PHU 시리즈 (대용량 DC전원 공급기, 5kW, 10kW, 15kW)

주요 특징

- 최대 전압 : 80V/200V/500V/750V/1000V/1500V
- 정격 전류 : 510A
- 정격 전력 : 5kW/10kW/15kW
- 지원 기능
  - CV/CC 우선 순위 선택 기능
  - AWS (다기능 웹 제어)
  - 적응 형 병령 연결 : 같은 전압, 다른 전력 제품간
  - 병렬 연결 : 최대 10개
  - 블리더 제어 기능
  - 내부 저항 기능
  - 패널 잠금 기능
- 19인치, 3U사이즈 설계
- 인터페이스
  - 기본 : USB, RS-232/485, LAN, 아날로그 제어 I/F(Non-Isolated)
  - RS-232&485 또는 GPIB 또는 CAN Bus 또는 DeviceNet 또는 Any Bus

제품 사양						
PHU-5kW 계열	80-170	200-70	500-30	750-20	1000-15	1500-10
정격출력						
전압	80V	200V	500V	750V	1000V	1500V
전류	170A	70A	30A	20A	15A	10A
전력	5kW	5kW	5kW	5kW	5kW	5kW
전력비	2.72	2.8	3	3	3	3
리플 & 노이즈						
CV P-P (10Hz~20MHz)	200mV	300mV	350mV	800mV	1600mV	2400mV
CV RMS (5Hz~1MHz)	16mV	40mV	70mV	200mV	350mV	400mV
CC RMS (5Hz~10MHz)	80mA	22mA	16mA	16mA	8mA	8mA
부하 변동률 (전부하의 10%~90% 변동)						
전압	40mV	100mV	250mV	375mV	500mV	750mV
전류	255mA	105mA	45mA	30mA	22.5mA	15mA
라인 변동률 (180~265VAC 변동 또는 342VAC~5280VAC 변동)						
전압	16mV	40mV	100mV	150mV	200mV	300mV
전류	85mA	35mA	15mA	10mA	7.5mA	5mA
프로그래밍 정확도						
전압 0.1%+(mV)	80mV	200mV	500mV	750mV	1000mV	1500mV
전류 0.2%+(mA)	340mA	140mA	60mA	40mA	30mA	20mA
측정 정확도						
전압 0.1%+(mV)	80mV	200mV	500mV	750mV	1000mV	1500mV
전류 0.2%+(mA)	340mA	140mA	60mA	40mA	30mA	20mA
부하 과도 회복 시간(Transient Response Time)						
시간	1.5ms	1.5ms	1.5ms	1.5ms	1.5ms	1.5ms
출력 반응 시간						
상승(무부하)	30ms	30ms	30ms	30ms	30ms	30ms
상승(정격부하)	30ms	30ms	30ms	30ms	30ms	30ms
하강(무부하)	10s	10s	10s	10s	10s	10s
하강(정격부하)	80ms	80ms	80ms	80ms	80ms	80ms
분해능 (프로그래밍/측정)						
전압	10mV	10mV	10mV	100mV	100mV	100mV
전류	10mA	10mA	1mA	1mA	1mA	1mA
온도 계수 (30분 예열 후)						
전압	100ppm/℃ from rated output voltage, following 30 minutes warm-up.					
전류	100ppm/℃ from rated output current, following 30 minutes warm-up.					

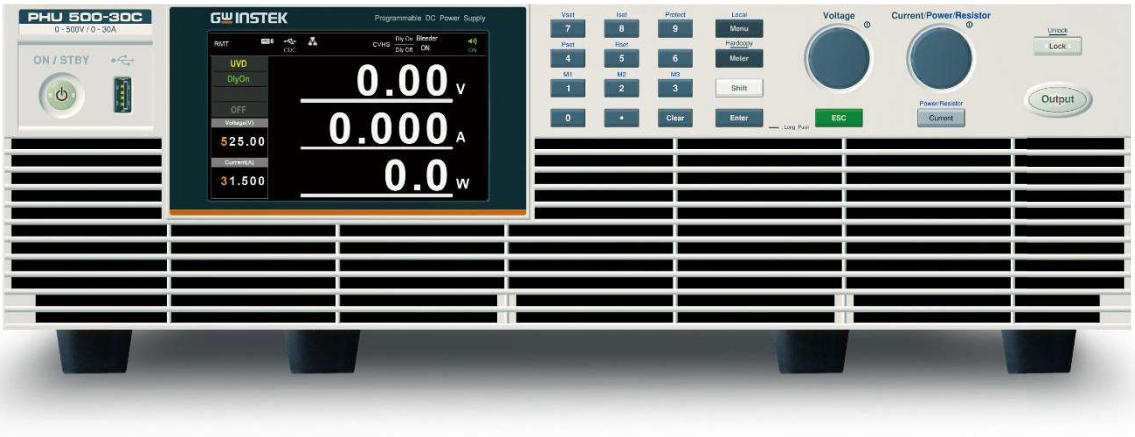
제품 사양						
PHU-10kW 계열	80-340	200-140	500-60	750-40	1000-30	1500-20
정격출력						
전압	80V	200V	500V	750V	1000V	1500V
전류	340A	140A	60A	40A	30A	20A
전력	10kW	10kW	10kW	10kW	10kW	10kW
전력비	2.72	2.8	3	3	3	3
리플 & 노이즈						
CV P-P (10Hz~20MHz)	200mV	300mV	350mV	800mV	1600mV	2400mV
CV RMS (5Hz~1MHz)	16mV	40mV	70mV	200mV	350mV	400mV
CC RMS (5Hz~10MHz)	160mA	44mA	32mA	32mA	22mA	22mA
부하 변동률 (전부하의 10%~90% 변동)						
전압	40mV	100mV	250mV	375mV	500mV	750mV
전류	510mA	210mA	90mA	60mA	45mA	30mA
라인 변동률 (180~265VAC 변동 또는 342VAC~5280VAC 변동)						
전압	16mV	40mV	100mV	150mV	200mV	300mV
전류	170mA	70mA	30mA	20mA	15mA	10mA
프로그래밍 정확도						
전압 0.1%+(mV)	80mV	200mV	500mV	750mV	1000mV	1500mV
전류 0.2%+(mA)	680mA	280mA	120mA	80mA	60mA	40mA
측정 정확도						
전압 0.1%+(mV)	80mV	200mV	500mV	750mV	1000mV	1500mV
전류 0.2%+(mA)	680mA	280mA	120mA	80mA	60mA	40mA
부하 과도 회복 시간						
시간	1.5ms	1.5ms	1.5ms	1.5ms	1.5ms	1.5ms
출력 반응 시간						
상승(무부하)	30ms	30ms	30ms	30ms	30ms	30ms
상승(정격부하)	30ms	30ms	30ms	30ms	30ms	30ms
하강(무부하)	10s	10s	10s	10s	10s	10s
하강(정격부하)	80ms	80ms	80ms	80ms	80ms	80ms
분해능 (프로그래밍/측정)						
전압	10mV	10mV	10mV	100mV	100mV	100mV
전류	10mA	10mA	1mA	1mA	1mA	1mA
온도 계수 (30분 예열 후)						
전압	100ppm/℃ from rated output voltage, following 30 minutes warm-up.					
전류	100ppm/℃ from rated output current, following 30 minutes warm-up.					

제품 사양						
PHU-15kW 계열	80-510	200-210	500-90	750-60	1000-45	1500-30
정격출력						
전압	80V	200V	500V	750V	1000V	1500V
전류	510A	210A	90A	60A	45A	30A
전력	15kW	15kW	15kW	15kW	15kW	15kW
전력비	2.72	2.8	3	3	3	3
리플 & 노이즈						
CV P-P (10Hz~20MHz)	200mV	300mV	350mV	800mV	1600mV	2400mV
CV RMS (5Hz~1MHz)	16mV	40mV	70mV	200mV	350mV	400mV
CC RMS (5Hz~10MHz)	240mA	66mA	48mA	48mA	26mA	26mA
부하 변동률 (전부하의 10%~90% 변동)						
전압	40mV	100mV	250mV	375mV	500mV	750mV
전류	765mA	315mA	135mA	90mA	67.5mA	45mA
라인 변동률 (180~265VAC 변동 또는 342VAC~5280VAC 변동)						
전압	16mV	40mV	100mV	150mV	200mV	300mV
전류	255mA	105mA	45mA	30mA	22.5mA	15mA
프로그래밍 정확도						
전압 0.1%+(mV)	80mV	200mV	500mV	750mV	1000mV	1500mV
전류 0.2%+(mA)	1020mA	420mA	180mA	120mA	90mA	60mA
측정 정확도						
전압 0.1%+(mV)	80mV	200mV	500mV	750mV	1000mV	1500mV
전류 0.2%+(mA)	1020mA	420mA	180mA	120mA	90mA	60mA
부하 과도 회복 시간						
시간	1.5ms	1.5ms	1.5ms	1.5ms	1.5ms	1.5ms
출력 반응 시간						
상승(무부하)	30ms	30ms	30ms	30ms	30ms	30ms
상승(정격부하)	30ms	30ms	30ms	30ms	30ms	30ms
하강(무부하)	10s	10s	10s	10s	10s	10s
하강(정격부하)	80ms	80ms	80ms	80ms	80ms	80ms
분해능 (프로그래밍/측정)						
전압	10mV	10mV	10mV	100mV	100mV	100mV
전류	10mA	10mA	10mA	1mA	1mA	1mA
온도 계수 (30분 예열 후)						
전압	100ppm/℃ from rated output voltage, following 30 minutes warm-up.					
전류	100ppm/℃ from rated output current, following 30 minutes warm-up.					

기타	
사용 환경 조건	실내 사용, 설치 카테고리 II (AC 입력), 오염 등급 2, 해발 2000m이하
동작 온도	0°C to 50°C
보관 온도	-25°C to 70°C
동작 습도	20% to 85% RH; No condensation
보관 습도	90% RH or less; No condensation
AC 입력 전원	C 시리즈 : 3상; 입력 범위 180VAC~265VAC, 47Hz~63Hz (Cover 200/230Vac)
	D 시리즈 : 3상; 입력 범위 342VAC~528VAC, 47Hz~63Hz(Cover 380/400/415/440/460/480Vac)
역률	>0.95
최대 입력 전류	C 시리즈 : 32A
	D 시리즈 : 16A
돌입 전류	C 시리즈 : 50A 이하
	D 시리즈 : 25A 이하
효율	87~94%
인터페이스 (기본)	USB(Device/Host), RS-232/485, LAN, 아날로그 제어(Non-Isolated)
인터페이스 (옵션)	RS-232&485 or GPIB or CAN Bus or Device Net or Any Bus or Modbus
냉각 팬	내부 팬에 의한 공기 냉각
치수 및 무게	449(W) x 131(H) x 660(D) mm, 약 21kg

주문 정보					
PHU-5kW		PHU-10kW		PHU-15kW	
PHU 80-170	(80V / 170A / 5kW)	PHU 80-340	(80V / 340A / 10kW)	PHU 80-510	(80V / 510A / 15kW)
PHU 200-70	(200V / 70A / 5kW)	PHU 200-140	(200V / 140A / 10kW)	PHU 200-210	(200V / 210A / 15kW)
PHU 500-30	(500V / 30A / 5kW)	PHU 500-60	(500V / 60A / 10kW)	PHU 500-90	(500V / 90A / 15kW)
PHU 750-20	(750V / 20A / 5kW)	PHU 750-40	(750V / 40A / 10kW)	PHU 750-60	(750V / 60A / 15kW)
PHU 1000-15	(1000V / 15A / 5kW)	PHU 1000-30	(1000V / 30A / 10kW)	PHU 1000-45	(1000V / 45A / 15kW)
PHU 1500-10	(1500V / 10A / 5kW)	PHU 1500-20	(1500V / 20A / 10kW)	PHU 1500-30	(1500V / 30A / 15kW)
기본 엑세서리					
옵션 & 선택가능한 엑세서리					
무료 다운로드					
소프트웨어, 드라이버					

Prestige / Harmony / Universal



GW Instek PHU Series

Multi-Range High Power DC Source

Features

- Voltage output: 80 V/ 200 V/ 500 V/ 750 V/ 1000 V / 1500 V
-
- Power output: 5 kW/ 10 kW/ 15 kW
- Maximum current output: 510 A
- C.V/ C.C priority mode
- Adjustable voltage/current rise and fall time
- AWS (Advanced Web Control)
- APC (Adaptive Parallel Connection)
- Parallel connection (maximum 10 units)
- High efficiency and high-power density
- Bleeder Control function
- Internal Resistance function
- Panel lock function
- Three sets of Preset Function
- Protection: OVP, OCP, OHP, UVL, AC Fail, FAN Fail
- Standard: USB, LAN, Isolated Analog control
- Option: RS-232&485 or GPIB or CAN Bus or Device Net or Any Bus
- 3U height and 19” Rack Mount Size

The **PHU** Series is a single-channel programmable DC power supply with a multi-range output feature which offers a wide range of voltage and current combinations for greater flexibility. The circuit design adopts **SiC**(silicon carbide) components to achieve high power density characteristics which can generate 15 kW of high output and keep the compact size at just 3U height.

PHU's wide voltage and current range, along with its high-power characteristics, can cover a broader range of testing applications such as **photovoltaic systems**, **electric vehicles (EVs)**, and **automotive electronics**, etc. The launch of PHU high-power DC power supplies enhances the completeness of the DC power supply product line of GW Instek, and provides customers with more comprehensive and integrated solutions.

The **AWS (Advanced Web Server)** function allows the user to operate devices directly through a web browser, without needing to install any complicated software or drivers. This functionality allows users to complete tasks more efficiently, saving time and increasing productivity.

The unique **APC (Adaptive Parallel Connection)** feature offers adaptability in parallel connection, allowing users to make the best choice according to their needs. For instance, users can opt for a 15 kW model and a 10 kW model to combine both to reach a 25 kW capacity within their budget constraints. Up to 10 PHU units can be connected to reach 150 kW without the need for additional power distribution for control.

For industry interface, PHU provides a variety of embedded industrial interface options to meet user needs, eliminating the need for users to prepare additional interfaces. The available ports including **EtherCAT**, **CANopen**, **Modbus**, **Profinet and DeviceNet**, etc. Except the standard built-in programmable sequence function, PHU also offers a variety optional functions including **Datalogger**, **MPPT** (Maximum Power Point Tracking), **Solar Array Simulator**, **AH/WH Mete**r and **Battery Simulation** to meet customer's requirements.

There are a total of 18 models, consisting of 3 power capacities (5 kW/10 kW/15 kW) and 6 voltages (80 V/200 V/500 V/750 V/1000 V/1500 V) to meet all customer needs.

Medium Voltage				High Voltage				High Current			
Model	V	A	W	Model	V	A	W	Model	V	A	W
PHU 500-30	500	30	5 kW	PHU 1000-15	1000	15	5 kW	PHU 80-170	80	170	5 kW
PHU 500-60	500	60	10 kW	PHU 1000-30	1000	30	10 kW	PHU 80-340	80	340	10 kW
PHU 500-90	500	90	15 kW	PHU 1000-45	1000	45	15 kW	PHU 80-510	80	510	15 kW
PHU 750-20	750	20	5 kW	PHU 1500-10	1500	10	5 kW	PHU 200-70	200	70	5 kW
PHU 750-40	750	40	10 kW	PHU 1500-20	1500	20	10 kW	PHU 200-140	200	140	10 kW
PHU 750-60	750	60	15 kW	PHU 1500-30	1500	30	15 kW	PHU 200-210	200	210	15 kW

Prestige / Harmony / Universal

AWS (Advanced Web Server)

AWS is a powerful function that simplifies operations. With AWS, users can operate devices directly through a web browser, without needing to install any complicated software or drivers. This functionality allows users to complete tasks more efficiently, saving time and increasing productivity.

Industry Interface

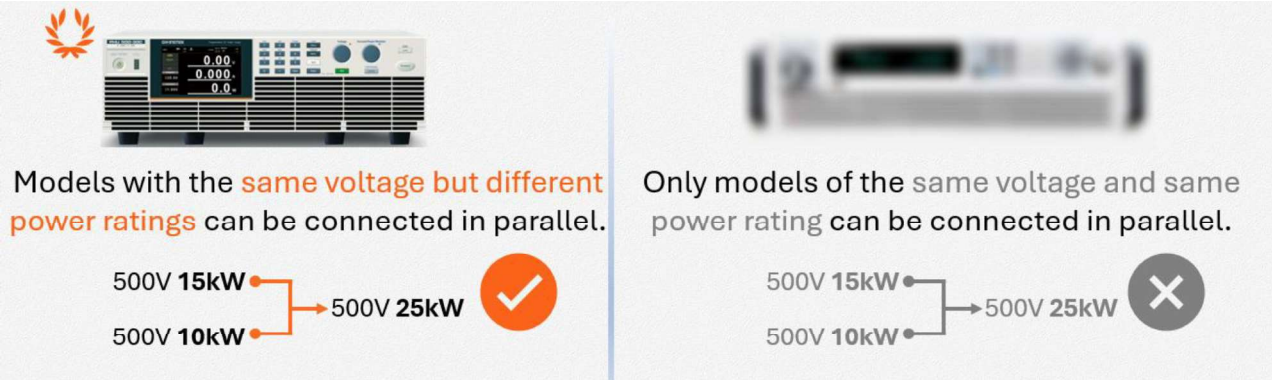
PHU provides a variety of embedded industrial interface options to meet user needs, eliminating the need for users to prepare additional interfaces.

EtherCAT CANopen Modbus DeviceNet PROFINET

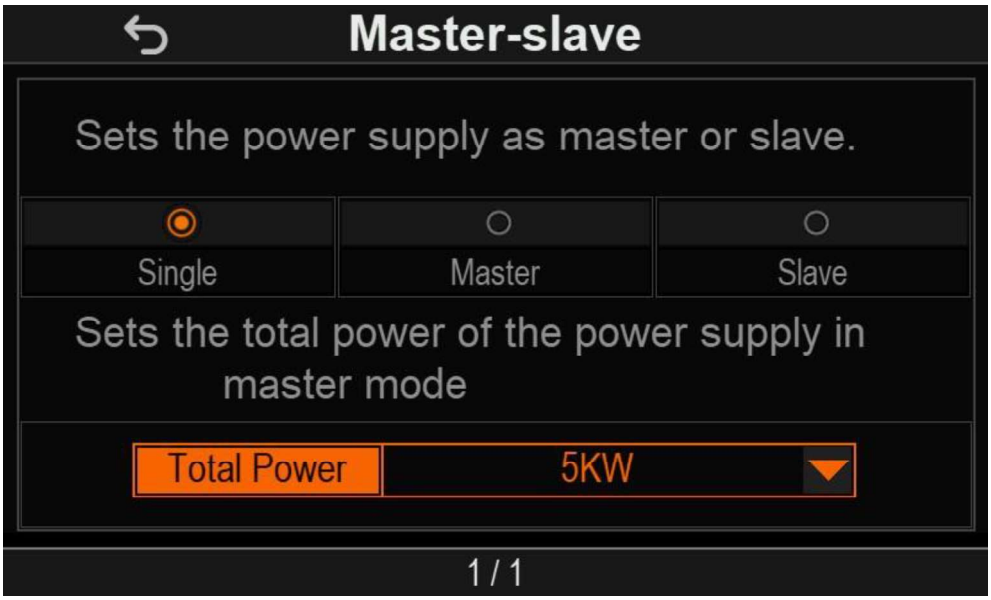
APC (Adaptive Parallel Connection)

The unique **APC** (Adaptive Parallel Connection) feature offers adaptability in parallel connection, allowing users to make the best choice according to their needs.

For instance, users can opt for a 15 kW model and a 10 kW model to combine both to reach a 25 kW capacity within their budget constraints. Up to 10 PHU units can be connected to reach 150 kW without the need for additional power distribution for control.



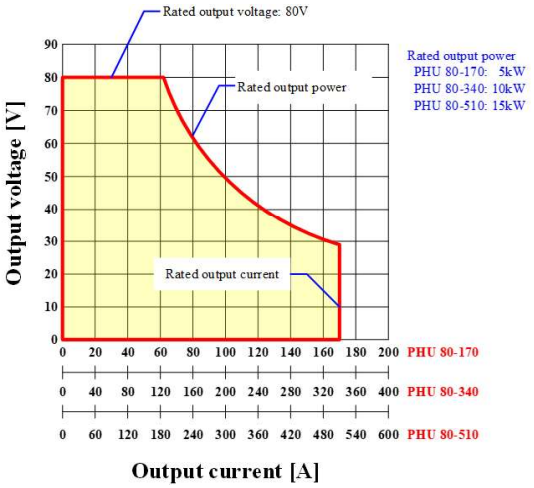
It is easy to set up the master-slave in the parallel connection function.



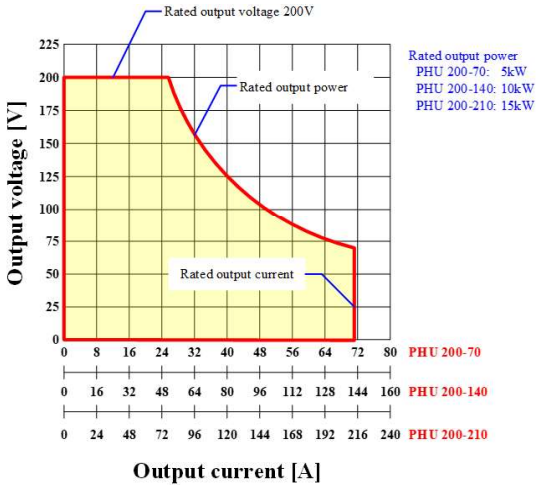
Multi-Range Output

This feature enables the power supply to automatically adapt to higher output voltages when there is a smaller current or handle higher currents when there is a lower voltage. It allows the use of a single source to address multiple voltage and current combinations.

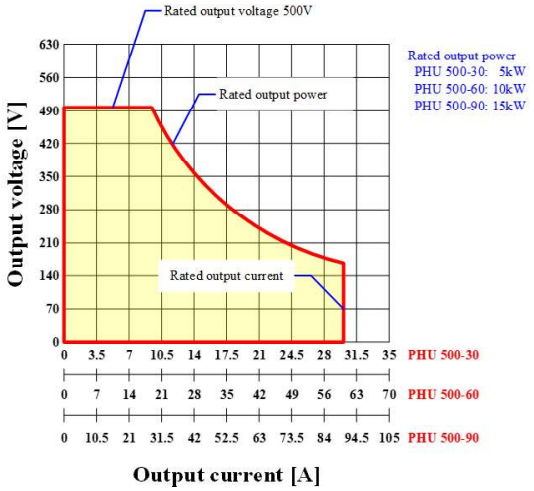
PHU 80



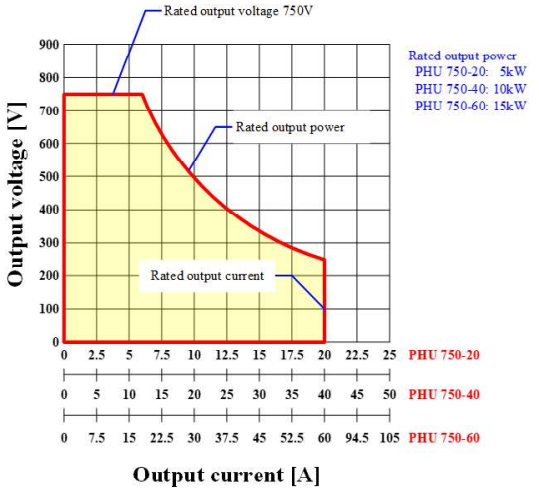
PHU 200



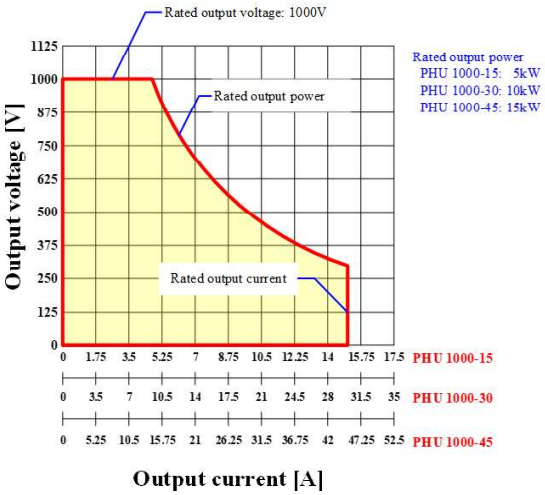
PHU 500



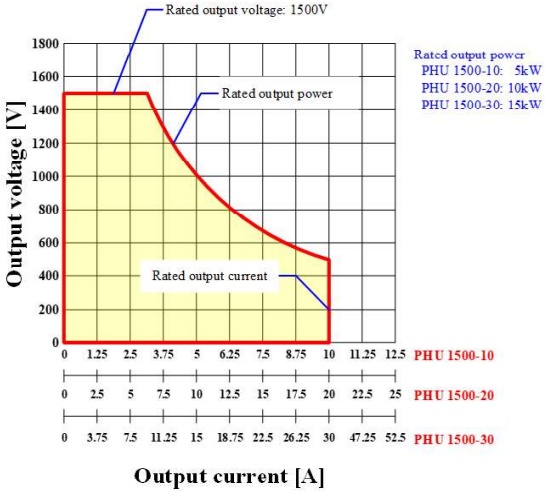
PHU 750



PHU 1000

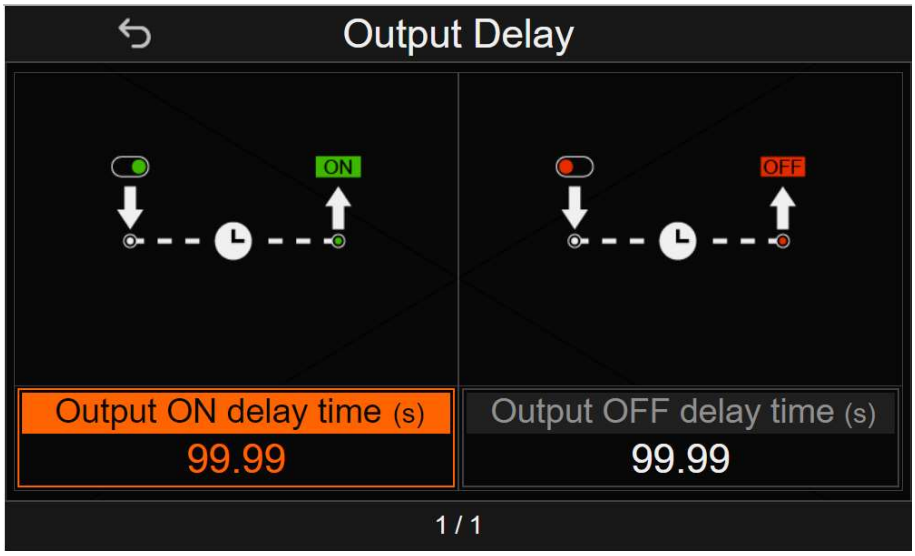


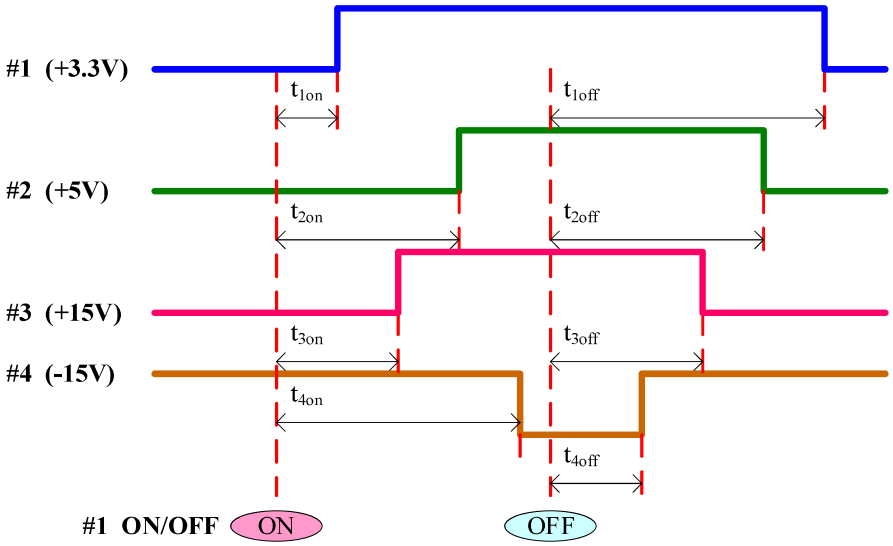
PHU 1500

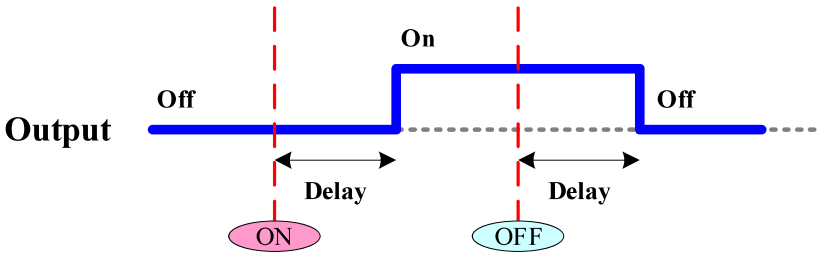


Output ON/OFF Delay

The output ON/OFF delay feature enables the setting of a specific time delay for output o after the power supply output is turned on, and a specific time delay for output off after th power supply output is turned off.

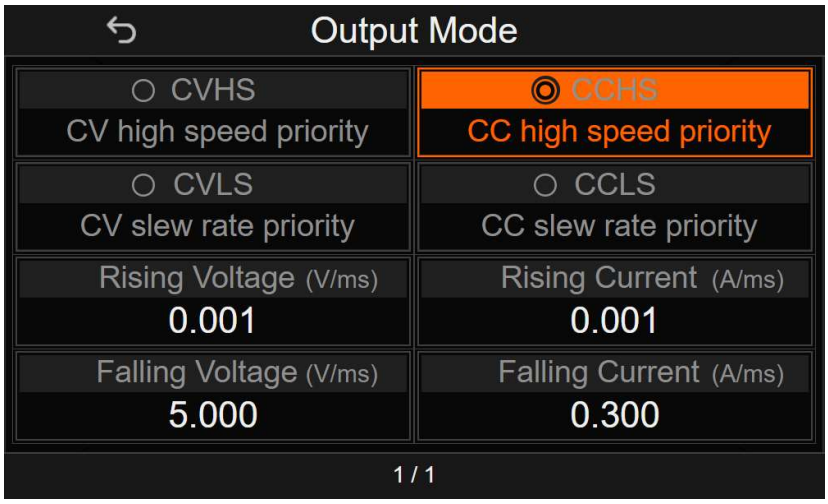


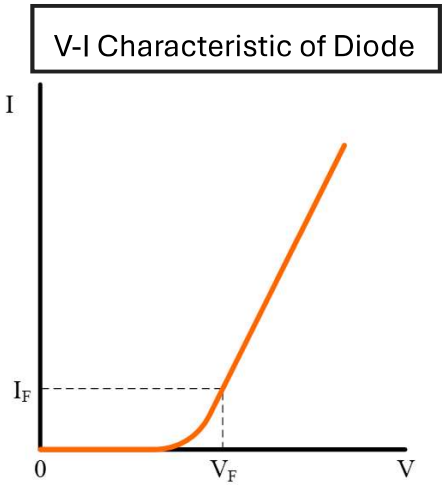




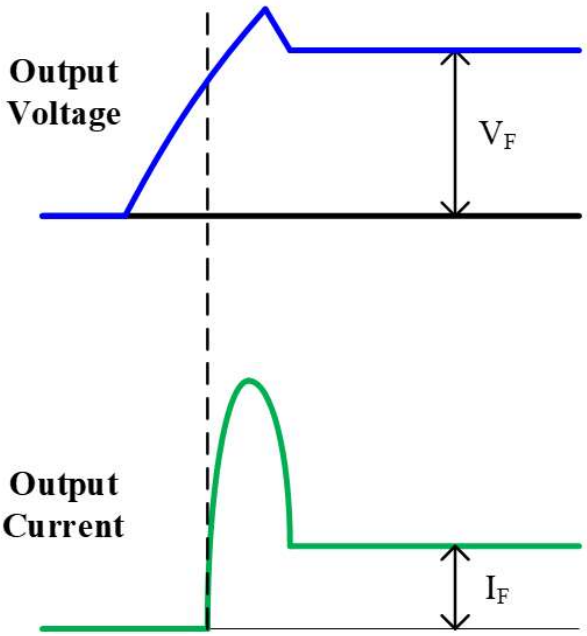
CV/CC Priority

The PHU 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.

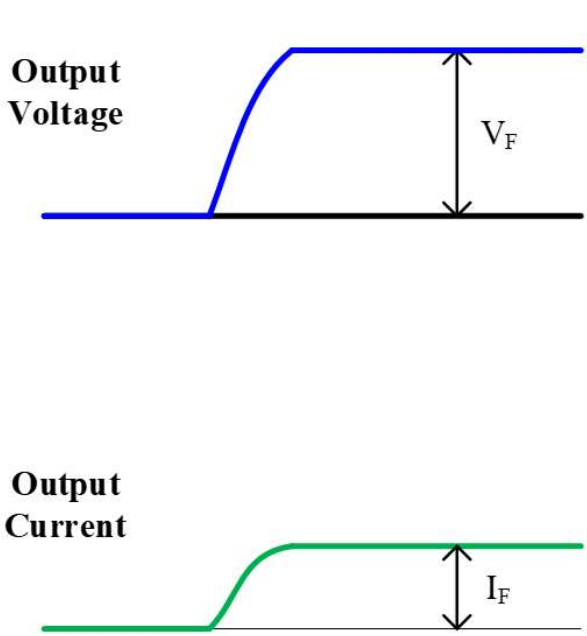




CV Priority Mode



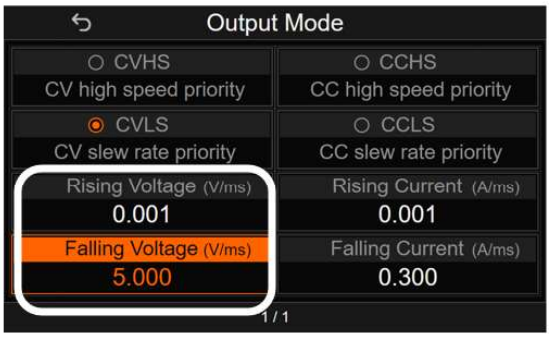
CC Priority Mode

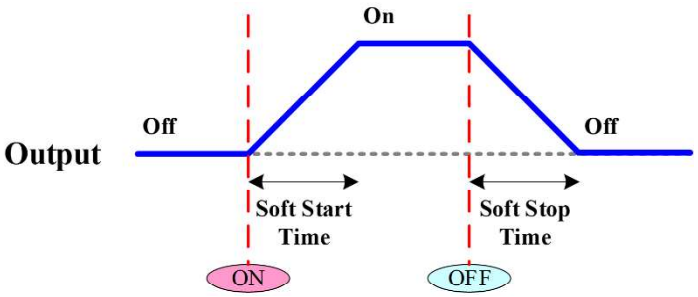


Slew Rate Control (Soft Start/Stop)

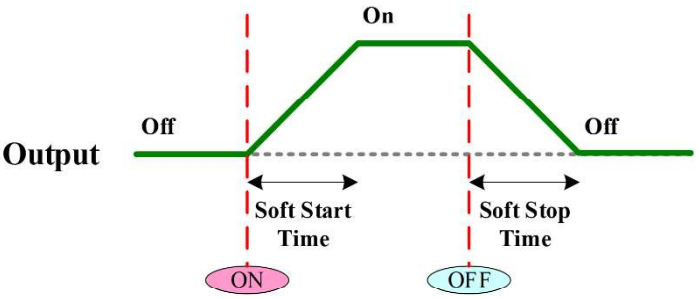
The default voltage (or current) rising speed when starting/stopping the output is set as the highest speed. PHU provides the function for the user to set the speed per their request for applications.

In **CVLS** (Constant **Voltage** Low Speed) mode, the user can set the parameter to control the **voltage rising** when starting the output and the **voltage falling** when stopping the output.





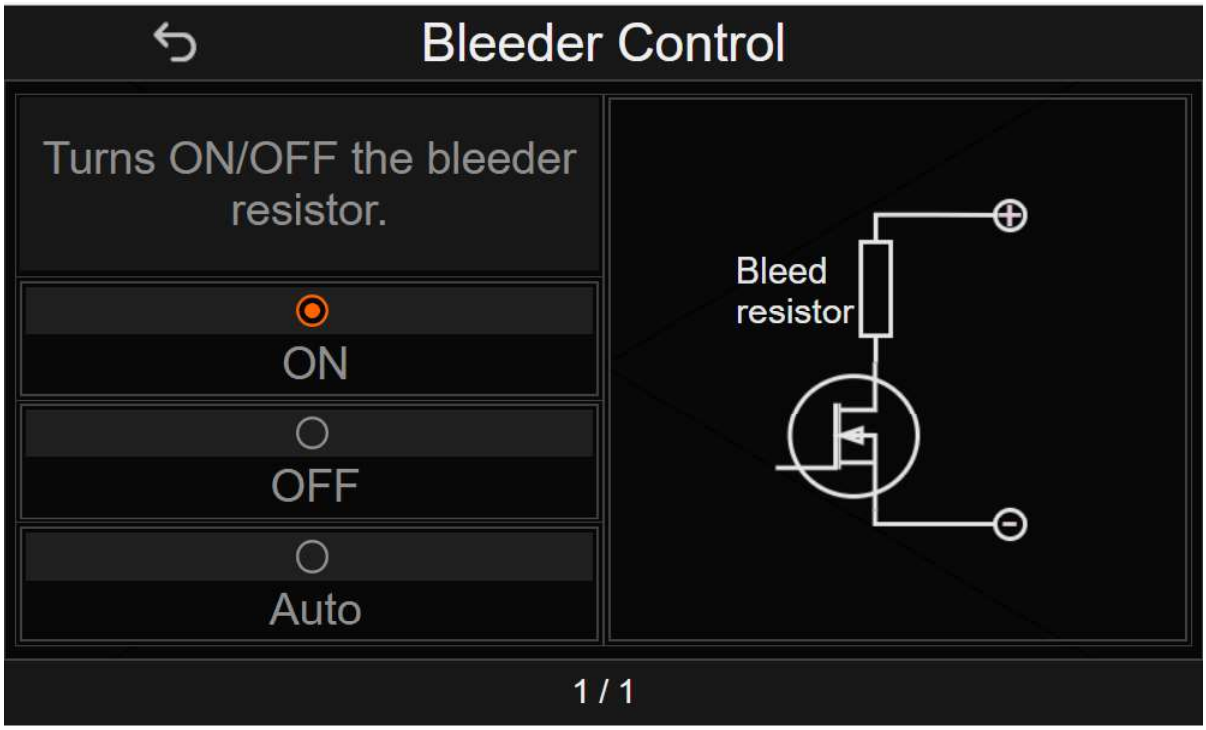
In **CCLS** (Constant **Current** Low Speed) mode, the user can set the parameter to control the **current rising** when starting the output and the **current falling** when stopping the output.

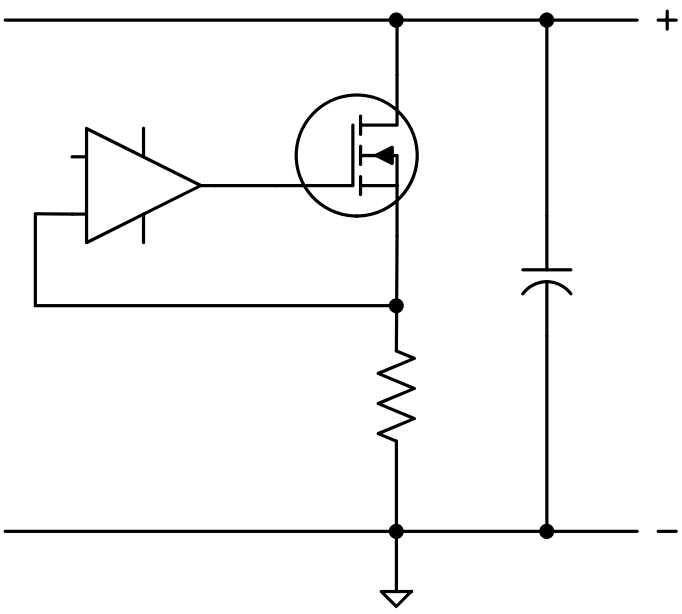


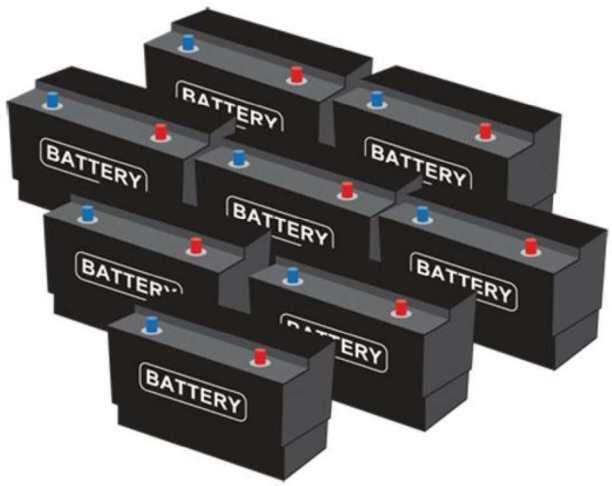
Bleeder Circuit ON/OFF Control

The bleeder circuit is a power supply circuit designed to discharge the electric charge stored in the power supply filter capacitors when the equipment is turned OFF, primarily for safety reasons to protect the DUT.

The bleed function can be disabled for specific purposes, such as battery applications.

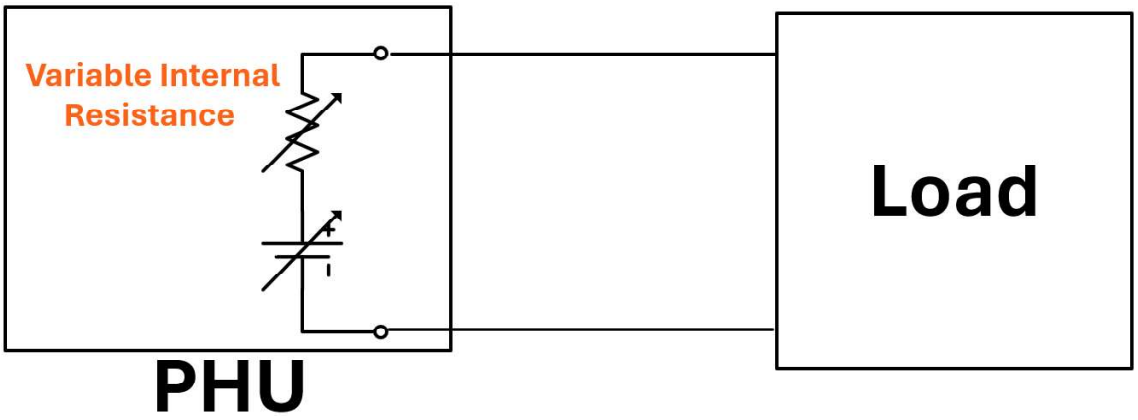


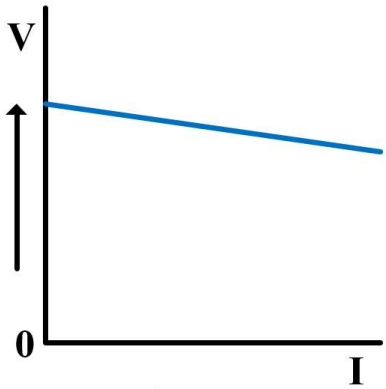


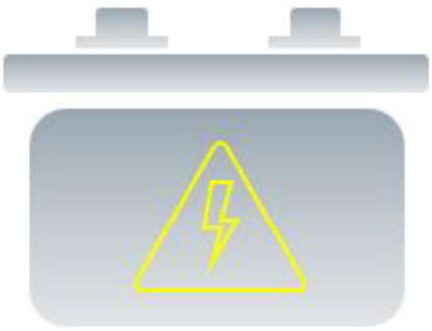


Variable Internal Resistance

The internal resistance of the power supply can be user-defined in software. When the internal resistance is set it can be seen as a resistance in series with the positive output terminal. This allows the power supply to simulate power sources that have internal resistances such as lead acid batteries.



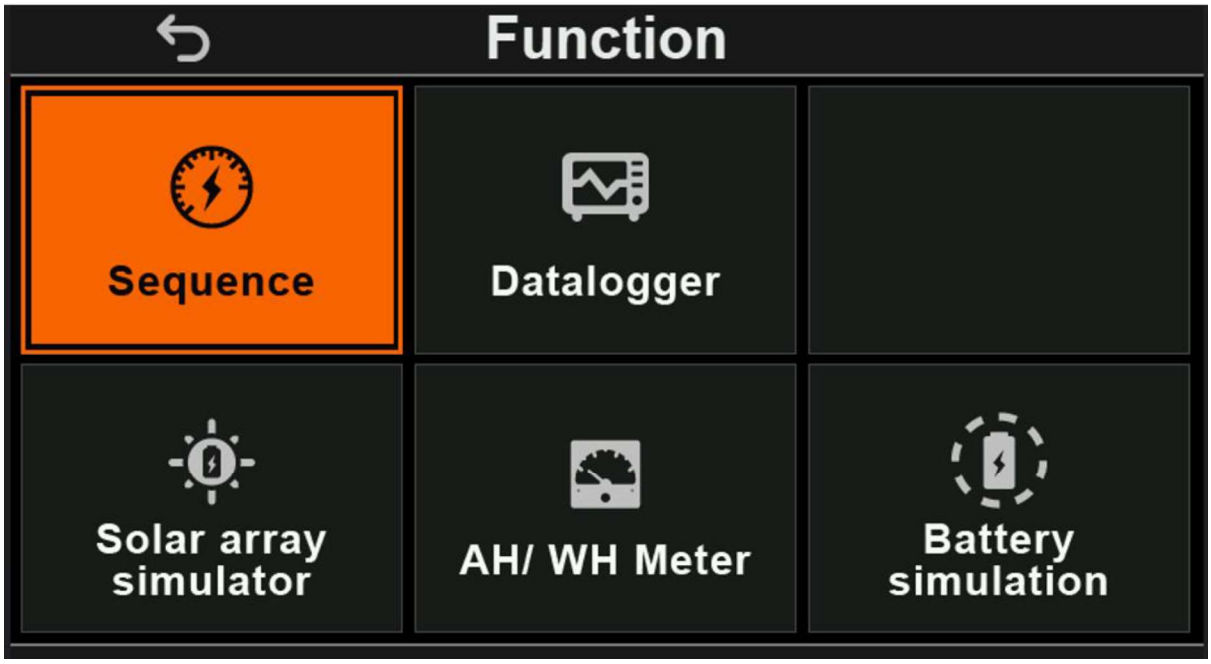




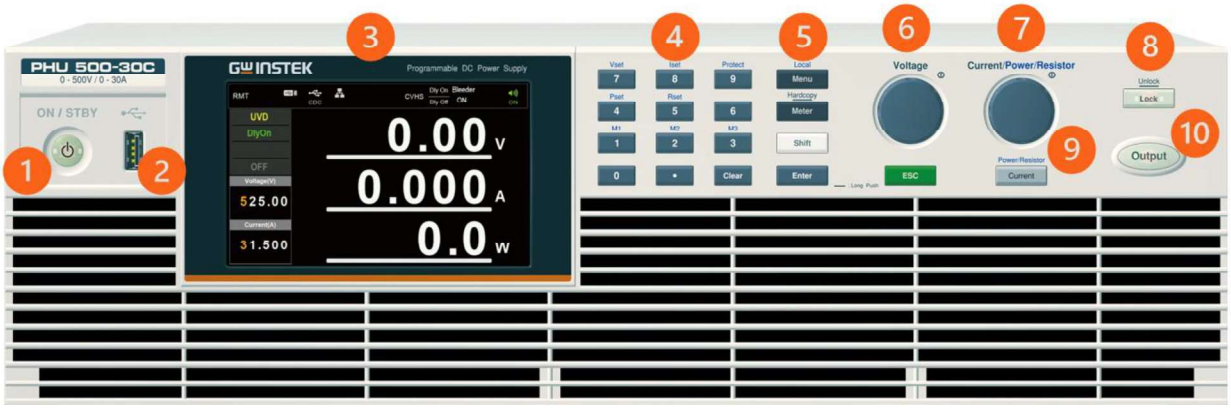
Chemical battery
Solar battery
Fuel cell

Function

Except the standard built-in programmable sequence function, PHU also offers a variety of optional functions including **Datalogger**, **Solar Array Simulator**, **AH/WH Meter** and **Battery Simulation** to meet customer's requirements.



Panel Introduction



1. Power Switch
2. USB A Port
3. Display Area
4. Number Button
5. Function Button
6. Voltage Adjust Knob
7. Current/Power/Resistance Adjust Knob
8. Panel Lock
9. Current/Power/Resistance Switch
10. Output Switch

1. Analog control
2. Anybus connection port
3. Digital I/O
4. Interconnect for parallel connection
5. LAN port
6. USB B port
7. DC output terminal
8. Remote Sense
9. Parallel control
10. AC input