



# PHX-Series (6kW~12kW)

Programmable Switching D.C. Power Supply

## FEATURES

- Output Voltage : 30V/60V/500V/1000V
- Output Current : 6A~400A
- Output Capacity : 6kW~12kW
- CV/CC Priority ; Particularly Suitable for the EV/HEV Battery Industry
- Adjustable Slew Rate (for Voltage/Current Rising & Falling)
- 3 set of Preset Memory
- Series and Parallel Operation  
2 Units in Series Operation ; Only for Output Voltage Below 500V Models  
(Includes 500V Model) or 10 Units in Parallel Operation (Example :  
12kW x 10 units in Parallel Connection for Output up to 120kW)
- High speed response time
- High Efficiency and High Power Density
- 19" Rack Mount Size Design (Rack Mount Adaptor as Optional Accessories)
- PC Remote Interface (Standard) : RS-232/RS-485, Up to 31 units with one PC
- Analog Control Interface (Standard)
- Protection Function : OVP/OCP/OTP

**GW INSTEK**  
Simply Reliable

The PHX- Series, programmable switching DC power supply, comprises 16 models and the voltage and current ranges are from 30V/200A to 1000V/12A. A single PHX-Series programmable Switching DC Power Supply unit outputs 6kW to 12kW depending on models. To meet the requirements of high power output such as starter motor, EV and HEV battery modules, the PHX-Series can be operated under Master/Slave control with same voltage units. To satisfy the higher power output requirements, the series outputs maximum current of 4000A by connecting 10 units in parallel. (For instance, 10 units of PHX 30-400S(F)C)

The design of the PHX-Series programmable switching DC power supply is to satisfy present requirements of power semiconductor components or power supply industry's high speed applications on V-I characteristics curve tests such as Starter Motor, HEV battery module and power semiconductor component. Power supplies with fast slew rate control are often required by semiconductor circuit design, power module design and product verification to carry out tests on electronic parts' characteristics. The PHX-Series programmable DC power supply, with its built-in adjustable rise or fall slew rate control, allows users to set the rise or fall slew rate parameters for each product's unique characteristics so as to ensure a thorough and complete product verification process. The emerging green energy industry has made LED products very popular. The LED Forward Voltage (VF) under C.V priority will produce inrush current and surge voltage. To solve this problem, the CC priority (option) feature effectively limits the occurrence of inrush current and surge voltage when the supplied voltage to the LED Forward voltage to prevent DUTs from being damaged. The series comprises 16 models and the model numbers are listed as follows. Two output power capacities of the PHX-Series are 6kW and 12kW. The maximum output power of 120kW can be achieved by connecting 10 units in parallel. (For instance, 10 units of PHX 30-400S(F)C)

Model Number	Function	Adjustable Internal Resistance Function	Adjustable Slew Rate Rising and Falling	Output On/Off Delay Time Function	CV/CC Priority
S (Standard)		—	—	—	—
F (Full Function)		✓	✓	✓	✓

### PANEL INTRODUCTION

CE

RS-232

RS-485

Analog Control

Isolated Analog Control

1. Power Switch

2. Voltage Setting Knob

3. Current Setting Knob

4. Function Key/Panel lock/Display Selection key

5. Preset Memory

6. Output Terminal

7. Isolated Analog Control Connector (1000V Only)

8. Analog Control Connector (For 30V/60V/500V)

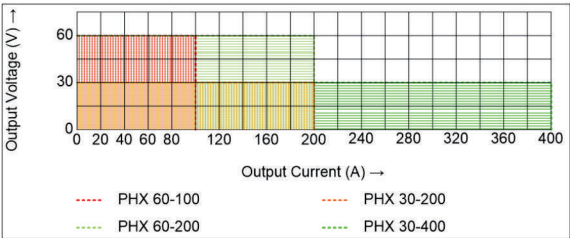
9. Master/Slave Control Connector

10. RS-485 Control Interface

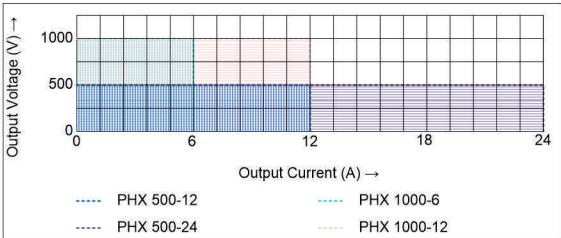
11. RS-232 Control Interface

12. AC Power Inlet

A. The Voltage and Current Collocations of All PHX-Series



Output Voltage for 30V/60V



Output Voltage for 500V/1000V

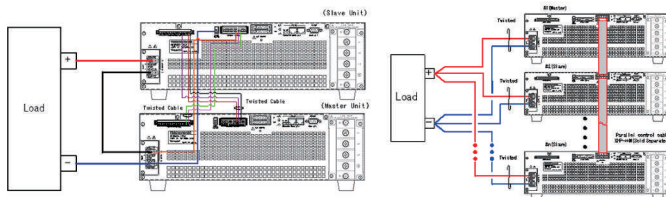


## B. CV/CC Priority Operation Mode

Model Number / Mode & Speed	PHX 30-200 PHX 30-400	PHX 60-100 PHX 60-200	PHX 500-12 PHX 500-24	PHX 1000-6 PHX 1000-12
CV High Speed	10ms	10ms	100ms	100ms
CV Med Speed	100ms	100ms	300ms	300ms
CV Low Speed	200ms	200ms	500ms	500ms
CC High Speed	10ms	10ms	10ms	10ms
CC Med Speed	100ms	100ms	100ms	100ms
CC Low Speed	200ms	200ms	200ms	200ms

PHX-series offers C.V or C.C priority operation mode in response to user demand for testing various characteristics of the DUT such as Battery & LED products. The C.V or C.C priority operation mode ministry again divided into: fast, medium, slow total of three different rates, in order to meet a variety of applications of the specific market. Related settings parameters as above.

## D. Series and Parallel Operation Mode

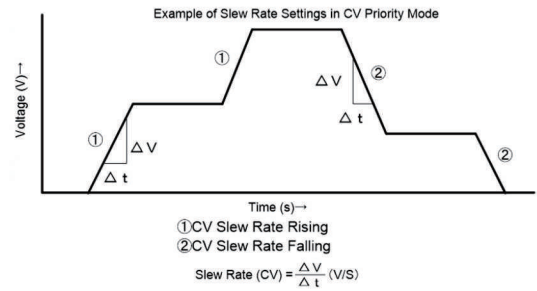


Wire Connection in Series Operation

Wire Connection in Parallel Operation

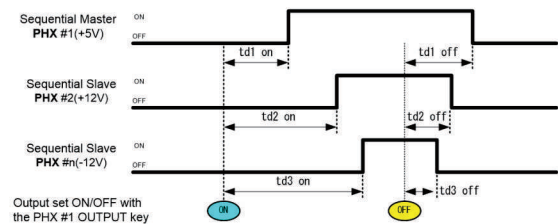
The PHX series power supply will elevate its total output current level when parallel arrangement (maximum 10 units) is adopted. When series arrangement is utilized, the total output voltage will be two fold (maximum) to that of the rated power output of a single unit. Series connection can only be done for models with rated output voltage under 500V. For parallel connection, the Master/Slave collocation is required. Once Master and Slave units are connected, all control operations must be done from Master unit.

## C. Adjustable Slew Rate



The PHX-Series power supply has CV and CC slew rate selections. Slew rate settings are divided into high speed priority setting and slew rate priority setting. When the high speed priority is in use, the CV or CC slew rate will utilize the fastest preset slew rate to conduct operation. The CV or CC rise and fall slew rate can be independently determined once the slew rate priority is adopted.

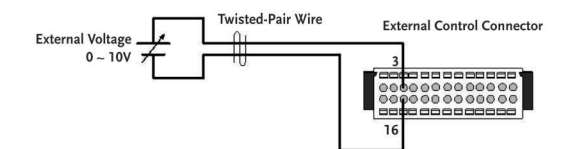
## E. Output On/ Off Delay Time Function (Ref User Manual Function Table Item 7 & 8)



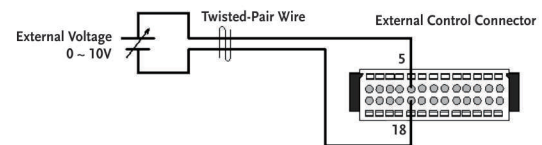
The Delayed time setting for each unit is from 00.00s to 99.99s

Master Unit, via its Output On / Off trigger, controls slave units to conduct multi-unit delayed and synchronized operation to meet user's requirements of different output sequences for testing multi-channel products.

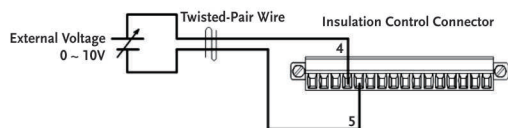
## F. Analog Control Interface



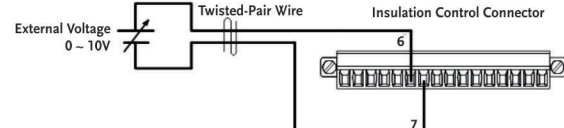
External voltage control of voltage output function (for 30V/60V/500V output models)



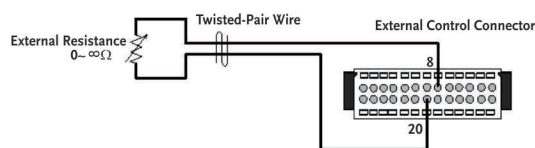
External voltage control of current output function (for 30V/60V/500V output models)



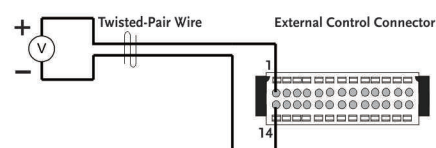
External voltage control of voltage output function  
(Isolated analog control interface for 1000V output model only)



External voltage control of current output function  
(Isolated analog control interface for 1000V output model only)



External resistance control of current output function (for 30V/60V/500V output models)



External voltage monitoring (for 30V/60V/500V output models)

On the rear panel of the PHX-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. This Analog Control Connector is complied with the Mil 26 pin connector (Phoenix Contact Type : DFM C1, 5/13ST3, 5LR) standard.

SPECIFICATIONS								
Model	PHX 30-200S(F)C	PHX 30-400S(F)C	PHX 60-100S(F)C	PHX 60-200S(F)C	PHX 500-12S(F)C	PHX 500-24S(F)C	PHX 1000-6S(F)C	PHX 1000-12S(F)C
OUTPUT RATINGS								
Output Voltage Rating	30V	30V	60V	60V	500V	500V	1000V	1000V
Output Current Rating	200A	400A	100A	200A	12A	24A	6A	12A
Output Power Rating	6000W	12000W	6000W	12000W	6000W	12000W	6000W	12000W
INPUT CHARACTERISTICS								
Input Range	180Vac ~ 242Vac, 3 phases							
Input Frequency Range	45~65Hz							
Phases	3- phase, 3 wire plus ground. Neutral not used.							
Model	PHX 30-200S(F)D	PHX 30-400S(F)D	PHX 60-100S(F)D	PHX 60-200S(F)D	PHX 500-12S(F)D	PHX 500-24S(F)D	PHX 1000-6S(F)D	PHX 1000-12S(F)D
OUTPUT RATINGS								
Output Voltage Rating	30V	30V	60V	60V	500V	500V	1000V	1000V
Output Current Rating	200A	400A	100A	200A	12A	24A	6A	12A
Output Power Rating	6000W	12000W	6000W	12000W	6000W	12000W	6000W	12000W
INPUT CHARACTERISTICS								
Input Range	342Vac ~ 440Vac, 3 phases							
Input Frequency Range	45~65Hz							
Phases	3- phase, 3 wire plus ground. Neutral not used.							
CONSTANT VOLTAGE MODE								
Range	0V~31.5V		0V~63V		0V~525V		0V~1050V	
Accuracy *11	0.1% of Setting + 5mV		10mV		0.1V		0.2mV	
Resolution	10mV		10mV		0.1V		1mV	
Load Regulation*4	0.005% of Rated Output Voltage		0.005% of Rated Output Voltage		0.005% of Rated Output Voltage		0.005% of Rated Output Voltage	
Line Regulation*5	0.003% of Rated Output Voltage		0.003% of Rated Output Voltage		0.003% of Rated Output Voltage		0.003% of Rated Output Voltage	
Ripple(RMS Value)*6	<10mV		<10mV		<50mV		<100mV	
Noise(p-p Value) (Typ.)*7	<100m Vp-p		<100m Vp-p		<300m Vp-p		<300m Vp-p	
Teperature Coefficient(Typ.)	±100ppm/ °C		±100ppm/ °C		±100ppm/ °C		±100ppm/ °C	
Transient Response Time*8	1ms or less		1ms or less		1ms or less		2ms or less	
Output Response Time*9	Rising(Rated Load)	200ms ±20%	Rising(Rated Load)	200ms ±20%	Rising(Rated Load)	500ms ±20%	Rising(Rated Load)	500ms ±20%
	Rising(No Load)	200ms ±20%	Rising(No Load)	200ms ±20%	Rising(No Load)	500ms ±20%	Rising(No Load)	500ms ±20%
	Falling(Rated Load)	200ms ±30%	Falling(Rated Load)	200ms ±30%	Falling(Rated Load)	500ms ±30%	Falling(Rated Load)	500ms ±30%
	Falling(No Load)	<1200ms	Falling(No Load)	<1200ms	Falling(No Load)	<1200ms	Falling(No Load)	<1200ms
Remote Sense Compensation Voltage(Single Wire)	5V		5V		5V		5V	
Residual Voltage When Output is OFF(Typ)	±10mV or less		±10mV or less		±25mV or less		±50mV or less	
Maximum Sink Current	1A±20%	2A±20%	1A±20%	2A±20%	250mA±20%	500mA±20%	125mA±20%	250mA±20%
CONSTANT CURRENT MODE								
Range	0.0A~210.0A	0.0A~420.0A	0.0A~105.0A	0.0A~210.0A	0.00A~12.60A	0.00A~25.20A	0.000A~6.300A	0.00A~12.60A
Accuracy *12	0.1A	0.2A	0.05A	0.1A	5mA	10mA	3mA	6mA
Resolution	0.1A	0.1A	0.1A	0.1A	10mA	10mA	1mA	10mA
Ripple(RMS Value)*6	<200mA	<400mA	<100mA	<200mA	<10mA	<20mA	<5mA	<10mA
Load Regulation*10	0.01% of rated output current		0.01% of rated output current		0.03% of rated output current		0.03% of rated output current	
Line Regulation*5	0.005% of rated output current		0.005% of rated output current		0.005% of rated output current		0.005% of rated output current	
Teperature Coefficient(Typ.)	±200ppm / °C		±200ppm / °C		±200ppm / °C		±200ppm / °C	
PROTECTION FUNCTION								
Over Voltage Protection Circuit(OVP)	0.30V~33.00V		0.60V~66.00V		5.0V~550.0V		10V~1100V	
Range	50mV		50mV		0.5V		5V	
Accuracy	0.2% of Setting + *10							
Over Current Protection Circuit(OVP)	2.0A~220.0A		1.0A~110.0A		0.12A~13.20A		0.060A~6.600A	
Range	4.0A~440.0A		2.0A~220.0A		0.24A~26.40A		0.12A~13.20A	
Accuracy	0.6% of Setting + *11							
	0.5A		1A		50mA		100mA	
					5mA		50mA	
OTHER FUNCTIONS								
CV Priority	High Speed	10ms		10ms		100ms		10ms
(Only for Full Featured type;	Medium Speed	100ms		100ms		300ms		300ms
Model Name With "F")	Low Speed	200ms		200ms		500ms		500ms
CC Priority	High Speed	10ms		10ms		10ms		10ms
(Only for Full Featured type;	Medium Speed	100ms		100ms		100ms		100ms
Model Name With "F")	Low Speed	200ms		200ms		200ms		200ms
CV Priority	Low Speed	200ms		200ms		500ms		500ms
(Only for Standard type ; Model Name with "S")								
GENERAL SPECIFICATIONS								
Cooling Fan	Forced air cooling by internal fan							
Dimensions & Weight	430x129x562	430x221x562	430x129x550	430x221x550	430x129x550	430x221x550	430x129x550	430x221x550
(W x H x D mm; Approx.)	24.0kg	43.0kg	22.0kg	38.0kg	22.0kg	37.0kg	22.0kg	40.0kg

Specifications subject to change without notice. HX-1000GD1BH

ORDERING INFORMATION			
<b>PHX-Series Programmable Switching DC Power Supply</b>			
Model	Voltage(V)	Current(A)	Power(kw)
PHX 30-200	0~30	0~200	6
PHX 60-100	0~60	0~100	6
PHX 500-12	0~500	0~12	6
PHX 1000-6	0~1000	0~6	6
PHX 30-400	0~30	0~400	12
PHX 60-200	0~60	0~200	12
PHX 500-24	0~500	0~24	12
PHX 1000-12	0~1000	0~12	12

**PHX 30 - 200 S C**

Series Name: PHX  
Voltage: 30  
Current: 200  
S: Standard  
F: Full Function

C: Input Voltage 180~240 VAC, 3 Phase  
D: Input Voltage 342~440 VAC, 3 Phase

ACCESSORIES	
Input Terminal Cover, Output Terminal Cover, Output Terminal Bolt (Attached to power supply for PHX-500-12/PHX-500-24/PHX1000-6/PHX-1000-12 Only) CD-ROM (Includes User Manual x 1; Basic User Manual)	
OPTIONAL ASSESSORIES	
Parallel Connection Bus-Bar (Optional; Custom made); Please Contact with our service center in detail	
PHX-001	Cable for Parallel Operation (for 30V/60V model; 300mm)
PHX-002	Cable for Parallel Operation (for 500V/1000V model; 300mm)
PHX-003	Cable for Series Operation (for 30V/60V model; 300mm)
PHX-004	RS485 Cable for PC Remote Control (1m)
PHX-005	RS232C Cable for PC Remote Control (2m)

## GOOD WILL INSTRUMENT CO., LTD.

No.7-1, Jhongsing Road, Tucheng Dist., New Taipei City 236, Taiwan  
T +886-2-2268-0389 F +886-2-2268-0639  
E-mail: marketing@goodwill.com.tw



www.gwinstek.com



www.facebook.com/GWInstek

**GW INSTEK**  
Simply Reliable