/T1 - \$2/T	0-18.75A	0-28A
1 and S2 Current 1 and T2 Time		0-37.5A	0–56A 11~0.5Sec.
3 Current 3 Time		0~18.75A	0~28A 39Sec. or Cont.
IEASUREMENTS OLTAGE READBACK V ME	TER	V.U1~5.5	- WHIEL
Range Resolution		r	700V 0.0125V
Accuracy Parameter		±0.05% of	(reading + range) Aax/Min,+/-Vpk
URRENT READBACK A ME	ETER	9.375Arms/18.75Arms	14Arms/28Arms
Resolution		0.2mA/0.4mA	0.3mA/0.6mA
Accuracy Parameter /ATT READBACK W METER		±0.05% of { reading   Irms, I N	ng + range ) @ 50/60Hz flax/Min,+/-lpk
Range	· ·	2800W	3750W
Resolution Accuracy *4		0.05W ±0.5% of ( reading + range ) @	0.0625W 50/60Hz , ±2% of ( reading + range )
/A METER ower Factor METER			spond To Vrms and Arms
Range Accuracy			1.000-1.000 ±(0.001/PF)*F)
equency METER(Hz)			,40-70Hz
			0.1%
Accuracy	VA,	VAR, CF_I, Ipeak, Imax., Imin. Vmax., Vmin., IHD, VHD,	ITHD, VTHD
Accuracy Other Parameter METER		Yes , Power on loading	during Inverter / UPS start up r the angle of load ON and load OFF loading
Accuracy Other Parameter METER THERS tart up Loading		0 ~ 359 degree can be programmed for	
Accuracy Other Parameter METER  THERS tart up Loading oad ON / OFF Angle talf Cycle and SCR/TRIAC L	oading	0 ~ 359 degree can be programmed for Postive or Negative half cycle, 90° Trailing edge of	or ceating edge current waveform can be programmed
Accuracy Dither Parameter METER THERS Start up Loading .oad ON / OFF Angle staff Cycle and SCR/TRIAC L Asster/Slave (3 Phase or Pa	rallel Application)	0 ~ 359 degree can be programmed for Postive or Negative half cycle, 90° Trailing edge of Yes, 1 master a	ind upto 7 slave units c, Resulotion 0.1V
Accuracy Where Parameter METER THERS tart up Loading bad ON / OFF Angle alf Cycle and SCR/TRIAC L laster/Slave By Phase or Pa kternal Programming Input when an according to the control of the control the control of the control of the control t	rallel Application)	0 - 359 degree can be programmed for Postive or Negative half cycle, 90 Trailing edge of Yes, 1 master = F.S / 10Vde	ind upto 7 slave units c, Resulotion 0.1V TTL 10V / ±10V
Accuracy Dither Parameter METER THERS Start up Loading Load ON / OFF Angle dalf Cycle and SCR/TRIAC L Master/Slave (3 Phase or Pa External Programming Input External SYNC Input Tronolitor (Isolated) monitor (Isolated) Interface (OPTION)	rallel Application)	0 ~ 359 degree can be programmed for Postive or Negative half cycle, 90 Trailing edge Yes, 1 master a Yes, 1 master a +70 ±56.25Apk / ±10Vpk GPIB; R5-	nd upto 7 slave units ;, Resulotion 0.1V  TTL  10V / ±10V  ±84Apk / ±10Vpk  232 ; LAN ; USB
Accuracy Dither Parameter METER  THERS Start up Loading and ON / OFF Angle talf Cycle and SCR/TRIAC L Master/Slave (3 Phase or Pa ticternal Programming Input Licternal SYNC Input 'monitor (Isolated) monitor (Isolated) monitor (Isolated) MAX. Power Consumption MAX. Power Consumption  Jopenstion Temperature "2	rallel Application) (OPTION)	0 ~ 359 degree can be programmed for Postive or Negative half cycle, 90° Trailing edge.  Yes, 1 master a F.S./10Vdt  #70 ±56.25Apk/±10Vpk  GPIB; RS-	ind upto 7 slave units : , Resulotion 0.1V  TTL  00 / ±10V  ±84Apk / ±10Vpk
Accuracy Other Parameter METER THERS tart up Loading .oad ON / OFF Angle dalf Cycle and SCR/TRIAC L daster/Slave (3 Phase or Pa kxternal Programming Input ixternal SYNC Input immonitor (Isolated) monitor (Isolated) menter (so (OPTION) ANX, Power Consumption	rallel Application) (OPTION)	0 ~ 359 degree can be programmed for Postive or Negative half cycle, 90° Trailing edge.  Yes, 1 master a F.S./10Vdt  #70 ±56.25Apk/±10Vpk  GPIB; RS-	nd upto 7 slave units , Resulotion 0.1V TTL 00V / ±10V 1 ±84Apk / ±10Vpk 232 ; LAN ; USB 150VA

- "2 Operating temperature range is v-a-u v, as specification appty for 20-23 v, except as noted
  "3 Turbo mode for up to 2X Current rating 8 Power rating support Fuse, Short/OCP/OPP test function
  "4 The specification apply for current less than 20Arms

AEL-5003-480-18.75



PEL-022 GPIB Card



PEL-023 RS-232 Card



PEL-024 LAN Card



PEL-025 USB Card



PEL-028 HANDLES, U-shaped handle (for AEL-5006/5008/5012/5015)



PEL-029 HANDLES Rack Accessories (for AEL-5002/5003/5004)





#### PEL-5000G Series





#### **FEATURES**

- \* 4U/6K High Power Density Design Also for **Bench Testing**
- \* Turbo Mode Function, Which Allows 1.5 Times the Rated Power or Current to be Used Within Two Seconds
- \* Turbo Mode can be Used with OCP/OPP/ BMS/Short Mode/Surge Mode/Hot Plug-In
- \* High Tolerance to Environmental Temperature, with 4k/5kW Models not Affected by **Environmental Temperature in Power Usage**
- \* Can set the Power-on Status Value
- \* Short Circuit Duration Can be set Within Short Circuit Test Voltage Meter Display Can be Configured as Polarity Positive ("+") or Negative("-")
- \* Optional Interface : GPIB, RS232, USB, LAN
- \* Protection function Testing for Battery BMS
- \* Protection Against V, I, W, and ℃

GW Instek PEL-5000G series single-channel electronic load provides 150V/ 600V/ 1200V models with a power range of 4,5,6kW. PEL-5000G can test and verify the specifications of batteries, electric vehicle chargers/charging stations, electric vehicle batteries and solar panels. PEL-5000G supports parallel connection for same voltage specification and different power models. PEL-5000G can support up to 8 units connected in parallel.

PEL-5000G Series has its own control and display panel, CC / CR / CV / CP /Dynamic modes. The new Turbo mode is designed for overload or protection testing, which includes OCP, OPP, Short for AC/DC or DC/DC power source; Over Charge/Discharge and Short for Battery BMS protection; and Blow/Not Blow testing for Fuse, Breaker or PTC Current Protection Components.

Support Short, OCCP and OCDP protection tests for battery BMS protection testing, the peak current before protection and protection response time are measured. The BMS, Fuse, OCP and OPP single-key test functions on the module make test more efficient. The SHORT duration setting and SHORT\_VH, SHORT\_VL setting function, also can measure Short Voltage and Current. PEL-500G also provides Programmable LOAD ON/OFF voltage, GO/NG meter check, Voltage meter display" + "or"-" is

Dynamic can be simulated under CC, CP mode. The current Rise / Fall slew rate can be adjusted individually and there is an external signal input so that load can have a simulated Specific Load Current Waveform. PEL-5000G also provides 150 sets Store / Recall larger memory is much advance feature for each different application. The 150 sets test parameter and status storage function can call the storage memory real time in accordance with the auto sequence requirement, at any time to tune out the stored memory for use.

The communication interfaces supported by PEL-5000G include GPIB, RS232, USB, and LAN. The power, voltage and current of each model are shown in the following table:

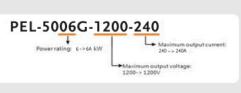


ORDERING INFORMATION

150V/400A/4000W High Power DC Electronic Load

## 150V/500A/5000W High Power DC Electronic Load 150V/600A/6000W High Power DC Electronic Load PEL-5005G-150-500 PEL-5006G-150-600 PEL-5004G-600-280 600V/280A/4000W High Power DC Electronic Load 600V/350A/5000W High Power DC Electronic Load PEL-5005G-600-350 600V/420A/6000W High Power DC Electronic Load PEL-5006G-600-420 PEL-5004G-1200-160 1200V/160A/4000W High Power DC Electronic Load PEL-5005G-1200-200 1200V/200A/5000W High Power DC Electronic Load PEL-5006G-1200-240 1200V/240A/6000W High Power DC Electronic Load

PEL-5004G-150-400



#### STANDARD ACCESSORIES

PEL-5000G Series operation manual BANANA PLUGS : Please refer to Fig.1 x 1 BNC – BNC CABLE : BNC to BNC CABLE, 1m x 1 HD-DSUB: 15PIN Parallel wire Parallel Wire x 1
PEL-028 HANDLES, U-shaped handle (fixed to the bracket) PEL-031 Rack Mount Kit For PEL-5000G

#### **OPTIONAL ACCESSORIES**

PEL-023 PEL-024 PEL-025	GPIB Card RS-232 Card LAN Card USB Card GPIB+RS-232 Card	GTL-248 GTL-250	USB Cable, USB 2.0, A-B Type, 1200mm GPIB Cable, Double Shielded, 2000mm GPIB Cable, Double Shielded, 600mm 9923 Current Waveform Generator + RS232 Interface
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Note: \* Regarding the product delivery date, please contact your regional sales representative.

#### Rear Panel



SPECIFICATIONS						
MODEL	PEL-5004	G-150-400	PEL-5005C	-150-500	PEL-5006C	-150-600
Power <sup>1</sup> Current	0 – 4kW 0 – 400A	0 – 6kW max, *1 0 – 600A max, *1	0 – 5kW 0 – 500A	0 – 7.5kW max.*1 0 – 750A max.*1	0 – 6kW 0 – 600A	0 – 9kW max." 0 – 900A max."
Voltage Min. Operating Voltage	0 ~ 0.7V(	150V ©400A	0 ~ 0.7V(	150V		150V p:600A
Protections Over Power Protection(OPP)			10	5%	•	<u> </u>
Over Current Protection(OCP) Over Voltage Protection(OVP)			10			
Over Temp Protection(OTP) Constant Current Mode			90°0	±5°C		***************************************
Range <sup>2</sup> Resolution	0 – 40A 0.64mA	0 – 400A 6.4mA	0 – 50A 0.80mA	0 – 500A 8.0mA	0 – 60A 0.96mA	0 – 600A 9.6mA
Accuracy 3 Constant Resistance Mode			± 0.05% of (S	etting + Range)		
Range Resolution	22.5kΩ ~ 0.375Ω 44μS	0.375Ω ~ 0.0018Ω 6.25μΩ	18kΩ ~ 0.3Ω 56μS	$0.3\Omega \sim 0.0015\Omega$ $5\mu\Omega$	15kΩ ~ 0.25Ω 67μS	0.25Ω ~ 0.0012Ω 4.167μΩ
Accuracy Constant Voltage Mode	± (0.1%(Vin / Setting) + 0.1% IF.S.)	± (0.2%(Vin / Setting) + 0.5% IF.S.) <sup>49</sup>	± (0.1%(Vin / Setting) + 0.1% IF.S.)		± (0.2%(Vin / Setting) + 0.1% IF.S.)	± (0.2%(Vin / Setting) + 0.5% IF.S.)*5
Range Resolution	14 15		0 - 2.5	150V mV		
Accuracy Constant Power Mode				etting + Range)		
Range Resolution	0 ~ 400W	400 ~ 4kW 64mW	0 ~ 500W 8mW	500 – 5kW 80mW	0 ~ 600W 9.6mW	600 ~ 6kW 96mW
Accuracy Constant Voltage Mode + Current Limit M	loda		± 0.2% of (Se	tting + Range)		
Range Resolution	150V 2.5mV	400A 6.4mA	150V 2.5mV	500A 8mA	150V 2.5mV	600A 9.6mA
Accuracy 4 Constant Voltage Mode + Power Limit Mo	± 0.05% of (Setting + Range)	± 1.0% of (Setting + Range)	± 0.05% of (Setting + Range)	± 1.0% of (Setting + Range)	± 0.05% of (Setting + Range)	± 1.0% of (Setting + Range)
Range Resolution	150V 2.5mV	4kW 64mW	150V 2.5mV	5kW 80mW	150V 2.5mV	6kW 96mW
Accuracy 4	± 0.05% of (Setting + Range)	± 1.0% of (Setting + Range)	± 0.05% of (Setting + Range)  OFF	± 1.0% of (Setting + Range)	± 0.05% of (Setting + Range)  OFF	± 1.0% of (Setting + Range)
Turbo Mode ** Short / OCP / OPP Test Function Max. Current	400A	600A	500A	750A	600A	900A
Max. Power Test Accuracy 6	4000W	6000W	5000W	7500W oding + Range)	6000W	9000W
Short Time	100 ~ 10000ms Continuous	100 – 2000ms	100 ~ 10000ms Continuous	100 – 2000ms	100 ~ 10000ms Continuous	100 – 2000ms
Setting, Accuracy Short V Hi	The same of the sa		+5	ms 00V / Resolution : 0.0025V		·
Short V Lo OCP Time (Tstep)	100ms	20ms	Setting range : 0.00V - 150	00V / Resolution : 0.0025V 20ms	100ms	20ms
Setting. Accuracy	Setting range : 0.00A - 400.00A /	Setting range : 0.00A - 600.00A /	±5 Setting range : 0.00A - 500.00A /	ms Setting range : 0.00A - 750.00A /	Setting range : 0.00A - 600.00A /	Setting range : 0.00A - 900.00A /
OCP ISTAR / ISTEP / ISTOP OCP VTH	Resolution : 6.4mA	Resolution : 9.6mA	Resolution: 8.0mA	Resolution : 12mA 00V / Resolution : 0.0025 V	Resolution : 9.60mA	Resolution : 14.4mA
OPP Time (Tstep) Setting, Accuracy	100ms	20ms	100ms	20ms	100ms	20ms
OPP PSTAR / PSTEP / PSTOP	Setting range: 0.00W - 4000.0W / Resolution: 64.0mW	Setting range : 0.00W - 6000.0W / Resolution : 96.0mW	Setting range : 0.00W - 5000.0W / Resolution : 80.0mW	Setting range : 0.00W - 7500.0W / Resolution : 120mW	Setting range : 0.00W - 6000.0W / Resolution : 96mW	Setting range : 0.00W - 9000.0W / Resolution : 144mW
OPP VTH BidS Test Mode*7	Resolution : 04.0mw	Resolution ; 96.0mw	Setting range : 0.00V - 150	00V / Resolution : 0.0025V	Resolution; 90mw	nesolution : 144mw
Max. Current	400A	600A	500A	750A ding + Range )	600A	900A
Meas. Accuracy Short test Time			0.05ms-10ms / R	esolution : 0.01ms 2ms		
Meas. Accuracy Setting Accuracy	6.00		±0.0	5ms		
Short ITH	Setting range : 0.19A - 200.00A / Resolution : 6.4mA	Setting range : 0.28A - 300.00A / Resolution : 9.6mA	Setting range : 0.24A - 250.00A / Resolution : 8.0mA	Setting range: 0.36A - 375.00A / Resolution: 12mA	Setting range : 0.28A - 300.00A / Resolution : 9.6mA	Setting range : 0.43A - 450.00A / Resolution : 14.4mA
OCP ISTAR	Setting range : 0.64A - 400.00A / Resolution : 6.4mA	Setting range : 0.96A - 600.00A / Resolution : 9.6mA	Setting range : 0.80A - 500.00A / Resolution : 8.0mA	Setting range : 1.20A - 750.00A / Resolution : 12mA	Setting range : 0.96A - 600.00A / Resolution : 9.6mA	Setting range : 1.44A - 900.00A / Resolution : 14.4mA
OCP TSTEP	0.05 ~ 10ms 11 ~ 1000ms	0.05 ~ 10ms	0.05 ~ 10ms 11 ~ 1000ms	0.05 ~ 10ms	0.05 ~ 10ms 11 ~ 1000ms	0.05 ~ 10ms
Meas. Accuracy OCP ISTEP	±0.1ms / ±0.5ms Setting range : 0.00A - 400.00A /	±0.5ms Setting range : 6.00A - 600.00A /	±0.1ms / ±0.5ms Setting range : 0.00A - 500.00A /	±0.5ms Setting range : 7.50A - 750.00A /	±0.1ms / ±0.5ms Setting range : 0.00A - 600.00A /	±0.5ms Setting range : 9.00A - 900.00A /
OCP ISTOP	Resolution : 6.4mA Setting range : 0.64A - 400.00A /	Resolution : 9.6mA Setting range : 0.96A - 600.00A /	Resolution: 8.0mA Setting range: 0.80A - 500.00A /	Resolution : 12mA Setting range : 1.20A - 750.00A /	Resolution : 9.6mA Setting range : 0.96A - 600.00A /	Resolution: 14.4mA Setting range: 1.44A - 900.00A /
OCPITH	Resolution: 6.4mA Setting range: 0.19A - 200.00A /	Resolution: 9.6mA Setting range: 0.29A - 300.00A /	Resolution: 8.0mA Setting range: 0.24A - 250.00A /	Resolution: 12mA Setting range: 0.37A - 375.00A /	Resolution: 9.6mA Setting range: 0.29A - 300.00A /	Resolution: 14.4mA Setting range: 0.44A - 450.00A /
Surge Test Mode	Resolution : 6.4mA	Resolution : 9.6mA	Resolution : 8.0mA	Resolution : 12mA	Resolution : 9.6mA	Resolution : 14.4mA
Surge Current Normal Current	0 -	600A 300A	0 - 0 -	375A	0-	900A 450A
Surge Time Surge Step Butt test Mode	10 ~ 2	2000ms ~ 5	10 ~ 2	000ms - 5	10~2	2000ms ~ 5
Mode CC	Setting range: 0.00A - 40	0.00A / Resolution : 6.4mA	Setting range : 0.00A - 50	0.00A / Resolution : 8.0mA	Setting range : 0.00A - 60	0.00A / Resolution : 9.6mA
Mode CP STOP Voltage(UVP)	Setting range: 0.00W - 400	0.0W / Resolution : 64.0mW	Setting range: 0.00V - 150	0.0W / Resolution : 80.0mW 00V / Resolution : 0.0025V	Setting range : 0.00W - 60	00.0W / Resolution : 96mW
STOP TIME STOP CAP.AH	1		Setting range : OFF 0.1 - 1	99999s / Resolution : 1s 9999AH / Resolution : 0.1AH		
STOP CAP,WH SEQ Load Mode (remode only)	1		Setting range : OFF 0.1 - 19	999WH / Resolution : 0.1WH		
Load mode Setting STEP	Y		2 -	/ CP 16		
Timing Resolution	3		20 ~ 1000 μs / 2~ 65	535ms / 66 ~ 999sec ms / 1sec		
Dynamic Mode Timing	<u> </u>					
Thigh & Tlow Resolution	P		0.001 / 0.01	9 / 999.9 / 9999ms / 0.1 / 1ms		
Accuracy Slew Rate	0.0256~1.600A / μs	0.2560~16.000A / μs	0.0320~2.000A / μs	μs / 1ms + 50ppm 0.3200~20.000A / μs	0.0384~2.400A / μs	0.3840~24.000A / μs
Resolution Min. Rise Time	0.0064A / μs	0.064A / μs	0.008A / μs 25 μs	0.08A / μs typical)	0.0096A / μs	0.096A / μs
Accuracy Current	<u></u>		±( 5% of Se	tting)±10µs		
Range Resolution	0 ~ 40A 0.64mA	40 ~ 400A 6.4mA	0 ~ 50A 0.8mA	50 ~ 500A 8mA	0 ~ 60A 0.96mA	60 ~ 600A 9.6mA
Conf Key Peremeter LDon Voltage			Setting range : 0.25V - 62	.50V / Resolution : 0.25V		
LDoFF Voltage Average Time			0-	250V / Resolution : 0.0025V 64		
Cy Res. Speed				astest)		
Voltage Read Back Range (5 Digital) Resolution	0 – 15V 0.25mV	15 – 150V 2.5mV	0 – 15V 0.25mV	15 – 150V 2.5mV	0 – 15V 0.25mV	15 ~ 150V 2.5mV
Accurac: Current Read Back Range [5 Digital]	0 ~ 40A	40 ~ 400A	0 - 50A	eading + Range) 50 ~ 500A	0 ~ 60A	60 ~ 600A
Resolutior Accuracy	0.64mA	6.4mA	0.8mA ± 0.05% of (Re	8mA ading + Range)	0.96mA	9.6mA
Power Read Back Range (5 Digital) Resolution	4	kW	5.0.0	W 1W	6	kW
Accurac <sup>*4</sup>			± 0.06% of (Re	ading + Range)		
Typical Short Resistance Maximum Short Current		lmΩ 00A	50			PmΩ OOA
Load ON Voltage	7		0 - 6	62.5V 2.25V		
Input Range & Power Consumption Dimension(H x W x D)	3 083	~ ~	100Vac ~ 240Vac , 47Hz 177mm x 440	~ 63Hz ; 550VA(max.) mm x 745mm	975	190
Weight Temperature <sup>18</sup>	32	2kg	32 0 –	5kg 40°C	32	.5kg
Safety & EMC				E		

Note \*1: The power rating specifications at ambient temperature = 25°C

Note \*2: The range is automatically or forcing to range II only in CC mode

Note \*3: If the operating current is below range 0.1%, the accuracy specification is 0.1% F.S.

Note \*4: Power range = Vrange x Irange

Note \*5: Turbo mode for up to 1.5% Current rating & Power rating support Surge, Bms, Short/OCP/OPP test function

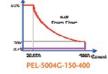
Note \*6: The best accuracy of OCP/OPP test is Istep/Pstep=1%F5

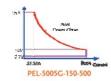
Note \*7: Bms Test function for Battery Management System Board SHORT, OCCP and DCDP Test

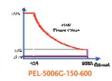
Note \*8: Operating temperature range is 0-40°C, All specifications apply for 25°Cs5°C, Except as noted

Note \*9: The specification is valid only for input voltage =1.5V and resistance setting > 0.0037Ω (PEL-5004G-150-400),

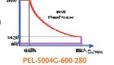
0.003Ω (PEL-5005G-150-500), 0.0025Ω (PEL-5006G-150-600)



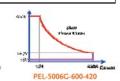




MODEL	PEL-5004G-600-280		PEL-50050	G-600-350	PEL-50060	G-600-420
ower <sup>c)</sup>	0 – 4kW	0 – 6kW max.*1	0 – 5kW	0 – 7.5kW max.*1	0 – 6kW	0 – 9kW max. *1
rrent tage	0 ~ 280A	0 ~ 420A max."		0 ~ 525A max."1		0 ~ 630A max."
n. Operating Voltage	1000	)280A		D350A	1000	D420A
er Power Protection(OPP) er Current Protection(OCP)			10	4%		
er Voltage Protection(OVP) er Temp Protection(OTP)				5% 25°C		
nstant Current Mode	0 – 28A	0 – 280A	0 – 35A	0 – 350A	0 – 42A	0 – 420A
solution curacy" <sup>2</sup> natant Resistance Mode	0.448mA	4.48mA	0.56mA ± 0.05% of (S	5.6mA etting + Range)	0.672mA	6.72mA
nge	128610Ω – 2.1435Ω	2.1435Ω – 0.0357Ω	102888Ω 1.7148Ω	1.7148Ω – 0.0285Ω	85740D - 1.4290D	1.4290Ω - 0.0238Ω
colution	± (0.1%(Vin / Setting) + 0.1% IF.S.)	± (0.2%(Vin / Setting) + 0.5% IF.S.)	± (0.1%(Vin / Setting) + 0.1% IF.S.)	± (0.2%(Vin / Setting) + 0.5% IF.S.)	± (0.2%(Vin / Setting) + 0.1% IF.S.)	± (0.2%(Vin / Setting) + 0.5%
netant Voltage Mode				600V		
colution				lmV etting + Range)		
netant Power Mode	0 – 400W	400 – 4kW	0-500W	500-5kW	0-600W	600-6kW
olution uracy *	6.4mW	64mW	8mW ± 0.1% of (Se	80mW etting + Range)	9.6mW	96mW
<b>stant Voltage Mode + Current Limit M</b> ge	600V	280A	600V	350A	600V	420A
olution uracy stant Voltage Mode + Power Limit Me	10mV ± 0.05% of (Setting + Range)	4.48mA ± 1.0% of (Setting + Range)	10mV ± 0.05% of (Setting + Range)	5.6mA ± 1.0% of (Setting + Range)	10mV ± 0.05% of (Setting + Range)	6.72mA ± 1.0% of (Setting + Range
ge	600V	4kW	600V	5kW	600V	6kW
olution uracy 4	10mV ± 0.05% of (Setting + Range)	64mW ± 1.0% of (Setting + Range)	10mV ± 0.05% of (Setting + Range)	80mW ± 1.0% of (Setting + Range)	10mV ± 0.05% of (Setting + Range)	96mW ± 1.0% of (Setting + Range)
to Mode " rt / OCP / OPP Test Function	OFF	ON	OFF	ON	OFF	ON
r. Current r. Power	280A 4000W	420A 6000W	350A 5000W	525A 7500W	420A 6000W	630A 9000W
Accuracy st Time	100 – 10000ms	100 ~ 2000ms	± 1.0% of (Re	ading + Range) 100 ~ 2000ms	100 – 10000ms	100 ~ 2000ms
ing. Accuracy	Continuous	TOU ~ ZOUUTIS	Continuous ±5	ims	Continuous	100 ~ 2000ms
ort V Hi ort V Lo			Setting range : 0.00V - 60 Setting range : 0.00V - 60	0.00V / Resolution : 0.01V 0.00V / Resolution : 0.01V		
P Time (Tstep) ting, Accuracy	100ms	20ms	100ms ±5	20ms ims	100ms	20ms
PISTAR / ISTEP / ISTOP	Setting range : 0.00A - 280.00A / Resolution : 4.48mA	Setting range : 0.00A - 420.00A / Resolution : 6.72mA	Setting range : 0.00A - 350.00A / Resolution : 5.6mA	Setting range : 0.00A - 525.00A / Resolution : 8.4mA	Setting range : 0.00A - 420.00A / Resolution : 6.72rnA	Setting range: 0.00A - 630.00 Resolution: 10.08mA
P VTH P Time(Tstep)	100ms	20ms	Setting range : 0.00V - 60 100ms	0.00V / Resolution : 0.01 V 20ms	100ms	20ms
ting, Accuracy	Setting range : 0.00W - 4000.0W /	Setting range : 0.00W - 6000.0W /	±5 Setting range : 0.00W + 5000.0W /	Setting range : 0.00W - 7500.0W /	Setting range : 0.00W - 6000.0W /	Setting range : 0.00W - 9000.0
P PSTAR / PSTEP / PSTOP	Resolution : 64.0mW	Resolution : 96.0mW	Resolution: 80.0mW	Resolution: 120mW 0.00V / Resolution: 0.01V	Resolution : 96mW	Resolution : 144mW
S Test Mode*7 x. Current	280A	420A	350A	525A	420A	630A
as. Accuracy 6	2001	4204	±3.0% of ( Rea	ading + Range ) desolution : 0.01 ms	42010	0304
as. Accuracy ting Accuracy			±0.0	12ms		
ort ITH	Setting range : 0.13A - 140.00A / Resolution : 4.48mA	Setting range : 0.20A - 210.00A /	Setting range: 0.16A - 175.00A /	Setting range: 0.25A - 262 50A /	Setting range: 0.20A - 210.00A /	Setting range : 0.30A - 315.0 Resolution : 10.08mA
PISTAR	Setting range: 0.44A - 280.00A /	Resolution: 6.72mA Setting range: 0.67A - 420.00A /	Resolution : 5.6mA Setting range : 0.56A - 350.00A /	Resolution : 8.4mA Setting range : 0.84A - 525.00A /	Resolution: 6.72mA Setting range: 0.67A - 420.00A /	Setting range : 1.00A - 630.00
PTSTEP	Resolution : 4.48mA 0.05 ~ 10ms 11 - 1000ms	Resolution : 6.72mA 0.05 ~ 10ms	Resolution : 5.6mA 0.05 ~ 10ms 11 – 1000ms	Resolution : 8.4mA 0.05 ~ 10ms	Resolution : 6.72mA 0.05 ~ 10ms 11 – 1000ms	Resolution : 10.08mA 0.05 ~ 10ms
as. Accuracy	±0.1ms / ±0.5ms	±0.5ms Setting range : 4.20A - 420.00A /	±0.1ms / ±0.5ms	±0.5ms	±0.1ms / ±0.5ms	±0.5ms
PISTEP	Setting range: 0.00A - 280.00A / Resolution: 4.48mA	Resolution: 6.72mA	Setting range : 0.00A - 350.00A / Resolution : 5.6mA	Setting range : 5.25A - 525.00A / Resolution : 8.4mA	Setting range : 0.00A - 420.00A / Resolution : 6.72mA	Setting range : 6.30A - 630.00 Resolution : 10.08mA
PISTOP	Setting range : 0.44A - 280.00A / Resolution : 4.48mA	Setting range: 0.67A - 420.00A / Resolution: 6.72mA	Setting range : 0.56A - 350.00A / Resolution : 5.6mA	Setting range: 0.84A - 525.00A / Resolution: 8.4mA	Setting range : 0.67A - 420.00A / Resolution : 6.72mA	Setting range: 1.00A - 630.00 Resolution: 10.08mA
PITH	Setting range : 0.13A - 140.00A / Resolution : 4.48mA	Setting range : 0.20A - 210.00A / Resolution : 6.72mA	Setting range : 0.17A - 175.00A / Resolution : 5.6mA	Setting range : 0.26A - 262.50A / Resolution : 8.4mA	Setting range : 0.20A - 210.00A / Resolution : 6.72mA	Setting range: 0.30A - 315.00 Resolution: 10.08mA
ge Test Mode ge Current		420A	0-	525A		630A
mal Current ge Time	10~2	210A 000ms	10~2	62.5A 9000ms	10~:	315A 2000ms
e Step test Mode		~5		~5		~ 5
le CC le CP	Setting range : 0.00A - 280 Setting range : 0.00W - 400	.00A / Resolution : 4.48mA 0.0W / Resolution : 64.0mW	Setting range: 0.00W - 500	0.00A / Resolution : 5.6mA 0.0W / Resolution : 80.0mW	Setting range : 0.00A - 420 Setting range : 0.00W - 60	0.00A / Resolution : 6.72mA 00.0W / Resolution : 96mW
P Voltage (UVP) P TIME			Setting range : OFF 1 -	0.00V / Resolution : 0.01V 99999s / Resolution : 1s	70 (31-00)	N77
P CAP,WH			Setting range : OFF 0.1 - 19 Setting range : OFF 0.1 - 19	9999AH / Resolution : 0.1AH 9999WH / Resolution : 0.1WH		
Load Mode ( remode only )  d Mode			cc	/ CP		
ting STEP				- 16 535ms / 66 ~ 999sec		
olution namic Mode			10 μs / 1	ms / 1sec		
ning gh & Tlow			0.010-9.999 / 99.5	99 / 999.9 / 9999ms		
olution uracy			1 μs / 10 μs / 100	/ 0.1 / 1ms µs / 1ms + 50ppm		
v Rate olution	0.01792~1.120A / μs 0.00448A / μs	0.1792~11.200A / μs 0.0448A / μs	0.0224~1.400A / μs 0.0056A / μs	0.2240-14.00A / μs 0.056A / μs	0.02688~1.680A / μs 0.00672A / μs	0.2688~16.800A / μs 0.0672A / μs
. Rise Time uracy				typical) tting )±10 µs		
rent ge	0 – 28A	28 – 280A	0 – 35A	35 – 350A	0 ~ 42A	42 – 420A
olution Key Peremeter	0.45mA	4.48mA	0.56mA	5.6mA	0.67mA	6.72mA
n Voltage FF Voltage			Setting range: 0.000V - 9	00.0V / Resolution : 0.4V 19.60V / Resolution : 0. 01V		
age Time Res. Speed				- 64 Fastest)		
age Read Back Range (5 Digital)	0 ~ 60V	60~ 600V	0 ~ 60V	60 ~ 600V	0 ~ 60V	60 ~ 600V
Resolution Accuracy	1.00mV	10.0mV		10.0mV eading + Range)	1.00mV	10.0mV
ent Read Back Range (5 Digital) Resolution	0 – 28A 0.448mA	28 – 280A 4.48mA	0 – 35A 0.56mA	35 – 350A 5.6mA	0 – 42A 0.672mA	42 – 420A 6.72mA
Accuracy er Read Back Range (5 Digital)	4	w.	5	ading + Range) kW		kw
Resolution Accuracy				01W rading + Range)		
cal Short Resistance		3mΩ	28.5	84mΩ		32mí2
imum Short Current d ON Voltage	21	OA .	3:	50A - 100V		20A
OFF Voltage ut Range & Power Consumption			100Vac ~ 240Vac , 47Hz			
ension(H x W x D)	1			Omm x 745mm		
ght nperature <sup>-1</sup>	3	2.5kg		3kg		33kg







Note \*1: The power rating specifications at ambient temperature = 25°C

Note \*2: The range is automatically or forcing to range II only in CC mode

Note \*3: If the operating current is below range 0.3%, the accuracy specification is 0.1% F.S.

Note \*4: Power ranges/Yange x lrange(the specification is valid only for the model PEL-600-XXX with loading current > 0.03% F.S.)

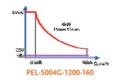
Note \*5: Turbo mode for up to 1.5X Current rating & Power rating support Surge, Bms, Short/OCP/OPP test function

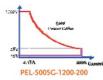
Note \*6: The best accuracy of OCP/OPP test is Istep/Pstep=1%F5

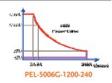
Note \*7: Bms Test function for Battery Management System Board SHORT, OCCP and OCDP Test

Note \*8: Operating temperature range is 0-40°C, All specifications apply for 25°C±5°C, Except as noted

Resolution   2.56mA	SPECIFICATIONS MODEL	PEL-50040	G-1200-160	PEL-50050		PEL-50060	G-1200-240
Company   Comp	Current	0 ~ 160A	0 ~ 240A max."	0 ~ 200A	0 ~ 300A max."	0 ~ 240A	0 ~ 360A max."
Control Programme	Min. Operating Voltage	15V@	200V 160A	15V@	200V 200A	15V <sub>0</sub>	200V D240A
Color   Colo	Over Power Protection(OPP) Over Current Protection(OCP)			10	1%		
Column	Over Temp Protection(OTP)	5		10. 90°C	5% ±5°C		
Company   Comp			0 – 160A 2.56mA	0 – 20A 0.32mA		0 – 24A 0.384mA	0 – 240A 3.84mA
Column	Accuracy Constant Resistance Mode			± 0.05% of (Se	tting + Range)		
Column   C	Resolution	2.2 uS	125μΩ	2.8 µS	100μΩ	3.3 µS	83.34μΩ
Company   Comp	Constant Voltage Mode	± (0.1%(vin / Setting) + 0.1% ir.s.)	± (0.2% (Vin / Setting) + 0.5% IF.S.)			± (0.2% (Vin / Setting) + 0.1% IF.S.)	± (0.2%(Vin / Setting) + 0.5% IF.S.)
Column	Resolution			20 ± 0.05% of (Se	nV tting + Range)		
The content of the	Range	0 ~ 400W			500-5kW	0-600W	
Company   Comp	Accuracy 4	ode	DAILIM	± 0.2% of (Se	ting + Range)	5.0ff/W	30fl W
Company   Comp	Range Resolution	1200V 20mV	2.56mA	20mV	3,2mA	20mV	3.84mA
Column		ie					
Max.	Resolution	20mV ± 0.05% of (Setting + Range)		20mV		20mV	
March	Turbo Mode " Short / OCP / OPP Test Function						
Description   100 - 100000	Max. Power			5000W	7500W		
Street 1997   1907   1908   1909			100 ~ 2000ms	100 – 10000ms			100 ~ 2000ms
Company   Comp	Short V Hi			±5 Setting range : 0.25V - 12i	ms 00.0V / Resolution : 0.02V		
Control   Print   Pr	OCP Time(Tstep)	100ms	20ms			100ms	20ms
Column   Series   Column   Series   Column   C	FEG. C. A. A. (ACC) 1975			Resolution: 3.2mA	Resolution: 4.8mA		
Description   Service cape   CORP   CORP	OPP Time(Tstep)			Setting range: 0.00V - 120	0.00V / Resolution : 0.02V		
Series age; 1000   10000   10000   10000   10000   10000   10000   100		Setting range : 0.00W - 4000.0W /	Setting range : 0.00W - 6000.0W /	±5 Setting range : 0.00W - 5000.0W /		Setting range : 0.00W - 6000.0W /	Setting range : 0.00W - 9000.0W /
Max. Course   1904   2004   2005	OPP VTH	Resolution : 64.0mW	Resolution : 96.UmW	Setting range : 0.00V - 120	0.00V / Resolution : 0.02V	Resolution : 96mW	Resolution : 144mW
Ches. No. 1976   Setting range; CSPA - 18586/   Setting rang	Max. Current Meas. Accuracy 6	160A	240A	±3.0% of ( Rea	ding + Range )	240A	360A
Setting   Temps   1909 A. 19	Meas. Accuracy			0.05ms~10ms / R ±0.0	esolution : 0.01ms 2ms		
Cop Fix   Setting ranger   23.54 - 160.006   Setting ranger   23.84 - 240.006   Sett	2000 00000						
OS - 10ms	OCP ISTAR	Setting range : 0.25A - 160.00A /	Setting range : 038A - 240.00A /	Setting range : 0.32A - 200:00A /	Setting range : 048A - 300.00A /	Setting range: 0.38A - 240.00A /	Setting range : 057A - 360.00A /
COP STOP   Setting range: 10.004 - 10.00.006   Setting range: 2.004 - 10.00.006   Setting range: 3.004 - 10.006   Setting range: 3.004 - 10.00   Se		0.05 – 10ms 11 – 1000ms		0.05 – 10ms 11 – 1000ms		0.05 – 10ms 11 – 1000ms	
CP STOP	10, 4400 (1999) 11 m	Setting range: 0.00A - 160.00A /	Setting range : 2.40A - 240.00A /	Setting range : 0.00A - 200.00A /	Setting range : 3.00A - 300.00A /	Setting range : 0.00A - 240.00A /	Setting range: 3.60A - 360.00A /
Setting range; 0.194 - 130.004   Setting range; 0.194 - 130.004	OCP ISTOP	Setting range : 0.25A - 160.00A / Resolution : 2.56mA	Setting range : 0.38A - 240.00A / Resolution : 3.84mA	Setting range : 0.32A - 200.00A / Resolution : 3.2mA	Setting range : 0.48A - 300.00A / Resolution : 4.8mA	Setting range : 0.38A - 240.00A / Resolution : 3.84mA	Setting range : 0.57A - 360.00A /
Surge Current		Setting range : 0.10A - 80.00A /	Setting range: 0.15A - 120.00A /	Setting range : 0.10A - 100.00A /	Setting range: 0.15A - 150.00A /	Setting range: 0.10A - 120.00A /	Setting range : 0.15A - 180.00A /
Description	Surge Current	0 - :	240A	0-	000A	0-	360A
Mode CC   Setting range : 0.000 - 160.000 / Resolution : 2.7mA   Setting range : 0.000 - 260.000 / Resolution : 2.7mA   Setting range : 0.000 / Resolution : 2.7mA   Setting range : 0.0000 / Resolution : 2.7mA   Setting range : 0.0000 / Resolution : 2.7mA   Setting rang	Surge Time	10 ~ 2	000ms	10 ~ 2	000ms	10 ~ 2	000ms
Setting range   COOP - 1,000,000   Sensition   COOP	Belt test Mode Mode CC	Setting range : 0.00A - 160	00A / Resolution : 2.56mA	Setting range : 0.00A -200	.00A / Resolution : 3.2mA	Setting range : 0.00A - 240	.00A / Resolution : 3.84mA
Setting range (OPF 0.1 - 19999847   Resolution o.104H	STOP Voltage (UVP)	Setting range : 0.00W - 4000	0.0W / Resolution : 64.0mW	Setting range: 0.00V - 120	0.00V / Resolution : 0.02V	Setting range : 0.00W - 600	00.0W / Resolution : 96mW
Carl Mode   CC   CP	STOP CAP.WH			Setting range : OFF 0.1 - 19 Setting range : OFF 0.1 - 19	999AH / Resolution : 0.1AH 999WH / Resolution : 0.1WH		
Finding   20 - 1000 js / 2 - 6555/sm / 66 - 999sec	Load Mode						
Dynamic   Mode	Timing			20 ~ 1000 μs / 2~ 65	535ms / 66 ~ 999sec		
Resolution	Dynamic Mode Timing	2					
Siew Rate	Resolution	() ()		0.001 / 0.01	/ 0.1 / 1ms		
Min. Rise Time	Slew Rate Resolution			0.0128~0.800A / μs 0.0032A / μs	0.1280-8.000A / μs 0.032A / μs	0.01536~0.960A / μs 0.00384A / μs	
Range	Min. Rise Time Accuracy			25 μs()	ypical)		
Cool   Parameter	Range						
LDOFF Voltage	Conf Key Parameter	U.ZOTTA	2.30MA			U.Jámn	J.MITMO.C
Voltage Read Back   Range   S Digital   O - 120V   120 - 1200V   O - 120V   120 - 1200V   O - 120V   120 - 1200V   O - 120V   O -	LDoFF Voltage Average Time			Setting range : 0.000V - 2- 0 -	19.0V / Resolution : 0.02V 64		
Resolution   2.00mV   20.0mV   20.0mV	CV Res. Speed Measurement Voltage Rend Resk, Proces (5 Digital)	0-1304	120 _ 12000		101001)	0_3260	130_13000
Current Read Back Range   S Digital   0 - 164	Resolution Accuracy	2.00mV	20.0mV	2.00mV ± 0.025% of (Re	20.0mV ading + Range)	2.00mV	20.0mV
Power Read Back   Range (5 Digital)	Current Read Back Range (5 Digital) Resolution			0 ~ 20A 0.32mA	20 ~ 200A 3.2mA		
Accuracy     ± 0.05% of [Reading + Range]	Power Read Back Range (5 Digital)	46	W	51	W	6	ew .
Typical Short Resistance   93.75m2   75m2   62.505m2   Maximum Short Current   160A   200A   240A   1 250V	Accuracy ** General			± 0.06% oF (Re	ading + Range)		
Load OFF Voltage 0 ~ 249V	Typical Short Resistance Maximum Short Current			20	0A		
	Load OFF Voltage			0-2	49V		
Input Bange & Power Consumption   100Vac ~ 240Vac ~ A714z ~ 6314; S50VA(max.)	Dimension(H x W x D)	32	g	177mm x 440	mm x 745mm	32	.5kg
Temperature* 0 - 40°C Safety & EMC CE	Temperature's			0~	10°C		







Note \*1: The power rating specifications at ambient temperature = 25°C

Note \*2: The range is automatically or forcing to range II only in CC mode

Note \*3: If the operating current is below range 0.1%, the accuracy specification is 0.1% F.S.

Note \*4: Power range = Vrange x Irange

Note \*5: Turbo mode for up to 1.5X Current rating & Power rating support Surge, Bms, Short/OCP/OPP test function

Note \*6: The best accuracy of OCP/OPP test is istep/Patep=1%FS

Note \*7: Bms Est function for Battery Management System Board SHORT, OCCP and OCDP Test

Note \*8: Operating temperature range is 0-40°C, All specifications apply for 25°C±5°C, Except as noted

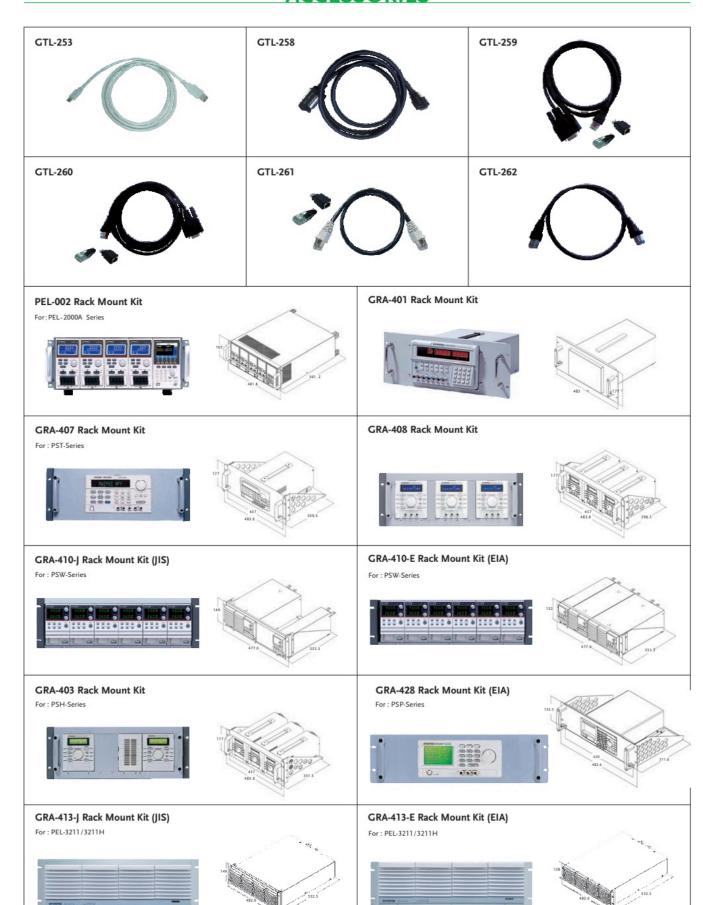
# **ACCESSORIES**

MODEL	DESCRIPTION	APPLICABLE DEVICE
APS-001	GPIB Interface Card	APS-7000 Series
APS-002	RS-232/USB Interface Card	APS-7050, APS-7100
APS-003 APS-004	Output Voltage Capacity (0~600Vrms)  Output Frequency Capacity (45–999.9Hz)	APS-7000 Series APS-7000 Series
APS-007	RS-232 Interface Card	APS-7200, APS-7300
APS-008	Air Inlet Filter	ASR-3000 Series
ASR-001	Air Inlet Filter	ASR-2000 Series
ASR-002	External Three Phase Control Unit	ASR-2000 Series, ASR-3000 Series
ASR-C003	GPIB Interface Card  Modbus TCP Feature	ASR-6000 Series
ASR-003	DeviceNet Interface Card	ASR-2000 Series, ASR-3000 Series, ASR-6000 Series ASR-6000 Series
ASR-005	CAN BUS Interface Card	ASR-6000 Series
ASR-006	External Parallel Cable	ASR-6000 Series
GET-001	Extended Terminal with max.30A for 30V/80V/160V models	PSW-Series, PSW-Multi Series
GET-002 GET-003	Extended Terminal with max.10A for 250V/800V models	PSW-Series, PSW-Multi Series
GET-003	Extended Universal Power Socket  Extended European Power Socket	ASR-2000 Series ASR-2000 Series
GET-005	Extended European Terminal with max.20A for 30V/80V/160V models	PSW-Series, PSW-Multi Series
GET-006	Universal Extension, AC signel phase 250V/13Amps	ASR-6000/3000/2000 Series
GPS-001	Knob, Voltage/Current Protection Knob	GPS-x303 Series, SPD-3606
GPW-001	UL/CSA Power Cord, 3000mm	PSU-Series
GPW-002 GPW-003	VDE Power Cord, 3000mm PSE Power Cord, 3000mm	PSU-Series PSU-Series
GPW-005	Power cord, 3m, 105°C, UL/CSA type	ASR-3000 Series
GPW-006	Power cord, 3m, 105℃, VDE type	ASR-3000 Series
GPW-007	Power cord, 3m, 105℃, PSE type	ASR-3000 Series
GPW-008	6RV3 Power Cord; 10AWG/3C, 3m Max Length, , RV5-5*3P, RV5-5*3P UL Type	ASR-6000 Series
GPW-011 GPW-012	6RV5 UL Power Cord; 10AWG/5C, 3m, RV5-5*5P,RV5-5*5P UL Type 6RVV5 VDE Power Cord; 2.5mm2/5C, 3m Max Length, RVS3-5*5P, RVS3-5*5P VDE Type	ASR-6000 Series ASR-6000 Series
GPW-012	6RVT5 PSE Power Cord; 2.5mm2/5C, 3m Max Length, RVS3-5*5P, RVS3-5*5P VDE Type 6RVT5 PSE Power Cord; 2.0mm2/5C, 3m Max Length, RVS2-5*5P, RVS2-5*5P PSE Type	ASR-6000 Series
GPW-014	6RV4 UL Power Cord; 10AWG/4C, 3m, RV5-5*4P,RV5-5*4P UL TYPE	ASR-6000 Series
GPW-015	6RVV4 VDE Power Cord; 2.5mm2/4C, 3m Max Length, RVS3-5*4P, RVS3-5*4P VDE Type	ASR-6000 Series
GRA-401	Rack Mount Kit, 19", 4U Size	GPC-Series, GPR-M Series, PPE-3323, PPS-3635, PPT-Series, PEL-300
GRA-403	Rack Mount Kit, 19", 4U Size	PSH-Series
GRA-407 GRA-408	Rack Mount Kit, 19", 4U Size Rack Mount Kit, 19", 4U Size	PST-Series PSS-Series
GRA-409	Rack Mount Kit, 19", 40 Size	APS-1102A
GRA-410-E	Rack Mount Kit (EIA), 19", 3U Size	PSW-Series, PSW-Multi Series
GRA-410-J	Rack Mount Kitt (JIS), 19", 3U Size	PSW-Series, PSW-Multi Series
GRA-413-E	Rack Mount Kitt (EIA), 19", 3U Size	PEL-3211A/3211AH
GRA-413-J	Rack Mount Kitt (JIS), 19", 3U Size	PEL-3211A/3211AH
GRA-414-E GRA-414-J	Rack Mount Kit (EIA), 19", 3U Size Rack Mount Kit (JIS), 19", 3U Size	PEL-3021A(H)/3041A(H)/3111A(H), PEL-3000AE Series  PEL-3021A(H)/3041A(H)/3111A(H), PEL-3000AE Series
GRA-419-E	Rack Mount Kit (EIA), 19", 2U Size	PCS-10001
GRA-419-J	Rack Mount Kit (JIS), 19", 2U Size	PCS-1000I
GRA-423	Rack Mount Kit, 19", 2U Size	APS-7000/7000E Series
GRA-424	Rack Mount Kit, 19", 3U Size	PSB-2000 Series
GRA-428 GRA-429	Rack Mount Kit (EIA), 19", 3U Size Rack Mount Kit, 7U Size	PSP-Series APS-7200 Series
GRA-430	Rack Mount Kit, 9U Size	APS-7300 Series
GRA-431-J	Rack Mount Kit (JIS)	PFR-Series
GRA-431-E	Rack Mount Kit (EIA)	PFR-Series
GRA-439-J	Rack Mount Kit (JIS), 19", 3U Size	ASR-2000 Series
GRA-439-E GRA-441-J	Rack Mount Kit(EIA)), 19", 3U Size Rack Mount Kit (JIS), 19", 3U Size	ASR-2000 Series PPX-Series
GRA-441-E	Rack Mount Kit (IS), 19 , 30 Size	PPX-Series
GRA-442-J	Rack Mount Kit (JIS), 19", 3U Size	ASR-3000 Series
GRA-442-E	Rack Mount Kit(EIA)), 19", 3U Size	ASR-3000 Series
GRA-449-J	Rack Mount Kit (JIS), 19", 3U Size	GPP-Series, GPP-3060/6030/3650, GPP-3610H/7250
GRA-449-E	Rack Mount Kit (EIA), 19", 3U Size	GPP-Series, GPP-3060/6030/3650, GPP-3610H/7250
GRA-450-J GRA-450-E	Rack Mount Kit (JIS), 19", 3U Size Rack Mount Kit (EIA), 19", 3U Size	GSM-20H10, PPH-Series GSM-20H10, PPH-Series
GRA-451-J	Rack Mount Kit (JIS), 19", 3U Size	ASR-6000 Series
GRA-451-E	Rack Mount Kit (EIA), 19", 3U Size	ASR-6000 Series
GRJ-1101	Module Cable (0.5m)	PSB-2000 Series
GRM-001	Slide Bracket 2pcs/set	PSU-Series
GTL-104A	Test Lead, U-type to Alligator Test Lead, Max. Current 10A, 1000mm	PFR/PSP/PST/GPC/GPD/GPP/GPR/GPS/GPE/PPT-Series, PPS-3635, SPD-3606, PPX-Series, GPP-3060/6030/3650
GTL-105A	Test Lead, Alligator to Banana Test Lead, Max. Current 3A, 1000mm	PFR/PSS/PST/GPC/GPD/GPP/GPR/GPS/PPT-Series, PEL-2000B, PPE-3323, SPD-3606,
GTL-117	Test Lead, Banana to Probe Test Lead, 1200mm	PCS-1000I, PPX-Series PPH-1503/1503D/1506D
GTL-117	Test Lead, O-type to O-type Test Lead, 1200mm  Test Lead, O-type to O-type Test Lead, Max. 40A, 1200mm	PEL-3000/3000H Series, PEL-2000A(B) Series
GTL-121	Sense Lead, O-type to Gree Lead, 1200mm	PEL-2000A(B) Series
GTL-122	Test Lead, U-type to Alligator Test Lead, Max. Current 40A, 1200mm	PSH-Series, GPR-U Series, GPR-H Series
GTL-123	Test Lead, O-type to O-type Test Lead, 1200mm	PSW-Series, APS-7000 Series
GTL-130	Test Leads: 2 x red, 2 x black, for 250V/800V models, 1200mm Test Leads for Rear Panel, 1200mm, 10A, 16 AWG	PSW-Series, PSW-Multi Series PFR-Series
GTL-134 GTL-137	Test Leads for Rear Panel, 1200mm, 10A, 16 AWG  Output Power wire(load wire_10AWG:50A, 600V/sense wire_16AWG:20A, 600V)	PFR-Series ASR-3000 Series
GTL-201A	Ground Lead, Banana to Banana, European Terminal, 200mm	AFG-200/100 Series, GPD-Series, GPP-Series, GPS-X303 Series, SPD-3606,
	STEET OF AN ARTHUR AND AN ARTHUR AND ARTHUR	PPX-Series, GPP-3060/6030/3650
GTL-203A	Test Lead, Banana to Alligator, European Terminal, Max. Current 3A, 1000mm	PSS/PST/GPD/GPP/GPS/SPS-Series, SPD-3606, PPH-1503/1503D/1506D, PPX-Series
GTL-204A	Test Lead, Banana to Alligator, European Terminal, Max. Current 10A, 1000mm	PFR/PSP/PSS/GPS/GPE/PPT/PST/GPD/GPP-Series, SPD-3606, PPH-1503/1503D/1506D, PPX-Series, GPP-3060/6030/3650
GTL-205A	Temperature Probe Adapter(Thermal Coupling, K-Type), about 1000mm	PPX-Series
GTL-207A	Test Lead, Banana to Probe Test Lead, 800mm	PCS-1000I, GSM-20H10
GTL-218	Test Lead, O-type to O-type Test Lead, Max. 200A, 1500mm	PSU/PSW/PEL-3000/3000H Series
GTL-219	Test Lead, O-type to O-type Test Lead, Max. 200A, 3000mm	PSU/PSW/PEL-3000/3000H Series
GTL-220	Test Lead, O-type to O-type Test Lead, Max. 300A, 1500mm	PSU/PSW/PEL-3000/3000H Series
GTL-221 GTL-222	Test Lead, O-type to O-type Test Lead, Max. 300A, 3000mm  Test Lead, O-type to O-type Test Lead, Max. 400A, 1500mm	PSU/PSW/PEL-3000/3000H Series PSU/PSW/PEL-3000/3000H Series
010222	rest case, onlype to onlype rest ceau, max. noon, 1300mm	. 50). STIPEE-3000/300011 Selies

# **ACCESSORIES**

MODEL	DESCRIPTION	APPLICABLE DEVICE
GTL-223	Test Lead, O-type to O-type Test Lead, Max. 400A, 3000mm	PSU/PSW/PEL-3000/3000H Series
GTL-232	RS-232C Cable, 9-pin, F-F Type, null modem, 2000mm	PSH/PSS-Series, APS-7000 Series, PEL-2000A(B) Series, ASR-6000/3000/2000 Series
GTL-232A	RS-232C Cable, 9-pin, F-F Type, null modem, 2000mm	PSP-Series PSP-Series
GTL-234	RS-232C Cable, 9-pin, F-F Type, 2000mm	APS-1102A
GTL-238	RS-232 Cable, 9-pin, M-F Type, 1000mm	PEL-500 Series
GTL-240 GTL-246	USB Cable, USB 2.0, A-B Type (L Type), 1200mm USB Cable, USB 2.0, A-B Type, 1200mm	PSW-Series, PSU-Series, APS-1102A, APS-7000 Series, PCS-10001  PFR-Series, PSU-Series, PSB-2000 Series, PPH-1503/1503D, GPD-Series, GPP-Series, APS-1102A,
G1L-246	USB Cable, USB 2.0, A-B Type, T200mm	PR-Series, PSU-Series, PSB-2000 Series, PPH-1303/13030, QPU-Series, QPP-Series, APS-1102A, APS-7000 Series, PEL-3000/3000H Series, PEL-3000AE Series, PEL-2000A(B) Series, PPX-Series, ASR-3000, Series, PEL-5000C Series, AEL-5000 Series, GPP-3060/6030/3650, GPP-3610H/7250, GSM-20H10, PEL-5000G
GTL-248	GPIB Cable, Double Shielded, 2000mm	PSB-2000 Series, PPH-1503, PSW/PSW-Multi/PSU/PSH/PSS/PPT-Series, APS-7000 Series, PEL-3000/3000H Series, PEL-3000AE Series, PEL-2000A(B) Series, ASR-6000/3000 Series, PEL-5000C Series, AEL-5000 Series, PEL-5000G Series, GSM-20H10
GTL-249 GTL-250	Frame Link Cable, 300mm GPIB Cable, Double Shielded, 600mm	PEL-2000A(B) Series PSW/PSW-Multi/PSU/PSH-Series, PSB-2000 Series, APS-7000 Series, PEL-5000C Series, AEL-5000 Series
GTL-255	Frame Link Cable, 300mm	PEL-3000/3000H Series
GTL-258	GPIB Cable, 25 pins Micro-D Connector	PFR-Series, PPX-Series, ASR-2000 Series, PSU-Series
GTL-259	RS-232 Cable with DB9 Connector to RJ45	PPX-Series, PFR-Series, PSU-Series
GTL-260 GTL-261	RS-485 Cable with DB9 Connector to RJ45 Serial Master Cable + Terminator, 0.5M	PPX-Series, PFR-Series, PSU-Series  PSU-Series, PFR-Series, PSU-Series, PPX-Series
GTL-262	RS-485 Slave Cable	PPX-Series, PFR-Series, PSU-Series
GUG-001	GPIB-USB Adaptor, GPIB to USB Adaptor	GDS-3000 Series, PSW-Series, PSW-Multi Series
GUR-001A	RS232-USB Cable, 300mm	PSW-Series, PSW-Multi Series
GUR-001B	RS-232 to USB Adapter with #4-40 UNC Rivet Nut	PSW-Multi Series
PCS-001	Basic Accessory Kit	PCS-10001
PEL-001 PEL-002	GPIB Card  Rack Mount Kit, PEL-2000 Series Rack Mount Kit	PEL-2000A(B) Series PEL-2000A(B) Series
PEL-002 PEL-003	Panel Cover	PEL-2000A(B) Series  PEL-2000A(B) Series
PEL-004	GPIB Card	PEL-3000/3000H Series, PEL-3000AE Series
PEL-005	Connect Cu Plate	PEL-3000/3000H Series
PEL-006	Connect Cu Plate	PEL-3000/3000H Series
PEL-007	Connect Cu Plate	PEL-3000/3000H Series
PEL-008 PEL-009	Connect Cu Plate Connect Cu Plate	PEL-3000/3000H Series  PEL-3000/3000H Series
PEL-010	Dust Filter	PEL-3000/3000H Series, PEL-3000AE Series
PEL-011	Load Input Terminal Cover	PEL-3000/3000H Series
PEL-012	Terminal Fittings Kits	PEL-3000/3000H Series
PEL-013	Flexible Terminal Cover	PEL-3000/3000H Series
PEL-014	J1/J2 Protection Plug	PEL-3000/3000H Series
PEL-016	LAN Card	PEL-2000A(B) Series
PEL-018	LAN Card	PEL-3000/3000H Series
PEL-022 PEL-023	GPIB Card RS-232 Card	PEL-5000C Series, AEL-5000 Series, PEL-5000G Series  PEL-5000C Series, AEL-5000 Series, PEL-5000G Series
PEL-024	LAN Card	PEL-5000C Series, AEL-5000 Series, PEL-5000G Series
PEL-025	USB Card	PEL-5000C Series, AEL-5000 Series, PEL-5000G Series
PEL-026	Hook Ring	PEL-5000C Series
PEL-027-1~4	Rack Mount Kit	PEL-5000C Series
PEL-028	HANDLES, U-shaped Handle (Fixed to the Bracket)	PEL-5000C Series, AEL-5000 Series
PEL-029 PEL-030	HANDLES Rack Accessories (for AEL-5002/5003/5004)  GPIB+RS-232 Card	AEL-5000 Series PEL-5000C Series, AEL-5000 Series, PEL-5000G Series
PEL-030	Rack Mount Kit	PEL-5000G
PEL-032	9923 Current Waveform Generator + RS232 Interface	PEL-5000G
PPX-G	GPIB Interface(Factory Installed)	PPX-Series
PSB-001	GPIB Card	PSB-2000 Series
PSB-003	Parallel Connection Kit (for Horizontal Installation), Kit Includes: (PSB-007 Joint Kit, Horizontal bus bar x 2 , PSB-005 x1)	PSB-2000 Series
PSB-004	Parallel Connection Kit (for Vertical Installation) Kit Includes: (PSB-007 Joint Kit, Verical bus bar x 2, PSB-005 x 1)	PSB-2000 Series
DCD AAF		
PSB-005	Parallel Connection Signal Cable	PSB-2000 Series
PSB-006	Parallel Connection Signal Cable Serial Connection Signal Cable	PSB-2000 Series
	Parallel Connection Signal Cable	22-79-13-00-1
PSB-006 PSB-007	Parallel Connection Signal Cable Serial Connection Signal Cable Joint Kit: Includes 4 Joining Plates, [M3x6]screws x 4 ; [M3x8]screw x 2	PSB-2000 Series PSB-2000 Series
PSB-006 PSB-007 PSB-008 PSU-001 PSU-01A	Parallel Connection Signal Cable Serial Connection Signal Cable Joint Kit: Includes 4 Joining Plates, [M3x6]screws x 4; [M3x8]screw x 2 RS232C Cable (PSB-2000 Only)	PSB-2000 Series PSB-2000 Series PSB-2000 Series
PSB-006 PSB-007 PSB-008 PSU-001 PSU-01A PSU-01B	Parallel Connection Signal Cable Serial Connection Signal Cable Joint Kit: Includes 4 Joining Plates, [M3x6]screws x 4; [M3x8]screw x 2 RS232C Cable (PSB-2000 Only) Front Panel Filter kit(Factory Installed) Joins a vertical stack of 2 PSU units together. 2U-sized handles x 2, joining plates x 2 Bus Bar for 2 units in parallel operation	PSB-2000 Series PSB-2000 Series PSB-2000 Series PSU-Series PSU-Series PSU-Series
PSB-006 PSB-007 PSB-008 PSU-001 PSU-01A PSU-01B PSU-01C	Parallel Connection Signal Cable Serial Connection Signal Cable Joint Kit: Includes 4 Joining Plates, [M3x6]screws x 4 ; [M3x8]screw x 2 RS232C Cable (PSB-2000 Only) Front Panel Filter kit (Factory Installed) Joins a vertical stack of 2 PSU units together. 2U-sized handles x 2, joining plates x 2 Bus Bar for 2 units in parallel operation Cable for 2 units in parallel operation	PSB-2000 Series  PSB-2000 Series  PSB-2000 Series  PSU-Series  PSU-Series  PSU-Series  PSU-Series
PSB-006 PSB-007 PSB-008 PSU-001 PSU-01A PSU-01B PSU-01C PSU-02A	Parallel Connection Signal Cable Serial Connection Signal Cable Joint Kit: Includes 4 Joining Plates, [M3x6]screws x 4; [M3x8]screw x 2 RS232C Cable (PSB-2000 Only) Front Panel Filter kit(Factory Installed) Joins a vertical stack of 2 PSU units together. 2U-sized handles x 2, joining plates x 2 Bus Bar for 2 units in parallel operation Cable for 2 units in parallel operation Joins a vertical stack of 3 PSU units Together. 3U-sized Handles x 2, joining plates x 2	PSB-2000 Series  PSB-2000 Series  PSB-2000 Series  PSU-Series  PSU-Series  PSU-Series  PSU-Series  PSU-Series
PSB-006 PSB-007 PSB-008 PSU-001 PSU-01A PSU-01B PSU-01C PSU-02A PSU-02B	Parallel Connection Signal Cable Serial Connection Signal Cable Joint Kit: Includes 4 Joining Plates, [M3x6]screws x 4; [M3x8]screw x 2 RS232C Cable (PSB-2000 Only) Front Panel Filter kit(Factory Installed) Joins a vertical stack of 2 PSU units together. 2U-sized handles x 2, joining plates x 2 Bus Bar for 2 units in parallel operation Cable for 2 units in parallel operation Joins a vertical stack of 3 PSU units Together. 3U-sized Handles x 2, joining plates x 2 Bus Bar for 3 units in Parallel Operation	PSB-2000 Series PSB-2000 Series PSB-2000 Series PSU-Series PSU-Series PSU-Series PSU-Series PSU-Series PSU-Series PSU-Series PSU-Series
PSB-006 PSB-007 PSB-008 PSU-001 PSU-01A PSU-01B PSU-01C PSU-02A PSU-02B PSU-02C	Parallel Connection Signal Cable Serial Connection Signal Cable Joint Kit: Includes 4 Joining Plates, [M3x6]screws x 4 ; [M3x8]screw x 2 RS232C Cable (PSB-2000 Only) Front Panel Filter kit(Factory Installed) Joins a vertical stack of 2 PSU units together. 2U-sized handles x 2, joining plates x 2 Bus Bar for 2 units in parallel operation Cable for 2 units in parallel operation Joins a vertical stack of 3 PSU units Together. 3U-sized Handles x 2, joining plates x 2 Bus Bar for 7 s units in Parallel Operation Cable for 3 units in Parallel Operation Cable for 3 units in Parallel Operation	PSB-2000 Series  PSB-2000 Series  PSB-2000 Series  PSU-Series  PSU-Series  PSU-Series  PSU-Series  PSU-Series
PSB-006 PSB-007 PSB-008 PSU-001 PSU-01A PSU-01B PSU-01C PSU-02A PSU-02B	Parallel Connection Signal Cable Serial Connection Signal Cable Joint Kit: Includes 4 Joining Plates, [M3x6]screws x 4; [M3x8]screw x 2 RS232C Cable (PSB-2000 Only) Front Panel Filter kit(Factory Installed) Joins a vertical stack of 2 PSU units together. 2U-sized handles x 2, joining plates x 2 Bus Bar for 2 units in parallel operation Cable for 2 units in parallel operation Joins a vertical stack of 3 PSU units Together. 3U-sized Handles x 2, joining plates x 2 Bus Bar for 3 units in Parallel Operation	PSB-2000 Series PSB-2000 Series PSB-2000 Series PSU-Series
PSB-006 PSB-007 PSB-008 PSU-001 PSU-01A PSU-01B PSU-01B PSU-02A PSU-02A PSU-02A	Parallel Connection Signal Cable Serial Connection Signal Cable Joint Kit: Includes 4 Joining Plates, [M3x6]screws x 4; [M3x8]screw x 2 RS232C Cable (PSB-2000 Only) Front Panel Filter kit(Factory Installed) Joins a vertical stack of 2 PSU units together. 2U-sized handles x 2, joining plates x 2 Bus Bar for 2 units in parallel operation Cable for 2 units in parallel operation Joins a vertical stack of 3 PSU units Together. 3U-sized Handles x 2, joining plates x 2 Bus Bar for 3 units in Parallel Operation Cable for 3 units in Parallel Operation Joins a Vertical Stack of 4 PSU units Together. 4U-sized Handles x 2, joining plates x 2 Bus Bar for 7 units in Parallel Operation Joins a Vertical Stack of 4 PSU units Together. 4U-sized Handles x 2, joining plates x 2 Bus Bar for 4 units in Parallel Operation Cable for 4 units in Parallel Operation	PSB-2000 Series  PSB-2000 Series  PSB-2000 Series  PSU-Series
PSB-006 PSB-007 PSB-008 PSU-001 PSU-01A PSU-01B PSU-01C PSU-02A PSU-02C PSU-03A PSU-03B PSU-03C PSU-03C PSU-032	Parallel Connection Signal Cable Serial Connection Signal Cable Joint Kit: Includes 4 Joining Plates, [M3x6]screws x 4; [M3x8]screw x 2 RS232C Cable (PSB-2000 Only) Front Panel Filter kit(Factory Installed) Joins a vertical stack of 2 PSU units together. 2U-sized handles x 2, joining plates x 2 Bus Bar for 2 units in parallel operation Cable for 2 units in parallel operation Joins a vertical stack of 3 PSU units Together. 3U-sized Handles x 2, joining plates x 2 Bus Bar for 3 units in Parallel Operation Cable for 3 units in Parallel Operation Joins a Vertical Stack of 4 PSU units Together. 4U-sized Handles x 2, joining plates x 2 Bus Bar for 4 units in Parallel Operation Cable for 4 units in Parallel Operation Cable for 4 units in Parallel Operation RS232 Cable with DB9 Connector Kit	PSB-2000 Series PSB-2000 Series PSB-2000 Series PSU-Series
PSB-006 PSB-007 PSB-008 PSU-001 PSU-01A PSU-01B PSU-01C PSU-02A PSU-02C PSU-03A PSU-03A PSU-03C PSU-03C PSU-032 PSU-03C PSU-032	Parallel Connection Signal Cable Serial Connection Signal Cable Serial Connection Signal Cable Joint Kit: Includes 4 Joining Plates, [M3x6]screws x 4; [M3x8]screw x 2 RS232C Cable (PSB-2000 Only) Front Panel Filter kit (Factory Installed) Joins a vertical stack of 2 PSU units together. 2U-sized handles x 2, joining plates x 2 Bus Bar for 2 units in parallel operation Cable for 2 units in parallel operation Joins a vertical stack of 3 PSU units Together. 3U-sized Handles x 2, joining plates x 2 Bus Bar for 3 units in Parallel Operation Cable for 3 units in Parallel Operation Joins a Vertical Stack of 4 PSU units Together. 4U-sized Handles x 2, joining plates x 2 Bus Bar for 4 units in Parallel Operation Joins a Vertical Stack of 4 PSU units Together. 4U-sized Handles x 2, joining plates x 2 Bus Bar for 4 units in Parallel Operation Cable for 4 units in Parallel Operation RS232 Cable with DB9 Connector Kit RS485 Cable with DB9 Connector Kit	PSB-2000 Series PSB-2000 Series PSB-2000 Series PSU-Series
PSB-006 PSB-007 PSB-008 PSU-001 PSU-01A PSU-01A PSU-01C PSU-02A PSU-02B PSU-02C PSU-03A PSU-03B PSU-03C PSU-03E PSU-03E PSU-03E PSU-03E PSU-03E PSU-03E	Parallel Connection Signal Cable Serial Connection Signal Cable Serial Connection Signal Cable Joint Kit: Includes 4 Joining Plates, [M3x6]screws x 4; [M3x8]screw x 2 RS232C Cable (PSB-2000 Only) Front Panel Filter kit(Factory Installed) Joins a vertical stack of 2 PSU units together. 2U-sized handles x 2, joining plates x 2 Bus Bar for 2 units in parallel operation Cable for 2 units in parallel operation Joins a vertical stack of 3 PSU units Together. 3U-sized Handles x 2, joining plates x 2 Bus Bar for 3 units in Parallel Operation Cable for 4 units in Parallel Operation RS232 Cable with DB9 Connector Kit RS485 Cable with DB9 Connector Kit PSU GPIB Interface Card (Factory Installed)	PSB-2000 Series PSB-2000 Series PSB-2000 Series PSU-Series
PSB-006 PSB-007 PSB-007 PSB-008 PSU-001 PSU-01A PSU-01B PSU-01C PSU-02A PSU-02C PSU-03A PSU-03C PSU-03C PSU-03C PSU-03E PSU-03C PSU-03E PSU-03C PSU-03E PSU-03C PSU-03C PSU-03C PSU-03C PSU-03C PSU-03C	Parallel Connection Signal Cable Serial Connection Signal Cable Joint Kit: Includes 4 Joining Plates, [M3x6]screws x 4; [M3x8]screw x 2 RS232C Cable (PSB-2000 Only) Front Panel Filter kit(Factory Installed) Joins a vertical stack of 2 PSU units together. 2U-sized handles x 2, joining plates x 2 Bus Bar for 2 units in parallel operation Cable for 2 units in parallel operation Joins a vertical stack of 3 PSU units Together. 3U-sized Handles x 2, joining plates x 2 Bus Bar for 3 units in Parallel Operation Joins a Vertical Stack of 4 PSU units Together. 4U-sized Handles x 2, joining plates x 2 Bus Bar for 3 units in Parallel Operation Cable for 3 units in Parallel Operation Cable for 4 units in Parallel Operation Cable for 4 units in Parallel Operation RS232 Cable with D89 Connector Kit RS485 Cable with D89 Connector Kit PSU GPIB Interface Card (Factory Installed) Isolated Current Remote Control Card (Factory Installed)	PSB-2000 Series PSB-2000 Series PSB-2000 Series PSU-Series
PSB-006 PSB-007 PSB-007 PSB-008 PSU-001 PSU-01A PSU-01B PSU-01C PSU-02A PSU-02B PSU-02C PSU-03A PSU-03B PSU-03C PSU-03E PSU-03E PSU-03C PSU-03E PSU-03C PSU-03E PSU-03C PSU-03C PSU-03C PSU-03B PSU-03C	Parallel Connection Signal Cable Serial Connection Signal Cable Joint Kit: Includes 4 Joining Plates, [M3x6]screws x 4; [M3x8]screw x 2 RS232C Cable (PSB-2000 Only) Front Panel Filter kit(Factory Installed) Joins a vertical stack of 2 PSU units together. 2U-sized handles x 2, joining plates x 2 Bus Bar for 2 units in parallel operation Joins a vertical stack of 3 PSU units Together. 3U-sized Handles x 2, joining plates x 2 Bus Bar for 3 units in parallel Operation Joins a vertical stack of 3 PSU units Together. 3U-sized Handles x 2, joining plates x 2 Bus Bar for 3 units in Parallel Operation Cable for 3 units in Parallel Operation Joins a Vertical Stack of 4 PSU units Together. 4U-sized Handles x 2, joining plates x 2 Bus Bar for 4 units in Parallel Operation Cable for 4 units in Parallel Operation RS232 Cable with DB9 Connector Kit RS485 Cable with DB9 Connector Kit RS485 Cable with DB9 Connector Kit PSU CPIB Interface Card (Factory Installed) Isolated Current Remote Control Card (Factory Installed)	PSB-2000 Series PSB-2000 Series PSB-2000 Series PSU-Series
PSB-006 PSB-007 PSB-007 PSB-008 PSU-001 PSU-01A PSU-01B PSU-01C PSU-02A PSU-02C PSU-03A PSU-03C PSU-03C PSU-03C PSU-03E PSU-03C PSU-03E PSU-03C PSU-03E PSU-03C PSU-03C PSU-03C PSU-03C PSU-03C PSU-03C	Parallel Connection Signal Cable Serial Connection Signal Cable Joint Kit: Includes 4 Joining Plates, [M3x6]screws x 4; [M3x8]screw x 2 RS232C Cable (PSB-2000 Only) Front Panel Filter kit(Factory Installed) Joins a vertical stack of 2 PSU units together. 2U-sized handles x 2, joining plates x 2 Bus Bar for 2 units in parallel operation Cable for 2 units in parallel operation Joins a vertical stack of 3 PSU units Together. 3U-sized Handles x 2, joining plates x 2 Bus Bar for 3 units in Parallel Operation Joins a Vertical Stack of 4 PSU units Together. 4U-sized Handles x 2, joining plates x 2 Bus Bar for 3 units in Parallel Operation Cable for 3 units in Parallel Operation Cable for 4 units in Parallel Operation Cable for 4 units in Parallel Operation RS232 Cable with D89 Connector Kit RS485 Cable with D89 Connector Kit PSU GPIB Interface Card (Factory Installed) Isolated Current Remote Control Card (Factory Installed)	PSB-2000 Series PSB-2000 Series PSB-2000 Series PSU-Series
PSB-006 PSB-007 PSB-007 PSB-008 PSU-001 PSU-01A PSU-01B PSU-01C PSU-02C PSU-02A PSU-02A PSU-03A PSU-03A PSU-03B PSU-05C-04 PSW-001	Parallel Connection Signal Cable Serial Connection Signal Cable Serial Connection Signal Cable Joint Kit: Includes 4 Joining Plates, [M3x6]screws x 4; [M3x8]screw x 2 RS232C Cable (PSB-2000 Only) Front Panel Filter kit (Factory Installed) Joins a vertical stack of 2 PSU units together. 2U-sized handles x 2, joining plates x 2 Bus Bar for 2 units in parallel operation Cable for 2 units in parallel operation Joins a vertical stack of 3 PSU units Together. 3U-sized Handles x 2, joining plates x 2 Bus Bar for 3 units in Parallel Operation Joins a Vertical Stack of 4 PSU units Together. 4U-sized Handles x 2, joining plates x 2 Bus Bar for 4 units in Parallel Operation Joins a Vertical Stack of 4 PSU units Together. 4U-sized Handles x 2, joining plates x 2 Bus Bar for 4 units in Parallel Operation Cable Bir therefore Cable with DB9 Connector Kit RS232 Cable with DB9 Connector Kit PSU GPIB Interface Card (Factory Installed) Isolated Current Remote Control Card (Factory Installed) Isolated Voltage Remote Control Card (Factory Installed) Accessory Kits	PSB-2000 Series PSB-2000 Series PSB-2000 Series PSU-Series
PSB-006 PSB-007 PSB-008 PSU-001 PSU-01A PSU-01A PSU-01C PSU-02A PSU-02B PSU-02C PSU-03A PSU-03C PSU-03C PSU-03E PSU-03C PSU-03E PSU-03C	Parallel Connection Signal Cable Serial Connection Signal Cable Serial Connection Signal Cable Joint Kit: Includes 4 Joining Plates, [M3x6]screws x 4; [M3x8]screw x 2 R5232C Cable (PSB-2000 Only) Front Panel Filter kit(Factory Installed) Joins a vertical stack of 2 PSU units together. 2U-sized handles x 2, joining plates x 2 Bus Bar for 2 units in parallel operation Cable for 2 units in parallel operation Joins a vertical stack of 3 PSU units Together. 3U-sized Handles x 2, joining plates x 2 Bus Bar for 3 units in Parallel Operation Cable for 3 units in Parallel Operation Joins a Vertical Stack of 4 PSU units Together. 4U-sized Handles x 2, joining plates x 2 Bus Bar for 4 units in Parallel Operation Joins a Vertical Stack of 4 PSU units Together. 4U-sized Handles x 2, joining plates x 2 Bus Bar for 4 units in Parallel Operation R5232 Cable with DB9 Connector Kit R5485 Cable with DB9 Connector Kit PSU GPIB Interface Card (Factory Installed) Isolated Current Remote Control Card (Factory Installed) Accessory Kits Simple IDC Tool	PSB-2000 Series PSB-2000 Series PSB-2000 Series PSU-Series PSU-Series, PFR-Series PSU-Series PSU-Series, PSU-Series PSU-Series PSU-Series PSU-Series PSU-Series PSU-Series PSU-Series
PSB-006 PSB-007 PSB-008 PSB-007 PSU-011 PSU-01A PSU-01A PSU-01B PSU-01C PSU-02A PSU-02B PSU-02B PSU-03C PSU-03A PSU-03C	Parallel Connection Signal Cable Serial Connection Signal Cable Serial Connection Signal Cable Joint Kit: Includes 4 Joining Plates, [M3x6]screws x 4; [M3x8]screw x 2 R5232C Cable (PSB-2000 Only) Front Panel Filter kit (Factory Installed) Joins a vertical stack of 2 PSU units together. 2U-sized handles x 2, joining plates x 2 Bus Bar for 2 units in parallel operation Cable for 2 units in parallel operation Joins a vertical stack of 3 PSU units Together. 3U-sized Handles x 2, joining plates x 2 Bus Bar for 3 units in Parallel Operation Joins a Vertical Stack of 4 PSU units Together. 4U-sized Handles x 2, joining plates x 2 Bus Bar for 4 units in Parallel Operation Joins a Vertical Stack of 4 PSU units Together. 4U-sized Handles x 2, joining plates x 2 Bus Bar for 4 units in Parallel Operation Cable for 4 units in Parallel Operation Cable for 4 units in Parallel Operation R5232 Cable with DB9 Connector Kit R5232 Cable with DB9 Connector Kit PSU GPIB Interface Card (Factory Installed) Isolated Voltage Remote Control Card (Factory Installed) Isolated Voltage Remote Control Card (Factory Installed) Accessory Kits Simple IDC Tool Contact Removal Tool Basic Accessory Kit for 30V/80V/160V models Series Operation Cable for 2 units (30V/80V/160V models	PSB-2000 Series PSB-2000 Series PSB-2000 Series PSU-Series PSW-Series, PSW-Multi Series PSW-Series, PSW-Multi Series PSW-Series, PSW-Multi Series
PSB-006 PSB-007 PSB-007 PSB-008 PSU-001 PSU-01A PSU-01B PSU-01C PSU-02A PSU-02B PSU-02C PSU-03A PSU-03A PSU-03B PSU-03C PSU-03B PSU-03C PSW-001 PSW-002 PSW-003 PSW-005 PSW-006	Parallel Connection Signal Cable Serial Connection Signal Cable Serial Connection Signal Cable Joint Kit: Includes 4 Joining Plates, [M3x6]screws x 4; [M3x8]screw x 2 RS232C Cable (PSB-2000 Only) Front Panel Filter kit(Factory Installed) Joins a vertical stack of 2 PSU units together. 2U-sized handles x 2, joining plates x 2 Bus Bar for 2 units in parallel operation Cable for 2 units in parallel operation Joins a vertical stack of 3 PSU units Together. 3U-sized Handles x 2, joining plates x 2 Bus Bar for 3 units in Parallel Operation Cable for 3 units in Parallel Operation Joins a Vertical Stack of 4 PSU units Together. 4U-sized Handles x 2, joining plates x 2 Bus Bar for 4 units in Parallel Operation Cable for 4 units in Parallel Operation RS232 Cable with DB9 Connector Kit RS485 Cable with DB9 Connector Kit PSU GPIB Interface Card (Factory Installed) Isolated Current Remote Control Card (Factory Installed) Isolated Voltage Remote Control Card (Factory Installed) Accessory Kits Simple IDC Tool Contact Removal Tool Basic Accessory Kit for 30V/80V/160V models Series Operation Cable for 2 units (30V/80V/160V models moly) Parallel Operation Cable for 2 units	PSB-2000 Series           PSB-2000 Series           PSU-Series           PSU-Series, PFR-Series           PSU-Series, PFR-Series           PSU-Series           PSU-Series           PSU-Series           PSU-Series           PSU-Series           PSU-Series           PSU-Series           PSW-Series, PSW-Multi Series           PSW-Series, PSW-Multi Series           PSW-Series, PSW-Multi Series           PSW-Series
PSB-006 PSB-007 PSB-007 PSB-007 PSB-008 PSU-011 PSU-01A PSU-01B PSU-01C PSU-02A PSU-02C PSU-03A PSU-03C PSU-03G PSU-03C PSW-003 PSW-004 PSW-005 PSW-006	Parallel Connection Signal Cable Serial Connection Signal Cable Serial Connection Signal Cable Joint Kit: Includes 4 Joining Plates, [M3x6]screws x 4; [M3x8]screw x 2 RS232C Cable (PSB-2000 Only) Front Panel Filter kit(Factory Installed) Joins a vertical stack of 2 PSU units together. 2U-sized handles x 2, joining plates x 2 Bus Bar for 2 units in parallel operation Cable for 2 units in parallel operation Joins a vertical stack of 3 PSU units Together. 3U-sized Handles x 2, joining plates x 2 Bus Bar for 3 units in Parallel Operation Cable for 3 units in Parallel Operation Cable for 3 units in Parallel Operation Cable for 4 units in Parallel Operation Cable for 4 units in Parallel Operation Cable for 4 units in Parallel Operation RS232 Cable with DB9 Connector Kit PSU GPIB Interface Card (Factory Installed) Isolated Current Remote Control Card (Factory Installed) Isolated Voltage Remote Control Card (Factory Installed) Accessory Kits Simple IDC Tool Contact Removal Tool Basic Accessory Kit for 30V/80V/160V models Series Operation Cable for 2 units Parallel Operation Cable for 2 units	PSB-2000 Series PSB-2000 Series PSB-2000 Series PSU-Series PSW-Series, PSW-Multi Series PSW-Series, PSW-Multi Series PSW-Series, PSW-Multi Series PSW-Series, PSW-Multi Series PSW-Series PSW-Series PSW-Series
PSB-006 PSB-007 PSB-007 PSB-008 PSU-001 PSU-01A PSU-01B PSU-01C PSU-02B PSU-02C PSU-03A PSU-03C PSW-001 PSW-002 PSW-003 PSW-004 PSW-005 PSW-005 PSW-007 PSW-007	Parallel Connection Signal Cable Serial Connection Signal Cable Serial Connection Signal Cable Joint Kit: Includes 4 Joining Plates, [M3x6]screws x 4; [M3x8]screw x 2 RS232C Cable (PSB-2000 Only) Front Panel Filter kit (Factory Installed) Joins a vertical stack of 2 PSU units together. 2U-sized handles x 2, joining plates x 2 Bus Bar for 2 units in parallel operation Cable for 2 units in parallel operation Joins a vertical stack of 3 PSU units Together. 3U-sized Handles x 2, joining plates x 2 Bus Bar for 3 units in Parallel Operation Cable for 3 units in Parallel Operation Joins a Vertical Stack of 4 PSU units Together. 4U-sized Handles x 2, joining plates x 2 Bus Bar for 4 units in Parallel Operation Joins a Vertical Stack of 4 PSU units Together. 4U-sized Handles x 2, joining plates x 2 Bus Bar for 4 units in Parallel Operation Cable for 4 units in Parallel Operation RS232 Cable with DB9 Connector Kit RS485 Cable with DB9 Connector Kit RS485 Cable with DB9 Connector Kit PSU GPIB Interface Card (Factory Installed) Isolated Current Remote Control Card (Factory Installed) Isolated Voltage Remote Control Card (Factory Installed) Accessory Kits Simple IDC Tool Contact Removal Tool Basic Accessory Kit for 30V/80V/160V models Series Operation Cable for 2 units Basic Accessory Kit for 250V/800V models Basic Accessory Kit for 250V/800V models	PSB-2000 Series PSB-2000 Series PSB-2000 Series PSU-Series PSW-Series, PSW-Multi Series PSW-Series, PSW-Multi Series PSW-Series, PSW-Multi Series PSW-Series, PSW-Multi Series PSW-Series PSW-Series PSW-Series
PSB-006 PSB-007 PSB-008 PSB-007 PSU-001 PSU-01A PSU-01B PSU-01C PSU-02A PSU-02B PSU-02C PSU-03C PSU-06 PSU-06 PSW-007 PSW-006 PSW-006 PSW-006 PSW-008	Parallel Connection Signal Cable Serial Connection Signal Cable Serial Connection Signal Cable Joint Kit: Includes 4 Joining Plates, [M3x6]screws x 4; [M3x8]screw x 2 R5232C Cable (PSB-2000 Only) Front Panel Filter kit (Factory Installed) Joins a vertical stack of 2 PSU units together. 2U-sized handles x 2, joining plates x 2 Bus Bar for 2 units in parallel operation Cable for 2 units in parallel operation Joins a vertical stack of 3 PSU units Together. 3U-sized Handles x 2, joining plates x 2 Bus Bar for 3 units in Parallel Operation Joins a Vertical Stack of 4 PSU units Together. 4U-sized Handles x 2, joining plates x 2 Bus Bar for 3 units in Parallel Operation Joins a Vertical Stack of 4 PSU units Together. 4U-sized Handles x 2, joining plates x 2 Bus Bar for 4 units in Parallel Operation Cable for 4 units in Parallel Operation Use Bers of Units in Parallel Operation Cable for 4 units in Parallel Operation Cable for 4 units in Parallel Operation Cable Grable with DB9 Connector Kit R5232 Cable with DB9 Connector Kit R5232 Cable with DB9 Connector Kit PSU GPIB Interface Card (Factory Installed) Isolated Voltage Remote Control Card (Factory Installed) Isolated Voltage Remote Control Card (Factory Installed) Accessory Kit Simple IDC Tool Contact Removal Tool Basic Accessory Kit for 30V/80V/160V models Series Operation Cable for 2 units Parallel Operation Cable for 3 units Parallel Operation Cable for 3 units Basic Accessory Kit for 30V/80V/160V models Output Terminal Cover for 30V/80V/160V models	PSB-2000 Series PSB-2000 Series PSB-2000 Series PSU-Series PSW-Series, PSW-Multi Series PSW-Series PSW-Series PSW-Series
PSB-006 PSB-007 PSB-007 PSB-008 PSU-001 PSU-01A PSU-01B PSU-01C PSU-02B PSU-02C PSU-03A PSU-03C PSW-001 PSW-002 PSW-003 PSW-004 PSW-005 PSW-005 PSW-007 PSW-007	Parallel Connection Signal Cable Serial Connection Signal Cable Serial Connection Signal Cable Joint Kit: Includes 4 Joining Plates, [M3x6]screws x 4; [M3x8]screw x 2 RS232C Cable (PSB-2000 Only) Front Panel Filter kit (Factory Installed) Joins a vertical stack of 2 PSU units together. 2U-sized handles x 2, joining plates x 2 Bus Bar for 2 units in parallel operation Cable for 2 units in parallel operation Joins a vertical stack of 3 PSU units Together. 3U-sized Handles x 2, joining plates x 2 Bus Bar for 3 units in Parallel Operation Cable for 3 units in Parallel Operation Joins a Vertical Stack of 4 PSU units Together. 4U-sized Handles x 2, joining plates x 2 Bus Bar for 4 units in Parallel Operation Joins a Vertical Stack of 4 PSU units Together. 4U-sized Handles x 2, joining plates x 2 Bus Bar for 4 units in Parallel Operation Cable for 4 units in Parallel Operation RS232 Cable with DB9 Connector Kit RS485 Cable with DB9 Connector Kit RS485 Cable with DB9 Connector Kit PSU GPIB Interface Card (Factory Installed) Isolated Current Remote Control Card (Factory Installed) Isolated Voltage Remote Control Card (Factory Installed) Accessory Kits Simple IDC Tool Contact Removal Tool Basic Accessory Kit for 30V/80V/160V models Series Operation Cable for 2 units Basic Accessory Kit for 250V/800V models Basic Accessory Kit for 250V/800V models	PSB-2000 Series PSB-2000 Series PSB-2000 Series PSU-Series PSW-Series, PSW-Multi Series PSW-Series, PSW-Multi Series PSW-Series, PSW-Multi Series PSW-Series, PSW-Multi Series PSW-Series PSW-Series PSW-Series

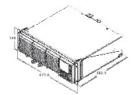




#### GRA-414-J Rack Mount Kit (JIS)

For: PEL-3021/3021H/3041/3041H/3111/3111H PEL-3031AE/3032AE





#### GRA-414-E Rack Mount Kit (EIA)

For: PEL-3021/3021H/3041/3041H/3111/3111H PEL-3031AE/3032AE





#### GRA-419 Rack Mount Kit (JIS)

For: PCS-1000I

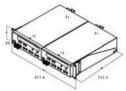




#### **GRA-419 EIA Rack Mount Kit**

For: PCS-1000





#### **GRA-423 Rack Mount Kit**

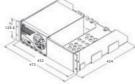
For: APS-7050/7100/7050E/7100E Series





For: PSB-2000 Series





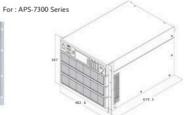
**GRA-429 Rack Mount Kit** 

For: APS-7200 Series





**GRA-430 Rack Mount Kit** 



## GRA-431-J Rack Mount Kit (JIS) with AC 100V/200V

For : PFR-Series





#### GRA-431-E Rack Mount Kit (EIA) with AC 100V/200V

For : PFR-Series

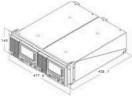




## GRA-439-J Rack Mount Kit (JIS)

For: ASR-2000 Series





#### GRA-439-E Rack Mount Kit (EIA)

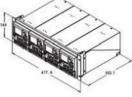
For : ASR-2000 Series





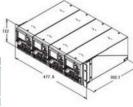
#### GRA-441-J Rack Mount Kit (JIS)



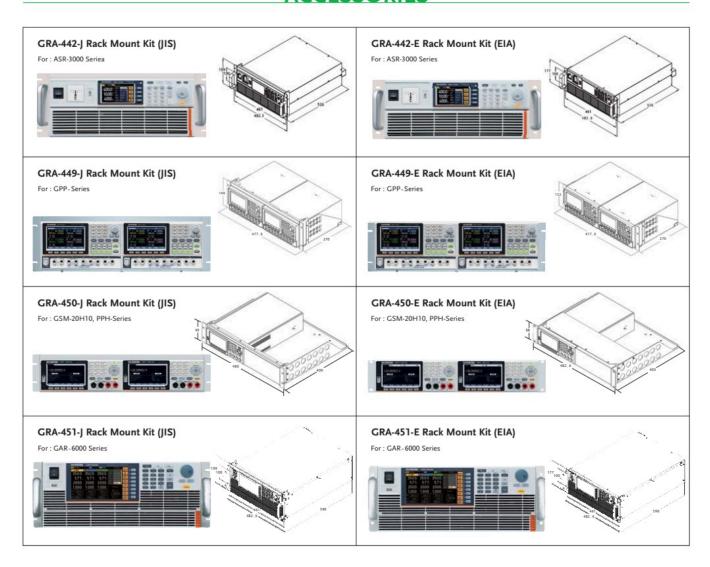


#### GRA-441-E Rack Mount Kit (EIA)





# **ACCESSORIES**



# Haben Sie Fragen? Ihr Distributor hilft Ihnen gerne weiter:



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