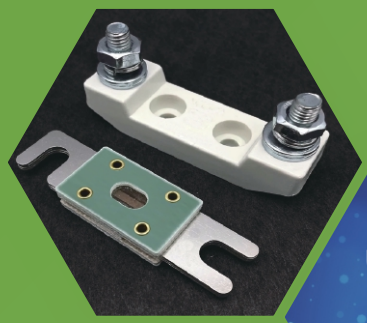
AC&DC Power Source

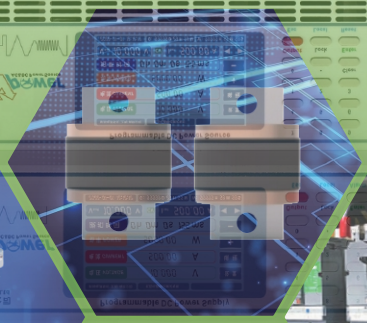
Hangyu Power System (Shanghai) Co., Ltd.

HY-PHSSU Series

Special Power Supply For Instantaneous Test Of Low Voltage Electrical Apparatus

Military Quality Power Supply Expert





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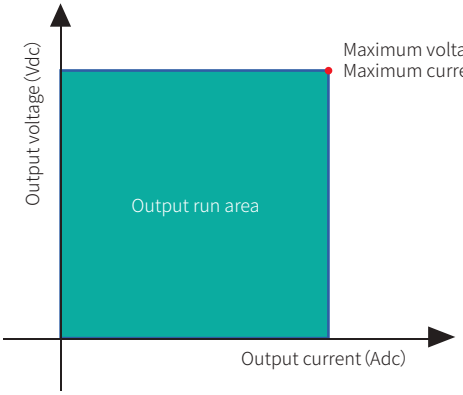
HY-PHSSU Series Special Power Supply For Instantaneous Test Of Low Voltage Electrical Apparatus

High performance,High precision,High power density



This series of power supply is specially designed for the instantaneous test of low-voltage electrical appliances, including circuit breaker trip test and fuse fuse test.

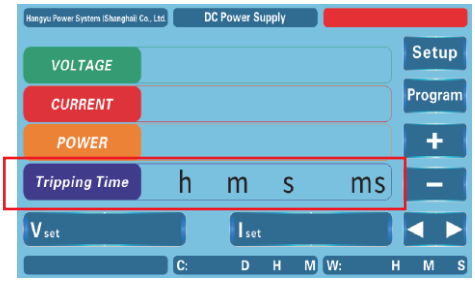
Product Features

- Meet the GB/T 14048.2 time constant 5ms/10ms test requirements
- Depending on the testing requirements, there are a variety of product models to choose from
- Can be multiple parallel, the maximum current up to 50kA
- Input standard PFC, power factor up to 0.99
- 16-bit D/A high precision converter for accurate output
- 20-bit A/D high precision converter, more accurate read back

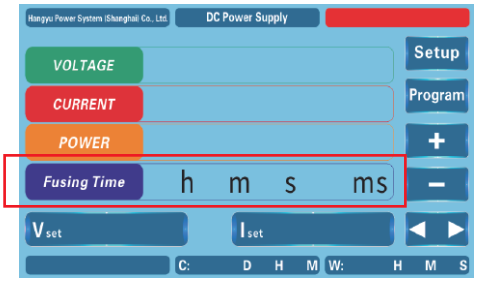
Application Field

- Circuit breaker trip test
- Fuse fusing test
- Relay instantaneous test
- Low voltage harness instantaneous test

Provide Display Time For Corresponding Testing Items Based On Different Customer Testing Requirements



For tripping test, the tripping time display is added.



For the fuse test, the fusing time display is added.

Sample Book Download

Low voltage Circuit Breaker Instantaneous Test: Release Limit And Characteristic Test

Circuit breaker is a key component in the power distribution system, it is responsible for the protection of electric system to avoid damage due to overload, short circuit and other fault disrupted work. The key test that the circuit breaker must perform is the instantaneous tripping test, which is designed to verify that the circuit breaker will trip instantaneously under fault conditions. In other words, when the circuit breaker detects a fault in the electrical system, it should open within a fraction of a second.

The instantaneous tripping test is carried out by applying fault current to the circuit breaker and measuring the time it takes for the circuit breaker to trip. Fault currents are typically generated using a test device that simulates fault conditions in an electrical system. The test device applies a high current to the circuit breaker,exceeding the rated current of the circuit breaker,measure the time required for the circuit breaker to trip.

Instantaneous Test Of Low-Voltage Circuit Breaker

Table 1 Power Factor And Time Constant Corresponding To Test Current

Test Current I kA	Power Factor $\cos\phi$		Time Constant ms			
	Short-Circuit	Operational Performance Capability	Overload	Short-Circuit	Operational Performance Capability	Overload
I≤3	0.9	0.8	0.5	5	2	2.5
3<I≤4.5	0.8			5		
4.5<I≤6	0.7			5		
6<I≤10	0.5			5		
10<I≤20	0.3			10		
20<I≤50	0.25			15		
50<I	0.2			15		

According to the "GB/T14048.2 Low voltage switchgear and control equipment Part 2: Circuit Breakers" standard 8.3.3.2 release limit and characteristic test requirements:

1、The action of the Short circuit release device should be verified at 80% and 120% of the short-circuit setting current of the release.For AC trials, the test current should have no asymmetric component.

For DC test, the test current should be no overshoot when switched on, and the time constant should be less than 10ms.

When the test current is equal to 80% of the short-circuit setting current, the release should be no movement, the current duration is:

—— For the instantaneous release device is 0.2s;

—— For timed release device, equal to manufacturers specified time delay of 2 times the time range.

When the test current is equal to 120% of the short-circuit setting current,the release device should operate:

—— For the instantaneous release device, it should be within 0.2s;

—— For timed release device, it should be operated within a time range equal to twice the delay time specified by the manufacturer.

2、The action of instantaneous or timed overload release should be verified at 90% and 110% of the set overload setting current of the release.For AC trials, the test current should have no asymmetric component.

For DC test, the test current should be no overshoot when switched on, and the time constant should be less than 10ms.

The action verification of the multi pole overload release should be carried out by simultaneously applying test current to all phase poles.

When the test current is equal to 90% of the overload setting current, the release should be no movement, the current duration is:

—— For the instantaneous release device is 0.2s;

—— For timed release device, time interval is equal to the delay time 2 times specified by the manufacturer.

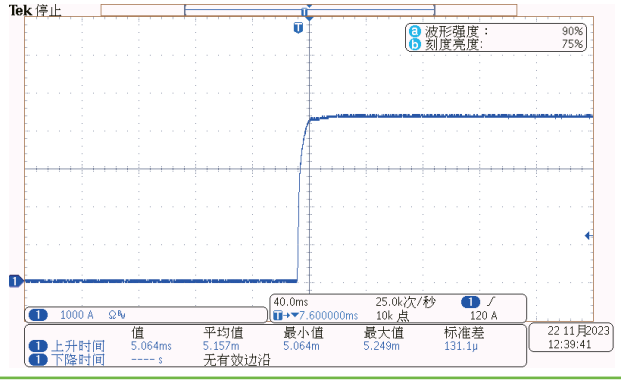
When the test current is equal to 110% of the overload setting current, the release device should operate:

—— For the instantaneous release device, it should be within 0.2s;

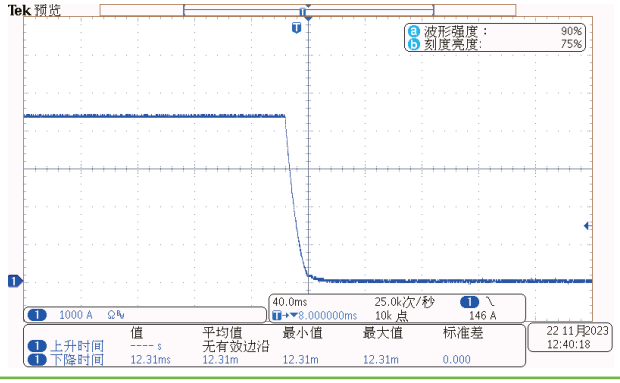
—— For timed release device, it should operate within a time interval equal to twice the delay time specified by the manufacturer.

For a circuit breaker with a marked neutral pole and an overload release, the test current of this release shall be 110%×1.2 of the current setting value.

*The measured figure of HY-PHSSU-L 10-4500 series power supply of Hangyu Power supply is as follows



■ 4500A current rise response time≤10ms



■ 4500A current drop response time≤20ms

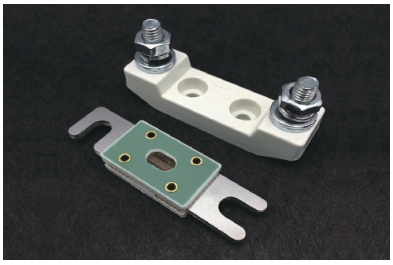
From the above, the characteristics of this feature test are:

1. The test current is large, but there is no voltage requirement;
2. Test main circuit power time is short;
3. There are a large number of test products (i.e. products),a high frequency of testing operations;

Hangyu power low-voltage electrical appliance test solution, with accurate test current, accurate control of power-on time,the best closing phase angle,overcome the difficulty of circuit breaker instantaneous characteristic test in an all-round way to ensure the quality of low-voltage electrical appliances.

Instantaneous Test Of Low-Voltage Fuses

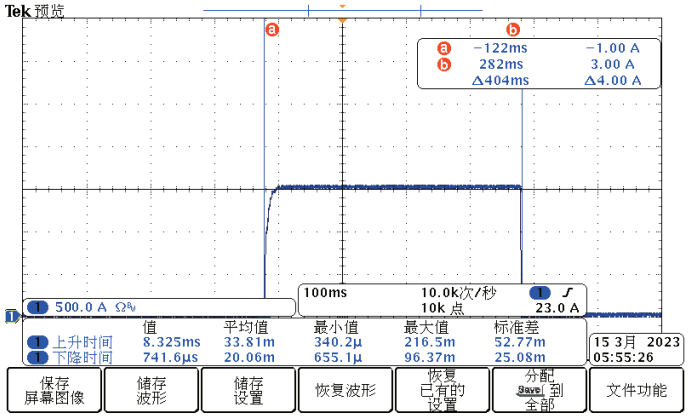
Low Voltage Fuse Instantaneous Test:Fusing Test



A fuse is also known as a current fuse, and the IEC127 standard defines it as a fuse-link or fuse. It mainly plays an overload protection role. By correctly installing fuses in the circuit, the fuses will automatically melt and cut off the current when the current abnormally rises to a certain height and heat, protecting the safe operation of the circuit.

The fuse test includes:

1, Agreed Tripping: can refer to GB/T 13539 standard 8.4.3.1
2, Agreed Non-Tripping: refer to GB/T 13539 standard 8.4.3.1
3, Fusing Time: can refer to GB/T 31465 standard 5.5
4, Current Impacting: can refer to GB/T 31465 standard 5.3



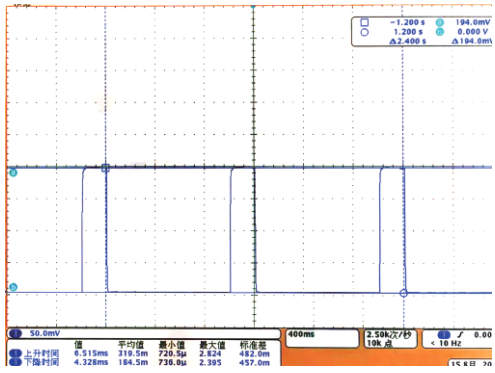
Using the HY-PHSSU-S 10-1500 model, the low-voltage fuse was tested and the output current quickly rose to the target current value within 10ms, and the current quickly dropped after the low-voltage fuse was blown. The measured waveform is shown in the figure above, and the fusing time of the low-voltage fuse can be observed.

Fusing Time: The time required from the time the overcurrent is applied until the current drops below a specified value.

Customer Case: Schneider Electric -16kA High Speed Response High Current Power Supply

Hangyu power adopts multiple machine parallel technology, the power supply can be used in a single machine, but also can be used in parallel, efficient and convenient use.

The maximum output current of the power supply is 16kA, which meets the time constant requirement of < 10ms, with high precision and fast response speed. At present, this power supply has been successfully delivered to the customer for use.



HY-PHSSU Series Selection And Technical Parameters

Communication And Select Purchase Functions

Communication Protocol	Standard Communication Interface	Optional Communication Interface
Modbus SCPI	RS-485 RS-232 Digital I/O	- LAN :Ethernet communicationinterface - CAN :CAN communication interface - GPIB :GPIB communication interface - IA :Analog quantity programming and monitoring interface (isolated type)

Choose And Buy Function

- T1 : Operating temperature -10°C to 50°C
- T2 : Operating temperature -20°C to 50°C
- CF : User defined features (please specify when ordering)

HY-PHSSU-S Series Naming Rules

Product Series	Technical Mode	Output Voltage	Output Current	Time Constant	Choose And Buy Function
HY-PHSSU	S	10	3000	10	CF
Series Name	Switching Circuit	Output Voltage	Output Current	Time Constant	User Defined

Product model: HY-PHSSU-S 10-3000-10-CF
The information of this machine model is:The output voltage is 0-10V, and the output current is 0-3000A
Time constant 10ms
Custom features that users choose to purchase

HY-PHSSU-L Series Naming Rules

Product Series	Technical Mode	Output Voltage	Output Current	Time Constant	Choose And Buy Function
HY-PHSSU	L	10	50kA	05	CF
Series Name	Linear Circuit	Output Voltage	Output Current	Time Constant	User Defined

Product model: HY-PHSSU-L 10-50kA-05-CF
The information of this machine model is:The output voltage is 0-10V, and the output current is 0-50kA
Time constant 5/10ms is optional, with 05 representing 5ms and 10 representing 10ms
Custom features that users choose to purchase

* All technical indicators can only be guaranteed when the equipment runs continuously for more than 30 minutes at the specified operating temperature.

HY-PHSSU Series Product Model Selection And Parameters

Special specifications outside the voltage/current range in the selection table can be customized.

HY-PHSSU-S Series Power Supply Model Selection

Models	Output Voltage	Output Current	Output Power
HY-PHSSU-S 10-500-10	10V	500A	5kW
HY-PHSSU-S 10-1000-10	10V	1000A	10kW
HY-PHSSU-S 10-1500-10	10V	1500A	15kW
HY-PHSSU-S 10-3000-10	10V	3000A	30kW

HY-PHSSU-L Series Power Supply Model Selection

Models	Output Voltage	Output Current	Output Power
HY-PHSSU-L 10-500	10V	500A	5kW
HY-PHSSU-L 10-1000	10V	1000A	10kW
HY-PHSSU-L 10-1500	10V	1500A	15kW
HY-PHSSU-L 10-3000	10V	3000A	30kW
HY-PHSSU-L 10-4500	10V	4500A	45kW
HY-PHSSU-L 10-6000	10V	6000A	60kW
HY-PHSSU-L 10-10kA	10V	10kA	100kW
HY-PHSSU-L 10-20kA	10V	20kA	200kW
HY-PHSSU-L 10-30kA	10V	30kA	300kW
HY-PHSSU-L 10-40kA	10V	40kA	400kW
HY-PHSSU-L 10-50kA	10V	50kA	500kW

* Time constant 5/10ms is optional, with 05 representing 5ms and 10 representing 10ms

HY-PHSSU Series Technical Parameters

HY-PHSSU-S Series Product Model And Technical Parameters

Models	HY-PHSSU-S 10-500-10	HY-PHSSU-S 10-1000-10	HY-PHSSU-S 10-1500-10	HY-PHSSU-S 10-3000-10
Rated Output Voltage	10V	10V	10V	10V
Rated Output Current	500A	1000A	1500A	3000A
Rated Output Power	5kW	10kW	15kW	30kW
Efficiency	84%	88%	89%	88%
Constant Current Mode (CC Mode)				
Output Range Can Be Set	0- Rated output value			
Input Adjustment Rate	0.1% of the rated output current (AC input 220V ± 15%, constant load)		0.1% of the rated output current (AC input 380V ± 15%, constant load)	
Load Adjustment Rate	0.05% of rated output current (no-load to full load, constant input voltage)	0.1% of rated output current (no-load to full load, constant input voltage)		
Ripple Effective Value rms (3Hz-300kHz)	⩽0.5% of rated output current			
Current Rise Response Time	Meet the GB/T 14048.2 time constant 10ms test requirements			
Input Power Supply				
Frequency	47Hz - 63Hz			
Connection Mode	Single-phase two-wire + ground wire, 220V ± 15%		Three-phase three-wire + ground wire, 380V ± 15% (-3P standard configuration model)	
Power Factor (Typical Value)	0.99(Single-phase input)		0.94(Three-phase input)	

HY-PHSSU-L Series Product Model And Technical Parameters

Models	HY-PHSSU-L 10-4500
Rated Output Voltage	10V
Rated Output Current	4500A
Rated Output Power	45kW
Efficiency	88%
Constant Current Mode (CC Mode)	
Output Range Can Be Set	0- Rated output value
Input Adjustment Rate	0.1% of rated output current (AC input 380V ± 15%, constant load)
Load Adjustment Rate	0.1% of rated output current (no-load to full load, constant input voltage)
Ripple Effective Value rms (3Hz-300kHz)	⩽0.5% of rated output current
Current Rise Response Time	Meet GB/T 14048.2 standard (time constant 5ms/10ms optional)
Input Power Supply	
Frequency	47Hz - 63Hz
Connection Mode	Three-phase three-wire + ground wire, 380V ± 15% (-3P standard configuration model)
Power Factor (Typical Value)	0.94(Three-phase input)

Programming And Readback Accuracy & Resolution

Voltage Output Programming Accuracy	0.05% of the rated output voltage, measured at the telemetry point
Current Output Programming Accuracy	0.1% of the output current + 0.05% of the rated output current (in constant current programming mode, the readback and monitoring accuracy do not include the influence of heating drift and load temperature change rate)
Voltage Setting Resolution	0.001V
Current Setting Resolution	0.001A (≤60A) ,0.01A (≤600A) , 0.1A (600A< I ≤ 6000A) , 1A (>6000A)
Voltage Output Read-Back Accuracy	0.05% of the rated output voltage
Current Output Read-Back Accuracy	0.1% of the output current + 0.05% of the rated output current (in constant current programming mode, the readback and monitoring accuracy do not include the influence of heating drift and load temperature change rate)
Voltage Read Back Resolution	0.00001V (≤10V),0.0001V (≤100V)
Current Read Back Resolution	0.00001A (≤10A), 0.0001A (≤ 100A), 0.001A (100A< I ≤1000A), 0.01A (I>1000A)

Stability & Temperature Coefficient

Temperature Drift	U: 0.05% I: 0.05% (After 30 minutes of power on at a certain input voltage and load ambient temperature, 8 hours)
Temperature Coefficient	U: 200ppm/°C I: 300ppm/°C (30 minutes after power on)

Protection Function

Protection Function	Output over voltage protection, over current protection, over temperature protection, over power protection

Environmental Condition

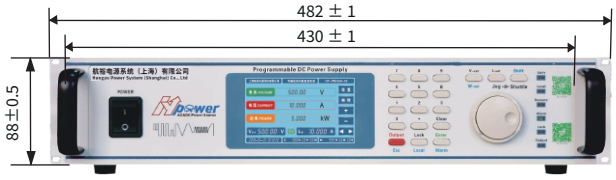
Environment	Indoor use; Installation overvoltage class: II; Pollution level: P2; Class II equipment
Operating Ambient Temperature	0°C to 50°C, optional -10°C to 50°C, -20°C to 50°C
Storage Ambient Temperature	-20°C to 65°C
Working Ambient Humidity	20%-90% RH, no dew formation, continuous operation
Storage Environment Humidity	10% - 95% RH, no dew formation
Altitude Above Sea Level	Above 2000 meters above sea level, every 100 meters up, the power will be reduced by 2%, or reduce the maximum working ambient temperature by 1°C per 100 meters; When not in operation, the altitude can reach 12,000 meters
Cooling	Forced air cooling, intelligent speed regulating fan, front/side air inlet, rear air outlet
Noise	≤ 65dB(A), use 1m to weighted measurement

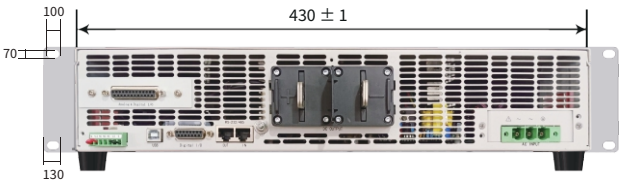
Control Panel

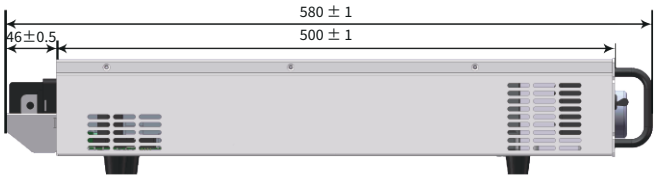
Display	4/7 inch LCD display, touch screen
Control Function	Digital key input, multi-stage adjustment knob (outer ring coarse adjustment/inner ring fine adjustment), output ON/OFF switch, Lock keyboard and touch lock, Reset Restart status indicator (Shift/Local/Remote/Alarm/Lock/Output)
Programming Function	Step, Ladder, Gradient

HY-PHSSU Series Product Appearance

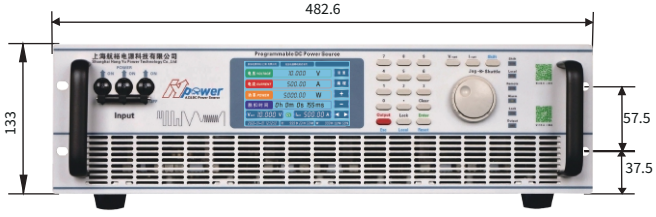
2U model size: 430(W) * 500(D) * 88(H) mm

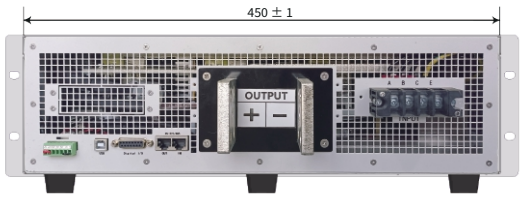


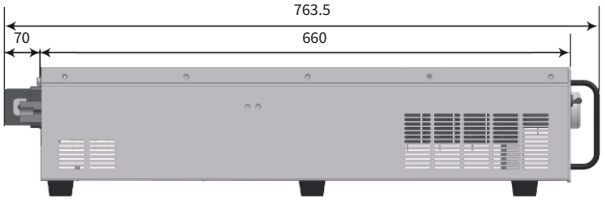




3U model size: 482.6(W) * 660(D) * 133(H) mm

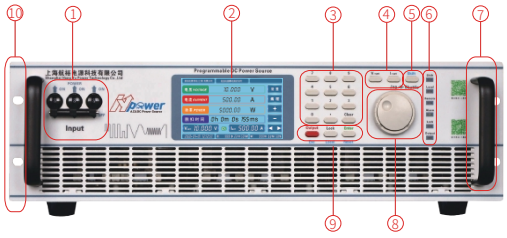




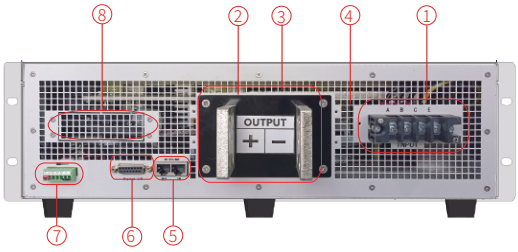


HY-PHSSU Series Control Panel And Display

Control Panel

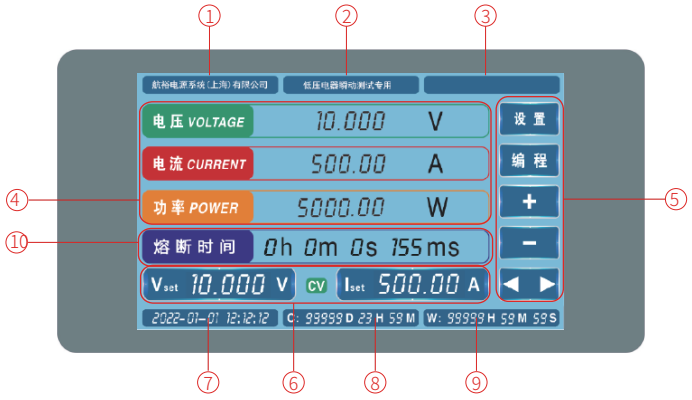


① Power input circuit breaker
② LCD display (4-inch, touch screen)
③ Number input keyboard
④ Voltage/current setting key
⑤ Shift Function reset key
⑥ Status indicator light
⑦ Chassis handle
⑧ Multi-stage adjustment knob (inner circle fine adjustment/outer circle coarse adjustment)
⑨ Lock, Enter, Esc, Local,Reset,Output ON/OFF
⑩ 19 inch standard rack mounting holes



① AC input terminal
② Output copper bar
③ Output protection cover
④ Heat dissipation air outlet
⑤ RS-485 & RS-232 communication interface
⑥ Digital I/O communication interface
⑦ Distal compensation measuring terminal
⑧ Choose to buy communication interface (Choose one of three)
LAN & CAN communication interface
GPIB communication interface
Analog quantity programming and monitoring interface

Display Interface



① Manufacturer's name
② Product name
③ Product series
④ Voltage/current/power read back display area
⑤ Function setting area
⑥ Voltage/Current Setpoints&CV/CC Status
⑦ Current time
⑧ Accumulated running time
⑨ This run time
⑩ Release time measurement display function

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Authorized distributor：