USER MANUAL

Triple Output

Programmable DC Power Supply

Model IT6300A

IT6322A/IT6332A/IT6333A

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Ver1.13/OCT, 2013/ IT6300A

IT6300A DC programmable power supply

About your safety

Please do not install replacement parts in the instrument, or perform any unauthorized modification. Please send the instrument to our company's maintenance department for maintenance, to ensure its security features.
Please refer to the manual for specific information warning or precautions to avoid personal injury or equipment damage.
There is no part that the operators can maintenance. If maintenance service is required, please contact trained service personnel.

Security regulation

To prevent electric shock, a non-authorized personnel is strictly not allowed to open the machine.
This equipment is strictly prohibited for use in life support systems or any other device with security requirements.
We can't accept responsibility for any direct or indirect financial damage or loss of profit that might occur when using the electronic load.

Safety symbols

Warning

It reminds the user, note some operating procedures, practices, conditions and other matters that may lead to human casualties.

Notes:

It reminds the user of some operating procedures, practices, conditions and other matters that may result in instrument damage or data lose forever.


Connect it to safety earth ground using the wire recommended in the user manual.


The symbol on an instrument indicates that the user should refer to the operating instructions located in the manual.


High voltage danger

Certification and Quality Assurance

IT6300A programmable DC power supply fully meets all of the technical specification in the manual.

Warranty

Our Company gives one year warranty for the materials and manufacturing of the product since the date of shipment.

Warranty Service

For the warranty service or repair the product, the product must be returned to the designated maintenance units. Return the product to us for warranty service, the customer should pre-pay the one-way Freight to the maintenance department, and our company is responsible for the return shipping cost.
If products are returned from other countries for maintenance service, then the customer should pay all freight, duties and other taxes.

Guarantee limit

The guarantee does not apply to the damage caused by the following conditions:
Improper or inadequate maintenance to the products by customer;
Customers use their own software or interface;
Unauthorized modification or misuse;
Operate this product not in the specified environment, or at the wrong place configuration and maintenance;
Damage from Customer self-installation of circuit, or defects due to customers use their products;
Product model or serial number of the fuselage has been altered, deleted, removed or made illegible;
Damage caused by accidents including but not limited to lightning, water, fire, abuse or neglect.

Notice

If the content of this manual is subject to change, we will not notice additionally

Introduction

IT6300A triple output programmable DC power supply，the output voltage or current of each channel can be set from 0 to max rated value.

The triple output power supply provides you with high-resolution, high accuracy and high stability, and supports over voltage, over temperature protection; Provides a serial or parallel mode, used to extend the voltage or current output capacity. Resolution reaches up to 1mV/1mA that it can meet the needs of a variety of applications, and is a great choice for University or R & D department and the manufacturer. The main features and advantages are as follows:

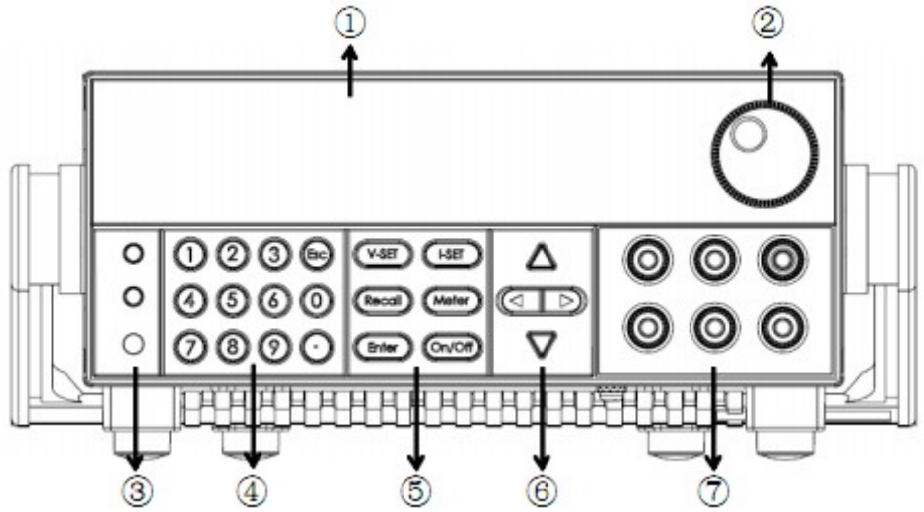
- Triple output voltage, all are adjustable.
- CH1 and CH2 can set to serial/parallel/track mode
- The voltage and current for the three channels can be displayed at the same time
- Small size of 1/2 2U
- VFD display
- Function keys with LED light
- Remote measurement function, compensation online pressure drop
- High accuracy 、resolution and stability
- Switch to control the output status
- Limited voltage and over heat protection
- Intelligent fan control, energy conservation, noise reduction
- Built-in RS232/USB communication interface
- Low ripple and low noise
- Shut off memory function
- Can be monitored by computer software
- Can calibrate through software
- Memory capacity of 36 groups, for save and recall
- Can adjust the voltage or current by knob
- Can adjust the stepping by Left/right arrow button
- Output timer function (0.1 ~ 99999.9 seconds)

Model	Channel	Voltage	Current
IT6322A	CH1	30V	3A
	CH2	30V	3A
	CH3	5V	3A
IT6332A	CH1	30V	6A
	CH2	30V	6A
	CH3	5V	6A
IT6333A	CH1	60V	3A
	CH2	60V	3A
	CH3	5V	3A

Chapter 1 Quick Reference

1.1 The front panel and rear panel description

1.1.1 Front panel



Picture 1

1 VFD display

2 Rotary knob

3 Power switch, Local and Shift key

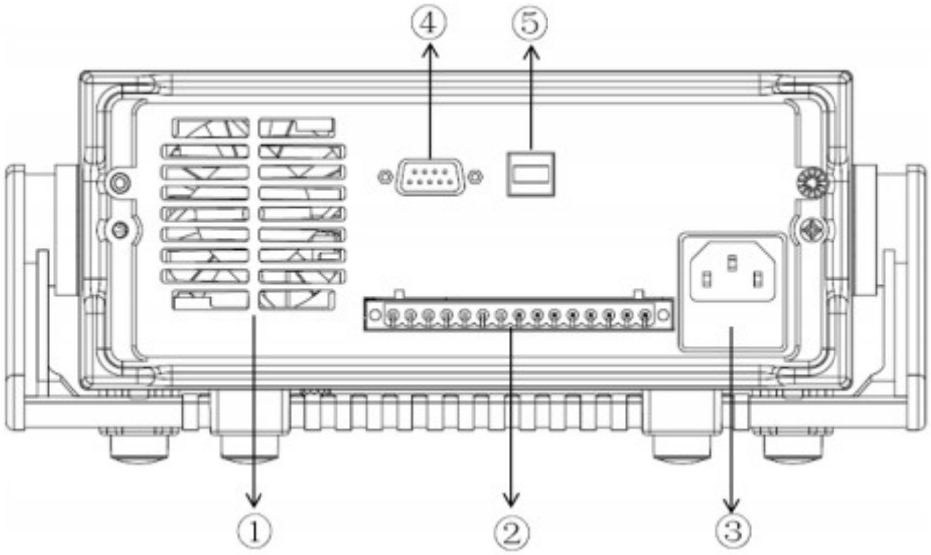
4 Numeric keys and ESC escape key

5 Function keys

6 Up/Down/Left/Right keys

7 Output terminal

1.1.2 The Rear Panel



Picture 2

1 Ventilation holes

2 Remote measurement terminal

3 110V/220V AC power selection switch and Fuse

4 RS232 communication interface

5 USB communication interface

Note: The 110v / 220v power switch is at the bottom of the instrument., please pay attention to the switch position before inserting the power cord, in order to avoid burnout the instrument

1.2 Preliminary Checkout

The following steps help you verify that the power supply is ready for use.

1.2.1 Check the list of supplied items

Verify that you have received the following items with your power supply, if anything is missing, contact your authorized supplier.

1. Power cord
2. User manual
3. Calibration report

1.2.2 Power on Pre-check

Before operation the power supply, please read the following safety guide:

Warning: The AC input voltage is 110V or 220V; please check the switching at the bottom of the power supply, to make sure it matches the voltage in your city. Otherwise, the power supply may be damaged.

Warning: The power supply provides a three-wire power cord; you should plug it to a three cord junction box. You should also make sure the power supply is well grounded.

Warning: The connection wire should have enough current capacity that it can bear the max rated current/short current of the power supply and not get too hot.

Warning: To avoid any fire or electric shock, please ensure the AC input voltage fluctuation not exceed 10% of the working voltage range.

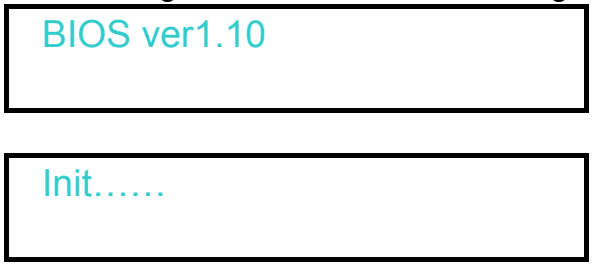
Note: In some situation, use the mis-configured main voltage for the instrument may cause the main fuse blew.

Note: If the power supply is used to charge a battery, please pay attention to the positive and negative polarity to avoid any damage.

After power up, the instrument will automatically perform a self test routine. If the power supply doesn't work, then refer to section 1.2.5.

1.2.3 Checkout procedure

After power on, during the self test, the following should be displayed on the VFD:



Picture 3

About 1S later, if EEPROM was damaged, then the VFD will display (about 2S):

Picture 4

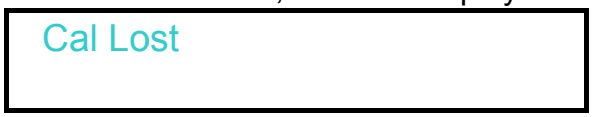
If the latest operation state of the power supply was lost, then the VFD will display (about 2S):

Picture 5

If send channel data, the channel response failure, the VFD display the tooltip information (about 2 s)

Picture 6

If calibration data read failure, the VFD display the tooltip information (about 2 s):



Picture 7

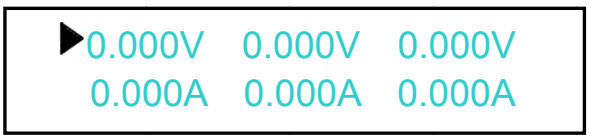
If the factory calibration data loss, restoring default data, the VFD display the tooltip information (about 2 s):

Picture 8

If the channel to send data loss, channel initialization failed, the VFD display the tooltip information (about 2 s):

Picture 9

VFD display information as follows, the first row displays the voltage, the second row displays the output state or the current . From left to right, as the first, second, third channel voltage current display area.



Picture 10

Note: the figure 10 is configuration menu (Config) for the factory set up on display, the different OutState and OutParam setting in the menu will affect on the final state of the display.

1.2.4 Output verification

The following procedure verify that the power supply outputs the correct voltage and current levels and properly responds to entries from the front panel.

Voltage Output Check

The following steps verify basic voltage function without load.

1) Press Power key to turn on the power supply
2) Press On/Off key to enable the output
3) Set the voltage value
   Adjust the voltage, then press Meter to lit the key (indicates it is in the METER mode), make sure that the set value and output value are same, and if the current displayed on the VFD is nearly 0A.

4）Make sure the voltage can be adjusted from zero to the maximum rated value.

5）Check the other two channels by the same method.

Note: when Meter key is gray, the power supply is in SET mode, then the VFD displays the set voltage and current; when the key is lit, then the power supply is in METER mode, the actual voltage and current display on the VFD. When the output is OFF, the "OFF" indicater will display at the current display area.

■ **Current output Check**

The following steps check the basic current functionality by shorting the power supply's output.

1) Press Power key to turn on the power supply
2) Press On/Off to disable the output, ensure the output is OFF.
3) Connect a short across (+) and (-) output terminals with an insulated test lead, use a wire sufficient to handle the maximum current.
4) Adjust the voltage value to 1V
5) Press On/Off to enable the output
6) Adjust the current
   Set some different current values, in METER mode, check whether the voltage value on VFD is near 0v, and the current on it is close to the value you set.
7) Make sure that the current can be adjusted from 0 to full rated value.
8) Disable the output and then remove the short wire
9) Check the other two channels by the same method.

1.2.5 If the power supply does not turn on

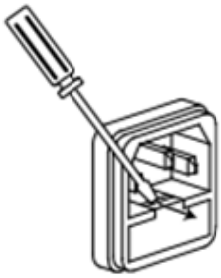
Use the following steps to help resolve the problems you might encounter when turn on the instrument:

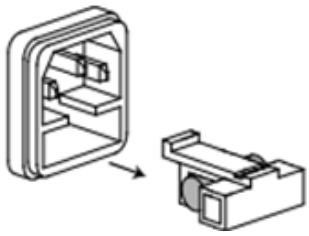
1) Verify that there is AC power applied to the power supply
   First, verify that the power cord is firmly plugged into the power receptacle on the rear panel of the power supply. You should also make sure that the power source you plugged the power supply into is energized. Then, verify that the power supply is turned on.
2) Verify the power-line voltage setting
   Make sure the voltage selector switch is set according to the present line voltage (110VAC or 220VAC) when the power supply is shipped from the factory. Change the voltage setting if it's not correct.
3) Verify the correct power-line fuse is installed
   If the fuse was damaged, please see the table below to replace the fuse for your power supply.

Model	Fuse Spec (220V AC)	Fuse Spec (110V AC)
IT6322A	3.15A T250V	6.3A T250V
IT6332A	5A T250V	10A T250V
IT6333A	5A T250V	10A T250V

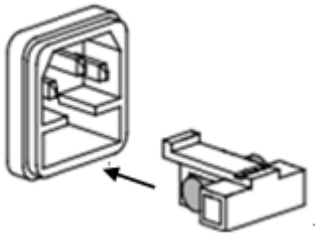
1.2.6 How to exchange the fuse

Open the small plastic cover below the power supply input socket on the back panel with a screwdriver, and you can see the fuse in it, please use the specifications in line fuse. Remove the power cord and then use a screwdriver to remove the fuse box.



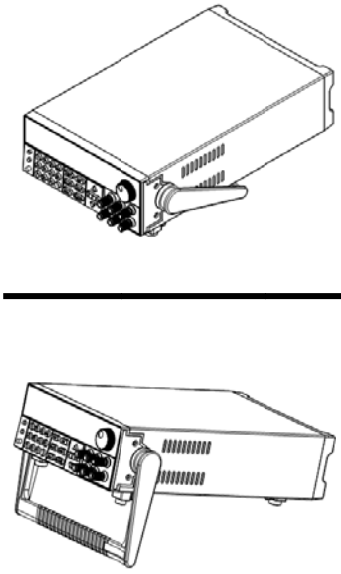


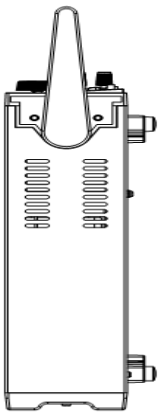
Use the same specification of fuse to replace the old one, install it to the fuse box and then insert.



1.2.7 Adjust the carrying handle

To adjust the position, grasp the handle by the sides and pull outward. Then rotate the handle to the desired position.



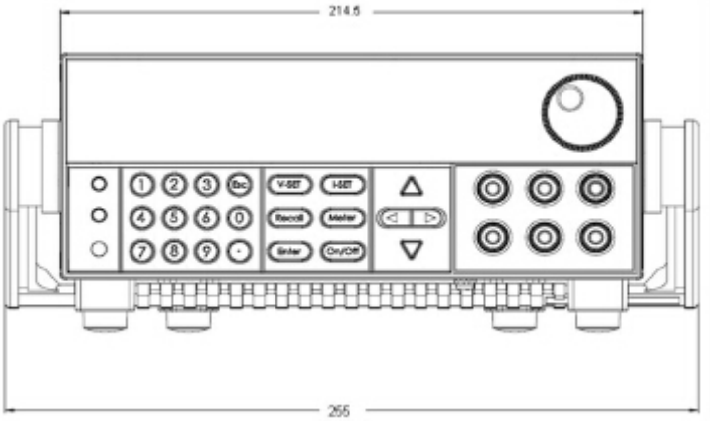


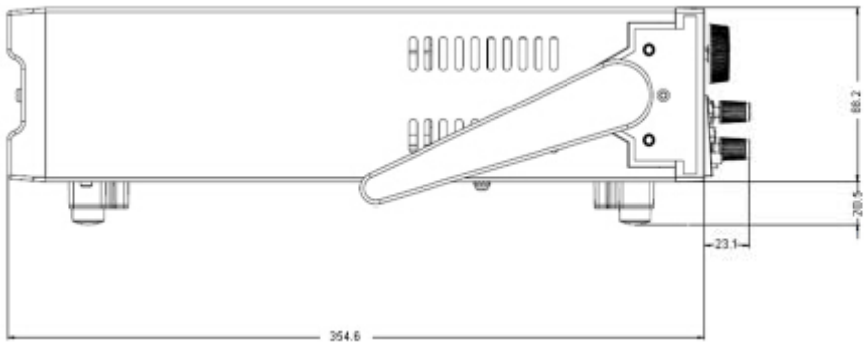
Bench operation **Handle**

Picture 11

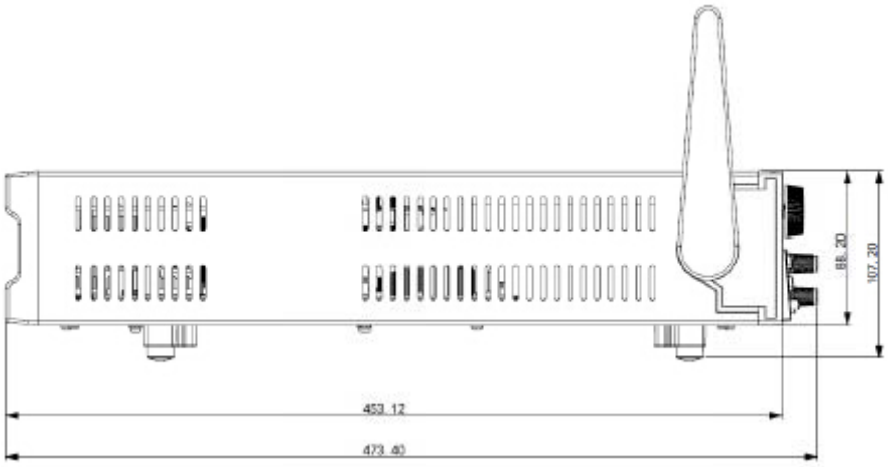
1.2.8 The size of the power supply

IT6322A dimension: 214.5mmW*88.2mmH*354.6mmD





IT6332A/IT6333A is lengthened, dimension: 214.5mmW*88.2mmH*453.1mmD



Chapter 2 Specification

2.1 Specification

IT6322A				
Parameters		CH1	CH2	CH3
Rated voltage (0 °C - 40 °C)	Voltage	0-30V	0-30V	0-5V
	LVP	31V	31V	6V
	Current	0-3A	0-3A	0-3A
	Power	90W	90W	15W
Load regulation (% of output+offset)	Voltage	⩽0.01%+3mV	≤0.01%+3mV	≤0.01%+3mV
	Current	⩽0. 1%+3mA	≤0.1%+3mA	≤0.1%+3mA
Line regulation (% of output+offset)	Voltage	⩽0.01%+3mV	≤0.01%+3mV	≤0.01%+3mV
	Current	⩽0. 1%+3mA	≤0.1%+3mA	≤0.1%+3mA
Setting resolution	Voltage	1mV	1mV	1mV
	Current	1mA	1mA	1mA
Readback resolution	Voltage	1mV	1mV	1mV
	Current	1mA	1mA	1mA
Setting accuracy （Within 12 months） (25 °C ± 5 °C) **(% of output+offset)**	Voltage	⩽0.03%+10mV	≤0.03%+10mV	≤0.03%+10mV
	Current	⩽0.1%+5mA	≤0.1%+5mA	≤0.1%+5mA
Readback accuracy (25 °C ± 5 °C) **(% of output+offset)**	Voltage	⩽0.03%+10mV	≤0.03%+10mV	≤0.03%+10mV
	Current	≤0.1%+5mA	≤0.1%+8mA	≤0.1%+5mA
Ripple and noise	Voltage（Vp-p）	⩽3mVp-p	⩽3mVp-p	⩽3mVp-p
	Voltage （rms）	≤1mVrms	≤1mVrms	≤1mVrms
	Current （rms）	⩽3mArms	⩽3mArms	⩽3mArms
TEMP coefficient (0 °C ~ 40 °C) **(% of output+offset)**	Voltage	⩽0.03%+10mV	≤0.03%+10mV	≤0.03%+10mV
	Current	⩽0.1%+5mA	≤0.1%+5mA	≤0.1%+5mA
Readback Temp. coefficient (% of output+offset)	Voltage	⩽0.03%+10mV		
	Current	⩽0.1%+5mA		
Parallel accuracy	Voltage	⩽0.02%+5mV		
	Current	⩽0.1%+20mA		
Memory	Save/recall	36 groups		
Timer	Time set	0.1~99999.9second		
	Resolution	0.1second		
	Function	Ouput timer		

IT6332A				
Parameters		CH1	CH2	CH3
Rated voltage (0 °C - 40 °C)	Voltage	0-30V	0-30V	0-5V
	LVP	31V	31V	6V
	Current	0-6A	0-6A	0-3A
	Power	180W	180W	15W
Load regulation (% of output+offset)	Voltage	⩽0.01%+3mV	≤0.01%+3mV	≤0.01%+3mV
	Current	⩽0.01%+3mA	≤0.01%+3mA	≤0.01%+3mA
Line regulation (% of output+offset)	Voltage	⩽0.01%+3mV	≤0.01%+3mV	≤0.01%+3mV
	Current	⩽0.01%+3mA	≤0.01%+3mA	≤0.01%+3mA
Setting resolution	Voltage	1mV	1mV	1mV
	Current	1mA	1mA	1mA
Readback resolution	Voltage	1mV	1mV	1mV
	Current	1mA	1mA	1mA
Setting accuracy (Within 12 months) (25 °C ± 5 °C) **(% of output+offset)**	Voltage	⩽0.03%+10mV	≤0.03%+10mV	≤0.03%+10mV
	Current	⩽0.1%+8mA	≤0.1%+8mA	≤0.1%+5mA
Readback accuracy (25 °C ± 5 °C) **(% of output+offset)**	Voltage	⩽0.03%+10mV	≤0.03%+10mV	≤0.03%+10mV
	Current	≤0.1%+8mA	≤0.1%+8mA	≤0.1%+5mA
Ripple and noise	Voltage（Vp-p）	⩽4mVp-p	≤4mVp-p	≤3mVp-p
	Voltage （rms）	≤1mVrms	≤1mVrms	≤1mVrms
	Current （rms）	⩽5mArms	≤5mArms	≤4mArms
TEMP coefficient (0 °C ~ 40 °C) **(% of output+offset)**	Voltage	⩽0.03%+10mV	≤0.03%+10mV	≤0.03%+10mV
	Current	⩽0.1%+5mA	≤0.1%+5mA	≤0.1%+5mA
Readback Temp. coefficient (% of output+offset)	Voltage	⩽0.03%+10mV		
	Current	⩽0.1%+5mA		
Parallel accuracy	Voltage	⩽0.02%+5mV		
	Current	⩽0.1%+30mA		
Memory	Save/recall	36 groups		
Timer	Time set	0.1~99999.9second		
	Resolution	0.1second		
	Function	Ouput timer		

IT6333A				
Parameters		CH1	CH2	CH3
Rated voltage (0 °C - 40 °C)	Voltage	0-60V	0-60V	0-5V
	LVP	61V	61V	6V
	Current	0-3A	0-3A	0-3A
	Power	180W	180W	15W
Load regulation (% of output+offset)	Voltage	⩽0.01%+3mV	≤0.01%+3mV	≤0.01%+3mV
	Current	⩽0.01%+3mA	≤0.01%+3mA	≤0.01%+3mA
Line regulation (% of output+offset)	Voltage	⩽0.01%+3mV	≤0.01%+3mV	≤0.01%+3mV
	Current	⩽0.01%+3mA	≤0.01%+3mA	≤0.01%+3mA
Setting resolution	Voltage	1mV	1mV	1mV
	Current	1mA	1mA	1mA
Readback resolution	Voltage	1mV	1mV	1mV
	Current	1mA	1mA	1mA
Setting accuracy (Within 12 months) (25 °C ± 5 °C) **(% of output+offset)**	Voltage	⩽0.03%+10mV	≤0.03%+10mV	≤0.03%+10mV
	Current	⩽0.1%+5mA	≤0.1%+5mA	≤0.1%+5mA
Readback accuracy (25 °C ± 5 °C) **(% of output+offset)**	Voltage	⩽0.03%+10mV	≤0.03%+10mV	≤0.03%+10mV
	Current	≤0.1%+5mA	≤0.1%+5mA	≤0.1%+5mA
Ripple and noise	Voltage（Vp-p）	⩽4mVp-p	≤4mVp-p	≤3mVp-p
	Voltage （rms）	≤1mVrms	≤1mVrms	≤1mVrms
	Current （rms）	⩽4mArms	≤4mArms	≤4mArms
TEMP coefficient (0 °C ~ 40 °C) **(% of output+offset)**	Voltage	⩽0.03%+10mV	≤0.03%+10mV	≤0.03%+10mV
	Current	⩽0.1%+5mA	≤0.1%+5mA	≤0.1%+5mA
Readback Temp. coefficient (% of output+offset)	Voltage	⩽0.03%+10mV		
	Current	⩽0.1%+5mA		
Parallel accuracy	Voltage	⩽0.02%+5mV		
	Current	⩽0.1%+30mA		
Memory	Save/recall	36 groups		
Timer	Time set	0.1~99999.9second		
	Resolution	0.1second		
	Function	Ouput timer		

2.2 Additional features

Suggested calibration frequency: 1time /Year

Line voltage supported (can be selected by the switch on the rear panel)
Option 01: 220VAC ± 10%， 47 to 63 Hz
Option 02: 110 VAC ± 10%， 47 to 63 Hz

Max input power

Module	IT6322A	IT6332A
Power	750VA	1000VA

Cooling
Fans
Operation temperature
0 to 40 °C
Storage temperature
-20 to 70 °C
Environmental conditions
Indore use only, max humidity 80%, no condensation.

Chapter 3 Front-panel Operation

So far we have covered the quick start chapter which briefly introduced the front panel operation and how to check basic voltage and current functionality. This chapter describes in detail how to operate the instrument manually via the front-panel keys.

3.1 Front-panel Operation Overview

- The power supply is shipped from the factory ready for front-panel operation mode. At power-on, the power supply will automatically enter the front-panel operation mode and the instrument can be controlled via the front panel keys and knob.
- The power supply enters remote mode as soon as a valid remote command is received via the communication connector in the rear. Switching to remote mode does not impact the supply's output parameters. In remote mode, front-panel operation is disabled. Only Meter and Local buttons are enabled. If the power supply is in remote mode, and the (Local) key is enabled, you can revert to manual mode by pressing the (Local) key.
- The power supply is in Set mode when it is powered on. In this mode, the VFD will display the setting voltage and current.
- The output of power supply can be enabled/disabled from the front panel by pressing the On/Off button.When turn on the output,the VFD will display the state and voltage/current of each channel."CC" represents constant current mode."CV" represents constant voltage mode.**When output is in OFF mode,VFD will have no any indicators of CC or CV.**
- The VFD also displays operation states or error information. " " means the power supply is in remote mode.When front-panel keys are locked, Enter button will be lit. " " means the power supply keyboard locked .For more details, please refer to chapter of "Descriptions about VFD marks"
- If the power supply is in set mode, you can modify parameters using the knob. If the power supply is in menu operation, the knob is used for menu selection.
- When V-set , I-set , Recall , Meter or On/Off buttons are lit,means they are selected and under corresponding state now.If pressing (Shift)+ Recall (Save), Recall button will keeping flickering and waiting for a number to be entered to specify the memory location.
- When V-SET/I-SET buttons are lit, following conditions will enable the cursor to display again.
  Pressing V-SET/I-SET buttons again
  Adjusting the knob

Pressing direction buttons

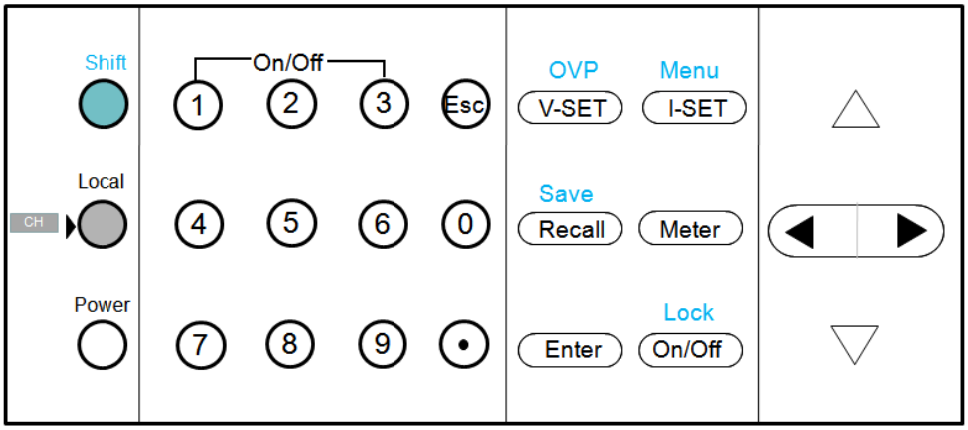
Note: If there is any operation on front panel within 5S, the cursor will disappear automatically. You can also disable the cursor by pressing ESC button. When VFD displays cursor, you can modify the parameters by adjusting knob or up/down keys, or move the cursor by right/left keys.

Details about key buttons' state:

V-set	When button is lit, means you can set voltage. When button keeps flickering, means in OVP setting mode.
I-set	When button is lit, means in current setting mode.
Recall	When button is lit, means in recall mode When button keeps flickering, means in save mode and waiting for a number to be entered to specify the memory location.
Meter	When button is lit, means current VFD displays actual voltage and current.
On/Off	When button is lit, means at least one channel output is on. Or all channels are in OFF mode.

Note: V-set, I-set, Recall buttons will not be lit at the same time.

3.2 Panel Description



Picture 12

0 ~ 9	Numeric keys.Use keys 1~3 to control the output state of the 3 channels which should coordinate with Shift key.Note:In key lock mode, Shift key is not needed.
Esc	Escape from the current setting or menu item.
(Shift)	Compound key
(Local)	Used to switch to local operation mode

(Power)	Used to power on/off the DC source
V-set /OVP	Used to set the voltage or shift+V-set to set OVP value
I-set /Menu	Used to set the current or shift+I-set to enter the menu operation.
Recall /Save	Save or recall different operating parameters in memory locations
Meter	Switch the display between setting value and actual value
Enter /Lock	Enter button to confirm the selection or Shift+Enter to lock the front keys
On/Off	Used to control the output state of all channels
◀ ▶	Right/Left key,use to move the cursor or scroll through the menu items
△ ▽	Up/down key,used to increase or decrease the setting value
(Shift)+1, (Shift)+2, (Shift)+3	Used to turn on the output of corresponding channel no matter in menu operation or Meter state

3.3 VFD Description

Explanation of enunciators on the display

C	In constant current mode
V	In constant voltage mode
🔒	Keyboard operation for the lock mode
Y	open the remote sense function
↑	Indicates the shift button is pressed
▶	Indicates the channel currently selected
T	Enable tracking mode

3.4 Menu Description

Press (Shift)+ I-set (Menu) to indicate operation mode.View the menu on the

VFD,and use the right/left key to change the setup, and up/down key to scroll through the complete menu items. Press Enter to enter the selected menu function.Press Esc button to return to the previous menu.When the item keeps filickering indicates it is selected currently.

Power Menu...					
	Config	Configuration Menu			
		Configuration Menu…		Configuration Menu	
		OutState	Power Out State Set	Power supply power on output state Settings	
			Off	all along OFF	
			Keep	Keep the last time state before the shutdown	
		OutParam	Power Out Param Set	Set up the related parameters when power on	
			Reset	default	
			Keep	Restore the last time parameters	
		Knob	Knob Function Set	Pulsating knob function Settings	
			Unlock	Pulsating knob function open	
			Lock	Pulsating knob function closed	
		Buzzer	Power Key Beeper Set	Key sound establishment	
			Off	Key sound closed	
			On	Key sound open	
		Communication	Communication Select	Communication interface choice	
			RS232	Choose RS232 communication interface	
				RS232 Communication Set	RS232 communication set
					4800, 8, N, 1,Single 9600 O Mux 19200 E 38400 57600 115200
			USB	Choose USB	

				communication interface		
	ExtPort	ExtPort settings…		External interface Settings		
		None				
	MemoryGroup	Select Memory Group		Memory group set		
		GRP1		Group 1		
		GRP2		Group 2		
		GRP3		Group 3		
		GRP4		Group 4		
	Command	SCPI Version Select…		SCPI version select		
		ITECH		ITECH SCPI command		
		EXT1		Extended SCPI command 1		
		EXT2		Extended SCPI command 2		
	ReturnMeter	Auto Return to Meter State				
		Off				
		Wait5Sec		The front panel display will change from setting to meter state automatically after 5s.		
	Reset	Reset Menu Default		Reset to		
				No		
				Yes		
	Exit					
System						
	Channel Sel …					
	CH1		System Menu…			
			Maxvolt		Maxvoltage Set	
					MaxVolt=31.000V	
			Outtimer		Out Timer State Set	
					Disable	
					Enable	
			Exit			
	CH2		System Menu…			
			MaxVolt		MaxVoltage Set	
					MaxVolt=31.000V	
			OutTimer		Out Timer State Set	
					Disable	
					Enable	

		Exit		
	CH3	System Menu…		
		MaxVolt	MaxVoltage Set	
			MaxVolt=6.000v	
		Outtimer	Out Timer State Set	
			Disable	
			Enable	
		Exit		
Comb	Power Combine Set…			
	Off			
	Series	Series Choose…	Select serial connect mode	
		CH1+CH2	Connect CH1 and CH2 in serial	
	Parallel	Parallel Choose…	Select parallel connect mode	
		CH1+CH2	Connect CH1 and CH2 in parallel	
		CH2+CH3	Connect CH2 and CH3 in parallel	
		ALL	Connect three channels in parallel	
	Track	Track Choose…	Enable tracking function	
		CH1+CH2		
		CH2+CH3		
		ALL		
Exit				

3.5 Panel Operation

Voltage operation should be taken before setting the voltage of the upper limit.

3.5.1 Channel Operation

When V-set or I-set button is lit, press (Local) key can switch between the three channels.

3.5.2 OUT ON/OFF

Pressing On/Off button toggles the output state of all 3 channes of the power supply.If the output state is ON,press it,to turn the output state to OFF.While the output state is OFF,press On/Off and the power supply output will turn ON.

To control channels individually,press (Shift)+ ①, (Shift)+ ②, (Shift)+ ③ corresponding to each channel. (Shift)+ ① controls the output state of the first channel, (Shift)+ ② controls the output state of the second channel, (Shift)+ ③

controls the output state of the third channel.
When the power supply is in remote mode,you can set the output state by sending SCPI command(OUTPut: ON | OFF).The output state operation does not affect any other parameter.

Note: The On/Off key controls the output state of all 3 channels simultaneously.
If you want to control the output state of individual channels,use the number keys 1-3 with shift button.

3.5.3 Timer operation

If the “Outtimer”is enabled for any channel In the menu, after the time set, the specified channel of the power supply will automatically switch to output off state. I. Please refer to Out Timer of chapter 3.6

3.5.4 Set Voltage

Solution 1: press (Local) to select channel, press V-set then enter a numerical value followed by Enter.

Solution 2: Press V-set ,then press ▶ ◀ to move the cursor position and adjust the voltage value using the knob. Press Esc or Enter to exit.

Solution 3: Press V-set ,then press ▶ ◀ to move the cursor position and adjust the voltage value using △ ▽. Press Esc or Enter to exit.

Note: When output in OFF mode and Meter button is dark, rotary knob and up/down keys can’t be used to adjust voltage and current.
If rotary knob is enabled, then adjusting it will real-time change the current output setup without pressing Enter to confirm.

3.5.5 Current Operation

Solution 1: press (Local) to select channel, press I-set then enter a numerical value followed by Enter.

Solution 2: Press I-set , then press ▶ ◀ to move the cursor position and adjust the

current value using the knob.Press Esc or Enter to exit.

Solution 3: Press I-set, then press ▶ ◀ to move the cursor position and adjust the current value using △ ▽. Press Esc or Enter to exit.

3.5.6 Save and Recall Operation

You can store up to 36 different operating states in memory locations 1 through 36.They are divided to four groups, each group includes nine different setups. Each operating state includes a constant voltage value, constant current value, maximum output voltage.

Press (Shift) + Recall(Save) followed by a number key to save the current operating state to non volatile memory.

Press Recall +number 1 to 9 to recall operating state assigned to this location.

You can also use the SCPI command(*SAV、*RCL) to save and recall.

When Save operation is done,there will be a corresponding information to indicate the successful or failed operation.While for Recall operation,only information to indicate failed recall.

Note: The power supply doesn't support Save/Recall operation when in serial/parallel or tracking mode.

If in serial/parallel mode and do Save/Recall operation, the VFD will display INV OPER (invalid Operation) to remind the user of a wrong operation.

If parameters want to be recalled do not exist, the current value position on VFD will display -----, and then resume after 2S.

3.5.7 OVP operation

Select the channel-----press (Shift)+ V-set(OVP)-----select "ON" and continue to set the OVP value.After set successfully,when the actual voltage is higher than OVP value,then VFD will display "OVER VOLT".

3.5.8 Key Lock Set

Press (Shift) + On/Off (Lock) can lock the front panel keys and label " " will be lit on the lower left corner

In key lock mode, all keys are disabled, except 1, 2, 3, On/Off, Meter (Local) and . (Shift)+ ⊙ keys.

3.5.9 Protections

Over Temperature Protection

If the internal temperature of the power supply exceeds 80℃,the instrument will protect itself by automatically turning power OFF. When this happens you will hear a buzzer and

the display will indicate the following:

Picture 13

3.6 Menu Description

In the menu, righ/left arrow keys and rotary knob used for flow around the menu, change the options, Enter Used to identify the current menu commands or into the next layer menu. Press Esc can exit menu or enter a layer menu.

Config

OutState

This parameter sets the output On/Off state at power up. If you select "**Keep**", the power supply will save the output state prior to power down and revert to that state at power up. If you select "**Off**", the output state is always "**OFF**" when the power supply is turned on. The recommend setting is "**OFF**".

OutParam

This menu item is used for set up power whether save the last output parameters. If you select "**Keep**", the power save the last time before the shutdown of the output parameters. The next time after startup power output parameter is still the last output parameters. If you select "**Reset"**, the power output for factory default output parameters.

Knob

This item enables ("On") or disables ("Off") the knob.

Buzzer

This item turns the beep sound for key presses "On" or "Off".

Communication

This item set the communication mode, optional communication interfaces are RS232, USB.

RS232 Communication Set

This item configures the baud rate for serial communication.Possible values are 4800,9600,19200,38400,57600,115200.When operating the power supply in remote mode,make sure that you configure idential baud rate settings for the power supply and the computer.

Optional settings of parity bit for serial communication are NONE,ODD and EVEN.Default setting is NONE.

USB

Select communication mode via USB interface.

MemoryGroup

You can store up to 36 different operating states in a nonvalatile memory space.All saved parameters are divided into four groups.They are Grp1,Grp2,Grp3 and Grp4.Each grop can save 9 different operating states(1~9).

Command

This item set the communication protocol.Possible settings are SCPI,EXT1 and EXT2.Default setting is SCPI.

ReturnMeter

This item enable(“Wait5Sec”) or disable(OFF) the function to turn back to meter state automatically.When select “Wait5Sec”,the display on front panel will automatically change to meter state under the condition of no operation,within 5S.

Reset

If you enter this menu and select “YES”,all parameters will be set to their default values.

Exit

Escape the menu.

System

This item set the max voltage and outtimer of each channel.

Choose one channel and set the parameters.

MaxVolt

The max voltage you set should be within the range of 0V to the maximum rated voltage.You can edit this value using the △,▽ keys or via numerical key pad followed by Enter.The default setting is the maximum rated voltage for each channel.

Out Timer

This item sets the output timer for each channel.The range is 0.1~99999.9S.If you enable this function,and the output state of all channels is on,the timer will start counting down immediately.Once the timer expires(count down from set value to zero) the output of the assigned channel will turn off.To disable the timer,set the output time to zero.Default setting is 0 seconds.

Comb

This item configures the instrument connection mode.

Off

”Off” means that each channel operates independently. When set successfully, front

panel will display “Remove success!”

Series (Series mode)

This function configures the instrument for series operation of CH1 and CH2.Press Enter button to confirm your set.And press Esc to quit the operation.

When enable series connection mode,the front panel will indicate “Series success!” and escape this screen after 2S.

Front display as follows in condition of output off and meter state.

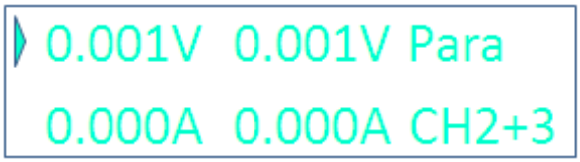
Picture 14

Parallel (Parallel mode)

This function configures the instrument for parallel operations of three channels.Possible combination mode are CH1+CH2,CH2+CH3,ALL. Press Enter button to confirm your set.And press Esc to quit the operation.

Take “CH2+CH3” as an example,press (Shift) + I-set (Menu) ------Select “Comb” and press Enter to confirm.-------select “ CH2+CH3” item and press Enter to confirm.The front panel will indicate “Parallel Success!” and escape this screen after 2S.

Front display as follows in condition of output off and meter state.



Picture 15

Track (sync output setting)

This function configures the instrument for tracking operations of three channels. Possible combination mode are CH1+CH2,CH2+CH3,ALL. Press Enter button to confirm your set.And press Esc to quit the operation.

In tracking mode,once the parameters of any one channel are changed,other channels will change proportionally.

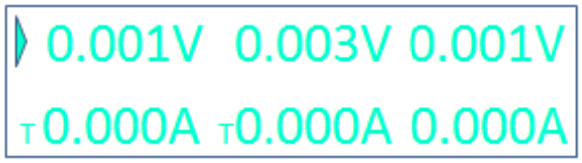
For example, set voltage and current of CH1 and CH2 as follows, CH1: 4V, 1A; CH2: 8V,

2A. Press (Shift) + I-set （Menu）into Menu, and press to select Comb, VFD will display as follows:

CH1+CH2 CH2+CH3 ALL

Select “CH1+CH2” and press Enter to confirm.The VFD will display “Track Set Success!” and escape this screen after 2S..

Front display as follows in condition of output off and meter state.



Picture 16

For example:In setting status, if voltage of CH1 is set as 2V, voltage of CH2 will automatically change to 4V proportionally.

Notice:Tacking function is disabled to the channel with 0V or 0A setting.In the former example,if CH2 setting is 0V or 0A,then when CH1 voltage is adjusted to 2V,CH2 will remain unchanged.

Parameters in Serial,Parallel or Tracking mode

Maximum voltage

Operate “CH1+CH2” in series,the max voltage is 62V the sum of the max voltage of CH1 and CH2.

Operate “CH1+CH2” in parallel,the max voltage is the smallest max voltage of the two channels. It is 31V.

Operate “CH2+CH3” in parallel,the max voltage is the smallest max voltage of the two channels,it is 6V.

Operate “CH1+CH2+CH3” in parallel,the max voltage is the smallest max voltage o f the three channels.It is 6V.

In tracking mode,the max voltage is 31V.

Out timer

In serial,parallel and tracking mode,the out timer function will be disabled.

Save/Recall

In serial,parallel and tracking mode,the Save/Recall function will be disabled.

Notice: When changed to serial,parallel or tracking mode,all channels will be OFF and voltage will be reset to 0V.The channels configured to serial,parallel or tracking

mode will be add a label of "[ ]" in the display.

Power Information

Press (Shift) +⊙, VFD will display power information; the information includes the following parts:

Power Model
Display the model of power supply: IT63XXA
Soft Version
firmware version of power supply: Ver=1.XX-1.XX

Power SN
Display the serial number of the power supply: SN:XXXXXXXXXXXXXXXXX

Calibration information

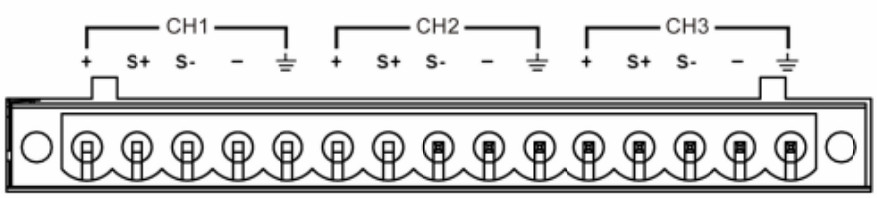
Display calibration information: 2005-8-26 17:46:13

Error Information

If error, press (Shift) +⊙, VFD will display error information, press any key to display the next error message, If not, then continue to display information on above (model, the software version, serial number, etc.)
Error message will be cleared in the display, but fault still exist.

3.7 Remote sense function

Remote voltage sensing is used to maintain good regulation at the load and reduce the degradation of regulaiton that would occur due to the voltage drop in the leads between the power supply and the load.By connecting the supply for remote voltage sensing,voltage is sensed at the load rather than at the supply's output terminals.This will allow the supply to automatically compensate for the voltage drop in the load leads and improve regulation.



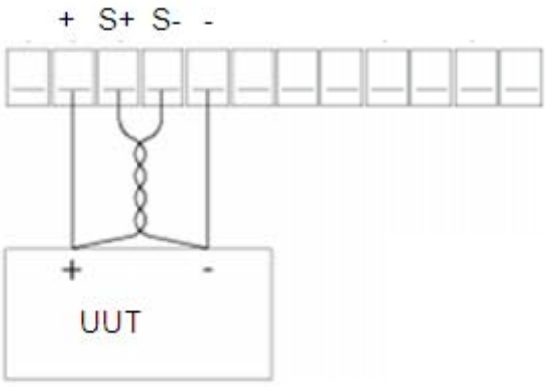
+, -: output terminal,the same as front pane output terminals
S+,S-: Remote sensing terminal

Disable remote sense function:
1. Use the standard shorting clip which has been installed before leave the factory.Or you can also use wires to short "S+" and "+","S-" and "-"..
2. Connect output "+" and "-" to the load input teminals "+" and "-".

Enable remote sense function:

1. Remove the shorting clip between “S+” and “+”,”S-“ and “-“.
2. Connect output “+” and “-“(front panel) to the load input teminals “+” and “-“.
3. Connect “S+” to “+” of the load,”S-“ to the “-“ of the load.

Note:To ensure the system stability, please use twisted-pair cables between sense terminal and load.



Chapter 4 Communication with PC

IT6300A Standard configuration have three communication interface:RS232，USB. The user can choose any one to realize the communication with the computer. The following content can help you understanding how to through the computer control power supply output.

4.1 RS232 interface

The power rear panel has a DB9 needle mouth. Using both for the COM (DB9) cable connect computer.Press (Shift) + I-set（Menu）, setting menu of configuration the same as the computer configuration before Activation connection. RS - 232 interface can use all of the SCPI command to programming.

Note: in the procedure ,the RS - 232 must be set consistently with the front panel system menu set .If you want to change,please press **(Shift)+** I-set **（Menu）**and access to menu to change.

RS-232 data format

RS-232 data is a start bit and a stop bit 10 words. Start bit and the number of stop bits can not be edit.However， press (Shift)+ I-set（Menu）and you can choose the following parity item. Parity options are stored in nonvolatile memory.

Baud rate

Press (Shift)+ I-set（Menu）,under the system menu, you can select a baud rate which is stored in nonvolatile memory :
4800 9600 19200 38400 57600 115200

RS-232 connection

RS - 232 serial port can connect with controller serial port by using a piece of RS - 232 cable with DB - 9 interface.(such as PC). The following table shows the plug of the pin.

If your computer connect with RS-232 interface with DB - 25 plug, you need a cable and a adapter which one aspect of the matter is DB - 25 plug the other end is DB - 9 plug.

Picture 17

RS - 232 plug pin

Pin number	Description
1	Connectionless
2	TXD, transmit data
3	RXD, receive data
4	Connectionless
5	GND
6	Connectionless
7	Connectionless
8	Connectionless
9	Connectionless

RS-232 troubleshooting

If the RS - 232 connection has a problem, check the following aspects:
The computer and power supply must be installed with the same baud rate, the same parity bit, the same data bit and the same flow control options. Pay attention to power configuration into a start bit and a stop bit. (These value is fixed.)
As the description of the RS - 232 connector ,you must use the correct interface cable or adapter. Attention even if cable have suitable plug, internal wiring also may be wrong.

Communication settings

You should first of all make power supply matching the PC of the following parameters before communication operation.
Baud rate: 9600(4800、9600、19200、38400、57600、115200). You can go through the panel into the system menu, setting communication baud rate.

Data bits: 8

Stop bit: 1

Parity: (none,even,odd)

EVEN Eight data bits have even check
ODD Eight data bits have odd check
NONE Eight data bits have no check

The machine address: (0 ~ 31, the factory a value of 0)

Parity=None	Start Bit	8 Data Bits	Stop Bit

4.2 USB interface

You can connect the power and computer by using a USB cable with an A type port and a B type port. All the power function can programmed through the USB.

The power supply USB488 interface functions are described as follows:

- ıntерface is 488.2 USB488 interface.
- Interface receive the request of REN_CONTROL, GO_TO_LOCAL, and LOCAL_LOCKOUT
- Interface receive command information about MsgID = TRIGGER USBTMC and pass on TRIGGER order to function layer。

The power USB488 device function are described as follows:

- Equipment can read all the forced SCPI command.
- Equipment is SR1 enabled。
- Equipment is RL1 enabled。
- Equipment is DT1 enabled。

4.3 Standard software and SCPI command

IT6300A power supply can use the company standard software IT7000 communicatio n software, and provides rich SCPI commands for secondary development. If you ne ed software/SCPI communication protocol, please enter www.itechate.com to downloa d or contact with ITECH directly.

Frequently Asked Question

1. The conductor weight specifications

The following form lists the AWG copper wire to withstand maximum current value

AWG	10	12	14	16	18	20	22	24	26	28
maximum current value (A)	40	25	20	13	10	7	5	3.5	2.5	1.7

Note: AWG (American Wire Gage), that is X line (the mark is on conductor). The above list is the load flow of a single conductor when it works on temperature 30 ℃

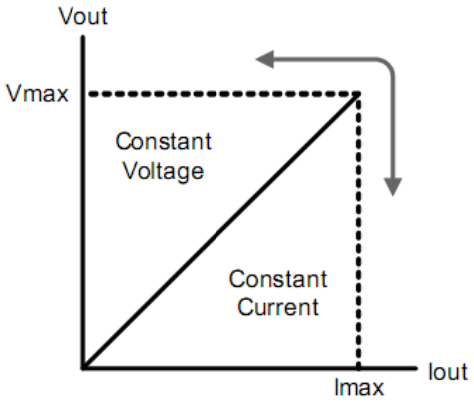
This is for your reference only.

2. Power supply can not be set as CC mode

Power supply with constant voltage/constant current can automatic switch. Through this function, the power can maintain uninterrupted operation while the load change and produces constant voltage mode to the constant current mode conversion.

In view of the current load, the power supply working in constant voltage mode, it will provide a controlled output voltage which output voltage drop constant along with the load resistance decreasing, until the current increase and limited to the default current value, and then conversions. By this time,the power supply into constant current output while the output voltage will scale reduce which is according to the load resistance get smaller.

When the current value is less than set value, power go back to constant voltage mode.

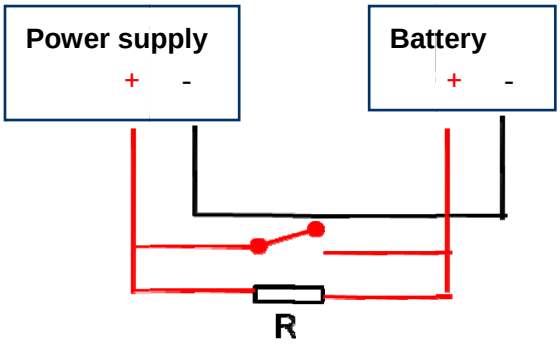


The power supply's work mode can be indicated by the mark area of VFD. If the VFD displays CV, the power supply IS in the constant voltage mode. If the VFD displays CC, the power supply is in the constant current mode.

3. Test battery , how to prevent flint when Joint battery?

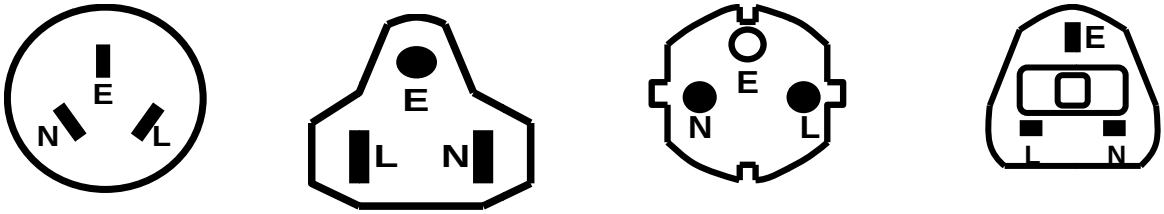
when Joint battery,it strikes fire that is because power supply positive and negative terminal capacitance discharge. The method of avoiding flint as follows: Please connect a switch to the wire, and parallel a charging current limiting resistor to the

wire. When all the wire connection has no problem,please close the switch.



Appendix

Types of power line



China	The United States, Canada,	Europe	Britain
IT-E171	IT-E172	IT-E173	IT-E174

Glyph

Open Close Main circuit disconnection closed Main circuit connection open

Support process

If you have a problem, follow these steps:

1 Check the documentation that come with the product

2 Visit the ITECH online service Web site is www.itechate.com ,ITECH is available to all ITECH customers. It is the fastest source for up-to-date product information and expert assistance and includes the following features:

Fast access to email AE

Software and driver updates for the product

Call ITECH support line 4006-025-000