High power and Programmable Switching Power supply

IT6500D Series User Manual

Model: IT6512D/IT6513D/IT6514D/IT6515D/IT6516D/
IT6517D/ IT6522D/IT6523D/IT6524D/IT6525D/
IT6526D/IT6527D/ IT6532D/IT6533D/IT6534D/
IT6535D/IT6536D/IT6537D

Version: V5.0/11,2023

Notices

Manual Part Number

402225

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Safety Notices

CAUTION

A CAUTION sign denotes a hazard. It calls attention to an operating procedure or practice that, if not correctly performed or adhered to, could result in damage to the product or loss of important data. Do not proceed beyond a CAUTION sign until the indicated conditions are fully understood and met.

WARNING

A WARNING sign denotes a hazard. It calls attention to an operating procedure or practice that, if not correctly performed or adhered to, could result in personal injury or death. Do not proceed beyond a WARNING sign until the indicated conditions are fully understood and met.

Note

A NOTE sign denotes important hint. It calls attention to tips or supplementary information that is essential for users to refer to.

Quality Certification and Assurance

We certify that series instrument meets all the published specifications at time of shipment from the factory.

Warranty

ITECH warrants that the product will be free from defects in material and workmanship under normal use for a period of one (1) year from the date of delivery (except those described in the Limitation of Warranty below).

Note

Visit https://www.itechate.com/en/support/register.html to complete product registration by filling out the necessary information to extend the warranty to two (2) years.

For warranty service or repair, the product must be returned to a service center designated by ITECH.

- The product returned to ITECH for warranty service must be shipped PRE-PAID. And ITECH will pay for return of the product to customer.
- If the product is returned to ITECH for warranty service from overseas, all the freights, duties and other taxes shall be on the account of customer.

Limitation of Warranty

This Warranty will be rendered invalid in case of the following:

- Damage caused by circuit installed by customer or using customer own products or accessories;
- Modified or repaired by customer without authorization;
- Damage caused by circuit installed by customer or not operating our products under designated environment;
- The product model or serial number is altered, deleted, removed or made illegible by customer;
- Damaged as a result of accidents, including but not limited to lightning, moisture, fire, improper use or negligence.

Safety Symbols

	Direct current		ON (power)
	Alternating current		OFF (power)
	Both direct and alternating current		Power-on state
	Chassis (earth ground) symbol.		Power-off state
	Earth (ground) terminal		Reference terminal
	Caution		Positive terminal
	Warning (refer to this manual for specific Warning or Caution information)		Negative terminal
	A chassis terminal	-	-

Safety Precautions

The following safety precautions must be observed during all phases of operation of this instrument. Failure to comply with these precautions or specific warnings elsewhere in this manual will constitute a default under safety standards of design, manufacture and intended use of the instrument. ITECH assumes no liability for the customer's failure to comply with these precautions.

WARNING

- **Do not use the instrument if it is damaged. Before operation, check the casing to see whether it cracks. Do not operate the instrument in the presence of inflammable gasses, vapors or dusts.**
- **The instrument is provided with a power cord during delivery and should be connected to a socket with a protective earth terminal, a junction box or a three-phase distribution box. Before operation, be sure that the instrument is well grounded.**
- **Please always use the provided cable to connect the instrument.**
- **Check all marks on the instrument before connecting the instrument to power supply.**
- **Ensure the voltage fluctuation of mains supply is less than 10% of the working voltage range in order to reduce risks of fire and electric shock.**
- **Do not install alternative parts on the instrument or perform any unauthorized modification.**
- **Do not use the instrument if the detachable cover is removed or loosen.**
- **To prevent the possibility of accidental injuries, be sure to use the power adapter supplied by the manufacturer only.**
- **We do not accept responsibility for any direct or indirect financial damage or loss of profit that might occur when using the instrument.**
- **This instrument is used for industrial purposes, do not apply this product to IT power supply system.**
- **Never use the instrument with a life-support system or any other equipment subject to safety requirements.**

WARNING

- **SHOCK HAZARD Ground the Instrument. This product is provided with a protective earth terminal. To minimize shock hazard, the instrument must be connected to the AC mains through a grounded power cable, with the ground wire firmly connected to an electrical ground (safety ground) at the power outlet or distribution box. Any interruption of the protective (grounding) conductor or disconnection of the protective earth terminal will cause a potential shock hazard that could result in injury or death.**
- **Before applying power, verify that all safety precautions are taken. All connections must be made with the instrument turned off, and must be performed by qualified personnel who are aware of the hazards involved. Improper actions can cause fatal injury as well as equipment damage.**
- **SHOCK HAZARD, LETHAL VOLTAGES This product can output the dangerous voltage that can cause personal injury, and the operator must always be protected from electric shock. Ensure that the output electrodes are either insulated or covered using the safety covers provided, so that no accidental contact with lethal voltages can occur.**
- **Never touch cables or connections immediately after turning off the instrument. Verify that there is no dangerous voltage on the electrodes or sense terminals before touching them.**
- **After using the device, turn off the power switch of the device before unplugging the power cord or disassembling the terminals. Do not touch the cable or the terminal immediately. Depending on the model, the dangerous voltage at the plug or terminal is maintained for 10 seconds after the device is switched off. Make sure that there is no dangerous voltage before touching them.**

CAUTION

- **Failure to use the instrument as directed by the manufacturer may render its protective features void.**
- **Always clean the casing with a dry cloth. Do not clean the internals.**
- **Make sure the vent hole is always unblocked.**

Environmental Conditions

The instrument is designed for indoor use and an area with low condensation. The table below shows the general environmental requirements for the instrument.

Environmental Conditions	Requirements
Operating temperature	0°C ~ 40°C
Operating humidity	20% ~ 80%(non-condensation)
Storage temperature	-10°C ~ 70 °C
Altitude	Operating up to 2,000 meters
Installation category	II
Pollution degree	Pollution degree 2

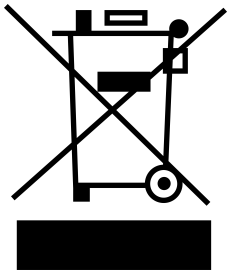
Note

In order to ensure the accuracy of measurement, it is recommended to operate the instrument half an hour after start-up.

Regulation Tag

CE	The CE tag shows that the product complies with the provisions of all relevant European laws (if the year is shown, it indicates that the year when the design is approved).
UKCA	The UKCA tag shows that the product complies with the provisions of all relevant United Kingdom laws (if the year is shown, it indicates that the year when the design is approved).
	This instrument complies with the WEEE directive (2002/96/EC) tag requirements. This attached product tag shows that the electrical/electronic product cannot be discarded in household waste.
10	This symbol indicates that no danger will happen or toxic substances will not leak or cause damage in normal use within the specified period. The service life of the product is 10 years. The product can be used safely within the environmental protection period; otherwise, the product should be put into the recycling system.

Waste Electrical and Electronic Equipment (WEEE) Directive



Waste electrical and electronic equipment (WEEE) directive, 2002/96/EC
The product complies with tag requirements of the WEEE directive (2002/96/EC). This tag indicates that the electronic equipment cannot be disposed of as ordinary household waste. Product Category
According to the equipment classification in Annex I of the WEEE directive, this instrument belongs to the “Monitoring” product.
If you want to return the unnecessary instrument, please contact the nearest sales office of ITECH.

Compliance Information

Complies with the essential requirements of the following applicable European Directives, and carries the CE marking accordingly:

- Electromagnetic Compatibility (EMC) Directive 2014/30/EU
- Low-Voltage Directive (Safety) 2014/35/EU

Conforms with the following product standards:

EMC Standard

IEC 61326-1:2012/ EN 61326-1:2013 [1][2][3]

Reference Standards

CISPR 11:2015+A1:2016 Ed 6.1

IEC 61000-3-2: 2018 RLV

IEC 61000-3-3: 2013+A1:2017

IEC 61000-4-2:2008

IEC 61000-4-3 2006+A1:2007+A2:2010/ EN 61000-4-3 A1:2008+A2:2010

IEC 61000-4-4:2012

IEC 61000-4-5:2014+A1:2017

IEC 61000-4-6:2013+cor1:2015

IEC 61000-4-11:2004+A1:2017

1. The product is intended for use in non-residential/non-domestic environments. Use of the product in residential/domestic environments may cause electromagnetic interference.
2. Connection of the instrument to a test object may produce radiations beyond the specified limit.
3. Use high-performance shielded interface cable to ensure conformity with the EMC standards listed above.

Safety Standard

IEC 61010-1:2010+A1:2016

Content

1 Inspection and Installation

1.1 Verifying the Shipment

Unpack the box and check the contents before operating the instrument. If wrong items have been delivered, if items are missing, or if there is a defect with the appearance of the items, contact the dealer from which you purchased the instrument immediately.

The package contents include:

Item	Qty.	Model	Remarks
power supply	x1	IT6500D series	This series include： IT6512D/IT6513D/IT6514D/ IT6515D/IT6516D/IT6517D/ IT6522D/IT6523D/IT6524D/ IT6525D/IT6526D/IT6527D/ IT6532D/IT6533D/IT6534D/ IT6535D/IT6536D/IT6537D
Power cord	x1	-	Number of the power cords vary depending on the model, See the Section 1.3 Connecting the Power Cord for power cord connection.
USB cable	x1	-	This accessory is selected when the USB interface is used for starting up remote operation.
Ex-factory Test Report	x1	-	It is the test report of the instrument before delivery.

Note

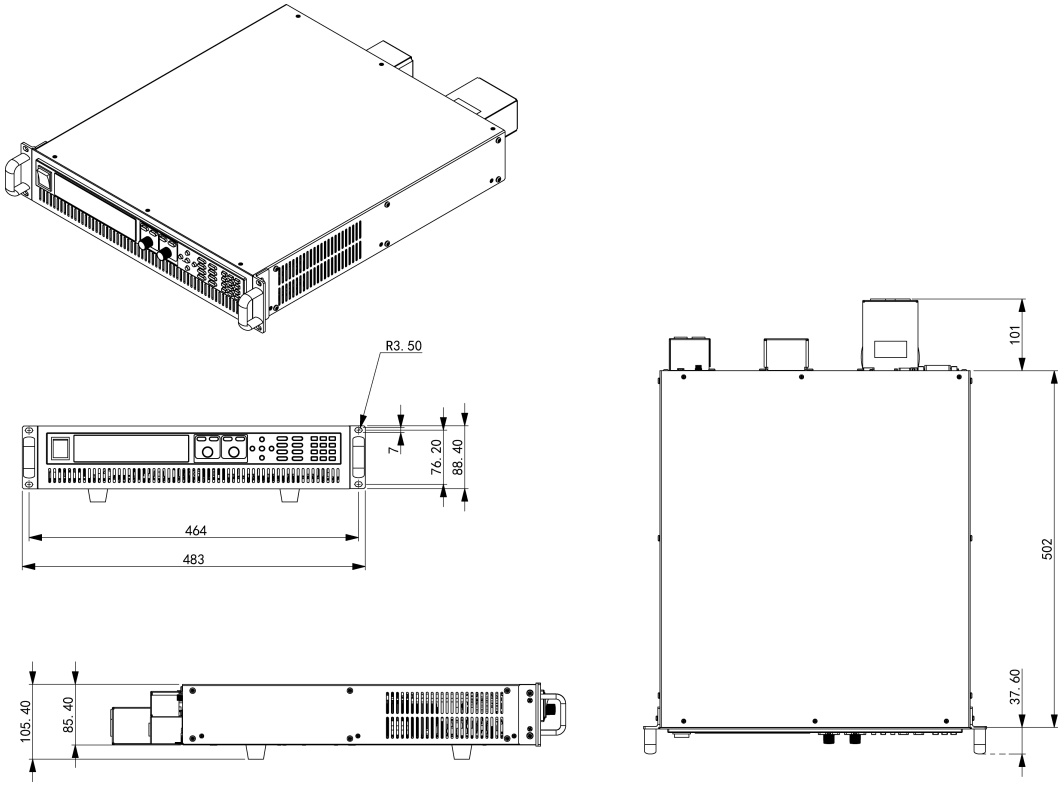
Upon verification of the shipment, keep the package and relevant contents thereof in a safe place. When returning the instrument for warranty service or repair, the specified packing requirements shall be met.

1.2 Instrument Size Introduction

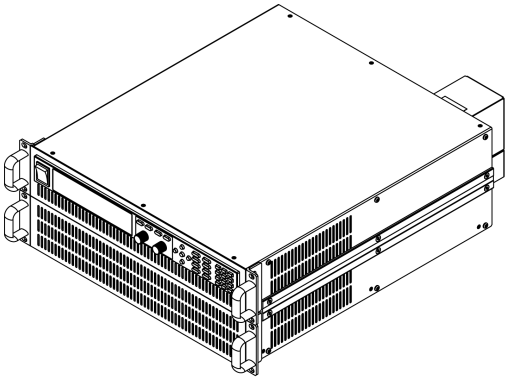
The instrument should be installed at well-ventilated and rational-sized space. Please select appropriate space for installation based on the instrument size.

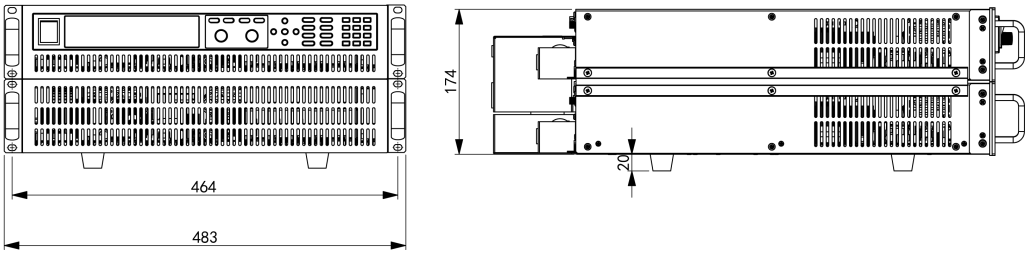
IT6500D series power supply different models are not the same size, the detail size of the power supply are shown as below. (Unit: mm, allowable deviation value: ±1mm)

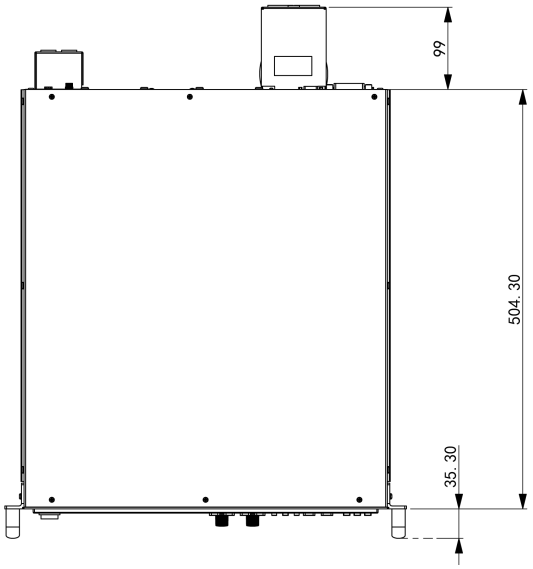
IT6512C/IT6513C/IT6514C/IT6515C/IT6516C/IT6517C/ IT6522C/IT6523C/IT6524C/IT6525C/ IT6526C/IT6527C



IT6532C/IT6533C/IT6534C/IT6535C/IT6536C/IT6537C







1.3 Connecting the Power Cord

AC Power Input Level

IT6500D series contains many models. Different model required different power ratings. Detailed AC input and maximum input apparent power refer to corresponding specification.

Note

IT6500D Series power supply can also work in 110V voltage circumstances. However, the output power is limited. For full-power output, please according to the specification and use 220V±10% voltage or 380V±10% voltage.

Before Connecting the Power Cord

WARNING

- **Before connecting power cord, be sure to confirm that the power voltage matches with the supply voltage.**
- **Before connecting power cord, be sure to switch off the instrument. Power switch is in Off position.**
- **To avoid fire or electric shock, Make sure to use the power cord supplied by ITECH.**
- **Be sure to connect the main power socket to the power outlet with protective grounding. Do not use terminal board without protective grounding.**
- **The instrument rear panel provides a separate screw used for chassis ground. Please make proper connections. In the event of a failure, not using a properly grounded protective earth and grounded outlet may result in personal injury or death due to electric shock.**
- **The power cords supplied with this product is certified for safety. In case the supplied lines assembly needs to be replaced, or an extension lines must be added, be sure that it can meet the required power ratings of this product. Any misuse voids the warranty of this product.**

Power Cord Type and Connecting Method

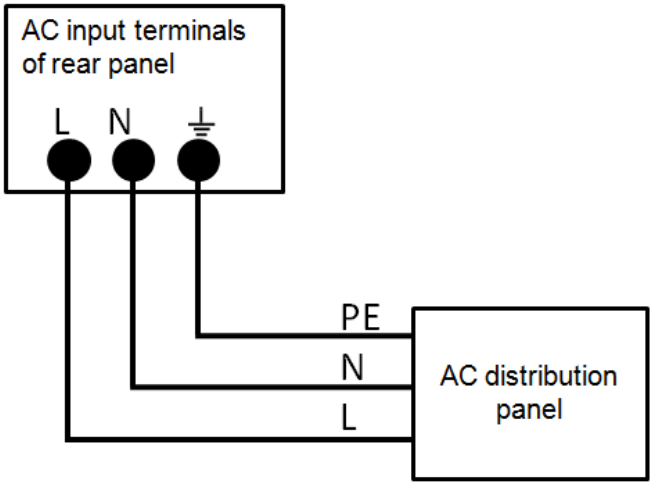
IT6500D series contains many models. Different model is supplied with different power cord. The power cord and connection of different models are introduced as follow.

- IT6512D to IT6537D series power supply provides the standard power cords as below.

  The IT6532D to IT6537D series power supply consist of two power supply units, and ITECH provides two power lines during delivery. The user needs to connect each power supply unit to the AC 220V power source.

  Connecting Method:

1. See the below illustration, one end of the AC power cord is connected to the AC input terminal in the rear board of the power supply. Connect the fire wire, zero line and ground to the corresponding terminal of the device.
2. Connect the plug on the other end of the power cord to your AC 220V power source. Connect the three terminals brown to line (L), blue to neutral (N), and yellow-green to ground (PE) on the other end of the power cord to your AC distribution panel.



1.4 Connecting the Device Under Test (DUT)

Precautions

To prevent electric shock and damage to the instrument, observe the following precautions.

WARNING

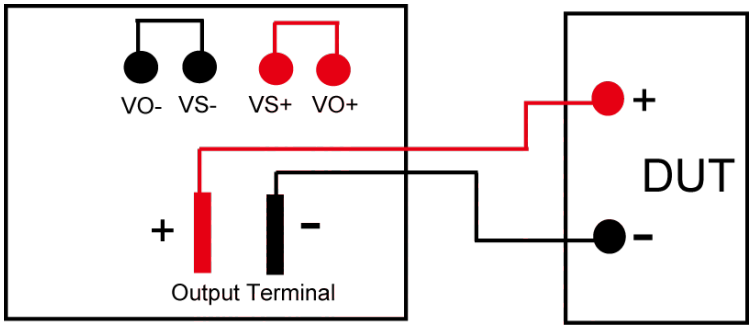
- **Before connecting test cables, be sure to switch off the power supply. Power switch is in Off position, otherwise touching the output terminals on the rear panel may result in personal injury or death due to electric shock.**
- **To avoid electrical shock, before testing, please make sure the rating values of the testing lines, and do not measure the current that higher than the rating value. All test lines shall be capable of withstanding the maximum short circuit output current of the power supply without causing overheat.**
- **If several loads are provided, each pair of load wires shall safely withstand the rated short circuit output current of the power supply under full load.**
- **To avoid battery short circuit, be sure to check that the test line end is not connected when connecting or disassembling the test line. When the test line end is connected with battery, short circuit may cause severe accident.**
- **Always use test lines provided by ITECH to connect the equipment. If test lines from other factories are used, please check that the test line can withstand maximum current.**
- **During wiring, check that the anode and cathode of the test lines are properly and tightly connected; anode ON and cathode OFF are prohibited.**

Specification

Test cables are not standard accessories for the instrument. Please select optional red and black test cables for individual sales based on the maximum current value. For specifications of test cables and maximum current values, refer to the A.1 Specifications of Red and Black Test Cables in chapter A Appendix for more information.

Local Measurement

The connection diagram and steps of local sensing are as follows:



1. Remove the output terminal cover.
2. Connect the Vo+ and Vs+, Vo- and Vs- for short circuit using the short clips on the back panel of the instrument or electric wire. When using local sense, the remote sense terminal cannot be disconnected.

   Note

   Do not disconnect the wires if remote sense is not used. Doing so will cause erratic behavior and may damage the power supply under certain conditions

3. Loosen the screws of the output terminals and connect the red and black test cables to the output terminals. Re-tighten the screws.

   When maximum current that one test cable can withstand fails to meet the current rated current, use multiple pieces of red and black test cables. For example, the maximum current is 1,200 A, then 4 pieces of 360 A red and black cables are required.

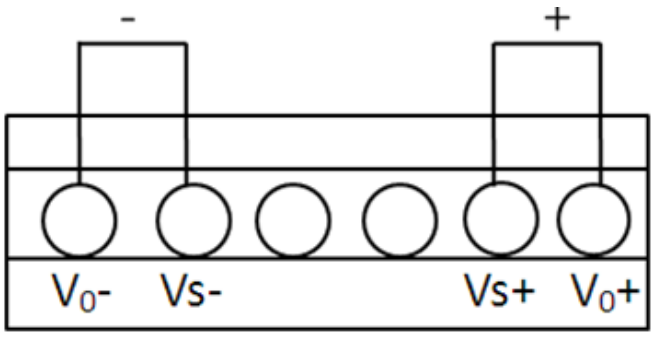
4. Install the output terminal cover.
5. Directly connect the other end of the red and black cables to the DUT.

Remote Sensing

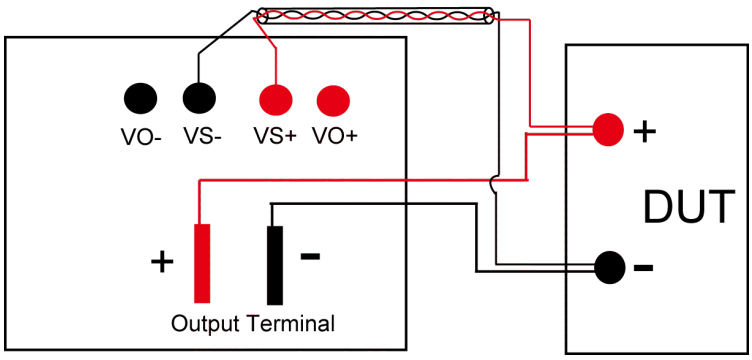
If the tested instrument consumes large current, a large voltage drop will be detected in connection line between tested instrument and power supply terminal. To ensure measurement accuracy, a remote sense measurement terminal Vs+ and Vs- are provided at power supply rear panel to compensate voltage drop lost in wire.

When the power supply is used for measuring battery charge in actual applications, the voltage drop of the wire will lead to voltage inconsistency of both ends and inconsistency of the cutoff voltage of power supply and the actual voltage of battery, resulting in inaccurate measurement.

The sense terminal of rear panel diagram as follows:



The connection diagram and steps of remote sensing are as follows:



1. Remove the output terminal cover.
2. Disconnect the wires/short clips between Vo+ and Vs+, Vo- and Vs-.
3. Use armored twisted-pair cables to connect the remote sense terminals and the equipment under test.
4. Loosen the screws of the output terminals and connect the red and black test cables to the output terminals. Make proper connection of the chassis ground. Re-tighten the screws.

   When maximum current that one test cable can withstand fails to meet the current rated current, use multiple pieces of red and black test cables. For example, the maximum current is 1,200 A, then 4 pieces of 360 A red and black cables are required.
5. Install the output terminal cover, leave the other end of remote sense cables and the red and black cables outside.
6. Connect the other end of the remote sense cables and the red and black cables to the DUT.

Note

To ensure the stability of the system, use armored twisted-pair cables between the remote sense terminals and the equipment under test.

2 Quick Reference

This Chapter will introduce power-on check steps of this series to ensure normal start-up and usage under initialization status of the power. Besides, to facilitate usage, this part also displays the functions of front board, rear board and key-board keys as well as display functions to a quick view of power appearance, structure and key usage functions before operation.

2.1 Brief Introduction

IT6500D series power supply is single output high-powered and programmable DC power supply which support CC mode and CV mode. It also has a super wide range of voltage and current applications. The whole series include more than 100 models. The maximum output voltage and current is up to 1000V and 1200A respectively. Users can choose the power supply that fits their testing requirements perfectly.

IT6500D series power supply is featured with:

- Low ripple and low noise
- High Resolution Display
- High visibility vacuum fluorescent display (VFD)
- Supporting with CV /CC /CP modes
- parallel function, active current averaging and expandable power output capacity
- Sequence programming (List mode)
- Adjustable rising time and falling time speed and independent time setting in various mode
- OVP, current limit protection, OCP, OTP and Vsense battery reverse protection
- Match the output reverse protection module to realize the anti-reverse protection (optional)
- Analog Control Interface and remote sense

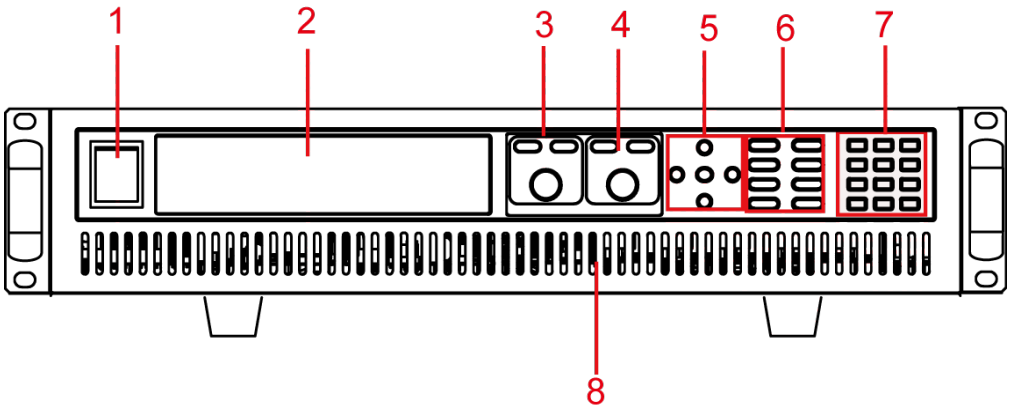
- Built-in RS232/USB/GPIB /LAN/CAN standard interfaces

Model	Voltage	Current	Power	Height
IT6512D	80V	120A	1800W	2U
IT6513D	200V	60A	1800W	
IT6514D	360V	30A	1800W	
IT6515D	500V	20A	1800W	
IT6516D	750V	15A	1800W	
IT6517D	1000V	10A	1800W	
IT6522D	80V	120A	3KW	
IT6523D	200V	60A	3KW	
IT6524D	360V	30A	3KW	
IT6525D	500V	20A	3KW	
IT6526D	750V	15A	3KW	
IT6527D	1000V	10A	3KW	
IT6532D	80V	240A	6KW	4U
IT6533D	200V	120A	6KW	
IT6534D	360V	60A	6KW	
IT6535D	500V	40A	6KW	
IT6536D	750V	30A	6KW	
IT6537D	1000V	20A	6KW	

2.2 Front Panel Introduction

The 2U models of IT6500D Series power supply have the same front panels. Other models have the same panels as 2U Model. The front panel diagram and function key diagram of 2U Model are as follows.

2U Model



1 Power Switch
2 VFD Screen
3 pulsating knob to control voltage, coarse button,fine button
4 pulsating knob to control current, coarse button,fine button
5 direction key and OK key
6 function keys and composite key
7 numeric key and Esc key
8 Vent hole

2.3 Keyboard Introduction

IT6500D series power supply different models are same the key function in front board, schematic graph as follow.

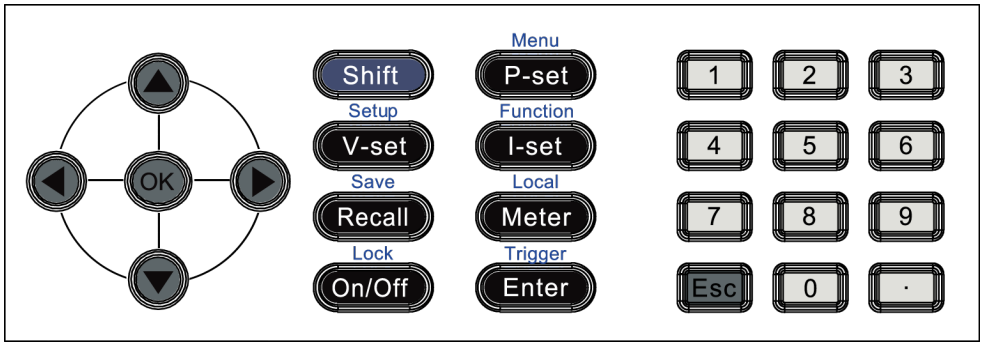


Table 2–1 Detailed description of keys

Key Name	Description
0-9	Numeric button
[Shift]	Composite key
[P-set]	Power setting button, used to set the output power value of power supply

Key Name	Description
[V-set]	Voltage setting button, used to set the output voltage of power supply
[I-set]	Current setting button, used to set the output current value of power supply
[Recall]	Callback button, used to recall a saved setting parameter
[Meter]	Meter button, used to switch the display between actual value and setting value
[On/Off]	Ouput on/off button, used to control the output status of power supply
Left and right direction button	Left and right direction button, used to adjust the location of the cursor
Up and down direction button	Up and down direction button, used to select the items of the menu or increase(decrease) the output voltage and current value
[Enter]	Confirm button, used to confirm the setting numbers or functions
[Esc]	Return key, used to cancel the setting or return previous menu level
.	Dot

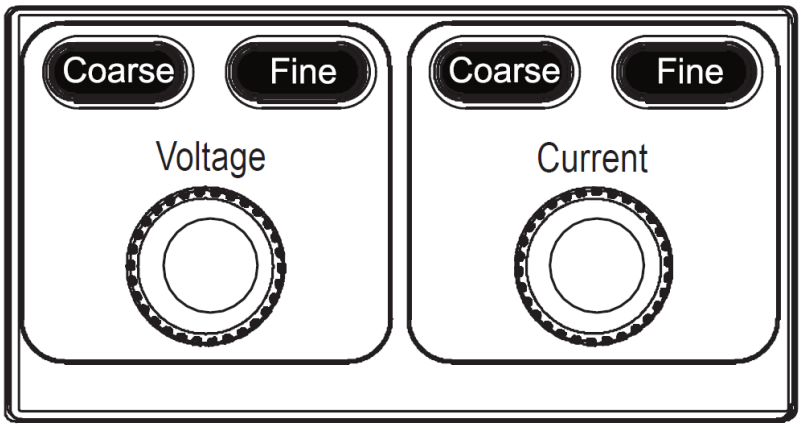
Composite key **[Shift]**, combined with other keys to realize functions marked above keys. The detailed functions are listed as follows.

Keys	Description
[Shift]+[P-set](Menu)	Enter the system and config menu
[Shift]+[V-set](Setup)	Enter the setup menu
[Shift]+[I-set](Function)	Enter the Function menu
[Shift]+[Recall] (Save)	Saves the present settings
[Shift]+[Meter] (Local)	In remote control, press **[Shift]+[Meter]** (Local) keys to switch the instrument to local control mode

Keys	Description
[Shift]+[Enter] (Trigger)	Generate a local trigger signal
[Shift]+[On/Off] (Lock)	Turn the keyboard lock on or off.

2.4 Rotary Knob and Coarse/Fine Button Introduction

IT6500D series power supply is supplied with the voltage adjustment knob and the current adjustment knob, as shown below.



Adjust the voltage or current set value

The voltage knob or the current knob is used to adjust the voltage set value or current set value. Rotate the knob clockwise to increase the set value and anticlockwise to decrease the set value.

- The user can press the **[Coarse]** button and then rotate the knob to adjust the set value in integer bit. The step size of Coarse adjustment is 10. You can press left and right navigation key to move the cursor position.
- The user can press the **[Fine]** button and then rotate the knob to adjust the set value in decimal bit. The step size of Fine adjustment is 0.1. You can press left and right navigation key to move the cursor position.

Select the menu item

The voltage adjustment knob can be used to select the menu item. Press **[Shift]+ [P-set]**(Menu) to enter the menu interface and then rotate the voltage adjustment knob to select the menu item from left to right.

2.5 VFD Indicator Lamps Description

IT6500D series power supply VFD indicator lamps description as follows:

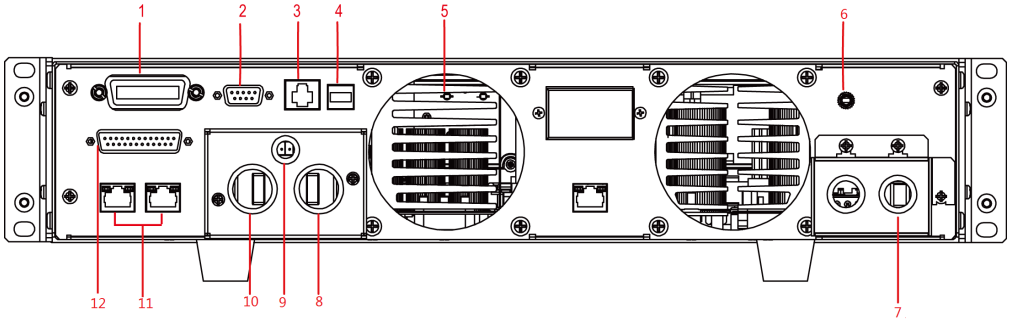
Table 2–2 Function VFD indicator lamps description

Flag	Function Description	Flag	Function Description
OFF	Power supply in off mode	CR	None
CV	Power supply in CV mode	Sense	None
CC	Power supply in CC mode	Auto	None
*	Open the keylock function	Addr	When received command successfully, the flag will display 3 seconds.
Rear	“Meter” button in on mode	Rmt	Remote control mode
Shift	using composite function	Error	Error occur
SRQ	Serial request query	Prot	Protections occur
CW	Power supply in CP mode	Trig	Power supply in triggering state

2.6 Rear Panel Introduction

Different models have same rear panels as 2U Model except system bus and AC input terminal. The rear panel of 2U model is shown as below.

2U Model



No.	Name	Description
1	GPIB interface	GPIB connector interface. Can be selected to use from front panel menu.
2	RS232 interface	RS232 connector interface. Can be selected to use from front panel menu.
3	LAN interface	LAN connector interface. Can be selected to use from front panel menu.
4	USB interface	USB connector interface. Can be selected to use from front panel menu.
5	Fan	Fan for cooling the device.
6	Ground screw	Ground screw for making chassis ground connections
7	AC power input socket and cover	Used to connect AC power to start instrument
8	The positive terminal of output	The positive terminal of output for connecting DUT.
9	Sense terminals	Remote sense terminals, used for maximizing measurement accuracy
10	The negative terminal of output	The negative terminal of output for connecting DUT
11	System bus	Used for communication between instruments in parallel operation
12	Analog interface and CAN interface	Analog interface and CAN interface

2.7 Power-on Selftest

A successful selftest indicates that the purchased power product meets delivery standards and is available for normal usage.

Before operation, please confirm that you have fully understood the safety instructions.

WARNING

- **To avoid burning out, be sure to confirm that power voltage matches with supply voltage.**
- **The system bus interface is not isolated from the output electrode. After power on, it is not allowed to insert or pull out the bus and terminal matching resistance.**

Power Switch Introduction

User can adjust the power switch directly to turn on or turn off the instrument.

The status of Power switch is as follows.

On Off On Off

If the instrument is the cabinet type, the rear panel of the cabinet provides a master power switch. The relationships between the device status and switch status are listed in the following table.

Master switch status	Desperate switch status	Device status
On	On	On
On	Off	Off
Off	On	Off
Off	Off	Off

Selftest steps

Normal selftest procedures:

1. Correctly connect the power cord. Press **Power** key to start up.
2. After selftest, VFD displays the output voltage and current status.

Error Information References

The following error information may occur when an error occurs during Power On self-test:

Error message	Meaning
Eeprom Failure	The EEPROM is damaged.
Mainframe Initialize Lost	The system setting data is lost.
Calibration Data Lost	The calibration data in EEPROM is lost.
Config Data Lost	The latest operation state of the power supply is lost.
NETWORKING…	The parallel operations are abnormal and can't finish the networking.

Exception Handling

If the power supply cannot start normally, please check as below steps.

1. Check whether the power cord is correctly connected and confirm whether the power supply is powered.
2. Check whether the power turn On. Power key is under **"I " "ON"** status.
3. Check whether the power voltage matches with the supply voltage. Please refer to corresponding specification to select proper AC input.
4. Check whether the terminal resistance (plug) of the system bus is correctly installed, before checking, confirm the alarm information have read.

   If no, Please re-install the terminal resistance. For 2U model, insert the terminal resistance at any end of the system bus interface. For other models, insert the terminal resistance to the bus Input of the first power supply system and the bus Output of the last power supply system.
5. When error information prompts at startup, Press **[Esc]** key to see whether present fault state can be cleared. Or, the user can attempt to clear the fault state by restarting the instrument. Do not restart the instrument until it is completely powered down. If not, contact ITECH engineer.

3 Function and Features

This chapter describes in detail the use of the front-panel keys and shows how they are used to accomplish instrument operation. This chapter is divided into the following sections:

3.1 Setting Voltage

The constant voltage range is from 0V to the maximum voltage value. It is very easy for you to set the constant voltage output. When you press **[V-set]**, this button will be lit and you can set the constant value. You have 3 solutions to set the constant voltage value.

- Directly input through number keys. Input the value you want to set and then please press **[Enter]** or **[OK]** button to confirm.
- Using knob to set value. Press **[V-set]** button, press **[Coarse]** button (-coarse adjustment, change the value in integer bit) or **[Fine]** button (fine adjustment, change the value in decimal bit), and then rotate the knob to set the value.
- Using left and right direction key to set value. Press **[V-set]** button Press **[Coarse]** button (coarse adjustment, change the value in integer bit) or **[Fine]** button (fine adjustment, change the value in decimal bit), move the cursor by left and right keys, then to adjust values through ▲and▼.

3.2 Setting Current

The constant current range is from 0A to the maximum current value. It is very easy for you to set the constant current output. When you press **[I-Set]**, this button will be lit, and you can set the constant current value. You have 3 solutions to set the constant current value.

- Directly input through number keys. Input the value you want to set and then please press **[Enter]** or **[OK]** button to confirm.
- Using knob to set value, Press **[I-set]**button, press **[Coarse]** button (coarse adjustment, change the value in integer bit) or **[Fine]** button (fine adjustment, change the value in decimal bit), and then rotate the knob to set the value.
- Using left and right direction key to set value. Press **[I-set]**button, press **[Coarse]** button (coarse adjustment, change the value in integer bit) or **[Fine]** button (fine adjustment, change the value in decimal bit), move the cursor by left and right keys, then to adjust values through ▲and▼.

3.3 Setting Power

The constant current range is from 0W to the maximum power value. It is very easy for you to set the constant power output. When you press **[P-set]**, this button will be lit. Then you can input the power value by numeric and press **[Enter]** or **[OK]** button to confirm.

3.4 Output On/Off Button

[On/Off] button is used to control the output state of power supply. If **[On/Off]** button is lit, this represents output is open. And in on mode, the indicator lamp (CC/CV/CW) will be lit.


Note

Please ensure that the DC source and product under test have been connected well before you press**[On/Off]** button.

3.5 Switching Setting Value and Actual Value

[Meter] button is used to switch the display between actual value and setting value. When **[Meter]** button is lit, this represents that VFD board display is actual value. Reversely, if **[Meter]** button is dark, VFD board display is corresponding to setting value.

This option allows users to enable an internal fixed timer delay (5 seconds) for the power supply to automatically switch from setting display to measured display. When enabled, if the power supply output state is ON (enabled) and if the display shows setting voltage and current, it will automatically switch to measured voltage and current display after 5 seconds. Factory default is Off status.

3.6 Switching Local/Remote Mode

Power supply provides local and remote modes. The two modes can be switched through communication commands. The default setting is local mode.

- Local mode: use press keys on the power supply front panel to operate.
- Remote mode: connect the power supply with PC, and operate power supply through PC. When it's remote mode, only **[On/Off]**, **[Meter]**, **[Shift]+[Meter]** (Local) work, with all the other panel keys not working. It can be switched to local mode by **[Shift]+[Meter]** (Local) . The power supply's output parameters won't be influenced when mode is switched.

3.7 Key Lock Function

[Shift]+[On/Off] (Lock) button can enable you to lock the front panel buttons, then VFD will display "*". In keylock mode, all buttons will not work except for **[On/Off]**, **[Meter]** and **[Shift]** buttons. Re-press **[Shift]+[On/Off]** (Lock) button will release the keylock function.

3.8 Save/Recall Operation

IT6500C can enable you to save some frequently-used parameters in nonvolatile memory up to 100 sets, so that you can recall the parameters quickly. The following ways can help you achieve the save and recall operations: by pressing composite button **[Shift] +[Recall]** (Save) button or

through command *SAV,*RCL.Save operation should work in with GROUP. Each GROUP can save 10sets, and there are 10 GROUP from 0-9.

Saved contents include as follows. You can also save the maximum and minimum values of the power supply.

- voltage set value of source
- current set value of source
- power set value of source
- maximum and minimum values of source
- State of load

3.8.1 Setting Group Number

To use the save and recall function, firstly, the user need to specify the Group number in the menu. The procedures are as follows.

1. Press composite keys **[Shift]+[P-set]**(Menu) to enter system menu.
2. Select **SYSTEM**, press **[Enter]**.
3. Select **Memory** with Left/Right key and press **[Enter]** to confirm.
4. Press numeric keys to set the Group value: Group=0.
   - Group=0: indicates save (recall) power source parameters in 0-9 sets.
   - Group=1: indicates save (recall) parameters in 10th -19th sets. Under this condition, number “1” represents to save or recall the 10th parameters. Number “2” represents to save or recall the eleventh parameter and so on.
   - Group=2 ~ Group=9 can be understood in the same manner.

3.8.2 Save Operation

Save the parameters to nonvolatile memory. The procedures are as follows.

1. Using composite key **[Shift]+ [Recall]**(Save) to save parameter.
2. The screen prompt "Save data to bank=0", directly input the location number through number keys.
3. Press **[Enter]**, save the preset value into specified memory region.

3.8.3 Recall Operation

Recall the saved parameters from specified memory region.

1. Press **[Recall]** key and recall the saved parameters.
2. The screen prompt "Recall data from bank=0", directly input the location number through number keys.
3. Press **[Enter]**, recall the parameters.

3.9 System Menu

Press the composite key **[Shift]+[P-set]**(Menu) to enter the menu function. At this time, VFD displays optional menus. Scroll the VFD screen with Left/Right key or knob, and the following functions will appear in sequence. Press **[Enter]** to enter function options where the screen display locates. Press **[Esc]** to return to previous menu.

Menu	Menu setting		
SYSTEM	System menu		
	Reset	Restore to factory defaults	
	Power-On	Set power on parameters	
		Rst(Def)	Initialize the system
		Sav0	Remain last shutdown parameters
	Trigger	Set the trigger mode	
		Manual(Def)	Manual trigger
		Bus	Bus trigger
		Ext	External trigger
	Memory	Work with Recall(Save) button to recall 100 sets saved parameters	
		Group = 0	0: represents 0-9 sets; 1: represents 10-19 sets, by parity of reasoning
	Buzzer	Set the buzzer function	
		On(Def)	enable the buzzer function
		Off	disable the buzzer function
	Commu-nication	Select the communication interface	
		RS232	Select RS232 communication interface

			Baud rate: 4800/9600/19200/38400/57600/115200
			Data bit: 8
			Parity bit: None/ E (Even parity)/O (Odd parity)
			Stop bit: 1/2
			Addr: Address=1
		USB(Def)	Select USB communication interface
		GPIB	Select GPIB communication interface
			Address= 15 Set the communication address (1 -30)
		LAN	Select LAN communication interface
			Info:The information of LAN
			LAN Status
			IP Mode
			IP Addr
			SubNet
			Gateway
			DNS1 (Primary address)
			DNS2 (Secondary address)
			MAC：8C:C8:F4:40:01:E1
			MDNS Status
			HostName
			HostDesc
			Domain
			TCPIP::INSTR
			Socket Port
			Config: Configure LAN information.
			IP-Mode: Set IP mode. Auto/Manual
			Server-Config: Configure the LAN services.
			MDNS：mDNS service state. Off /On
			PING：Ping service state. On/Off
			telnet-scpi：telnet service state. On/ Off

				Web: web service state. On/Off
				VX-11VXI-11 service state. On/Off
				Raw-socket: RAWSocket service state. On/Off。
				Restore: Select whether to reset the LAN to the default settings or not. And the settings take effect after restart.
				Reset: Select whether to confirm the LAN setting or not. And the settings take effect after restart.
		CAN		Select CAN communication interface
				250K: Baud rate
				Addr: address of power supply
				Prescaler: Prescaler
				BS1 Value: Not settable
				BS2 Value: Not settable
	Return-Meter	Enables automatic delay to switch display from setting to measured value (meter).		
		Off(Def)		Auto return Meter function disabled.
		On		Auto return Meter function enabled
	P-Out	Power whether power supply was on		
		Off(Def)		After power on, the instrument will be in the off state.
		Last		If output was on prior to turning the power off, the ON state will be resumed after power on.
CONFIG	Config menu			
	Load-Status		Setting the load status.	
		Load		
			Off(Def)	Load function is switched off.
			On	Load function is switched on.
		Static-Curr	Setting the static current when output is Off	
			Off	Turn off static current function (-avoid current flow-backward)
			On(Def)	Turn on static current function (-clear voltage mantissa)
	Monitor		10V(Def)	10V monitoring mode options

		5V	5V monitoring mode options
	Ext- Ctrl	External control mode and related parameter setting	
		Voltage(Def)	Voltage setting mode selection
		10v/5v	10V or 5V setting mode selection. select by left/right key.
		Resistance	Resistance setting mode selection.
		10k/5k	10K or 5K setting mode selection, select by left/right key.
		Off	Disable or enable this function. Select by up/down key.
		On	
	Parallel	Parallel mode set up	
		Single	Single mode
		Master	Act as a master mode
			Master Mount: Master Mount: total number of instruments in parallel.
		Slave	Act as a slave mode
	Filter	Set the display filter frequency of the power supply	
		Low	Low speed frequency
		Mid(Def)	Middle speed frequency
		Fast	High speed frequency
INFO	Product information		
	Model	Model of power supply	
	Ver	Software version	
	SN	Serial number	
	Last Cal	calibration information for last time	

Note

Press **[Shift]+[P-set]**(Menu) to view the menu items, press **[Esc]** to quit menu operation.Besides, press **[Esc]** button can enable you quit the function operation state.

3.9.1 Restored to Factory Setting(Reset)

This option is used to restore all settings in the system menu to factory setting values.

1. Press composite keys **[Shift]+[P-set]**(Menu) enter to system menu.
2. Select **SYSTEM**, Press **[Enter]**.
3. Select **Reset**, Press **[Enter]**key, restore to factory setting values

The default value for system menu as follows.

Menu Parameter	Default Value
Power-On	Rst(Def)
Trigger	Manual(Def)
Memory	Group = 0
Buzzer	On(Def)
Communication	USB(Def)
ReturnMeter	Off(Def)
P-Out	Off(Def)
Load	Off(Def)
Static-Curr	On(Def)
Ext- Ctrl	Voltage(Def)/10V(Def)
Parallel	Single
Filter	Mid(Def)

3.9.2 Power On Parameter(Power-on)

When the power-on parameter is set as Rst, at each time of power on, the set parameters of the power supply will be 0V, 0.5A (The current set value of different models are different.) and the power rated value. The parameter setting values under Setup and Function menus will also be restored to initial values.

Rst will not initialize the system setting and configuration setting. If Sav0 is selected, the parameters will be all setting values at the time of last power-off, including output setting values of the power supply.

3.9.3 Trigger Mode (Trigger)

Trigger is used for trigger the output of voltage, current and power, and there're three kinds of trigger options: Manual, Bus, and Ext. The default settings is Manual.

1. Press composite keys **[Shift]+[P-set]**(Menu) enter to system menu.
2. Select **SYSTEM**, press **[Enter]** to confirm.
3. Select **Trigger** with Left/Right key and press **[Enter]** to confirm.
4. Select trigger source with Left/Right key and press **[Enter]** to confirm.
   - Manual: the trigger signal will be given by composite keys **[Shift]+[Enter]**(Trigger).
   - Bus: bus trigger mode.
   - Ext: external signal trigger.

3.9.4 Key Sound Set (Buzzer)

This item can set the buzzer state. On option indicates that when you push buttons, the buzzer will sound. Off option indicates that the buzzer function is disabled. Factory default is On option.

1. Press composite keys **[Shift]+[P-set]**(Menu) enter to system menu.
2. Select **SYSTEM**, press **[Enter]** to confirm.
3. Select **Buzzer** with Left/Right key and press **[Enter]** to confirm.
4. Select **On** or **Off**, the buzzer will change state.

3.9.5 Communication Set (Communication)

Under this item, you can set the concrete communication mode. This unit has provided multiple communication interfaces: RS232/USB/GPIB/LAN/CAN. The customer can choose any one according to his demands.

1. Press composite keys **[Shift]+[P-set]**(Menu) enter to system menu.
2. Select **SYSTEM**, press **[Enter]** to confirm.
3. Select **Communication** with Left/Right key and press **[Enter]** to confirm.
4. Select RS-232/USB/GPIB/LAN/CAN，and press **[Enter]** to confirm.

   Please ensure the configuration consistency between our instrument and PC, so that you could have a successful communication.
   - Select RS-232: The baudrate options of RS232 are 4800, 9600, 19200, 38400, 57600, 115.2K. Data bit is 8bits. Parity bit has three options: NONE, ODD, EVEN.
   - Select GPIB: The GPIB are addressable from 1-30.

- Select CAN: The baudrate options are 20K(20K, 40K, 50K, 80K, 100K, 125K, 150K, 200K, 250K, 400K, 500K, 500K), the address: 1-127

5. After set, press the **[Esc]** to return.

3.9.6 Return to Meter state (Return Meter)

This option allows users to enable an internal fixed timer delay (5 seconds) for the power supply to automatically switch from setting display to measured display. When enabled, if the power supply output state is ON (enabled) and if the display shows setting voltage and current, it will automatically switch to measured voltage and current display after 5 seconds.

1. Press composite keys **[Shift]+[P-set]**(Menu) enter to system menu.
2. Select **SYSTEM**, press **[Enter]** to confirm.
3. Select **ReturnMeter** with Left/Right key and press **[Enter]** to confirm.
4. Select **On** or **Off**with Left/Right key and press **[Enter]** to confirm.

3.9.7 Power On Output State (P-OUT)

This item can set the power on output state. If you select Last item, that indicates the power on output state is the same with output state before this item is set. If you select Off item, unit will automatically in off mode when you power on. Factory default is Off option. And this setting is effected by Power-on, and take effect when the Power-on set to Save0.

1. Press composite keys **[Shift]+[P-set]**(Menu) enter to system menu.
2. Select **SYSTEM**, press **[Enter]** to confirm.
3. Select **P-Out** with Left/Right key and press **[Enter]** to confirm.
4. Select **Last** or **Off**with Left/Right key and press **[Enter]** to confirm.

3.9.8 Load Setup Option (Load)

The power supply has an internal dummy load that can be enabled to increase the speed of the voltage fall time for high speed test applications. Default setting is Off status.

- When used to charge the battery, the Load status must be set to off. Keeping the load function turned on will cause the battery not to be fully charged.
- when used to adjust the rise time and the fall time speed, the Load status must be set to On. The default value of sink current is 0.5A, and the power rated value is 150W.

1. Press composite keys **[Shift]+[P-set]**(Menu) enter to system menu.

2. Select **CONFIG**, press **[Enter]** to confirm.
3. Select **Load-Status** with Left/Right key, and press **[Enter]** to confirm.
4. Select **Load** with Left/Right key, and press **[Enter]** to confirm.
5. Select **On** or **Off** and press **[Enter]** to confirm.

3.9.9 Setting Filter

This option sets the display filter frequency of the power supply. The filter function of this series of power supply is averaging calculation. The average values of different frequencies are different, as shown below: Low: 2^16; Mid: 2^14; High: 2^8.

1. Press composite keys **[Shift]+[P-set]**(Menu) enter to system menu.
2. Select **CONFIG**, press **[Enter]** to confirm.
3. Select **Filter** with Left/Right key and press **[Enter]** to confirm.
4. Select **Low**, **Mid** or **Fast** with Left/Right key and press **[Enter]** to confirm.

3.10 Setup Menu

Related power supply parameters can be set in Configuring Menu. Details are as follows:

- Voltage/current/power slope
- OVP/OCP/OPP
- Maximum and minimum values of voltage/current/power

Setup	Source	Configure menu		
		Slope	Set the slope	
			V-Rise: voltage rise slope	
			V-Fall: voltage fall slope	
			I-Rise: current rise slope	
			I-Fall: current fall slope	
			P-Rise: power rise slope	
			P-Fall power fall slope	
		OVP	Over voltage protection	
			On	Enable over voltage protection function
				V: OVP value
				Delay: delay time of protection

			Off	Disable over voltage protection function
		OCP	Over current protection	
			On	Enable over current protection function
				I: OCP value
				Delay: delay time of protection
			Off	Disable over current protection function
		OPP	Over power protection	
			On(Def)	Enable over power protection function
				P: OPP value
				Delay: delay time of protection
			Off	Disable over power protection function
		Limit	V-Max	Maximum voltage setting
			V-Min	Minimum voltage setting
			I-Max	Maximum current setting
			I-Min	Minimum current setting
			P-Max	Maximum power setting
			P-Min	Minimum power setting

3.11 Setting Output Rise Time/Fall Time

Rise/fall time is the time taken for one voltage point to rise/fall to the other under the output status is ON. When view the fall time that voltage falls to 0V, set 0V through **[V-set]**. After press **[Enter]** to confirm, voltage will fall based on the set fall time.

This series of power supply is supported the rise and fall times in all modes , the range of time is 0.001S to 24H.

1. Press **[Shift] + [V-set]**(Setup) to enter power supply setting screen.
2. Select "**Source**", press **[Enter]**.
3. Select **Slope**.

   You can set the rise/fall times for voltage, current and power. The unit is second (S). Each setting can be selected through the Up/Down key. Adjust

the rise time through the numeric key, Up/Down key or knob. After input, then press **[Enter]** or **[OK]** for confirmation.

- V-Rise/ V-Fall: Voltage rise/fall slope.
- I-Rise/ I-Fall: Current rise/fall slope.
- P-Rise/P-Fall: Power rise/fall slope.

Note

The drop rate of the voltage is affected by the internal load. Enable the internal load to get the drop rate of the voltage up. Please refer to 3.9.8 Load Setup Option (Load) for more detailed setting.

3.12 Protection Function

IT6500DSeries provides OVP, OCP, OPP for power supply . In addition, this power supply also provides OTP, Sense reverse protection, power-down protection and input under-voltage protection. In case of protection, please check fault reason and remove fault. Press the **[Esc]** key to disarm protection status.

OVP

User can enable the over voltage protection function and set the protection value in setup menu, Over Voltage Protection will be triggered when the voltage exceeds the protection value. Many reasons could cause over voltage protection. For example: caused by internal defect, misoperation or too high external voltage.

- The protection value smaller than set value
- Input too high external voltage
- Internal defect

Once the power supply is over voltage protected, will the output be shut down at once, and “Prot” indicator lamp will be lit, and prompt “Over Voltage” will be displayed on VFD screen. Please avoid inputting a external voltage higher than 120% rated value, or the instrument will be damaged. When the power source is in OVP state, you should check the external cause firstly. When the external factors are excluded, please press [On/Off] button. Then the unit could have a output voltage again. If in remote control mode, you should clear the OVP state, then could you open the output by OUTP ON command.

Set the OVP voltage value as follows:

1. Press composite keys **[Shift]+[V-set]**(Setup) enter to setup menu.

2. Select **Source**, press **[Enter]** to confrim.
3. Select **OVP** with Left/Right key and press **[Enter]** to confirm.
4. Select **On** to enable the OVP function, and press**[Enter]**.
5. Set the OVP value with numeric key and press **[Enter]** to confirm.
6. Set the OVP delay time with numeric key, the range of delay time is 0.001S to 10.00S.
7. Press **[Esc]** to exit menu setting.

OCP

User can enable the over current protection function and set the protection value in setup menu, Over Current Protection will be triggered when the current in circuit exceeds the protection value. Once the power supply is over voltage protected, will the output be shut down at once, and “Prot” indicator lamp will be lit, and prompt “Over Current” will be displayed on VFD screen. At same time, the beeper will be on.

When the set value of current smaller than OCP value, the current set value limit the output current value to protect the instrument.

Set the OCP current value as follows:

1. Press the composite key **[Shift]+[V-set]**(Setup) to enter the setup Menu.
2. Select **Source** in the menu and press **[Enter]** for confirmation.
3. Select **OCP** with Left/Right key and press **[Enter]** for confirmation.
4. Select **On** to enable OCP function and press **[Enter]**.
5. Set OCP current value with numeric key and press **[Enter]** for confirmation.
6. Set OCP delay time with numeric key and press **[Enter]** for confirmation. The range of delay time is 0.001S to 10.00S.
7. Press **[Esc]** to exit menu setting.

OPP

OPP is a protection measure taken when the actual power exceeds the rated power of the power supply. Under OPP, the power supply output will be switched off and VFD indicator “Prot” will be lighted on. In addition, the VFD display screen will display “Over Power”.

Set the OPP power value as follows:

1. Press the composite key **[Shift]+ [V-set]**(Setup) to enter the setup Menu.
2. Select **Source** in the menu and press **[Enter]** for confirmation.

3. Select **OPP** with Left/Right key and press **[Enter]** for confirmation.
4. Select **On** to enable OPP function and press **[Enter]**.
5. Set OPP power value with numeric key and press **[Enter]** for confirmation.
6. Set OPP delay time with numeric key and press **[Enter]** for confirmation. The range of delay time is 0.001S to 10.00S.
7. Press **[Esc]** to exit menu setting.

Over-Temperature Coefficient protection

When internal power device of instrument is higher than about 90 °C, the instrument is under Temperature Coefficient protection. At this time, the instrument will automatically be OFF and VFD will display “Over Temperature Coefficient”.

Power down protection

With power-down protection, when the instrument power supply is switched off and the instrument detects power-down status, the instrument will immediately execute output switch-off and the instrument interface will display “power-down”.

Under Voltage Protection

When internal voltage is low due to internal fault or when AC input voltage is low, the instrument will initiate the under-voltage protection. Or when 110V AC power supply is connected, the instrument output function is limited. When the set output power exceeds limit value, the instrument will also initiate under-voltage protection status. In the case of under-voltage protection, the instrument interface will prompt “Under Voltage Prot”.

Sense Reverse Protection

The instrument defaults to provide sense reverse protection. When the output state is ON and the difference between output terminal voltage and sense remote voltage exceeds the specified voltage, sense reverse protection will be enabled after 500ms. The power supply output will be immediately switched to Off and the buzzer will sound if the sense terminals are reversed. The display screen will display “Sense Reverse Prot”. Press **[Esc]** to clean the protection.

When the power source is in Sense Reverse Protection state, you should check the whether the polarities are connected reversely or not firstly. When the polarities connect correctly, please press **[On/Off]** button. Then the unit could have a output voltage again.

The voltage difference between output terminal and remote sense terminal of each model is not the same. The detailed value is shown in the next table. When the remote sense terminal is connected reversely, the maximum voltage will not exceed the sum of set voltage and the difference voltage.

IT6512D~IT6532D	5V
IT6513D~IT6533D	5V
IT6514D~IT6534D	7V
IT6515D~IT6535D	10V
IT6516D~IT6536D	15V
IT6517D~IT6537D	20V

3.13 Setting Maximum and Minimum Values

The maximum voltage of the power supply ranges from V-min to full-rated output voltage. Press the composite key **[Shift] + [V-set]** (Setup) to enter the Configuring Menu for setting maximum and minimum values of power supply voltage, current and power. When limit setting is finished, the voltage, current and power setting values can only be set within the maximum and minimum limits.

Note

Function and external analog programming are not limited by Limit.

Set the maximum and minimum voltages as follows:

1. Press the composite key **[Shift]+[V-set]**(Setup) to enter the Configuring Menu.
2. Select **Source** in the menu and press **[Enter]** for confirmation.
3. Select **Limit** with Left/Right key and press **[Enter]** for confirmation.
4. Set the V-Max with numeric key and press **[Enter]**.
5. Set the V-Min with numeric key and press **[Enter]** for confirmation.

   Or, select the maximum/minimum current or power with Arrow key.
6. Set maximum/minimum current or power with numeric key or press **[Esc]** to exit menu setting.

After the maximum/minimum voltage is set, the output voltage can only be set within this range. Vmax factory setting is the rated output voltage of corresponding model of the power supply. V-Min is 0V.

3.14 Charge Protection

This power supply is applicable to battery charge test and provides charge protection during battery charge test. Even when the internal load is activated, the UUT will not be discharged. During charge protection, the power supply switches off output as follows.

1. Power output is switched off (On/Off key is lighted off) and power supply will stop output.
2. The internal load discharges the capacity energy at power output through a small current.
   - When capacity energy discharge of the power supply is normal, it means that no energy storage device is found. Continue to discharge the current to 0V. To end.
   - When abnormal capacity energy discharge is detected, the UUT connected at the output terminal is a battery or other energy storage devices. To step3.
3. The power supply will automatically adjust the internal load discharge current to 0 and stop discharge.

   This protection function forbids UUT discharge to guarantee device safety. It also avoids insufficient charge during battery charge test.

3.15 Static Protection Function of Battery

The power supply is designed with the battery protection function in static state (when the output is off). If the DUT is the energy storage device like battery, the power supply will prevent battery from consumption.

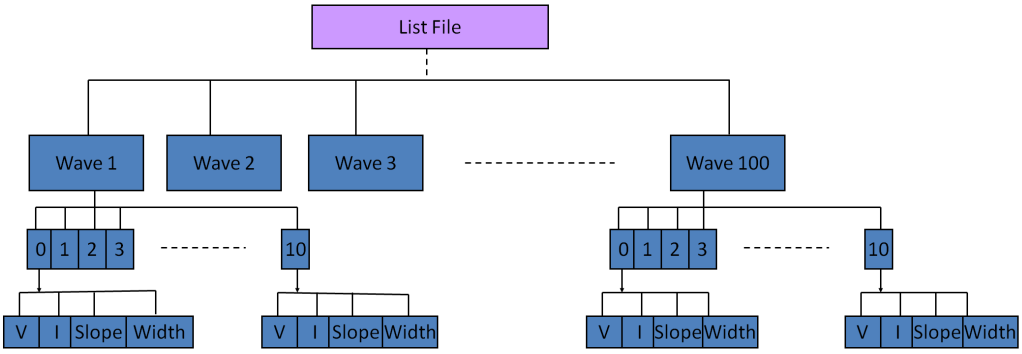
1. Press **[Shift]+[P-set]**(Menu) to enter the system menu.(Menu).
2. Select **CONFIG→Load-Status→Load**, enable the internal load. (Default setting is Off status)
3. Press **[Esc]** to exit menu setting.
4. Select **Static-Curr** and turn off static current function when output is Off.

If the DUT is the energy storage device like battery, you need to turn off the static current function. Otherwise, the current of the battery will be consumed and flow backwards to the power supply. The value of the current flowing backwards of different models is not the same. It ranges from 0.1A to 0.5A approximately.

3.16 LIST Operation

LIST mode comprises 10 files (File1-File10) in total, and each has 10 waves. Each wave has 10 steps. You need to edit the voltage, current, pulse width and rise/fall slope of each step. Each wave can set repetition, so does each list file. Ten wave files can be linked in sequence under one list.

Relationship between List file and wave file is shown below.



List file can select any one from 100 waves. Each List file can select 10 wave files at most and combine them into a List file based on sequence.

Each wave file has ten steps. The List file can select the wave file and set the count of repetitions to be executed.

List function menu is as follows.

List	List function menu	
	On/Off	List function switch
	Recall	List file recall
		Recall List File: Need to recall list file number.
	EditFile	List file edit
		Repeat: count of List file repetitions (0-65535)
		Wave Count: total count of waves contained in this List file. (1-10)

		1st Wave Select: number of the first wave selected
		1st Wave Repeat: count of repetitions of the first wave selected (0-65535)
		Yes/No: save to the file or not
	EditWave	Wave file edit
		Recall Wave: Need to recall Wave file number.
		Recall Wave: Need to recall Wave file number.
		Step1 Voltage: Voltage setting of step 1 (0-Vmax)
		Step1 Current: Current setting of step 1 (0-Imax)
		Step1 Width: Width setting of step 1 (0s-24h)
		Step1 Slope: Slope setting of step 1 (0s-24h)
		Save to Wave: save to the Wave file

Wave edit and List edit have no order of priority.

Editing Wave

List file can arrange and link several Wave files. The user can pre-edit several Wave files and select edited wave file that meets requirements during usage. In this series of power supply, at most 100 wave files can be edited.

Take an example for 3 steps, the steps of editing Wave file are as follows:

1. Press **[Shift]**+**I-set**(Function) to enter List operation.
2. Press the Right key to select **EditWave** from the menu, and press **[Enter]** to confirm.
3. Press numeric key to input the number of Wave file under edit, where Recall Wave= 01, and press **[Enter]** to confirm.

   ```
   Recall Wave: 01
   ```

4. Press numeric key to input total count of steps for the current Wave file, where Step Count=03, and press **[Enter]** to confirm.

```
Step Count=03
```

5. Press the numeric key to set the voltage, current, slope and width of the Wave step 1 in sequence.

```
Step1 Voltage = 1V
Step1 Current = 1A
Step1 Width = 1s
Step1 Slope = 0.1s
```

6. After editing the above parameters in step 1, continue to edit the same parameters for step 2 and step 3. Count of steps is up to customer requirements. At most 10 steps can be edited. The edited **Step Count** shall be consistent with the one defined by the customer.
7. Select **Save to Wave** to save, and press **[Enter]** for confirmation. Select Yes. After editing, select Yes or No. Select **Yes** to save to the Wave file. Select **No** not to save and return back to the List Setting screen.

Editing List File

List file editing means to arrange and link several Waves in certain sequence.

Take an example for 3 wave files, the steps of editing list file are as follows:

1. Press **[Shift]**+**[I-set]**(Function) to enter List operation.
2. Press the Right key to select **EditFile** from the menu.
3. Press the numeric key to set the count of repetitions in executing this List file. For example, if there are 2 repetitions, Repeat = 2.

```
Repeat = 2
```

4. Press the numeric key to set the count of Waves contained in this List. For example.

```
Wave Count = 3
```

5. Press the numeric key to input the number and count of repetitions of the first Wave selected.

```
1st Wave Select = 02
1st Wave Repeat = 1
```

6. Press the numeric key to input the number and count of repetitions of the second Wave selected.

```
2nd Wave Select = 02
2nd Wave Repeat = 1
```

7. Select the Wave arranged and count of repetitions in sequence. The Wave count and arrangement sequence of each List file can be defined by the

customer based on requirements. A List file can link 10 Waves at most. The edited Wave count shall be consistent with the one defined by the customer.

8. Select **Save to File = 01** to save. Press **[Esc]** not to save and return back to the List Setting screen.

Run List File

After editing List file, the user needs to set the trigger mode and run List function. Return to the main screen for triggering. Detailed steps are as follows:

- Before starting up List function, please set trigger mode first. See Section 3.9.3 Trigger Mode .
- Trigger the List file as follows

1. Press **[Shift]**+ **[I-set]**(Function) to enter List operation.
2. Press the Right key to select **Recall** from the menu, and press [Enter] for confirmation.

   ```
   Recall File Name = 01
   ```

3. Press Arrow key to select **Off**, and press **[Enter]** for confirmation. Then, **Off** is changed to **On**. List function is switched on.

   ```
   On Recall EditFile EditWave
   ```

4. Press **[Esc]** back to the main screen. Press **[On/Off]** to switch on power output. The screen is displayed as follows.

   ```
   0.00V    0.00A
   0.0W       List
   ```

5. Press **[Shift]**+**[Enter]**(Trigger) for triggering. The VFD Trig is lighted up.

Note

If **On Recall EditFile EditWave** is displayed under LIST MENU or the external analog control function is switched on, neither List nor Wave file editing is accessible. In this case, change **On Recall EditFile EditWave** to **Off Recall EditFile EditWave** before operation.

3.17 Parallel Operation

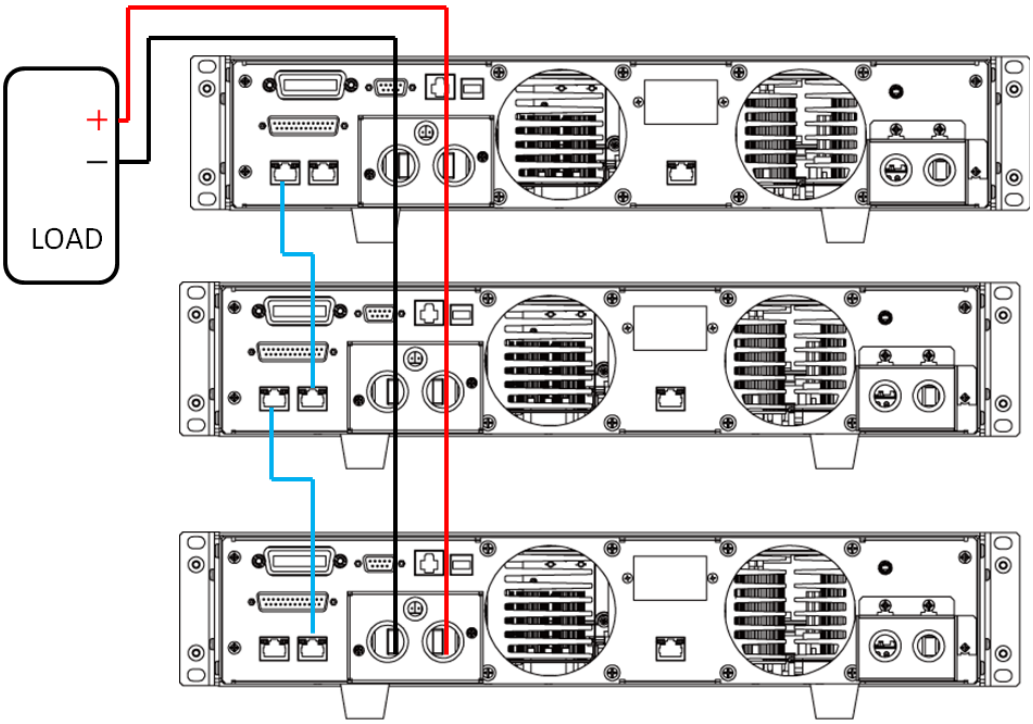
CAUTION

- **When connecting the system bus, please note the built-in terminal matching resistance at the rear panel. If the resistance is removed, the instrument may not work properly. The user can install the terminal matching resistance on the Input end of the first system bus and the Output end of the last system bus. Please place the removed terminal matching resistance in a safe location. If you need to change to the single device operation mode, you need to re-attach the terminal matching resistance.**
- **The system bus interface is not isolated from the output electrode. After power on, it is not allowed to insert or pull out the bus and terminal matching resistance.**
- **During wiring, check that the anode and cathode of the parallel output cables are properly and tightly connected; anode ON and cathode OFF are prohibited.**

This series of power supply supports mutual parallel operation of same models and to increase output power and output current. In addition, active current sharing is provided for parallel instruments.

The figure below shows 3 pcs power supplies in parallel, in which, the system bus is used for master-slave connection.

Figure 3–1 Schematic Diagram of 3 Pcs Power Supplies in Parallel



The master-slave connection for configuring 3 pcs power supplies is as follows:

1. Configure one power supply as the Master and the other power supplies as Slave. Press the composite key **[Shift]+[P-set]**(Menu) to enter the System Menu.
2. Press the Right key to select **CONFIG** and press **[Enter]** to enter the Configuring Menu.
3. Press the Right key to select **Parallel** and press **[Enter]** for parallel setting.
   - Single: Single mode.
   - Slave: Salve mode.
   - Master: Master mode. If Master mode is selected, you need to set the number of Salves for the Master.

     Mount: total number of instruments in parallel. For example, Mount=3.
4. After setting of host and slave, switch off the power supply. Connect the networking.
5. Connect the networking as shown above. Please connect the network after parallel setup. Otherwise, at start up, the power supply will detect parallel setup fault and fail to start up.

To change Parallel Mode to Single Mode, follow the steps below:

1. Power off the power supplies.
2. Remove System Bus among the power supplies.
3. Install the terminal matching resistance on the device which is uninstalled. Insert it to the Input or Output of the System Bus interface.
4. Restart the power supply and enter to “NETWORKING…” status.
5. Press **[shift]**+**[Esc]**, clear the error status and set the master mode or slave mode to single mode.
6. Repeat steps 3 through 4 for each device under parallel mode to change all devices to single operation mode.

3.18 Analogue Interface (Enhanced Isolation)

A DB25 analog interface is set at the rear panel of the power supply, through which, you can connect the external voltage (0V-5V/0V-10V) or external resistance (0KΩ-5KΩ/0KΩ-10KΩ) to program output voltage or current on 0-full range. At the same time, with analog monitoring function (0V-5V/0V-10V), you can monitor the output voltage or current on 0-full range.

Analog signal bandwidth is less than 100Hz,. support any waveform within signal bandwidth. When the program signal frequency or amplitude exceeds output capacity, the output amplitude will be automatically limited.

In parallel operation, you can program or monitor output through the host analog interface. The 0V-5V/0V-10V program and monitoring range is changed to 0-full range of parallel machine. Safe electrical isolation is set between this analog interface and output electrode.

To run this function, you need to set the parameters below:

Monitor	10V(Def)	10V monitoring mode options
	5V	5V monitoring mode options
Ext- Ctrl	External control mode and related parameter setting	
	Voltage(Def)	Voltage setting mode selection
	10V(Def)/5V	10V or 5V setting mode selection, select by Left/Right key.
	Resistance	Resistance setting mode selection
	10k(Def)/5k	10K or 5K setting mode selection, select by Left/Right key.

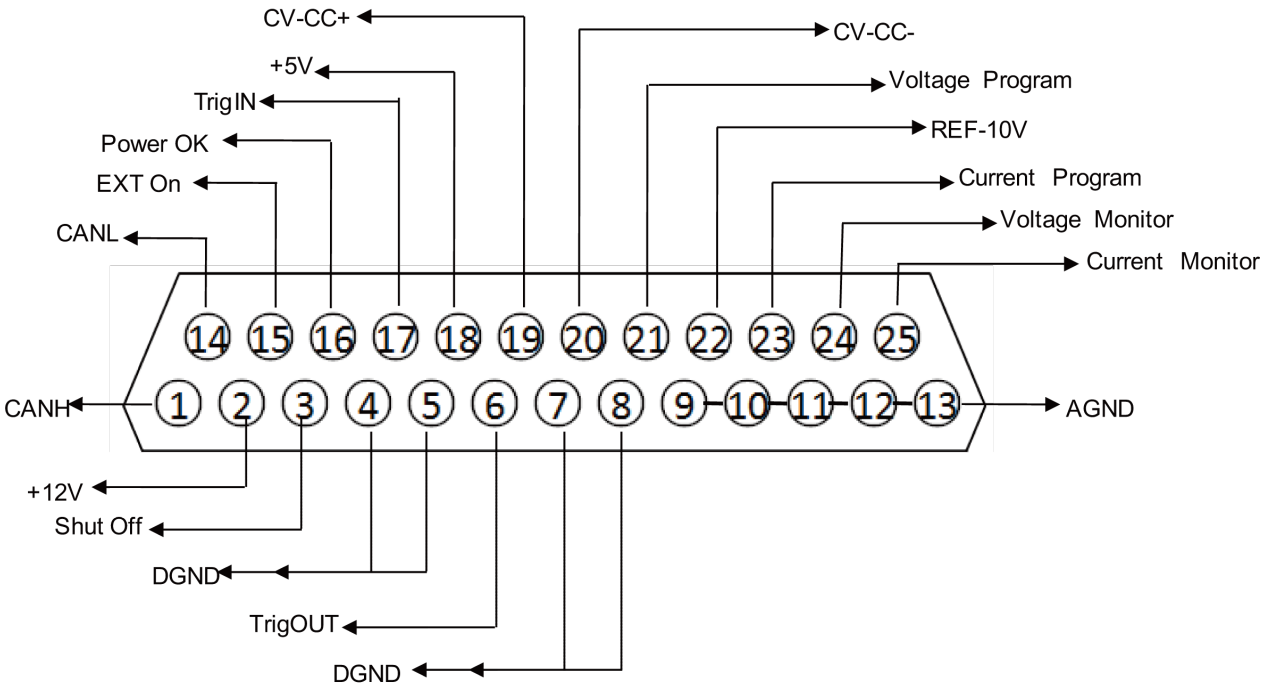
	Off	Disable or enable this function. Select by up/down key.
	On	

The above parameters can be selected through the configuration menu.

1. Press the **[Shift]+[P-set]**(Menu) to enter the menu.
2. Press the Right Key to select **CONFIG** and press **[Enter]** to enter the configuration menu.
3. Press the Right Key to select the **Ext-Ctrl** and press **[Enter]** to enter the configuration of external analog parameters. When setting every item, please use the Up/Down Key for selection.

   After selecting the **Ext-Ctrl** as **On**, exit the Menu. At this time, the Rear indicator on the VFD status bar will be lighted on and the right corner will display **Analog**.

Figure 3–2 DB25 Analogue Interface Description



Pin	Name	Description
Pin 1 and Pin 14	CANH CANL	Pin 1 used for CAN H interface, and Pin 14 used for CAN L interface.
Pin 2	+12V	Power supply output 12V, driving capacity 0.1A

Pin	Name	Description
Pin 3	Shut Off	Used for switching off the function under emergency status (In general circumstances, the pin is suspended, and defaulted to low level); when external high level is connected, output is off.
Pin 15	EXT ON	Used for controlling output On/Off of the power supply; default setting is high level. Output is controlled by On/Off; when external low level is connected, or when it is short circuited to DGND, output is switched off. At this time, setting of output On/Off fails.
Pin 16	Power OK	Used for indicating whether the power output is normal; if so, output 5V; in case of power supply failure, output 0V.
Pin 17	TrigIN	Input signal of reverse protection mode. When input is low level, alarm "OutPut Reverse Protect" fault. At the mean while, in external trigger mode, when input is low level, then actualize trigger function.
Pin 6	TrigOUT	Output signal of reverse protection mode. When power supply output is On, this pin outputs high level; when this power supply output is Off, this pin outputs low level; it can be used for synchronous control of On/Off for other devices with driving capacity of 5V/5mA.
Pin 18	+5V	The power supply outputs 5V voltage, which is used for digital power supply with driving capacity of 0.1A.
Pin 19 and Pin 20	CV_CC+ CV_CC-	The output between these two pins is used for indicating the working status of power supply; under CV mode, the output between these two pins is –5V; and under CC mode, 5V.
Pin 21	Voltage Program (Voltage setting)	Output voltage of analog control: In setting the Voltage and 10v, the input analog range should be 0-10V voltage, and the regulated output voltage should be from 0 to full range; In setting the Voltage and 5v, the input analog range should be 0-5V voltage, and the regulated output voltage should be from 0 to full range; In setting the Resistance and 10K, the input analog range should be 0-10K resistance, and the regulated output voltage should be from 0 to full range; In setting the Resistance and 5K, the input analog range should be 0-5K resistance, and the regulated output voltage should be from 0 to full range;

Pin	Name	Description
Pin 22	REF_10V	The 10V reference voltage output by the power supply can be connected to a resistance subdivision for analog control.
Pin 23	Current Program (Current Setting)	Output current of analog control: In setting the Voltage and 10v, the input analog range should be 0-10V voltage, and the regulated output current should be from 0 to full range; In setting the Voltage and 5v, the input analog range should be 0-5V voltage, and the regulated output current should be from 0 to full range; In setting the Resistance and 10K, the input analog range should be 0-10K resistance, and the regulated output current should be from 0 to full range; In setting the Resistance and 5K, the input analog range should be 0-5K resistance, and the regulated output current should be from 0 to full range;
Pin 24	Vlotage Monitor (Voltage monitoring)	The actual value from monitoring is the corresponding monitor voltage value. For example, when the analog voltage is 10V, power supply control voltage 0~80V and the power supply output voltage 20V, this pin will output 2.5V voltage. Similarly, when the analog voltage is 5V, control voltage 0~80V and the power supply output voltage 20V, this pin will output 1.25V voltage.
Pin 25	Current Monitor (Current monitoring)	The actual value from monitoring is the corresponding monitor voltage value. For example, when the analog voltage is 10V, power supply control current 0~120A and the power supply output current 12A, this pin will output 1V voltage. Similarly, when the analog voltage is 5V, control current 0~120A and the power supply output voltage 12A, this pin will output 0.5V voltage.
Pins 9, 10, 11, 12 and 13	Connection to AGND	Ground wires for analog interfaces (including Pin 21 VPRG, Pin 22 REF_10V, Pin 23 IPRG, Pin 24 VMON, Pin 25 IMON).
Pins 4, 5, 7,8	Internal connection to DGND	Ground wires for Pin 15 EXT ON, Pin 3 SHUT OFF, Pin 16 POWER OK, Pin 17 TrigIN, Pin 6 TrigOUT,Pin 19 CV_CC+ and Pin 20 CV_CC-.

Note

- The value of the output current must be under the definition value of the current which is driving capacity in the DB25 pins of the power supply. Otherwise, the power supply will be damaged.
- The maximum digital signal input voltage≤5V
- The maximum analog signal input voltage≤12V

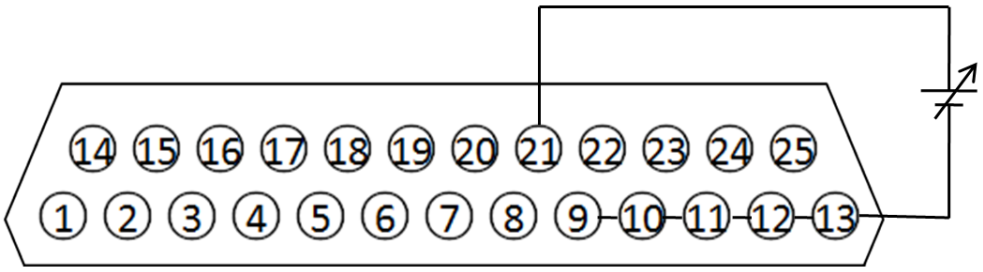
Voltage Setting (Voltage Program)

This function enables change of voltage output through external analog signal by connecting external DC voltage (under voltage mode) or an external resistor (under resistor mode) to Pin 21. To enable this function, the output control should be under the external analog control mode. Used for controlling the external voltage range of full-scale output voltage or the resistor can be selected from 0~5V/0~10V or 0~5KΩ/0~10KΩ. To switch on the voltage setting, the operations as follows:

1. Select the **MENU (Menu)→CONFIG (Configure)→Ext-Ctrl (External Analog Control)**.
2. Press the Right Key to select Voltage (or Resistance).
3. Press the Right/Left Key to select the voltage mode or resistor mode.

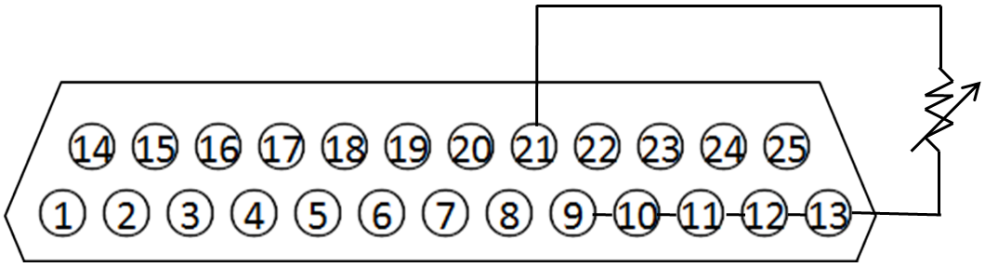
- Voltage Mode

  Under voltage mode, the user can set the voltage output value of power supply through Pin 21.



- Resistor Mode

  Pin 21 and Pin 13 (GND wire) can be connected to a resistor for setting the output voltage value of the power supply.



To set the 0~5V/0~10V or 0~5KΩ/0~10KΩ external analog setting range, the operations as follows:

1. Select the **MENU (Menu)→CONFIG (Configure)→Ext-Ctrl (External Analog Control)**.
2. Press the Right Key to select Voltage (or Resistance).
3. Press the Right Key to select 5V/10V or 5KΩ/10KΩ.

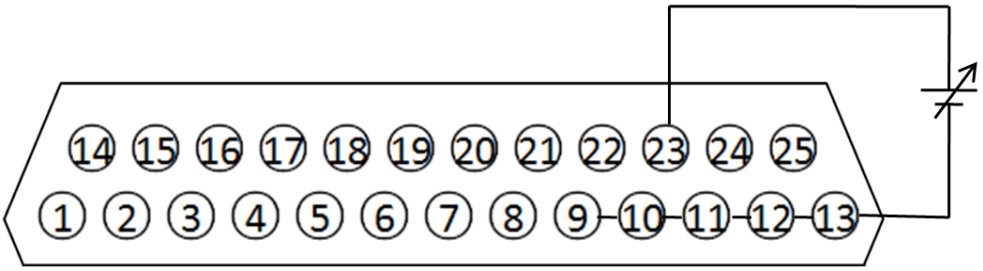
Current Setting (Current Program)

This function enables change of current output through external analog signal by connecting external DC voltage (under voltage mode) or an external resistor (under resistor mode) to Pin 23. To enable this function, the output control, should be under the external analog control mode. Used for controlling the external voltage range of full-scale output voltage or the resistor can be selected from 0~5V/0~10V or 0~5KΩ/0~10KΩ. To switch on the current setting, the operations as follows:

1. Select the **MENU (Menu)→CONFIG (Configure)→Ext-Ctrl (External Analog Control)**.
2. Press the Right Key to select Voltage (or Resistance).
3. Press the Right/Left Key to select the voltage mode or resistor mode.

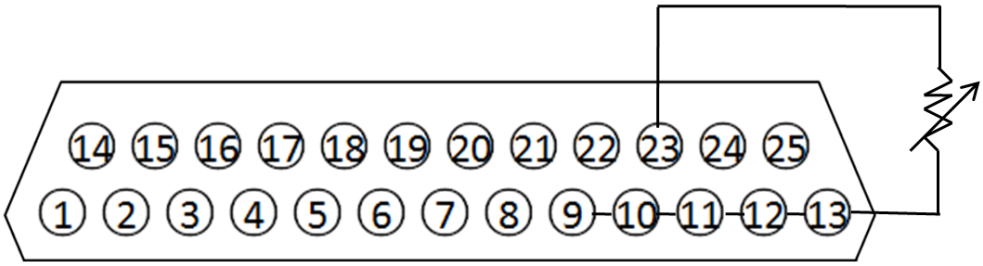
- Voltage Mode

  Under the voltage mode, the user can set the voltage output value of the power supply through Pin 23.



- Resistor Mode

  Pin 23 and Pin 13 (GND wire) can be connected to a resistor for setting the output voltage value of the power supply.



To set the 0~5V/0~10V or 0~5KΩ/0~10KΩexternal analog setting range, the operations as follows:

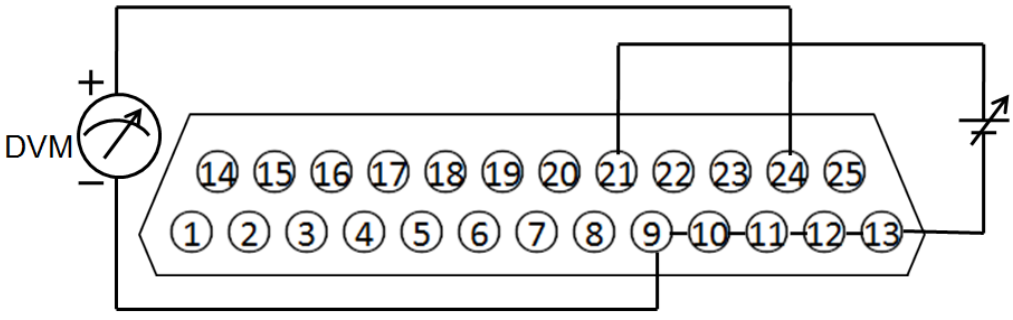
1. Select the **MENU (Menu)→CONFIG (Configure)→Ext-Ctrl (External Analog Control)**.
2. Press the Right Key to select Voltage (or Resistance).
3. Press the Right Key to select 5V/10V or 5KΩ/10KΩ.
4.

Voltage monitoring

This function enables monitoring of voltage output via Pin 24 or the GND pin (i. e., Pin 13), which can be connected to a digital voltmeter (DVM). To use this function, the output control should be under the external analog control mode. The output voltage monitoring range (which reflects the power supply output voltage from zero to full scale) can be selected from 0-10V or 0-5V. To switch on the monitoring range setting, the operations as follows:

1. Select the **MENU (Menu)→CONFIG (Configure)→Monitor (External monitor mode)**.
2. Press the Right Key to select the output voltage monitoring range (0~10V or 0~5V).

The connection setting of digital voltmeter is shown below.



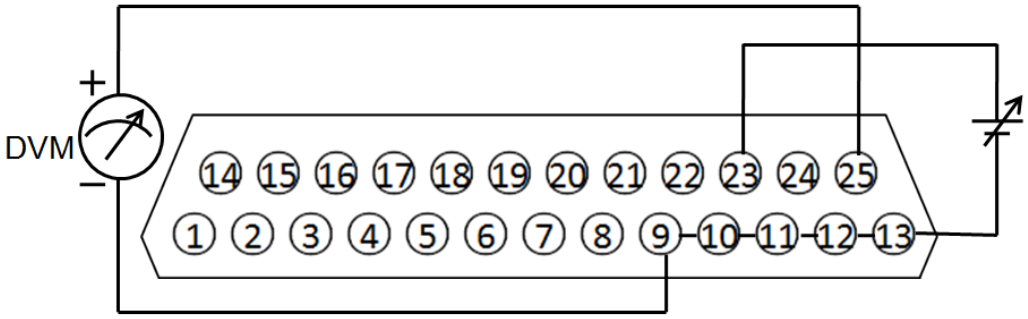
Current monitoring

This function enables monitoring of current output via Pin 25 or the GND pin (i. e., Pin 13), which can be connected to a digital voltmeter (DVM). To use this function, the output control should be under the external analog control mode. The output current monitoring range (which reflects the power supply output

current from zero to full scale) can be selected from 0-10V or 0-5V. To switch on the monitoring range setting, the operations as follows:

1. Select the **MENU (Menu)→CONFIG (Configure)→Monitor (External monitor mode)**.
2. Press the Right Key to select the output current monitoring range (0~10V or 0~5V).

The connection setting of digital voltmeter is shown below.



4 Remote Control

This series power supply have five standard communication interfaces: RS232, USB, GPIB, LAN and CAN. The customer can choose any one according to his demands.

4.1 RS232 Interface

This series power supply have a DB9 interface on rear panel. Using a cable with two COM ports to connect power supply and PC. Then please enter the menu to configure the communication parameters. all SCPI commands can be used for programming.

Note

The setup about RS232 in the program should agree with the configuration in the system set. please enter the system Menu to change the communication parameters.

RS-232 Data style

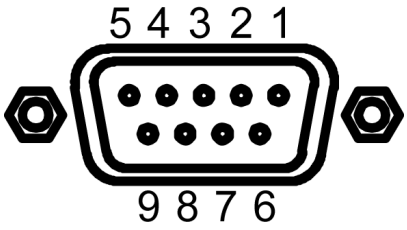
RS232 with start bit and stop bit. The start bit and stop bit cannot be edited. While you could select the odd parity or even parity under the system set. Odd or EVEN options have been saved in the nonvolatile memory.

Baudrate

Edit baudrate: You can enter the menu setup, select the baudrate among the following options: 4800/ 9600/ 19200/ 38400/ 57600/ 115200

RS-232 connection

Please use a straight-through RS232 cable with DB9 interface and connect the RS232 serial port with the controller's serial port(for example. PC). The table as below gives a detailed description for each pin.



RS-232

Pins	Description
1/4/6/9	connectionless
2	TXD, transmit data
3	RXD,receive data
5	GND
7	CTS, clear the sending
8	RTS, ready to send

Note

If your computer is using a RS-232 interface with DB-25 connector, you need an adapter cable with a DB-25 connector at one end and the other side is a DB-9(not blank modem cable).

RS-232 Troubleshooting:

If you meet some problems when communicating with PC by RS232 interface, please check the following items:

- PC and power supply must have the same configuration in the following items: baudrate, parity bit, data bit and flow control. Please note that power supply has been configured with a start bit and stop bit(the two values are fixed).
- Ensure you have used the correct communication cable. Please pay attention that some cable may not have a correct internal wiring even it is with a appropriate DB9 interface.
- The RS232 communication cable should have been connected to a correct serial port of the PC.

Communication Setup

Please ensure the PC and power supply have the same configuration in the following items.

Baud rate: 9600(4800, 9600, 19200, 38400, 57600, 115200).You could enter the system menu to set the baudrate.

Data bit: 8

Stop bit: 1

Parity bit: (none, even, odd)

- EVEN 8 data bits have even parity
- ODD 8 data bits have odd parity

- NONE 8 data bits have no parity

Native machine address: (0 ~31, factory default is 0)

Start Bit	8 Data Bits	Parity=None	Stop Bit

4.2 USB Interface

Use a cable with two USB ports to connect power supply and PC. You can program through USB interface to achieve all functions of power supply.

The functions of USB488 interface are as follows:

- Interface is 488.2 USB488 interface
- Receive the following request: REN_CONTROL, GO_TO_LOCAL, and LOCAL_LOCKOUT
- When the interface receives MsgID = TRIGGER USBTMC command, it will transmit the TRIGGER command to the function layer

The functions of power supply's USB488 are as follows:

- receive all SCPI commands
- device is SR1 enabled
- device is RL1 enabled
- device is DT1 enabled

4.3 GPIB Interface

Use a IEEE488 bus to connect GPIB interfaces of power supply and PC. Please ensure that the screws have been screwed down in order to have a full connection. Then press **[Shift] +[P-set]** (Menu) to enter the system menu to set the address. The address range of power supply is 1-30. After you set the address, please press **[Enter]** button to confirm. GPIB address is saved in nonvolatile memory.

4.4 LAN Interface

When connect PC through LAN interface, the following is required to use the LAN interface. The LAN interface complies with the LXI standard.

Note

- When using one crossover cable to connect PC directly, the gateway address should be consistent with that of the PC, and the IP address should be at the same network segment with the PC's IP address.
- When the instrument and computer are connected to the router, an independent IP address must be assigned for the instrument.

The user can view the related information of LAN interface or configure the communication parameters in system menu.

View LAN Interface Information

The operation steps to view the LAN interface information are as follows.

1. Press **[Shift]+[P-set]**(Menu) to enter into the system menu interface.
2. Use left and right keys or rotate the voltage knob to select **SYSTEM** and press **[Enter]** key to confirm.
3. Use left and right keys or rotate the voltage knob to select **Communication** and press **[Enter]**key to confirm.
4. Use left and right keys or rotate the voltage knob to select **LAN** and press **[Enter]**key to confirm.

   The first displayed menu item **Info** is to view the LAN interface information.
5. Press **[Enter]**key to confirm.
6. Use left and right keys or rotate the voltage knob to review the LAN interface information, Refer to 3.9 System Menu for more information.
7. After setting, press **[Esc]** to exit.

Configure LAN Interface Information

The configurable parameters are described as follows.

The instrument address

- IP Addr: This value is the Internet Protocol (IP) address of the instrument. An IP address is required for all IP and TCP/IP communications with the instrument. An IP Address consists of 4 decimal numbers separated by periods. Each decimal number ranges from 0 through 255 with no leading zeros (for example, 169.254.2.20).
- Sub Net: This value is used to enable the instrument to determine if a client IP address is on the same local subnet. The same numbering notation applies as for the IP Address. When a client IP address is on a different subnet, all packets must be sent to the Default Gateway.

- Gateway: This value is the IP Address of the default gateway that allows the instrument to communicate with systems that are not on the local subnet, as determined by the subnet mask setting. The same numbering notation applies as for the IP Address. A value of 0.0.0.0 indicates that no default gateway is defined.
- DNS1: This field enters the primary address of the server. Contact your LAN administrator for server details. The same numbering notation applies as for the IP Address. A value of 0.0.0.0 indicates that no default server is defined.

  DNS is an internet service that translates domain names into IP addresses. It is also needed for the instrument to find and display its hostname assigned by the network. Normally, DHCP discovers the DNS address information; you only need to change this if DHCP is unused or not functional.
- DNS2: This field enters the secondary address of the server. Contact your LAN administrator for server details. The same numbering notation applies as for the IP Address. A value of 0.0.0.0 indicates that no default server is defined.

LAN service

The configurable services include: mDNS, Ping, Telnet, Web, VXI-11 and Raw Socket.

The operation steps to configure are as follows.

- This configures the instrument address (IP Mode).
  1. Press **[Shift]+[P-set]**(Menu) to enter into the system menu interface.
  2. se left and right keys or rotate the voltage knob to select **SYSTEM** and press **[Enter]**key enter to system menu.
  3. se left and right keys or rotate the voltage knob to select **Communication** and press **[Enter]**key to confirm.
  4. se left and right keys or rotate the voltage knob to select **LAN** and press **[Enter]**key to confirm.

     Select **Config** to configure.
  5. Press **[Enter]**key to confirm, This parameter is in modification.
     - Auto: automatically configure the addressing of the instrument
     - Manual: manually configure the addressing of the instrument
  6. After setting, press **[Esc]** to exit.
- This selects the LAN services to enable or disable (Server Config).
  1. Press **[Shift]+[P-set]**(Menu) to enter into the system menu interface.
  2. se left and right keys or rotate the voltage knob to select **SYSTEM** and press **[Enter]**key enter to system menu.
  3. se left and right keys or rotate the voltage knob to select **Communication** and press **[Enter]**key to confirm.
  4. se left and right keys or rotate the voltage knob to select **LAN** and press **[Enter]**key to confirm.
  5. se left and right keys or rotate the voltage knob to select **Server-Config** and press **[Enter]**key to confirm.

6. se left and right keys or rotate the voltage knob to select the desired service, and press **[Enter]**key to confirm.

Note

User need to set the Socket Port when select enable the Raw Socket.

7. Rotate the knob to adjust the value, and press **[Enter]**key to confirm.
   – On: indicates enable the service.
   – Off: indicates disable the service.
8. After setting, press **[Esc]** to exit.

Reset the LAN to the Default Settings

The operation steps to reset the LAN to the default settings are as follows.

1. Press **[Shift]+[P-set]**(Menu) to enter into the system menu interface.
2. se left and right keys or rotate the voltage knob to select **SYSTEM** and press **[Enter]**key enter to system menu.
3. se left and right keys or rotate the voltage knob to select **Communication**，and press **[Enter]**key to confirm.
4. se left and right keys or rotate the voltage knob to select **LAN**，and press **[Enter]**key to confirm.
5. se left and right keys or rotate the voltage knob to select **Restore**，and press **[Enter]**key to confirm.
   - NO: indicates refuse to reset the LAN to the default settings.
   - YES: indicates reset the LAN to the default settings.
6. After setting, press **[Esc]** to exit.

Confirm the LAN Setting

After configuring the LAN settings, the user need to confirm the settings to make it valid in the instrument. The operation steps to confirm the LAN settings are as follows.

1. Press **[Shift]+[P-set]**(Menu) to enter into the system menu interface.
2. se left and right keys or rotate the voltage knob to select **SYSTEM** and press **[Enter]**key enter to system menu.
3. se left and right keys or rotate the voltage knob to select **Communication**，and press **[Enter]**key to confirm.
4. se left and right keys or rotate the voltage knob to select **LAN**，and press **[Enter]**key to confirm.
5. se left and right keys or rotate the voltage knob to select **Reset**，and press **[Enter]**key to confirm.
   - NO: indicates refuse to confirm the LAN setting.
   - YES: indicates confirm the LAN setting.

6. After setting, press **[Esc]** to exit.

4.4.1 Using the Web Interface

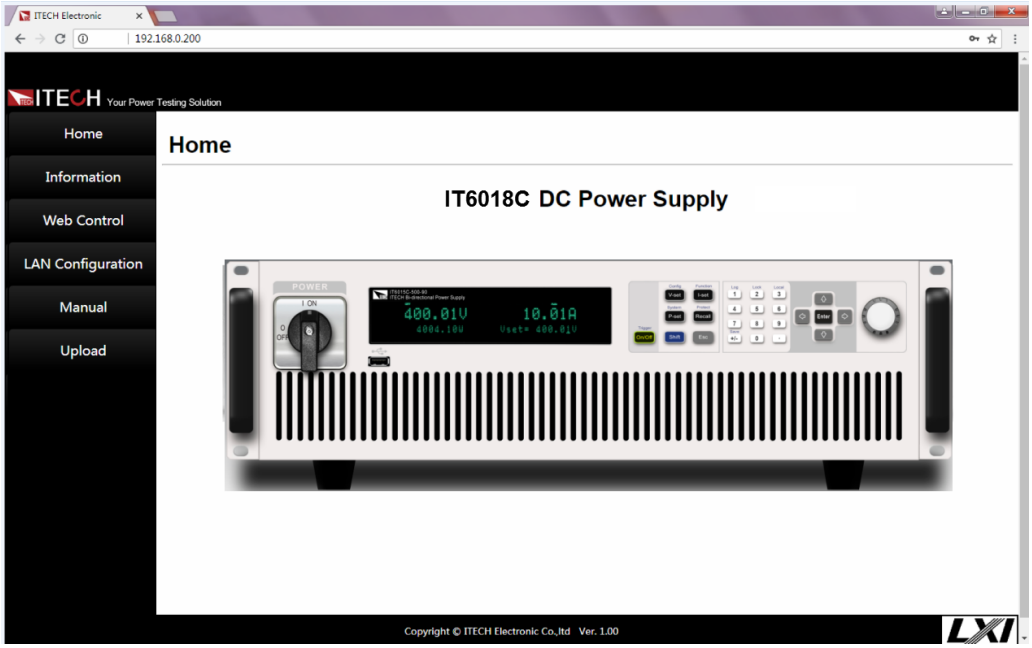
The instrument has a built-in Web interface for monitoring and controlling the instrument via a Web browser. To use the Web interface, connect the instrument and PC over LAN and enter the instrument's IP address into the address bar at the top of your PC's Web browser, you can access the front panel control functions including the LAN configuration parameters.

Note

- Please confirm the IP address and Gateway is configured correctly. The detailed information refer to the Configure LAN Interface Information.
- You must enable Web service if you wish to remotely control your instrument using its built-in Web interface. Refer to LAN services setting for the detailed operation procedures.
- Up to six simultaneous connections are allowed. With additional connections, performance will be reduced.

As shipped, the login password of the Web interface defaults to 12345678. To change the password, click the Security button in the navigation bar on the left side of the window after login.

Enter the password and then click the LOGIN button, the Web Interface will appear in the browser as shown below. The following figure is just as an example and the Web interface of different models are different. The actual shown page shall be subject to the connected instrument.



You can select different interfaces by clicking the seven buttons shown in the navigation bar on the left side of the window. The detailed descriptions are as follows.

- Home: Web home interface, displays the model and appearance of the instrument;
- Information: displays the serial number of the instrument and more system information as well as LAN configuration parameters;
- Web Control: enables the Web control to begin controlling the instrument. This page allows you to monitor and control the instrument;
- LAN Configuration: reconfigure the LAN parameters;
- Security: change the password and control access to the Web interface;
- Manual: go to the ITECH official website and view or download the relevant documents.
- Logout: logout the Web interface.

4.4.2 Using Telnet

The Telnet utility (as well as sockets), is another way to communicate with the instrument without using I/O libraries or drivers. In all cases, you must first establish a LAN connection from your computer to the instrument as previously described.

In an MS-DOS Command Prompt box, type “telnet hostname” where hostname is the instrument’s hostname or IP address. Press the Enter key and you should get a Telnet session box with a title indicating that you are connected to the instrument and 23 is the instrument’s telnet port. Type the SCPI commands at the prompt.

4.4.3 Using Sockets

CAUTION

The instruments allow up to six simultaneous socket connections to be made.

ITECH instruments have SCPI socket services, which can be used to send and receive SCPI commands, queries, and query responses. All commands must be terminated with a newline for the message to be parsed. All query responses will also be terminated with a newline.

4.5 CAN Communication Port

There is one DB25 interface at the rear panel of power supply, and the pin definition is shown below. The user can use this terminal for PC connection; to activate connection, be sure that the values set in the System menu are same as the corresponding values set in PC.

Note

CAN setting in the program shall be consistent with the one set in the System menu of front panel. To query and change.

Baud Rate

In the front panel [Shift] + [P-set](Menu), under the System menu, the user can select one Baud rate stored in NVM: 20K|40K|50k|80k|100k|125k|150k|200k|250k|400K|500K|1000K.

CAN Pin Definition

Use DB25 interface for connection. CAN interface pin is as follows.

Pin No.	Description
H	CAN_H
L	CAN_L

CAN Troubleshooting:

If CAN connection fails, check that:

- The PC and power supply have same Baud rate.
- Appropriate interface pin or adapter is used, as described in CAN connector.
- The interface cable is correctly connected (CAN_H to CAN_H, CAN_L to CAN_L).
- Check whether 120 Ω terminal resistance is connected.

Setting Communication

Before running communication, please match the power supply parameters with the PC parameters as shown below.

Baud rate: 20K(20K|40K|50k|80k|100k|125k|150K|200k|250k|400K|500K|1000K). You can enter the System menu through panel and set the communication Baud rate.

Addr.: 1-127

Prescale (Pres): Not settable. Change with Baud rate setting.

PTS (BS1): Not settable. Change with Baud rate setting.

PBS (BS2): Not settable. Change with Baud rate setting.

Baud rate	(Prescale)	PTS	PBS
20k	150	1	6
40K	75	1	6
50K	60	1	6
80K	75	1	1
100K	30	1	6
125K	30	0	5
150K	20	6	1
200K	15	1	6
250K	15	1	5
400K	15	1	1
500K	6	1	6
1000K	3	1	6

5 Technical Specification

This chapter will introduce the main technical parameters of thispower, such as rated voltage/current/power and so on. Besides, we will introduce the working environment and storage temperature.

5.1 Main Technical Parameters

5.1.1 IT6512D

Parameter		IT6512D Ver:V1.6
Output Rating(0 ℃-40 ℃)	Output Voltage	0 ~ 80V
	Output Current	0 ~ 120A
	Output Power	0 ~ 1800W
Line regulation ±(%of Output+Offset)	Voltage	≤0.01%+10mV
	Current	≤0.01%+60mA
Load regulation ±(%of Output+Offset)	Voltage	≤0.01%+30mV
	Current	≤0.05%+120mA
Setup Resolution	Voltage	10mV
	Current	10mA
	Power	0.1W
Read Back Resolution	Voltage	10mV
	Current	10mA
	Power	0.1W
Setup Accuracy[1] (within 12 months, 25℃ ±5℃) ±(%of Output+Offset)	Voltage	≤0.05%+30mV
	Current	≤0.2%+120mA
	Power	1%+30W
Read Back Accuracy[2] (within 12 months, 25℃ ±5℃) ±(%of Output +Offset)	Voltage	≤0.05%+30mV
	Current	≤0.2%+120mA
	Power	1%+30W
Ripple	Voltage	≤80mVp-p

Parameter		IT6512D Ver:V1.6
(20Hz -20MHz)	Current	≤0.05%+60mArms
Setup Temperature Coefficient (%of Output/℃+Offset)	Voltage	≤0.01%+30mV
	Current	≤0.02%+120mA
Read Back Temperature Coefficient (%of Output/℃+Offset)	Voltage	≤0.01%+30mV
	Current	≤0.02%+120mA
Rise time(no load)	Voltage	≤30ms
Rise time(full load)	Voltage	≤30ms
Fall time(no load)	Voltage	≤200ms
Fall time(full load)	Voltage	≤40ms
Transient Response Time	Voltage	≤3ms
AC Input[3]	Voltage	220Vac±10%
	Frequency	47Hz ~ 63Hz
Setup stability-30min (%of Output +Offset)	Voltage	≤0.05%+30mV
	Current	≤0.1%+120mA
Setup stability-8h (%of Output +Offset)	Voltage	≤0.05%+30mV
	Current	≤0.1%+120mA
Readback stability-30min (%of Output +Offset)	Voltage	≤0.05%+30mV
	Current	≤0.1%+120mA
Readback stability-8h (%of Output +Offset)	Voltage	≤0.05%+30mV
	Current	≤0.1%+120mA
Efficiency	80%	
Remote Sense Compensation Voltage	3V	
Command Response Time	20mS	
Power Factor	0.99	
Maximum input current[4]	12A	
Maximum input apparent power	2300VA	
Storage temperature	-10℃ ~ 70℃	
Protective function	OVP, OCP, OPP, OTP, Vsense reversed protect	
Standard Interface	USB/RS232/CAN/GPIB/LAN	
Isolation (output to ground)	500V	
Parallel Number	≤8	

Parameter	IT6512D Ver:V1.6
Working temperature	0 ~ 40℃
Dimension (mm)	483mmW×105.4mmH×640.8mmD
Weight(net)	17Kg

5.1.2 IT6522D

Parameter		IT6522D Ver:V1.6
Output Rating(0 ℃-40 ℃)	Output Voltage	0 ~ 80V
	Output Current	0 ~ 120A
	Output Power	0 ~ 3000W
Line regulation ±(%of Output+Offset)	Voltage	≤0.01%+10mV
	Current	≤0.01%+60mA
Load regulation ±(%of Output+Offset)	Voltage	≤0.01%+30mV
	Current	≤0.05%+120mA
Setup Resolution	Voltage	10mV
	Current	10mA
	Power	0.1W
Read Back Resolution	Voltage	10mV
	Current	10mA
	Power	0.1W
Setup Accuracy[1] (within 12 months, 25℃ ±5℃) ±(%of Output+Offset)	Voltage	≤0.05%+30mV
	Current	≤0.2%+120mA
	Power	1% + 30W
Read Back Accuracy2 (within 12 months, 25℃ ±5℃) ±(%of Output+Offset)	Voltage	≤0.05%+30mV
	Current	≤0.2%+120mA
	Power	1%+30W
Ripple (20Hz -20MHz)	Voltage	≤80mVp-p
	Current	≤0.05%+60mArms
Setup Temperature Coefficient (%of Output/℃+Offset)	Voltage	≤0.01%+30mV
	Current	≤0.02%+120mA
Read Back Temperature Coefficient (%of Output/℃+Offset)	Voltage	≤0.01%+30mV
	Current	≤0.02%+120mA

Parameter		IT6522D Ver:V1.6
Rise time(no load)	Voltage	≤30ms
Rise time(full load)	Voltage	≤30ms
Fall time(no load)	Voltage	≤200ms
Fall time(full load)	Voltage	≤20ms
Transient Response Time	Voltage	≤3ms
AC Input[3]	Voltage	220Vac±10%
	Frequency	47Hz ~ 63Hz
Setup stability-30min (%of Output +Offset)	Voltage	≤0.05%+30mV
	Current	≤0.1%+120mA
Setup stability-8h (%of Output +Offset)	Voltage	≤0.05%+30mV
	Current	≤0.1%+120mA
Readback stability-30min (%of Output +Offset)	Voltage	≤0.05%+30mV
	Current	≤0.1%+120mA
Readback stability-8h (%of Output +Offset)	Voltage	≤0.05%+30mV
	Current	≤0.1%+120mA
Efficiency	80%	
Remote Sense Compensation Voltage	3V	
Command Response Time	20mS	
Power Factor	0.99	
Maximum input current[4]	19A	
Maximum input apparent power	3800VA	
Storage temperature	-10℃ ~ 70℃	
Protective function	OVP, OCP, OPP, OTP, Vsense reversed protect	
Standard Interface	USB/RS232/CAN/GPIB/LAN	
Isolation (output to ground)	500V	
Parallel Number	≤8	
Working temperature	0 ~ 40℃	
Dimension (mm)	483mmW×105.4mmH×640.8mmD	
Weight(net)	17Kg	

5.1.3 IT6532D

Parameter		IT6532D Ver:V1.6
Output Rating(0 ℃-40 ℃)	Output Voltage	0 ~ 80V
	Output Current	0 ~ 240A
	Output Power	0 ~ 6KW
Line regulation ±(%of Output+Offset)	Voltage	≤0.01%+10mV
	Current	≤0.01%+120mA
Load regulation ±(%of Output+Offset)	Voltage	≤0.01%+30mV
	Current	≤0.05%+240mA
Setup Resolution	Voltage	10mV
	Current	100mA
	Power	0.1W
Read Back Resolution	Voltage	10mV
	Current	100mA
	Power	0.1W
Setup Accuracy[1] (within 12 months, 25℃ ±5℃) ±(%of Output+Offset)	Voltage	≤0.05%+30mV
	Current	≤0.2%+240mA
	Power	1%+60W
Read Back Accuracy[2] (within 12 months, 25℃ ±5℃) ±(%of Output+Offset)	Voltage	≤0.05%+30mV
	Current	≤0.2%+240mA
	Power	1%+60W
Ripple (20Hz -20MHz)	Voltage	≤80mVp-p
	Current	≤0.05%+120mArms
Setup Temperature Coefficient (%of Output/℃+Offset)	Voltage	≤0.01%+30mV
	Current	≤0.02%+240mA
Read Back Temperature Coefficient (%of Output/℃+Offset)	Voltage	≤0.01%+30mV
	Current	≤0.02%+240mA
Rise time(no load)	Voltage	≤30ms
Rise time(full load)	Voltage	≤30ms
Fall time(no load)	Voltage	≤200ms
Fall time(full load)	Voltage	≤20ms
Transient Response Time	Voltage	≤3ms
AC Input[3]	Voltage	220Vac±10%

Parameter		IT6532D Ver:V1.6
	Frequency	47Hz ~ 63Hz
Setup stability-30min (%of Output +Offset)	Voltage	≤0.05%+30mV
	Current	≤0.1%+240mA
Setup stability-8h (%of Output +Offset)	Voltage	≤0.05%+30mV
	Current	≤0.1%+240mA
Readback stability-30min (%of Output +Offset)	Voltage	≤0.05%+30mV
	Current	≤0.1%+240mA
Readback stability-8h (%of Output +Offset)	Voltage	≤0.05%+30mV
	Current	≤0.1%+240mA
Efficiency	80%	
Remote Sense Compensation Voltage	3V	
Command Response Time	20mS	
Power Factor	0.99	
Maximum input current[4]	38A	
Maximum input apparent power	7600VA	
Storage temperature	-10℃ ~ 70℃	
Protective function	OVP, OCP, OPP, OTP, Vsense reversed protect	
Standard Interface	USB/RS232/CAN/GPIB/LAN	
Isolation (output to ground)	500V	
Parallel Number	≤8	
Working temperature	0 ~ 40℃	
Dimension (mm)	483mmW×194mmH×640.8mmD	
Weight(net)	35Kg	

5.1.4 IT6513D

Parameter		IT6513D Ver:V1.6
额定值 (0 ℃-40 ℃)	Voltage	0 ~ 200V
	Current	0 ~ 60A
	Power	0 ~ 1800W
Line regulation ±(%of Output+Offset)	Voltage	≤0.01%+20mV

Parameter		IT6513D Ver:V1.6
	Current	≤0.01%+30mA
Load regulation ±(%of Output+Offset)	Voltage	≤0.01%+50mV
	Current	≤0.05%+60mA
Setup Resolution	Voltage	10mV
	Current	10mA
	Power	0.1W
Read Back Resolution	Voltage	10mV
	Current	10mA
	Power	0.1W
Setup Accuracy[1] (within 12 months, 25℃ ±5℃) ±(%of Output+Offset)	Voltage	≤0.05%+100mV
	Current	≤0.2%+60mA
	Power	≤1%+30W
Read Back Accuracy[2] (within 12 months, 25℃ ±5℃) ±(%of Output+Offset)	Voltage	≤0.05%+100mV
	Current	≤0.2%+60mA
	Power	≤1%+30W
Ripple (20Hz -20MHz)	Voltage	≤200mVp-p
	Current	≤50mArms
Setup Temperature Coefficient (%of Output/℃+Offset)	Voltage	≤0.05%+100mV
	Current	≤0.2%+60mA
Read Back Temperature Coefficient (%of Output/℃+Offset)	Voltage	≤0.05%+100mV
	Current	≤0.2%+60mA
Rise time(no load)	Voltage	≤100ms
Rise time(full load)	Voltage	≤100ms
Fall time(no load)	Voltage	≤200ms
Fall time(full load)	Voltage	≤40ms
Transient Response Time	≤2ms	
AC Input[3]	Voltage	220V±10%
	Frequency	47Hz ~ 63Hz
Setup stability-30min (%of Output +Offset)	Voltage	≤0.05%+100mV
	Current	≤0.2%+60mA
Setup stability-8h (%of Output +Offset)	Voltage	≤0.05%+100mV
	Current	≤0.2%+60mA

Parameter		IT6513D Ver:V1.6
Readback stability-30min (%of Output +Offset)	Voltage	≤0.05%+100mV
	Current	≤0.2%+60mA
Readback stability-8h (%of Output +Offset)	Voltage	≤0.05%+100mV
	Current	≤0.2%+60mA
Efficiency	89%(30V/60A)~90.5%(200V/9A)	
Remote Sense Compensation Voltage	2V	
Command Response Time	20mS	
Power Factor	0.99	
Maximum input current[4]	10A	
Maximum input apparent power	2100VA	
Storage temperature	-10℃~70℃	
Protective function	OVP, OCP, OPP, OTP，Vsense reversed protect	
Standard Interface	USB/RS232/CAN/GPIB/LAN	
Isolation (output to ground)	500V	
Parallel Number	≤8	
Working temperature	0~40℃	
Dimension (mm)	483mmW×105.4mmH×640.8mmD	
Weight(net)	17Kg	

5.1.5 IT6523D

Parameter		IT6523D Ver:V1.6
Output Rating (0 ℃-40 ℃)	Voltage	0~200V
	Current	0~60A
	Power	0~3000W
Line regulation ±(%of Output+Offset)	Voltage	≤0.01%+20mV
	Current	≤0.01%+30mA
Load regulation ±(%of Output+Offset)	Voltage	≤0.01%+50mV
	Current	≤0.05%+60mA
Setup Resolution	Voltage	10mV
	Current	10mA

Parameter		IT6523D Ver:V1.6
	Power	0.1W
Read Back Resolution	Voltage	10mV
	Current	10mA
	Power	0.1W
Setup Accuracy[1] (within 12 months, 25℃ ±5℃) ±(%of Output+Offset)	Voltage	≤0.05%+100mV
	Current	≤0.2%+60mA
	Power	≤1%+30W
Read Back Accuracy[2] (within 12 months, 25℃ ±5℃) ±(%of Output+Offset)	Voltage	≤0.05%+100mV
	Current	≤0.2%+60mA
	Power	≤1%+30W
Ripple (20Hz -20MHz)	Voltage	≤200mVp-p
	Current	≤50mArms
Setup Temperature Coefficient (%of Output/℃+Offset)	Voltage	≤0.05%+100mV
	Current	≤0.2%+60mA
Read Back Temperature Coefficient (%of Output/℃+Offset)	Voltage	≤0.05%+100mV
	Current	≤0.2%+60mA
Rise time(no load)	Voltage	≤100ms
Rise time(full load)	Voltage	≤100ms
Fall time(no load)	Voltage	≤200ms
Fall time(full load)	Voltage	≤20ms
Transient Response Time	≤2ms	
AC Input[3]	Voltage	220V±10%
	Frequency	47Hz ~ 63Hz
Setup stability-30min (%of Output +Offset)	Voltage	≤0.05%+100mV
	Current	≤0.2%+60mA
Setup stability-8h (%of Output +Offset)	Voltage	≤0.05%+100mV
	Current	≤0.2%+60mA
Readback stability-30min (%of Output +Offset)	Voltage	≤0.05%+100mV
	Current	≤0.2%+60mA
Readback stability-8h (%of Output +Offset)	Voltage	≤0.05%+100mV
	Current	≤0.2%+60mA
Efficiency	89%(50V/60A) ~ 90.5%(200V/15A)	

Parameter	IT6523D Ver:V1.6
Remote Sense Compensation Voltage	2V
Command Response Time	20mS
Power Factor	0.99
Maximum input current[4]	19A
Maximum input apparent power	3800VA
Storage temperature	-10℃ ~ 70℃
Protective function	OVP, OCP, OPP, OTP，Vsense reversed protect
Standard Interface	USB/RS232/CAN/GPIB/LAN
Isolation (output to ground)	500V
Parallel Number	≤8
Working temperature	0 ~ 40℃
Dimension (mm)	483mmW×105.4mmH×640.8mmD
Weight(net)	17Kg

5.1.6 IT6533D

Parameter		IT6533D Ver:V1.6
Rate (0 ℃-40 ℃)	Voltage	0 ~ 200V
	Current	0 ~ 120A
	Power	0 ~ 6KW
Line regulation ±(%of Output+Offset)	Voltage	≤0.01%+20mV
	Current	≤0.01%+60mA
Load regulation ±(%of Output+Offset)	Voltage	≤0.01%+50mV
	Current	≤0.05%+120mA
Setup Resolution	Voltage	10mV
	Current	10mA
	Power	0.1W
Read Back Resolution	Voltage	10mV
	Current	10mA
	Power	0.1W
Setup Accuracy[1]	Voltage	≤0.05%+100mV

Parameter		IT6533D Ver:V1.6
(within 12 months, 25℃ ±5℃) ±(%of Output+Offset)	Current	≤0.2%+120mA
	Power	≤1%+60W
Read Back Accuracy[2] (within 12 months, 25℃ ±5℃) ±(%of Output+Offset)	Voltage	≤0.05%+100mV
	Current	≤0.2%+120mA
	Power	≤1%+60W
Ripple (20Hz -20MHz)	Voltage	≤200mVp-p
	Current	≤100mArms
Setup Temperature Coefficient (%of Output/℃+Offset)	Voltage	≤0.05%+100mV
	Current	≤0.2%+120mA
Read Back Temperature Coefficient (%of Output/℃+Offset)	Voltage	≤0.05%+100mV
	Current	≤0.2%+120mA
Rise time(no load)	Voltage	≤100ms
Rise time(full load)	Voltage	≤100ms
Fall time(no load)	Voltage	≤200ms
Fall time(full load)	Voltage	≤20ms
Transient Response Time	≤2ms	
AC Input[3]	Voltage	220V±10%
	Frequency	47Hz ~ 63Hz
Setup stability-30min (%of Output +Offset)	Voltage	≤0.05%+100mV
	Current	≤0.2%+120mA
Setup stability-8h (%of Output +Offset)	Voltage	≤0.05%+100mV
	Current	≤0.2%+120mA
Readback stability-30min (%of Output +Offset)	Voltage	≤0.05%+100mV
	Current	≤0.2%+120mA
Readback stability-8h (%of Output +Offset)	Voltage	≤0.05%+100mV
	Current	≤0.2%+120mA
Efficiency	89%(50V/120A) ~ 90.5%(200V/30A)	
Remote Sense Compensation Voltage	2V	
Command Response Time	20mS	
Power Factor	0.99	

Parameter	IT6533D Ver:V1.6
Maximum input current[4]	38A
Maximum input apparent power	7600VA
Storage temperature	-10℃ ~ 70℃
Protective function	OVP, OCP, OPP, OTP，Vsense reversed protect
Standard Interface	USB/RS232/CAN/GPIB/LAN
Isolation (output to ground)	500V
Parallel Number	≤8
Working temperature	0 ~ 40℃
Dimension (mm)	483mmW×194mmH×640.8mmD
Weight(net)	35Kg

5.1.7 IT6514D

Parameter		IT6514D Ver:V1.6
Output Rating(0 ℃-40 ℃)	Output Voltage	0 ~ 360V
	Output Current	0 ~ 30A
	Output Power	0 ~ 1800W
Line regulation ±(%of Output+Offset)	Voltage	≤0.01%+40mV
	Current	≤0.01%+15mA
Load regulation ±(%of Output+Offset)	Voltage	≤0.01%+135mV
	Current	≤0.05%+30mA
Setup Resolution	Voltage	10mV
	Current	10mA
	Power	0.1W
Read Back Resolution	Voltage	10mV
	Current	10mA
	Power	0.1W
Setup Accuracy[1] (within 12 months, 25℃ ±5℃) ±(%of Output+Offset)	Voltage	≤0.05%+135mV
	Current	≤0.2%+30mA
	Power	1%+30W
Read Back Accuracy[2]	Voltage	≤0.05%+135mV

Parameter		IT6514D Ver:V1.6
(within 12 months, 25℃ ±5℃) ±(%of Output+Offset)	Current	≤0.2%+30mA
	Power	1%+30W
Ripple (20Hz -20MHz)	Voltage	≤360mVp-p
	Current	≤0.05%+30mArms
Setup Temperature Coefficient (%of Output/℃+Offset)	Voltage	≤0.01%+135mV
	Current	≤0.02%+30mA
Read Back Temperature Coefficient (%of Output/℃+Offset)	Voltage	≤0.01%+135mV
	Current	≤0.02%+30mA
Rise time(no load)	Voltage	≤250ms
Rise time(full load)	Voltage	≤250ms
Fall time(no load)	Voltage	≤850ms
Fall time(full load)	Voltage	≤140ms
Transient Response Time	Voltage	≤3ms
AC Input[3]	Voltage	220Vac±10%
	Frequency	47Hz ~ 63Hz
Setup stability-30min (%of Output +Offset)	Voltage	≤0.05%+135mV
	Current	≤0.1%+30mA
Setup stability-8h (%of Output +Offset)	Voltage	≤0.05%+135mV
	Current	≤0.1%+30mA
Readback stability-30min (%of Output +Offset)	Voltage	≤0.05%+135mV
	Current	≤0.1%+30mA
Readback stability-8h (%of Output +Offset)	Voltage	≤0.05%+135mV
	Current	≤0.1%+30mA
Efficiency	80%	
Remote Sense Compensation Voltage	3V	
Command Response Time	20mS	
Power Factor	0.99	
Maximum input current[4]	12A	
Maximum input apparent power	2300VA	
Storage temperature	-10℃ ~ 70℃	

Parameter	IT6514D Ver:V1.6
Protective function	OVP, OCP, OPP, OTP, Vsense reversed protect
Standard Interface	USB/RS232/CAN/GPIB/LAN
Isolation (output to ground)	500V
Parallel Number	≤8
Working temperature	0 ~ 40℃
Dimension (mm)	483mmW×105.4mmH×640.8mmD
Weight(net)	17Kg

5.1.8 IT6524D

Parameter		IT6524D Ver:V1.6
Output Rating(0 ℃-40 ℃)	Output Voltage	0 ~ 360V
	Output Current	0 ~ 30A
	Output Power	0 ~ 3000W
Line regulation ±(%of Output+Offset)	Voltage	≤0.01%+40mV
	Current	≤0.01%+15mA
Load regulation ±(%of Output+Offset)	Voltage	≤0.01%+135mV
	Current	≤0.05%+30mA
Setup Resolution	Voltage	10mV
	Current	10mA
	Power	0.1W
Read Back Resolution	Voltage	10mV
	Current	10mA
	Power	0.1W
Setup Accuracy[1] (within 12 months, 25℃ ±5℃) ±(%of Output+Offset)	Voltage	≤0.05%+135mV
	Current	≤0.2%+30mA
	Power	1%+30W
Read Back Accuracy[2] (within 12 months, 25℃ ±5℃) ±(%of Output+Offset)	Voltage	≤0.05%+135mV
	Current	≤0.2%+30mA
	Power	1%+30W
Ripple (20Hz -20MHz)	Voltage	≤360mVp-p
	Current	≤0.05%+30mArms

Parameter		IT6524D Ver:V1.6
Setup Temperature Coefficient (%of Output/℃+Offset)	Voltage	≤0.01%+135mV
	Current	≤0.02%+30mA
Read Back Temperature Coefficient (%of Output/℃+Offset)	Voltage	≤0.01%+135mV
	Current	≤0.02%+30mA
Rise time(no load)	Voltage	≤250ms
Rise time(full load)	Voltage	≤250ms
Fall time(no load)	Voltage	≤850ms
Fall time(full load)	Voltage	≤70ms
Transient Response Time	Voltage	≤3ms
AC Input[3]	Voltage	220Vac±10%
	Frequency	47Hz ~ 63Hz
Setup stability-30min (%of Output +Offset)	Voltage	≤0.05%+135mV
	Current	≤0.1%+30mA
Setup stability-8h (%of Output +Offset)	Voltage	≤0.05%+135mV
	Current	≤0.1%+30mA
Readback stability-30min (%of Output +Offset)	Voltage	≤0.05%+135mV
	Current	≤0.1%+30mA
Readback stability-8h (%of Output +Offset)	Voltage	≤0.05%+135mV
	Current	≤0.1%+30mA
Efficiency	80%	
Remote Sense Compensation Voltage	3V	
Command Response Time	20mS	
Power Factor	0.99	
Maximum input current[4]	19A	
Maximum input apparent power	3800VA	
Storage temperature	-10℃ ~ 70℃	
Protective function	OVP, OCP, OPP, OTP, Vsense reversed protect	
Standard Interface	USB/RS232/CAN/GPIB/LAN	
Isolation (output to ground)	500V	
Parallel Number	≤8	
Working temperature	0 ~ 40℃	

Parameter	IT6524D Ver:V1.6
Dimension (mm)	483mmW×105.4mmH×640.8mmD
Weight(net)	17Kg

5.1.9 IT6534D

Parameter		IT6534D Ver:V1.6
Output Rating(0 ℃-40 ℃)	Output Voltage	0 ~ 360V
	Output Current	0 ~ 60A
	Output Power	0 ~ 6KW
Line regulation ±(%of Output+Offset)	Voltage	≤0.01%+40mV
	Current	≤0.01%+30mA
Load regulation ±(%of Output+Offset)	Voltage	≤0.01%+135mV
	Current	≤0.05%+60mA
Setup Resolution	Voltage	10mV
	Current	10mA
	Power	0.1W
Read Back Resolution	Voltage	10mV
	Current	10mA
	Power	0.1W
Setup Accuracy[1] (within 12 months, 25℃ ±5℃) ±(%of Output+Offset)	Voltage	≤0.05%+135mV
	Current	≤0.2%+60mA
	Power	1%+60W
Read Back Accuracy[2] (within 12 months, 25℃ ±5℃) ±(%of Output+Offset)	Voltage	≤0.05%+135mV
	Current	≤0.2%+60mA
	Power	1%+60W
Ripple (20Hz -20MHz)	Voltage	≤360mVp-p
	Current	≤0.05%+60mArms
Setup Temperature Coefficient (%of Output/℃+Offset)	Voltage	≤0.01%+135mV
	Current	≤0.02%+60mA
Read Back Temperature Coefficient (%of Output/℃+Offset)	Voltage	≤0.01%+135mV
	Current	≤0.02%+60mA
Rise time(no load)	Voltage	≤250ms

Parameter		IT6534D Ver:V1.6
Rise time(full load)	Voltage	≤250ms
Fall time(no load)	Voltage	≤850ms
Fall time(full load)	Voltage	≤70ms
Transient Response Time	Voltage	≤3ms
AC Input[3]	Voltage	220Vac±10%
	Frequency	47Hz ~ 63Hz
Setup stability-30min (%of Output +Offset)	Voltage	≤0.05%+135mV
	Current	≤0.1%+60mA
Setup stability-8h (%of Output +Offset)	Voltage	≤0.05%+135mV
	Current	≤0.1%+60mA
Readback stability-30min (%of Output +Offset)	Voltage	≤0.05%+135mV
	Current	≤0.1%+60mA
Readback stability-8h (%of Output +Offset)	Voltage	≤0.05%+135mV
	Current	≤0.1%+60mA
Efficiency	80%	
Remote Sense Compensation Voltage	3V	
Command Response Time	20mS	
Power Factor	0.99	
Maximum input current[4]	38A	
Maximum input apparent power	7600VA	
Storage temperature	-10℃ ~ 70℃	
Protective function	OVP, OCP, OPP, OTP, Vsense reversed protect	
Standard Interface	USB/RS232/CAN/GPIB/LAN	
Isolation (output to ground)	500V	
Parallel Number	≤8	
Working temperature	0 ~ 40℃	
Dimension (mm)	483mmW×194mmH×640.8mmD	
Weight(net)	35Kg	

5.1.10 IT6515D

Parameter		IT6515D Ver:V1.6
额定值 (0 ℃-40 ℃)	Voltage	0 ~ 500V
	Current	0 ~ 20A
	Power	0 ~ 1800W
Line regulation ±(%of Output+Offset)	Voltage	≤0.01%+50mV
	Current	≤0.01%+10mA
Load regulation ±(%of Output+Offset)	Voltage	≤0.01%+100mV
	Current	≤0.05%+20mA
Setup Resolution	Voltage	100mV
	Current	10mA
	Power	0.1W
Read Back Resolution	Voltage	100mV
	Current	10mA
	Power	0.1W
Setup Accuracy[1] (within 12 months, 25℃ ±5℃) ±(%of Output+Offset)	Voltage	≤0.05%+200mV
	Current	≤0.2%+20mA
	Power	≤1%+30W
Read Back Accuracy[2] (within 12 months, 25℃ ±5℃) ±(%of Output+Offset)	Voltage	≤0.05%+200mV
	Current	≤0.2%+20mA
	Power	≤1%+30W
Ripple (20Hz -20MHz)	Voltage	≤500mVp-p
	Current	≤40mArms
Setup Temperature Coefficient (%of Output/℃+Offset)	Voltage	≤0.03%+100mV
	Current	≤0.1%+30mA
Read Back Temperature Coefficient (%of Output/℃+Offset)	Voltage	≤0.03%+100mV
	Current	≤0.1%+30mA
Rise time(no load)	Voltage	≤200ms
Rise time(full load)	Voltage	≤200ms
Fall time(no load)	Voltage	≤350ms
Fall time(full load)	Voltage	≤60ms
Transient Response Time	≤2ms	
AC Input[3]	Voltage	220V±10%

Parameter		IT6515D Ver:V1.6
	Frequency	47Hz ~ 63Hz
Setup stability-30min (%of Output +Offset)	Voltage	≤0.03%+100mV
	Current	≤0.1%+30mA
Setup stability-8h (%of Output +Offset)	Voltage	≤0.03%+100mV
	Current	≤0.1%+30mA
Readback stability-30min (%of Output +Offset)	Voltage	≤0.03%+100mV
	Current	≤0.1%+30mA
Readback stability-8h (%of Output +Offset)	Voltage	≤0.03%+100mV
	Current	≤0.1%+30mA
Efficiency	90%(150V/20A) ~ 93%(500V/6A)	
Remote Sense Compensation Voltage	5V	
Command Response Time	20mS	
Power Factor	0.99	
Maximum input current[4]	10A	
Maximum input apparent power	2100VA	
Storage temperature	-10℃ ~ 70℃	
Protective function	OVP, OCP, OPP, OTP，Vsense reversed protect	
Standard Interface	USB/RS232/CAN/GPIB/LAN	
Isolation (output to ground)	500V	
Parallel Number	≤8	
Working temperature	0 ~ 40℃	
Dimension (mm)	483mmW×105.4mmH×640.8mmD	
Weight(net)	17Kg	

5.1.11 IT6525D

Parameter		IT6525D Ver:V1.6
额定值 (0 ℃-40 ℃)	Voltage	0 ~ 500V
	Current	0 ~ 20A
	Power	0 ~ 3000W
Line regulation ±(%of Output+Offset)	Voltage	≤0.01%+50mV

Parameter		IT6525D Ver:V1.6
	Current	≤0.01%+10mA
Load regulation ±(%of Output+Offset)	Voltage	≤0.01%+100mV
	Current	≤0.05%+20mA
Setup Resolution	Voltage	100mV
	Current	10mA
	Power	0.1W
Read Back Resolution	Voltage	100mV
	Current	10mA
	Power	0.1W
Setup Accuracy[1] (within 12 months, 25℃ ±5℃) ±(%of Output+Offset)	Voltage	≤0.05%+200mV
	Current	≤0.2%+20mA
	Power	≤1%+30W
Read Back Accuracy[2] (within 12 months, 25℃ ±5℃) ±(%of Output+Offset)	Voltage	≤0.05%+200mV
	Current	≤0.2%+20mA
	Power	≤1%+30W
Ripple (20Hz -20MHz)	Voltage	≤500mVp-p
	Current	≤40mArms
Setup Temperature Coefficient (%of Output/℃+Offset)	Voltage	≤0.03%+100mV
	Current	≤0.1%+30mA
Read Back Temperature Coefficient (%of Output/℃+Offset)	Voltage	≤0.03%+100mV
	Current	≤0.1%+30mA
Rise time(no load)	Voltage	≤200ms
Rise time(full load)	Voltage	≤200ms
Fall time(no load)	Voltage	≤350ms
Fall time(full load)	Voltage	≤30ms
Transient Response Time	≤2ms	
AC Input[3]	Voltage	220V±10%
	Frequency	47Hz ~ 63Hz
Setup stability-30min (%of Output +Offset)	Voltage	≤0.03%+100mV
	Current	≤0.1%+30mA
Setup stability-8h (%of Output +Offset)	Voltage	≤0.03%+100mV
	Current	≤0.1%+30mA

Parameter		IT6525D Ver:V1.6
Readback stability-30min (%of Output +Offset)	Voltage	≤0.03%+100mV
	Current	≤0.1%+30mA
Readback stability-8h (%of Output +Offset)	Voltage	≤0.03%+100mV
	Current	≤0.1%+30mA
Efficiency	90%(150V/20A)~93%(500V/6A)	
Remote Sense Compensation Voltage	5V	
Command Response Time	20mS	
Power Factor	0.99	
Maximum input current[4]	19A	
Maximum input apparent power	3800VA	
Storage temperature	-10℃~70℃	
Protective function	OVP, OCP, OPP, OTP，Vsense reversed protect	
Standard Interface	USB/RS232/CAN/GPIB/LAN	
Isolation (output to ground)	500V	
Parallel Number	≤8	
Working temperature	0~40℃	
Dimension (mm)	483mmW×105.4mmH×640.8mmD	
Weight(net)	17Kg	

5.1.12 IT6535D

Parameter		IT6535D Ver:V1.6
额定值 (0 ℃-40 ℃)	Voltage	0~500V
	Current	0~40A
	Power	0~6KW
Line regulation ±(%of Output+Offset)	Voltage	≤0.01%+50mV
	Current	≤0.01%+20mA
Load regulation ±(%of Output+Offset)	Voltage	≤0.01%+100mV
	Current	≤0.05%+40mA
Setup Resolution	Voltage	100mV
	Current	10mA

Parameter		IT6535D Ver:V1.6
	Power	0.1W
Read Back Resolution	Voltage	100mV
	Current	10mA
	Power	0.1W
Setup Accuracy[1] (within 12 months, 25℃ ±5℃) ±(%of Output+Offset)	Voltage	≤0.05%+200mV
	Current	≤0.2%+40mA
	Power	≤1%+60W
Read Back Accuracy[2] (within 12 months, 25℃ ±5℃) ±(%of Output+Offset)	Voltage	≤0.05%+200mV
	Current	≤0.2%+40mA
	Power	≤1%+60W
Ripple (20Hz -20MHz)	Voltage	≤500mVp-p
	Current	≤80mArms
Setup Temperature Coefficient (%of Output/℃+Offset)	Voltage	≤0.03%+100mV
	Current	≤0.1%+60mA
Read Back Temperature Coefficient (%of Output/℃+Offset)	Voltage	≤0.03%+100mV
	Current	≤0.1%+60mA
Rise time(no load)	Voltage	≤200ms
Rise time(full load)	Voltage	≤200ms
Fall time(no load)	Voltage	≤350ms
Fall time(full load)	Voltage	≤30ms
Transient Response Time	≤2ms	
AC Input[3]	Voltage	220V±10%
	Frequency	47Hz ~ 63Hz
Setup stability-30min (%of Output +Offset)	Voltage	≤0.03%+100mV
	Current	≤0.1%+60mA
Setup stability-8h (%of Output +Offset)	Voltage	≤0.03%+100mV
	Current	≤0.1%+60mA
Readback stability-30min (%of Output +Offset)	Voltage	≤0.03%+100mV
	Current	≤0.1%+60mA
Readback stability-8h (%of Output +Offset)	Voltage	≤0.03%+100mV
	Current	≤0.1%+60mA
Efficiency	90%(150V/40A) ~ 93%(500V/12A)	

Parameter	IT6535D Ver:V1.6
Remote Sense Compensation Voltage	5V
Command Response Time	20mS
Power Factor	0.99
Maximum input current[4]	38A
Maximum input apparent power	7600VA
Storage temperature	-10℃ ~ 70℃
Protective function	OVP, OCP, OPP, OTP，Vsense reversed protect
Standard Interface	USB/RS232/CAN/GPIB/LAN
Isolation (output to ground)	500V
Parallel Number	≤8
Working temperature	0 ~ 40℃
Dimension (mm)	483mmW×194mmH×640.8mmD
Weight(net)	35Kg

5.1.13 IT6516D

Parameter		IT6516D Ver:V1.6
额定值 (0 ℃-40 ℃)	Voltage	0 ~ 750V
	Current	0 ~ 15A
	Power	0 ~ 1800W
Line regulation ±(%of Output+Offset)	Voltage	≤0.01%+75mV
	Current	≤0.1%+7.5mA
Load regulation ±(%of Output+Offset)	Voltage	≤0.01%+200mV
	Current	≤0.05%+15mA
Setup Resolution	Voltage	100mV
	Current	1mA
	Power	0.1W
Read Back Resolution	Voltage	100mV
	Current	1mA
	Power	0.1W
Setup Accuracy	Voltage	≤0.05%+300mV

Parameter		IT6516D Ver:V1.6
(within 12 months, 25℃ ±5℃) ±(%of Output+Offset)	Current	≤0.2%+15mA
	Power	≤1%+30W
Read Back Accuracy (within 12 months, 25℃ ±5℃) ±(%of Output+Offset)	Voltage	≤0.05%+300mV
	Current	≤0.2%+15mA
	Power	≤1%+30W
Ripple (20Hz -20MHz)	Voltage	≤750mVp-p
	Current	≤30mArms
Setup Temperature Coefficient (%of Output/℃+Offset)	Voltage	≤0.03%+100mV
	Current	≤0.1%+30mA
Read Back Temperature Coefficient (%of Output/℃+Offset)	Voltage	≤0.03%+100mV
	Current	≤0.1%+30mA
Rise time(no load)	Voltage	≤250ms
Rise time(full load)	Voltage	≤250ms
Fall time(no load)	Voltage	≤500ms
Fall time(full load)	Voltage	≤40ms
Transient Response Time	≤3.5ms	
AC Input	Voltage	220V±10%
	Frequency	47Hz ~ 63Hz
Setup stability-30min (%of Output +Offset)	Voltage	≤0.03%+100mV
	Current	≤0.1%+30mA
Setup stability-8h (%of Output +Offset)	Voltage	≤0.03%+100mV
	Current	≤0.1%+30mA
Readback stability-30min (%of Output +Offset)	Voltage	≤0.03%+100mV
	Current	≤0.1%+30mA
Readback stability-8h (%of Output +Offset)	Voltage	≤0.03%+100mV
	Current	≤0.1%+30mA
Efficiency	91.5%(200V/15A) ~ 93.5%(750V/4A)	
Remote Sense Compensation Voltage	5V	
Command Response Time	20mS	
Power Factor	0.99	
Maximum input current	10A	

Parameter	IT6516D Ver:V1.6
Maximum input apparent power	2000VA
Storage temperature	-10℃ ~ 70℃
Protective function	OVP, OCP, OPP, OTP，Vsense reversed protect
Standard Interface	USB/RS232/CAN/GPIB/LAN
Isolation (output to ground)	750V
Parallel Number	≤8
Working temperature	0 ~ 40℃
Dimension (mm)	483mmW×105.4mmH×640.8mmD
Weight(net)	17Kg

5.1.14 IT6526D

Parameter		IT6526D Ver:V1.6
额定值 (0 ℃-40 ℃)	Voltage	0 ~ 750V
	Current	0 ~ 15A
	Power	0 ~ 3000W
Line regulation ±(%of Output+Offset)	Voltage	≤0.01%+75mV
	Current	≤0.1%+7.5mA
Load regulation ±(%of Output+Offset)	Voltage	≤0.01%+200mV
	Current	≤0.05%+15mA
Setup Resolution	Voltage	100mV
	Current	1mA
	Power	0.1W
Read Back Resolution	Voltage	100mV
	Current	1mA
	Power	0.1W
Setup Accuracy (within 12 months, 25℃ ±5℃) ±(%of Output+Offset)	Voltage	≤0.05%+300mV
	Current	≤0.2%+15mA
	Power	≤1%+30W
Read Back Accuracy (within 12 months, 25℃ ±5℃) ±(%of Output+Offset)	Voltage	≤0.05%+300mV
	Current	≤0.2%+15mA
	Power	≤1%+30W

Parameter		IT6526D Ver:V1.6
Ripple (20Hz -20MHz)	Voltage	≤750mVp-p
	Current	≤30mArms
Setup Temperature Coefficient (%of Output/℃+Offset)	Voltage	≤0.03%+100mV
	Current	≤0.1%+30mA
Read Back Temperature Coefficient (%of Output/℃+Offset)	Voltage	≤0.03%+100mV
	Current	≤0.1%+30mA
Rise time(no load)	Voltage	≤250ms
Rise time(full load)	Voltage	≤250ms
Fall time(no load)	Voltage	≤500ms
Fall time(full load)	Voltage	≤20ms
Transient Response Time	≤3.5ms	
AC Input	Voltage	220V±10%
	Frequency	47Hz ~ 63Hz
Setup stability-30min (%of Output +Offset)	Voltage	≤0.03%+100mV
	Current	≤0.1%+30mA
Setup stability-8h (%of Output +Offset)	Voltage	≤0.03%+100mV
	Current	≤0.1%+30mA
Readback stability-30min (%of Output +Offset)	Voltage	≤0.03%+100mV
	Current	≤0.1%+30mA
Readback stability-8h (%of Output +Offset)	Voltage	≤0.03%+100mV
	Current	≤0.1%+30mA
Efficiency	91.5%(200V/15A) ~ 93.5%(750V/4A)	
Remote Sense Compensation Voltage	5V	
Command Response Time	20mS	
Power Factor	0.99	
Maximum input current	19A	
Maximum input apparent power	3800VA	
Storage temperature	-10℃ ~ 70℃	
Protective function	OVP, OCP, OPP, OTP ，Vsense reversed protect	
Standard Interface	USB/RS232/CAN/GPIB/LAN	
Isolation (output to ground)	750V	

Parameter	IT6526D Ver:V1.6
Parallel Number	≤8
Working temperature	0 ~ 40℃
Dimension (mm)	483mmW×105.4mmH×640.8mmD
Weight(net)	17Kg

5.1.15 IT6536D

Parameter		IT6536D Ver:V1.6
额定值 (0 ℃-40 ℃)	Voltage	0 ~ 750V
	Current	0 ~ 30A
	Power	0 ~ 6KW
Line regulation ±(%of Output+Offset)	Voltage	≤0.01%+75mV
	Current	≤0.1%+15mA
Load regulation ±(%of Output+Offset)	Voltage	≤0.01%+200mV
	Current	≤0.05%+30mA
Setup Resolution	Voltage	100mV
	Current	10mA
	Power	0.1W
Read Back Resolution	Voltage	100mV
	Current	10mA
	Power	0.1W
Setup Accuracy (within 12 months, 25℃ ±5℃) ±(%of Output+Offset)	Voltage	≤0.05%+300mV
	Current	≤0.2%+30mA
	Power	≤1%+60W
Read Back Accuracy (within 12 months, 25℃ ±5℃) ±(%of Output+Offset)	Voltage	≤0.05%+300mV
	Current	≤0.2%+30mA
	Power	≤1%+60W
Ripple (20Hz -20MHz)	Voltage	≤750mVp-p
	Current	≤60mArms
Setup Temperature Coefficient (%of Output/℃+Offset)	Voltage	≤0.03%+100mV
	Current	≤0.1%+60mA
Read Back Temperature Coefficient	Voltage	≤0.03%+100mV

Parameter		IT6536D Ver:V1.6
(%of Output/℃+Offset)	Current	≤0.1%+60mA
Rise time(no load)	Voltage	≤250ms
Rise time(full load)	Voltage	≤250ms
Fall time(no load)	Voltage	≤500ms
Fall time(full load)	Voltage	≤20ms
Transient Response Time	≤3.5ms	
AC Input	Voltage	220V±10%
	Frequency	47Hz ~ 63Hz
Setup stability-30min (%of Output +Offset)	Voltage	≤0.03%+100mV
	Current	≤0.1%+60mA
Setup stability-8h (%of Output +Offset)	Voltage	≤0.03%+100mV
	Current	≤0.1%+60mA
Readback stability-30min (%of Output +Offset)	Voltage	≤0.03%+100mV
	Current	≤0.1%+60mA
Readback stability-8h (%of Output +Offset)	Voltage	≤0.03%+100mV
	Current	≤0.1%+60mA
Efficiency	91.5%(200V/30A) ~ 93.5%(750V/8A)	
Remote Sense Compensation Voltage	5V	
Command Response Time	20mS	
Power Factor	0.99	
Maximum input current	38A	
Maximum input apparent power	7600VA	
Storage temperature	-10℃ ~ 70℃	
Protective function	OVP, OCP, OPP, OTP，Vsense reversed protect	
Standard Interface	USB/RS232/CAN/GPIB/LAN	
Isolation (output to ground)	750V	
Parallel Number	≤8	
Working temperature	0 ~ 40℃	
Dimension (mm)	483mmW×194mmH×640.8mmD	
Weight(net)	35Kg	

5.1.16 IT6517D

Parameter		IT6517D Ver:V1.6
Output Rating(0 ℃-40 ℃)	Output Voltage	0 ~ 1000V
	Output Current	0 ~ 10A
	Output Power	0 ~ 1800W
Line regulation ±(%of Output+Offset)	Voltage	≤0.01%+100mV
	Current	≤0.01%+5mA
Load regulation ±(%of Output+Offset)	Voltage	≤0.01%+375mV
	Current	≤0.05%+10mA
Setup Resolution	Voltage	100mV
	Current	1mA
	Power	0.1W
Read Back Resolution	Voltage	100mV
	Current	1mA
	Power	0.1W
Setup Accuracy[1] (within 12 months, 25℃ ±5℃) ±(%of Output+Offset)	Voltage	≤0.05%+375mV
	Current	≤0.2%+10mA
	Power	1%+30W
Read Back Accuracy[2] (within 12 months, 25℃ ±5℃) ±(%of Output+Offset)	Voltage	≤0.05%+375mV
	Current	≤0.2%+10mA
	Power	1%+30W
Ripple (20Hz -20MHz)	Voltage	≤1.5Vp-p
	Current	≤0.05%+10mArms
Setup Temperature Coefficient (%of Output/℃+Offset)	Voltage	≤0.01%+375mV
	Current	≤0.02%+10mA
Read Back Temperature Coefficient (%of Output/℃+Offset)	Voltage	≤0.01%+375mV
	Current	≤0.02%+10mA
Rise time(no load)	Voltage	≤300ms
Rise time(full load)	Voltage	≤300ms
Fall time(no load)	Voltage	≤700ms
Fall time(full load)	Voltage	≤60ms
Transient Response Time	Voltage	≤3ms
AC Input[3]	Voltage	220Vac±10%

Parameter		IT6517D Ver:V1.6
	Frequency	47Hz ~ 63Hz
Setup stability-30min (%of Output +Offset)	Voltage	≤0.05%+375mV
	Current	≤0.1%+10mA
Setup stability-8h (%of Output +Offset)	Voltage	≤0.05%+375mV
	Current	≤0.1%+10mA
Readback stability-30min (%of Output +Offset)	Voltage	≤0.05%+375mV
	Current	≤0.1%+10mA
Readback stability-8h (%of Output +Offset)	Voltage	≤0.05%+375mV
	Current	≤0.1%+10mA
Efficiency	80%	
Remote Sense Compensation Voltage	3V	
Command Response Time	20mS	
Power Factor	0.99	
Maximum input current[4]	12A	
Maximum input apparent power	2300VA	
Storage temperature	-10℃ ~ 70℃	
Protective function	OVP, OCP, OPP, OTP, Vsense reversed protect	
Standard Interface	USB/RS232/CAN/GPIB/LAN	
Isolation (output to ground)	1000V	
Parallel Number	≤8	
Working temperature	0 ~ 40℃	
Dimension (mm)	483mmW×105.4mmH×640.8mmD	
Weight(net)	17Kg	

5.1.17 IT6527D

Parameter		IT6527D Ver:V1.6
Output Rating(0 ℃-40 ℃)	Output Voltage	0 ~ 1000V
	Output Current	0 ~ 10A
	Output Power	0 ~ 3000W
Line regulation	Voltage	≤0.01%+100mV

Parameter		IT6527D Ver:V1.6
±(%of Output+Offset)	Current	≤0.01%+5mA
Load regulation ±(%of Output+Offset)	Voltage	≤0.01%+375mV
	Current	≤0.05%+10mA
Setup Resolution	Voltage	100mV
	Current	1mA
	Power	0.1W
Read Back Resolution	Voltage	100mV
	Current	1mA
	Power	0.1W
Setup Accuracy[1] (within 12 months, 25℃ ±5℃) ±(%of Output+Offset)	Voltage	≤0.05%+375mV
	Current	≤0.2%+10mA
	Power	1%+30W
Read Back Accuracy[2] (within 12 months, 25℃ ±5℃) ±(%of Output+Offset)	Voltage	≤0.05%+375mV
	Current	≤0.2%+10mA
	Power	1%+30W
Ripple (20Hz -20MHz)	Voltage	≤1.5Vp-p
	Current	≤0.05%+10mArms
Setup Temperature Coefficient (%of Output/℃+Offset)	Voltage	≤0.01%+375mV
	Current	≤0.02%+10mA
Read Back Temperature Coefficient (%of Output/℃+Offset)	Voltage	≤0.01%+375mV
	Current	≤0.02%+10mA
Rise time(no load)	Voltage	≤300ms
Rise time(full load)	Voltage	≤300ms
Fall time(no load)	Voltage	≤700ms
Fall time(full load)	Voltage	≤30ms
Transient Response Time	Voltage	≤3ms
AC Input[3]	Voltage	220Vac±10%
	Frequency	47Hz ~ 63Hz
Setup stability-30min (%of Output +Offset)	Voltage	≤0.05%+375mV
	Current	≤0.1%+10mA
Setup stability-8h (%of Output +Offset)	Voltage	≤0.05%+375mV
	Current	≤0.1%+10mA

Parameter		IT6527D Ver:V1.6
Readback stability-30min (%of Output +Offset)	Voltage	≤0.05%+375mV
	Current	≤0.1%+10mA
Readback stability-8h (%of Output +Offset)	Voltage	≤0.05%+375mV
	Current	≤0.1%+10mA
Efficiency	80%	
Remote Sense Compensation Voltage	3V	
Command Response Time	20mS	
Power Factor	0.99	
Maximum input current[4]	19A	
Maximum input apparent power	3800VA	
Storage temperature	-10℃ ~ 70℃	
Protective function	OVP, OCP, OPP, OTP, Vsense reversed protect	
Standard Interface	USB/RS232/CAN/GPIB/LAN	
Isolation (output to ground)	1000V	
Parallel Number	≤8	
Working temperature	0 ~ 40℃	
Dimension (mm)	483mmW×105.4mmH×640.8mmD	
Weight(net)	17Kg	

5.1.18 IT6537D

Parameter		IT6537D Ver:V1.6
Output Rating(0 ℃-40 ℃)	Output Voltage	0 ~ 1000V
	Output Current	0 ~ 20A
	Output Power	0 ~ 6KW
Line regulation ±(%of Output+Offset)	Voltage	≤0.01%+100mV
	Current	≤0.01%+10mA
Load regulation ±(%of Output+Offset)	Voltage	≤0.01%+375mV
	Current	≤0.05%+20mA
Setup Resolution	Voltage	100mV
	Current	1mA

Parameter		IT6537D Ver:V1.6
	Power	0.1W
Read Back Resolution	Voltage	100mV
	Current	1mA
	Power	0.1W
Setup Accuracy[1] (within 12 months, 25℃ ±5℃) ±(%of Output+Offset)	Voltage	≤0.05%+375mV
	Current	≤0.2%+20mA
	Power	1%+60W
Read Back Accuracy[2] (within 12 months, 25℃ ±5℃) ±(%of Output+Offset)	Voltage	≤0.05%+375mV
	Current	≤0.2%+20mA
	Power	1%+60W
Ripple (20Hz -20MHz)	Voltage	≤1.5Vp-p
	Current	≤0.05%+20mArms
Setup Temperature Coefficient (%of Output/℃+Offset)	Voltage	≤0.01%+375mV
	Current	≤0.02%+20mA
Read Back Temperature Coefficient (%of Output/℃+Offset)	Voltage	≤0.01%+375mV
	Current	≤0.02%+20mA
Rise time(no load)	Voltage	≤300ms
Rise time(full load)	Voltage	≤300ms
Fall time(no load)	Voltage	≤700ms
Fall time(full load)	Voltage	≤30ms
Transient Response Time	Voltage	≤3ms
AC Input[3]	Voltage	220Vac±10%
	Frequency	47Hz ~ 63Hz
Setup stability-30min (%of Output +Offset)	Voltage	≤0.05%+375mV
	Current	≤0.1%+20mA
Setup stability-8h (%of Output +Offset)	Voltage	≤0.05%+375mV
	Current	≤0.1%+20mA
Readback stability-30min (%of Output +Offset)	Voltage	≤0.05%+375mV
	Current	≤0.1%+20mA
Readback stability-8h (%of Output +Offset)	Voltage	≤0.05%+375mV
	Current	≤0.1%+20mA
Efficiency	80%	

Parameter	IT6537D Ver:V1.6
Remote Sense Compensation Voltage	3V
Command Response Time	20mS
Power Factor	0.99
Maximum input current[4]	38A
Maximum input apparent power	7600VA
Storage temperature	-10℃ ~ 70℃
Protective function	OVP, OCP, OPP, OTP, Vsense reversed protect
Standard Interface	USB/RS232/CAN/GPIB/LAN
Isolation (output to ground)	1000V
Parallel Number	≤8
Working temperature	0 ~ 40℃
Dimension (mm)	483mmW×194mmH×640.8mmD
Weight(net)	35Kg

5.2 Supplemental characteristics

State storage capacity: 100 sets

Recommended calibration frequency: once a year

Cooling style: fans

A Appendix

A.1 Specifications of Red and Black Test Cables

ITECH provides you with optional red and black test cables, which are sold individually and you can select for test. For specifications of ITECH test cables and maximum current values, refer to the table below.

Model	Specification	Length	Description
IT-E30110-AB	10A	1m	A pair of red and black test cables with an alligator clip at one end and a banana plug at the other end
IT-E30110-BB	10A	1m	A pair of red and black test cables with banana plugs at both ends
IT-E30110-BY	10A	1m	A pair of red and black test cables with a banana plug at one end and a Y-terminal at the other end
IT-E30312-YY	30A	1.2m	A pair of red and black test cables with Y-terminals at both ends
IT-E30320-YY	30A	2m	A pair of red and black test cables with Y-terminals at both ends
IT-E30615-OO	60A	1.5m	A pair of red and black test cables with round terminals at both ends
IT-E31220-OO	120A	2m	A pair of red and black test cables with round terminals at both ends
IT-E32410-OO	240A	1m	A pair of red and black test cables with round terminals at both ends

Model	Specification	Length	Description
IT-E32420-OO	240A	2m	A pair of red and black test cables with round terminals at both ends
IT-E33620-OO	360A	2m	A pair of red and black test cables with round terminals at both ends

For maximum current of AWG copper wire, refer to table below.

AWG	8	10	12	14	16	18	20	22	24	26	28
The Maximum Current Value (A)	60	40	30	20	13	10	7	5	3.5	2.5	1.7

Note

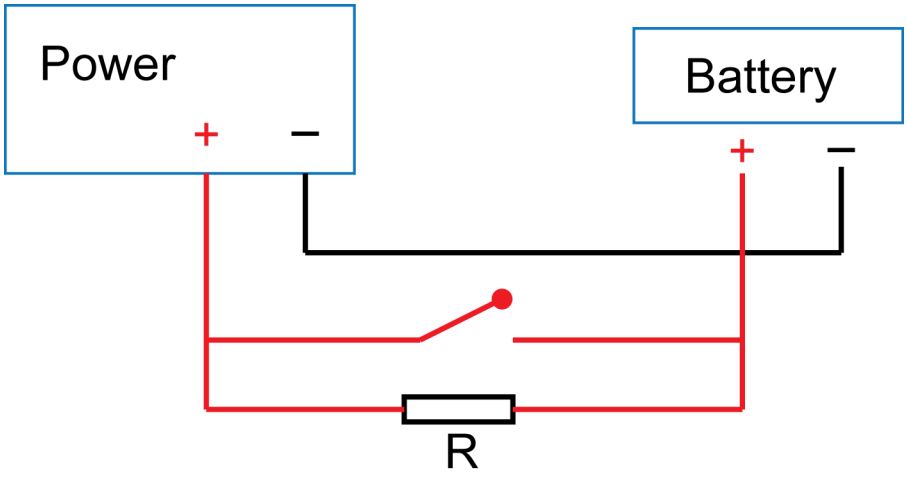
- AWG (American Wire Gage), it means X wire (marked on the wire). The table above lists current capacity of single wire at working temperature of 30°C. For reference only.
- Along with temperature, you must also consider voltage drop when selecting wire sizes.

  Although the instrument will compensate for the voltage in the wires, it is recommended to minimize the voltage drop as much as possible to prevent excessive power consumption from the instrument and poor dynamic response to load changes. Larger diameter wire sizes will help minimize wire voltage drops. Twisting or bundling wires will help reduce transient voltage drops.

A.2 How to avoid it couldn’t start when test battery

When test battery, the main reason of no start is that battery (residual voltage) discharges capacitors of positive and negitive terminals of the power supply.

Method to avoid no start: connect a switch which is parrallel with a current limiting discharging resistor. Close the switch after all the all leads connected well. The wiring diagram as follows:

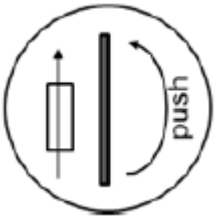
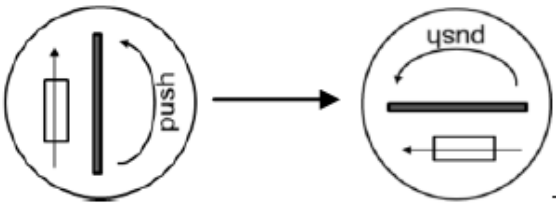
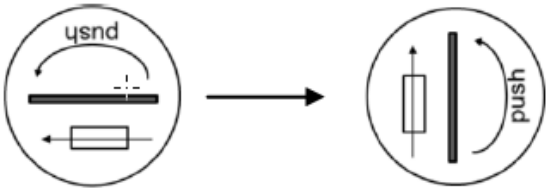
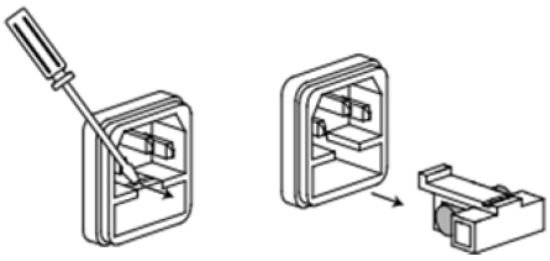


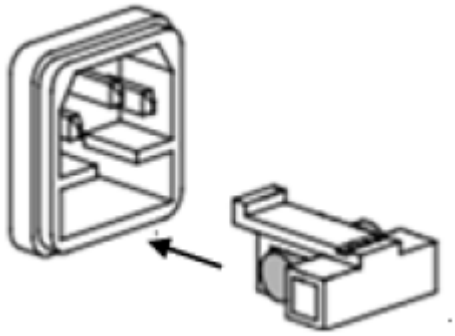
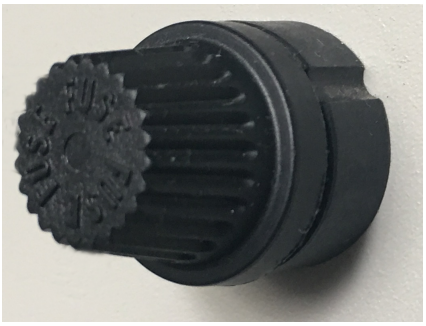
A.3 Fuse Replacement

Different models of our company product are supplied with different fuse assembly. The way to replace the fuse changes accordingly. The common ways are as follows. Please choose the corresponding way of disassembly and replacement based on the fuse assembly of the actual instrument.

Note

If there are no fuse assembly on the instrument rear panel, it means that you can't replace the fuse by yourself. Please contact the ITECH engineer on the condition of the same malfunction.

The type of the fuse	The way to replace
	1. Use a screwdriver to push and turn the fuse box anti-clockwise. When turned to 90 degrees, release the screwdriver. Refer to the picture below.  2. The fuse box will bounce up, then you can see the fuse in it. Take out the blown fuse. 3. Please replace with a fuse of the same specification. Refer to the technical specification of the corresponding instrument. 4. When install, put into the fuse box as the picture below. Then use a screwdriver to push and turn the fuse box to 90 degrees clockwise. Refer to the picture below. 
	The power cord jack of the instrument includes the fuse. Please refer to the rear panel introduction of the corresponding instrument for the detailed position. The replacement steps for this type of the fuse are as follows. 1. First pull out the power cord, and then take out the fuse block from the power cord jack with a small screwdriver, as shown below.  2. Have a visual inspection of the fuse to see whether it is burnt out; if yes, replace it with another fuse of the same specification. Refer to the corresponding technical specifications for fuse rating.

The type of the fuse	The way to replace
	3. After replacement, mount the fuse block to the original position, as illustrated below. 
	1. Push and turn the fuse box anti-clockwise by hand. When turned to 90 degrees, release the screwdriver. 2. The fuse box will bounce up, then you can see the fuse in it. Take out the blown fuse. 3. Please replace with a fuse of the same specification. Refer to the technical specification of the corresponding instrument. 4. When install, put into the fuse box firstly. Then Push and turn the fuse box to 90 degrees clockwise.

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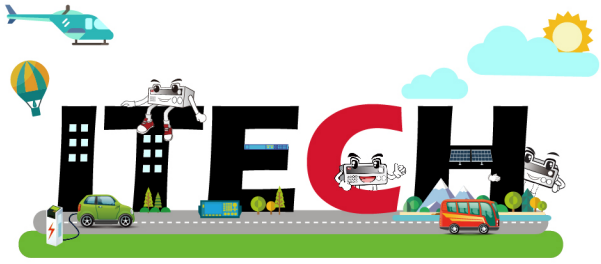

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